



ARCHAEOLOGICAL
SERVICES
WYAS

**D-Campus
Sheffield
South Yorkshire**

Archaeological Investigations

Volume I

Text and Figures

April 2010

Report No. 2058

CLIENT

GMI Construction Group PLC

D-Campus Sheffield South Yorkshire

Archaeological Investigations

Summary

Archaeological Services WYAS were commissioned by GMI Construction Group PLC to undertake an archaeological excavation on land at Harmer Lane and Sheaf Street, Sheffield, on the site of the former Sheffield bus station. The excavations located several structures identified in the cartographic record. Elements of the Sheaf Island Cutlery Works were identified and a probable dividing wall between these premises and the Sheaf Saw Mills to the south was also located. At the north-west of the site remains of the Central Hammer Works were revealed and to the south of these, 19th century tenement dwellings to the south and east of Mate's Square were identified. Later in the same century, the tenements to the south were extended northwards, effectively filling in Mate's Square. A cobble surface and an associated stone-built tank were identified beneath the made-ground deposits on which the tenements were built. These features could not be identified in the cartographic record. Drainage features cut in to the underlying natural alluvial deposits were also recorded.



ARCHAEOLOGICAL
SERVICES
WYAS

Report Information

Client: GMI Construction Group PLC
Address: Middleton House, Westland Road, Leeds, LS11 5UH
Report Type: Archive Report
Location: Land at Harmer Lane and Sheaf Street, Sheffield
County: South Yorkshire
Grid Reference: SK 3585 8720
Period(s) of activity represented: Post-medieval, Modern
Report Number: 2058
Project Number: 3347
Site Code: ECA07
Planning Application No.: 05/04691/FUL
Museum Accession No.: -
Date of fieldwork: January to April 2007
Date of report: March 2010
Project Management: Alistair Webb BA MifA
Fieldwork supervisor: Adrian Chadwick PhD
Report: Phil Weston BSc MA
Illustrations: Ian Atkins, John Prudhoe
Photography: Paul Gwilliam
Research: Dan Lee

Produced by: Archaeological Services WYAS, PO Box 30,
Nepshaw Lane South, Morley, Leeds LS27 0UG
Telephone: 0113 383 7500
Email: admin@aswyas.com

Authorisation for
distribution: -----

ISOQAR ISO 9001:2000
Certificate No. 125/93

© Archaeological Services WYAS

Specialists:

Chris Cumberpatch (Pottery)
Susi White (Clay pipes)
Ken Hawley (Metal alloys)
Alan Vince and Kate Steane (Ceramic building material)
Alan Vince and Kate Steane (Mortar and plaster)
Jennifer Jones (Industrial residues)
Gail Hama (Glass)
Gail Hama (Worked bone, shell, jet and wood)
Gail Hama (Metal, slag and stone)
Gail Hama (Ceramic finds)
Steven J Allen (Wood)
Quita Mould (Leather)
Jane Richardson (animal bone and shell)

Contents

Volume 1

Report information	ii
Contents (Volume 1)	iv
Contents (Volume 2)	vi
List of Figures	vii
List of Plates	viii
List of Tables	ix
Acknowledgements	ix
1 Introduction	1
Site location and topography	1
Soils, geology and land-use	1
2 Archaeological and Historical Background	1
Evaluation results	3
3 Excavation Aims and Objectives	17
4 Excavation Methodology	19
5 Excavation Results	19
Area A/D	19
Area B	27
Area C	27
Area E	28
Area F	31
6 Artefact Record	33
Pottery	33
Clay tobacco pipe	62
Metal alloy	81
Ceramic building material	84
Mortar and plaster	88
Industrial residues	89
The examination and analysis of a combustion boat	90
Glass	93
Worked bone, shell, jet and wood	95
Metal, slag and stone	96
Ceramic material	98
Wood	98
Leather	102
Flint	103
7 Environmental Record	104
Animal bone and shell	104
Biological remains	106

8	Discussion	111
	Area A/D	111
	Area B	113
	Area C	114
	Area E	114
	Area F	116
	Site development and social history.....	116
9	Conclusions	129

Figures

Plates

Contents

Volume 2

Appendices

Appendix 1: Inventory of primary archive

Appendix 2: Concordance of contexts

Appendix 3: Written Scheme of Investigation/Project Design

Appendix 4: Pottery catalogue

Appendix 5: Pottery photo plates

Appendix 6: Clay pipe catalogue

Appendix 7: Clay pipe illustrations

Appendix 8: Industrial residue identifications

Appendix 9: Site matrices

Bibliography

List of Figures

- 1 Site location
- 2 Plan of the site showing excavations area and evaluation trenches (Scale 1:1250@A4)
- 3 Gosling's 1736 map of Sheffield showing the approximate location of site (Scale *c.* 1:1500@A3)
- 4 Fairbank's 1771 map of Sheffield showing the approximate location of site (Scale *c.* 1:1500@A3)
- 5 Fairbank's 1797 map of Sheffield showing the approximate location of site (Scale *c.* 1:1500@A3)
- 6 Fairbank's 1808 map of Sheffield showing the approximate location of site (Scale *c.* 1:1500@A3)
- 7 John Leather's 1823 map of Sheffield showing the approximate location of site (Scale *c.* 1:1500@A3)
- 8 Tayler's 1832 map of Sheffield showing the approximate location of site (Scale *c.* 1:1500@A3)
- 9 OS 1850 map of Sheffield showing location of site and archaeological remains (Scale 1:750@A4)
- 10 OS 1890 map of Sheffield showing location of site and archaeological remains (Scale 1:750@A4)
- 11 Goad's Insurance Plan of 1896 showing location of site (Scale *c.* 1:500@A4)
- 12 OS 1905 map of Sheffield showing location of site and archaeological remains (Scale 1:750@A4)
- 13 OS 1923 map of Sheffield showing location of site and archaeological remains (Scale 1:750@A4)
- 14 OS 1935 map of Sheffield showing location of site and archaeological remains (Scale 1:750@A4)
- 15 Plan of Trench 1, northern section, lower level (Scale 1:100)
- 16 Plan of Trench 1, southern section, upper level (Scale 1:100)
- 17 Plan of Trench 2 (Scale 1:100)
- 18 Plan of Trench 3 (Scale 1:100)
- 19 Plan of Trench 3: Phase II excavations, eastern end (Scale 1:100)
- 20 Plan of Trench 4 (Scale 1:100)
- 21 Plan of Trench 5 (Scale 1:100)
- 22 Plan of Trench 6 (Scale 1:100)
- 23 Area A/D, Phase 1 Features (Scale 1:100)
- 24 Areas A/D, Phase 1 sections (Scale 1:20)
- 25 Plan of Areas A/D and E (Scale 1:100)
- 26 Area A/D, the Tenement Buildings (Scale 1:100)
- 27 Area A/D, the 'Well' feature and associated drains (Scale 1:100)
- 28 Plan of Area C (Scale 1:50)
- 29 Overlay plans of Area E (Scales 1:100 and 1:20)
- 30 Plan of Area F (Scale 1:100)

List of Plates

- 1 Area A/D. Structure 009, the stone tank
- 2 Area A/D. Northern wall of stone tank (009), mouth of culvert (010) and waterlogged timbers (2134)
- 3 River Street
- 4 Area A/D. Excavation of buildings 1-6. View south-west
- 5 Excavation of buildings 1-7 showing gennel between buildings 6 and 7 in the foreground. View north-east
- 6 Area A/D. Feature 1862, possible retaining walls for staircase in cellar 8
- 7 Area A/D. Dividing wall between the yards/living spaces of structures 7 and 8 showing the fireplace/sink plinths
- 8 Area A/D. Coal chute in cellar 14, typical of cellars 1-8 and 10-15
- 9 Area A/D. Stairs cellar 13
- 10 Area A/D. West facing wall of cellar 14, showing the bottom four courses of a brick vaulted ceiling to the left and the scar of the dividing wall between cellars 14 and 15 by the scale
- 11 Area A/D. Cellar steps cut in to existing wall, typical of those in cellar 1 to 6
- 12 Area A/D. Cellar 10 backfilled with stacked bricks and flagstones
- 13 Area A/D. Cleaning up the Central Hammer Works remains
- 14 Area B. Scar of vaulted ceiling associated with the Sheaf Saw Mill
- 15 Area E. The Sheaf Island Works basements
- 16 Area E. Excavation of the Sheaf Island Works basements
- 17 Area E. Culvert and wattle revetments
- 18 Area E. Culvert
- 19 Area E. Cobble surface
- 20 Area F. General view of walls 1015, 1016, 1033 and 1038
- 21 Area F. Culvert

List of Tables

- 1 Clay pipe context summary
- 2 Century range for bowl fragments
- 3 Marked bowls
- 4 Metal alloy finds from context 1000
- 5 Unstratified metal alloy finds
- 6 Metal alloy finds by context
- 7 Ceramic building material by context
- 8 Ceramic building material by fabric
- 9 Ceramic building material by form
- 10 Ceramic building material with lettering
- 11 Plaster and mortar by context
- 12 Iron finds by type
- 13 Non-ferrous metal and slag finds by type
- 14 Wood samples by species
- 15 Organic finds by context and type
- 16 Animal bones and shells by phase and area (excludes unstratified and unphased material)

Acknowledgements

ASWYAS would like to thank GMI Construction Group PLC for commissioning the works. Dinah Saich of the South Yorkshire Archaeology Service and Derek Bayliss of the South Yorkshire Industrial History Society Field Recording Group for their valuable input.

1 Introduction

Archaeological Services WYAS were commissioned by GMI Construction Group PLC to undertake an archaeological excavation on land at Harmer Lane and Sheaf Street, Sheffield on the site of the former Sheffield bus station (Figs 1 and 2). A planning application (05/04691/FUL) has been submitted by Scarborough Developments (Sheffield) Limited for a proposed office and commercial development. The proposed development comprises four office blocks that are to be constructed on piers with car parking beneath in an open basement. A Project Design was produced by Archaeological Services (hereafter ASWYAS, 2007) and approved by the South Yorkshire Archaeology Service (hereafter SYAS).

The site has previously been subject to three archaeological investigations; a desk-based assessment (Lee *et. al.* 2004), a watching brief during geological test trenching (Martin 2006b) and most recently, an archaeological evaluation consisting of the excavation of six trial trenches (Lee 2007). These works were undertaken to ascertain the impact the proposed development would have on the potential buried archaeological and historical remains in this part of inner city Sheffield. The results of these investigations highlighted the survival of buried archaeological structures and deposits relating to the late post-medieval industrial and domestic use of the area.

Site location and topography

The site is situated to the north-west of Midland Station in Sheffield city centre (site centred SK 3585 8720). It covers an area of *c.* 1.4 hectares and is bounded to the north by Pond Hill, the east by Sheaf Street, the south by Harmer Lane and to the west by Pond Street (Fig. 2).

Soils, geology and land-use

The soils in this part of Sheffield are unclassified. The drift geology consists of alluvium over-lying Upper Carboniferous coal measures of the Westphalian C type (British Geological Survey Sheet 100). The site, prior to excavation, was under demolition rubble.

2 Archaeological and Historical Background

The desk-based assessment (Lee 2004) revealed that the majority of the site was utilised as agricultural/meadow land during the medieval period up until the late 18th century. Potential for the discovery of medieval remains, however, does exist at the extreme north-west of the site, in the vicinity of the Old Queen's Head pub (formally known as 'Hall-in-the Ponds'). This pub is thought to date to the 15th century and is believed to have once been a small banqueting house. Archaeological excavations along the west side of the building revealed considerable disturbance from post-medieval activity. Wood was found that was subsequently dated by dendrochronology to 1510 (Webster 1992). A wall of unknown construction/date on a north/south alignment has also been exposed adjacent to the pub.

The development encompasses an area that lies within the post-medieval industrial centre of Sheffield. From cartographic evidence (Fairbanks' map) it is known that the northern end of the site was occupied by 1797, with a small colliery and coal yard, situated to the west of the Bamford goit (Fig. 5). By this time, the River Sheaf had also been straightened (to the east of the site) and a dam had been cut above the newly created Sheaf Lane (later to become Harmer Lane). This map also depicts buildings, shown as a hachured area, in the north-west part of the site. The dam, however, was short lived, as by 1808 it no longer appears on the Fairbanks' map of this date (Fig. 6). The majority of the colliery complex had also been removed by 1808.

John Leather's map of 1823 (Fig. 7) records very little change from 1808 whilst Tayler's map of 1832 (Fig. 8) indicates development along the western side of River Street and to the east at its northern end. The first edition 1850 Ordnance Survey map (hereafter OS) indicates that much of this development was domestic dwellings whilst it also shows industrial development along the western bank of the Sheaf in the form of the Sheaf Island Works (Fig. 9).

The site had evolved by 1905 with the cutlery works expanding and the creation of Sheaf Saw Mills in the southern part of the site (Fig. 12). By 1935, however, the sawmill and the domestic dwellings are no longer illustrated and would seem to have been demolished (Fig. 14).

The Goad plan dating to 1937 gives a very clear indication of the use of each of the industrial buildings on the site, at this time (not reproduced). The Central Hammer Works is shown at the extreme north-west of the site, with individual workshops, stores and offices clearly indicated. A range of crucible furnaces within the Sheaf Island Works to the extreme south-east of this complex is also recorded, although these appear to have been disturbed by a large modern manhole for the Don Valley Sewer.

The buildings of the Hammer Works are illustrated on maps until 1981 when they appear to have been demolished. It is on this map that the Sheaf Valley Baths, constructed to the south of the site, are first shown. The Sheaf Island Works and Cutlery Works appear in a similar form, with some minor changes, most notably the demolition of the range of crucible furnaces. The Sheaf Island Works were finally demolished in 1984 and the site redeveloped for car parking and a bus station.

A scheme of geotechnical investigations (2005) was subject to archaeological monitoring. This revealed brick walls, structures and concrete wall surviving below deep deposits of made ground (up to 3m in places). The majority are believed to date to the 19th to 20th centuries and may form components of the Cutlery Works, the Sheaf Island Works and the Bamford Goit. At the south of the site a brick/sandstone wall and a brick floor were identified that may comprise either part of the Sheaf Saw Mills or the later swimming baths. These

investigations confirmed the presence of industrial buildings below deep deposits of made ground (Martin 2006b).

Evaluation results

At the end of 2006, ASWYAS carried out an archaeological evaluation of the site consisting of the excavation of six trial trenches. The results of the evaluation are detailed below.

Trench 1

Trench 1 was orientated north to south and was a maximum of 24.5m in length, 13.5m in width and up to 4m deep. The Sheaf Valley Baths, which were constructed in the mid 20th century and demolished in the 1990s, overlay the entire trench area evidenced by the numerous large concrete pile foundations revealed during excavation.

