Archaeological Excavation
Final Report
ESB Substation
O'Connell Street Lower
Dublin 1

Licence No. 03E0433
Report No: 03079-R3

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For
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1 Introduction

1.1 This report describes the results of an archaeological excavation undertaken on behalf of the Railway Procurement Agency as part of the Luas Development. The site is situated within the Historic City of Dublin (DU018-020) as listed on the Record of Monuments and Places (DU018-020). The excavation was located at the site of an ESB sub-station in the central median of O'Connell Street between the statues of William Smith O'Brien and Daniel O'Connell.

1.2 Structural remains were identified by Kevin Weldon of Margaret Gowen and Company Ltd during ongoing monitoring (01E0733) of the works and removal of rubble overburden at the site. Following a site inspection by Edward Bourke Senior Archaeologist and Laura Claffey, Archaeologist of the National Monuments Section of the Department of the Environment, Heritage and Local Government (formerly *Dúchas*) on the 25th March 2003, it was agreed that the site be preserved by record and a licensed excavation ensued.

1.3 The excavation was directed by Christine Baker with a team of 5-6 archaeologists under licence no. 03E0433 over a two week period commencing 31 March 2003. Preceding this two days of hand clearance took place (27th-28th March 2003).

1.4 The excavation programme revealed a number of structural features including a quay wall, together with surrounding archaeological deposits, which were indicative of late 17th and 18th century development in this area.

2 Historical Background

2.1 O'Connell Street, as it is now known was formerly Sackville Street. Named after Lionel Cranfield Sackville, first duke of Dorset and Lord Lieutenant of Ireland (1731-1737, 1751-1755) it was originally known as Drogheda Street after Viscount Moore, Earl of Drogheda who in 1729 sold his interest to the Right Honourable Brabazon, Lord Duncannon and Luke Gardiner. Drogheda Street terminated north the intersection with the present Abbey Street.

2.2 The present Lower O'Connell Street where the excavation site was located formed part of Bachelors Walk, which had its origins in the Amory grant of 1675. From the medieval period the majority of lands immediately north of the River Liffey formed part of St Mary's Abbey. Throughout this period, and even subsequent to the dissolution of the monasteries in 1539, the area remained undeveloped and subject to tidal flooding.

2.3 In January 1675, the city granted Jonathon Amory, a merchant, a lease for 299 years 'of that part of the Strand on the north side of the Liffey, situate betwixte the wall of the Pill, in the possession of Lord Sangtry, and the water mill lately built by Mr Gilbert Mabbott'. Equivalent to the area between the modern Hal'penny Bridge and the Abbey theatre the grant encompassed 'all which stand and premises are covered every tide at full sea with water and is part of the river Analiffy' (de Courcy 1998, 15).

2.4 The formation of the quays proceeded quickly in late 17th and 18th centuries. Although there was no formal civic guide to the building of the quays, some of which were built as single units, the quay width for the Amory Grant was stipulated as 60ft (McCullough 1984, 33). The result was a strip of newly developed land, which landlocked and preserved the old shoreline behind it and upon which was, constructed a terrace of houses on an esplanade, Bachelor's Quay.

2.5 The origin of the name Bachelors Quay or Bachelors Walk as it was also known is unclear. It has been suggested that it originated from 'some long deceased capitalist named Batchelor' or its use as a promenade for unattached males. The latter is unlikely as there was difficulty of access to the area pre 1675 and not long afterwards it became a busy quay (de Courcy 1998, 15).

2.6 Construction of the houses of Bachelors Walk began in the early 1700s. The houses were 4 storey over basement and were built overlooking the quayside (Pearson 2000, 372). By the late 18th century, the area was dominated by merchants (Watson 1792). An eminent inhabitant was the mapmaker John Rocque who lived there from 1754 to 1760 (de Courcy 1996, 15). Bachelor's Quay was transected by a laneway known as the North Lotts, which originally accommodated the stables and warehouses of both Upper Abbey St and Bachelors Walk (Pearson 2000, 375).

2.7 The new city developments including those north of the Liffey were not spatially integrated with the medieval core nor particularly well connected to it. As a measure to counter this 'The Commissioners for the Making of Wide and Convenient Street and Passages', otherwise known as the Wide Street Commissioners, was set up by an Act of Parliament of 1757 (Sheridan 2001, 69). Their remit was refined and extended in an Act of Parliament of 1790 (Clause XV) which underlined the rights of the Commissioners to alter existing streets or build new ones 'when and as often as it shall appear to the said Commissioners, or any nine or more of them, to be necessary or expedient' (Sheridan 2001, 119).

2.8 A direct consequence of this was construction of a new bridge, Carlisle Bridge (O'Connell Bridge) and the extension of Sackville Street. The proposed building of the Carlisle Bridge was first mooted in the mid 18th century but its opponents principally the merchants established in the old port precinct and along the older quays held up its construction for almost 50 years. It was finally opened in 1795 (de Courcy 1996, xxxiii).

2.9 The Commissioners were empowered to buy all buildings, grounds and properties necessary to their design. On their orders materials from buildings pulled down were to be removed from the site as fast as possible (Sheridan 2001, 118). Such development was not without its objectors. In 1792 Henry Attivel holding some of the plots where new houses were being erected along Lower Sackville Street wrote to the Commission

'The line from Sackville Street to the New Bridge being divided by a lane of 6 feet which is taken off the rere of my Ground appears to me and those whom I have Let to as avery great Nuisance tending to create dirt, and probably will be resorted to by Thieves, and Night Tenantry..' (Sheridan 2001, 141).

2.10 The activities of the Wide Street Commissioners had a considerable impact on streetscape of the eastern limit of Bachelors Walk and its environs. Nos.36-41 Bachelors Walk disappeared and at least 8 Abbey St houses including that of James Sullivan a wine cooper at no.72 were demolished (Pearson 2000, 364).

2.11 There were safeguards for tenants-at-will or yearly tenants who were given compensation for having to leave. In 1782, 39 Bachelors Walk an old house was valued at £574 while 2 new houses built by a Mr Thwaite were worth £2,250 (Pearson 2000, 372).

2.12 Of the houses removed from Bachelors Walk, No.41 had been owned by Simon Vierpyl, a sculptor who had repaired the quay wall in about 1779 at a cost of £41. His house, which he had purchased in 1768 had a 'shew shop' there. His neighbour at No. 40 was a Dr Achmet Borumbadab who established 'the great cold baths' there in 1772. He subsequently took over the yard of No.41 where plastering was carried out for the baths, which contained 21 tunnels of arched brickwork and 21 grates (Pearson 2000, 372).

2.13 A seal from a glass bottle (3E0433:7:18) associated with the construction of a structure (F4) excavated during the excavation was inscribed David Haoard 1711 (Fig. 14). David Howard (to use the modern spelling) was a vintner and churchwarden of the Parish of St. Werburghs. Although no reference to his ownership of premises at Bachelors Walk has been uncovered he did hold property in Essex Street. In 1716 David Howard , City Vintner was allowed 'all that parcel of weastground situated to the south side of Essex Street....as is the same is granted by the Minister to Church Wardens...of the Parish of St. Werboroughs.. (Deed no. 8057).

2.14 The quays and what is now known Lower O'Connell Street underwent almost continuous redesign and development from the time of the Amory Grant in 1675 to the present, a process reflected in the quay wall revealed and associated archaeological deposits, excavated on the Luas site.

3 Cartographic Analysis

3.1 Close to the excavated site, de Gomme's map of 1673 (Fig. 2) depicts a small cluster of buildings roughly where the Abbey theatre is today. It has been suggested that a length of 100m of riverbank was excluded from the Amory Grant in this locality, as the presence of building precluded it from being 'covered every tide by full sea' (de Courcy 1996, 7). To the east of these buildings a block wall is depicted possibly indicating a quay. However only a single line perhaps indicating the landline or a revetment is shown to the west of these building which corresponds with a line north of the present Bachelors and Eden quays.

3.2 On Brooking's map of 1728 (Fig. 3) none of the individual building plots or the structures on them are shown but the intersection of Drogheda Street, Abbey Street and the North Lotts is apparent. The layout of this streets and the position of the quay indicate the quantity of development had taken place within half a century.

3.3 Rocque's Map of 1756 is the first map to show the individual plots and the structures associated with them (Fig. 4). An overlay of the excavation site on this map depicts the location of the structural features revealed in relation to the structures recorded in 1756. While many of the structural features revealed during excavation predate Rocque's map there are elements of continuity in the overall layout.

3.4 Wilson's Dublin directory maps of 1777 (Fig. 5) and 1804 (Fig. 6) show the effect of the extension of Sackville Street to the Carlisle Bridge by the Wide Streets Commission. The eastern limit of Bachelors Walk has been truncated and the intersection of Abbey St and the Lots formalised.

4 Archaeological Background

4.1 The site is situated outside the walled medieval city, on the north side of the River Liffey, within the Historic City of Dublin (DU018-020). In proximity are a number of sites listed on the Record of Monuments and Places. To the east is DU018-020154 listed as a 'Glasshouse site' located at O'Connell St Lower/Harbour Court (NGR 31600/23449) and to the south and west DU018-020428, the Quay at Bachelors Walk/Eden Quay (NGR 31586/23437).

4.2 Only two other archaeological excavations have been carried out on O'Connell Street in recent years. The first was undertaken at the site of Nelson's Pillar in advance of the construction of the Spire. Excavated by Franc Myles (01E0871), it unearthed the cellars of three-bay Dutch Billys, the first buildings on the site, which probably date to the last decade of the 18th century (Franc Myles pers comm.).

4.3 The second excavation (02E1825) took place approximately 5.5m south of the present site as part of the Luas development (01E0733). A brick outhouse attached to a wall of cobblestone construction, the latter possibly dating to the latter half of the 17th century were uncovered (Franc Myles pers comm.). These structures were sealed by the demolition rubble created by the expansion of O'Connell Street in the 1790s. The structures were preserved in situ and the ESB sub-station redesigned and relocated to its present position.

5 Development and Stratigraphy

5.1 The ESB sub-station was originally designed to measure 31.8m in length by 6m in width. It was subject to redesign which resulted in an area of impact which measured 30.3m in length with an average width of 8m widening to 9m in width towards the southern limit of the site. The foundation levels of the sub-station were to be approximately 5m below the present ground surface. Engineering trenching and cores identified boulder clay at approximately 3.5m below present ground level. The limits of the site were subject to piling and subsequent pouring of concrete. This allowed for an area c.5.80m in average width and 28m in length to be excavated.

Stratigraphy

5.2 The upper levels of stratigraphy were consistent across the site, comprising a sealing layer of demolition rubble (Phase 4) created by the widening of the street in the 1790s. Beneath this, there were two distinct lower sequences of stratigraphy, which were demarcated by the quay wall (F1) (Phase 1). To the north of the quay wall was Phase 2, a series of organic rich layers (F6, F10, F11) and associated structures (F4, F5). To the south of the quay wall (Phase 3) was a single reclamation deposit (17) cut by later structures (F16, F18-F20).

5.3 The underlying deposits on site consisted of natural sand (F13). Feature 13 was characterized by orange to grey coarse sand with moderate inclusions of riverine silt. Contiguous with the water table the underlying stratigraphy is consistent with the results of geotechnical coring, which identified boulder clay c. 3.5m below the present ground level, sealed by river silts. A total of 5 artefacts were recovered from interface of F13 with the base of the organic rich layers. They included clay pipe stems (mean stem bore date 1699) , 17th-19th century pottery and animal bone.

6 Excavation Results

6.1 *Phase 1*

6.1.1 *Feature 1*

The first phase of activity was characterized by the construction of the quay wall (F1) (Plates 1-3). This wall had an average overall width of 1.80m and was exposed a maximum length of 5.70m. Aligned east-west, it consisted of two distinct walls with a sand and rubble core (Plate 4). The northern wall measured 0.50m in width and 0.90m in height with 4 -5 courses. These courses were consisted of large uneven blocks (0.20m-0.30m diam.), which were bonded with a yellow sand-rich lime mortar. The southern wall measured 0.46m in width, 0.70m in maximum height and had a maximum of 4 courses. The blocks measured 0.20m-0.30m in diameter.

The fill of the core of the wall consisted of a backfill layer of rubble/mortar/redbrick and large stones (<0.26m diam.), which overlay a sand and silt mix, becoming increasingly stony towards the base. Several artifacts were recovered from the core of F1 including by-products from glass making. These were identified as 10 fragments of black/green glass slag, one of which has an impression of a rod (03E0433:1:82). The range of pottery retrieved included a large North Devon Gravel tempered ware pot (1600-1700 AD), sherds of Staffordshire slipware (1670-1800 AD), mottled ware (1670-1800 AD) and red earthen ware (1690-1900 AD) (Appendix 2).

A footing was apparent only on the northern face of the wall. It extended for 3.40m from the eastern limit of the excavation and consisted of a single course, which extended for an average of 0.20m north of the wall face (Fig. 7).

6.1.2 *Feature 14*

The quay wall was cut into sand (F13). The cut (F14) was only apparent immediately north of the quay wall and was first identified c.0.18m below the top of F1. Reclamation deposits (F17) abutted F1 directly to the south. Feature 14 extended for a maximum of 0.50m north of F1 and measured approximately 0.37m in maximum depth. The fill consisted of an orange stony sandy silt with mortar and redbrick inclusions which was originally of firm compaction, but once breached became

friable. Approximately 14 sherds of pottery (North Devon sgraffito, gravel tempered ware, black glazed earthen ware) were recovered from this fill dating from the 17th to 19th centuries.

6.2 *Phase 2*

This phase was characterized structural remains which consisted of a house (F4) and a well (F5) which were cut through archaeological deposits (F6, F10, F11). Phase 2 (Fig. 7) was located north of the quay wall. Immediately overlying the riverine sands (F13) was a truncated metalled surface (F11).

6.2.1 *Feature 11*

The greater part of this metalled surface formed an interior surface of F4 but extended beyond this western limit of this structure for c.0.40m. It was also located c.1.60m south of the structure (F4). Here it had been truncated by the east-west test trench but the surviving deposit measured 1.50m NS x 3.10m EW (Plate 5). Feature 11 consisted of cobbles (<0.10m) and pebbles (<0.05m) set into the riverine sand (F13) with occasional redbrick inclusions. It is likely that it was laid down to provide a stable surface.

6.2.2 *Feature 10*

This consisted of an extensive layer, which encompassed the northern quadrant of the site from Feature 1, the quay wall to the limit of excavation, an area of approximately 8m NS x 5.80m EW. It directly overlaid the metalled surface (F11). It was moderately compact clayey silt black in colour oxidizing to grey-brown. Organic in nature it retained moisture and included occasional pebbles especially where it interfaced with F11. Feature 10 had a maximum depth of 0.27m.

The structure F4 and well F5 were cut through this layer which yielded 168 artefacts including a range of pottery dating from the 17th to 19th centuries (Westerwald, North Devon gravel tempered ware, Frechen, Nottingham stoneware, red and black glazed earthenwares) (Appendix 2), leather and a wig curler (03E0433:10:30). The glass assemblage for this feature contained part of an onion shaped bottle (03E433:10:129) which was in use in the early 18th century (Appendix 7). A total of 18 undecorated

clay pipe stems with a mean stem date of 1753, and two complete bowls (03E0433: 27, 28) of possible Dutch manufacture and datable to the period 1680-1710 were recovered from this feature (Appendix 3) (Fig. 13). A worked wood fragment (03E0433:10:16) was identified as a split oak fragment which suggests a supply of oak in the surrounding hinterland (Appendix 12). A total of 9 fragments of leather shoes and several leather offcuts were recovered from this layer (Appendix 4). In addition the good preservation allowed for the recovery of a strip of textile (03E0433:10:26) which has been interpreted as a trim or binding strip (Appendix. 6).

6.2.3 *Feature 6*

This layer also encompassed the northern quadrant of the site and immediately overlay layer, F10. It comprised a dark brown/black sandy silt, organic in nature, which ranged from 0.30m to a maximum of 0.70m in depth (south of F4). The structure F4 and well F5 were cut through this layer which yielded 341 artefacts recovered including leather scraps, glass, 14 clay pipe stems with a mean stem date of 1714 and an accumulative bowl date of 1690-1710 (Appendix 3) and pottery dating from the 17th to 19th centuries (including North Devon slipware, sgraffito, gravel tempered ware, Mocha ware, Chinese Porcelain and Westerwald). Two sherds of unidentified medieval import ware were also noted (Appendix 2). In addition a single copper alloy pin (03E0433:6:4) and an incomplete buckle frame (03E0433:6:3) were recovered from this deposit (Fig. 15). The former was identified as a wire drawn pin, a type that had its origins in the 12th century but was still in use by the 19th century (Appendix 9). Several iron tools were also recovered including a handle with partial blade (03E0433:6:1), a punch (03E0433:6:2), awl (03E0433:6:5) and two nails (03E0433:6:6, 8). Two wooden pins were also retrieved from this layer. 03E0433:6:16 was of blackthorn and measured 16.6cm x 0.8cm while 03E0433:6:19 was also of blackthorn and measured 11.5cm x 0.4cm (Appendix 12). The organic nature of the layer resulted in the preservation of 40 leather artefacts including elements of welted constructed shoes, a belt and a possible purse. The construction of the shoes and use of iron nails in the soles dates them from the late 17th century (Appendix 4).

6.2.4 *Feature 9*

This was a vertical cut through F6, identified for approximately 4m EW from the eastern limit of excavation. It had a maximum width 0.26m, and depth of 0.58m. The

fill consisted of moderately compact green grey sandy silt with very occasional stone inclusions. Three pieces of scrap leather (03E433:9:1-3) were recovered from this cut, which was truncated by a later cut, Feature 7.

6.2.5 *Feature 7*

This feature was the cut for both structure F4 and the well F5 indicating a contemporary date of construction. Significantly a glass bottle seal (03E433:7:18) was recovered from the fill of this cut. Dated 1711 (refer paragraph 2.13) it provides a terminus post quem for the construction of these structures.

Feature 7 extended for approximately 5m EW and for an average of 0.17m both north and south of the structures it encompassed. It had a maximum depth of 0.17m to the north of F4 but was deeper (0.30m max.) to the south where F4 had a footing. The fill of F7 consisted of a friable orange brown silty sand, with inclusions of animal bone, a leather shoe (03E433:7:1), an undatable clay pipe bowl (03E433:7:2) and two undecorated stem fragments (03E433:7:19, 20) (Appendix 3). The pottery retrieved from F7 included Nottingham stoneware, North Devon sgraffito, red, black and tin glazed earthen ware dating providing a date range from the 17th to the 19th centuries (Appendix 2). Assessment of the plant remains identified gorse, hemp, hop, bracken, hazelnut shell and carrot as well as marine shell (oyster, mussel) fragments (Appendix 5).

6.2.6 *Feature 4*

This feature consisted of the southwest quadrant of a house structure (Fig. 7, Plate 5). The EW linear section measured 5m in length and was truncated by the eastern limit of excavation. Approximately 2.35m of the NS section was exposed before being truncated by the northern limit of the excavation. The walls survived to a minimum height of 0.40m but to a maximum height of 1.30m in northern baulk. The walls ranged from 0.57m to 0.70m in width. The maximum with footing (to the south and west) was 1.15m. The structure was characterized by uneven low quality courses of blocks (0.12m-0.20m). There was an average 2 courses reaching a maximum of 5 (6 in section). The mortar, of which very little was apparent, was a yellow, sandy lime. Feature 4 overlay the metalled surface F11 (Fig. 8).

6.2.7 *Feature 5*

This feature located at the southwest corner of structure F4 (Plate 6). It was a sub-circular stone well, with slight internal corbelling noticenble ns the well descends. It measured 1.68m in maximum diameter and 0.82m in depth. There were a total of 7 courses, 4–5 of which was above the present water line. The average block thickness was 0.19m. No mortar was evident, with sandy clay between the slabs. This feature was contained within F7, and cut through F6 and F10 into F13 where the base was attained.

Three distinct fills were evident within the well. The upper fill (F5:c.1) was a sandy clayey silt mixed with lime and masonry fragments and redbrick (0.42m in depth). An assessment of the plant remains identified a rich assemblage of fruits and seeds as well as bracken, hemp, and hops. Interestingly the moderately frequent fragments of wheat/rye 'bran' recorded may indicate a component from human faeces (Appendix 5). This overlay F5:c.2. a sandy clay with occasional redbrick. Small roots permeated the deposit. Uncharred seeds of raspberry, sedge and the leaf spines of gorse were contained within this deposit. The basal layer (F5:c.3) was a waterlogged clayey sandy clay. Several artefacts were recovered from the interior of the well including glass, 6 clay pipe stems which produced a mean stem date of 1725. A single example (03E0433:5:3) was decorated with hand applied coiled circles commonly found on Dutch imported bowls of 17th/18th centuries, while another example (03E0433:5:29) had hand applied decoration datable from 1750-1850 (Appendix 3). The pottery recovered from F5 included White salt glazed stoneware, painted pearlware, Chinese porcelain and creamware with an average date range from the late 17th to 19th centuries (Appendix 2). A semi worked quartzite stone, 0.15m in diameter was also recovered from the well (Appendix 11).

6.3 ***Phase 3***

This phase relates to the activity south of the quay wall (F1). It is characterized by walls (F16, F18-F20) cut into an extensive reclamation deposit (F17).

6.3.1 *Feature 17*

This was an orange stony layer confined to the south of the quay wall (F1). It was cut by later structures F16, F18, F19 F20 and directly overlay riverine sand F13. This feature appears to have been redeposited natural gravel used as infill during

reclamation. Banked up against the quay wall Feature 17, decreased in depth from north to south (1.07m-0.52m). A total of 30 artefacts were recovered mainly from the interface with overlying deposits and structures including bottle glass.

A total of 15 undecorated clay pipe stems with a mean stem date of 1678 and a single complete clay pipe bowl (03E0433:17:3) datable to the period 1700-1740 were recovered from this deposit (Appendix 3).

The pottery which reflected that found elsewhere on site was datable predominantly to the 17th and18th centuries and included North Devon gravel tempered ware, sgrafitto, tin, red and black glazed earthenwares (Appendix 2).

6.3.2 *Features 15 & 16*

Feature 16 was a linear wall that was exposed across the full width of the site, 5.80m (Plate 7). A cut (F15) for this wall was visible only to the north of F16 where it extended for a maximum of 0.54m. Feature 15 had a maximum depth of 0.40m and was filled with a friable sandy and stony silt. This cut was truncated to the south of F16 by the laying of slabs, F19 and a later structure F20.

The wall F16 had a maximum height of 0.92m (0.30m minimum) and measured 0.47m in width at its top widening to 0.61m at its base (Fig. 9). It consisted of 3-5 courses with a maximum block height of 0.28m. The presence of a footing was noted extending for 1.86m eastwards from the western limit of the excavation and corresponding with the maximum number of courses (5), The footing consisted of 2 courses which measured 0.20m-0.40m in height and extended 0.12m-0.14m beyond the southern face of F16 (Plate 10). It was cut into the underlying riverine sand (F13). Feature 16 was bonded with a solid grey lime based mortar.

Approximately 0.06m north of Feature 16 was an upright squared wooden post (F21) (Plate 8). This post measured 0.57m in height and ranged from 0.02m to 0.05m in width with a tapered blunt point having some evidence of bark and possible lime. It was identified as Scots pine, which was reintroduced into Ireland in the late 17th century (Appendix 12). Abutting the base of the northern face of the western quadrant

of F16 was a discoloured sandy deposit, 2.40m in length and 0.10m in thickness, which possibly constituted the remnants of a beam. The eastern courses of F16 overlay a sand and dark grey compact silt, the distribution of which is uneven and may represent the shadow of a wooden revetment that no longer survives.

6.3.3 *Feature 18*

This feature was a N-S aligned linear wall bonded with F16 (Plate 9). It measured approximately 11m in length, 0.47m-0.66m in width and 0.14m-0.50m in height (Fig. 11). The block height varied from 0.14m to 0.27m. Feature 18 was characterized by a single course for the southern 7m, the remainder consisting of 2-3 courses. Approximately 3.90m south of its intersection with F16 was a gap in the wall, which measured 0.44m NS. Feature 18 was also characterized by a rounded terminal. Cut into the infill layer F17, this wall overlay the riverine sand (F13).

Approximately 2.30m north of its terminal and 0.40m east of the east face of F18 was a wooden post, Feature 22, identified as Scots pine (Appendix 12). It measured 0.40m in length and 0.045m in maximum width. Square in section it tapered to the base and had no evidence of joints or fixing. Feature 23 a similar squared Scots pine post, also to the east of F18, was fragmented into three pieces and badly degraded.

A total of 30 artefacts were associated with F18, including 5 undecorated clay pipe stems with a mean stem date of 1690 and a single initialled example (03E0443: 18:1). The glass assemblage from this feature contained a fragment of a green phial (03E433:18:2) (Fig. 14). Typically used for medicines or perfumes the phial dates to mid-18th century (Appendix 7). In addition 4 fragments of glass slag blue/black/green in colour were recorded (Appendix 8).

The pottery associated with this wall reflected that found elsewhere on site and was datable predominantly to the 17th and18th centuries. The assemblage included North Devon gravel tempered ware, Bristol/Staffordshire slipware, tin, red and black glazed earthenwares and Chinese porcelain (Appendix 2).

6.3.4 *Feature 19*

Flush with the top of the remains of Feature16 was a single course of large slabs (F19) (Plate 7). Feature 19 abutted F18 to the west and was located 0.26m south of F16. The slabs had a maximum thickness of 0.10m and a maximum width of 1.10m. They were set onto mixed rubble, redbrick and mortar mix, 0.04m in thickness, which lay directly above infill layer Feature 17. It may have constituted the base of a drain.

6.3.5 *Feature 20*

This feature consisted of the northeast quadrant of a structure. The east-west linear wall was located 0.20m south of F16. It extended from the eastern limit of excavation and was exposed for c.2.30m. It abutted F18 to the west. At the NE corner Feature 20 survived to 3 courses with remnants of limestone mortar visible. The remainder of the structure was aligned roughly N-S, and was exposed as single course for c. 6.70m. Situated c.0.20m above the EW wall, this wall rested on 0.02m of dark grey/black silt, which directly overlay the infill layer, F17.

An element of flooring was visible for c.0.97m NS in the west facing section, 0.20m below the NNE/SSW wall (F20). Approximately 0.03m in thickness it extended for 0.14m EW.

6.4 ***Phase 4***

This phase constituted the latest activity on the site and can generally be associated with the levelling of the buildings during the redesign of the street by the Wide Streets Commission in the 1790s. The evidence for this phase is mainly confined to the section faces of the uppermost deposits of the excavation and the following features, which impacted directly on the identified archaeological layers (F6 etc.)

6.4.1 *Feature 2*

This was a linear feature cut into the organic rich layer, F6. Located c.0.35m south of the northern limit of excavation this feature was orientated east-west and measured 1.45m in length, 0.22m in width and 0.07m in depth. The rubble fill included animal bone, oyster shell, seven fragments of glass slag, and an iron nail (03E0433:2:1). The inclusion of Styrofoam in this fill indicates modern disturbance.

6.4.2 *Feature 3*

This was a rectangular cut truncated by the northern limit of excavation. V shaped in profile it measured 0.63m EW x 0.12m NS and had a maximum depth of 0.12m. The fill was similar to that in Feature 2 and included a single sherd of 18th century mottled ware (03E0433:3:1).

6.4.3 *Feature 12*

This feature was a redeposit of mixed orange sandy silt with mortar and redbrick inclusions, immediately abutting the northern face of the quay wall, F1. Feature 12 measured 2m NS x 1.20m EW and had a maximum depth of 0.43m. It overlay layer F6. A total of 81 artefacts were recovered from this deposit including pottery dating from the 17 to 19th centuries. A single sherd of Ham Green B (1175-1250 AD) was recovered from this deposit (Appendix 2). In total 11 undecorated clay pipe stems with a mean stem date of 1699 and a single complete bowl datable to the period 1680-1710, were recovered from this feature. Three metal finds were recorded including a lead cloth seal (03E0433:12:78) which has been identified as an alnage seal, a quality inspection and tax system in place from 1328 until its abolition in 1724 (Appendix 9). A possible strap end (03E0433:12:1), a pennanular ring fitting (03E0433:12:81) and a copper alloy button (03E0433:12:80) were also recorded.

7 Discussion

7.1 *Phasing & Development*

7.1.1 The historical, cartographic and archaeological evidence provide a detailed picture of development between 1675 and 1756. The earliest construction on site was the quay wall (F1). Its presence firmly divides the stratigraphy of the site (Fig. 12) but it is not recorded as a structure on any of the available historical maps.

7.1.2 To the north of the quay wall (F1) are reclamation deposits associated with the construction of house structure (F4) and a well (F5). In line with the evidence, the structure dates to post 1711, the glass bottle seal (03E433:7:18) of that date being retrieved from the construction phase (foundation trench, F7). Cartographically it is possible to correlate the house F4 with the rear of the structure on Rocque's map of 1756. This would place the well (F5) in the rear garden of this plot (Fig. 4).

7.1.3 To the south of the quay wall (F1) were the natural gravel river deposits (F17, F13) of the Liffey. The pebbles indicate a fast flowing river (Linzi Simpson per comm.). Two separate structural phases of historical development took place within this area. The earlier being the construction of the EW wall (F16) and the NS wall (F18). Given its morphology, it is possible to interpret this structure as a jetty or pier. The rounded terminal of F18 precludes its inclusion within a house structure while its location as noted in 1774 was at 'the best lying for ships in the river is from Bachelors Lane to the graving bank'. This area also had a reputation for 'the deepest water between the walls from the old glass house to Bachelors Lane. (de Courcy 1996, 16).

7.1.4 While there is no conclusive dating evidence available for the construction of a jetty the cartographic analysis indicates that it must predate Brookings map of 1728. Given the rapid development of this area it is likely that it would have been put in place soon after the construction of the original quay wall. The pottery recovered from the deposit (F17), which this structure (F16/F18) is cut into, is very mixed, however, c.54% can be dated to the 17th century.

7.1.5 The next phase of construction in this area resulted in F20 an EW and NS wall. Cartographically this can be aligned with the eastern plot boundary of Rocque's map of 1756. However the element of flooring associated with F20 may indicate an earlier structure no longer extant in 1756.

7.1.6 Phase 4 constituted the latest activity on the site and can generally be associated with the levelling of the buildings during the redesign of the street by the Wide Streets Commission in the 1790s. This is reflected in the date range of finds from features of this phase which included pottery from the 17th to 19th centuries.

7.2 *Economy and Diet*

7.2.1 As analysed the bone assemblage profile consists of sheep/goat, cattle, pig with dog, cat, bird, hare and fish. They have been categorised according to phases of development. Phases 1-3 were analysed as a single unit representing the recovery of bone from 11 contexts datable to the pre 1790 period. Phase 4 relates to the levelling and redesign of the streets in the 1790s by the Wide streets Commission (Appendix 1).

7.2.2 *Phases 1–3*

On the basis of the number of fragments retrieved, sheep constitute the most frequent species, followed by cattle. The sheep were slaughtered at 2–3 years which may indicate the importance of secondary products. The cattle were slaughtered between 1.5-3 years and it is likely that they were slaughtered in the immediate area although a majority of the butchery marks indicate secondary stage butchery. A very small number of pig bones were recovered (3), a single horse bone, cat, and mandible from a dog with a height in the range of a German Shepard. Fowl, turkey, goose and duck and three fish bones (herring, flatfish) were identified. A single wild animal in the form of a hare was also identified.

7.2.3 *Phase 4*

The profile of the assemblage of Phase 4 is similar to that of Phases 1-3, with the sheep again constituting the majority of species. Butchering marks indicate a separation of the meat-rich parts from the meat poor parts and a slaughter age of 2-3

years. Cattle again display marks indicative of the secondary butchering stage. Small amounts of pig (4), a single horse bone, cat, fowl, turkey, goose duck and fish were identified reflecting the profile of Phases 1-3. A rabbit was found in this assemblage but displayed no butchery marks.

The assemblage represents both food waste and butchering waste. A large percentage of sheep/goat butchery waste might either be explained by specialised butchering of sheep/goat or by the consumption by people of a lower economic status of inferior cuts of mutton. This latter hypothesis would however only be valid if there was a significant price difference between beef and mutton. The animal husbandry strategies for sheep/goat seem to have been the same in post-medieval Dublin. In comparative assemblages, the predominance of adults, i.e. animals over 2-3 years of age, indicate the importance of wool in the medieval and post-medieval periods. An example from Phase 4 of a pathology resulting from repeated stress may have been caused by the penning of an animal in a muddy enclosure, perhaps indicating locally kept animals.

While adult cows may have been kept within Dublin for dairying purposes (Maxwell 1936:117) the majority would have been from outside the city where there was plentiful access to grazing and brought into Dublin for slaughtering. This is reflected in the O'Connell Street assemblage where secondary butchering, that is where limbs are disarticulated and chopped into smaller pieces, was evident.

The limited evidence for pigs is in line with evidence from comparable sites. Pigs were generally exported and did not form a substantial element in the diet as it was also stated to be more expensive than other meat. In comparison the evidence from the bird species present in the assemblage are indicative of a different socio-economic consumer. While limited in number, most of the bones derive from the meat-rich parts of the body. According to household accounts, poultry was the third largest expense in the meat category. However most of these accounts derive from upper or middle class rural households, and would thus not necessarily be valid for urban households. (Clarkson & Crawford 2001, 36-7).

7.3 *Plant remains*

7.3.1 The samples analysed for plant remains were focused on the area of the site that contained structural remains, that is the cut for the structure (F7) and associated well (F5) and the organic layer they were cut into. A broad range of woody and herbaceous plant material, fruits, seeds and leaf fragments were identified (Appendix 5). The relatively small amounts of food remains included wheat, rye 'bran' while the fruits were identified as strawberry, fig, grape and apple. Although they as the author suggests may originate as waste from a stable, they may also represent human domestic occupation. The food remains assemblage from post medieval deposits at Smithfield, Dublin 7 also contained grape pips, apple/pears and native fruits including strawberry as well as figs and bilberrys (Johnston 2003).

7.3.2 Native seasonal fruits have long been exploited and are commonly recovered from both medieval and post medieval deposits. The post medieval period saw an increased consumption of sugar and an occupation with the preservation of fruit as jams and jellies. Grapes on the other hand were a luxury imported item and have been found in post medieval deposits at Moore St/Parnell St. and were also recovered in a deposit with a high fruit seed concentration from chamber pot found in a basement at Tram St. (Johnston 2001). Up until recently imported fruits were seen as an indicator of social status, however their ubiquitous presence on post medieval urban sites must indicate a less stringent socio-economic divide.

7.3.3 Material from the well (F5) includes sedge (indicative of damp deposits), gorse, and leaf box, the latter of which may have originated in formal gardens. The deposit F6 contained hemp (possibly used for rope making), hop, straw and bracken were also present in deposits of a similar period at Newmarket, and are suggestive of stable litter. Similarly those remains from the cut (F7) for the structures contain gorse, hemp, hop and bracken with the addition of nutshell and carrot. Although the plant and food remains are from a wide variety of sources the author's predominant interpretation is one of litter.

7.3.4 Neither the profile of the faunal assemblage or the plant remains at O'Connell Street is indicative of any particular social strata.

7.4 *Material Culture*

7.4.1 The artefacts recovered from O'Connell Street reflect the period of focused development at the site which primarily encompasses the last decades of the 17th century and the early decades of the 18th century. Although mixed and with date ranges from the 17th to the 19th centuries the commencement date for the usage of the majority of the pottery types identified in the 777 sherd assemblage, is the 17th century. A total of 13 sherds of medieval pottery were identified, the residual effect of former land use.

7.4.2 The core of the quay wall (F1) produced North Devon gravel tempered ware of the period 1600-1700 and included jars, chamber pots, bowls, a pipkin and a jug and mottled ware (1670-1800) including tankards and bowls.

7.4.3 The entire pottery assemblage consisted of a minimum of 122 vessels which included cooking pots, bowls, plates, saucers, cups, storage vessels and chamber pots indicating a domestic assemblage (Appendix 2).

7.4.4 The dating of the clay pipe assemblage provides much narrower parameters for the usage of the site. For example F6, an organic layer produced a pottery assemblage which has a date range of 1600–1900, whereas the accumulative clay pipe bowl date is 1690-1710. Likewise the pottery assemblage from F17 is 1600-1800, whilst the accumulative clay pipe bowl date from F17 is 1700-1740 (Appendix 3).

7.4.5 Further datable evidence was recovered in the form of a lead cloth seal (03E0433:12:78) which was identified as an almage seal, a system textile taxing which was in place from 1328 until its abolition in 1724. Significantly a glass bottle seal (03E433:7:18) was recovered from the fill of the cut (F7) for the structural and well remains (F4, F5). Dated 1711 (refer paragraph 2.13) it provides a terminus post quem for the construction of these structures.

7.5 *Industrial Activity*

7.5.1 Evidence for industry on site was indirect. A total of 22 fragments of glass slag were recovered, all of which were by-products of glass making. However given the proximity of the glass works the slag may not be evidence of glass working on site.

7.5.2 An incomplete ceramic crucible (03E0433:0:4) was recovered but uncontextable. It had been fired and refired resulting in a blackened interior due to the oxidisation of metal (Appendix 10). However there while this may constitute limited evidence for metalworking there was no hearth or slag identified to infer specific metallurgical activity on the site.

7.5.3 Indirect evidence from analysis of the animal bone assemblage may indicate craft working. On site butchering and the removal of cattle hornecores may infer hide working and glue making.

8 Conclusions

8.1 The background to the development of the Liffey quays was an expansion of trade. The period around 1660 was characterized by the export of live sheep and cattle which was halted by the Cattle Act of 1663-67. Subsequently the wool and linen trades gained momentum and allied with the expansion into continental markets resulted in an increase in shipping (Somerville-Large 1979, 128).

8.2 The late 17th century saw a rapid expansion of the city and the quays on both sides of the Liffey. Circa 1677 the Duke of Ormonde suggested warehouses and residences should have a stone quay along the river, a prototype for the entire system which had previously been based on wooden revetting. Further impetus was provided in 1707 by an initiation of a plan for the port by Prince George of Denmark and the establishment of the Ballast office (McCullough 1989, 37). The rapidity of the development was reflected elsewhere. At Strand St Little archaeological and cartographical evidence shows that in 1610 the site lay on the foreshore. By 1673 it had been reclaimed from the river, and by 1728 houses had been erected on the site (Hayden 2000).

8.3 The archaeological resolution of the site of the ESB substation in O'Connell Street uncovered evidence for the extensive and rapid development of an area of the north quays between the commencement of their development in 1675 to the total point when the area was overcome by the widening of O'Connell Street in the 1790s.

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Appendix A - *Report of the animal bones from O'Connell St, Dublin (03E0433)*

By Lena Strid

Tables

Appendices

Plates

1 Introduction

1.1 In 2003, excavations took place at O'Connell St, Dublin (Licence No. 03E0433), uncovering layers and structures from the late 17th century up to modern times (Baker 2003). Finds included pottery, glass, tiles, clay pipes, leather fragments and animal bones. The animal bone assemblage was hand retrieved, and is likely to be biased towards larger fragments.

1.2 The site is chronologically divided into four phases. Phase one represents the construction of the quay wall in the late 17th century, and underlying deposits. Phase two consists of structures and layers north of the quay wall, whereas phase three consists of structures and layers south of the quay wall. Phase two and three are believed to be more or less contemporary, originating shortly after the construction of the quay wall. Phase four represents the latest activity on site, and can generally be associated with the levelling of buildings during the redesign of the street in the 1790s.

1.3 Bones were found in eleven contexts (see table 1.). Due to the rapid development of the site and wide datings of the features, all pre-1790 contexts – i.e. contexts belonging to phase 1–3 - are analysed as one unit. Contexts representing the post-1790 phase are analysed as one unit.

Table 1 - Contexts containing bones

Phases	Context	Description of context
Phase one	F1	Quay wall
	F13	Underlying natural layer
Phase two	F5	Well
	F6	Top cultural layer
	F10	Base cultural layer
Phase three	F15	Cut for jetty/pier F16
	F17	Reclamation deposit
Phase four	F2	Feature cut into F6
	F3	Cut
	F12	Cultural layer overlaying F6
	F0	Cleanback

2 Methodology

2.1 The bones were identified to species using a comparative reference collection, as well as osteological books and articles. Where possible, sheep and goat were identified to species,

using Boessneck et al (1964), Kratochvil (1969) and Prummel & Frisch (1986). They were otherwise classified as 'sheep/goat'. Ribs and vertebrae, with the exception for atlas and axis, were classified by size: 'large mammal' representing cattle, horse and deer, 'medium mammal' representing sheep/goat, pig and large dog, and 'small mammal' representing small dog, cat and hare.

2.2 Modern breaks were disregarded when calculating the total number of fragments. The minimum number of individuals (MNI) were calculated on the most frequently occurring bone for each species, using Serjeantson's (1996) zoning guide, and taking into account left and right sides, as well as epiphyseal fusion. For comparison, the number of identified fragments per species (NISP) was also calculated.

2.3 For ageing, Habermehl's (1976) data on epiphyseal fusion were used. Three fusion stages were recorded: unfused, in fusion, and fused. In fusion indicates that the epiphyseal line still is visible. Cattle horncores were aged according to Armitage (1982), using texture and appearance of the horncore surface. Mandibles were aged using data on tooth eruption and tooth wear. Tooth wear was recorded using Grant's tooth wear stages (Grant 1982), and correlated with tooth eruption, as well as the wear rate of the mandibular M3 (Benecke 1988, in Vretemark 1997), in order to estimate an age for the animal/s.

2.4 Sheep pelves were possible to sex, using data from Boessneck et al (1964) and Prummel & Frisch (1986). Pig canines were sexed using Schmid (1972).

2.5 Measurements were taken according to von den Driesch (1976), using digital callipers with an accuracy of 0.01 mm. Large bones were measured using an osteometric board, with an accuracy of 1 mm. Withers' height of dog was calculated using Harcourt (1974).

3 Comparative sites

3.1 Post-medieval assemblages from four other Dublin sites - Aston Quay (02E1621), Longford St (00E0137), Phoenix St (02E0229) and Tram St (02E0229) - were used as comparative material. With the exception of Longford St, the comparative material derives from contexts that are contemporary with the two phases of the Aston Quay

assemblage. The Longford post-medieval assemblage is, however, only dated as 'post-medieval' (Strid 2003, McQuade 2000, 2002a, 2002b).

4 Assemblage

4.1 The assemblage consisted of 722 fragments, of which 329 (45.6%) could be determined to species. The species present included cattle, sheep/goat, pig, horse, dog, cat, hare, rabbit, fowl, goose, turkey and duck. Several indeterminable bird and fish bones were also found. Only 143 fragments were totally indeterminable. The rest of the indeterminable fragments consist of vertebrae and ribs, assigned to large, medium and small mammal respectively. Due to the retrieval method (see chapter 1), there is a bias against small bones, and consequently against small animals. The bones were in a good condition, with little gnawing or erosion. No bones showed traces of burning.

5 Phase 1–3

5.1 The bone assemblage from phase 1–3 consisted of 400 bones, of which 44% could be determined to species. 69 bones (17%) were completely indeterminable.

5.2 Of the 75 sheep/goat bones, 15 were identified as sheep. As no bones could be determined to goat, it is likely that most - if not all - of the sheep/goat bones are sheep bones. This follows the pattern of other contemporary Dublin sites (Aston Quay, Tram St, Phoenix St, Longford St etc).

5.3 Judging from the number of fragments, sheep/goat is the most frequent species, with cattle coming second, and cat and goose coming third. Pig, horse, dog, hare, fowl, turkey, duck and fish are also present in small numbers. When using MNI, sheep/goat is still the most frequent species (MNI: 7), and cattle being the second most frequent species (MNI:5). Goose is represented by two individuals, and the remaining species by one individual each.

5.4 The ratio of small, medium sized and large ribs and vertebrae do not correspond to the figures given by NISP or MNI. Large ribs and vertebrae are over-represented in relation

to the medium sized ones. While this to some respect may be attributed to the retrieval method, it also hints that cattle may be more frequent than the figures indicate at first sight. In all studied post-medieval Dublin assemblages (see chapter 2.2.), pig bones are far fewer in number than sheep/goat. It is therefore likely that the medium-sized ribs and vertebrae mostly derive from sheep/goat, rather than pig. If added to the number of fragments from cattle and sheep/goat, cattle will be the most frequent species (n: 182), and sheep/goat the second most frequent (n:116).

Table 2 - Assemblage from phase 1-3: Anatomical distribution of all species, including NISP, MNI and weight. Skeletal element used for MNI is marked with an asterisk

	Horse	Cattle	Sheep/goat	Pig	Dog	Cat	Hare	Fowl	Turkey	Goose	Duck	Bird	Fish	Small	Medium	Large	indet
Horncore			1														
Skull		2	2										1				2
Mandible		4	9	1	1												
Loose teeth		3	3														
Hyoid																	1
Atlas		1	1														1
Axis																	
Vertebra													1		5	16	
Sacrum		1														1	
Rib														1	36	97	
Sternum										3*							
Scapula		5	9*			1			1								
Humerus		3	1				1		2								
Radius		3	4	1		2	1										
Ulna		7	3			1		1		1							
Carpal bones		5															
Metacarpal		12	12	1													
Pelvis		7	4					1		2	1	3					
Femur		4	3									1					
Patella																	
Tibia	1	1	8			2		1									
Fibula																	
Calcaneus		6*	2														
Astragalus		3	1														
Malleolare																	
Tarsal bones		1															
Metatarsal			8														
Phalanx 1		1	7														
Phalanx 2		1															
Phalanx 3		1															
Indet. metapod																	

Indet.													1				62
Total (NISP)	1	68	75	3	1	6	2	3	3	6	1	3	3	1	41	114	66
MNI	1	5	7	1	1	1	1	1	1	2	1						
Weight (g)	211.9	5982.8	1675	69.7	58.7	18.8	6.2	44.7	11.2	29.4	1.3	20.2	9.7	2.3	232.5	3514.7	1133.5

5.5 *Cattle*

5.5.1 Sixty-eight cattle bones were identified. A further 114 fragments are identified as large mammals, and the scarcity of horse bones in the assemblage makes it reasonable that most, if not all, of these 114 fragments derive from cattle. Most of the body parts are present in the assemblage. It is therefore likely that the cattle were slaughtered in the area.

5.5.2 Twenty cattle bones could be age estimated using epiphyseal fusion stages (see table 3). The majority of the bones indicate animals between 1.5 and 3 years old at death. While corresponding to the slaughter ages at Aston Quay (n: 9), it is not in correspondence with the Phoenix St assemblage (n: 71), where there was no apparent preference for certain slaughter ages. There is somewhat correspondence with the Longford St assemblage (n: 17), where there are few animals below 1.5 years being slaughtered, and an almost equal amount of animals between 1.5 and 3 years, and animals older than 3 years being slaughtered. It's not known whether the differences in slaughter ages reflect actual differences in slaughter patterns between different areas in Dublin, or whether the narrow slaughter ranges for the O'Connell Street and Aston Quay assemblages are an illusion, reflecting the few bones used for ageing.

5.5.3 It was not possible to make a sex estimation on any of the cattle bones, due to fragmentation. There is a distinct metrical sexual dimorphism on the metacarpals (cf McCormick & Murphy 1997:200), but due to the known increase in size during the post-medieval period, in combination with the lack of large data collections for reference, a metrical sex estimation could not be carried out.

5.5.4 The measurable cattle bones mostly fall within the range of cattle bones from the three comparative sites (see table 4). The small differences are likely due to either sex dimorphism or differences in the quality of the fodder.

5.5.5 Some cattle bones displayed butchering marks. The majority of these derived from a secondary butchering stage, where the limbs are disarticulated and chopped into smaller pieces. One humerus had several chopmarks distally, a carpal bone had been chopped in half, a metacarpal had been chopped off distally, and two femora were

chopped off at the trochanter minor. An ulna had cutmarks on the olecranon, indicating disarticulation of the elbow joint. The horncore had been sawn off one skull, indicating the use of horncores a raw material for various crafts.

Table 3 - Assemblage from phase 1-3: Cattle epiphyseal closure. (UF = unfused, IF = in fusion, F = fused)

	Very young	UF	IF	F	% UF
Early fusion (< 1.5yrs)	1				
Acetabulum		1			
Humerus di				2	
Radius px					
Phalanx 2 px				1	
Early fusion subtotal	1	1		3	40%
Mid fusion (2-2.5yrs)					
Tibia di			1		
Metacarpal di		1		2	
Metatarsal di		1			
Phalanx 1 px					
Mid fusion subtotal		2	1	2	40%
Late fusion (> 3yrs)					
Humerus px					
Radius di				3	
Ulna px		1		1	
Ulna di					
Femur px				2	
Femur di		1			
Tibia px		2			
Calcaneus px					
Late fusion subtotal		4		8	40%

Table 4 - Assemblage from phase 1-3: Cattle measurements in comparison with measurements from Longford St, Phoenix St and Tram St.

Bone	Measurement	Site	No.	Mean	Min	Max
Calcaneus	GL	O'Connell St	3	136.9	131.8	14.6
		Phoenix St	4	119.6	113.8	131.8
		Tram St	1	143.2	142.0	144.4
Metacarpal	GL	O'Connell St	1	191.0		
		Longford St	1	211.0		
		Tram St	3	188.2	172.0	221.0
Metacarpal	Bd	O'Connell St	4	65.6	55.7	74.2
		Longford St	2	75.0	74.0	76.0
		Phoenix St	10	54.6	48.9	68.0
		Tram St	5	59.7	50.4	71.6

Phalanx 1	Gl.Pe	O'Connell St	1	59.3		
		Longford St	1	63.8		
		Phoenix St	21	57.8	49.7	66.0
		Tram St	9	57.5	51.3	63.9

5.6 *Sheep/goat*

5.6.1 Of the 75 sheep/goat bones in the assemblage, 15 were identified as sheep (see table 5). As mentioned previously, it's highly likely that a great majority of the sheep/goat assemblage consist of sheep, with few or no goats present.

5.6.2 Judging from epiphyseal fusion, very few sheep in the assemblage were slaughtered before 1-2 years of age (see table 6). Several bones suggest an age at death of over two or three years. Two unfused scapulae indicate the presence of young lamb/s of less than five months of age. Whether these represent natural deaths or deliberate slaughter is unknown. The four mandibles that were used for ageing confirm the epiphyseal age estimation, as all third molars are worn (see table 7). The slaughter pattern at O'Connell St corresponds to the Phoenix St assemblage (n: 97) and the Longford St assemblage (n: 43), where most sheep were over two years old when slaughtered. This may indicate the importance of secondary products. From the archaeological/osteological material alone, it is not possible to say whether milk or wool was the most important secondary product. If wool was the main product, the predominance of females (see below) would be unnecessary, as both sexes produce wool of similar quality. If milk was the most important product, one would expect a large number of young lambs being slaughtered. These may of course have been sold on the hoof and slaughtered elsewhere. We may, on the other hand, be dealing with adult sheep that were sold on the hoof and slaughtered in the O'Connell St area.

5.6.3 Two sheep/goat pelves derived from females. Of the three comparison sites, sex estimation was only carried out at Aston Quay, where three sheep pelves deriving from females were found. This predominance of ewes would correspond to the idea of sheep being used predominantly for milk in post-medieval urban environments.

5.6.4 The measurable sheep/goat bones mostly fall within the range of sheep/goat bones from the four comparative sites (see table 7). The small differences are likely due to either sex dimorphism or differences in the quality of the fodder.

5.6.5 Some sheep/goat bones displayed butchering marks. One atlas was split longitudinally, reflecting the custom of carcasses being suspended and divided in half as part of the initial butchering stage. One horncore had chopmarks diagonally across, indicating the removal of the horn sheath, perhaps for using it as a raw material for horn working, or for the boiling of glue. One pelvis displayed butchering marks, being chopped off longitudinally at the ilium, either in order to separate the leg from the torso, or as part of dividing the carcass into two halves (see chapter 3.).

Table 5 - Assemblage from phase 1-3: Anatomical distribution of sheep and indeterminable sheep/goat, including NISP and weight

	Sheep/goat	Sheep
Horncore	1	
Skull	2	
Mandibula	7	2
Loose teeth		
Hyoid		
Atlas	1	
Axis		
Vertebra		
Sacrum		
Rib		
Scapula	6	3
Humerus	1	
Radius	4	
Ulna	2	1
Carpal bones		
Metacarpal	11	1
Pelvis	4	
Femur	1	2
Patella		
Tibia	3	5
Fibula		
Calcaneus	1	1
Astragalus	1	
Malleolare		
Tarsal bones		
Metatarsal	8	
Phalanx 1	7	
Phalanx 2		
Phalanx 3		
Indet. metapod		
Total (NISP)	60	15
Weight (g)	1162.0	513.0

Table 6 - Assemblage from phase 1-3: Sheep/goat epiphyseal closure. (UF = unfused, IF = in fusion, F = fused)

	Very young	UF	IF	F	% UF
Early fusion (< 1yrs)					
Acetabulum					
Scapula px		2			
Humerus di					
Radius px					
Phalanx 1 px				7	
Phalanx 2 px					
Early fusion subtotal		2		9	22%
Mid fusion (1-2yrs)					
Tibia di				5	
Metacarpal di				8	
Metatarsal di				7	
Mid fusion subtotal				20	0%
Late fusion (> 3yrs)					
Humerus px					
Radius di				3	
Ulna px		1		1	
Ulna di					
Femur px				2	
Femur di		1			
Tibia px		2			
Calcaneus px				2	
Late fusion subtotal		4		8	33%

Table 7 - Assemblage from phase 1-3: Mandibular wear stages of sheep/goat, with estimated age according to Benecke (1988). PM = Post-mortem loss

	P4	*M1*	*M2*	*M3*	*M.W.S.*	*Estimated age*
Sheep 1	*g*	*j*	*h*	*g*	*39*	*5-6 years*
Sheep 2	*j*	*k*	*h*	*g*	*33*	*2-5 years*
Sheep 3	*PM*	*h*	*g*	*e*	*33*	*2-5 years*
Sheep/goat 1	*g*	*h*	*f*	*PM*	*33*	*2-5 years*

Table 8 - Assemblage from phase 1-3: Sheep/goat measurements in comparison with measurements from Aston Quay, Longford St, Phoenix St and Tram St.

Bone	Measurement	Site	No.	Mean	Min	Max
Metacarpal	Bd	O'Connell St	6	30.3	28.0	33.5
		Phoenix St	11	27.8	24.1	33.2
		Tram St	11	27.8	24.9	30.1
Metatarsal	Bp	O'Connell St	6	28.1	26.3	30.0
		Phoenix St	16	25.9	19.3	29.7
		Tram St	13	28.0	24.7	31.8

Phalanx 1	Gl.Pe	O'Connell St	9	41.2	38.3	43.7
		Phoenix St	6	41.2	38.7	46.0
		Tram St	4	39.1	32.5	43.0
Radius	Bd	O'Connell St	1	34.3		
		Longford St	3	29.2	24.8	31.5
		Phoenix St	12	27.2	23.2	33.1
Tibia	Bd	O'Connell St	4	30.8	27.1	34.3
		Aston Quay	1	31.3		
		Phoenix St	16	27.5	21.5	34.3
		Tram St	21	30.3	23.1	34.7

5.7 *Pig*

5.7.1 Only three pig bones were found in the assemblage: a mandible, a metacarpal and a radius. As the premolars are fully erupted, the mandible derived from a male pig older than 12-15 months. The other bones could not be aged, but judging by size, no juveniles were present.

5.7.2 Due to the small number of bones, little can be said about any slaughtering preferences. However, since pigs reach their full size at the age of two (Härde 1997:85), and as there are no secondary products to gain from them, they are usually slaughtered at that age, with only a few breeding animals being allowed to live.

5.7.3 The few remains of pig in comparison with cattle and sheep/goat, as well as the lack of older pigs, corresponds with data from Aston Quay, Tram St and Phoenix St.

5.8 *Horse*

5.8.1 The one horse bone in the assemblage derives from an animal of ca 3.5 years of age. Horse is present at Longford St, Phoenix St, and Tram St, albeit in very small numbers. Where age estimation could be carried out, these bones derived from adult individuals.

5.9 *Dog*

5.9.1 One mandible, deriving from an adult dog, is found in the assemblage. As with horse, dog is usually present in small numbers in urban post-medieval assemblages, and its

presence in O'Connell St should be no surprise. Whether the dog remains derived from a stray or a pet is unknown.

5.9.2 Using measurements of the mandibular first molar, and comparing those with measurements of complete dogs found on two other post-medieval Dublin sites, a size estimation could be carried out for the O'Connell St dog. The tooth size of the O'Connell St dog is similar to the second South Great Georges Street dog, whose estimated withers' height is in range of a german shepherd.

Table 9 - Measurements of the mandibular M1, radius, and estimated withers' height (radius) of dogs from O'Connell St, Railway St and South Great Georges St.

	Length of M1 (mm)	Breadth of M1 (mm)	Length of radius (mm)	Estimated withers' height
O'Connell St	21.8	8.6		
James Joyce/Railway St	15.4	5.4	81.6	27.9 cm
S.G.Georges St	16.6	11.5	215.0	70.3 cm
S.G.Georges St	22.1	9.0	187.0	61.4 cm

5.10 ***Cat***

5.10.1 Cat is mainly represented in the assemblage by limb bones. The bones derive from several contexts, and would thus be unlikely to belong to the same individual. Cat is present at the other sites, also in few numbers.

5.11 ***Hare***

5.11.1 The humerus of a young hare is the only remains of a wild mammal in the assemblage. No butchering marks were found, and it is unknown whether the bone derives from a young animal that strayed into Dublin, or if the hare was killed outside the town and was brought in to be sold at the market. Hare meat is not common in post-medieval references, but occur sometimes.

5.12 ***Bird***

5.12.1 Four species of bird are present in the assemblage: fowl, turkey, goose and duck. It's uncertain whether the goose and duck bones derive from domestic or wild birds, as it

is very hard to distinguish between wild and domestic goose and duck. Due to the skeletal distribution (see below), it is however reasonable to assume that they derive from domestic birds. The bones derive from the meat-rich parts of the body (see table 10), which would indicate them being remains of meals.

5.12.2 According to household accounts from the mid-late 18th century, poultry was the third largest expense in the meat-category, after beef and mutton. In general, chicken was the most common bird on the dinner table, after duck, goose and turkey (Clarkson & Crawford 2001:36-37). Unfortunately, little has been published on non-upper class urban household accounts. It's therefore hard to tell whether birds were as rare as the archaeological material indicates, or if many bird bones have been lost due to taphonomic processes.

Table 10 - Assemblage from phase 1–3: Anatomical distribution of bird bones

	Fowl	Turkey	Goose	Duck	Indet. bird
Skull					
Mandible					
Vertebra					
Rib					
Sternum			3		
Clavicle					
Coracoid					
Scapula		1			
Humerus		2			
Radius					
Ulna	1		1		
Carpometacarpus					
Phalanx 1 (wing)					
Phalanx 2 (wing)					
Phalanx 3 (wing)					
Pelvis	1		2	1	2
Femur					1
Tibiotarsus	1				
Tarsometatarsus					
Phalanx 1 (foot)					
Phalanx 2 (foot)					
Phalanx 3 (foot)					
Total	3	3	6	1	3

5.13 ***Fish***

5.13.1 Three fish bones, one probably deriving from cod, were found in the assemblage. Due to lack of good reference collections, they could not be estimated to species. The scarcity of fish bones is likely due to the retrieval method (see chapter 1.).

6 Phase 4

6.1 The bone assemblage from phase 4 consisted of 322 bones, of which 44% could be determined to species. 74 bones (23%) were completely indeterminable.

6.2 Of the 74 sheep/goat bones, ten were identified as sheep. As no bones could be determined to goat, it is likely that most - if not all - of the sheep/goat bones are sheep bones. This follows the pattern of other contemporary Dublin sites (Aston Quay, Tram St, Phoenix St, Longford St etc).

6.3 Judging from the number of fragments, sheep/goat is the most frequent species, with cattle coming second, and duck and goose third. Pig, horse, cat, rabbit, fowl, turkey and fish are also present in small numbers (see table 11.). When using MNI, sheep/goat is still the most frequent species (MNI: 6), and cattle being the second most frequent species (MNI:3). Goose and duck are represented by two individuals each, and the remaining species by one individual each. While the ratio of small, medium sized and large ribs and vertebrae do not correspond to the figures given by NISP or MNI, the margin of error is not very large. It is likely that this reflects the retrieval method.

Table 11 - Assemblage from Phase 4: Anatomical distribution of all species, including NISP, MNI and weight. Skeletal element used for MNI is marked with an asterisk

	Horse	Cattle	Sheep/goat	Pig	Cat	Rabbit	Fowl	Turkey	Duck	Goose	Bird	Fish	Medium	Large	Indet
Horncore															
Skull		3	5												
Mandibula		5	2	1											
Loose teeth		5	1												
Hyoid															
Atlas															
Axis															
Vertebra													6	6	
Sacrum															
Rib													35	49	
Sternum										3*	1				
Coracoid								1			1				
Scapula		2	7					2							
Humerus		3		1	1			1							
Radius		1	5	1					1		1				
Ulna		2	3						2*						
Carpal bones		1													
Metacarpal		5	18*					1							
Pelvis		3	8			1			1	1					
Femur		2	1				1								
Patella															
Tibia		2	5						1		1				
Fibula				1											
Calcaneus		2													
Astragalus		1													
Malleolare															
Tarsal bones		2													
Metatarsal		3*	11				1				4				
Phalanx 1			7							1					
Phalanx 2	1	1													

Phalanx 3		1													
Indet. metapod															
Indet.												2			74
Total (NISP)	1	44	74	4	1	1	2	5	5	5	7	2	42	55	74
MNI	1	3	6	1	1	1	1	1	2	2					
Weight (g)	75.4	4673.0	1790.6	100.7	7.4	1.1	9.2	20.8	6.3	34.3	28.2	8.0	236.9	1836.9	1653.9

6.4 *Cattle*

6.4.1 Forty-three cattle bones were identified. A further fifty-seven fragments are identified as large mammals, and the scarcity of horse bones in the assemblage makes it reasonable that most, if not all, of these fifty-seven fragments derive from cattle. Most of the body parts are present in the assemblage, which indicate that the cattle were slaughtered in the area.