The northern part of the trench revealed deep made ground deposits totalling 4m in depth. Modern piles (119) from the mid 20th century swimming baths extended down through the made ground layers, distorting the sections and dragging layers downwards around them. A modern drain (157) enclosed between two brick walls (156) set on a concrete base (157) was located to the south-west of the trench and was perhaps contemporary with the swimming pool (Fig. 15).

The modern made ground layers were evident for a considerable depth (c.2.5m) with the upper trench step consisting of very modern make up layers of hardcore and demolition waste extending to a maximum depth of 1.55m (114, 115, 116, 117, 188 and 120). These most likely derive from the demolition of the swimming baths in the 1990s and the re-landscaping of the area. They overlaid a series of earlier 20th century made ground deposits that consisted of gravely levelling layers (121, 130) and an ash and clinker rich layer (122). These sealed a series of tipped deposits that were introduced from the north, comprising various interleaving layers of building demolition material containing stone, brick and mortar within a silty sand soil matrix (123, 124, 125, 126, 127, 128 and 129). These deposits overlay a compacted layer forming a surface foundation layer most likely contemporary with the former Sheaf Saw Mills. The tipped layers may therefore represent an episode of deliberate and rapid backfilling of the area after the saw mill was demolished in the early 20th century.

The remains of the saw mill had been heavily disturbed and only part of a compacted sub-surface levelling layer (131), some floor flags (143) and a stone and brick pillar base (144, 145) survived (Fig. 15). Much of the western area of the trench had been disturbed during the demolition of the swimming pool and the area was made up with loose demolition material and concrete (142). Pillar base 144/145 survived to a height of 0.39m and consisted of a large squared sandstone block (145) with two upper courses of machine-made bricks bonded with purple ash mortar set in a square (144). A line of squared sandstone flags (143), situated to the south of the pillar, was laid above layer 131 and may have formed part of a floor. No other evidence of the saw mill survived.

A machine excavated sondage to the south revealed that pillar 144/145 was constructed above layer 133, and layer 131 overlay further layers of made ground. These comprised thin layers of building rubble (132), and two sandy silt layers containing building demolition material (133, 134). These layers totalled 0.7m in depth and probably represent levelling layers prior to the construction of the saw mill in the later 19th century. However, this date is through inference as no dating evidence was obtained. Below these deposits a 0.1m thick layer of dark brown-grey sandy silt (135) was exposed. Deposit 135 may represent an episode of stabilisation in the area or perhaps a ground surface and may be related to the silty base of the former dam that is depicted on the 1797 map of the area (Lee *et al.* 2004). This layer had been dragged down by a pile to the north and was probably once level. Whilst the silt content of deposit 135 is high, the small angular stones and brick fragments, as well as the sandy texture, suggest that it was derived from the importing of topsoil material rather than deposition within a watery environment. The silt layer overlays a substantial layer of re-deposited natural clay and coal deposits (136) that measured 0.7m thick and would have become saturated and been reduced to an unstable swamp if below water. Layer 136 overlay firm mottled orange natural clay (147) containing rounded pebbles.

The southern part of Trench 1 revealed the foundations, external cobbled area and internal features of a range of works dating from the mid to late 19th century that fronted Harmer Lane (Fig. 16). A 7.5m by 5.8m part of the works was exposed comprising external brick walls 103 and 104, and wall 102 which also formed the main boundary wall to the saw mill to the north. Wall 102 extended across the width of the trench for c.9m. These features appear to represent the remains of a workshop that may have been used to manufacture files and rasps, as several examples were found within the overlaying demolition rubble (100). Access to this part of the workshop was gained through a door to the south indicated by door-step, 113. The interior of the building contained a raised concrete floor (106) with a central sunken area defined by large squared sandstone slabs (185). The sunken area was c.0.27m deep and contained a large concrete machine base (108) with five metal location bolts. The area of concrete floor to the north of the machine had been disturbed and dragged down by a double concrete pile. This disturbance also affected a large squared sandstone block (112) that was found at an angle, and probably formed part of another machine base. An area of modern cement and bricks (110) to the south of the machine base formed part of the workshops demolition and could not be removed by machine and had to be left in-situ. A stone foundation (187), probably relating to the machine base, was identified in another slightly sunken area to the west of the machine base continuing into the trench edge.

Other internal features within the workshop include a short length of internal brick wall (186), a brick setting consisting of two low walls (183) and a wooden beam (182) that was recessed into the concrete floor on the internal side of wall 103 to the east of machine base 108. An iron location bracket for a beam was bolted to the top of the wooden beam 182. This may be associated with activities relating to the machine base, as may iron location points in the upper surface of floor 106. A patch of orange sand, noted on the surface of concrete floor

106, may have been used for moulding iron or steel, however no direct evidence was identified to support this supposition.

It is most likely that the machine base 108 supported a stamping out machine or drop hammer and the iron or steel making process was carried out elsewhere in the works. A small sunken area (107) 0.18m deep was exposed in the north-east corner of the workshop and the rubble backfill (100) contained several rasps. The function of this area was unclear and it had been modified recently evidenced by the concrete slab base. The internal features of the workshop continued into the western baulk.

An external cobbled area (101) was recorded to the south and east of the workshop. This comprised large squared sandstone cobbles set in tight rows that abutted the external walls of the building. A small (sandstone) grinding wheel was set into the cobbles in the south-east corner of the trench. Two sandstone bollards (181) up to 0.34m high were set into the cobbles on the south-east corner of the building to protect it from vehicle damage. A small rectangular brick setting (180) that measured 0.11m high abutted the external eastern face of wall 103, and may have represented a base for a keeping shelf. A small section of walling (188) observed in the western corner of the trench may represent a further structure associated with these workshops.

Trench 2

Trench 2 measured 16m by 9m with an average maximum machine excavated depth of 2.6m (Fig.17). The trench was split in to two areas: the upper area which contained the remains of early 19th century domestic tenements, and the lower area which contained an earlier phase of 18th century structures. The features exposed in the trench are discussed below in date order.

18th century features

The earliest deposits were exposed in a machine-excavated sondage to the east of the tenements. They comprised three layers of silty clay material (211, 212 and 260) that overlay the natural clay. These layers may represent a bank, measuring up to 0.7m high, which sloped down to the north and south. This interpretation is tentative as this was only viewed in section. These layers were cut by the construction cuts for the buildings described below and were sealed by buried topsoil (213), which was overlain by made ground layers (214-216) and a levelling layer 146.

The Building

The earliest structure consisted of a vertically sided linear wall cut (190) 0.88m deep that contained the remains of a west-north-west to east-south-east orientated stone constructed wall (191). The wall cut truncated layer (212) that may have formed part of a bank with layer 211. Wall 191 was constructed from large roughly hewn and irregularly shaped sandstone blocks with a flat edge used to form the face of the wall. No bonding material was apparent and only the lower course of stones survived to a maximum height of 0.25m. The wall had

been heavily robbed of material prior to burial and continued into the east and west baulks. A total length of 1.38m was exposed and a single stone set at a right-angle to the main east-west length of wall indicates a possible corner to the building. The stones were set directly onto the flat base of the wall cut. A layer of dark black, coarse, gritty ash and clinker (192) appears to represent a levelling layer for a floor, although no floor or deposits associated with the use of the building were identified. Mid to late 18th century pottery was recovered from deposit 192.

The Cobbled Surface

The linear edge of a cobbled surface (262) set perpendicular to wall 191, was exposed to the south-east of the trench. The cobbles were set within a shallow, flat-based, cut (261) that measured 0.33m in depth and cut through deposit 260 that forms part of an earlier bank.

The cobbled surface may have formed an external area to the building represented by wall 191. The cobbles consisted mostly of tightly set rounded river pebbles between 100-200mm in length with occasional bricks to form a surface up to 0.2m thick. Bricks were also used to form the edge and the structure was bonded with a dark grey, clinker-rich, mortar. The cobbles had been robbed on the east side.

A greyish black silty sand with frequent clinker and coal fragments (263) 0.14m thick and a layer of compact reddish brown clay (264) 70mm thick abutted the cobbles to the east. Pottery dating to the 18th century was recovered from layer 263. Above layer 264 was a clinker and ash rich deposit of compact greyish black silty sand 0.13m thick (271). This was sealed by a layer of compact clinker rich blackish grey silty sand 0.1m thick (265) that yielded mid to late 18th century pottery. Cut (261) was filled to the east with firm mixed clay containing frequent brick fragments and mortar flecks (266).

Abandonment of early structures

The abandonment of these structures saw the introduction of a series of backfill and made ground layers. Wall 191 was robbed of stone material resulting in a variable demolition layer of mostly small to medium angular sandstone fragments (193) up to 0.65m thick with some brick and tile inclusions. The wall cut was then backfilled with a mixed mid brown clayey silt (194) that was up to 0.7m thick and extended beyond the box section. Both deposits yielded pottery dating from the mid to late 18th century. An upper layer of dark brown sandy clay (209) 0.4m thick and a layer of demolition rubble (210) 0.3m thick were used to fill in the upper part of the wall cut. It appears that the area was then re-landscaped with a layer of imported topsoil-like material (213) up to 0.45m thick that sealed the area. The stratigraphic sequence suggests that the cobble surface and building were abandoned at the same time. There may have then been a period of stabilisation of the area after the introduction of layer 213 prior to further re-landscaping with the addition of a thin 0.2m thick layer of demolition material consisting of brick fragments within a dark grey gritty matrix (214), and thin layers of loose black sandy silt with frequent clinker and ash (269) and dark brownish red clay (270). These were then overlain by a more consolidated layer mid yellowish brown silty clay

0.35m thick (215) with irregular boundaries, and a more consistent layer of dark grey/black course gritty sand with moderate sandstone fragments, coal and clinker 0.4m thick (216) which was used to raise the ground level of the area most likely in preparation for the construction of the tenements.

19th Century Features

The upper part of the trench was overlain by a layer, 0.9m in depth, of modern overburden comprising hardcore and concrete (276, 277) and demolition debris (278) from the recently demolished bus station. Below this were two levelling layers of demolition rubble (205/273 and 274) that totalled 0.7m in depth. Layer 205 yielded an assemblage of 18th and 19th century pottery. They sealed the remains of a series of early 19th century tenements associated with a sandy compacted bedding layer (146/148) and a single line of squared cobbles (147) that appeared to form the central line of a gutter that drained to the south. Layer 148 contained pottery dating from the mid 19th century.

The remains of three early to mid 19th century tenements were identified at the western side of the trench (Fig. 17). Structures 1 and 2 were more extensive than Structure 3, to the north, which was disturbed by a modern drain. The ground floor rooms of the dwellings were between 3.6m and 3.9m along the north-south axis and were up to 1.8m in width but continued into the west trench baulk. The eastern outer walls of the structures (150, 152 and 154) were constructed from handmade bricks and bonded with a lime based mortar set onto a stone slab base. They were 0.23m wide, the lower course of bricks was laid header and on the side, and they were a maximum of 0.25m high, including the stone foundation. The dividing walls between the rooms differed. The northern section of wall 150 comprised a single course of bricks thick laid stretcher, whereas the northern wall of Structure 2 (152) was again a single course thick but with the bricks laid header, resulting in a wider more substantial wall. This may indicate a different use for the rooms with perhaps the wall 150 representing an internal dividing wall within a property, and 152 representing a dividing wall between properties. The limited extent of the excavations hindered interpretation in this area. Hand excavated box sections in the north-east corners of Structures 1 and 2 revealed short extensions to the stone foundations of the dividing walls to the south which may have supported an internal structure such as a stairwell. No evidence of cellarage was located.

The internal box sections within the tenements revealed several layers of internal make up and pre-construction levelling layers. Both areas were capped by a thin levelling layer of silty clay between 50mm and 100mm in depth (149, 151). Pottery dating from the 19th century with earlier wares was recovered from both these deposits.

The section within Structure 2 revealed that deposit 151 sealed thin levelling layers of brownish yellow clay silt (179) 70mm thick, a firm black silty sand layer (178) 45mm thick and an orange brown silty sand (177) 45mm thick. These were above two compacted foundation levelling layers; a lightly compacted dark brownish black silty sand layer (176) 100mm thick, which overlay a firm brownish red clay silt layer (175) 100mm thick. These

deposits are likely to have formed a compacted surface for an earlier yard. Below these were a series of made ground layers that were brought into raise the ground level of the area prior to the construction of the dwellings. They comprised a re-deposited clay layer (172) 0.16m thick, above a dark grey-black clay silt layer (171) 0.12m thick and a lower layer of mixed greyish brown clay silt (170) excavated to 0.28m deep. Layer 172 had a small possible post-hole (173, 174) 0.13m wide cut into it; however, this most likely was formed from disturbance relating to the construction of the building foundations. Layers 170, 171, 172, 175 and 177 contained pottery dating from the early to mid 19th century. A virtually identical sequence of layers was excavated in the box section of Structure 1 to the south including similar compacted layers and made ground levelling below (149, 161-5). Layers 161, 163 and 164 yielded late 18th to early 19th century pottery. The lower made ground layers within the box sections (161, 170) may equate to layer 213 although this relationship was not observed physically.

Trench 3

Trench 3 was excavated in two phases to a maximum depth of 3.19m. The first phase of excavation removed the modern overburden of concrete and hardcore to expose the remains of the Central Hammer works that appear to be depicted on the historical maps from the later 19th century. The main features of these works comprised; exterior cobbled yard surfaces, exterior walls to the works, a large internal drop hammer base and a furnace. The cobbled surface of River Lane was also exposed to the east. These structures were cut by a large modern drain that traversed the trench from the south-west to north-east.

The second phase of excavation was undertaken in the east of the trench and revealed deep layers of made ground below River Lane and around the hammer base. These deposits overlay a large cut feature containing dark silts that may represent a pond or slow flowing ditch. The features from Trench 3 will be discussed in date order below.

Early Features -17th to 18th Century

The earliest feature identified comprised the edge of a large cut feature (517) exposed during the Phase II excavations in the eastern end of the trench (Fig. 18). This feature cut a 0.26m deep layer of light grey clay (512) to the east that has been interpreted as possible bank material. If correct, this indicates the presence of an earlier bank, although as so little of this feature was exposed no further interpretation can be presented.