6.4.2 Fifteen cattle bones could be age estimated using epiphyseal fusion stages (see table 12.). There is no peak in slaughter ages, but rather a steady slaughter over all age groups. This is similar to the Phoenix St assemblage from the mid – late 17th century, where there were no apparent preferences for certain slaughter ages. The two assemblages contemporary with phase 4 of O'Connell St (Phoenix St Phase 4 and Tram St phase 4) contain too few bones to make a certain slaughtering pattern. However, in both sites there are almost an equal amount of bones from calves (less than one year old) and adults over 3.5 years. Whether this reflects an actual slaughter pattern or is a pure coincidence due to the small amount of bones, is unknown.

6.4.3 It was not possible to make a sex estimation on any of the cattle bones, due to fragmentation. For reasons discussed in chapter 2.1.1., an estimation based on the metrical sexual dimorphism on the metacarpals was not carried out.

6.4.4 Few cattle bones were measurable. When comparing the O'Connell St measurements with the ones from Tram St, they mostly fall in the same range (see table 13). Some differences can be noted however. The pelvis measurement from Tram St is far larger than the one from O'Connell St. While this may be an indication of the presence of an ox and a cow, it could simply be the difference between a fully grown animal at Tram St, and a juvenile at O'Connell St, due to the early fusing of the pelvis. On a similar note, there is a rather large difference between the two metacarpal measurements from O'Connell St, which might be an indication of sex (see above).

6.4.5 Seven cattle bones displayed butchering marks. As with the bones from phase 1-3 (see chapter 2.1.1.), most derives from a secondary butchering stage, where the limbs are disarticulated and chopped into smaller pieces. Two humeri displayed chopmarks

at a break mid-shaft, as well as at the distal joint. An astragalus had had small bits chopped off, which likely had occurred when separating the meat-rich upper parts of the hind leg from the meat-poor lower parts. Two pelves displayed chopmarks at the acetabulum, which may have originated either as an attempt to disarticulate the femur from the hip socket, or during dismemberment of the pelvis into smaller pieces. One complete metatarsal had two parallel chopmarks distally, on the posterior side. Nothing was chopped off, and the reason for these chopmarks is not clear. Further, a horncore had been sawn off one skull, indicating the use of horncores a raw material for various crafts.

Table 12 - Assemblage from phase 4: Cattle epiphyseal closure. (UF = unfused, IF = in fusion, F = fused).

	Very young	UF	IF	F	% UF
Early fusion (< 1.5yrs)					
Acetabulum					
Scapula px		1			
Humerus di		1		2	
Radius px					
Phalanx 2 px			1		
Early fusion subtotal		2	1	2	40%
Mid fusion (2-2.5yrs)					
Tibia di					
Metacarpal di				2	
Metatarsal di		1			
Phalanx 1 px					
Mid fusion subtotal		1		2	33%
Late fusion (> 3yrs)					
Humerus px					
Radius di		1			
Ulna px		1		1	
Ulna di					
Femur px				1	
Femur di					
Tibia px			1		
Calcaneus px		1		1	
Late fusion subtotal		3	1	3	43%

Table 13 - Assemblage from phase 4: Cattle measurements in comparison with measurements from Phoenix St and Tram St.

Bone	Measurement	Site	No.	Mean	Min	Max
Metacarpal	Bd	O'Connell St	2	64.7	59.2	70.1
		Tram St	1	65.1		
Metatarsal	Bp	O'Connell St	1	49.7		
		Tram St	1	51.5		
Pelvis	LAR	O'Connell St	1	53.6		
		Tram St	1	70.0		

6.5 *Sheep/goat*

6.5.1 Of the seventy-four sheep/goat bones in the assemblage, ten were identified as sheep (see table 14). As mentioned in chapter 2.2., it's highly likely that a great majority of the sheep/goat assemblage consist of sheep, with few or no goats present.

6.5.2 Judging from epiphyseal fusion, very few sheep in the assemblage were slaughtered before 2-3 years of age (see table 15.). The one mandible that could be used for ageing confirms the epiphyseal age estimation, as the third molar is worn (see table 16.). The slaughter pattern at O'Connell St corresponds to the earlier assemblages, dating to the 18th century (O'Connell St, Longford St, Phoenix St), where most sheep were over two years old when slaughtered. Unfortunately, the one contemporary assemblage, at Tram St, yields little information on ageing, due to its small size. It is however likely that there were little differences in sheep husbandry strategies in Dublin between the 18th and 19th centuries.

6.5.3 Two sheep/goat pelves derived from females. Of the three comparison sites, sex estimation was only carried out at Aston Quay, where three sheep pelves deriving from females were found. This predominance of ewes would correspond to the idea of sheep being used predominantly for milk in post-medieval urban environments.

6.5.4 Few sheep/goat could be used for comparison with contemporary materials (see table 17.). There is very little difference for the tibia measurement, whereas there is a large difference for the scapula measurement. Assumably this reflects the small sample, where one large ram or wether may skew the figures. One first phalanx was markedly

longer than the others (see appendix 3.), and it is assumed that it may derive from a ram or wether.

6.5.5 Butchering marks occurred on four sheep/goat bones. One pelvis displayed two cutmarks at the sacral joint. These may have been caused either as part of separating the leg from the spine, or being due to filleting. Three radii had a chopmark medially on the distal surface, indicative of separation of the meat-rich parts from the meat-poor parts of the front leg.

Table 14 - Assemblage from phase 4: Anatomical distribution of sheep and indeterminable sheep/goat, including NISP and weight

	Sheep/goat	Sheep
Horncore		
Skull	3	2
Mandibula	1	1
Loose teeth	1	
Hyoid		
Atlas		
Axis		
Vertebra		
Sacrum		
Rib		
Scapula	4	3
Humerus		
Radius	5	
Ulna	3	
Carpal bones		
Metacarpal	18	1
Pelvis	8	
Femur	1	1
Patella		
Tibia	2	3
Fibula		
Calcaneus		
Astragalus		
Malleolare		
Tarsal bones		
Metatarsal	11	
Phalanx 1	7	
Phalanx 2		
Phalanx 3		
Indet. metapod		
Total (NISP)	64	10
Weight (g)	1346.0	444.6

Table 15 - Assemblage from phase 4: Sheep/goat epiphyseal closure. (UF = unfused, IF = in fusion, F = fused)

	Very young	UF	IF	F	% UF
Early fusion (< 1yrs)					
Acetabulum					
Scapula px					
Humerus di					
Radius px					
Phalanx 1 px					
Phalanx 2 px				7	
Early fusion subtotal				7	0%
Mid fusion (1-2yrs)					
Tibia di				3	
Metacarpal di		1		17	
Metatarsal di		1		10	
Mid fusion subtotal		2		30	6%
Late fusion (> 3yrs)					
Humerus px					
Radius di		2		2	
Ulna px				1	
Ulna di					
Femur px		1	1		
Femur di					
Tibia px					
Calcaneus px					
Late fusion subtotal		3	1	3	43%

Table 16 - Assemblage from phase 4: Mandibular wear stages of sheep/goat, with estimated age according to Benecke (1988)

	P4	M1	M2	M3	M.W.S.	Estimated age
Sheep 1	f	j	g	g	38	5-6 years

Table 17 - Assemblage from phase 4: Sheep/goat measurements in comparison with measurements from Tram St.

Bone	Measurement	Site	No.	Mean	Min	Max
Scapula	GLP	O'Connell St	2	39.6	38.4	40.8
		Tram St	1	31.8		
Tibia	Bd	O'Connell St	3	31.2	30.3	32.1
		Tram St	2	32.2	31.0	33.4

6.6 *Pig*

6.6.1 Of the four pig bones found in the assemblage, two could be age estimated. One fused proximal radius derived from a pig over 1 year of age. One mandible with an erupting second incisor derived from a pig of ca 1-1.5 years of age. The other bones could not be aged, but judging by size, no juveniles were present.

6.6.2 Due to the small number of bones, little can be said about any slaughtering preferences. Pigs are usually slaughtered at the age of two, when they reach their full size (Hårde 1997:85), as there are no secondary products to gain from them. The pig that died at an earlier age might have been deliberately killed due to lack of feed, or because it showed signs of disease. It could also have succumbed to disease or trauma.

6.6.3 The few remains of pig in comparison with cattle and sheep/goat, as well as the lack of older pigs, corresponds with data from Aston Quay, Tram St and Phoenix St.

6.7 *Horse*

6.7.1 A second phalanx is the only horse bone from phase 4. It is fused, and derives from an animal older than one year. As mentioned earlier, horse bones are rare on post-medieval urban sites. They likely derive from adult horses used for load-carrying, which were slaughtered when they became too worn out.

6.8 *Cat*

6.8.1 The cat remains consist of one humerus of a ca one year old cat. The inclusion of a few cat bones is rather common on post-medieval urban sites. It likely derived from a stray or from a pet in the neighbourhood.

6.9 *Rabbit*

6.9.1 One rabbit pelvis was found in the assemblage. Rabbit was eaten during the post-medieval period, but as no butchering marks were found, it is uncertain whether the bone is the remains of a meal, of a rabbit that only was skinned, or if it derived from a

wild rabbit. Rabbit bones were found in Longford St, Phoenix St and Tram St. However, butchering marks were only present on the bones from Longford St.

6.10 *Bird*

6.10.1 Four species of bird are present in the assemblage: fowl, turkey, goose and duck. It's uncertain whether the goose and duck bones derive from domestic or wild birds, as it is very hard to distinguish between wild and domestic goose and duck. Due to the skeletal distribution (see table 18.), it is however reasonable to assume that they derive from domestic birds. Most bones derive from the meat-rich parts of the body, which would indicate them being remains of meals.

6.10.2 According to household accounts from the mid-late 18th century, poultry was the third largest expense in the meat-category, after beef and mutton. In general, chicken was the most common bird on the dinner table, after duck, goose and turkey (Clarkson & Crawford 2001:36-37). Unfortunately, little has been published on non-upper class urban household accounts. It's therefore hard to tell whether birds were as rare as the archaeological material indicates, or if many bird bones have been lost due to taphonomic processes.

Table 18 - Assemblage from phase 4: Anatomical distribution of bird bones

	Fowl	Turkey	Goose	Duck	Indet. bird
Skull					
Mandible					
Vertebra					
Rib					
Sternum			3		1
Clavicle					
Coracoid	1			1	
Scapula		2			
Humerus		1			
Radius				1	1
Ulna				2	
Carpometacarpus					
Phalanx 1 (wing)			1		
Phalanx 2 (wing)					
Phalanx 3 (wing)					
Pelvis			1	1	
Femur	1				
Tibiotarsus				1	1
Tarsometatarsus	1				4

Phalanx 1 (foot)					
Phalanx 2 (foot)					
Phalanx 3 (foot)					
Total	4	3	5	6	7

6.11 *Fish*

6.11.1 Two fish bones were found in the assemblage. Due to lack of good reference collections, they could not be estimated to species. The scarcity of fish bones is likely due to the retrieval method (see chapter 1.).

7 Butchering patterns

7.1 Some vertebrae, both of large and medium-sized mammals, were divided in half longitudinally, probably by using a heavy knife. This practice indicates that the carcasses were suspended during the first stages of the butchering process. Several ribs displayed chopmarks. They were most frequently placed at the vertebral joint and on the body of the rib. Most chopmarks on long bones occur at the proximal or distal end of the bone, indicating that the limbs were disarticulated at the joints during the butchering process. Larger longbones were sometimes chopped in half or in thirds, as indicated by two cattle humeri from phase 4.

7.2 There are no discernable differences in butchering patterns between phase 1-3 and phase 4, nor between large and medium-sized mammals. In both cases, the carcasses were sometimes – but not always – suspended and divided in half, using a heavy knife. The meat-poor lower legs were separated, and the meat-rich parts of the upper body were divided into smaller pieces. Usually, the legs were dismembered at the joints, and the ribs were divided into two or more parts.

7.3 Chopmarks on the distal end of metapodials may indicate the removal of feet for the boiling of glue. Two cattle horncores had been sawn off, assumably for using the horn sheath as a raw material. A loose sheep horncore displayed chopmarks diagonally across it. These chopmarks were likely caused by the removal of the horn sheath.

8 Pathology

8.1 Four bones displayed pathological conditions. Such low amount of pathologies are not unusual, considering that the majority of diseases do not leave any traces in bones, and that most of the animals probably were fairly healthy. With the exception of a sheep metatarsal, the pathological bones all derive from phase 1-3.

8.2 A cattle femur had some slight woven bone growth at the trochanter minor, which would indicate a minor infection of the bone or of the periosteum – a thin membrane surrounding the bone.

8.3 There are some exostoses on the medial side of a cattle secondary phalanx. These are likely to derive from muscle strains, perhaps associated with traction or soft surfaces (see below).

8.4 The medial epicondyle of a sheep metatarsal had been extended medially through extra bone growth (see plate 1.). Similar extensions of epicondyles are known on cattle metatarsals. This condition has been associated with repeated stress that might have been caused by using the animal for traction. An alternative interpretation is repeated stress due to walking on very soft ground (Johnstone pers. comm., Davis pers. comm.). As sheep rarely were used for traction during the post-medieval period, the pathological condition may have been caused by penning the animal in a muddy enclosure. This may indicate an animal being kept in an urban environment, as assumably there would be some variation in ground conditions on rural sites.

8.5 A cattle incisor showed steep wear lingually and buccally. This may reflect an animal that has been gnawing on hard objects, such as metal bars. It is known that animals that get little stimulation may adopt meaningless and/or destructive behaviour. According to Whitehall's census in 1798, cows were kept inside the city in dairies (Maxwell 1936:117). If these cows were tied up during their lactation period of 10-11 months, with little room to move about, they may have started displaying such behaviour.

9 Discussion

9.1 The assemblage represents both food waste and butchering waste. Most skeletal parts were present, which is indicative of butchering near site. Several bones displayed butchering marks and cutmarks. The butchering procedure for the main meat-producing species varies a little. Sometimes the carcasses were suspended, and then divided along the spine with a heavy knife. At other times, this stage was omitted. On cattle the ribs were separated from the spine, and the ribs divided into two or three parts. The limbs were dismembered at the joints. Larger bones could also be severed at mid-shaft.

9.2 Despite sheep being the most frequent animal, both when using MNI and using NISP, cattle were probably the most important meat animal for the people living near the O'Connell Street area. If carcass weight is taken into account, using data from the 1780s, five cattle would weigh 3420 pounds, whereas seven sheep would only weigh 483 pounds (Clarkson & Crawford 2001:40). The figures for phase 4 are 2052 and 414 pounds respectively.

9.3 The cattle were mainly slaughtered at an age where they would have reached their full growth (McQuade 2001:4). Similar slaughtering strategies seem to have been applied for pigs. Sheep were mostly slaughtered at a later age, reflecting the importance of their secondary products.

9.4 The high proportion of ewes in the assemblage indicates that the sheep were used mainly for milk. Naturally, wool and meat were important by-products, but these do not necessarily require a higher proportion of females. Very few remains of lambs were found at the site, which may indicate different socio-economically related eating habits. Lamb meat may have been expensive, and thus used mainly by those who could afford it.

9.5 The small percentages of pig, dog, cat, hare, rabbit, birds and fish correspond with the other three Dublin assemblages used for comparison. Neither Longford St nor Phoenix St contains any bird bones. It is not certain whether the small number of pigs and birds reflect general eating habits in Dublin, or if it relates to socio-economical factors.

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Appendix 1a - Key to Abbreviated Metrical Terms (After Von Den Driesch 1976).

Cranial measurements

Cattle skull:

22: Length of the premolar row

Sheep/goat skull:

14: Greatest length of the lacrimal

21: Length of the cheektooth row

22: Length of the molar row

23: Length of the premolar row

Sheep/goat mandible:

7: Length of the cheektooth row

8: Length of the molar row

9: Length of the premolar row

10: Length and breadth of M3

Dog mandible:

10: Length of the molar row

13: Length and breadth of the carnassial (M1)

14: Length of the carnassial alveolus

19: Height of the mandible behind M1

Post-cranial measurements

Bd: Breadth of distal end

BFp: Greatest breadth of the Facies articularis proximalis

BG: Breadth of glenoid cavity

Bp: Breadth of proximal end

BPC: Greatest breadth across the coronoid process

BTr: Greatest breadth of the region of the Trochanter tertius

Dd: Greatest depth of the distal end

Did: Greatest diagonal of the distal end

Dp: Greatest depth of the proximal end

Dip: Greatest diagonal of the proximal end

GB: Greatest breadth

GL: Greatest length

GLl: Greatest length, lateral

GLm: Greatest length, medial

GLP: Greatest length of glenoid process

GLPe: Greatest length of peripheral half

L: Length of the metacarpus II

LAR: Length of acetabulum on the rim

LFo: Inner length of Foramen obturatum

LG: Length of glenoid cavity

LO: Length of the olecranon

SD: Smallest breadth of diaphysis

SDO: Smallest depth of olecranon

SLC: Smallest length of Collum scapulae

Appendix 2: Assemblage From Phase 1-3: Cranial & Post-Cranial Measurements

Cranial measurements						
Species	**Bone**	**Measurement**				
Sheep/goat	Mandible	7	72.7	74.7	77.1	
	Mandible	8	49.4	51.1	53.8	
	Mandible	9	22.2	23.5	23.7	23.9
	Mandible	10	22.7/8.4	24.3/8.3		
Dog	Mandible	10	39.5			
	Mandible	13	21.8/8.6			
	Mandible	14	22.6			
	Mandible	19	32			

Post-cranial measurements								
Species	**Bone**	**Measurement**						
Cattle	Calcaneus	GL	131.8	134.4	144.6			
	Calcaneus	GB	43	45	45			
	Metacarpal	GL	191					
	Metacarpal	Bp	55.7	64.9	67.5	74.2		
	Metacarpal	Bd	60.1					
	Metacarpal	SD	37					
	Phalanx 1	Bp	32.2					
	Phalanx 1	Bd	29.6					
	Phalanx 1	SD	27					
	Phalanx 1	GLPe	59.3					
	Ulna	SDO	51.7					
Sheep/goat	Astragalus	Bd	23.4					
	Astragalus	BTr	14					
	Astragalus	GLl	35.2					
	Astragalus	GLm	33					
	Calcaneus	GL	70.6					
	Calcaneus	GB	25					
	Metacarpal	Bd	28	28.7	29.3	30.9	31.1	33.5

	Metatarsal	Bd	26.3	26.5	28	28.7	29.1	30			
	Pelvis	LAR	24.8	26.7							
	Pelvis	LFo	39.3	41.6							
	Phalanx 1	Bp	12.8	12.9	13.2	13.5	14.2	14.4	14.6	15.4	15.4
	Phalanx 1	Bd	11.7	12.1	12.1	12.2	13.2	13.7	13.8	14.2	15
	Phalanx 1	SD	9.8	10.1	11	11.1	11.3	11.7	11.8	12	13.1
	Phalanx 1	GLPe	38.3	40.6	40.8	40.9	41.4	41.6	41.9	42	43.7
	Radius	Bd	34.3								
	Scapula	GLP	43								
	Scapula	BG	29.2								
	Scapula	LG	30.8								
	Scapula	SLC	25.1								
	Tibia	Bd	27.1	29.8	32	34.3					
	Ulna	BPC	19								
	Ulna	LO	48.4								
	Ulna	SDO	26.4								
Cat	Radius	GL	91.9								
	Radius	Bp	8.1								
	Radius	Bd	12.3								
	Radius	SD	5.4								
	Tibia	BD	14.7								
	Tibia	SD	7.3								
Fowl	Ulna	GL	99.7								
	Ulna	SD	6.2								
	Ulna	Did	13.4								
	Tibiotarsus	GL	133.7								
	Tibiotarsus	Bd	13.9								
	Tibiotarsus	SD	7.8								
	Tibiotarsus	Dd	15.9								

Appendix 3: Assemblage From Phase 4: Cranial And Post-Cranial Measurements

Cranial measurements			
Species	**Bone**	**Measurement**	
Cattle	Skull	22	78.0
Sheep/goat	Skull	14	52.1
	Skull	21	71.9
	Skull	22	46.6
	Skull	23	24.0
Sheep/goat	Mandible	7	74.7
	Mandible	8	51.3
	Mandible	9	23.4
	Mandible	10	23.1/8.4

Post-cranial measurements																	
Species	**Bone**	**Measurement**															
Cattle	Astragalus	Bd	45.2														
	Astragalus	GLl	70.1														
	Metacarpal	Bd	59.2	70.1													
	Metacarpal	SD	30.4														
	Metatarsal	GL	235														
	Metatarsal	Bp	49.7														
	Metatarsal	Bd	55.2														
	Metatarsal	SD	30.9	30.9													
	Pelvis	LAR	53.6														
	Ulna	SDO	53.0														
Sheep/goat	Metacarpal	Bd	28.1	28.7	28.8	29.2	29.3	29.4	29.8	30.0	30.7	30.9	31.5	32.3	32.8	32.8	33.2	33.5
	Metatarsal	Bd	25.7	27.5	27.7	29.0	29.5	29.6	30.1	30.5	31.9							
	Pelvis	LAR	23.4															

	Pelvis	LFo	40.6			
	Phalanx 1	Bp	14.9	15.1	15.4	15.6
	Phalanx 1	Bd	12.7	14.0	14.6	14.6
	Phalanx 1	SD	11.3	11.6	13.0	13.1
	Phalanx 1	GLPe	40.9	41.6	41.6	47.1
	Scapula	GLP	38.4	40.8		
	Scapula	BG	23.3			
	Scapula	LG	27.6	30.9		
	Scapula	SLC	22.0	23.4	26.8	27.7
	Tibia	Bd	30.3	31.2	32.1	
	Ulna	LO	47.9			
	Ulna	SDO	26.9			
Pig	Radius	Bp	28.2			
Horse	Phalanx 2	GL	57.0			
	Phalanx 2	Bp	61.1			
	Phalanx 2	Bd	57.3			
	Phalanx 2	SD	50.4			
	Phalanx 2	BFp	55.8			
	Phalanx 2	Dp	40.0			
Fowl	Carpometacarpus	GL	69.7			
	Carpometacarpus	Bp	21.1			
	Carpometacarpus	L	66.1			
Duck	Radius	GL	72.0			
	Radius	Bd	6.6			
	Radius	SD	3.3			
	Tibiotarsus	SD	4.9			
	Ulna	GL	77.5			
	Ulna	SD	5.0			
	Ulna	Did	10.6			

Appendix 1b - Assemblage from Phase 1-3: Cranial and Post-Cranial Measurements

Cranial measurements						
Species	**Bone**	**Measurement**				
Sheep/goat	Mandible	7	72.7	74.7	77.1	
	Mandible	8	49.4	51.1	53.8	
	Mandible	9	22.2	23.5	23.7	23.9
	Mandible	10	22.7/8.4	24.3/8.3		
Dog	Mandible	10	39.5			
	Mandible	13	21.8/8.6			
	Mandible	14	22.6			
	Mandible	19	32			

Post-cranial measurements						
Species	**Bone**	**Measurement**				
Cattle	Calcaneus	GL	131.8	134.4	144.6	
	Calcaneus	GB	43	45	45	
	Metacarpal	GL	191			
	Metacarpal	Bp	55.7	64.9	67.5	74.2
	Metacarpal	Bd	60.1			
	Metacarpal	SD	37			
	Phalanx 1	Bp	32.2			
	Phalanx 1	Bd	29.6			

	Phalanx 1	SD	27							
	Phalanx 1	GLPe	59.3							
	Ulna	SDO	51.7							
Sheep/goat	Astragalus	Bd	23.4							
	Astragalus	BTr	14							
	Astragalus	GLl	35.2							
	Astragalus	GLm	33							
	Calcaneus	GL	70.6							
	Calcaneus	GB	25							
	Metacarpal	Bd	28	28.7	29.3	30.9	31.1	33.5		
	Metatarsal	Bd	26.3	26.5	28	28.7	29.1	30		
	Pelvis	LAR	24.8	26.7						
	Pelvis	LFe	39.3	41.6						
	Phalanx 1	Bp	12.8	12.9	13.2	13.5	14.2	14.4	14.6	15.4	15.4
	Phalanx 1	Bd	11.7	12.1	12.1	12.2	13.2	13.7	13.8	14.2	15
	Phalanx 1	SD	9.8	10.1	11	11.1	11.3	11.7	11.8	12	13.1
	Phalanx 1	GLPe	38.3	40.6	40.8	40.9	41.4	41.6	41.9	42	43.7
	Radius	Bd	34.3							
	Scapula	GLP	43							
	Scapula	BG	29.2							
	Scapula	LG	30.8							
	Scapula	SLC	25.1							
	Tibia	Bd	27.1	29.8	32	34.3				
	Ulna	BPC	19							

	Ulna	LO	48.4
	Ulna	SDO	26.4
Cat	Radius	GL	91.9
	Radius	Bp	8.1
	Radius	Bd	12.3
	Radius	SD	5.4
	Tibia	BD	14.7
	Tibia	SD	7.3
Fowl	Ulna	GL	99.7
	Ulna	SD	6.2
	Ulna	Did	13.4
	Tibiotarsus	GL	133.7
	Tibiotarsus	Bd	13.9
	Tibiotarsus	SD	7.8
	Tibiotarsus	Dd	15.9

Appendix 1e: Assemblage from Phase 4: Cranial And Post-Cranial Measurements

Cranial measurements			
Species	**Bone**	**Measurement**	
Cattle	Skull	22	78.0
Sheep/goat	Skull	14	52.1
	Skull	21	71.9
	Skull	22	46.6
	Skull	23	24.0
Sheep/goat	Mandible	7	74.7
	Mandible	8	51.3
	Mandible	9	23.4
	Mandible	10	23.1/8.4

			Post-cranial measurements
Species	**Bone**	**Measurement**	
Cattle	Astragalus	Bd	45.2
	Astragalus	GLl	70.1
	Metacarpal	Bd	59.2 70.1

	Metacarpal	SD	30.4
	Metatarsal	GL	235
	Metatarsal	Bp	49.7
	Metatarsal	Bd	55.2
	Metatarsal	SD	30.9 30.9
	Pelvis	LAR	53.6
	Ulna	SDO	53.0
Sheep/goat	Metacarpal	Bd	28.1 28.7 28.8 29.2 29.3 29.4 29.8 30.0 30.7 30.9 31.5 32.3 32.8 32.8 33.2 33.5
	Metatarsal	Bd	25.7 27.5 27.7 29.0 29.5 29.6 30.1 30.5 31.9
	Pelvis	LAR	23.4
	Pelvis	LFo	40.6
	Phalanx 1	Bp	14.9 15.1 15.4 15.6
	Phalanx 1	Bd	12.7 14.0 14.6 14.6
	Phalanx 1	SD	11.3 11.6 13.0 13.1
	Phalanx 1	GLPe	40.9 41.6 41.6 47.1
	Scapula	GLP	38.4 40.8
	Scapula	BG	23.3
	Scapula	LG	27.6 30.9
	Scapula	SLC	22.0 23.4 26.8 27.7
	Tibia	Bd	30.3 31.2 32.1
	Ulna	LO	47.9
	Ulna	SDO	26.9
Pig	Radius	Bp	28.2
Horse	Phalanx 2	GL	57.0

	Phalanx 2	Bp	61.1
	Phalanx 2	Bd	57.3
	Phalanx 2	SD	50.4
	Phalanx 2	BFp	55.8
	Phalanx 2	Dp	40.0
Fowl	Carpometacarpus	GL	69.7
	Carpometacarpus	Bp	21.1
	Carpometacarpus	L	66.1
Duck	Radius	GL	72.0
	Radius	Bd	6.6
	Radius	SD	3.3
	Tibiotarsus	SD	4.9
	Ulna	GL	77.5
	Ulna	SD	5.0
	Ulna	Did	10.6

Appendix 2 - The Pottery From O' Connell St, Dublin 1 (03E433)

By Ann Byrne M.A.

1 Introduction

1.1 Seven hundred and seventy seven sherds of pottery were recovered during excavations at O'Connell Street in Dublin. Thirteen sherds of pottery were medieval, the rest were post-medieval in date.

1.2 This report is divided into two sections. The first section deals with the individual pottery types recovered from the site. A short introduction to each pottery type is provided before discussing specific examples. A table showing the pottery types recovered, sherd numbers, MNV and dates for the types accompanies this section. MNV or Minimum Number of Vessels is calculated by choosing the most common diagnostic feature for each pottery type and comparing them to establish the minimum possible number of vessels.

1.3 The second section of the report deals with the pottery in relation to the excavation and the contexts in which it was found. This section is accompanied by five tables. The first table deals with the pottery from the cleanback, which preceded the excavation. The four remaining tables deal with the pottery recovered from each of the four phases of activity identified on the site.

2 The Pottery

2.1 **Ham Green B:** This ware shares the same origin in Bristol as Ham Green A but has a somewhat larger date range from c.1175-1250. The ware is also similar to Ham Green A in terms of fabric (except that this ware tends to have more quartz and calcite inclusions). Therefore stylistic grounds are normally used to distinguish them. Where un-diagnostic sherds are present in the assemblage they tend to be placed in the B category and as a result, B ware is often over-represented (McCutcheon, forthcoming Back Lane, 5). The pottery is decorated with a dark green glaze. Ham Green B wares are characterised by distinctive frilled bases and collared rims. Unlike A wares, decoration is both incised and applied. Horizontal and vertical grooving and combing are common (Barton, 1988, 279). Ham Green B ware is also characterised by applied zoomorphic decoration (Gahan and

McCutcheon, 1997, 294) A range of vessel forms are found including jugs and cooking pots. Two sherds of Ham Green B, representing a jug, were found. The sherds have a grey core, with frequent inclusions, and a dark green glaze. Neither have any decoration.

2.2 **Unidentified medieval pottery:** The origin of a number of the sherds could not be conclusively identified although due to certain distinctive characteristics of the sherds it could be said that they dated to the medieval period. Some of these are almost certainly French imported wares, however the region could not be verified.

2.3 **North Devon:** The North Devon pottery centres of Bideford and Barnstaple traded extensively with Ireland during the 17th century. The pottery produced in this area is distinguished by a grey margin, which was the result of insufficient levels of oxygen during firing (Gahan and Twohig, 1997, pg 135). Four distinctive wares from the North Devon production centres have been found in Ireland.

2.3.1 *North Devon gravel tempered ware:* This ware is the coarsest of three as a result of the inclusion of quartz sand to the clay. It is often decorated with internal green or brown glaze. These wares were mainly used for everyday domestic purposes and occur in the form of large cooking pots and containers for various purposes (Mc Cutcheon, 1995, pg 62). The vessel types represented by the sherds include jars, bowls and chamber pots.

2.3.2 *North Devon gravel free ware:* Gravel free and sgraffito wares are finer than the gravel tempered variety, however often retaining the characteristic grey margin. The gravel free wares also had an internal green or brown glaze. These wares were mainly used as tableware due to their finer quality (Meenan, 1997, pg 350). A cup is represented by the sherds in the assemblage. The cup has an internal dark green glaze.

2.3.3 *Sgraffito ware:* As mentioned above the sgraffito type has a similar fabric to the gravel free ware. It differs mainly in terms of decoration. A white slip was applied to the surface of the vessel. Designs were scratched into the slip, exposing the red fabric underneath. Finally, a lead glaze was applied which, when fired, made the slip appear yellow and the incised decoration appear brown in colour (Gahan and Towhig, 1997,

pg147). The sherds recovered represent two plates. Each plate is divided up into three sections by sgraffito line boarders. This results in three zones of decoration on each plate. Patterns within these zones include diagonal lines and spirals.