Feature 517 possessed a steep sided edge and measured 0.85m deep. It was orientated north-west to south-east and had a flat base. The cut was visible at 49.57m OD and the base was at 48.82m OD. Only the northern edge of this feature was exposed, although it appears to continue to the east, south and west beyond the trench baulks. A test pit to the south of the cut indicated a slight rise in the base to 48.95m OD and two small test pits to the west (adjacent to the later hammer base 340) indicated a continuation of the feature in this direction. Cut 517 was initially filled by a series of homogenous deposits, the lowest of which comprised a mid grey brown silty clay 0.27m thick containing black flecks and moderate sub-rounded

pebbles (516). This was below a 0.1m thick layer of black sandy clay (515), and a more substantial 0.27m thick layer of mid brownish grey silty clay (513). Both these deposits contained organic plant remains. The upper fills consisted of slumped light grey sandy clay material (511) that tipped in from the north-east side and an upper 0.45m thick layer of light brown grey silty clay (510). All the fills appeared to have been deposited within a still, or very slow flowing, watery environment.

The upper fills were then re-cut by a near vertically sided and flat-based feature (509) in a probable attempt to renew the water feature. This cut was only visible in section and was filled in the base by a black silt layer 60mm thick containing rich inclusions of organic plant material (508). Sealing this deposit was a thick layer of mid grey sandy clay (507) that contained a small assemblage of early 18th century pottery including some 17th century wares. An asymmetrical concave feature (506), that may represent a possible ditch or pit, cut through deposit 507. This feature (506) contained a single fill of mid-grey brown sandy clay (505). These features were then sealed by a series of interleaving layers of mid yellow, brown and reddish layers of sandy clay and some gritty material (499-504), which was overlain by a levelling layer of black coal waste, 0.46m thick, which signifies the final disuse of the water feature. Layers 503 and 504 contained 18th century pottery.

Similar layers were identified to the west within the test pits and in section adjacent to the later machine base. The stony natural (522), overlain by layers of black and grey sandy silts (521, 520, 519, fills of ditch 517), were sealed by a soft layer of clean, mid brownish orange, silty sand (460). This layer also continued to the east. Layer 460 was overlain by a series of gritty or stony deposits (463, 484) and shallow concave cuts (458/485, 486/462, 461). These deposits were overlain by a mid-orangey brown, sandy silt, layer (459). A series of possible gullies (464) were observed to cut through deposit 459. These gullies were filled with soft grey brown silt (465). These stony layers, cuts and gullies may represent a continued effort to drain the area. Layer 459 yielded pottery dating to the late 18th to early 19th centuries, and fill 485 contained earlier wares dating to the 17th to early 18th century.

Re-landscaping of the area (mid 19th Century)

After the final infilling and levelling of the water feature the area around Trench 3 was made up considerably. This was achieved by the addition of several layers of made ground that effectively raised the ground level by 1.77m to the surface of the new road, River Lane (formerly River Street).

Several made ground layers (404-5, 408-19) of various mixed deposits were used to increase the ground level. These included a yellow/orange clay levelling layer (419=466=467) and a black layer of coal waste material (418=468=498) which were observed across the phase II excavations. The made ground layers were cut by a deep, vertically sided, pipe-trench (403) that was backfilled with nine infill layers (393-400). This feature pre-dates the construction of the road surface of River Lane in the mid 19th century. River Lane was observed to comprise small granite sets (292) above a gritty bedding layer 0.22m thick (392).

Later 19th and 20th Century Features

Central Hammer Works

The central and western part of Trench 3 contained the remains of the Central Hammer Works. These consisted of external wall foundations (337), internal walls (360, 470), brick settings (338, 339), a large concrete hammer base (340), external cobbled yards area (365), and a furnace in the north-west corner (471 – 474) (Fig. 18).

The external wall of the works consisted of a large foundation (337) that measured over 2m in depth, 0.75m wide and were set onto a large concrete plinth foundation. This wall foundation contained numerous large sandstone grinding wheels that supported the machine-made brick body of the wall. It was capped with concrete. Two adjacent brick settings (338, 339) were also set onto the same concrete foundation.

To the west, a further brick wall (360) on a similar alignment to wall 337 was noted. It measured 0.56m wide and whilst believed to be the base of a major load-bearing wall, it is likely to have been internal to the works. To the south-east, a further two brick walls (432, 433) were exposed. They measured 0.23m in width and may have formed the external walls to an additional building to the south. A cobbled surface (365), consisting of large squared sandstone sets that contained around ten grinding wheels, was exposed in the central western area.

The Hammer Base

Central to the area previously investigated by the evaluation trench a massive reinforced concrete cube (340) was identified which, measured 4m by 3m in plan and 1.84m deep. It was constructed within a square wall 'mould' (359) and interpreted as a hammer base. The machine base had been modified, probably during the 20th century, with the removal of parts of wall 359 and the addition of concrete. The hammer would have been located onto the top of the concrete base and held in place by four 30mm diameter steel rods that were bedded in and remained *in situ*. Due to the size of the base it is likely that it supported a large drop hammer. A setting of steel girders (362) observed to the south was probably related to this hammer base.

The Furnace

Part of a brick constructed furnace was excavated in the north-west corner of the excavation. It comprised two linear raised beds (473), orientated east/west, set either side of an access channel (471). The structure survived to a maximum depth of 1.58m, with a total length of 3.6m and width of 2.6m being excavated. The furnace continued into the trench edge to the north and west. A fire-box and stoke-hole, with thick steel plates as a lintel (482, 472), were present at the east end of the southern bed. This arrangement was mirrored to the north. It is possible that two additional fire-boxes also provided heat from the west.

The furnace operated by drawing heat from the fire-box around and up the stepped flue that showed evidence of re-building (474). The heat then travelled across the raised bed, above

which it appeared to have been drawn up a chimney as indicated by the heat affected fire-bricks on the southern wall. The majority of the furnace was constructed from fire-bricks (southern wall and raised bed) and the front of the raised beds were constructed from large, specially shaped, angular bricks. The floor of the central access channel (471) was constructed from stone slabs and the brickwork around the stoke-hole was of standard machine-made bricks. The southern raised bed contained a layer of fine light grey sand (325), up to 0.28m thick, which comprised thin lenses suggesting it may have been laid in distinct layers. A thin layer of mid-pinkish grey sand (326) up to 0.11m thick covered the floor in the access channel (471), the pink colouration suggesting some mixing with ash. Coal ash material was present around the stoke-hole and fire-box. On abandonment, the furnace was filled with brick rubble (311) that contained a number of specialised, curved, fire-bricks.

The function of the furnace remains unclear (Dinah Saich and Derek Bayliss pers comm.). It is possible that the sand beds were used to hold steel items for which the control of heat was important, perhaps slowing cooling as in the annealing process, but this is a tentative hypothesis. The sand within the raised bed was pure grey; however, the sand in the access channel was pinkish suggesting some mixing with ash. This may suggest that the access channel was used to load the beds with steel items and heat was not drawn through this area. Wear grooves on the brickwork in the north-east corner of the bed indicate that the channel was regularly cleared out from the direction of the stoke-hole.

Trench 4

Trench 4 was excavated to an average depth of 1m to 1.2m where the tops of structural features were exposed below modern hardcore and concrete (424, 425) (Fig. 20). Several machine-excavated sections, between 2.10m and 2.5m deep, were used to investigate the surrounding made ground deposits. A small right-angle section of probable early 19th walling and an earlier culvert were identified within the central sondage and appear to relate to features depicted on the 1st edition Ordnance Survey map. These features were truncated by mid to late 19th century walls, including a cellar, which formed the later more extensive cutlery works. These buildings appear to have totally replaced the earlier range of structures. The course of a goit was also identified, which had been back-filled with hardcore during the construction of the former bus station. Natural alluvium was located in the east part of the trench. The features are discussed in more detail below.

Early 19th century works

Within the central area and in a hand-excavated box section the remains of structures and associated deposits were identified. Above re-deposited clay (495), the scant remains of a possible earlier stone foundation (494) were identified. Overlying this foundation was a layer of dark, yellowish-brown clay (493), 0.3m thick. Layer 493 yielded a 17th to 18th century brown glazed coarseware base in two fragments that hints at an early date for foundation 494. Cutting through deposit 493 was a stone constructed culvert (477), which was exposed for a length of 1.18m and was aligned north-east to south-west. Although excavation of these

features was limited, it is unlikely that they continue beyond the machine sondage as the mid-19th century wall foundations had heavily disturbed the area.

The excavations undertaken in this area indicate that culvert 477 had been cut by the extension a substantial brick wall (440). Wall 440 was orientated north to south and measured 5.1m in length by 1.8m in height and 0.53m in width. It was constructed from handmade bricks in stretcher coursing and bonded with a mid-grey, lime-based, mortar. This wall appeared to have been extended to the north, which probably signifies the enlargement of the building. Wall 496 was tied into the western side of wall 440, although it had been robbed to a much lower level and had collapsed to the south.

Layer 493 was overlain by a series of make up layers (490, 478 and 442) that contained large quantities of mid to late 19th century domestic waste, consisting mostly of pottery. This relates to the abandonment of the earlier range of buildings and the construction of the later works dating to this period.

Mid-late 19th century cutlery works (Fig. 13)

The later structures are characterised by large linear wall foundations constructed from machine-made bricks bonded with a dark black ash-based mortar. These walls traversed the trench on a north to south alignment. The northern part of the walls was not exposed as they were cut by modern pipe trench 346. The walls are believed to form part of the mid to late 19th century cutlery works depicted on the later 19th century maps and which dominated the site by this time and removed the majority of earlier buildings. The main part of the works consisted of two wings orientated north to south with the goit to the east. Wing 1, situated to the west measured 2m wide internally and was defined by walls 343 and 483. Wing 2 measured 1.8m wide and was defined by walls 437 and 453. These walls were between 0.45m and 0.6m wide, and between 1.41m and 1.86m deep. The brickwork had been constructed above a concrete foundation. The area between the wall foundations was made up with various layers of material. Wall 437, appears to form the western side of the goit and the eastern edge of Wing. 2. It appears from the excavated section that wall 437 predates wall 453. This indicates an earlier phase to the goit and that the goit has been partially backfilled and re-built during the construction of the cutlery works.

The construction cut (445) for wall 453 had been cut through various layers of made ground (451, 450, 448, 447 and 446). Cut 454 may either represent a continuation of the foundation cut into the natural alluvium (455) or more localised disturbance such as a possible pit. It is possible that layer 451 may have slumped into the foundation cut during construction, or that the wall was built in stages, with the lower foundation backfilled before the upper brickwork was completed. A roughly laid brick surface (443) that survived in the north part of Wing 2 probably does not represent an original floor. Wing 1 was backfilled with similar made ground deposits, which were capped by a floor layer of concrete.

To the north-western edge of the trench a large cellar and probable external yard area was identified. The rectangular cellar was defined by Wall 345 that was up to 0.65m wide forming an internal space of >4.4m by 2.75m wide and 1.9m deep. It contained a concrete floor that was divided in the centre by a narrow wall suggesting it may have been used for storage. A green fibrous substance, that may have contained copper, was left in-situ in the north-west corner of the cellar. The cellar had been backfilled with modern hardcore and was cut by a modern pipe trench.

In the south-western corner a substantial wall (348) and a series of perpendicular low-set external boundary walls (429, 430, 350 and 351) were identified (Fig. 20). All these were on a slightly different alignment to Wings 1 and 2. The boundary walls were between one and three courses high, and set on sandy silt levelling layers (353, 354, 357 and 385). Two sandstone flags (347) were located in the north of the area that abutted wall 345 and may have formed a floor. A machine-excavated sondage demonstrated that levelling layer 385 was more than 1m in depth; natural ground was not reached.

The Goit

The former goit that extended from the Bamford Dam in the south to Forge Dam to the north of Pond Hill traversed the eastern end of the trench. It was 2.6m wide and was machine-excavated out to a depth of 3.75m below the current ground level. This revealed that it had been filled with hardcore during construction of the former bus station. This test excavation was backfilled for health and safety reasons. No silts survived in the goit base. As discussed above, it appears the goit was raised in level when the mid-19th century works were built as evidenced by deposits 446-448. The goit depicted on the 1st edition Ordnance Survey map appears wider than on the later 19th century and early 20th century editions. The cartographic and stratigraphic sequence therefore indicates that the goit was narrowed and formalised within walls 437 and 381 in the mid 19th century. The side-walls of the goit were constructed onto large foundations of concrete and stone with the remains of wooden boarding or shuttering evident on the inner face. It appears that the goit was re-channelled, and possibly re-levelled, when the cutlery works and the Sheaf Island Works were constructed.

Sheaf Island Works

Part of the Sheaf Island Works was excavated to the east of the goit. Few substantial remains survived and it is likely that this wing of the complex was demolished some time ago, perhaps in the early 20th century. The area was also disturbed by a modern drain and mechanical excavator activity backfilled with hardcore (346). Part of a concrete surface or floor was also noted towards the eastern trench edge.

Wall 381 probably formed the external wall of the works as well as the goit wall and was constructed from machine-made bricks bonded with black ash mortar. This wall was constructed onto a possible earlier stone constructed foundation (382) consisting of large sandstone slabs bonded with orange and yellow clay, 0.38m deep, which may represent the foundation of an earlier building. Some other structural remains included a brick setting or

possible surface (428), a small section of a one course high brick wall with a rubble foundation (373, cut 374), and a slightly more substantial two course high brick wall on stone slab foundations (368, cut 370). Both walls were made from handmade bricks bonded with a lime-based mortar. They may represent former internal features within the works.

The stratigraphic sequence indicates that wall construction cut 374 post-dates wall cut 370. However, the walls may well have been in use at the same time. These walls cut a series of make-up layers comprising gritty and sandy silt material (370, 367, 371 and 375). Below these were further layers of make-up material (376-379) that became increasingly clayey with depth and sealed the mid-brownish grey silt natural (426). This totalled 2.25m of made ground above alluvial deposits.

Trench 5

Trench 5 was orientated north to south and was 24.10m in length, 9.45m in width and up to 2m deep. Excavations revealed the substantial remains of the former cutlery works, external yard areas and a modern well. Contamination from hydrocarbons limited excavation in the central part of the trench. The structures were below modern layers of concrete and hardcore (195, 196) and demolition rubble (197) which were removed by machine.

Joseph Rogers Works

The main feature in this trench comprised the rectangular wing of the former cutlery works. This consisted of two external brick walls (227 and 238) that had the west end modified and a concrete wall added (228) (Fig. 21). The internal space of the wing measured 4.55m^2 and up to 1.1m in depth. The feature continued into the east trench edge. The floor consisted of large flat concrete slabs (230) with two large and two small recesses (231 and 232) and an iron right-angle bar bolted down suggesting it formed a machine base. Excavation around the recesses and in the south part of the room was limited due to the presence of contaminated backfill and asbestos. The machine base continued beyond the concrete wall to the west (226) with a step (225) adjacent to the trench edge. The building wing was recently modified and the machine base was abandoned when the concrete wall (228) was added and the main part of the room above the machine base was backfilled with loose material (255) and capped by a modern concrete floor.

Earlier structures were identified between the modern modifications including a lower area of flooring consisting of sandstone flagging (234). This flagging was abutted by brick walls (235) that had been reduced in height to the lower course of brick. These walls may represent small external storage bays. A large square sandstone block (236), situated to the south-east of wall 235, may have derived from a machine base.

The remainder of the southern part of the trench contained a wide range of structures, apparently exterior to the main wing of the building. These included an area of later 19th century cobble yard surface (222) with a line of stone slabs to the east (224), and brick boundary walls (220 and 237). A cast iron gas pipe (233) entered the trench from the south

and stopped at a square fitting adjacent to wall 227. Large concrete blocks (202 and 203) in the south-east corner may have been used to mount machinery. A square, brick constructed, feature (246) that measured 1.16m wide, abutted the northern side of wall 238. It contained loose modern brick demolition rubble (247) and was excavated internally to a depth of 1.8m. The function of this structure is unclear.

In the south-eastern edge of the trench a circular well (159) was identified. It had been backfilled with loose concrete and brick demolition material (160). The well shaft was 1.06m in diameter internally with vertical sides that tapered in slightly at the top. Special curved 'type 24' bricks had been used and were bonded tightly. The shaft was only excavated to a depth of 1m due to the loose nature of the backfill and danger of subsidence. Two large iron plates set vertically at 0.38m apart in the east wall of the shaft appeared to form part of a water extraction mechanism. A linear brick wall overlain by stone slabs (204) linked the well to a circular brick structure 0.66m in diameter (199) that may also have formed part of the water system. The high quality of construction of the water system suggests an early 20th century date.

Excavation to the north of the building wing was limited due to hydrocarbon contamination of the clay made-ground deposits (258) that underlay a modern brick yard-surface (244). The yard-surface was fragmentary and had been disturbed by a modern drain trench and had been removed from the western part of the trench. Two grinding stones (243 and 244) had been set into this surface. A linear brick boundary wall (248) that measured 0.55m in height abutted a slightly raised cobbled area (249) to the north. These external yard areas may have housed fuel tanks.

Trench 6

Trench 6 measured 23.75m in length and 8.85m in width and was excavated to an average depth of 2m below ground level (Fig. 22). Three smaller areas were reduced to approximately 3.2m below ground level through made ground layers. The remains of two buildings were located; the west edge of the Sheaf Island Grinding Wheel works was exposed in the north-east part of the trench and the recently modified foundations of the range of buildings that may have formed part of the grinding wheel or Sheaf Island Cutlery works was exposed in the south-west corner of the trench. A series of large iron town gas pipes that traversed the trench north to south between the buildings at a depth of 49.76m OD hindered excavation in this area. The grinding works were sealed by modern tarmac and demolition rubble.

Early make up layers

The earliest deposits in Trench 6 comprised possible buried topsoil (280/294) that predated the Sheaf Island Grinding Wheel works. This was exposed in two sections that were machine excavated to the south of the building wing through the later yard layers. These machine sections revealed natural alluvium (274/293) at between 49.47m and 49.54m OD. This natural comprised a very clean soft mid brown silt overlain by the buried topsoil (280/294), a mid grey brown layer of soft sandy silt 0.24m thick (280/294). This was sealed by a make up

layer comprising small fragments of brick rubble (281/295) which was sealed by an extensive firm layer of light orange-yellow clay (282/296). Deposit 282/296 measured up to 0.41m deep and continued below the wing of the grinding works. The clay layer probably derives from an attempt to provide a firm base for building in the area.

Sheaf Island Grinding Wheel works

The remains of the Sheaf Island Grinding Wheel works were identified in the north-eastern end of the trench. It comprised a western wall (302 and 319) exposed for a total length of 5.3m. A small rectangular wing represented by walls 303, 320, 330 and 361 was identified to the west.

A concrete floor (322) was identified to the east of wall 302/319 at c.50.50m OD and appears to represent an internal floor to the building. The excavations indicate that the works in this area have been modified several times. Wall 319 was constructed from handmade bricks bonded with a grey lime based mortar suggesting an earlier 19th century date. The walls to the south (302 and 303) were constructed from frogged machine-made bricks bonded with a dark grey hard mortar. This suggests later 19th century modification of the building to the south, which may correspond to the demolition of the southern part of the range for the construction of Sheaf Street. Wall 361 to the north was also constructed of the same bricks suggesting a later 19th century date.

The rectangular wing to the west of wall 302/319 had an internal space of 3.4m by 1.2m. The walls were much narrower, generally a single brick width, and were set onto stone foundations, which included some grinding wheels (320 and 334). The foundation stones (334) measured 0.28m in depth and were interspersed with an orangey brown sandy clay bonding material (391). These overlay two gritty clay levelling layers (327 and 328) and a lower silty clay levelling layer (329) totalling 0.42m in depth. These were above a series of irregular layers of grey, orange and brown silty clay make up layers (330, 331 and 332) that totalled a maximum of 0.7m in depth and overlay a distinctive layer of firm blue orange re-deposited clay (296). This layer was also encountered to the south (see below). Four small wings are shown on the 1850 map (Fig. 9) on the west side of the building and it is possible the features exposed represent the bases of steps. A possible cellar was located to the north of wall 323 as a partially brick filled void.

Southern Building Range

The range of buildings exposed in the south-west corner of the trench had been greatly modified in the 20th century and consisted of concrete foundations (310) and external brick walls capped with concrete (306). The internal area to the west consisted of a level cracked concrete floor (304) at 51.16m OD. A modern tarmac surface (291) exposed throughout the trench (in the lower step) abutted the southern building at the level of floor 304. A 10m by 3.8m area of the building was exposed and left in-situ. The only hint at an earlier phase of building comprised a setting of handmade bricks bonded with a lime based mortar (308) to the east of 310, but this had been disturbed.

External Yard and Modern Layers

The central area of the trench between the northern and southern building ranges consisted of a series of external yard surfaces. Two machine sondages were used to investigate the make-up layers in this area and the layers exposed above the natural alluvium have been described above. Clay foundation layer (282/296) was overlain by a series of compacted silty sand surfaces (283-285) that represent a succession of yard levels totalling 0.65m thick. A line of grinding stones (318) was set within surface layer 285 and a line of rectangular cobbles (316) formed the edging stones for the yard layers in the west. A modern drain trench (286/287) was cut from the level of layer 285, and several concrete clad drainpipes were present to the west (317). Above drain 286 was a thin layer of coal rich material (288) and two make up layers (289 and 290) below modern tarmac (291). The tarmac sealed the entire central and north areas of the trench overlaying the grinding works, and abutting the upper concrete edge southern building. Above the tarmac was a large 1.28m thick layer of loose brick and concrete rubble (315) derived from late 20th century demolition in the area. This layer was overlain by two, gravel rich, layers (313 and 314).

3 Excavation Aims and Objectives

In the area of the proposed development it was deemed, because of the evidence obtained during the archaeological evaluation, which any below ground works would impact on any surviving archaeological structures/deposits within and below the current ground cover. It was therefore recommended by SYAS that an archaeological excavation and strip and record exercise should take place in order to preserve by record the archaeological deposits.

The general aims and objectives of the archaeological excavation in Area A were:

- To gather sufficient information to establish the continuation/presence/absence of archaeological remains identified in the evaluation by trial trenching;
- To determine the extent, condition, character, quality of survival, importance and date of any archaeological remains present;
- To provide information that will enable an assessment of the potential and significance of the archaeology of the site to be made and the impact that the proposed development will have upon this, and;
- To provide information that will enable an informed decision to be taken regarding the future treatment of the remains and any mitigation measures appropriate either in advance of and/or during the construction programme.

The specific aims and objectives were:

Area A/D

- To excavate the area around Trenches 2 and 3 in two phases. Firstly hand excavate and record the area of early 19th century tenement dwellings and the possible annealing furnace in the north-west corner of Trench 3 (space permitting). Secondly, the whole area will be reduced to the lower level of the 18th century ground level in order to investigate the structures identified below the 19th century dwellings.

Area B

- To evaluate the area using a strip and record method. The area will assess the survival of the remains of the southern range of buildings of the mid to late 19th century Joseph Rodgers Cutlery Works. The aim is to provide a rapid assessment of the upper levels of archaeological remains in the area and take advice from SYAS should further excavation be required:

Area C

- To evaluate the area using a strip and record method. The area will investigate the potential survival of the remains of the crucible furnace depicted in the historical mapping, and assess the extent of the modern disturbance around the Don Valley Interceptor Sewer manhole shaft. The aim is to provide a rapid assessment of the upper levels of archaeological remains in the area and take advice from SYAS should further excavation be required.

Area E

- To evaluate the area using a strip and record method. The area will assess the survival of the 18th century features encountered around Trenches 2 and 3 to the immediate west. The aim is to provide a rapid assessment of the upper level of the archaeological remains in the area and take advice from SYAS should further investigation be required.

Area F

- To evaluate the area using a strip and record method. The area will assess the extent and survival of the grinding shop of the Sheaf Island grinding wheel. The aim is to provide a rapid assessment of the upper level of the archaeological remains in the area and take advice from SYAS should further investigation be required

4 Excavation Methodology

All archaeological investigations were undertaken in accordance with recognised professional standards (English Heritage 1991, 2002; Institute of Field Archaeologists 2002) and ASWYAS methodologies (ASWYAS 2005).

Modern overburden was stripped using a 360° excavator fitted with a ditching bucket. The spoil was stockpiled on site.

All the archaeological remains encountered were planned at a scale of 1:20. The initial pre-excavation plan was multi-context and for the most-part thereafter, the remains were planned single context. All sections and elevations were drawn at a scale of 1:10. An extensive photographic record was generated consisting of black and white prints, colour slides and digital photographs. Photogrammetry was also used in order to produce scaled elevations and plans of selected structural elements.

A concordance of contexts, finds and environmental samples is presented in Appendix 1 and an inventory of the primary archive is presented in Appendix 2. A copy of the project design is included in Appendix 3. ASWYAS currently hold the site archive, which will be deposited at Sheffield City Museum at a time agreed with SYAS.

5 Excavation Results

Area A/ D

The archaeological remains in this combined area have, where possible, been assigned to one of five phases based on stratigraphic relationships and artefactual evidence. A stretch of River Street/Lane was exposed running approximately north-north-east/south-south-west through Areas A, D and E. The road provided a convenient on-site division between Area A/D to the west and Area E to the east.

The mechanical stripping of Area A/D revealed the remains of the Central Hammer Works to the north and two terraces of north/south aligned tenement dwellings further to the south. The gap between the terraces provided an opportunity to machine down through the made ground deposits associated with the dwellings and investigate the earlier wall and surface identified in Evaluation Trench 3.

Phase 1

The Phase 1 archaeological remains were cut in to the underlying natural alluvial deposits laid down by the meandering and occasional flooding of the River Sheaf. These consisted of a collection of ditches, a gully, pits, postholes and stakeholes, a stone-built tank with associated culvert and a stone cobble surface (Fig. 23).

The linear features

The gully (2143) and four of the ditches (2202, 2210, 2178 and 2193) were all on a similar north-north-east/south-south-west alignment and relatively close to each other suggesting they were concerned with the maintenance of a drainage feature. The most substantial of these features was the ditch 2178. A 6.00m length was revealed, which was 0.88m wide and 0.60m deep. The excavation of a section through the feature revealed an upper re-cut (2193) (Fig. 24). The ten fills of 2178 produced three sherds 18th century pottery and three fragments of clay pipe dated to between 1660 and 1800. The four fills of the re-cut (2193) produced nine sherds of 18th century pottery including three sherds of TP Pearlware dating to between 1780 and 1840 and thirteen fragments of clay pipe dated to between 1660 and 1750.

Gully 2143 measured 2.70m in length, was 0.30m wide and 0.12m deep. Its single fill (2144) was a sandy silt that produced two sherds of 18th century pottery including a sherd of White Salt Glazed Stoneware which dates to c. 1720 to 1780. Gully 2143 was observed to cut ditch 2202 to the east.

A 4.00m length of ditch 2210 was identified. It was 0.97m wide, 0.19m deep and contained a single fill (2211). Fill 2211 was silty in nature indicating wet conditions during its formation. It produced 6 fragments of clay pipe dated to between 1690 and 1800.

Directly to the west of 2210 a 4.00m length of ditch 2202 (=2223) was revealed. Two hand excavated sections were dug through 2202, which identified a series of fine, silty, fills reminiscent of the local palaeochannel deposits. No finds originated from the ditch fills except at the point where 2202 was truncated by pit 2125. The pit fills produced a large assemblage of finds similar in composition to those found in the fills of 2202 which interfaced with the pit cut. It is therefore, thought likely that either the finds from ditch 2202 were intrusive from the pit or that the base of the cut was misidentified and its lower fill(s) attributed to the ditch. If this is the case, then ditch 2202 is more likely to be a palaeochannel as its fills suggest.

The fifth ditch of Phase 1 (2043) was identified whilst excavating the drainage system of the Phase 3 tenements (014). The ditch was truncated by these later features and produced 15 sherds of 18th century pottery.

Pits, postholes and stakeholes

Pit 2125 measured 0.90 by 0.94m and was 0.20m deep but, as noted above, it is possible that this is not the true depth of the feature. The large finds assemblage recovered from its two fills (2129 and 2131) consisted of 185 sherds of 18th century pottery, 159 clay pipe fragments dated to between 1680 and 1820, four fragments of CBM, a piece of ferrous material probably related to the electroplating process, a piece of glass waste, two pieces of fuel ash slag and animal bone. Pit 2125 was cut to the north-east by pit 2171.

Pit/posthole 2171 was oval in plan and measured 0.42 by 0.24 by 0.09m deep. Its single, orange, sandy silt fill produced no finds.

Posthole 2113 (0.87 by 0.84 by 0.36m) with postpipe 2115 (0.30 by 0.29 by 0.40m) were located on the western edge of ditch 2178 and observed in section to cut the upper fill (2192) of the ditch re-cut 2193. The backfill (2114) of posthole 2113 consisted of redeposited silty clay natural, which contained glass, CBM, four sherds of 18th century pottery and seven clay pipe fragments dated to between 1700 and 1800. The basal fill (2123) of postpipe 2115 contained a fragment of clay pipe dated to between 1700 and 1800, whilst the upper fill (2116) produced a piece of CBM and an 18th century sherd of pottery.

Elongated cut 2169 (1.24 by 0.32 by 0.10m) was interpreted on site as perhaps a furrow or plough scar. If this is the case, then it is possible that gully 2143, 1.50m to the west, is of a similar origin as it runs on a parallel course. The single fill (2170) of 2169 was a clayey silt that contained one piece of CBM, a sherd of 18th century pottery and a clay pipe fragment dated to between 1700 and 1800.