2.3.4 *North Devon slipware:* This slipware has the same fabric, slip and glaze as North Devon sgraffito but lacks the sgraffito decoration. Slip decoration is commonly found on North Devon tablewares. A plate is represented by the sherds recovered.

2.4 **Frechen stoneware:** This stoneware is named after its site of production in Frechen near Cologne, Germany. Pottery was being produced here from at least 1500 and it was imported extensively into Britain and Ireland in the 16th and 17th centuries (Hurst *et al*, 1986, pg 214). At around 1500 Frechen potters moved to Cologne and set up potteries there. The pottery produced there is practically indistinguishable from Frechen and will be included here as the same category. Frechen stoneware has a dark grey fabric with an all-over brown, 'tiger' salt glaze (ibid). These wares could be left simple, with only the 'tiger' mottling, or decoration, such as medallions or *Bartmanner*, could be added. Frechen is typically found in the form of jugs, mugs and tankards. A single sherd of Frechen, probably from a jug, is present in the assemblage. One sherd has a small fragment of a *Bartmann* mask remaining.

2.5 **Westerwald stoneware:** This stoneware is so called after the region of its production, in Westerwald, Germany. It became popular in Britain and Ireland, as an exported ware, in the 17th and 18th centuries when it replaced Frechen as the most popular exported German stoneware (Gaimster, 1997). It is indistinguishable from the 17th century Raeren jugs as the potters used the same moulds but *it is suggested that all blue decorated wares should be called Westerwald* (Hurst *et al*, 1986, pg 221). The fabric consists of a grey stoneware, which was covered with a blue salt glaze. Zone and medallion decoration are common on Westerwald vessels but overall unrestricted decoration is also found (Hurst *et al*, 1986, pg 222). Common forms include jugs, tankards and chamber pots. The sherds represent a jug. The sherds are mainly decorated with floral patterns in cobalt blue. One sherd is decorated with an octagonal medallion containing a crown, which is surmounted by a cross. Westerwald stoneware was often used as a medium for political exchange from the 16th century to the 18th century and the choice of political subjects represented on the wares was largely tied up with trade connections. As a result, on those wares *intended for*

the western European export market, the royal portraiture or arms of England, France and Spain were frequently used by Raeren potters... (Gaimster, 1997, 153).

2.6 **Tin glazed earthenware:** These wares were being made in Britain, Ireland and the Netherlands in the 17th and 18th centuries. All three types are found in Ireland and this has led to difficulties in identifying and classifying tin glazed earthenware (McCutcheon, 1995, pg 61.Gahan and Twohig, 1997, pg 144). Fabric for these wares ranges from buff to red. For this ware *the usual lead glaze is made white and opaque by the addition of tin oxide, which gives a good surface on which to paint. It disguises the thick earthenware body of the pot and makes it look like porcelain* (Draper, 1984, pg 25). Tin glazed earthenware has a characteristic sandwiched appearance created by the thick fabric between two layers of white glaze. The glaze is also very brittle and easily flakes away (www.stmarys.ca/academic/arts/anthropology/sdavis/ceramics/tin.htm). Forms are generally tablewares such as plates, cups, bowls and candlesticks. Tin glazed earthenware was also used to make ornamental pieces.

Mostly saucers but also plates, cups, bowls and jugs are represented by the sherds of tin glazed earthenware. A number of the vessels are decorated with blue painted floral motifs, while others are left plain.

2.7 **Chinese export porcelain:** Chinese porcelain was being imported into Europe as early as 1660. The fabric or 'paste' of the porcelain is made up of kaolin clay and very finely ground feldspathic rock and is known as 'hard paste' fabric (www.jefpat.org/diagnostic/Historic_Ceramic_Web_Page/HistoricWareDescriptions/porcelain.htm). Chinese porcelain is characterised by a very compact white-grey body with glass like qualities and a glossy feldspathic glaze that fuses with the paste. Numerous decorative motifs were used including floral designs, house and garden scenes and birds. A number of different styles of porcelain were imported. The most common imported style was underglaze blue. Forms most frequently include teawares.

The sherds represent a teacup and a saucer. All of the sherds are decorated with floral patterns. Most are painted in underglaze blue except for one sherd, which has red enamelling along with under glaze blue decoration. Enamelling was often added to

underglaze blue porcelain to increase the value of otherwise mediocre pieces (Powell, 1994, 66)

2.8 **Bristol-Staffordshire slipware:** This ware was imported into Ireland in the late 17th century and the 18th century (Gahan and Twohig, 1997, pg 148). The fabric is pink or buff. A white and a red slip were added to the fabric. Decoration was applied in the upper slip. (www.stmarys.ca/academic/arts/anthropology/sdavis/ceramics/stafford.htm). Different types of decoration were applied in the upper slip such as marbling, feathering and combing or large dots (these were mainly used as rim decoration). Once glazed the ware appeared either yellow with brown decoration or brown with yellow decoration, depending on the order in which the slips had been applied. Vessel forms include plates, bowls, mugs, pitchers, posset cups, chamber pots and candlesticks (ibid).

Plates and cups are represented in the assemblage. These are decorated with typical patterns including lines, feathering and combing, and dots.

2.9 **Mottled ware:** This ware was also made in the Bristol-Staffordshire region and therefore the fabric is often the same buff colour as Bristol/Staffordshire slipware. However, the colour can range from buff to grey for finer wares and red to yellow with buff inclusions for coarser wares (www.jefpat.org/diagnostic/Historic_Ceramic_web_Page/HistoricWareDescriptions/Manganese_mottled.htm). The *vessels were covered in a brown glaze with obvious bleeding which produced a 'treacly' appearance* (Gahan and Twohig, 1997, pg 148). Vessel forms for finer wares include tankards, which are distinguished by characteristic banding around the base. The fine wares also include mugs and cups while coarse ware forms include bowls, chamber pots and jars.

The majority of the vessels are tankards, however cups and bowls are also represented. Most of the vessels are decorated simply with mottling. A number of the tankards have banding around the bases. One sherd is decorated with a raised 'snail-shell' like spiral.

2.10 **Fulham stoneware:** This stoneware has a pale buff or grey fabric covered in a brown salt glaze (Gahan and Twohig, 1997, 151). It was produced from the late seventeenth century

to the late eighteenth century. A single sherd of this stoneware, possibly from a jug, is present in the assemblage.

2.11 **Nottingham stoneware:** This stoneware was in production from the late seventeenth century into the eighteenth century (Jennings, 1981, 219). The fabric ranges from a light buff colour to dark grey and is usually thin (Draper, 1984, 33). The vessels were glazed using a ferruginous slip, which appears as a lustrous brown glaze on fired vessels (Jennings, 1981, 221). Various types of decoration were used on Nottingham stoneware including sprigging, piercings and moulding. Typical forms include mugs and tankards, tea and coffee pots and pitchers. Two tankards are represented in the assemblage. Both of the tankards have banding around the base.

2.12 **Miscellaneous Stoneware:** This encompasses the large variety of stoneware that was produced in Britain and Ireland from the late 17th to the 20th century, which cannot be included in the above categories. Due to the large number of types being produced and the similarity between the types made in different areas, it is very difficult to divide many of the stonewares up depending on dates and region of production, therefore they are included under this general category. A mug and a jug are represented by the miscellaneous stoneware sherds.

2.13 **White salt glazed stoneware:** Production of this ware occurred between the first and last quarter of the 18th century (McCutcheon, 1995, pg 62). The thin white stoneware fabric was covered in an all-over white salt glaze. The uneven nature of the salt glaze restricted the use of painted decoration, which is rare on salt glazed stoneware. Instead, the rims are often decorated in various patterns. *Common plate rim motifs were: "dot, diaper and basket"; "bead and reel"; and "barley" pattern* (www.stmarys.ca/academic/arts/anthropology/sdavis/ceramics/.htm). Forms such as plates, teapots, tankards and chamber pots are found in this fabric. The sherds in the assemblage represent two saucers and one cup. None of the pieces have painted or rim decoration.

2.14 **Staffordshire white dipped stoneware:** This stoneware was produced in Staffordshire during the eighteenth century (Jennings, 1981, 221). The vessels have a buff/grey fabric

and a white salt glaze. The rims of the vessels were dipped in an iron slip (ibid). Vessel forms are generally tankards and mugs. Two mugs of this type are represented in the assemblage.

2.15 **Black glazed earthenware:** This ware was being produced in large quantities in the 18th and 19th centuries although it was produced on a smaller scale at least two centuries previous to this. Blackwares were made in both Britain and Ireland and it can be hard to distinguish between them. In general however, Irish wares tend to be less well fired with a matte black glaze over a brick red fabric (Meenan, 1997, pg 349). British wares on the other hand, are well fired, producing a purple/red fabric sometimes with buff inclusions. The glaze on British wares also tends to be glossier (ibid). Blackware was generally used for large vessels such as pitchers and storage containers.

Storage vessels, a chamber pot and a cup are represented by the sherd. The fabric of the cup is a fine brick red earthenware with a thin, glossy black glaze. This may be Whieldon Jackfield blackware, which began to be made around 1750. This ware was generally used to make tea and coffee service forms (www.jefpat.org/Historic_Ceramic_Web_Page/HistoricWareDescriptions/Jackfield.htm).

2.16 **Red earthenwares:** *Glazed red earthenware:* The fabric of these wares ranges in colour *from a light red or buff to a dark brown or red* (Meenan, 1997, pg 352) and they lack obvious inclusions. A clear lead glaze was often added to the interior, which appears orange or brown. Although these wares were produced extensively in both Ireland and Britain from the late 17th century to 19th century, they *have been generally assumed to be local to each area as it would have been uneconomical to import vessels of such size and* bulkiness from a distance" (ibid). Vessel forms range from tablewares to large storage jars. Plates, bowls, chamber pots and a small inkpot are represented by the sherds. The glaze on the vessels varies from clear to orange or green and on some vessels the glaze is slightly mottled.

2.16.1 *Unlgazed red earthenware:* The fabric of this ware is the same as that for glazed red earthenwares. Flowerpots were commonly made in this fabric (Meenan, 1997,

pg352). A small number of sherds of unglazed red earthenware were recovered. These represent a flowerpot.

2.16.2 *Slip decorated glazed red earthenware:* This ware is the same as glazed red earthenware except for the addition of trailed slip around the rims, usually on plates and dishes. Three plates and one bowl are represented in this ware. All are decorated with wavy lines and dots in a white slip covered by a clear lead glaze.

2.17 **Agate ware**: This ware was produced in the Staffordshire region in the eighteenth century (www.anteques.com). The body is made up of different clays, which fire to various colours and over which a clear lead glaze was applied (Gahan and Twohig, 1997, pg 152). A single sherd of agate ware was found.

2.18 **English porcelain**: English porcelain began to be made in imitation of Chinese porcelain from c.1745. The fabric consists of a 'soft paste' made up of clays combined with various ingredients, including small amounts of sand, gypsum soda, soapstone, and salt (www.jefpat.org/diagonstic/Historic_Ceramic_Web_Page/HistoricWareDescriptions/porcelain.htm). The glaze on English porcelain is less glossy than Chinese porcelain glaze and it does not fuse as well to the paste so it remains distinct from the fabric. Another characteristic of English porcelain is the use of transfer prints along with the traditional Chinese style decoration of under and over painting (www.stmarys.ca/academic/arts/anthropology/sdavis/ceramics/eporcel.htm).

A single base sherd from a saucer was found. The sherd is decorated with Chinoiserie floral patterns.

2.19 **Creamware:** Josiah Wedgwood developed this ware in 1762. (www.stmarys.ca/academic/arts/anthropology/sdavis/ceramics/cream.htm). A clear lead glaze was applied over the buff fabric to produce a yellow/cream coloured ware. Earlier examples tend to be a deeper yellow than later examples. Creamware can be decorated in a number of ways i.e. it can be painted, transfer printed, or given decorative edges (ibid). Alternatively it could be left plain. The lead glaze appears a deep yellow or green in the crevices of vessels, which provides a good method for identifying this ware (www.jefpat.org/diagnostic/Index.htm). Typical forms include tablewares like cups and

teapots but other forms such as chamber pots are also found. The sherds found represent a plate, which is undecorated and a bowl, which has a small fragment of blue painted decoration. On another sherd the rim is painted green.

2.20 **Pearlware:** In 1779 Josiah Wedgwood developed pearlware as an improvement upon the earlier creamwares (www.bbc.co.uk/antiques/antiquesroadshow/pearlware/shtml). Pearlware has a whiter fabric than creamware as result of the addition of more white clay and calcined flint (ibid). Pearlware glaze is also distinguishable from that of creamware. The glaze appears blue in the crevices of vessels as a result of the addition of cobalt oxide (ibid). Pearlware is decorated in much the same way as creamware, with painting, transfer prints and decorative edges. Tablewares are the most common forms. The sherds represent a painted pearlware cup. The internal base of the cup has a blue painted floral pattern. A handle, possibly from the same cup, is painted down the centre with a floral design.

2.21 **Unidentified post-medieval pottery:** A number of the sherds could not be identified in terms of region of origin, however certain characteristics (e.g. internal glaze, fabric quality etc) suggested that they were post-medieval in date. It is likely that a number of the sherds represent imported French wares.

Table 1: The pottery from O' Connell Street

Fabric	Sherds	MNV	Forms	Date
Ham green B ware	2	1	jug	1175-1250
Unidentified medieval	11	3	1 cooking pot, 1 jug, 1 bowl	Medieval
North Devon gravel tempered ware	104	10	4 jars, 2 chamber pots, 2 bowls, 1 pipkin, 1 jug	1600-1700
North Devon gravel free ware	3	1	cup	1600-1700
North Devon sgraffito	12	2	2 plates	1600-1700
North Devon slipware	2	1	plate	1600-1700
Frechen stoneware	1	1	Jug	1600-1700
Westerwald stoneware	5	1	Jug	1600-1800
Tin glazed earthenware	73	17	4 saucers, 3 plates, 3 bowls, 2 cups, 2 jugs?, 1 bowl?, 2 unidentified	1600-1800

Chinese porcelain	5	2	1 saucer, 1 cup	1660-1800
Bristol-Staffordshire slipware	42	7	3 plates, 2 cups, 2 unidentified	1670-1800
Mottled ware	199	23	19 tankards, 2 bowls?, 1 cup	1670-1800
Fulham stoneware	1	1	Jug?	1690-1775
Nottingham stoneware	7	2	2 tankards	1690-1800
Miscellaneous stoneware	12	3	1 mug, 1 jug?, 1 unidentified	1690-1900
White salt glazed stoneware	5	3	2 saucers, 1 cup	1700-1800
Staffordshire white dipped ware	3	2	2 mugs	1710-1765
Red slip coated ware	13	3	1 tankard, 1 cup, 1 jug?	1700-1800
Black glazed earthenware	124	8	6 storage vessels, 1 chamber pot, 1 cup	1690-1900
Unglazed red earthenware	6	1	Bowl	1690-1900
Glazed red earthenware	104	15	8 plates, 4 bowls, 2 chamber pots, 1 inkpot	1690-1900
Slipware	19	4	3 plates, 1 bowl	1690-1900
Agate ware	1	1	Unidentified	1725-1750
English porcelain	1	1	saucer?	1745-present
Creamware	2	1	plate	1762-1820
Painted creamware	2	2	1 bowl, 1 unidentified	1762-1820
Painted pearlware	3	1	cup	1779-1840
Mocha ware	2	1	Bowl	1790-1820
Post-medieval unidentified	13	4	1 bowl, 1 plate, 1 jar, 1 jug	Post-medieval
Total	**777**	**122**		

3 The Excavation

3.1 Before the excavation two days of cleanback took place. A large amount of pottery was recovered during cleanback, dating to the eighteenth and nineteenth centuries.

3.2 *Phase I:* The results of the excavation at O'Connell Street indicated four separate phases of activity on the site. The first phase was characterised by the construction of the quay wall. The wall was filled with mixed material including rubble, mortar and brick as well as sand and stones. A large amount of pottery was recovered from this fill including a large quantity of North Devon gravel tempered ware, representing a chamber pot.

The quay wall cut into a sand layer F13. This layer contained a sherd each of black glazed earthenware and Bristol-Staffordshire slipware. The fill of the cut F14 also revealed some post-medieval pottery including North Devon wares, glazed red and black glazed earthenwares and Bristol-Staffordshire slipware.

3.3 *Phase II:* Phase II was characterised by a house structure (F4) and a series of deposits related to this. The first deposit, F11, lay directly over the sand layer (F13) in Phase I. The metalled surface, F11, consisted of cobbles and pebbles and may have been laid down to provide a steady surface. No pottery was recovered from this layer. However F10, directly above this, contained post-medieval pottery. This organic black silty clay contained a large amount and variety of post-medieval pottery types including painted pearlware, which dates from the late eighteenth century to the early nineteenth century.

F10 was directly overlaid by F6, which contained the largest variety of post-medieval pottery found on the site. F6 consisted of a dark brown sandy silt and along with the other features from Phase II, was cut by the house structure. This context also contained a small number of sherds dating to the late eighteenth/early nineteenth century. F9, a cut through F6, contained no post-medieval pottery. F7, which was the cut for both the house (F4) and the well (F5), contained post-medieval pottery and also interestingly a glass seal dated 1711. This seal provides a *terminus post quem* for F7.

The final feature containing pottery in Phase II is the well F5. This well had three fills containing post-medieval pottery. Some late eighteenth/early nineteenth century wares were present in the fills.

Three of the contexts in phase II contained a small amount of late eighteenth/ early nineteenth century pottery. It is probable that these sherds are intrusive in the contexts as similar wares are absent from contexts related to the later phases. Furthermore, the historical and cartographic evidence disagree with such a date. It is unlikely that phase II dates any later than the mid eighteenth century.

3.4 *Phase III:* This layer is characterised by a number of structures cut into land reclamation deposits on the south quay wall. F17 was a layer of redeposited natural clay, which was deposited during a period of land reclamation and eventually cut by later structures. The post-medieval pottery recovered from this layer included North Devon wares, Bristol-Staffordshire slipware and black glazed and glazed red earthenwares. A number of sherds of post-medieval pottery were related to the wall F18 in Phase III. The remaining features in this phase, F19 (a layer of slabs) and F20 (the northeast quadrant of a structure) contained no pottery.

3.5 *Phase IV:* This phase is associated with the demolition of the structures from the previous phases. F2, a linear cut into the organic fill F6, contained no pottery. A single sherd of mottled ware was recovered from the fill of the cut F3.

The final feature in Phase IV, F12, consisted of a deposit of orange sandy silt with mortar and redbrick inclusions. The pottery found in this layer consisted of similar types seen in the earlier layers and phases, including North Devon wares, tin glazed earthenware, mottled ware and Bristol Staffordshire slipware.

A similar range of pottery was recovered from contexts related to all the phases on site. The pottery generally dates from the late seventeenth century to the eighteenth century (wares with a date range spanning a larger period, such as black glazed wares, are considered in relation to the other pottery types in the same context). The medieval sherds recovered are clearly residual in all phases, while the late eighteenth/early nineteenth

century sherds in the phase three contexts are (as established above) intrusive in these layers. As a result of the similarity of the pottery types found in all phases it is difficult to establish, based on the ceramic evidence alone, a specific chronology for the different phases. It is clear however, that activity began no later than the end of the seventeenth century and continued throughout the eighteenth century. The absence of nineteenth century wares in the later phases suggests that activity in this area ceased soon before the end of the eighteenth century.

Table 2: The pottery from Cleanback

Context No.	Fabric	Date	Find No.
0/ Cleanback	North Devon sgraffito ware	1600-1700	7,74
	North Devon gravel tempered ware	1600-1700	8,78-92,142
	Mottled ware	1670-1800	10-55
	Blackware	1690-1900	56-72
	Unidentified medieval cooking ware		73
	Unidentified early post-medieval		75
	Tin glazed earthenware	1600-1800	76,77,111-114
	Nottingham stoneware	1690-1800	115, 116, 145
	Fulham stoneware	1675-1775	117
	Creamware	1672-1820	97
	Painted creamware	1762-1820	98
	White salt glazed stoneware	1700-1800	99,100,145
	Glazed red earthenware	1690-1900	101-110,124-141
	Stoneware	1690-1900	143,147
	Slip decorated red earthenware	1690-1900	144
	Post-medieval unidentified		148,149

Table 3: The pottery from Phase I

Context No.	Fabric	Date	Find No.
1	North Devon gravel tempered ware	1600-1700	2-19,21-38
	Mottled ware	1670-1800	39-52,80,81
	Tin glazed earthenware	1600-1800	53-60
	Slip decorated red earthenware	1690-1900	61-73
	Stoneware	1690-1900	74,76
	Red slip coated ware	1700-1800	75

	Porcelain	1660-1800	77
	Bristol/Staffordshire slipware	1670-1800	78
	Glazed red earthenware	1690-1900	79
13	Black glazed earthenware	1690-1900	4
	Bristol/Staffordshire slipware	1670-1800	5
14	Glazed red earthenware	1690-1900	1,4,5
	Post-medieval unidentified		2
	North Devon Sgraffito	1600-1700	3
	North Devon gravel tempered ware	1600-1700	6,7
	Black glazed earthenware	1690-1900	8-12
	Bristol/Staffordshire slipware	1670-1800	13,14

Table 4: The pottery from Phase II

Context No.	Fabric	Date	Find No.
5	Glazed red earthenware	1690-1900	12,26
	Mottled ware	1670-1800	13-15
	Bristol/Staffordshire slipware	1670-1800	16
	White salt glazed stoneware	1700-1800	17,18
	English porcelain	1745-present	19
	Painted pearlware	1779-1840	20
	Blackware	1690-1900	21,22
	Creamware	1762-1820	23
	Chinese porcelain	1660-1800	24
	Agate ware	1725-1750	27
6	Tin glazed earthenware	1600-1800	72,73,276,323-341
	Glazed red earthenware	1690-1900	74,126-137,171-174,274,275,285-290
	Black glazed earthenware	1690-1900	75-125,146
	Post-medieval unidentified		138-141
	Nottingham stoneware	1690-1800	160,161,163,277,278
	Stoneware	1690-1900	143,162,164,279
	Mottled ware	1670-1800	144,175-236
	North Devon slipware	1600-1700	145,282
	Unidentified medieval import ware		151-155
	North Devon sgraffito	1600-1700	156-159
	Painted creamware	1762-1820	165,307-314

	North Devon gravel tempered ware	1600-1700	166,239-260
	Slip decorated red earthenware	1690-1900	167-170
	Mocha ware	1795-1840	237-238
	Red slip coated ware	1700-1800	261-263,280
	Westerwald	1600-1800	264,315-322
	Bristol/Staffordshire slipware	1670-1800	265-270
	Chinese porcelain	1660-1800	271-273
	Unidentified medieval import ware		281,283,284
7	Nottingham stoneware	1690-1800	3
	Black glazed earthenware	1690-1900	4
	Tin glazed earthenware	1600-1800	5-7
	North Devon sgraffito	1600-1700	8
	Mottled ware	1670-1800	9-13
	Early post-medieval unidentified		14
	Glazed red earthenware	1690-1900	15-17
10	Painted pearlware	1779-1840	31,109
	Tin glazed earthenware	1600-1800	32-40,90,159,160
	Westerwald	1600-1800	41,120-121
	North Devon gravel tempered ware	1600-1700	43-50,110,111
	Red slip coated ware	1700-1800	51,52,93,94
	Glazed red earthenware	1690-1900	53,112-119,162-168
	Frechen	1600-1700	54
	Unglazed red earthenware	1690-1900	55-59
	Mottled ware	1670-1800	60-88,95-98
	Nottingham stoneware	1690-1800	102
	Stoneware	1690-1900	89,100,101
	Unidentified medieval import ware		91
	Black glazed red earthenware	1690-1900	92,130-158
	North Devon slipware	1600-1700	99
	Bristol/Staffordshire slipware	1670-1800	103-109
	Post-medieval unidentified		161

Table 5: The pottery from Phase III

Context No.	Fabric	Date	Find No.
17	North Devon gravel tempered ware	1600-1700	5,6
	Unglazed red earthenware	1690-1900	7
	North Devon sgraffito	1600-1700	8-10
	Tin glazed earthenware	1600-1800	11-15
	Glazed red earthenware	1690-1900	19
	Bristol/Staffordshire slipware	1690-1800	20,21
	Red slip coated ware	1700-1800	22-24
	Black glazed earthenware	1690-1900	25-29
18	Glazed red earthenware	1690-1900	3-9,28,29
	North Devon gravel tempered ware	1600-1700	10-12
	Bristol/Staffordshire slipware	1670-1800	13,27
	Chinese porcelain	1660-1800	14
	Black glazed earthenware	1690-1900	15-19
	Red slip coated ware	1700-1800	20
	Tin glazed earthenware	1600-1800	21-24
	Mottled ware	1690-1800	25-26

Table 6: The pottery from Phase IV

Context No.	Fabric	Date	Find No.
3	Mottled ware	1670-1800	1
12	Tin glazed earthenware	1600-1800	4-10
	Mottled ware	1670-1800	11-21,40-60
	Slip decorated red earthenware	1690-1900	22
	Bristol/Staffordshire slipware	1670-1800	23-35
	Black glazed earthenware	1690-1900	36-39,61,62
	Unidentified imported ware		63
	North Devon sgraffito	1600-1700	64
	Stoneware	1690-1900	65,66
	Westerwald	1600-1800	67
	North Devon gravel tempered ware	1600-1700	68-71
	Ham green B	1175-1250	72,73
	Early post-medieval unidentified		74
	Glazed red earthenware	1690-1900	75-77

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Appendix 3 - *Clay pipes O'Connell St. Dublin (03E0433)*

By Adam Slater

Summary

A total of ten complete and fragmentary bowls and one hundred and thirty-two stem fragments were recovered from archaeological contexts of O'Connell St. These all dated to the seventeenth and eighteenth centuries.

1 Introduction

1.1 Smoking was introduced to Britain in the late sixteenth century by English merchant adventurers, but unfortunately for schoolchildren the world over, probably not by Sir Walter Raleigh himself. The habit of using a small clay pipe bowl was adopted from the very beginning, as an adaptation of the wooden and reed pipes of the Native Americans. A steady increase in tobacco smoking followed and this manufacture of pipes blossomed in many towns in England and Scotland.

1.2 The spread of the smoking habit during the seventeenth century can be attributed to England's growing position as a world colonial trade power. Pipes were being made in most English port cities (Bristol, London, Plymouth, Portsmouth etc) in the early seventeenth century and had spread to Holland by 1611 (Ayto), and importantly to Youghal by 1687 (Ibid). As time passed the bowls developed regional characteristics that often allow a place of origin to be attributed. It was also common practice of a makers mark being added which sometimes can be related to an individual or family. The shape of bowls can be seen to change in a relatively short time, which allows a precise date to be given, and as these bowls were designed to be readily disposable, the deposition of a broken pipe tends to be close to its date of manufacture.

1.3 Pipes grew steadily in size throughout the seventeenth and eighteenth centuries, forever connected to the constantly declining price in tobacco due to larger American plantations, almost every large town in Ireland having its own pipe manufacturers by this time.

1.4 The nineteenth century saw a mass production of pipe bowls using techniques and materials developed in the industrial revolution. This also lead to a general

standardisation of pipes throughout Britain and Ireland; large squat bowls with short stems called Cutty or Dudheen pipes, often bearing the name of the maker or advertising the type of tobacco sold with be bowls.

1.5 The smoking of tobacco in clay-pipes was generally abandoned by the 1930s, replaced by wooden cutty or briar pipes and cigarettes, although a few makers continued in business into the 1950s by baking novelty and bubble pipes.

2 Bowl Dating

2.1 The rapid change in bowl styles in the seventeenth and eighteenth centuries allows accurate dating to be carried out using published typologies (Oswald 1974), and by comparisons to published assemblies found elsewhere in Ireland and England (Lane, Slater, Norton). Generally this produces an accurate date for the deposition of the feature under scrutiny, due to the disposable nature of clay pipes. Table 1 shows both the dates of individual bowls and an accumulative date for the context if the bowl types within it differ.

2.2 Of the ten bowls recovered from archaeological deposits from O'Connell Street, two were too fragmentary to be accurately dated. Of the remaining eight, the earliest correspond with straight-sided wide mouthed spurred bowls of Oswald type 8 and 9, dating to 1680-1710. Two larger bowls, similar to these were also recovered, the mouths on these are parallel to the stem, a feature commonly attributed to post 1700, possibly due to developments in moulding technology. These bowls correspond to Oswald type 10, dating 1700–1740.

2.3 One bowl, with a sharply curving front and well shaped heel and mouth parallel to the stem dated to 1700-1740, and corresponds with an Oswald type 21 bowl.

3 Stem Bore Dating

3.1 Stem bore dating is a technique developed in the USA on large assemblages of colonial date pipe stems. The theory is based on the principle that the bore through the centre of

the pipe stem *decreases at a fixed rate* over time, and that once a mean diameter for a group of stems within a context is found, then a date can be assigned to that group (Harrington). A regressive mathematical formula was developed from this study (Binford), which gives a precise year for the deposition of the particular deposit. This formula can be written as:

Y=1931.85-38.26X

Y is the date of the context, and X is the mean borehole diameter of the group.

3.2 The stems used in this original study were of English manufacture, and therefore probably are of the same manufacture as the majority of pipes found on seventeenth and eighteenth century sites in Ireland.

3.3 Further work on Stem Bore Dating has been carried out on large assemblages found in Cork city (Lane, 1997a), which modified the dating technique slightly, widening the parameters for each stem bore size by comparing the stems dated by the Harrington and Binford methods to those in an already dated context.