Pit/posthole 2147 (0.68 by 0.48 by 0.15m) was located roughly between ditch 2178 and palaeochannel/ditch 2202. Its single fill (2148) was a sandy clay that contained no finds.

Possibly associated with pit/posthole 2147 was a group of stakeholes (2154, 2156, 2158, 2160, 2162, 2164, 2166, 2168) and a posthole (2152) (group context 016). Of all these features only one stakehole (2162) produced any finds and these consisted of two sherds of 18th century pottery. The post and stakeholes may be evidence of a fence-line placed to emphasise the boundary delineated by the ditch 2178. Equally, it could have been a precursor to the ditch or even post dated it.

Four sub-circular postholes (2078, 2079, 2086 and 2102) in a roughly rectangular arrangement were identified approximately 5.00m to the south-south-west of the above features and just to the west of structure 009 (see below). All the features were cut into the underlying alluvium/clay natural. Posthole 2078 (0.45 by 0.39 by 0.13m deep) contained two fills, the upper of which (2076), produced one sherd of 18th century pottery and three fragments of clay pipe dated to between 1640 and 1800. The single fill of 2079 (2080) contained a piece of fuel ash slag, five 18th century sherds of pottery and five fragments of clay pipe dated to between 1650 and 1750. Posthole 2086 contained fill 2083, which contained 18th century pottery but also a clay pipe fragment from between 1800 and 1900. The final posthole in the arrangement (2102) contained a single fill (2103), which produced a clay pipe fragment dated to between 1700 and 1800 as well as two sherds of 18th century pottery.

Pits 2101 (4.4 by 2.7 by 0.12m deep) and 2105 (0.27 by 0.20 by 0.12m deep) also produced an 18th century pottery assemblage from their respective fills, 2104 and 1734.

Structure 009

Structure 009 (group context) was a rectangular stone-built tank-like feature aligned north-north-east/south-south-west with an associated culvert (010), constructed of stone and brick, entering it midway along its northern face (Plate 1, Fig. 23). Much of the stone presumably used in the construction of 009 had been robbed out but the patches of masonry that did survive consisted of well dressed sandstone blocks. Unfrosted bricks had also been used in its construction at the point where the culvert joined the tank. The external dimensions of the tank were 6.80 by 3.10m and it measured 5.70 by 1.50m internally. The whole structure sat within a construction cut (2097), which was cut into the underlying natural clay (1971).

Following the removal by hand of various dumped layers of re-deposited natural and rubble that post-dated the abandonment of Structure 009 (e.g. 2071, 2109 and 2201), a layer of waterlogged timbers was encountered (Plate 2). The timbers (2132) were predominantly planks roughly aligned north-west/south-east with a single north-east/south-west beam also noted. The timbers were only present at the northern end of structure 009 around and below the mouth of the culvert. The location of 2132 beneath the mouth of the culvert suggests it is not *in situ* as the presumed constantly wet conditions would have resulted in the timbers having to be regularly replaced due to wet rot. It is therefore, more likely that the timbers were originally located above the mouth of the culvert and so are possibly the remains of a suspended surface or elements of a roof that have collapsed in.

Further to the south, 2132 was replaced by a dark brown silty layer (2133) which contained flecks of decomposed wood. It is suggested that 2133 may represent a continuation of 2132 but in a much more degraded state. A few fragments of clay pipe stem and two bowl fragments with fluted decoration dated to between 1780 and 1900 were recovered from 2133.

Preserved beneath 2132 and 2133 was a layer of yellow-green sawdust (2175). The preservation by waterlogging of this and the other organic deposits suggests the culvert continued to flow into Structure 009 long after it was no longer in use.

The large pottery assemblage generated by the excavation of Structure 009 was recovered from the various backfill layers most likely deposited following the abandonment of the tank. The assemblage dates this occurrence to the early decades of the 19th century.

Structure 010

The culvert (010) was on a similar north-north-east/south-south-west alignment. It was constructed of two rows of poor quality hand-made bricks that may have been seconds or wasters. The bricks were un-bonded, laid in three courses and capped with roughly hewn sandstone slabs. The culvert sat within the construction cut 2070 which had then been backfilled with redeposited natural (2072) above the stone capping. Layer 2072 produced 53 fragments of clay pipe dating to between 1750 and 1900 and 72 sherds of later 18th century pottery. The culvert was still open with only a 50mm deep build-up of dark grey silty

sediment (2075) in the bottom which contained a single sherd of 18th to 19th century pottery. The levels taken on site indicate the culvert fell away from the tank suggesting, therefore, that water entered the tank at a level now truncated away.

Deposits 2072 and 2075 were likely associated with the construction and use of the culvert and tank and the pottery suggests a later 18th century date for the structures. This date, when contrasted with the likely early 19th century date for the abandonment of the structures, suggests they were only in use for a comparatively short time-span.

Surface 011

Surface 011 (group context) consisted of sandstone kerbstones with tightly packed cobblestones to the east. The very patchy remains of a brick constructed footpath ran parallel and tight up against the kerbstones to the west. Pottery recovered from the cobblestone bedding layer (2013=2028) predominantly dated to the later 18th century but two sherds of presumably intrusive later 19th century were also recovered. No physical relationship survived between 009 and 011 but both features shared a similar alignment; markedly, a few degrees different to the alignment of the later north to south tenement terraces immediately to the east and west. Furthermore, 011 was truncated by the eastern range of tenements, negating the possibility that 011 was a surviving section of Mate's Square as it and the terrace were contemporary features as indicated by the 1850 OS map (Fig. 9).

Phase 2 (Fig. 25)

River Street/Lane

A well preserved 21m section of River Street/Lane was revealed during the excavation (Plate 3). It consisted of well-dressed, pink, rectangular granite sets, with longer granite kerbstones surviving on the western side of the street. It had a fine cambered surface, and a wear hollow on its eastern edge indicated an old goods entrance into the Sheaf Island works, marked on the 1935 OS map.

The tenement buildings

Two north/south aligned tenement ranges were identified in Area A/D. The western range consisted of the remains of eight structures split by a gennel, six to the north (1-6), two to the south (7-8) (Plates 4 and 5). Cartographic evidence indicates that the southern two structures (7-8) belong to the same, and earlier, phase of development as the eastern range. The partially uncovered eastern range consisted of structures 10-15.

Context group 012

The eastern range of tenements and the two southernmost dwellings of the western range (context group 012) are first definitively identifiable on the Ordnance Survey map of 1850 (Fig. 9). These tenements, with another north/south aligned range which fell outside the

excavation area to the west, formed three sides of Mate's Square. The area that they occupied is shown to be built up on Tayler's map of 1832 but the detail is sufficiently poor to as to inhibit the identification of any elements of 012. The 1850-51 cartographic evidence suggests that, at the time, the tenements consisted of terraced housing with pavements to the east and west.

The western halves of the six southernmost tenements of the eastern range visible on the 1850 map and the majority of structures 7 and 8 fell within the excavation area (Fig. 25). The remains of structures 7 and 8 consisted of some sandstone and some brick wall footings, forming cellars to the west and yards or living space to the east. The cellar walls of structure 8 were constructed of sandstone up to 1.10m deep. Built on top of this were the first three courses of a now missing vaulted ceiling constructed of unfrosted bricks bonded with lime mortar. The first few courses of the sandstone upper walls were stratigraphically above the vaulting. The truncated remains of a coal chute were identified within the upper wall of the western side of the structure at approximately street level.

A brick-built structure was identified at the south-western corner of the cellar (Plate 6). It intersected the sandstone cellar footings but it was not clear if it was part of the original build or a later addition. It was interpreted on site as the retaining walls for an access staircase. The cellar floor consisted of sandstone flags of varying size. The cellar of structure 7 was only minimally investigated due to unstable walls and ground but appeared to be of similar construction.

The yards or living spaces to the east of the cellars were similar in plan but varied in their construction. The wall of the northernmost yard structure (7) was constructed of sandstone blocks whilst the yard of structure 8 was defined by brick-built walls. Rather than this distinction representing separate phases of build, the use of sandstone for the northern and eastern wall of structure 7 was more likely due to the fact that these elevations faced on to Mate's Square and so done for aesthetic reasons.

The dividing wall between structures 7 and 8 was constructed of a single skin of unfrosted bricks bonded with a light grey lime mortar. Two pairs of brick-built support plinths, perhaps for a sink or fireplace, were located either side of the mid-point of the wall between the yards of structures 7 and 8 (Plate 7). No occupation surfaces were identified within the yard/living space areas. Two sherds of a salt glazed sewer pipe date from 1850+ and a clay pipe bowl fragment dated to between 1800 and 1900 were recovered from the fill of the construction cut associated with the walls of the yards/living spaces.

The eastern walls of structures 7 and 8 ran parallel with a truncated section of stone kerbing. The kerbing defined a 0.80m wide strip of ground between itself and the structure walls, which was interpreted on site as a robbed out section of pavement. The cartographic evidence indicates that a road surface should have been present immediately to the east of the kerbing,

however, none was encountered. It is likely that the surface once consisted of stone sets and that these were reclaimed prior to the demolition and inundation of the site.

Similarly, stone kerbing ran parallel to the western walls of structures 7 and 8, again providing a pavement space. A tarmac surface lay immediately to the west of the kerbing which, when machined away, revealed very sparse stone sets confirming that the sets had indeed been reclaimed.

Structures 10 to 15 were represented by the remains of six cellars numbered north to south, 10 to 15. Cellars 12 and 13 were separated by a gennel which is visible on the 1850-51 Ordnance Survey map. The cellars were of a similar construction to cellar 8 in that they consisted of sandstone walls, the remains of brick vaulted ceilings and sandstone upper walls. Each cellar had a street level coal chute in its western wall (Plate 8) and cellar 13 still had a stone flag staircase against its northern wall (Plate 9). All the cellars had sandstone flag floors in varying degrees of repair. The dividing walls between the cellars had been demolished/ removed and only survived as a single course of bricks laid between the separate flag floors and scars on the east and west walls (Plate 10).

Cellar 13 was the only one which still had its means of access still intact. This consisted of a stone staircase built up against the external northern wall adjacent to the gennel. It was noted however, that the steps and their foundations were butted up against the wall suggesting that they might not have been part of the original build. It is unlikely that the other cellars of 012 had similar stone-built access stairs as they have had to have been constructed up against the single brick skin dividing walls, putting more pressure on an already flimsy structure. Access via timber staircases is postulated here but no archaeological evidence was apparent.

Two brick and stone flag constructed culverts were identified in the gennel between cellars 12 and 13. Culvert 1977 exited cellar 12 along its southern edge and joined up with culvert 1976 which exited cellar 13 on a north/south alignment before turning through 90° and leaving the site along its eastern limit. A north/south aligned drain was identified beneath the floor of cellar 11; the fill produced two sherds of 19th century pottery.

Phase 3

Context group 014

The western range of tenements (context group 014) consisted of structures 1 to 6 and is first apparent in the cartographic record on the Ordnance Survey map of 1889. They were built on a similar alignment to the structures in context group 012 and approximately 2.00m immediately to the north of structure 7, thus maintaining the gennel noted earlier (Fig. 25).

The footprint of the tenements matched those of structures 7 and 8 in that cellars were indentified to the west with yards or living spaces to the east. Likewise, the materials used in the construction of the dwelling were similar to those used in the previous phase. Sandstone blocks had been used for the construction of the cellar walls and unfrogged bricks had

formed vaulted ceilings. Sandstone blocks had again been used for the walls directly above the cellars and bricks were used for the yard/living space walls. The sand stone kerbs that were identified to the east and west of structures 7 and 8 continued, to the north of the gennel, on their alignment, thereby defining pavements to the east and west of structures 1 to 6.

The only notable difference between the structures of 012 and 014 were the cellar dividing walls. Where a single skin of bricks had been used for their construction in structures of context group 012, substantial sandstone walls up to 0.28m thick were employed between the cellars of 014.

Access to the cellars was probably initially gained via timber staircases. No direct evidence for such features was identified but sockets that could have held timbers were noted in the cellar walls and scars in the floors of cellars 2 and 6 suggest structures once stood there. These proposed timber stairs were replaced at some point during the use of the cellars with stone steps. As can be seen in Plate 11, the steps were cut into the wall necessitating the rebuilding of the wall above the steps.

When the cellars were removed by machine, sinuous stone capped, brick-lined culvert drains were found beneath them (e.g. 1913, 1947). A mixed assemblage of pottery was recovered from the backfills of these drainage features but the large component of tablewares such as White Ware and Blue Banded Ware indicate a mid to late 19th century date. An unusual feature of the drainage system was a section that fed in to, or was itself fed by, a circular brick-lined well or cistern (1745) on the western side of the cellars, near the western limit of excavation in Area A/D (Fig. 27). It might have been designed to help 'flush through' the drains under the cellar floors.

Phase 4

Abandonment and demolition of the tenements

At a time between 1923 and 1935, the two tenement ranges were demolished. Prior to their demolition the cellars of structures 1 to 6 and 10 to 15 were backfilled with regularly stacked bricks and occasionally flagstones (Fig. 25, Plate 12). It is likely this was done in order to eliminate the chances of creating soft spots as more material was brought in and dumped over the area to raise the local ground level.

Phase 5

The northern end of Area A/D fell within the area previously revealed by Evaluation Trench 3 and so, other than hand cleaning the remains of the Central Hammer Works and re-planning them, no further investigation or recording took place (Plate 13). The cartographic record indicates that the development of the northern end of Area A/D began some time prior to 1850-51 and redevelopment and alterations to structures are noted on subsequent maps through to the OS map of 1935. It is therefore likely that the remains encountered belong to the later phases of development and as the tenements to the south were demolished by this

time, the remains have been placed in a later phase than the dwellings. For a full description of the remains of the Central Hammer Works please see Trench 3 above.

Area B

Area B was excavated approximately central to the site. Its western extremity abutted Area A and its eastern end partially incorporated Evaluation Trench 5. Overburden in the area proved to be exceptionally deep necessitating the stepping of the trench edges, which reduced its original dimensions of 36m by 11m. Due to the great depth of Area B (up to 5m) and the friable nature of the overburden, no hand investigation of the encountered remains was attempted.

The top of a large wall, aligned east-west, was encountered approximately 2m below ground surface. Machine excavation was continued along the southern aspect of the wall until a solid surface was encountered a further 3m down. Large concrete plinths were observed sitting on the surface. These were interpreted from the trench edge as perhaps anchor bases for large machinery.