3.4 Because all the original work was carried out in 1950's America, all measurements are in sixty-fourths of an inch.

Table 1: Bowl and Stem Dates *per context*

Feature No.	Find No.	Description;	Stem Bore;	Date;
Cleanback	6	Undecorated Stem fragment, large round heel remains, suggestive of 17/18th cent date.	8/64"	
Cleanback	151	Undecorated Stem fragment	6/64"	
Cleanback	152	Undecorated Stem fragment	6/64"	
Cleanback	153	Undecorated Stem fragment	6/64"	
Cleanback	154	Undecorated Stem fragment	5/64"	
Cleanback	155	Undecorated Stem fragment	5/64"	
Cleanback	156	Undecorated Stem fragment	6/64"	
Cleanback	157	Undecorated Stem fragment	6/64"	

Cleanback	158	Undecorated Stem fragment	6/64"	
Cleanback	159	Undecorated Stem fragment	5/64"	
Cleanback	160	Undecorated Stem fragment	7/64"	
Cleanback	161	Undecorated Stem fragment	6/64"	
Cleanback	162	Undecorated Stem fragment	5/64"	
Cleanback	163	Undecorated Stem fragment	6/64"	
Cleanback	164	Undecorated Stem fragment	6/64"	
Cleanback	165	Undecorated Stem fragment	8/64"	
Cleanback	166	Undecorated Stem fragment	8/64"	
Cleanback	167	Undecorated Stem fragment	6/64"	
Cleanback	168	Undecorated Stem fragment	5/64"	
Cleanback	169	Undecorated Stem fragment	6/64"	
Cleanback	170	Undecorated Stem fragment	6/64"	
Cleanback	171	Undecorated Stem fragment	6/64"	
Cleanback	172	Undecorated Stem fragment	5/64"	
Cleanback	173	Undecorated Stem fragment	5/64"	
		Mean Stem Bore ;	**6/64"**	
		Y=1931.85-38.26X;	**1702**	
1	1	Undecorated stem Fragment	4/64"	
		Sample too small to provide accurate date.		
5	3	Stem fragment, remains of coiled circles hand applied, decoration commonly found on Dutch imported bowls of 17th/18th centuries.	6/64"	
5	28	Undecorated stem Fragment	5/64"	
5	29	Stem fragment, hand applied stamp of 'JAMES EATON LIVE[rpool?], probably mid 18th- mid nineteenth century.	5/64"	
5	30	Undecorated stem Fragment	7/64"	
5	31	Undecorated stem Fragment	5/64"	
5	32	Undecorated stem Fragment	5/64"	
		Mean Stem Bore ;	**5.4/64"**	
		Y=1931.85-38.26X;	**1725**	
6	147	Complete bowl, large round heel. Long narrow fwd leaning body. Corresponds with Oswald type 8.	5/64"	1680-1710
6	148	Complete bowl, large pedestal foot. Wide mouth with smoothly curved underside. Corresponds with	5/64"	1680-1710

		Oswald type 9.		
6	149	Small spurred bowl (spur broken), well crafted finish, with pronounced curve on front. Oswald type 21.	7/64"	1690-1730
6	150	Undecorated stem fragment	6/64"	
6	342	Undecorated stem fragment	6/64"	
6	343	Undecorated stem fragment	5/64"	
6	344	Undecorated stem fragment	5/64"	
6	345	Undecorated stem fragment	6/64"	
6	346	Undecorated stem fragment	6/64"	
6	347	Undecorated stem fragment	6/64"	
6	348	Undecorated stem fragment	5/64"	
6	349	Undecorated stem fragment	6/64"	
6	350	Undecorated stem fragment	5/64"	
6	351	Undecorated stem fragment	6/64"	
6	352	Undecorated stem fragment	6/64"	
6	353	Undecorated stem fragment	6/64"	
6	354	Undecorated stem fragment	6/64"	
6	355	Undecorated stem fragment	6/64"	
6	356	Undecorated stem fragment	6/64"	
6	357	Undecorated stem fragment	6/64"	
6	358	Undecorated stem fragment	6/64"	
6	359	Undecorated stem fragment	6/64"	
6	360	Undecorated stem fragment	5/64"	
6	361	Undecorated stem fragment	6/64"	
6	362	Undecorated stem fragment	6/64"	
6	363	Undecorated stem fragment	5/64"	
6	364	Undecorated stem fragment	5/64"	
6	365	Undecorated stem fragment	6/64"	
6	366	Undecorated stem fragment	5/64"	
6	367	Undecorated stem fragment	7/64"	
6	368	Undecorated stem fragment	8/64"	
6	369	Undecorated stem fragment	5/64"	
6	370	Undecorated stem fragment	5/64"	
6	371	Undecorated stem fragment	5/64"	
6	372	Undecorated stem fragment	5/64"	
6	373	Undecorated stem fragment	5/64"	
6	374	Undecorated stem fragment	7/64"	
6	375	Undecorated stem fragment	5/64"	

6	376	Undecorated stem fragment	5/64"	
6	377	Undecorated stem fragment	6/64"	
6	378	Undecorated stem fragment	5/64"	
		Mean Stem Bore;	5.7/64"	
		Y=1931.85-38.26X;	**1714**	
		Accumulative bowl date;		**1690-1710**
7	2	Broken bowl, large heel. Undatable	6/64"	
7	19	Undecorated stem fragment	5/64"	
7	20	Undecorated stem fragment	7/64"	
		Sample too small to provide accurate date.		
10	27	Complete bowl, straight sided with very wide mouth and round prominent foot. Corresponds with Oswald 9, possibly Dutch manufacture of same date.	5/64"	1680-1710
10	28	Complete bowl, irregular heel, curved front and straight back. Corresponds with Oswald type 8.	7/64"	1680-1710
10	29	Undecorated stem fragment	7/64"	
10	122	Undecorated stem fragment	6/64"	
10	169	Undecorated stem fragment	6/64"	
10	170	Undecorated stem fragment	7/64"	
10	171	Undecorated stem fragment	9/64"	
10	172	Undecorated stem fragment	5/64"	
10	173	Undecorated stem fragment	7/64"	
10	174	Undecorated stem fragment	5/64"	
10	175	Undecorated stem fragment	5/64"	
10	176	Undecorated stem fragment	6/64"	
10	177	Undecorated stem fragment	6/64"	
10	178	Undecorated stem fragment	7/64"	
10	179	Undecorated stem fragment	7/64"	
10	180	Undecorated stem fragment	6/64"	
10	181	Undecorated stem fragment	6/64"	
10	182	Undecorated stem fragment	6/64"	
10	183	Undecorated stem fragment	6/64"	
10	184	Undecorated stem fragment	7/64"	
		Mean Stem Bore;	4.6/64"	

		Y=1931.85-38.26X;	**1753**	
		Accumulative bowl date;		**1680-1710**
12	2	Complete bowl, long straight sides, curved front. Narrow well shaped heel. Oswald type 9	7/64"	1680-1710
12	3	Undecorated stem fragment	7/64"	
12	82	Undecorated stem fragment	7/64"	
12	83	Undecorated stem fragment	5/64"	
12	84	Undecorated stem fragment	6/64"	
12	85	Undecorated stem fragment	7/64"	
12	86	Undecorated stem fragment	7/64"	
12	87	Undecorated stem fragment	6/64"	
12	88	Undecorated stem fragment	5/64"	
12	89	Undecorated stem fragment	5/64"	
12	90	Undecorated stem fragment	5/64"	
12	91	Undecorated stem fragment	6/64"	
		Mean Stem Bore;	6.1/64"	
		Y=1931.85-38.26X;	**1699**	
		Accumulative bowl date;		**1680-1710**
13	1	Broken bowl, too fragmentary to date.		
13	2	Undecorated stem fragment	5/64"	
13	6		5/64"	
13	7		5/64"	
13	8		6/64"	
13	9		6/64"	
13	10		8/64"	
13	11		6/64"	
13	12		6/64"	
13	13		8/64"	
13	14		6/64"	
13	15		5/64	
13	16		6/64"	
13	17		7/64"	
		Mean Stem Bore;	6.07/64	
		Y=1931.85-38.26X;	**1699.**	
17	3	Complete bowl, long curved front with round heel	8/64"	1700-1740

		and wide mouth. Corresponds to Oswald 10.		
17	4	Undecorated Stem fragment	8/64"	
17	31	Undecorated Stem fragment	6/64"	
17	32	Undecorated Stem fragment	8/64"	
17	33	Undecorated Stem fragment	7/64"	
17	34	Undecorated Stem fragment	4/64"	
17	35	Undecorated Stem fragment	6/64"	
17	36	Undecorated Stem fragment	6/64"	
17	37	Undecorated Stem fragment	8/64"	
17	38	Undecorated Stem fragment	8/64"	
17	39	Undecorated Stem fragment	5/64"	
17	40	Undecorated Stem fragment	5/64"	
17	41	Undecorated Stem fragment	6/64"	
17	42	Undecorated Stem fragment	8/64"	
17	43	Undecorated Stem fragment	6/64"	
17	44	Undecorated Stem fragment	7/64"	
		Mean Stem Bore;	6.6/64"	
		Y=1931.85-38.26X;	1678	
		Accumulative bowl date;		1700-1740
18	1	Stem fragment, remains of spur, Initials ID on sides.	5/64"	
18	30	Undecorated Stem fragment	5/64"	
18	31	Undecorated Stem fragment	7/64"	
18	32	Undecorated Stem fragment	8/64"	
18	33	Undecorated Stem fragment	7/64"	
18	34	Undecorated Stem fragment	6/64"	
		Mean Stem Bore;	6.3/64"	
		Y=1931.85-38.26X;	1690	

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Appendix 4 - *Leather Report O'Connell Street (03E0433)*

By Siobhán Scully

1 Introduction

1.1 Sixty-five artefacts of leather were recovered from archaeological excavations at O'Connell Street. Twenty-nine of these are the remains of footwear, one may be a belt or strap, two may have been purses, four are worked leather fragments whose function is unknown and there are twenty-six offcuts of leather and three fragments.

1.2 The majority of the leather artefacts, forty, came from a dark brown, organic, sandy silt layer, F6, which was cut by the house structure F4 and the well F5 (Baker 2003, 9). This context also had the largest quantity of post-medieval pottery from the site, which was dated to between the 17th and the 19th centuries (Byrne 2003, 7). The layer below F6, which was F10, a black, organic, clayey silt, had twenty leather artefacts and was also cut by F4 and F5 (Baker 2003, 9). The organic nature F6 and F10 would have helped to preserve the leather. Of the remaining leather artefacts, three came from F9, a vertical cut through F6 and one from F7, which was the cut for the house structure F4 and the well F5. F7 also contained a glass bottle seal dating to 1711, which provided a *terminus post quem* for the construction of F4 and F5 (*ibid.*, 10). The area of O'Connell Street that was excavated only began to be developed after the granting of a lease to Jonathon Amory from the city in 1675 and this was followed by the development of the quays during the 17th and 18th centuries (*ibid.*, 2). The contexts in which the leather artefacts were found were all to the north of the quay wall (*ibid.*, 7) and are all post-medieval in date.

2 Footwear

2.1 The leather footwear from the site is very fragmentary in nature. There are few footwear uppers represented; only three quarters (03E0433:0:2, 03E0433:6:22, 03E0433:6:25), a possible lace (03E0433:6:36) and a fragment of a welt (03E0433:10:5). All the other footwear artefacts are from the sole, but these too are very fragmentary and not one complete sole remains. The leather is also in bad condition, being heavily delaminated in most cases. The fragmentary and worn nature of the footwear fragments may suggest that they were used until they were worn beyond where they could be repaired and then eventually discarded. There is no evidence of repair on any of the pieces.

2.2 Before 1500 shoes were made by the turnshoe method, where the shoe was made inside out and then turned out. This was replaced by the welted method of construction, with the seams on the outside and it allowed for the making of much heavier shoes (Thornton 1990, 592). A strip of leather, called a welt, was attached to the sole and the upper, and layers of soles and insoles could be built up as well as stacked heels (O'Rourke 1997a, 177). The footwear fragments from O'Connell Street appear to have been constructed using the welted method. This can be seen from one sole (03E0433:6:28) which still has a welt attached. There is also an unattached welt fragment (03E0433:10:5). The sole or heel fragments do not have the edge/flesh seams found with the turnshoe technique. The stitch holes generally perforate the leather and there appear to have been layers of insoles and soles, although only three soles have their layers still joined together (03E0433:6:24, 03E0433:6:53, 03E0433:10:1). Post-medieval footwear fragments of welted construction have been recovered from a number of excavations in Ireland. Thirty-nine footwear fragments from disturbed and post-medieval layers at Patrick Street, Dublin were found (O'Rourke 1997a, 177), all the 17th century shoes from Skiddy's Castle and Christ Church, Cork were of welted construction (O'Rourke 1997b, 313) and two shoes of welted construction were recovered from a 17th century pit at Philip's Lane, Cork (Gleeson 2003, 370).

2.3 There are only three quarters among the leather artefacts from O'Connell Street. One of the quarters (03E0433:0:2) has a combination of stitching; it has edge/flesh stitching on the backseam and on the seam that meets the vamp. It still has stitching material *in situ*. Another quarter has flesh stitching (03E0433:6:25) and one has stitch holes which perforated the leather (03E0433:6:22) and retains stitching material *in situ*. Only one of the surviving quarters can give an idea of what the original shoe would have looked like. This quarter (03E0433:0:2) has a rectangular extension at the front which has a thong hole for fastening the shoe. The two close lines of grain stitching on this quarter and on another upper fragment (03E0433:6:25) may have been for decoration, although the stitching on the latter appears to be on the flesh side.

2.4 The soles are all incomplete so an estimation of shoe size cannot be made. Although the soles are incomplete, they appear to have been from broad shoes with little waisting. Of the foreparts that can be identified, five have rounded toes (03E0433:6:34, 03E0433:6:44, 03E0433:10:1, 03E0433:10:4, 03E0433:10:11) and two have pointed toes (03E0433:6:24, 03E0433:10:21). Eight of the sole fragments can be identified as heels, one could be the

heel or the toe, nine are from the forepart of the sole, three are from the thread, one has both the thread and waist, one has the thread and forepart and one is too fragmentary to be identified.

2.5 It is difficult to tell the grain from the flesh side of most of the sole fragments as the leather is, in most cases, in poor condition and heavily delaminated. The part of the shoe that rests on the ground, or top piece, usually has the grain side down and this becomes worn (Thornton 1990, 618). There are five possible top pieces among the O'Connell Street soles (03E0433:6:20, 03E0433:6:26, 03E0433:6:32, 03E0433:10:11, 03E0433:10:18). There are seven possible insoles (03E0433:6:17, 03E0433:6:28, 03E0433:6:35, 03E0433:6:39, 03E0433:6:41, 03E0433:6:44 03E0433:6:48) which would have had the grain side facing upwards, under the foot. One sole fragment (03E0433:6:24) is either the insole or a middle and there are two definite middle fragments (03E0433:6:34, 03E0433:10:15). Two of the leather artefacts (03E0433:6:53, 03E0433:10:1) have the three layers of their stacked soles remaining, and one has two layers (03E0433:6:24).

2.6 The soles display different examples of stitching. Eleven of them have stitch holes which perforate the leather while five have grain stitching, four has flesh stitching and three have either flesh or grain stitching. The stitch lengths range from 1mm to 10mm and seven have stitching material *in situ* (03E0433:6:28, 03E0433:6:35, 03E0433:6:39, 03E0433:10:4, 03E0433:10:11, 03E0433:10:15, 03E0433:10:19). Two of the soles retain wooden pegs (03E0433:6:53, 03E0433:10:1) which were used to hold the stacked soles together. One sole (03E0433:6:24) has iron corrosion products around the stud holes, indicating that iron nails were used in the construction of the shoe. The use of iron nails in shoe making dates to the late 17th century (O'Rourke 1997, 177). One of the 17th century soles from Philip's Lane, Cork was constructed of seven layers of leather which were welted and held together with wooden pegs and nails (Gleeson 2003, 370). The welted method of construction also meant that a separate stacked heel could be used. Separate heels could be made in two different ways in the late 16th and 17th centuries; a stacked heel made from layers or jumps of leather, or a wooden block covered with leather (O'Rourke 1997, 177). One heel from O'Connell Street (03E0433:10:18) was probably from a stacked heel. It is not wide enough for an adult size insole and probably formed a narrow stacked heel that was added onto a sole.

3 Belt/strap

3.1 A wide linear piece of leather is either a belt or a strap (03E0433:6:27). It has two rows of stitching near both long edges. The short edges are both torn. There are no central perforations for fastening.

4 Possible Purse

4.1 One fragment of worked leather (03E0433:6:21) is possibly one half of a purse. It is rectangular in shape and torn along almost the whole width of one side. The untorn part is cut and not sewn, unlike the other three sides, suggesting that this end was open. One of the unidentified worked pieces leather (03E0433:10:10), which is semi-circular in shape, is possibly also one half of a purse or a small bag. It has stitching all around the curved edge and has three lines of stitching down the middle which may be decorative. A leather artefact from Waterford, classified as miscellaneous, was suggested to be some form of purse. It was folded over and sewn on three sides, the fourth side being cut and had two perforations in one side and one in the other, which were probably for fastening (O'Rourke 1997c, 726). This artefact was medieval in date and the possible purse from O'Connell Street that most closely resembles it (03E0433:6:21) is post-medieval in date. It also would have been made from two pieces of leather stitched together and there are no perforation holes for fastening.

5 Miscellaneous Worked leather

5.1 There are four pieces of worked leather whose function cannot be identified (03E0433:6:30, 03E0433:6:33, 03E0433:6:37, 03E0433:6:52). They have definitely been worked and cannot be classified as offcuts. One long linear piece (03E0433:6:37) has a large oblique slit and may have been used for fastening.

6 Offcuts & fragments

6.1 There are twenty-six offcuts and three fragments of leather. The offcuts and fragments have no evidence of stitch marks. The offcuts have at least one cut edge, but usually have more, while the fragments just have torn edges. Eleven of the offcuts are triangular in shape, a typical shape of the left-over pieces after the animal skin has been cut (Thornton 1990, 592). Four are rectangular in shape, four were sub-rectangular and eleven were irregular in shape, one of which was from the edge of the animal skin (03E0433:6:15).

One small, thin fragment of leather is attached to an animal bone, but this may have been post-depositional.

7 Catalogue

03E0433:0:2 Footwear upper. Right quarter. Edge/flesh stitching on backseam and where the quarter meets the vamp. Row of stitch holes along the bottom seam where the quarter joined with the sole (stitch L 3mm). Rectangular extension with pointed end at the front of the quarter. It is pierced with a hole (4mm x 4mm), through which a thong fastening may have been threaded. There are two rows of stitching on the outer grain side (stitch L 1.5mm) along the top edge and along the edge of the extension, which creates a raised surface between the two lines of stitching. This stitching is only faintly visible on the flesh side. L 110 (L with strap113.6mm) Wth 61-72mm Wth of strap 20mm Th 2mm.

03E0433:6:13 Offcut. Triangular. All edges are cut and there is no evidence of stitching. Bent. L min. 110mm Wth 6-37mm Th 2mm.

03E0433:6:14 Offcut. Triangular. All edges are cut and there is no evidence of stitching. L min. 100mm Wth 10-42mm Th 2.5-3.3mm.

03E0433:6:15 Offcut. Long edge is cut and the other edge is the edge of the animal skin. No evidence of stitching. L 101mm Wth 20mm Th 3.3-4mm.

03E0433:6:17 Heel. Insole of heel, grain side facing upwards. Grain stitching all along the edge of the insole. Flesh side almost entirely delaminated. Stitch L across straight edge 3.5mm, Stitch L around heel 2mm. L 45mm Wth 54mm T 2-3mm.

03E0433:6:20 Fragment of sole. Thread. Stitching along the inside and outside joint (Stitch L 6-7mm), the other two sides are cut, one is cut straight and the one towards the forepart is cut diagonally. Grain side almost totally delaminated, suggesting that this is the top piece that was next to the ground. L 97mm Wth 88mm Th 3mm.

03E0433:6:21 Possible purse. Rectangular piece of worked leather, torn along one side. The other three sides are stitched (stitch L 3mm). The stitch holes perforate the leather. Some stitching material remains *in situ*. A small section of the torn end is undamaged and this was cut, suggesting that this end was open. The flesh side is partially delaminated. L 77mm Wth 87mm Th 3-4.3mm.

03E0433:6:22 Possible fragment of footwear upper. Quarter. Stitching holes (stitch L 10mm) which perforate the leather along one edge. Two other cut edges remain but the remainder is torn. Almost entirely delaminated on flesh side and partially on the grain side. L 123mm Wth 50-61mm Th 3.2mm.

03E0433:6:23 Large offcut or fragment of leather. There are some cut edges but most of them are torn. It is also torn in the centre. No evidence of stitching. Some delamination on the flesh side. L 178mm Wth 105mm Th 1.8mm.

03E0433:6:24 Fragment of sole. Forepart, possible insole or middle, of a pointed shoe. Remains of corrosion products from iron nails. Fragment of an insole layer above this one which is heavily covered in corrosion products. There was probably a top piece (the section next to the ground) attached to the underside of the large sole fragment as the grain side is not delaminated enough to have been the top piece. No stitching holes visible. L 74mm Wth 64mm Th 4.2-6.2mm.

03E0433:6:25 Fragment of footwear upper. Possibly part of a quarter. Double row of flesh-stitching on the long edge and a short double row of flesh stitching on the opposite edge before the leather is torn. The short seam between these two sets of stitching appears to have a row of small stitch holes which perforate the leather. At the opposite end of the fragment there is a gash in the leather where it has been cut. L 86mm Wth 21-35mm Th 2mm.

03E0433:6:26 Heel fragment. Rounded heel. Has flesh-stitching along the cut edge, which is faintly visible on the grain side. Has large stitch holes on the right hand side (stitch L 8-9mm) of the rounded heel, but the rest of the heel torn. The grain side is almost totally delaminated, and there are a few small stones imbedded in it, suggesting that this was the side that was in contact with the ground. L 53mm Wth 72mm Th 2-4mm.

03E0433:6:27 Belt or strap fragment. Wide, linear piece of leather with two rows of stitching (stitch L 5mm) near both long edges. The flesh side is delaminated and the stitch holes are visible but they may not have been so originally. There is stitching material *in situ*. One of the short edges is cut, but the other is torn. L 108mm Wth 45mm Th 4.5mm.

03E0433:6:28 Fragment of sole. Thread, torn towards the forepart. Leather is very delaminated and worn on both sides making it difficult to identify which is the flesh or grain side. There are stitching holes (stitch L 6mm) along either edge on the side which faced towards the ground. A row of widely-spaced stitch holes go across the thread of the sole near the waist end. Remains of attached welt (L 72mm Wth 9mm Th 3mm) on flesh side. L 65-115mm Wth 72mm Wth of extension 17mm Th 4-5.5mm.

03E0433:6:29 Heel fragment. Rounded heel fragment, small stretch of stitching (stitch L 6mm) remaining on the right hand side, the remainder is torn. No stitching along the slightly curved front part of the heel. Both sides are delaminated. L 52mm Wth 57mm Th 4mm.

03E0433:6:30 Leather fragment. Sub-rectangular piece of leather with faint remains of stitching along one side, possibly the grain side. The other side is delaminated and the other edges are cut. L 59mm Wth 48mm Th 2.3-4mm.

03E0433:6:31 Offcut of leather. Triangular in shape. All edges are cut. No stitch holes present. L 55mm Wth 6-18mm Th 4-5mm.

03E0433:6:32 Heel fragment. Top piece of heel. Almost entirely delaminated on grain side. Very small stitch holes (stitch l. 2mm) present on the left-hand side of the heel. The front part of the heel is slightly curved. L 41mm Wth 62mm Th 1.5-3.1mm.

03E0433:6:33 Fragment of worked leather. Linear fragment, pointed at one end. Edge/flesh stitching on two sides. The other two sides are cut. There is a curved line of stitching on the grain side, intersected by a straight line of grain stitching, coming from the short flat edge. L 56mm Wth 25-28mm Th 2mm.

03E0433:6:34 Fragment of sole. Forepart of sole with rounded toe. Possibly the middle part of a stacked sole. Large stitched holes (stitch l. 18mm) all around the curved edges. Large hole in the middle and is torn from this hole to the thread side of the forepart. Delaminated on the flesh side. L 80mm Wth 74mm Th 4.6-5.5mm.

03E0433:6:35 Sole fragment. Insole, may be heel or toe, but is torn along most of the curved surface, one short stretch of stitch holes (stitch L 8mm) remain. Grain stitching along the straight edge. Delaminated on the flesh side. Probably an insole with the grain side facing upwards. L 68mm Wth 70mm Th 4.4mm.

03E0433:6:36 Possible lace. Narrow strip of leather, torn at either end. No stitch holes present but may be lace for fastening a shoe. L 52mm Wth 5mm Th 1.2-3mm.

03E0433:6:37 Leather fragment. Long strip of leather, with large oblique slit (35mm x 4mm) in wider end. Delaminated on the flesh side. Possibly was used as a fastener of some sort but there is no evidence of stitching. L 260mm Wth 7-22mm Th 1.1-3.3mm.

03E0433:6:38 Large offcut of leather. One long straight side, and a long curved side. One short side forms a point and the other is torn. 4 small tears in the leather with a number of small holes. Two possible stud marks beside the long straight end. No stitch holes present. Some small stones adhering to the grain side. L 135mm Wth 65-79mm Th 2.2-3mm.

03E0433:6:39 Sole fragment. Insole, probably from the forepart of the sole, flesh stitching along the remaining left-hand side. The remaining sides are torn, except for a small portion of the thread end. Grain side delaminated. L 80mm Wth 26-44mm Th 2.5-3.8mm.

03E0433:6:40 Offcut of leather. Roughly triangular offcut, with curved sides. All sides cut with no evidence of stitch holes. L 70mm Wth 11-61mm Th 1.8-3mm.

03E0433:6:41 Sole fragment. Probably part of waist and thread, possibly an insole. Grain stitching along each long side, with very small stitch holes (stitch L 1.5-2mm), visible on the flesh side, which is delaminated. One of the shorter sides is cut and the other is torn. L 106mm Wth 68-75mm Th 5.2mm.

03E0433:6:42 Offcut of leather. Triangular in shape. All edges are cut. No stitch holes present. L 93mm Wth 26mm Th 4mm.

03E0433:6:43 Offcut of leather. Sub-rectangular piece of leather. All edges are cut and there are no stitch holes present. L 85mm Wth 34-40mm Th 2.5mm.

03E0433:6:44 Sole fragment. Very thin fragment, possibly of an insole. Possibly part of a rounded toe, only a small part of which remains. Long stitch holes (stitch L 10mm) around edge, with large oblique holes in the centre. L 71mm Wth 24-45mm Th 1.6mm.

03E0433:6:45 Offcut of leather. Rectangular strip of leather. All edges are cut and there are no stitch holes. L 78mm Wth 16-19mm Th 1.5-2mm.

03E0433:6:46 Offcut of leather. Small sub-triangular piece of leather, edges are cut, though a little torn at one edge. No stitch holes. L 67mm Wth 11mm Th 1.6mm.

03E0433:6:47 Fragment or offcut of leather. Irregular fragment of leather with a number of cut sides, though very torn also. Two large holes in it. No evidence of stitch holes. L 115m Wth 25-57mm Th 3-4mm.

03E0433:6:48 Heel or sole fragment. Possible insole of heel, with large holes (13mm x 5mm) along the remaining curved edge. Part of the curved side is torn. Two holes in the centre. Straight edge is cut. L 72mm Wth 70mm Th 3.2-4mm.

03E0433:6:49 Offcut or fragment of leather. Strip of leather. One long edge is cut and the other is torn. No evidence of stitch marks. L 100mm Wth 12-22mm Th 3.2-4.5mm.

03E0433:6:50 Offcuts. Two triangular offcuts. Very thin and delaminated on the flesh side. The long edges are cut and the short ones are torn. No evidence of stitch marks. 1. L 121mm Wth 6-29mm Th 0.3-0.7mm. 2. L 123mm Wth 9-28mm Th 0.4mm.

03E0433:6:51 Offcut of leather. Narrow strip of leather, which is pointed at one short end and torn at the other. The long edges are cut. No evidence of stitch marks. L 114mm Wth 12mm Th 0.7-1.5mm.

03E0433:6:52 Fragment of worked leather. Sub-rectangular piece of leather, curved at one corner. Edge/flesh stitching along both of the long edges. There is a double row of flesh-stitching just inside the edge of the rounded corner. The opposite short edge is cut.

The long edge opposite the rounded corner appears to have a section of leather cut out of it leaving a small strip with edge/flesh stitching which extends a short length beyond the curved edge. There are small oblique slashes near the short cut edge on the grain side, which may be the remains of whip stitching, but the leather is very cracked here. The function of the fragment is unknown. L 66mm Wth 49mm Th 1.5mm.

03E0433:6:53 Fragment of stacked sole, possibly the heel. 3 layers remain apparently joined by a wooden peg. Only a small fragment of the uppermost insole remains, with the two below being more complete. They are rounded at the heel and have a straight edge at the waist end. There are a number of oblique stitching holes randomly spaced over the surface of the two lower soles. The lowermost, possibly the top piece of the sole, has the grain side facing downwards. L 62mm Wth 64mm Th 5.2mm.

03E0433:6:60 Small torn fragment of leather attached to bone. The leather is very thin and delaminated and probably became attached to the bone after deposition. L 60mm Wth 24mm Th 0.2mm.

03E0433:7:1 Possible fragment of sole. Possibly part of a small stacked heel, the leather is delaminated and torn on one side and there is no evidence of stitch marks. L 36mm Wth 38 Th 2-4.5mm.

03E0433:9:1 Leather offcut/fragment. Triangular in shape with all edges cut, no evidence of stitch marks. L 108mm Wth 18-35mm Th 0.7-1mm..

03E0433:9:2 Leather fragment. Irregular in shape with one small stretch of cut edge, the remainder are torn. Two small holes in the body of the leather which could possibly have been stitch holes. Delaminated on flesh side. L 43mm Wth 36mm Th 0.7mm.

03E0433:9:3 Leather fragment. Irregular in shape with one cut edge, the rest are torn. No evidence of stitch holes. L 45mm Wth 23mm Th 0.9mm.

03E0433:10:1 Fragment of stacked sole, possibly a rounded toe, but torn on one side. 3 layers that appear to be held together by wooden pegs (8mm x 3mm x 8mm), only 2 of which remain *in situ*. Delaminated on the flesh side of the insole. L 56mm Wth 65mm Th 7.6mm.

03E0433:10:2 Offcut of leather. Irregular in shape with one cut curved side and the other edges are torn. No evidence of stitch holes. The flesh side is cracked. L 78mm Wth 22-42mm Th 2mm.

03E0433:10:3 Offcut of leather. Thick offcut, triangular in shape. All edges are cut and there is no evidence of stitching. L 77mm Wth 31mm Th 4.3mm.

03E0433:10:4 Fragment of sole. Thread and forepart of sole. A little waisted towards the thread end of the sole. The thread end is cut and has two possible stud holes near the edge, one of which still has material *in situ*. There are stitch marks around most of the edge of what may be the grain side but the other side is so delaminated it is difficult to tell which is the flesh or grain side. The stitch holes are only visible on part of the delaminated side. There are two torn holes in the forepart of the sole. L 130mm Wth 80mm Th 3.5mm.

03E0433:10:5 Possible welt fragment. The two long edges are cut and one has edge/flesh stitching (stitch L 2mm). The short ends are torn. L 91mm Wth 8-13mm Th 1.5mm.

03E0433:10:6 Fragment of leather. Has one cut edge and the other edges are torn. There is no evidence of stitch holes and the leather is very cracked and delaminated. L 69mm Wth 62mm Th 2mm.

03E0433:10:7 Offcut or fragment of leather. Small rectangular piece of leather with one cut side and the rest are torn. Almost entirely delaminated on the flesh side. No evidence of stitch marks. L 24mm Wth 15mm Th 2-3mm.

03E0433:10:8 Offcut of leather. Triangular piece of leather with 2 cut edges and one torn. No evidence of stitch marks. L 33mm Wth 28mm Th 1mm.

03E0433:10:9 Offcut of leather. Thick strip of lenther. Cut on all sides with no evidence of stitch marks. Delaminated on both sides. L 76mm Wth 10mm Th 2.2-3mm.

03E0433:10:10 Large fragment of worked leather. Semi-circular in shape. It has small, widely spaced stitch holes (stitch L 9mm) which perforate the leather around the curved edge. The straight cut edge has no stitch holes. Down the middle are three rows of stitching, 10mm between each row, going from the cut edge to the curved seam. They are closely spaced stitches (stitch L 2mm) with stitching material still *in situ*. L 143mm Wth 73mm Th 2.2-2.6mm.

03E0433:10:11 Fragment of sole. Forepart of large sole, possibly the top piece. Stitch holes all around the edge perforate the leather and there appears to be some stitching material still *in situ*. What might be the grain side is very delaminated and the flesh side has a diagonal row of 4 slashes through the body of the forepart, which pierces the leather towards the rounded toe. L 116mm Wth 101mm Th 4mm.