The southern aspect of the wall showed evidence, in the form of scars on the brick face, of vaulted roofs above the basement area (Plate 14). The wall was interpreted as the remains of the southernmost east/west aligned range of the Sheaf Island Cutlery Works which formed a boundary between these works and the Sheaf Saw Mills to the south. The vault roofed basements were thought to be associated with the latter works.

Area C

Area C was positioned in order to ascertain the survival and condition of the remains of the Sheaf Island Cutlery Works closer to the course of the River Sheaf (Fig. 2). At ground level Area C measured approximately 26m by 11m, however, due to the presence of up to 3.5m of overburden (1000), the trench had to be stepped several times to ensure safe working conditions. These safety measures meant that when the archaeological horizon was encountered, an area some 11.5m by 2.5m was available for investigation.

Area C revealed four walls (1203, 1204, 1206 and 1210) constructed of rough-hewn limestone blocks, bonded with lime mortar and a brick wall (1215) (Fig. 28). Wall 1203 was abutted by the north-south aligned wall 1204 at its eastern end forming a right-angle. The eastern end and southern aspect of 1203 was faced with unfrogged red bricks bonded with dark purple-grey mortar. The upper two courses of 1213, designated 1205, were mortared in at an angle suggesting they were the first elements of a brick-built vaulted ceiling.

Wall 1206 was likewise faced on its three exposed sides with purple-grey mortared, unfrogged brick skins (1214-16). The surviving upper courses of 1214 (=1208) were again set at an angle suggesting they formed the lower part of a vaulted ceiling.

Wall 1210 was aligned north/south and situated at the far eastern end of the trench. It was abutted by brick wall 1215 at its northern end forming a right angle.

Brick wall 1215 was constructed of unfrosted bricks bonded with purple-grey mortar. It was 1.00m wide with two courses of bricks either side of a lime mortar core. It is thought that the lime mortar masked a limestone core wall similar to 1203, 1204 and 1206. The upper courses of 1215 (1209) again appeared to be the lower elements of a brick vaulted ceiling.

The walls and proposed vaulted ceilings identified in Trench 3 have tentatively been interpreted as the remains of coal storage cellars that may have been located under a furnace associated with Sheaf Island Cutlery Works. Following the demolition of the cellars they were backfilled with rubble after which concrete was poured in, probably to consolidate the ground ahead of further development.

Area E

A large proportion of the archaeological material revealed in Area E consisted of modern brick walls and concrete floors (context group 001), which constituted the remains of the Sheaf Island Works basements (Fig. 23, Plates 15 and 16). The elements of 001, which constituted the Phase 8 remains, survived to depths of up to 3.00m below ground level, with the exception of one small area, removing any earlier remains. Excavation of the small untruncated area revealed the following phases of archaeological deposits.

Phase 1

At the base of the stratigraphic sequence was the natural alluvial deposit 1852. The earliest feature cut in to 1852 was the gully 1879 (Fig. 29; D). It was aligned north-north-east/south-south-west and only a short 2.10m section was visible as it was truncated to the south by Phase 2 gully 1851 and exited the excavation to the north. It was 1.30m in width, 0.50m deep and contained three fills. All the fills were clayey silt deposits indicating wet conditions when they were laid down. Seventeenth to 18th century pottery was recovered from the upper fill (1880) and decomposed timbers (1897) were recorded in the basal fill (1895). The timbers appeared to be the remains of planking which suggests 1852 might have been a timber lined culvert.

Phase 2

A 5.50m section of the north-west/south-east aligned gully 1851 was identified in the excavation area (Fig. 29). Its two fills (1850 and 1855) were composed of sandy silt suggesting they formed under wet conditions. The upper fill (1850), produced fragments of clay pipe dated to between 1700 and 1800 and eleven sherds of 17th to 18th century pottery. Given the nature of the fills and the feature's similar alignment with the Phase 3 drainage channel and the Phase 4 culvert, it has been interpreted as an earlier drainage feature. Gully 1851 was truncated along its southern edge by the Phase 3 drainage channel 1848.

A row of stakeholes (1841) was located along the NE edge of gully 1851 (Fig. 29; C). It is possible that they were part of revetments for 1851 but they may also have been part of a fence line emphasising a boundary delineated by the gully.

Phase 3

The drainage channel/ditch 1848 was on a similar alignment to the Phase 2 gully 1851 and of a similar length. Two sections were hand excavated through 1848 revealing a series of three very silty waterborne deposits in each section. The nature of these deposits indicates that they were laid down under wet conditions and supports the drainage channel interpretation. The lower fill (1849) produced fragments of clay pipe dated to between 1750 and 1850 and seven sherds of 18th century pottery.

A linear deposit of decomposed timbers and staining (1842) was identified in plan and section in the top of drainage channel 1848 (Fig. 29; E). Where preservation of 1842 was at its best, it appeared to be the remains of a wattle and stake fence line or revetment. The revetment interpretation is favoured as, where it was placed, it would have helped to consolidate the edge of the drainage channel combating the slumping in of bank material, thus aiding the flow of water. This interpretation was confirmed when the Phase 4 culvert 006 and the fills of 1848 were removed which revealed a lower section of wattle and stake revetments (1929) (Fig. 29; F) in a much better state of preservation (Plate 17). Drainage channel 1848 was severely truncated by the Phase 4 culvert 006.

The arrangement of stakes designated 1854 (Fig. 29; E) was located directly to the north-east of 1842 and probably represent another attempt to consolidate the side of the drainage channel. The stakes of 1854 were driven in to the fill of the Phase 2 gully 1851.

Phase 4

The culvert (006) was shown stratigraphically to be the most recent of the drainage features. It sat within a construction cut that truncated drainage channel/ditch 1848 and its fills (Fig. 29). It was constructed of two parallel sandstone walls 0.95m apart capped with a vaulted brick roof (Plate 18). The sandstone walls, where complete, stood to a height of 0.65m and were up to 0.48m thick. The sandstone blocks were roughly hewn and set within a light orange-grey silty clay; no mortar was evident. The vaulted brick roof was constructed of a single skin of unfrogged, coarse grained bricks, laid on their edges. The bricks were bonded with a creamy grey, lime based, mortar.

The fill of the culvert (1845) consisted of alternate layers of very dark grey fine silt and orange sand. Fill 1845 produced a mixed assemblage of pottery including sherds of transfer printed Whiteware dating to the mid to late 19th century alongside sherds of formal and vernacular tablewares dating to the 18th and 18th to early 19th century. Where the brick roof of the culvert was missing, the culvert fill was directly beneath the overlying made ground deposit 1863, indicating that the culvert was no longer in use when 1863 was deposited.

Phase 5

The Phase 5 archaeology was cut in to the made ground deposit 1863, which consisted of redeposited natural mixed with coal and crushed building rubble fragments (Fig. 29; B). The pottery from 1863 consisted of 18th century wares indicating that the material had been redeposited. The archaeological remains consisted of ditch (1811), a land drain (1807) and a wall (1782) with an associated construction cut (1781).

The wall 1782 was constructed of three to four courses of roughly hewn sandstone blocks overlaid by a single course of unfrosted bricks bonded with a pale grey lime mortar. A truncated section of 1782 some 7.00m in length was revealed aligned north-west-south-east similarly to the ditch and land drain. The substantial sandstone footing suggest the wall was load bearing rather than a simple division but there was no evidence to indicate whether it was an internal or external structure. Clay pipe fragments dating to 1750-1850 were recovered in association with 1782. The latest element of the highly mixed pottery assemblage dated to the late 19th to early 20th centuries. No other structures were identified that might have been contemporary with 1782.

A truncated 5.48m section of land drain 1807 was identified. It was 0.53m in width, 0.20m deep and contained four fills (1808, 1809, 1810 and 1818). The basal fill, 1808, was a fine silty deposit that most likely formed through the action of fine grained material percolating down through, and in-between, the tightly packed sandstone blocks that constituted fill 1818. Fill 1818 was interpreted as an intentionally placed deposit intended to aid sub-surface drainage. The upper fills, 1809 and 1810, were interpreted as evidence for episodes of intentional backfilling of the feature.

Ditch 1811 was 1.05m in width, 0.27m deep and a truncated section some 5.50m in length was exposed. Ditch 1811 was cut through the upper fill (1810) of land drain 1807 and the layer 1822 which in turn thinly overlaid the wall footing 1782. The ditch was filled by a single deposit (1812) which was of a silty nature suggesting it formed over a period of time under wet conditions. Clay pipe fragments dated between 1780 and 188 were recovered from 1812. The Phase 5 horizon was overlaid by the made ground layer 1969, which shared characteristics with 1863 in that it consisted of redeposited natural mixed with coal and crushed building rubble fragments.

Phase 6

Made ground 1969 was cut by context group 004 features. These features consisted of 28 postholes and stakeholes which varied in shape and size (Fig. 29; A). No coherent pattern was apparent which would have led to a confident interpretation so the features must be considered tenuous evidence for fence lines or perhaps rack structures. The Phase 6 archaeology was sealed by made ground deposit 1613, which consisted of redeposited natural with small amounts of coal and building rubble.

Phase 7

The Phase 7 archaeological remains consisted of a layer of stone cobbles (002) which overlaid a bedding layer of crushed clinker and gravel (1612) (Fig. 25, Plate 19). The cobble surface was truncated by the walls of the Sheaf Island Works and by associated service trenches resulting in four discrete patches. The cobbles from patch to patch varied a little in orientation and size but these differences were thought to be the result of ongoing maintenance rather than representing different surfaces. This surface was laid over made ground deposit 1613.

Phase 8

The final archaeological Phase in Area E consisted of the demolished remains and in-filled basements of the Sheaf Island Works (Fig. 25). The basement adjacent to River Lane, had deep light wells extending down from street level and window recesses, some of which still had window frames in place. Other recesses at the basement floor level contained storage heaters some of which were still plugged in to wall sockets. Concrete steps led through to further basements to the east and also to brick buildings that had probably fronted onto the works yard surface, shown on the 1905 and 1935 OS maps. Knife blanks, knife wasters and grinding wheels were recovered from the rubble in this part of Area E, the only evidence for cutlery working from the whole site.

Area F

Area F was located at the north-east corner of the site. Due to the presence of several modern service trenches associated with Ponds Forge Bus Station, its proposed area of 23m by 10m could not be attained resulting in the excavation of an L-shaped trench measuring 20.5m by 11.5m at its long axis (Fig. 30). The truncation suffered by Area F meant that the archaeological remains only survived in small patches making any relationships between these areas difficult to identify.

The archaeological remains in the south-west corner of the trench consisted of a rectangular brick structure (1032), brick walls (1013, 1015, and 1038), two truncated structures (1016 and 1033) and two surfaces (1030 and 1014). The rectangular structure (1032) was constructed of frogged bricks bonded with dark brown mortar. It was interpreted on site as a soak-away or manhole cover and remained unexcavated.

Wall 1013 consisted of a single course of lime mortar bonded, unfrogged bricks two skins thick and some 0.84m in length. It was abutted by concrete surface 1014 indicating the floor was laid following the construction of 1013. Wall 1013 was on a north/south alignment, similar to wall 1038 1.50m to the south.

Wall 1038 consisted of two skins of unfrogged bricks bonded with lime mortar (Plate 20). It intersected with wall 1015 at a right angle, possibly forming the external corner of a

structure. Although of similar alignment and construction to wall 1013 directly to the north, a physical relationship could not be established as 1038 was overlaid by concrete surface 1014.

Wall 1015 consisted of three skins of unfroged bricks bonded with lime mortar. Wall 1038 was keyed into 1015 indicating the walls were part of the same phase of building.

Structure 1016 appeared to be the truncated remains of a rectangular building abutting the outer, south facing, aspect of wall 1015. It was constructed of froged bricks bonded with light grey mortar. A concrete slab was noted internal to the structure. Structure 1016 was interpreted as a collapsed manhole on site but remained unexcavated.

Structure 1033 abutted the west facing aspect of wall 1038. It consisted of two short, parallel, brick walls set perpendicular to wall 1038. The bricks were unfroged and bonded with dark purple-black mortar. A ceramic drain pipe was indentified exiting the structure leading to its interpretation as a toilet.

External to structure 1033 was the heavily truncated remains of surface 1030. It consisted of patches of concrete and tarmac suggesting it had been maintained. It is possible 1030 was contemporary with surface 1014.

The archaeological remains revealed in the eastern end of Area F consisted of a wall footing (group number 008), a stone slab surface (1019) and three concrete surfaces (1026, 1027 and 1031).

The wall footing (008) consisted of large stone slabs and blocks (1020, 1024 and 1025) interspersed with patches of brick work (1021, 1022, 1023 and 1028). It is likely the stone elements of the wall previously served a different function, perhaps machine bases. One stone block (1025) had a piece of ironwork embedded in it supporting the theory that the stone blocks were reused in the wall.

Tarmac surface 1026 was located to the south and abutted wall 008. The surface located to the north of wall 008 consisted of interspaced patches of concrete (1027 and 1031) and stone slabs (1019).

The archaeological remains revealed in the middle and northern end of Area F consisted of four walls (1001, 1002, 1006 and 1051), five surfaces (1007, 1009, 1037, and 1046) and a stone-built culvert (1055) with associated features (1061 and 1063).

Wall 1002 was on a north/south alignment and located within the western edge of Area F. It was constructed of unfroged bricks and roughly hewn sandstone blocks bonded with a dark purplish to black ash mortar. It was only visible in the trench section making interpretation problematic.

Wall 1006 was constructed of mixed froged and unfroged bricks bonded with a hard light sandy brown mortar. It was two skins thick and at least two courses deep. Modern service

trenches to the north and south had truncated 1006 leaving only a section of wall some 1.20m in length in situ.

Wall 1001 was constructed of up to nine courses of unfrogged bricks bonded with a hard, light pinkish brown mortar. It was aligned east-north-east/west-south-west. Pottery associated with 1001 dated to the mid to late 19th century. A hand-dug sondage was excavated against the north-north-west face of wall 1001 up to a depth of 0.80m at which point, the robbed out remains of a brick surface (1046) was encountered. Surface 1046 was constructed of unfrogged bricks bonded with a purplish-grey mortar. The construction cut for 1001 (1047) was seen to truncate the structure 1051.

Structure 1051 consisted of two sides of a possible square or rectangular feature. It was constructed of unfrogged bricks bonded with a purplish grey mortar. The interior of this structure was not excavated so no interpretation can be offered. However, it was truncated by the construction of wall 1001 making it an earlier feature.

Surface 1007 consisted of a concrete slab and frogged bricks bonded with a dark grey-brown mortar. Interpretation was difficult as the surface was highly truncated by modern service trenches leaving only a small area intact, but it was thought to be the remains of a machine base. Conjoined to 1007 directly to the south was surface 1009. Surface 1009 consisted of a truncated patch of sandstone blocks edged to the south with unfrogged bricks and bonded with brownish-black mortar. It was not clear whether 1009 was a continuation of 1007 or a working surface associated with the proposed machine base.

Surface 1037 was similar in construction to surface 1007, consisting of concrete and frogged bricks bonded with grey-brown mortar. As with all the archaeological remains in Area F, 1037 was highly truncated leading to difficulty in interpretation. However, given its similarity to 1007, 1037 has also been tentatively interpreted as a machine base or plinth.

During the excavation of the sondage mentioned above, a culvert (1055) (Plate 21), a sandstone wall/ structure (1061) and a compacted cinder surface (1063) were identified in the east-facing section. Other than recording the features in section no further investigation took place making interpretation problematic. It is noted however, that the features were thought to be contemporary.

6 Artefact Record

Pottery by C.G. Cumberpatch PhD

Introduction

The pottery assemblage from site of the former Sheffield Bus station or D-Campus adjacent to Ponds Forge and Sheffield railway station was examined by the author in December 2008 and January 2009. The assemblage consisted of a total of 5894 sherds of pottery weighing 128,205 grams and represented a maximum of 5303 vessels. The data are summarised in

Appendix 4, Tables 1 - 9. The pottery was accompanied by a quantity of ceramic building material, other ceramic fragments and additional items which are listed in Table 10. The assemblage was unmarked which precluded a comprehensive programme of refitting to identify cross-context joins. Those which have been noted in the data tables are the result of attention to specific distinctive vessels and should be regarded as indicative of a larger number of such joins between the contexts involved. It is probable that many other joins remain unidentified.

The assemblage included a wide range of material spanning the period between the 17th and early to mid 20th centuries. Unusually for a site in Sheffield, there appeared to be a number of contexts and phases within which the pottery related to activities on or close to the site. While some of the later groups seem to represent the dumping of material brought into the site, possibly from some distance away (as discussed below in connection with unphased material) the earlier material seems to represent more normal site formation processes and as such is of considerable significance in the wider context of sites in Sheffield.

The dumping of material prior to or associated with building work is a process which has been noted on sites across Sheffield and while the details remain obscure it is clear that material was being collected for use in this manner both locally and more widely. In the immediate vicinity of the D-Campus site, excavations in Sheaf Square produced clay tobacco pipe manufacturing waste from Leeds while the analysis of the assemblage from Suffolk Road was one of the first on which this process was identified although it was initially misinterpreted as indicating local dumping outside the built-up area of the town (Cumberpatch 2003a). The D-Campus assemblage included echoes of both these assemblages in the presence of pottery manufacturing debris and of severely water-worn sherds of pottery which must have been derived from a water-course prior to deposition.

These characteristics, in addition to the importance of the pottery from the interpretation of the site itself, makes the assemblage an important one that should be retained in its entirety in the hope that future work will be possible which will cast further light on the highly distinctive character of later 18th and 19th century pottery assemblages from Sheffield.

Type series

Medieval and post-medieval wares

Medieval and post-medieval wares were extremely rare in the D-Campus assemblage. Medieval wares were represented by a single sherd of Coal Measures ware from context 442, Area E and by a sherd of Reduced Sandy ware from context 2072. Such stray finds are not uncommon on sites in Sheffield but are almost invariably residual within later contexts.

Later medieval to early post-medieval pottery was represented exclusively by Cistercian ware from contexts 1917, 1625, 1644 and possibly 1799 and 507=1799. In all cases the sherds were residual in later contexts. Cistercian ware is somewhat commoner than other medieval

and early post-medieval types and is known from a number of sites on the edge of the medieval and early post-medieval town (West Bar, Sheffield Riverside, Little London etc).

Blackware

Blackware, a typological and, to some extent, technological, development of the earlier Cistercian ware, is a characteristic product of the 17th century pottery industry (Moorhouse and Slowikowski 1992, Cumberpatch 2002, Spavold and Brown 2005). Blackwares occur regularly but in small quantities on sites in Sheffield and can be difficult to distinguish from some Late Blackwares, particularly where small body sherds are concerned. Generally speaking Blackwares are found as residual elements in later contexts as, to date, very few undisturbed 17th century contexts have yet been excavated in the city. This was true on the D-Campus site where Blackwares occurred widely but in small quantities, generally in the 18th century deposits.

Redware and Slipware Type 1

Like Blackware, Redware is a typical 17th century type of pottery characterised by its soft buff to orange fabric and the use of clear glaze inside dishes and bowls giving the characteristic shiny red finish from which the type takes its name. Redware production was widespread during the 17th century and probably continued into the early years of the 18th century, with the Mottled Coarsewares (described below) perhaps representing a development of the type. Sherds of Redware were somewhat more abundant than those of Blackware and while this may be an indication of their slightly later date, the quantities are too small for chance factors or taphonomic considerations to be ruled out.

Type 1 Slipware is essentially Redware with the addition of trailed slip decoration forming patterns of varying complexity around the rim and on the inside surface of bowls and dishes. The patterns are generally abstract, including wavy lines, stars, short flashes and more complex curvilinear designs. Like the Redwares the main period of production seems to lie in the 17th century but probably continues into the early 18th century. As with the Redware, the numbers of sherds from the D-Campus site were low.

Slipware

The use of slip, a suspension of clay and colourants in water, to decorate pots is of great antiquity. It is a versatile and relatively straightforward method of adding a variety of colours to plain wares either to modify the colour of the fired clay body or to add additional colours to the underlying body. The use of different coloured slips on the same pot is a common method of decorating both utilitarian and more formal wares.

Use of the term Slipware in this report has, with the exception of the Type 1 Slipwares described above, been reserved for the 18th century wares manufactured in the 'country potteries' which formed a significant part of the pottery industry throughout the early modern and recent periods.

Slipware was manufactured extensively in South Yorkshire, as it seems to have been generally across the country. A summary of the information available to date has been provided elsewhere (Cumberpatch 2004a:13-15, Table 5) and need not be repeated here, other than to note that the ware seems to have been one of the principal products of the small, family run 'country potteries' that provided the operators with an income additional to that from small scale farming or smallholding. The organisation of the industry appears to have been similar to that of the 'dual economy' practiced by nail makers, edged tool makers and others in the metal industries in South Yorkshire. In view of the widespread nature of manufacture, the terms Staffordshire Slipware and Metropolitan Slipware, used in many publications, are regarded by the author as misleading and obsolete and have not been used in this report.

The commonest type of vessels appear to have been medium to large sized press-moulded dishes and bowls (e.g. Cox and Cox 2001: Figure 5, Colour Plate 1) although hollow wares are also known (e.g. Cox and Cox 2001; Figure 6). The decoration on the dishes and bowls was typically produced by the use of two or more layers of slip (generally white, red brown and dark brown) modified with the use of feathers, pointed tools or joggling to give a swirled effect. Hollow wares were decorated with trailed slip designs (e.g. context 2134 & 2072) as well as feathered designs.

Late Blackware and Slip Coated ware

Late Blackware represents a development of the 17th century Blackware type and can be difficult to distinguish from it, particularly where small body sherds share similar hard, dense, dark red fabrics. Both types have hard black glaze internally and externally, although typically the Late Blackware vessels have a small foot to the base and the external glaze ends above the foot, leaving an unglazed band on the lowest part of the body and the base. This suggests that the vessels were dipped in glaze either before or after the interior had been glazed. Complete vessels are rare, but the impression is that the typical form was a globular vessel with a handle; these may have been jugs, porringers or both. Eighteenth century mugs and tankards tend to be straight-sided and so it is probably unlikely that these globular vessels were used for drinking. In his autobiography Benjamin Franklin refers to using a porringer for a breakfast of 'hot water gruel, sprinkled with pepper, crumbled with bread and a bit of butter in it' (2005; 31). Later in his life, his wife replaced his earthenware porringer with a Chinese porcelain bowl.

An important variant of the Late Blackware type has a buff body with a layer of red slip which gives a black colour similar to those with the darker red bodies. These have been described in the tables as *Slip Coated wares*, following Barker and Ford (1999). The intention appears to have been to produce vessels resembling Blackwares using the same buff coloured body as for the Mottled wares and Slipwares.

The Late Blackware type forms part of the larger group of vernacular tablewares which also included the Mottled wares and various kinds of Slipware and which appear to represent a continuation of the post-medieval traditions of eating and drinking through the 18th century, alongside the formal tablewares that come to dominate domestic pottery assemblages from the early 19th century onwards (Cumberpatch 2003b).

Late Blackwares were certainly manufactured locally (Cumberpatch 2004a:13-14) but at present there is no reliable method of linking individual sherds or vessels with particular potteries as there have been no detailed comparative studies of the fabrics or vessel forms.

Mottled ware

Mottled wares form part of the vernacular tableware tradition which developed out of the post-medieval tradition at the end of the 17th century (Cumberpatch 2003b). They are defined by their glaze which is honey coloured and includes manganese which gives the finish a distinctive mottled appearance. Mottled wares typically have a buff to pale cream fabric with the glaze varying in colour from a light brown or honey colour with darker streaks (giving the characteristic mottled effect) to a dark, almost black finish with the mottling much harder to detect. On occasion both variants are present on the same pot, one inside and one outside. Mottled ware is of 18th century date and, although Barker and Ford (1999) have no conclusive evidence for production in Staffordshire into the later 18th century, there is good evidence it was manufactured throughout the century in South Yorkshire (Cumberpatch 2004a: 13, Table 5), with production at the Sheffield Manor and Silkstone potteries dating to the early 17th century and later 18th century respectively.

A small number of coarseware sherds were classified as *Mottled Coarseware*. These were larger, thicker walled sherds which bore brown or honey coloured mottled glaze similar in terms of its finish to that seen on the smaller vessels but with fabrics which were closer in type to the Brown Glazed Coarsewares.

Tin Glazed Earthenware

Tin Glazed earthenwares are a regular find on sites in Sheffield but it is rarely possible to identify either the origin of individual vessels or the designs employed to decorate them. The friable, flakey glaze frequently suffers after excavation and during the finds processing process and is particularly susceptible to damage when bagged with other sherds. Two examples are shown in Plates 1 and 2 (contexts 1734 and 2069 respectively). Tin Glazed earthenwares were imported extensively from the Netherlands but were also made in London, Bristol, Liverpool, Glasgow, Norwich and Whitehaven. Production extended from the later 16th to the mid 18th century but to date it has not been possible to identify the origin of the sherds from sites in Sheffield. A project dedicated to this material would be of considerable interest both from the point of view of dating the sherds and also of establishing their origin.

White Salt Glazed Stoneware

White Salt Glazed Stoneware (WSGSW) was the first ceramic body to challenge effectively the dominance of imported Chinese porcelain and to bring fine, hard whitewares within the financial reach of consumers of the middle and aspirant middle classes. Developed in Staffordshire in the early 18th century, this was the most significant home produced refined tableware manufactured between *c.*1720 and *c.*1780 (Edwards and Hampson 2005). It was produced at a number of potteries in the Don Valley, the most famous being Rockingham where production appears to have continued until at least 1775 (Cox and Cox 2001:31-33). White Salt Glazed Stoneware is known to have been manufactured at the Rotherham Old Pottery during the 18th century and a vessel bearing John Platt's name and the date 1767 is held in the Victoria and Albert Museum (Lawrence 1974:122, Edwards and Hampson 2005; 230-232).

The date range shown in the tables (*c.*1720 – *c.*1780) reflects the known dates of production at Swinton and also makes allowance for possible later production elsewhere (Barker and Ford 1999). There is little direct evidence for the source of the sherds found on sites in Sheffield as White Salt Glazed Stonewares rarely carry maker's marks and the designs were shared by many potteries. This lack of certainty regarding the origin of the sherds from sites in Sheffield means that they cannot be used as a reliable means of dating the deposits other than to indicate the presence of an early/mid to late 18th century component within the assemblages in which they are found. In view of this, sherds from individual contexts must be discussed in their own right and with reference to associated contexts before plausible date ranges for these contexts can be suggested. Although it has not yet been possible to undertake formal comparisons of sites across Sheffield, it seems that the assemblage from the D-Campus is one of the larger ones from the city and most probably indicates that the Phase 1 deposits in which it occurs are slightly earlier than early phases on other sites. More generally the presence of this type of pottery suggests that consumers in Sheffield were able and willing to obtain the latest in fashionable tablewares, perhaps implying that some of the documentary sources which emphasise more negative features of the city were perhaps not entirely impartial in their descriptions of social and economic conditions during the 18th century.

Creamware

The general date range for Creamwares, the first of the lead-glazed refined earthenwares, has been taken as *c.*1740 – *c.*1820, based on the evidence from Staffordshire (Barker and Ford 1999) together with that from South Yorkshire. Lawrence cites a trade card issued by Platt and Walker, owners of the Rotherham Old Pottery between 1766 – 1772, which includes a reference to 'Cream Colour' ware which may well be identified with Creamware although there are some discrepancies between names used in the 18th century and those common today amongst archaeologists and collectors. Documentary references indicate that production at the Swinton Pottery was underway in June 1770 and the earliest marked piece

dates to 1771 (Cox and Cox 2001:34). Creamware appears to have been a major element in the earlier phases of manufacture at the Don Pottery (established in 1801) where production continued until well into the 1820s (Griffin 2001:104) and at the Leeds Pottery from its establishment in 1770 (Griffin 2005). Barker and Ford have suggested that the popularity of the ware began to decline after *c.*1780 but the continuation of production at the Don Pottery into the 19th century suggests that such changes in fashion took place at different times and perhaps at different rates in different places throughout the country. In his discussion of the relative dating of Creamware at the Leeds pottery, Griffin has noted that Creamware production continued into the third decade of the 19th century (2005:193). It should not, therefore, be assumed that the Creamwares necessarily predate the Pearlwares (discussed below), as production of the latter appears to have begun, at the Don Pottery at least, in the first decade of the 19th century (Griffin 2001:104).

Creamwares are a regular component of pottery assemblages from Sheffield and occur in both 18th and early 19th century contexts and in those which appear to have been redeposited in the mid to later 19th century. Flatwares are by far the commonest type of vessel recovered but hollow wares also occur although in much smaller numbers.