03E0433:10:12 Fragment of sole, possibly the forepart. The toe end is torn. Some stud holes remain with material *in situ*, possibly wooden pegs. The leather is very delaminated on both sides. L 54mm Wth 91mm Th 3.6-5mm.

03E0433:10:13 Offcut of leather. Strip of leather, slightly curved. The edges are cut and there is no evidence of stitch marks. The leather is cracked and the flesh and grain sides are coming apart. L 100mm Wth 22-26mm Th 4mm.

03E0433:10:14 Offcut of leather. Irregular in shape. The edges are cut and there are no stitch marks. The flesh side is delaminated. L 86mm Wth 39mm Th 37mm.

03E0433:10:15 Sole fragment. Forepart, possibly the middle, but one side is entirely delaminated and the other is worn so it is difficult to tell. It is torn at the thread end and has a tear through the middle of the forepart. There are stitch holes around the edge which perforate the leather, narrowly spaced (stitch L 4mm) on one side and wider (stitch L 10mm) on the other. L 134mm Wth 89mm Th 3mm.

03E0433:10:17 Sole fragment. Small fragment of sole, possibly from the thread. One small stretch of cut edge remains with grain-stitching. The other edges are torn and there are some small cracks in the leather. L 65mm Wth 52mm Th 2-2.4mm.

03E0433:10:18 Heel fragment. Small heel fragment, possibly part of a narrow stacked heel. One side is entirely delaminated and the other is worn, though possibly this is the grain side and the top piece of the heel, the one nearest the ground, as there are some small stones adhering. There is a row of small stitch holes (stitch L 1.5mm) all around the edge. L 42mm Wth 50mm Th 2.5-3mm.

03E0433:10:19 Possible sole fragment. Very small fragment of leather possibly from the sole of a shoe. Two small sections of cut edge remaining, the longest of which has flesh-stitching. The other edges are torn. L 53mm Wth 18-23mm Th 2.5mm.

03E0433:10:20 Offcut of leather. Thin, triangular offcut, all edges are cut and there is no evidence of stitch holes. L 74mm Wth 34mm Th 1mm.

03E0433:10:21 Sole fragment. Forepart of shoe with pointed toe. Row of small stitch holes (stitch L 1.5mm) along one edge but are no longer visible on the other edges. The straight edge appears to be cut but is quite worn. There are a large number of small stones adhering to both sides of the leather. L 74mm Wth 79mm Th 3.5mm.

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Appendix 5 - *Assessment of plant remains (with notes on other biological remains)*

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Palaeoecology Research Services *PRS* 2004/49

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1 Summary

1.1 Four bulk sediment samples recovered from deposits encountered during excavations at O'Connell Street, Dublin, Republic of Ireland, were submitted for an assessment of their archaeobotanical potential. Brief notes were also made of other biological remains from the processed subsamples. Four phases of activity were identified related to the rapid development of the area between 1675 and the 1790s.

1.2 Plant remains, almost all preserved by anoxic waterlogging, were rather frequent in the washovers. Woody and herbaceous debris formed the greater part of the plant material, but there were also fruits and seeds, leaf fragments (notably of box) and some other plant parts, such as the shoots and detached leaves (thorns) of gorse or furze. The former seem most likely to have originated in formal gardens, the latter in material brought as fuel. An origin for much of this material in litter such as that found in stables cannot be ruled out. Many of the other taxa are quite likely to have arrived in hay or other cut grassland vegetation. The small amounts of food remains present, including wheat/rye 'bran' and a few fruits (strawberry, fig, grape, apple) might all originate in waste from a stable, though material from human domestic occupation is also possible; the absence of eggs of intesinal parasites perhaps favouring the first of these. Clearly material arrived in these deposits from a wide range of sources, whatever the mechanisms for collecting them together. Charred remains other than wood charcoal were confined to traces of bracken frond fragments, rare barley grains and some grass/cereal (straw) stem, all of which might represent burning of litter and might have arrived with the coal/cinder component of the deposits in ash. Well preserved insect remains were recovered from the samples from the organic silt layer F6. In one case (Sample 1), a larger subsample might yield an interpretatively useful assemblage of insects, which would enhance the interpretation of site environment and human activity and, in particular, help to confirm the likely origin of the biological remains in the deposit.

1.3 Only very small quantities of shell and animal bone were recovered, neither of which was of any real interpretetive value.

1.4 Further material, if available, should be processed, perhaps using samples as large as 5 kg, and the plant material recorded more thoroughly, though a semi-quantitative record will suffice. It is highly desirable that any insect remains recovered be recorded in conjunction with further study of the plant macrofossils.

1.5 **KEYWORDS:** O'CONNELL STREET; DUBLIN; REPUBLIC OF IRELAND; ASSESSMENT; POST-MEDIEVAL; 1600 TO 1800 AD; PLANT REMAINS; CHARRED PLANT REMAINS; PEAT; CHARRED CEREAL GRAINS; INVERTEBRATE REMAINS; INSECT REMAINS; BEETLES; GRAIN PESTS; MOLLUSC REMAINS; SHELLFISH; SNAILS; VERTEBRATE REMAINS; FISH BONE

2 Introduction

2.1 An archaeological excavation was carried out by Margaret Gowen and Co. Limited, at O'Connell Street, Dublin, Republic of Ireland, between the 27th and the 11th of April 2003.

2.2 Four bulk sediment samples ('GBA'/'BS' *sensu* Dobney *et al.* 1992) were submitted to Palaeoecology Research Services Limited (PRS), County Durham, UK, for an assessment of their archaeobotanical potential.

3 Methods

3.1 The sediment samples were inspected and their lithologies were recorded, using a standard *pro forma*, prior to processing. In each case, a subsample (or, for the smaller samples, all of the submitted material) was disaggregated in water and sieved to 300 microns. The sieved material was then subjected to a washover broadly using the techniques of Kenward *et al.* (1980).

3.2 Plant remains in the four washovers (and the general nature of this fraction) were recorded briefly by 'scanning', identifiable taxa and other components being listed directly to a PC using *Paradox* software.

3.3 Although submitted primarily for archaeobotanical assessment, notes were made of other biological remains recovered. In particular, a few insect remains were recovered during checking of the washovers and these have been examined briefly.

3.4 Three of the samples were examined for the eggs of intestinal parasitic nematodes using the 'squash' technique of Dainton (1992). Assessment slides were scanned at 150x magnification with 600x used where necessary. Although primarily for the detection of intestinal parasitic nematode eggs, the 'squash' technique routinely reveals other microfossil remains, and where present these have been noted.

3.5 The residues were primarily mineral in nature and were dried, weighed and their components recorded. Where possible, bone fragments in the residues were identified to species or species group, using the reference collection at PRS.

4 Results

4.1 The results are presented by Feature/Context. Archaeological information, provided by the excavator, is given in square brackets. A brief summary of the processing method and an estimate of the remaining volume of unprocessed sediment (of that submitted) follows (in round brackets) after the sample number.

4.2 *Phase 2 – deposits associated with a house (F4) and well (F5) dating to post-1711*

4.2.1 **Feature/Context F5/C2** [secondary well fill – contained pot and other artefacts of late 17th to 19th century date (1690-1800 AD)]

Sample 2/T (1.6 kg sieved to 300 microns with washover; no unprocessed sediment remains)

Moist, mid to dark grey-brown, crumbly to unconsolidated, sandy clay silt. Small stones (2 to 6 mm) were abundant and larger stones (6 to 20 mm), pieces of ?mortar/plaster and fine herbaceous detritus were all present.

The washover consisted of about 100 ml of cinders, coal, and fragments of woody and herbaceous roots (which might or might not be ancient). Uncharred remains, probably ancient, comprised a few raspberry (*Rubus idaeus* L.) seeds, sedge (*Carex*) and cinquefoil/tormentil (*Potentilla*) achenes, a single fragment of greenish evergreen leaf (box, *Buxus sempervirens* L.) and two fragments of tubular epidermis which (especially in the light of the evidence from other samples) were probably leaf spines of gorse (*Ulex*, probably *U. europaeus* L.).

Preservation of insect remains was rather poor (substantially worse than in the samples from F6, see below) and very few fossils were present. They probably have no interpretative potential even if a large subsample were to be processed.

The fairly large residue (dry weight 0.76 kg) was mostly of sand and stones, with a little coal and cinder (16 g), mortar/plaster (26 g), slag (6 g), glass (2 g) and a single pond snail (*Lymnaea peregra* (Müller)).

4.2.2 **Feature/Context F6/C1** [organic silt layer, ?consolidation – contained pot and other artefacts of 17th to 19th century date (1600-1800 AD)]

Sample 1/T (2.3 kg sieved to 300 microns with washover and microfossil 'squash'; no unprocessed sediment remains)

Moist, mid to dark grey-brown, crumbly (working soft), humic, slightly clay sandy silt, with some stones (2 to 6 mm) and fine herbaceous detritus present.

The small washover of about 180 ml of organic material included, amongst the coarser material some probable food remains (apple, *Malus sylvestris* Miller, endocarp ('core') and seeds), strawy debris (probably, in fact, mainly dicotyledonous stem fragments rather than conventional 'straw'), as well as various fragments of

gorse (leaves, leafy shoot fragments and twig fragments). The rather rich assemblage of fruits and seeds, whose preservation was generally good, sometimes extremely good, included some taxa likely to have originated in grass/hay and straw taxa, and there was also bracken (some of it charred) and some peat, all suggesting deposition of a mixed litter, perhaps from something like a stable. Hemp and hop were again present, presumably representing some other activities. Some very small fragments of box leaves were present, too, and the trace of mineralised fig (*Ficus carica* L.) seeds is not unexpected in a context of this date; the moderately frequent fragments of wheat/rye 'bran' also recorded may indicate a component from human faeces, if not animal feed or herbivore dung.

Artefactual material included small fragments of leather and a little well-preserved yarn.

In addition, modest numbers of well-preserved insect remains were present, and it is likely that paraffin flotation of a fairly large (say, 5 kg) subsample would have provided a useful assemblage. The fauna included synanthropes (notably the spider beetle *Tipnus unicolor* (Piller and Mitterpacher)), species associated with decaying matter including dung, and some from water and living vegetation.

The medium-sized residue (dry weight 0.53 kg) was mostly sand, with coal and cinders (8 g) and charcoal (to 50 mm), and traces of pot (6 g), glass (2 g), metal/slag (12 g, including a metal pin), clay pipe stem (2 g), leather (2 g), wood (6 g), hazel nutshell (<1 g) and marine shell (~20 fragments to 20 mm including mussel, *Mytilus edulis* L., and ?oyster, cf. *Ostrea edulis* L.). Bone from this sample was well-preserved. Seven of the fragments were fish bone, of which one was a herring (*Clupea harengus* L.) vertebra and one a flatfish (Pleuronectidae sp., probably plaice or flounder) vertebra. Other fragments included several bird phalanges and a distal radius fragment of a ?large chicken.

The 'squash' subsample was approximately equal parts organic detritus and inorganic material. A few pollen grains/spores, some ?phytolith fragments and some diatoms (at

least 2 different forms) were noted. No eggs of intestinal parasitic worms were recorded.

Sample 47 (2.0 kg sieved to 300 microns with washover and microfossil 'squash'; approximately 1.5 litres of unprocessed sediment remain)

Moist, dark grey-brown (to black internally – sulphide staining), crumbly and layered in places (working soft), humic, slightly sandy silt. Fine herbaceous detritus and ?ash were present.

The small washover of about 175 ml consisted of woody debris, coal, cinder, and some well-preserved plant macrofossils including leaf fragments of box. Overall, the material seemed very similar to that from the other sample from this feature (Sample 1) though much less rich. Interpretatively significant taxa recorded here but not in Sample 1 included grape (*Vitis vinifera* L.) and flax (*Linum usitatissimum* L.).

Preservation of the small number of insect remains was good; there were some fly puparia, an aquatic bug, a *Sitona* clover weevil, and an *Aphodius* dung beetle. It seems unlikely that the concentration of remains in this layer was high enough for an interpretatively useful analysis, however.

The medium-sized residue (dry weight 0.47 kg) was mostly sand, with some coal and cinder (6 g) and traces of pot (1 g), glass (<1 g), unidentified marine shell fragments (~8, to 12 mm) and leather (removed during processing and stored wet in a fridge). Seven bone fragments were also recovered from this sample. Of these, six could not be identified to species. A single eel (*Anguilla anguilla* (L.)) vertebra was recorded.

The 'squash' subsample was almost identical to that from Sample 1 (above), i.e. approximately equal parts organic detritus and inorganic material, with a few pollen grains/spores, some ?phytolith fragments and some diatoms (at least 2 different forms). In addition, a single live soil nematode was seen. No eggs of intestinal parasitic worms were recorded.

4.2.3 **Feature/Context F7/C3** [fill of cut for F5 (and F4) – contained pot and other artefacts of 17th to 19th century date (1690-1800 AD; including a glass seal inscribed with the date 1711)]

Sample 3/T (2.75 kg sieved to 300 microns with washover and microfossil 'squash'; approximately 2 litres of unprocessed sediment remain)

Moist to wet, dark grey-brown, soft and sticky (working soft), ?humic, sandy clay silt. Stones (2 to 6 mm), ?twigs or roots and marine shell fragments were present in the sample.

The small washover (of about 120 ml of organics) comprised wood fragment, with cinders, coal, leather, and herbaceous detritus, as before. Much the same kinds of remains were present as in samples from F6, with gorse, box, hemp, hop, and bracken all represented, and with the addition of hazel (*Corylus avellana* L.) nutshell, and carrot (*Daucus carota* L.), this last perhaps part of a cut grassland vegetation component. Other food remains were lacking, however, and in particular no wheat/rye bran was noted.

The medium-sized residue (dry weight 0.7 kg) was mostly sand, with some coal and cinder (8 g), and traces of brick/tile (22 g), slag (20 g), pot (2 g), glass (1 g), further hazel nutshell (<1 g) and marine shell (~40 fragments to 35 mm, mostly of oyster with a little mussel). In addition, there were three fragments of rather poorly preserved bone. Two could not be identified, the third was a herring vertebra.

The 'squash' subsample was approximately equal parts organic detritus and inorganic material. A few pollen and fungal grains/spores were noted, but no parasite eggs were seen.

5 Discussion and statement of potential

5.1 Plant remains, almost all preserved by anoxic waterlogging, were rather frequent in the washovers; apart from cinder and coal fragments, they made up the bulk of this fraction. Woody and herbaceous debris formed the greater part of the plant material, but there were also fruits and seeds, leaf fragments (notably of box, *Buxus sempervirens* L.), and some other plant parts, such as the shoots and detached leaves (thorns) of gorse or furze, *Ulex* (probably *U. europaeus* L.). The former seem most likely to have originated in formal gardens, the latter in material brought as fuel. An origin for much of this material in litter such as that found in stables cannot be ruled out—the presence of stalk and pinnule (frond) fragment of bracken (*Pteridium aquilinum* (L.) Kuhn), small scraps of leather, and even a little peat is consistent with this. Many of the other taxa are quite likely to have arrived in hay or other cut grassland vegetation, notably the fruits or seeds of yellow-rattle (*Rhinanthus*), buttercups (*Ranunculus* Section *Ranunculus*), self-heal (*Prunella vulgaris* L.) and small legume flowers, probably clovers (*Trifolium*, with red clover, *T. pratense*, pods present in one sample), as well as taxa such as *Hypochoeris* (cat's ears) and *Leontodon* (hawkbits). The small amounts of food remains present, including wheat/rye (*Triticum/Secale*) 'bran' and a few fruits (strawberry, fig, grape, apple) might all originate in waste from a stable, though material from human domestic occupation is also a possibility; the absence of eggs of intestinal parasites perhaps favouring the first of these.

5.2 Clearly material arrived in these deposits from a wide range of sources, whatever the mechanisms for collecting them together: hemp (*Cannabis sativa* L.) and hop (*Humulus lupulus* L.) fruits were present in small numbers, for example.

5.3 Charred remains other than wood charcoal were confined to traces of bracken frond fragments, rare barley grains and some grass/cereal (straw) culm (stem), all of which might represent burning of litter and might have arrived with the coal/cinder component of the deposits in ash.

5.4 The plant remains show some similarities with post-medieval material from Newmarket Street, Dublin (Hall *et al.* 2004), where remains of hemp, hop, gorse were all present, though where there was rather more evidence for imported peatland material. Rather

similar assemblages, with abundant remains of gorse, but also in some contexts fruits of hop, have also been recorded recently from post-medieval deposits at a site in Bridge Street, Chester (Jaques *et al.* 2004), England.

5.5 Well preserved insect remains were recovered from the samples from the organic silt layer F6. In one case (Sample 1), a larger subsample might yield an interpretatively useful assemblage of insects, which would enhance the interpretation of site environment and human activity and, in particular, help to confirm the likely origin of the biological remains in the deposit.

5.6 The recovered shell was, in the main, of highly fragmented marine shellfish and of no real interpretative value. A single freshwater snail was recovered from the well fill F5—its presence in such a context being unsurprising!

5.7 The bone recovered from the subsamples from the organic layer F6 was rather well preserved, whereas that from F7 was poorly preserved. In each case, the remains were too few to be of any interpretative value. No bone was recovered from the fill of the well F5.

6 Recommendations

6.1 With the exception of some recent analyses of post-medieval material from a site in Newmarket Street (Hall *et al.* 2004) little work appears to have been carried out on plant remains from this period in Dublin and the opportunity to add to the growing corpus of records should be taken. Further material, if available, should be processed, perhaps using samples as large as 5 kg, and the plant material recorded more thoroughly, though a semi-quantitative record will suffice.

6.2 It is highly desirable that any insect remains recovered be recorded in conjunction with further study of the plant macrofossils.

7 Retention and disposal

7.1 All of the remaining sediment, together with the remains extracted from the processed subsamples, should be retained for the present.

8 Archive

8.1 All material is currently stored by Palaeoecology Research Services (Unit 8, Dabble Duck Industrial Estate, Shildon, County Durham), along with paper and electronic records pertaining to the work described here.

Acknowledgements

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Appendix 6 – Textile Report O'Connell Street (03E0433)

By Siobhán Scully

1 Introduction

1.1 One textile fragment was recovered from the excavations at O'Connell Street. It is a long narrow strip of fabric, brown in colour with a fine weave. It came from an organic clayey silt, F10, which was cut by the house structure F4 and the well F5. There were a large number of artefacts from this context, including pottery dating from the 17th to the 19th century, leather artefacts and a wig curler (Baker 2003, 9).

1.2 The strip of textile is possibly a trimming or binding strip but there is no evidence of it having been attached to another garment. The type of stitch used would normally be used on a hem where the stitching would not show through to the front. The stitching on a trim would most likely pierce the fabric so as to attach it to the other piece of fabric. It could possibly be an offcut of a trim that had not been attached but had lines of stitching as decoration. Puckering in the fabric suggests that the parallel lines of stitching continued through the length of the strip.

2 Description

2.1 **03E0433:10:26** Textile. Long narrow strip of mid-brown textile with fine weave. It has one straight line of stitching 3mm from the one edge. It is a slip stitch, which does show through to the other side, with small, even stitches (stitch L 1mm) made with a brown thread, the same colour as the textile. This line of stitching runs the whole length of the fabric. There are two other short lines of stitching near the opposite edge to the right hand side of the fabric. One is 52mm in length, with the same colour thread and stitch length. The other line of stitching consists of two short lengths, one 8mm long, the other 4mm long with a space of 15mm between them, also with brown thread and the same stitch length. All the lines of stitching are parallel. The textile strip is badly frayed at each end and at a few places in the middle. Possibly a trim or binding strip. L 260mm Wth 10mm T 0.1mm.

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Appendix 7 – Glass Finds Report O'Connell St, Dublin City (03E0433)

By Edel Witherow

1 Introduction

1.1 Twenty-two glass objects were retrieved from this excavation. Most of these were fragments of dark green or black glass bottles, the majority being wine bottles. One light green phial bottle fragment, (03E433:18:2) was recovered. Also included in this collection is a bottle seal, (03E433:7:18).

Base Sherds	14
Body Sherds	2
Lip, Neck & Shoulder Sherds	2
Neck & Lip Sherds	1
Neck Sherds	2
Glass Seal	1

1.2 Seventeen of the bottle fragments consist of black glass. This type of glass is actually very dark green but it became known as 'black glass'. It was first produced in mid 17th Century. This variety of glass bottle provided many advantages such as protecting the contents from light and being stronger than previous bottles.[1]

1.3 A useful dating feature of glass bottles is the presence or type of pontil scar on the base of a bottle. A pontil scar is a mark left on the base of a bottle, which was made by the removal of the punty rod, which held the bottle in place while the glass was being blown. A sand pontil scar is recognised by the remaining grains of sand within the circular line of the pontil scar. A disc pontil scar can be recognised by rough chips of glass in an irregular elliptical shape on the base. Both of these types of pontil scars are commonly found on early English and European bottles in the 18th and early 19th Century.[2] All of the identifiable pontil scars from this collection are sand pontil scars.

1.4 One of the glass finds from this collection, (03E433:10:129), consists of a lip, neck and shoulder sherd. It has an applied string rim. The shape of this sherd indicates that it was

[1] Polack, Ada, "Glass: Its Tradition and its Makers", 1975
[2] Van Der Bossche W, "Antique Glass Bottles", Antique Collectors Club, 2001

part of an onion shaped bottle. This was the most popular shape for wine bottles around the early 18th Century, after this the bottles became longer and more cylindrical.

1.5 The lip, neck and shoulder sherd of a phial, (03E433:18:2), was also retrieved from this site. It has light green glass with a flared lip. This type of bottle was used for medicines or perfumes. This phial dates to mid- 18th Century.[3]

1.6 The bottle seal, (03E433:7:18), is circular with embossed lettering: "David Haoerd, 1711". It was common in the 17th and 18th Centuries for wealthy people to send their own bottles to wine merchants to be filled up. Glass bottles were seen as status symbols, which were made to order. As a means of identification, the bottles were marked or sealed.[4]

2 Catalogue

03E433:0:3, Base sherd of free blown bottle, black glass with grey patina, sand pontil scar, c.18th–early 19th Century[5]

03E433:0:5, Base sherd of free blown bottle, black glass with gold coloured patina, low kick-up, sand pontil scar, c. 18th-early 19th Century

03E433:2:2, Base sherd of free blown bottle, black glass, sand pontil scar, c. 18th-early 19th Century

03E433:2:3, Base sherd of free blown bottle, black glass, brown patina on interior, medium kick-up, sand pontil scar, c. 18th-early 19th Century

03E433:5:1, Neck sherd of bottle, light green glass with heavy grey/cream patina on both sides with irideseent sheen

03E433:5:2, Lip and neck sherd of free blown bottle, black glass with grey patina on exterior, applied string rim, 17th/ 18th Century

03E433:6:62, Base sherd of bottle, black glass with patches of brown patina, sand pontil scar, c. 18th-early 19th Century

[3] www.glass.co.nz/English vials.html "English Apothecary Vials"
[4] Fletcher, Edward, "Bottle Collecting", 1975
[5] Van den Bossche, W. " Antique Glass Bottles", 2001

03E433:6:63, Body sherd of bottle, olive green glass with brown patina, slight scratches on surface

03E433:6:64, Base sherd of bottle, black glass with brown patina on both sides

03E433:6:65, Base sherd of bottle, black glass with brown patina on interior and sides, surface of exterior is rough

03E433:6:66, Neck sherd of bottle, dark green glass, small infrequent bubbles

03E433:7:18, Glass seal, circular, embossed lettering "David Haoerd 1711", Diameter: 42.4mm, Thickness: 10.6mm,

03E433:10:123, Base sherd of bottle, black glass with patches orange/brown patina, low kick-up, sand pontil scar c. 18th-early 19th Century

03E433:10:124, Base sherd of bottle, black glass with grey/iridescent patina, medium kick up

03E433:10:125, Base sherd of bottle, black glass with brown patina

03E433:10:126, Base sherd of bottle, black glass, brown patina, low kick up, sand pontil scar, c. 18th-early 19th Century

03E433:10:127, Base sherd of bottle, black glass with brown patina, medium kick up,

03E433:10:128, Base sherd of bottle, black glass with brown patina, medium kick up, sand pontil scar c. 18th-early 19th Century

03E433:10:129, Lip, neck and shoulder of bottle, applied string rim, black glass with orange patina, possibly from an onion bottle, late 17th Century[6]

03E433:17:1, Body sherd of bottle, black glass with brown/iridescent patina

03E433:17:2, Base sherd of bottle, black glass with brown/iridescent patina

03E433:18:2, Lip, neck and shoulder of phial, light green translucent glass, flared lip

[6] Noel Hume, Ivor, "A Guide to Artefacts of Colonial America", 1969

Appendix 8 – Glass Slag Report O'Connell Street 03E0433

By Siobhán Scully

1 Introduction

1.1 Twenty-two fragments of glass slag were recovered from the archaeological excavations at O'Connell Street. They are by-products from glass-making and two pieces (03E0433:0:174, 03E0433:1:82) have the impression of a rod. The rod would have been rested against these waste pieces during the glass-making process.

2 Catalogue

03E0433:0:174 Piece of glass slag. Blue in colour with impression from a rod. 58mm x 45mm x 30mm. Rod impression 35mm x 23mm.

03E0433:1:82 Ten pieces of glass slag. Black/green in colour. One piece has an impression from a rod, 65mm x 65mm x 53mm. Rod impression 60mm x 37mm.

03E0433:2:4 Seven pieces of glass slag. Blue/black/green in colour

03E0433:18:36 Four pieces of glass slag. Blue/black/green in colour.

Appendix 9 – *Metal Report O'Connell Street 03E0433*

By Siobhán Scully

1 Introduction

1.1 There were thirteen metal objects recovered from the archaeological excavations on O'Connell Street.

1.2 Six of the metal artefacts recovered were of non-ferrous metal and included a bronze pin (03E0433:6:4), a lead cloth seal (03E0433:12:78), a possible strap-end (03E0433:12:1), a ring fitting (03E0433:12:81) and two possible buttons (03E0433:0:150, 03E0433:12:80).

1.3 The copper alloy pin (03E0433:6:4) has a wire-wound head. Wire-drawn pins are commonly found in medieval and post-medieval contexts (Hayden & Walsh 1997, 136). They began to appear during the 12th century and reflected developments in manufacturing technology (Pitchard 1991, 297). There is evidence from the excavations at Winchester of the use of wire drawn pins from the 13th century onwards (Biddle & Barclay 1990, 560). Strips of brass were hand-drawn through draw plates. The wire was then cut into small lengths to form the shanks of the pins. Lengths of wire were wound into spirals to form the heads and then attached to the shanks. Occasionally, a drop-stamp was applied to the head to smooth out the spirals (Biddle & Barclay 1990, 564). A drop-stamp was not applied to the O'Connell Street pin, as the spirals are clearly visible. The head and shank were also made separately. Pin-making continued more or less unchanged until the 19th century (*ibid.*). Wire-drawn pins were used for fastening women's veils and later for dress-making, although they also had many other household uses, such as in blankets or in upholstery (Biddley & Barclay 1990, 560, 564; Pritchard 1991, 297).

1.4 Lead cloth seals were used throughout Europe from the 13th to the 19th century (Egan 1995, 1). Lead seals were applied to newly woven cloth as a guarantee of the cloth's quality and also to establish that the relevant tax had been paid (*ibid.*). The seal from O'Connell Street is an alnage seal, that is, the cloth had been inspected by an officer of the Crown, found to be of adequate quality and the tax had been paid (*ibid.*). The alnage system was established in 1328 (Statute 2 Ed. III c.14; Egan 1995, 1) and continued until its abolition in 1724. The seal from O'Connell Street is a two-disc seal, which was the

usual form, although four-disc seals were also used (Egan 1992, 1-2). It is similar to a seal recovered from the excavations of the Abbey River, Limerick (98E0581:121), which had a similar stamp. There may be a textile imprint on the back of the O'Connell Street seal.

1.5 One artefact has been tentatively identified as a strap-end (03E0433:12:1). Strap-ends were fixed to costume, such as girdles or belts, though there has also been a suggestion that they may have been used as book-markers (Pritchard 1991, 126; Hinton 1990, 500). The indentations in the broken end of the O'Connell Street strap-end may have been rivet holes.

1.6 The penannular ring-fitting (03E0433:12:81) may have been used in household fixtures. Rings fittings from Winchester, which came from 15th century and later contexts, may have been used for hanging curtains and other textiles (Hinton 1990, 1095).

1.7 Two copper alloy objects have been identified as buttons (03E0433:0:150, 03E0433:12:80) but they are both very badly corroded. One may have had a separate attaching rivet (03E0433:0:150).

1.8 Seven ferrous artefacts were recovered from the excavations in O'Connell Street. Three of these are nails (03E0433:2:1, 03E433:6:6, 03E433:6:8) and three are tools, including an awl (03E0433:6:5), a punch (03E0433:6:2) and the remains of a handle (03E0433:6:1). There is one buckle (03E0433:6:3).

1.9 The three ferrous nails (03E0433:2:1, 03E433:6:6, 03E433:6:8) are all heavily encrusted with adhering corrosion products. They are all very short. Two have round, domed heads (03E0433:2:1, 03E433:6:6) and are possibly of Type B from Ford and Walsh's typology of nails (Hayden & Walsh 1997, 140-1). The other nail (03E433:6:8) has a flat head and is possibly of Type G (*ibid.*). By the early 19th century iron nails were completely made by machine. Towards the end of the 18th century in America nail stems were cut by machine and the heads were shaped by hammering, and by 1815 they were entirely machine-made. Before this nails were hand-wrought (Hume 1969, 253). Hand-made nails did not change much over time. The carpentry nails found during excavations at

Patrick Street, Dublin were dated from the 13th to the 16th century and were identified as belonging to Type A-H from Ford and Walsh's typography (Hayden & Walsh 1997, 140-1).

1.10 The awl (03E0433:6:5) was probably used for leather working. Awls were used to make holes in the leather for the thread to go through (Goodall 1990, 249). Awls are often found on medieval urban sites and were in use throughout the medieval period (Carroll & Quinn 2003, 266). There were 48 awls and punches from the excavations of medieval Waterford (Scully 1997, 469). The punch (03E0433:6:2) was more likely to have been used for metalworking. It would have been used to make holes in iron and a similar punch, which dated to the late 13th century, was found in excavations in Winchester (Goodall 1990, 199). The function of the object with the handle (03E0433:6:1) is unknown, as it is broken below the handle.

1.11 The iron buckle (03E0433:6:3) has a plain, rectangular frame and appears to be incomplete and there is no pin present. Rectangular iron frames are sometimes regarded as being horse furniture rather than clothing accessories but they could also have been used on swords or saddle bags and occasionally as belt fasteners on costume (Egan 1991, 50, 53).

2 Catalogue

2.1 *Non-Ferrous Metal*

03E0433:0:150 Possible bronze button. Heavily corroded. Circular domed head, with separated circular shank, round and flat at the base. Diam. 20mm Th 9mm.

03E0433:6:4 Pin. Wire-bound head. Circular, tapering shank. Head and shank appear to be made separately. L 52.5mm Diam. of shank 1mm Diam. of head 3mm.

03E0433:12:1 Sub-rectangular object, possibly a strap-end. Broken at one end. No perforations or attachments, but there are two small half-moon shapes at the broken end, and these may have been perforations. L min. 24mm Wth 20.2mm Th 1.2mm.

03E0433:12:78 Lead Cloth Seal. Two-disc lead cloth seal. Disc one: Diam. 1mm textile imprint. Disc two: Diam. 21mm G.R DUBLI(N)... crown.

03E0433:12:80 Possible bronze button. Heavily corroded. No details visible. Diam. 27mm Th 8mm.

03E0433:12:81 Copper alloy ring fitting. Penanular hoop, oval in section. Diam. 28mm Th 3mm x 4mm.

2.2 *Ferrous Metal*

03E0433:2:1 Nail. Heaving encrusted with adhering corrosion products. Circular, bent shank, with round domed head. Dims. including corrosion products: L 53mm Wth 14mm Th 12. Dims. from x-ray: L 42mm Wth of shank 5mm Wth of Head 11mm.

03E0433:6:1 Handle. Short-handled object, with partial blade remaining. Handle: L 115mm Wth 22-28mm Blade: L 75mm Wth min. 60mm.

03E0433:6:2 Punch. Flat shank, with flat rectangular head. L115mm, Shank Wth 10mm Shank Th 7mm, Head 12mm x 8mm.

03E0433:6:3 Buckle. Incomplete buckle frame. L 55mm Wth 47mm Th 7-9mm.

03E0433:6:5 Awl. Curving slender shank. Some adhering corrosion products. L 80mm Wth 3mm.

03E0433:6:6 Nail. Heaving encrusted with adhering corrosion products. Short circular shank with round domed head. Dims. including corrosion products: L 17mm Wth 6-17mm. Dims. from x-ray: L 20mm Wth of shank 3mm Wth of Head 7mm.

03E0433:6:8 Nail. Heaving encrusted with adhering corrosion products. Short rectangular tapering shank with flat head. Dims. including corrosion products: L 25mm Wth 8mm. Dims. from x-ray: L 34mm Wth of shank 2-5mm Wth of head 12mm.

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Appendix 10 - *Ceramic Crucible Report O'Connell Street 03E0433*

By Siobhán Scully

1 Introduction

1.1 A ceramic crucible was recovered from the excavations at O'Connell Street. The crucible is incomplete but the base and part of the wall remain. It is not possible to identify the type of ceramic it is due to it having been fired and re-fired. Ceramic crucibles are usually affected in some way by the heat they are subjected to by firing. This can produce a thin 'glaze' on the exterior (Bayley & Barclay 1990, 176), and there are traces of this on the crucible from O'Connell Street. The blackened colour of the interior of the crucible is due to the oxidisation of metal in the melt (*ibid.*).

1.2 There were thirteen ceramic crucible fragments from Skiddy's Castle, Cork representing six to eight crucibles and they all had flat bases and flared walls, which dated them to the 15th century and after (McCutcheon 1997, 163). These flat-based crucibles superseded the medieval round-based crucibles and large numbers of triangular-based crucibles were imported from Germany in the 17th and 18th centuries (*ibid.*).

2 Description

03E0433:0:4 Fragment of ceramic crucible with flat, circular base and part of the slightly flared wall remaining. The interior base of the crucible is rounded. Lump of glass slag on the exterior of the base and small fragment of metal slag on the interior. H min. 41mm; Ext. Diam. of base 41mm; T of wall 4.7mm T of base approx. 10mm.

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Appendix 11 - *Stone Finds Report O' Connell Street Lower, Dublin 1 03E0433*

By Marie-Anne Lennon

1 Introduction

1.1 The excavation undertaken at the ESB sub-station in the central median on Lower O'Connell Street revealed four main phases of activity. Structural remains were first identified during monitoring. Further excavation revealed structural elements in the form of a quay wall, house structure and well, highlighting the rapid expansion of this area in the eighteenth century. A large number of objects were recovered from the site including glass, pottery, clay pipe, tile and stone.

2 Discussion and description

2.1 The stone is sub circular in shape but appears takes on an over all octagonal shape. It is an unfinished worked stone. It has very smooth flat upper and base surfaces, with two sides of the stone worked into flat smooth surfaces (giving it an octagonal shape). The rest of the stone remains un-worked. The stone is most likely quartzite processing characteristics such as a white-cream colour with a sparkling appearance due to its mineral inclusions. This find was recovered from a well (feature 5). The well was located at the southwest corner of F4, a house structure. The well was sub-circular in shape, with internal corbelling as it descends. There were a total of 7 courses within the well, with 4-5 above water level. The well contained three distinct fills. The upper fill was sandy clay mixed with lime and masonry fragments. It appears that this stone was retrieved from this layer. A total of 27 artefacts were recovered from the interior of the well. These include glass, tile, clay pipes and pottery, which dates from the seventeenth to the nineteenth century. This broad dating band makes it impossible to attribute a date to this stone.

3 Catalogue

03E0433 sub circular in shape with a smooth flat base and upper surface. Two sides of the stone are worked creating a smooth surface. The rest of the stone remains un- worked. The stone is un-finished and therefore its use is unknown. Its upper surface measures 153.6mm x 127.5mm.The lower surface measures 153.8mm x 153.8mm. the stone mensures 77mm in thickness.

Appendix 12 - *Analysis of the Wood Remains of Connell Street (03E0433)*

By Ellen O'Carroll - February 2004

1 Introduction

1.1 Eight samples of wood were submitted for analysis. The wood was sampled from excavations carried at an ESB sub-station in the central median of O'Connell Street between the statues of William Smith O'Brien and Daniel O'Connell. The excavation programme revealed a number of structural elements including a quay wall, and their surrounding archaeological deposits, which were indicative of late 17th and 18th century development in this area.

1.2 The eight samples analysed here were retrieved from activities associated with phase 2 and phase 3 of the excavations. Two wooden pins, a worked point and two worked wood fragments were uncovered from layers associated with a structure F4 and related to phase 2. Two wooden posts and a squared wooden object were sampled from activity south of the Quay wall and associated with phase 3 of the excavations.

2 Methods

2.1 The process for identifying wood, whether it is charred, dried or waterlogged, is carried out by comparing the anatomical structure of wood samples with known comparative material or keys (Schweingruber 1990). Thin slices were taken from the transversal, tangential and longitudinal sections of each piece of wood and sampled using a razor blade. These slices were then mounted on a slide and glycerine was painted onto the wood to aid identification. Each slide was then examined under a high powered stereomicroscope at magnifications of 100-400x. By close examination of the microanatomical features of the samples the species were determined. The diagnostic features used for the identification of wood are micro-structural characteristics such as the vessels and their arrangement, the size and arrangement of rays, vessel pit arrangement and also the type of perforation plates. It is important to note that, only in some cases were all the characteristic features described above present in the archaeological samples. It was very difficult to obtain thin sections from sample no. 18 as it was worked on both ends. The transverse section obtained from a broken section of the artefact was unidentifiable as its microstucture was much distorted.

3 Results

Table 1: Species identified from wood samples excavated at O Connell St., Dublin

Feature no.	Find no.	Find type	Species	Annual rings	Comment
23	1	Wooden post	*Pinus silvestris*	10+	Squared post.
22	1	Wooden post	*Pinus silvestris*	10+	Squared post Originally pointed.
21	1	Wood piece	*Pinus silvestris*	5+	Squared timber. Slightly pointed. Possible part of post
6	16	Wood pin	*Prunus spinosa*		In two pieces. 16.6cm x 0.8cm (max diam).
0	1	Worked wood fragment	*Prunus spinosa*		Branch material. Not worked.
6	19	Wood pin	*Prunus spinosa*		11.5 x 0.4cm (max diam)
6	18	Worked point	Unidentifiable		Microstructure distorted
10	16	Worked wood fragment	*Quercus sp.*		Radial split wooden fragment.

4 Discussion

4.1 There were three species present in the wood remains (Table 1). These were oak (*Quercus spp.*), blackthorn (*Prunus spinosa*) and pine (*Pinus silvestris*).

4.2 A series of pine posts were identified from phase 2 of the excavations. These were squared and were probably originally pointed. It was generally thought that although Scots pine was common throughout Ireland after the last glaciation, it had declined and was absent by the medieval period and not reintroduced until the late 17th century. Scots pine has been identified by the author at numerous pre-historic and early medieval sites throughout Ireland. The Scots pine identified from these excavations may have been imported or may have grown in woodlands close to Dublin City.

4.3 The quality and texture of Scots pine depends on the rate of growth of each tree. Scots pine wood is not naturally durable and is no longer widely planted as a commercial forest species in Ireland.

4.4 A split oak wood fragment was identified from the excavations. Sessile oak *(Quercus petraea)* and pedunculate oak *(Quercus robur)* are both native and common to Ireland and the wood of these species can not be differentiated on the basis of their anatomic characteristics. Pendunculate oak is found growing in areas of heavy clays and loams, particularly where the soil is alkaline. Sessile oak is found on acid soils and often in pure stands. Unlike pendenculate oak, it thrives on well drained soils but is tolerant of flooding (Beckett 1979, 40-41). Both species of oak grow to be very large trees (30-40m high) and they were one of the most important species of wood for the production of large timbers due to its great durability and strength.

4.5 Two blackthorn (*Prunus spinosa*) pins were identified from the samples analysed above. Blackthorn is valued for its hard wood and modern so-called shillelaghs are constructed from blackthorn. Blackthorn sticks have been identified from early Christian period by the author from Lemanaghan bog, Co. Offaly. Blackthorn would have made a very suitable hard wood for the manufacture of wooden pins. It is a thorny shrub found in woods and scrubs on all soil types. In a woodland situation blackthorn is more likely to occur in clearings and at the woodland edges.

5 Conclusions

5.1 It is clear from the analysis above that pine was selected for use as posts while blackthorn was used for the manufacture of the two wooden pins. Blackthorn pins have also been identified from 17th century layers at a nearby site on Ormond Quay, Dublin 1. The function of the oak wood fragment is unknown therefore little else can be said about this sample.

5.2 According to the old tree list both oak and pine are Nobles of the wood *Airig Fedo*, and would have been held in high esteem while blackthorn was considered a commoner of the woods or *Fodla fedo* (Mac Coitir 2003, 14).

5.3 The oak identified suggests that there was a supply of oak in the surrounding hinterland of Dublin City in the 17th /18th Century. The Scots pine could have originated from native woodlands, recently planted Scots pine forests or imported from abroad. The blackthorn

may have been selected quite close by to the site in the nearby hedgerows, or at the edge of the secondary woodlands.

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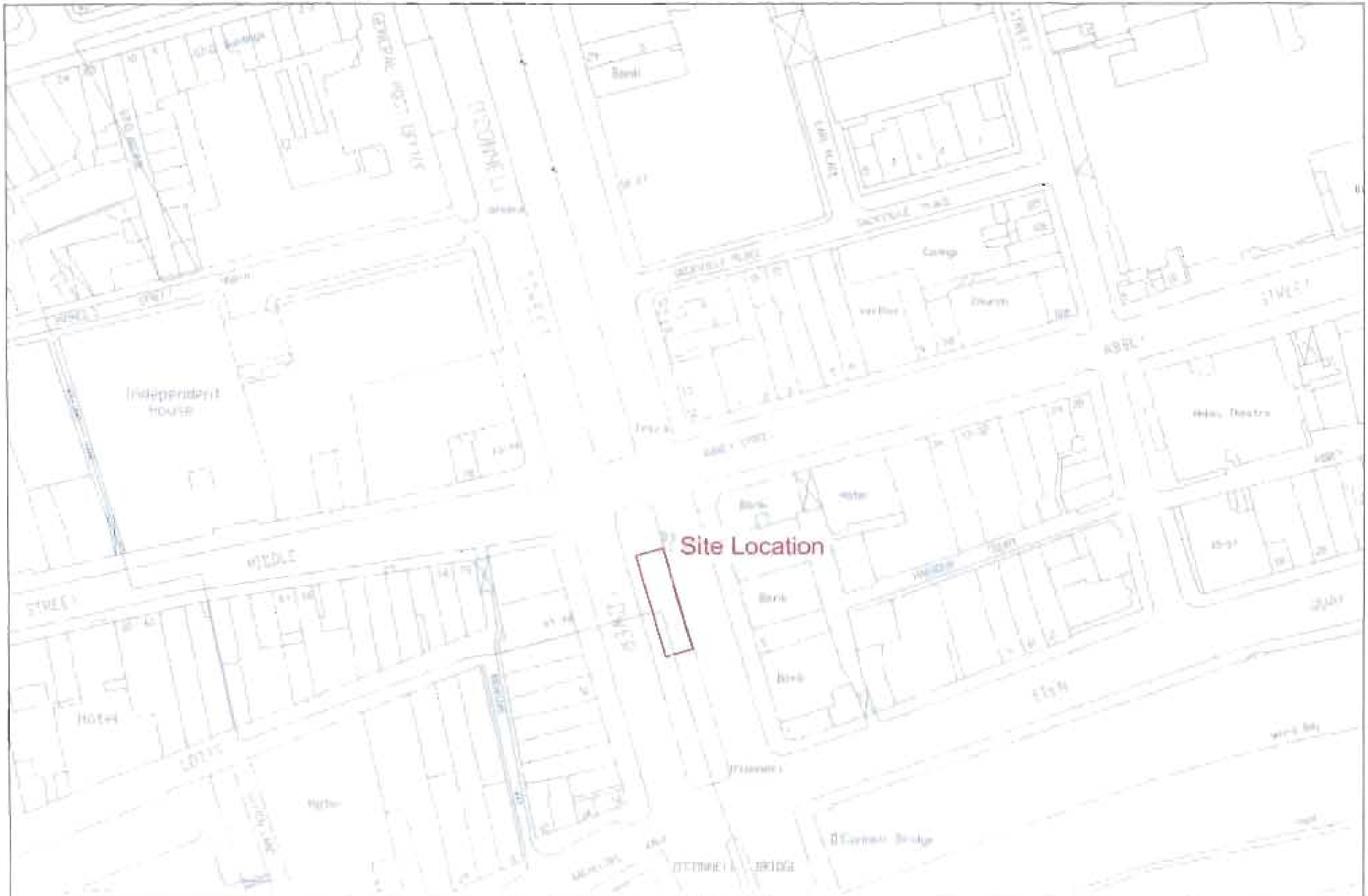

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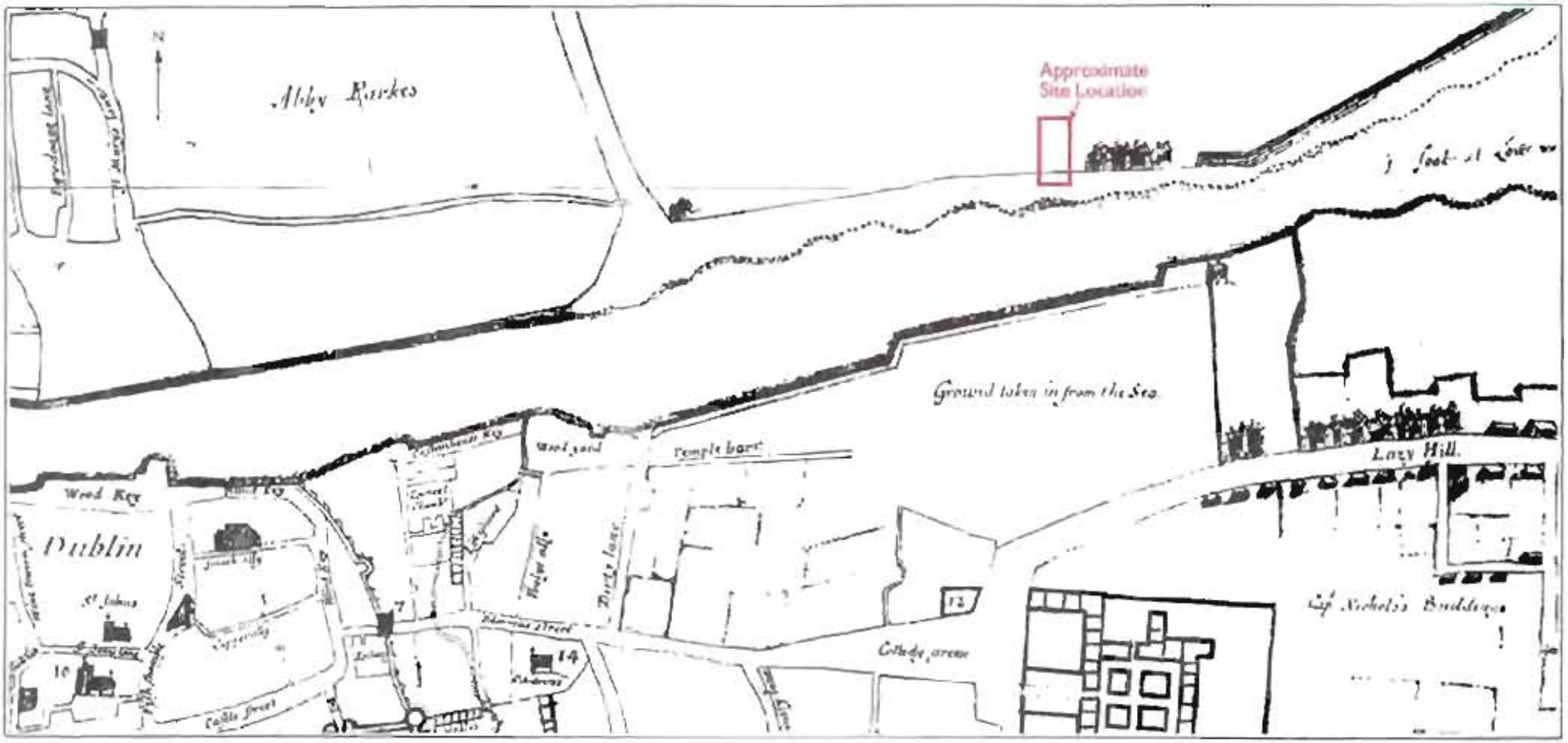
SITE LOCATION



Job O'Connell Street Lower, ESB Substation, LUAS, Dublin 1
Ref. 03079
Date 05.01.05
Client RPA
Scale Not applicable
Fig. 2 de Gomme, 1673

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Client RPA
Scale Not applicable
Fig. 3 Brooking, 1728

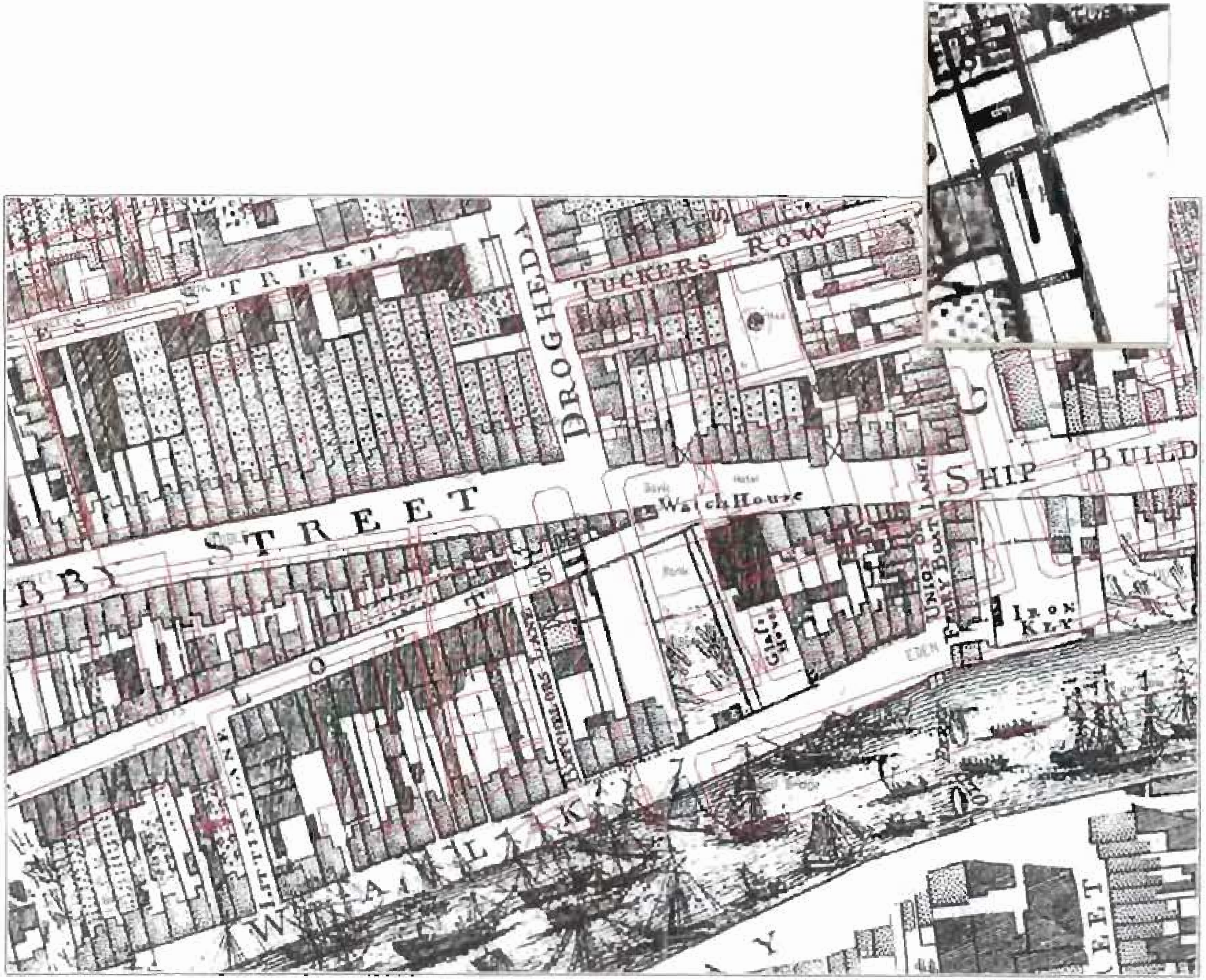

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Fig 4 Rocque, 1756

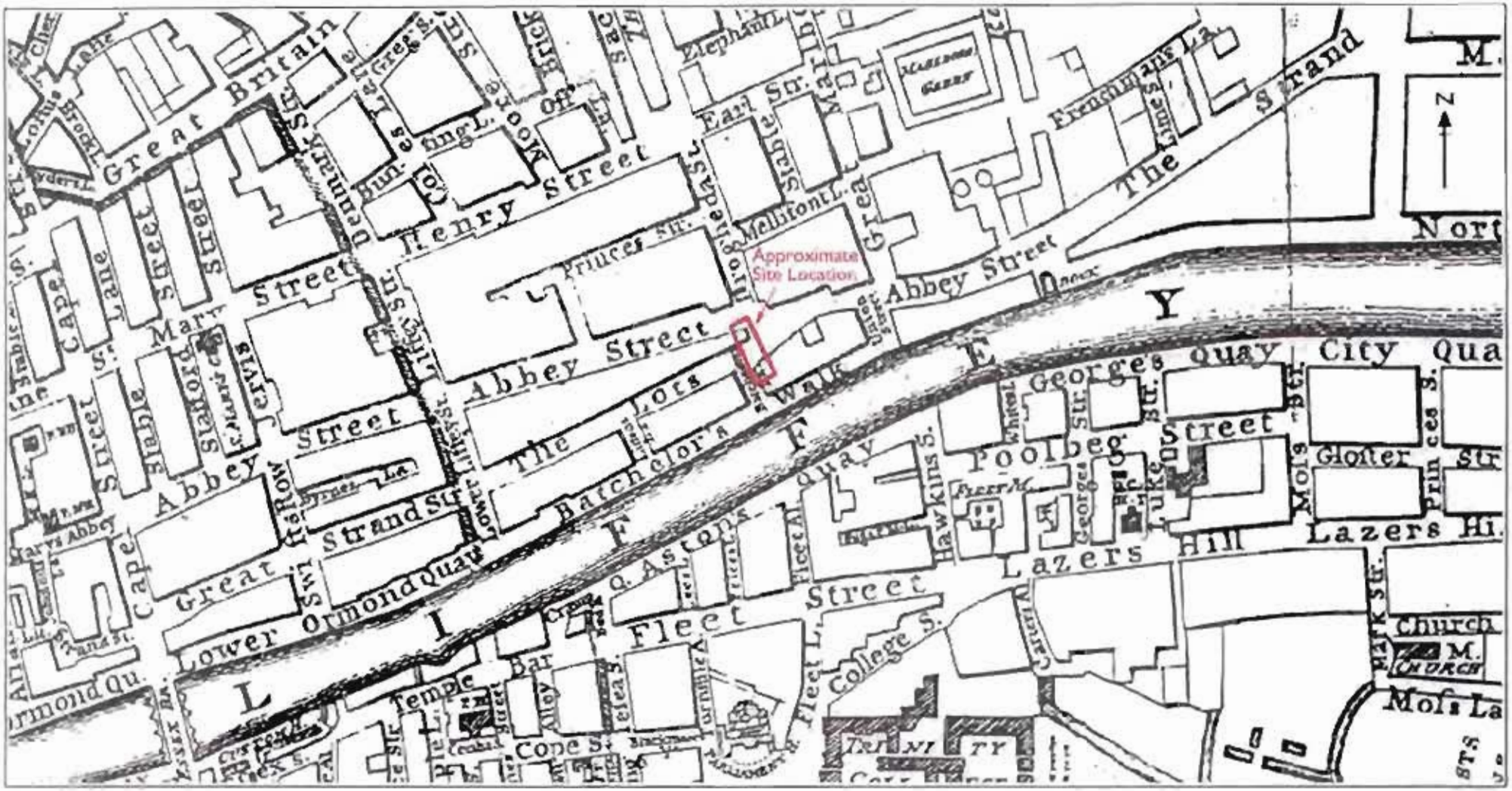

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Fig. 5	Wilson, 1777

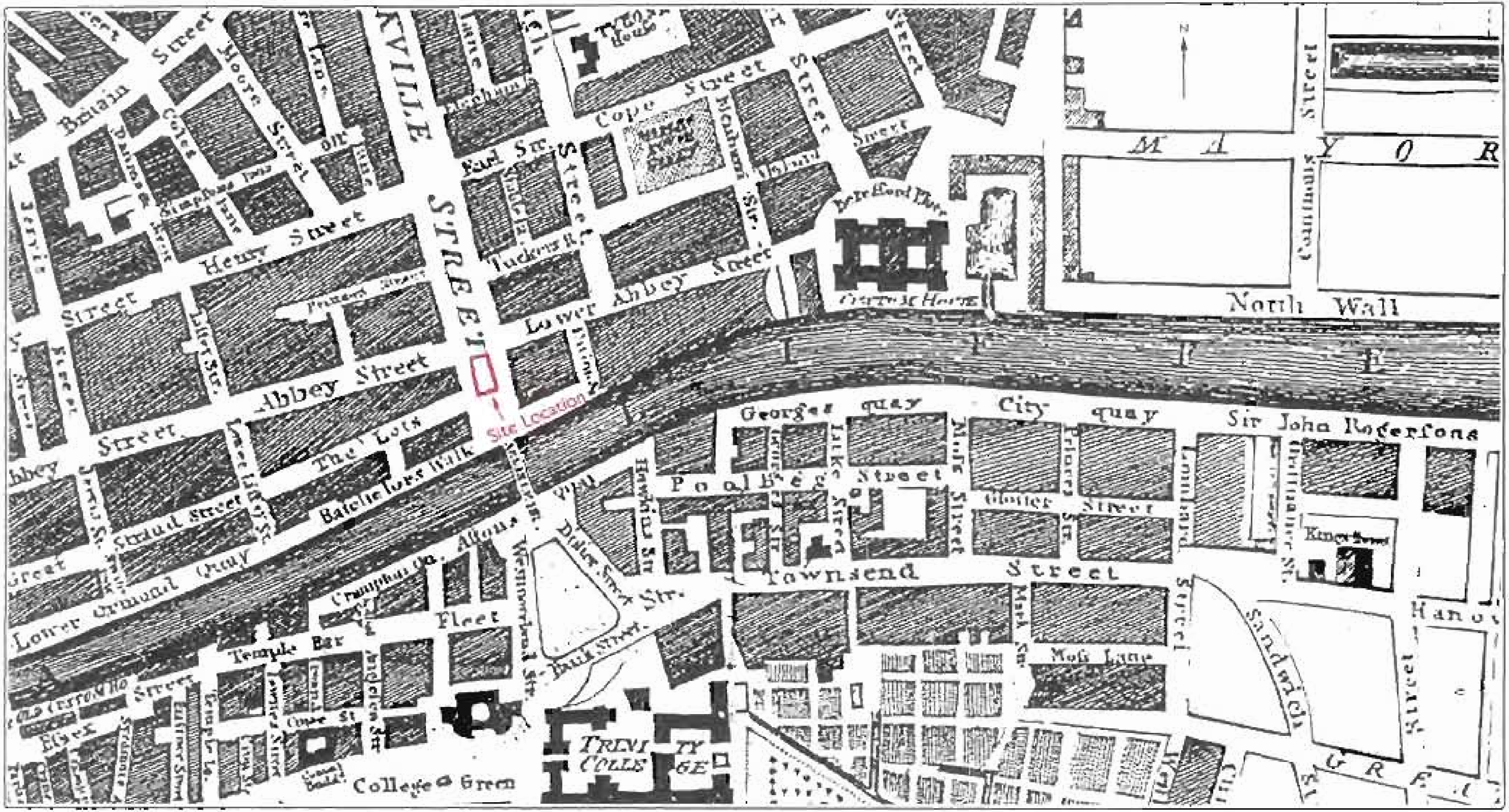

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Fig. 6	Wilson, 1804

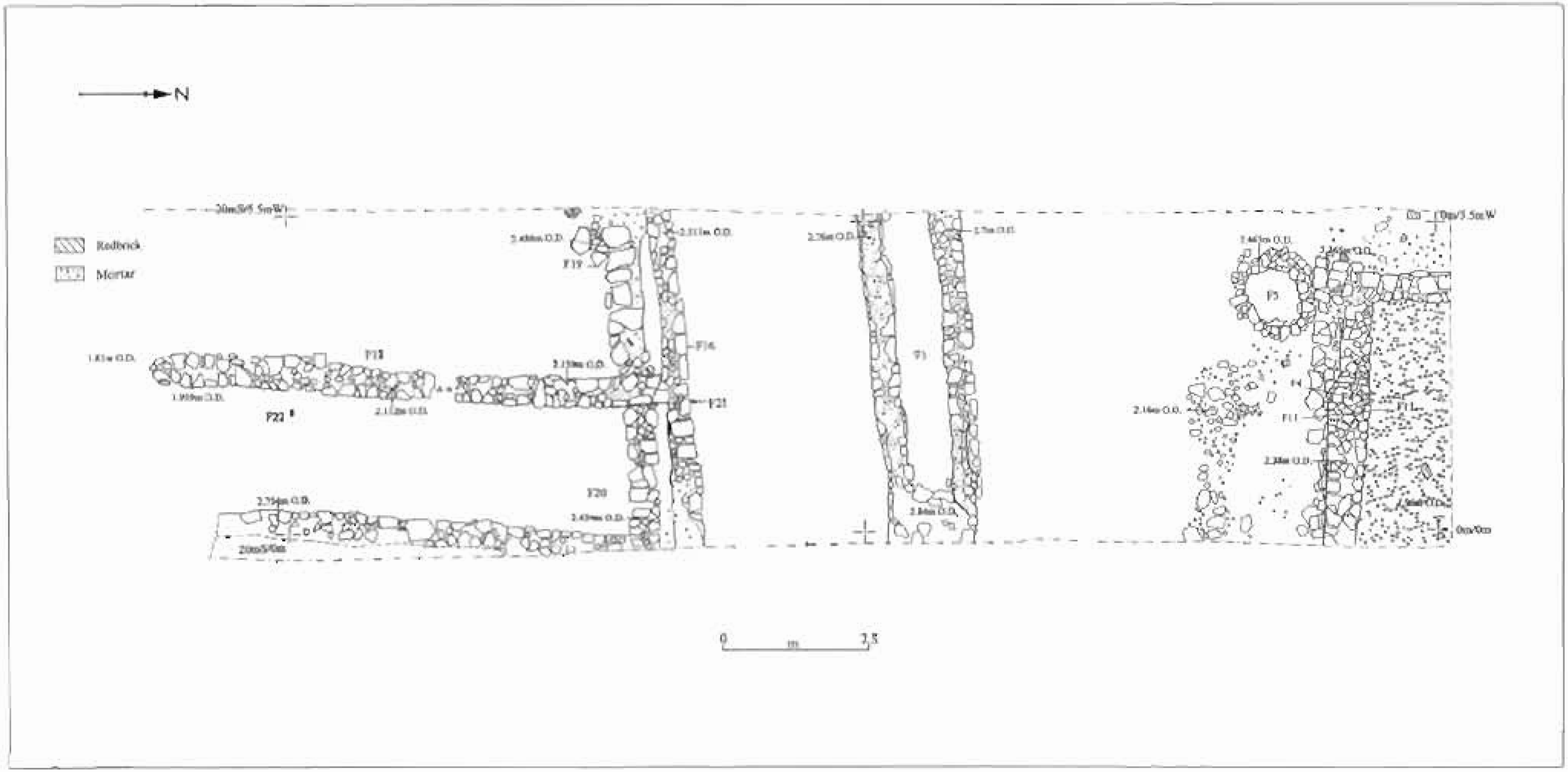

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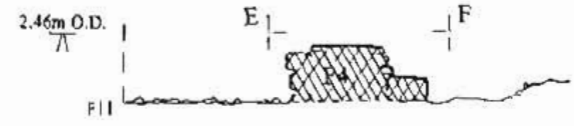
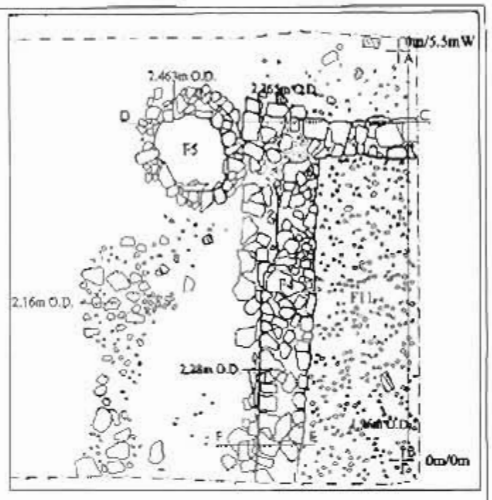
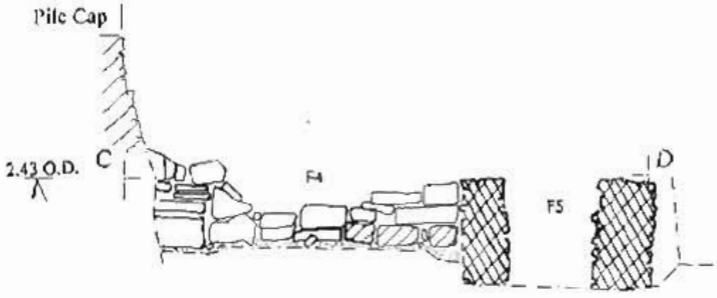
Fig.

Plan# 4C: Profile Running N/S, F11 and House F4





Plan# 4A: West Facing Elevation, F4 and Well F5



Plan# 4B South Facing Elevation, House F4

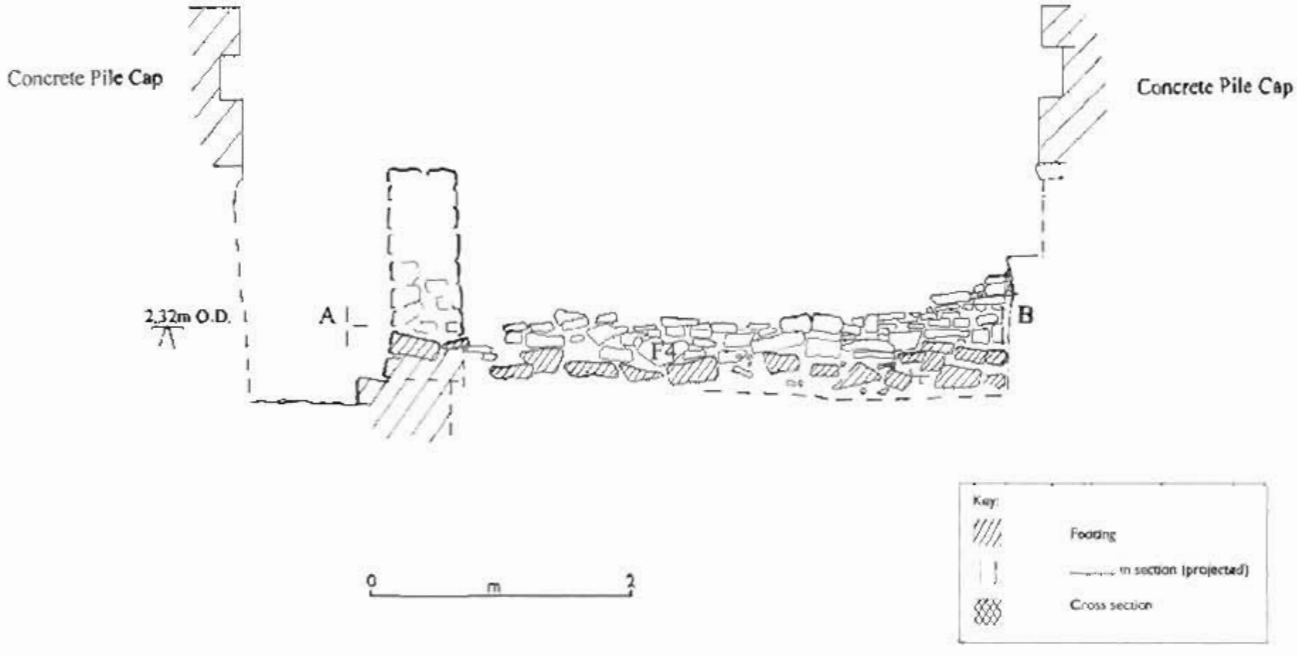


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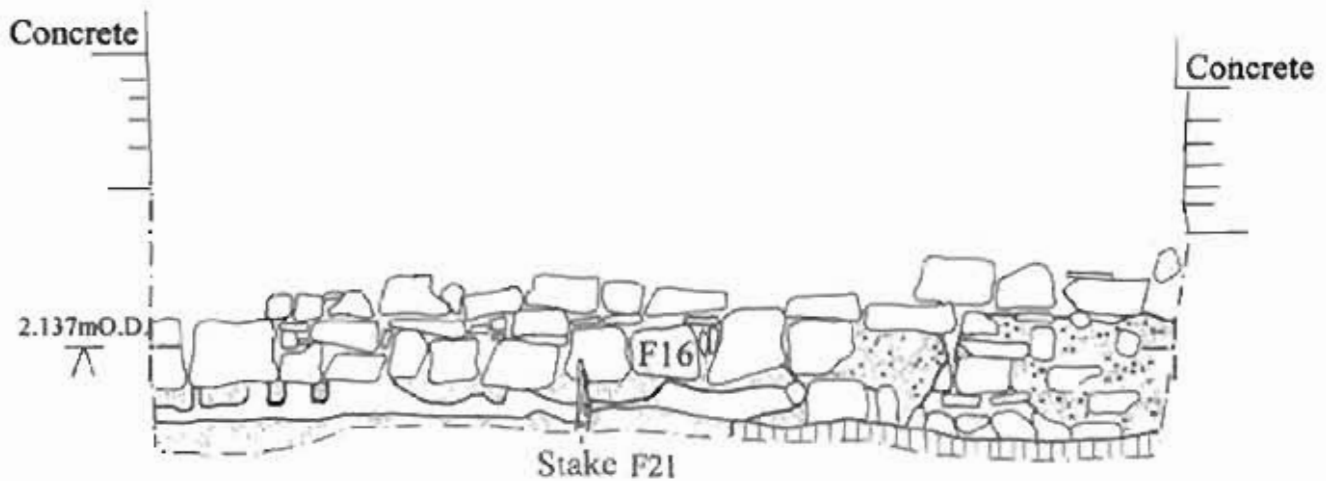
Fig. 8	Feature 4, elevations

North Facing Elevation



Key
Mortar
Sand
Remnants Of Beam/Yellow Sand

0 m 2

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Scale As indicated
Fig. 9 Feature 16, north facing elevation

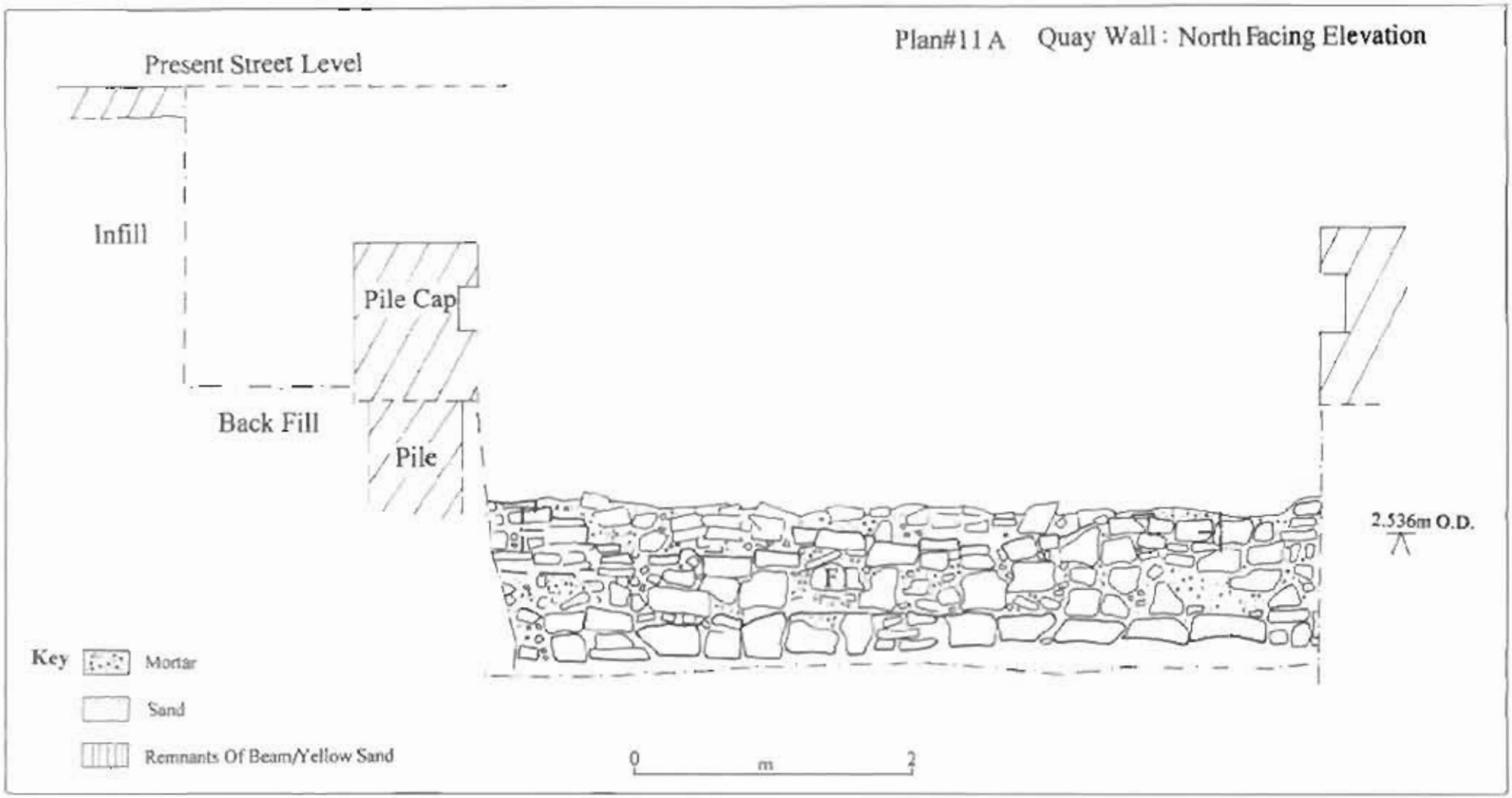

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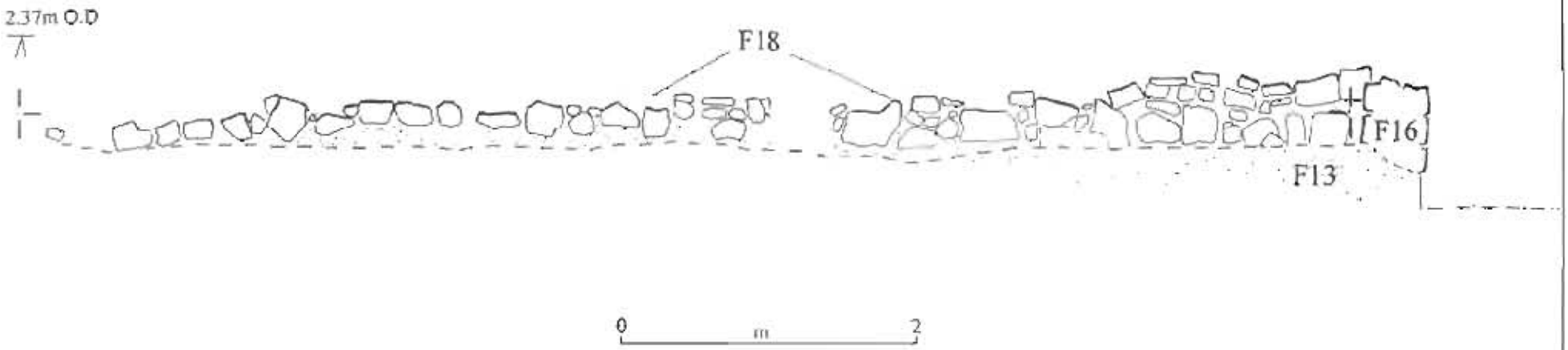
Fig. 10 Feature 1, north facing elevation

Plan#10 : East Facing Elevation



Key

Mortar

Sand

Remnants Of Beam/Yellow Sand

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Fig. 11 Feature 18, east facing elevation

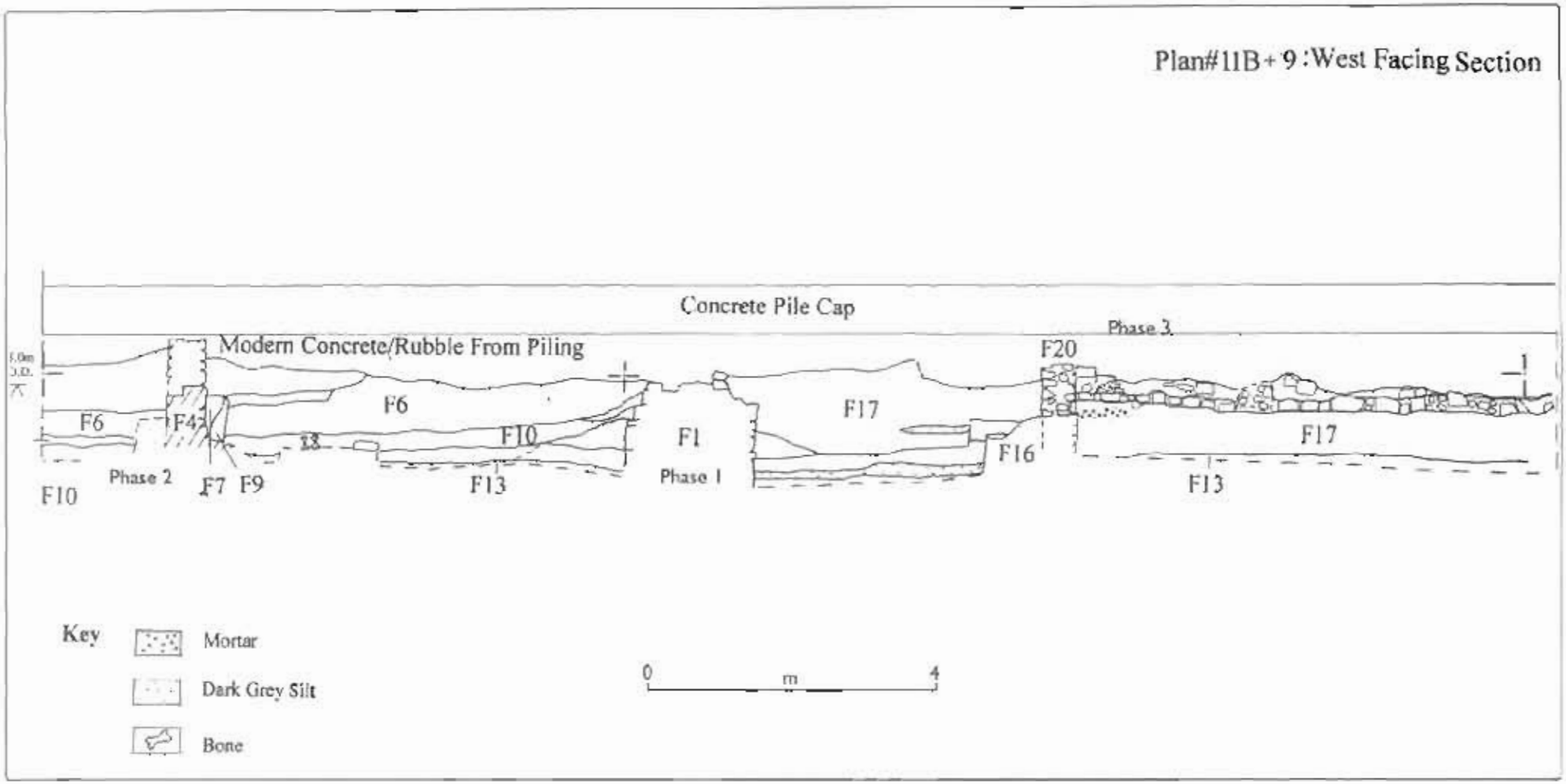

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Fig. 17	West facing section through the site

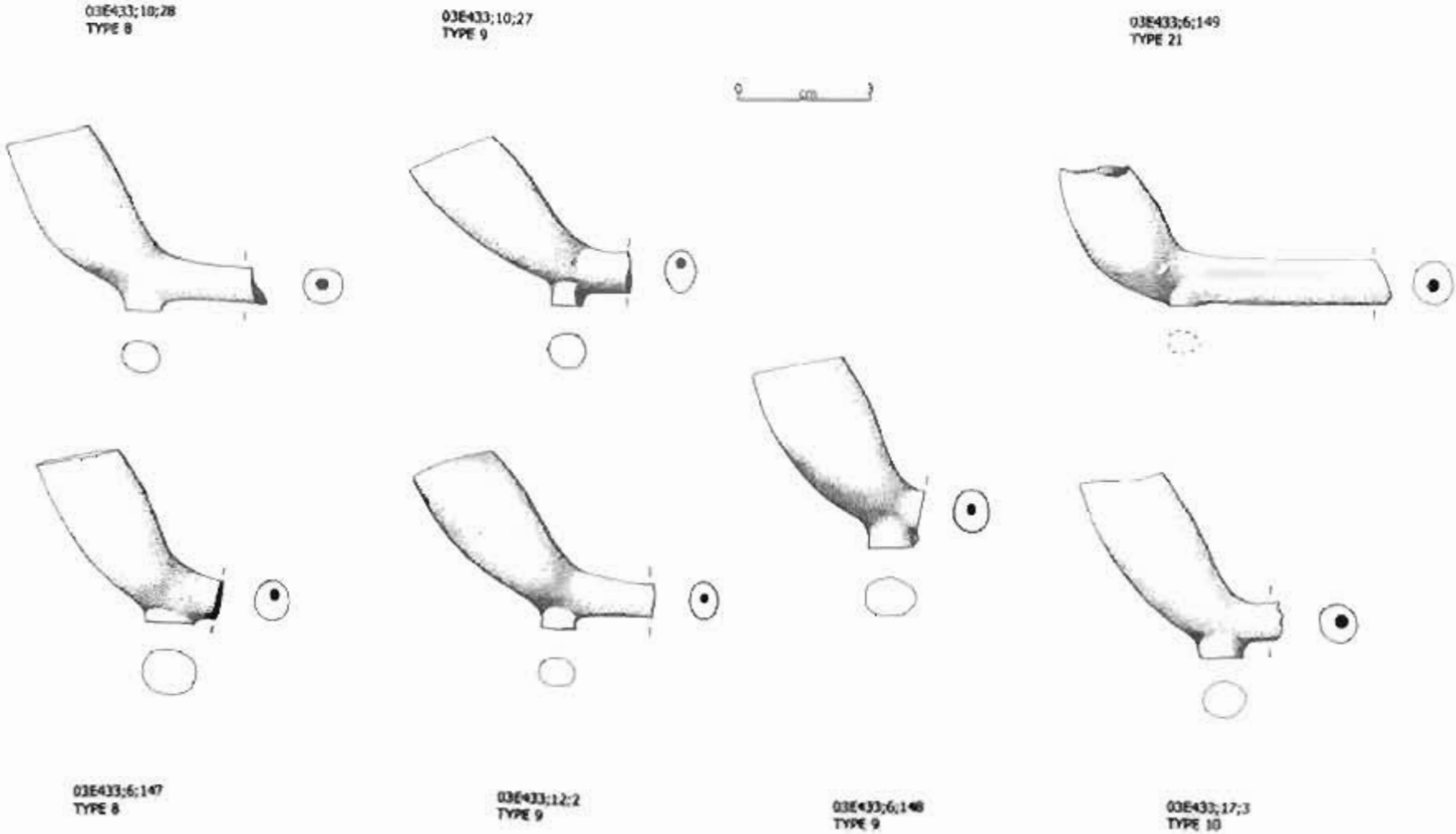

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Fig 11 Clay pipe

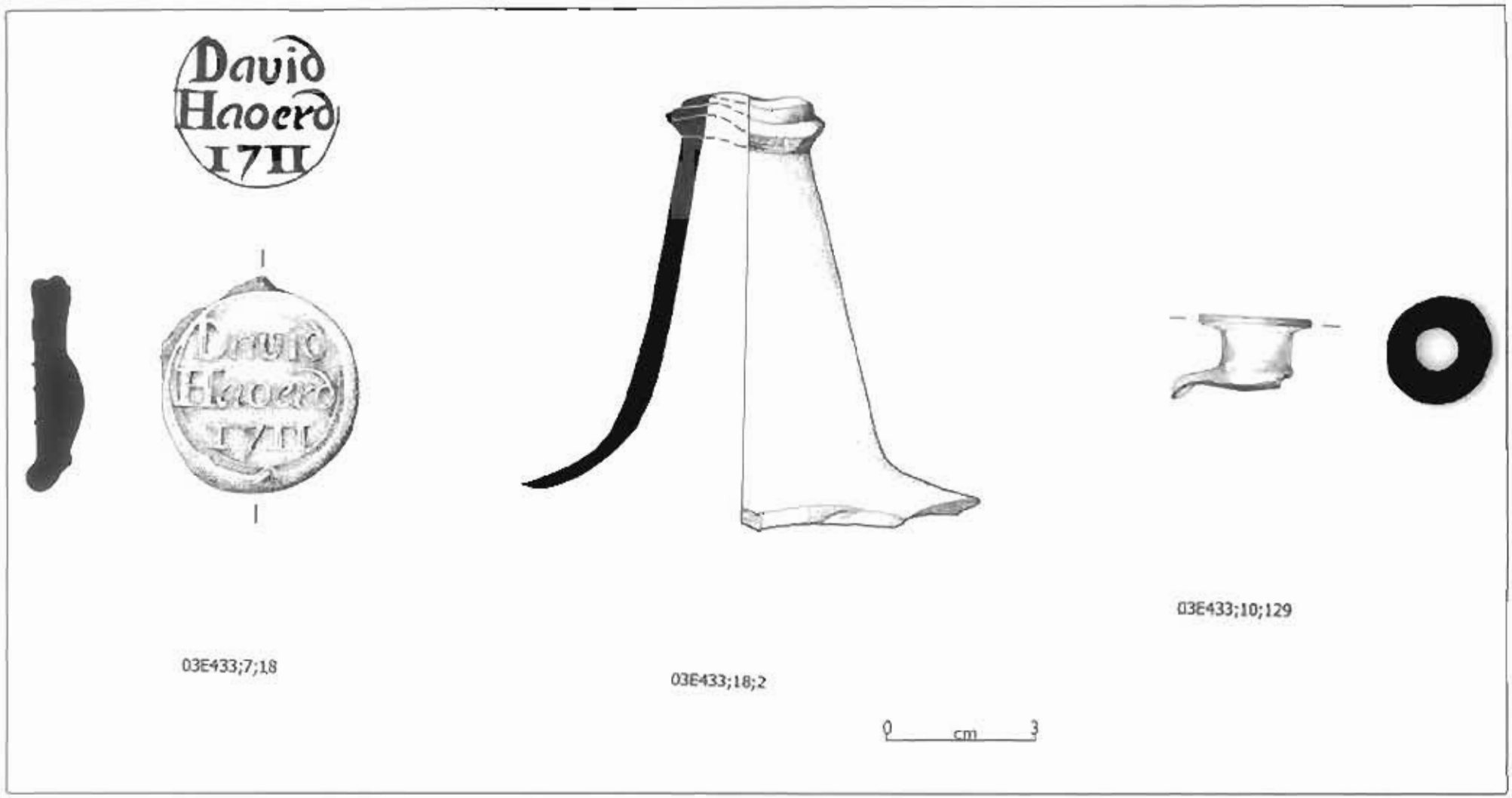

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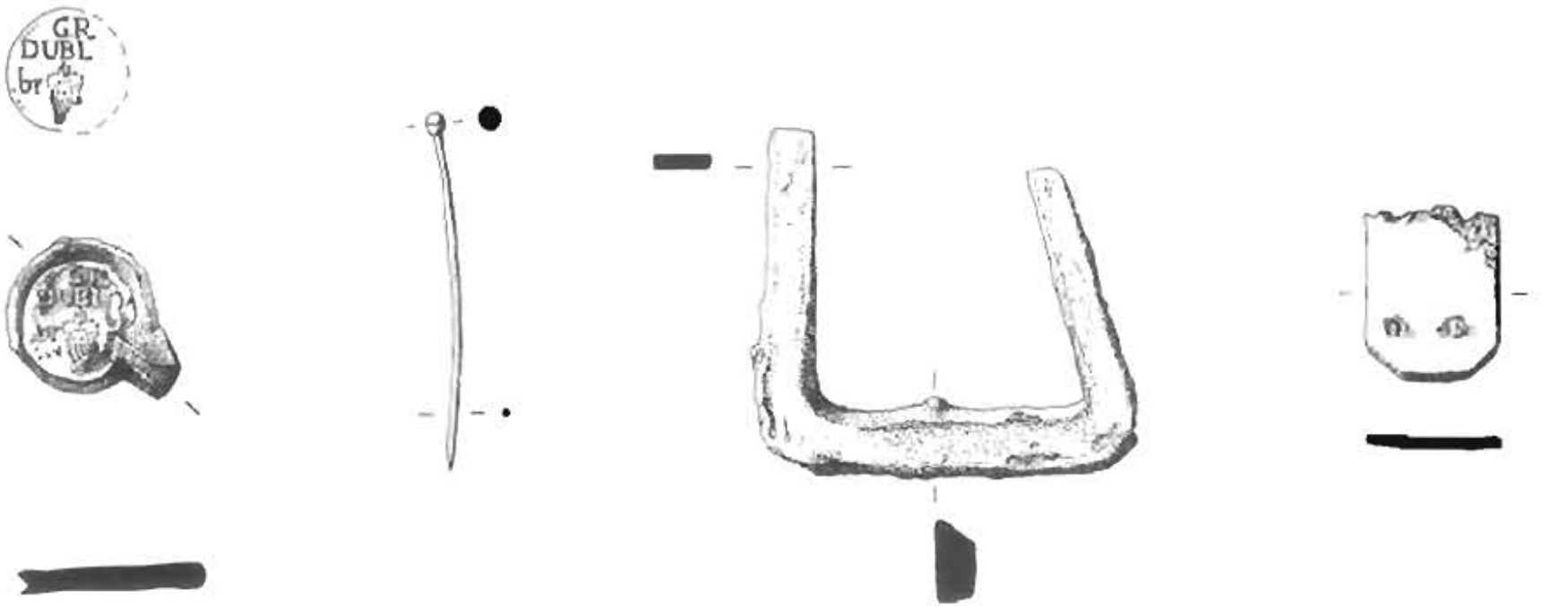
Fig. 14 Glass Finds illustrations



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03E433;6;4

03E433;6;3

03E433;12;1

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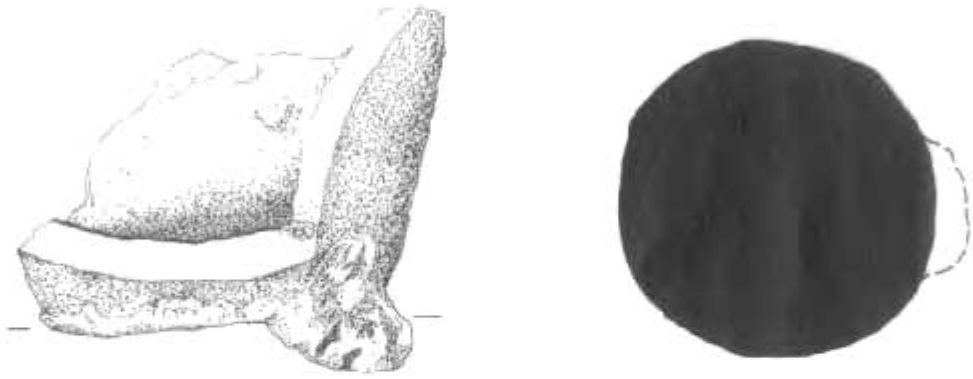
Fig. 15 Metal Finds Illustrations



03E433;0;4

0 cm 3

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Fig. 16 Crucible illustration

Plate 1 Feature 1, quay wall, facing south

Plate 2 Feature 1, quay wall, facing northwest

Plate 3 Feature 1, facing west, pre-excavation

Plate 4 Feature 1, facing west, post-excavation

Plate 5 Features 4 & 5, facing northwest, post-excavation

Plate 6 Feature 5, facing west, post-excavation

Plate 7 Features 16, F18-F20, facing northwest, mid-excavation

Plate 8 Features 16 & F18, facing south, post-excavation

Plate 9 Feature 18, facing north, post-excavation

Plate 10 Features 16 & F18, facing north, post-excavation