Pearlware and Edged ware

A general date range of *c.*1780 – *c.*1840 has been ascribed to the Pearlwares on the basis of Barker's dating of the industry in Staffordshire. While this gives a useful broad indication of the longevity of the type, the evidence from the documented South and West Yorkshire potteries allows a little more precision. It should be noted that Pearlwares are somewhat more difficult to identify precisely than are either White Salt Glazed Stonewares or Creamwares. The chief characteristic, a blue-white tint to the glaze, obtained by including small quantities of cobalt and copper in the glaze (Barker and Ford 1999), is not one which is particularly distinctive because Whitewares occasionally appear to have been subject to slight 'bluing' as the colour from the transfer printed designs leached into the surrounding glaze. This is of particular relevance to the D-Campus site as a significant group of transfer printed wares from contexts 442, 478, 490 and 497 seems to represent either late, pale transfer printed Pearlwares or unusually early transfer printed Whitewares. This group is discussed further below.

The first reference to transfer printed wares at Swinton dates to 14th July 1788 and early printed wares from the pottery appear to have been in both black and blue (Cox and Cox 2001:70-2). Production of Pearlwares continued after the pottery was taken over by the Bramelds in 1806 with transfer printed patterns in blue, brown and black. Two and possibly three sherds bore Brameld stamps indicating a date of manufacture between 1806 and 1842. The implications of this are discussed further below. The two clearer marks are shown in Plates 1 and 2.

After 1820 a wider range of printed designs were manufactured and individual pieces continue to be described as Pearlware by Cox and Cox up until *c.*1830, although production

of transfer printed wares continued up until the closure of the pottery in 1842, presumably with a progressive whitening of the glaze, as seen elsewhere.

Production at the Don Pottery began in 1801 and transfer printed Pearlwares were one of the staple products of the factory. In terms of the identification of these wares, Griffin has noted that Don Pearlware ranges from a very obvious addition of cobalt, one may at times be tempted to say ‘over generous’ to a glaze where it is hardly discernable at all (2001:104).

Edged wares (or shell-edged wares) form a distinctive group within the wider Pearlware category. The distinctive characteristics of the group is the moulded ‘grass’ pattern edge emphasised with blue paint. Barker has suggested that the type, which was easy and cheap to manufacture, was popular from c.1810 to the early 1830s although Brooks has cited an earlier date of c.1784 based on evidence from the United States of America (2005:41). Barker’s date range has been used in this report but it might be necessary to revise this in future. Edge ware was manufactured widely and as vessels are rarely marked it is virtually impossible to ascribe individual sherds to particular potteries.

A particularly fine group of Edged wares was recovered from contexts 442, 478 and 490, including examples with edges resembling Brooks’ ‘Rococo’ edge type dated to c.1784 – c.1812 alongside apparently slightly later types. Further discussion of this important group of pottery can be found below.

Whiteware

Whitewares represent a development from the earlier Pearlwares and are characterised by a whiter finish without the distinctive bluing seen on the typical Pearlwares. As discussed above and demonstrated by the group from contexts 442, 478, 490 and 497 the distinction between the two groups is far from straightforward given the variability in the Pearlware finish and the occasional tendency for colour to ‘bleed’ into the glaze from the blue transfer printed designs. A similar range of transfer printed designs appears on both types and the history of these designs, as outlined by Coysh and Henrywood (1997: 8 - 11), does not reflect the transition from Pearlware to Whiteware.

A particularly distinctive variant of the transfer printed Whiteware group are those bearing ‘Flow Blue’ decoration in which the colour of the transfer printed decoration has been allowed to bleed or flow into the surrounding glaze. Such wares appear to date from c.1835/ c.1845 and were particularly popular in the USA. They regularly occur on sites in Sheffield, including D-Campus although they rarely constitute a significant proportion of the total. Few of the transfer printed Whitewares bore maker’s marks and of those which were marked, the marks were not datable (e.g. Plate 3). A whiteware pot lid is shown in Plate 18.

The range of vessels types in transfer printed Whiteware and Pearlware was relatively wide with a number of carvers and servers identified alongside the ubiquitous plates of various sizes. Hollow wares were somewhat rarer but included cups, bowls and jugs.

Slip Banded Whitewares and Blue Banded wares

Banded wares, both blue painted or slipped and decorated with a variety of coloured slips (brown, black and red-brown), are a common find on sites in Sheffield and, as one of the cheapest decorated hollow wares available during the 19th century, clearly represented a significant part of many domestic ceramic assemblages. Banded decoration is found on both whiteware and cane coloured ware bodies (the latter described below) and the combination of band and line widths and colours is highly variable. Inevitably, given the fragmentation of the vessels, it is rarely possible to determine the precise combination of lines and bands which make up individual motifs or, indeed the extent to which there were regular patterns shared by particular vessel types or sets of complementary vessels.

According to Barker and Ford (1999) slip decoration first appears on Staffordshire Creamwares and Pearlwares around 1775 and on whitewares from the 1830s/1840s. Banded wares continued in production into the 20th century (and are still manufactured as ‘Cornish wares’), but as the 19th century progressed the numbers of banded mugs declined and the number of bowls, particularly the carinated or ‘London’ form, increased. Barker and Ford suggest that the rounded bowls are generally pre-1815 in date with the carinated bowls becoming popular subsequently. This having been noted, it should be said that the rounded bowls from sites in Sheffield generally do not seem to be as early as this; the vessels lack the thin, fine finish which seems to be characteristic of Pearlwares and the ring-foot bases have a thick, rounded profile which is a trait perhaps more commonly associated with Whitewares. This having been noted, the majority of the bowls from D-Campus which were identifiable to form were carinated and were found in the later phases of the site.

A rare variant on the standard blue banded theme is represented by a small bowl from context 1555 and a pedestal based ‘tazza’ like vessel from context 478. These were decorated with rilled bands emphasised with pale blue paint.

Sponged ware

Sponged decoration, irregular blue patches created by the use of a small sponge dipped in paint, appears on teawares from the early 19th century and became much more common from the 1840s with the introduction of the pre-cut sponges which were used to produce repeated patterns including diamonds, flowers, fronds etc (Barker and Ford 1999). Sponged wares of both types were cheap and easy to produce as they required very little skill to decorate. As a result they were popular amongst poorer sections of the population. Although Sponged wares are a common find on sites throughout Sheffield (and often accompany the broadly contemporary Blue Banded wares described above) they were present in relatively small numbers in the D-Campus assemblage and the sponge printed wares were particularly scarce. Whether this implies that the source of the pottery on the site was from somewhat more well-

to-do households than that found elsewhere in the city is unclear and is the type of question that will perhaps only be answered as and when assemblages from different sites can be compared and contrasted.

Cane Coloured wares, Slip Banded Cane Coloured wares and Mocha ware

Cane Coloured ware is present on sites throughout the Sheffield in both slip banded and plain varieties. The name 'Cane Coloured ware' has been preferred to 'Yellow ware' (as used by Barker and Ford, 1999) to avoid confusion with 16th and 17th century Yellow wares and the later Yellow Glazed Coarsewares. Contemporary 19th century names included yellow ware, yellow cane ware and Derbyshire ironstone cane ware. Although often associated with Sharpe's pottery at Swadlincote and with other Derbyshire potteries, Cane Coloured and related wares were also made more widely with production known from both Staffordshire and in the Don Valley where excavations have produced numerous examples of wares manufactured locally (e.g. Griffin 2001:212, Plate 300). It should not, therefore, be thought of as a regionally restricted ware in any sense.

The slip decorated Cane Coloured sherds have been listed in the tables as *Slip Banded CC wares* in order to distinguish them from slip banded Whitewares and plain Cane Coloured wares. Decorative motifs consisted of a variety of combinations of white, blue and green lines and bands in various widths. Wavy lines were rarer but were noted on some vessels. It is unclear whether there were regular patterns or sequences of lines repeated on different vessels.

Vessel types included pie dishes, mugs, jugs and other hollow wares, not all of them identifiable. Details are given in the data tables.

Mocha ware forms a particularly distinctive part of the banded ware group. Mocha decoration, created by introducing a drop of a weak acidic solution onto a band of wet slip, resulting in a fine feather-like pattern, is particularly common on cane coloured bodies, but does also occur on whitewares (e.g. Griffin 2001:212, Plate 300). The technique flourished between c.1795 and c.1895 (Barker and Ford 1999) and has recently been revived. As with the Cane Coloured wares, there has been a tendency to link the technique with the Derbyshire potteries, but it was certainly far more widespread as the evidence from the Don and Top Potteries has demonstrated.

Bone China and Porcelain

Bone china is a type of soft paste porcelain which became the standard type of Staffordshire body by c.1810 (Barker and Ford 1999). It consisted of china clay, china stone and up to 50% calcined bone and was normally lead glazed. The result was a distinctive very white body with a 'crystalline' appearance in cross-section. Bone china was in widespread production by 1810 and a variety of decorative techniques were employed including transfer printing (notably employing the Two Temples design which was common in the D-Campus assemblage), sprigging and painting. Although often associated with expensive wares, Bone

China was also used for the manufacture of cheap teawares and as such is a common find on sites in Sheffield.

The term *Porcelain* has been reserved for the relatively small number of sherds of what appears to be hard-paste porcelain of suspected Chinese origin. The lack of attention paid to porcelain from archaeological contexts makes the identification of Chinese and other Far Eastern wares extremely difficult and as a result it is difficult to determine what proportion of these sherds are actually imports and how many are later British or European copies. The suggested date ranges should be treated with some caution and are indicative at best. Examples of the decorated sherds are shown in Plates 6, 7 and 8.

Brown Glazed Coarseware, Brown Glazed Fineware and Yellow Glazed Coarseware

Brown glazed utilitarian wares generally form a major part of pottery assemblages dating to between the later 16th/early 17th and early 20th centuries but remain the least investigated of any major class of domestic pottery within this period. For this reason, and in spite of clear differences in both the details of vessel form and fabric, it is exceptionally difficult to provide adequate date ranges for particular sub-types or individual vessels. The suggested date ranges set out in the data tables should be considered as the maximum possible and where more closely datable material is present this should be used as the indicator of the possible date of the group or assemblage. Generally speaking, the characteristics of the individual utilitarian vessels were consistent with the dates derived from the tablewares which accompanied them and it seems likely that the mottled brown glaze present on many examples is a characteristic of 18th century vessels with the darker brown glaze being perhaps more typical of 19th century examples.

Two groups of wares have been identified within the larger brown glazed utilitarian ware group.

The origin of the *Brown Glazed Coarsewares* (BGCW) can be traced back to the 16th and early 17th centuries (Cumberpatch 2003b) and similar wares remained in production throughout the 19th century and into the early years of the 20th century. The commonest vessel form is the pancheon, a narrow-based wide-mouthed bowl, typically glazed internally. The numbers of these vessels excavated in Sheffield is vast and it seems that they must have fulfilled a variety of domestic functions (attested uses include the preserving of eggs and the preparation of fruit vinegars; Watson pers. comm). Production is poorly understood and documented but must have played a significant part in the economy of the county throughout the period of their use. Large jars and cisterns are also regularly found on sites in Sheffield although they are not usually as common as pancheons. The closed vessels are distinguished by their internal and external glaze, in contrast to the pancheons which were glazed internally only. The numbers of cisterns identified is likely to under-represent the actual numbers in use as it is only when the spigot hole is found that a positive identification can be made. All of these forms were present in the D-Campus assemblage but, with the exception of a small number of contexts excavated during the evaluation phase of the project (contexts 442, 478,

490 and 497) there was a general rarity of the type which marks the assemblage out from the majority form sites in Sheffield.

Brown Glazed Finewares (BGFW) form a distinctive group within the utilitarian ware tradition and consist mainly of smaller hollow wares including jars and jugs. On sites in Sheffield generally they appear to be of later 17th and 18th century date and to occur in 19th century contexts principally as a residual element. In this regard, the D-Campus assemblage is similar to others from elsewhere in the city.

Yellow Glazed Coarseware (YGCW) distinguished by the thin layer of white slip internally which, under the clear glaze, gave a yellow finish, is normally rare on urban sites and is rarely represented by more than three or four vessels. This appeared to be the case at D-Campus although it may be that the quantity from Area A/D is slightly higher than average; verification of this would require comparisons to be made between sites.

Brown Salt Glazed Stoneware and other Stonewares

Brown Salt Glazed Stonewares are ubiquitous on 18th and 19th century sites in Sheffield (and elsewhere) and formed a substantial part of the assemblage from the D-Campus (in contrast to the Brown Glazed Coarsewares with which the stonewares are often associated). The group as a whole can be divided into three sub-groups; tablewares, cooking/storage wares and retail or transport vessels (bottles, flagons etc). Tablewares are typically of 18th century date and include mugs and tankards, jugs and bowls (e.g. Jennings 1981: Fig 100). Such vessels become rarer in the later 18th and 19th centuries and production appears to have shifted towards the manufacture of utilitarian wares including bottles and flasks and cooking vessels (loaf pots, stew pots, souse pots) and storage jars (Walter 1999). In part this appears to be connected with the rise of the coal fired domestic cooking range incorporating an oven which allowed families to more easily prepare food in their own homes and so created a demand for a range of durable cooking vessels suitable for oven use. These vessels were often decorated with bands of rouletting around the body, often combined with repeated stamped patterns consisting of stars, wheel patterns and short curved or angular lines. The presence or absence of such designs is indicated in the data tables as is the date range of individual vessels.

The majority of cooking wares from the D-Campus were stew pots or lidded storage jars. Unlike other sites, loaf pots and nappers were entirely absent but whether this was related to the chronology of the assemblage or to some other factor is unclear.

Bottles and flagons were manufactured in both brown salt glazed versions and also in grey, buff and green variants, with the latter, together with other vessels without the typical brown finish, together classified as *Stoneware* in the data tables. Bottles and flagons were typically green in colour and two fragments bore parts of applied and stamped plaques recording the volume of the vessels (contexts 1566 and 442). Other bottles were much smaller and had

probably contained ink (context 1000, Area A/D). A parallel sided jar with a black printed label on the outside is shown in Plate 9.

An unusual vessel from context 420 is shown in Plate 10. This appears to be a late Westerwald or Westerwald type jar with elaborate sprigged decoration and a wide flanged rim. A second sherd from the same or an identical vessel was noted in context 1613.

Unglazed Red Earthenware

Although other types of vessels (mainly jars) do occur in Unglazed Red Earthenware, the commonest types of vessel are those intended for horticultural use and particularly flowerpots. These are a regular find on sites in Sheffield. It is probable that this is, at least in part, a result of the fact that 'Sheffield became *the* pioneer of large-scale allotment provision ... more than a century before the passing of the earliest allotment legislation' (Flavell 2005:19, emphasis in the original). The examples from D-Campus include sherds stamped with the name of one of the most famous manufacturers of flowerpots, Sankey (e.g. contexts 1974=1973, 1000). Other contexts produced small groups of sherds in a variety of fabrics and with different rim forms (e.g. contexts 1505, 1515, 1546 and 1558). A number of larger vessels in unglazed earthenware fabrics have been listed as possible flowerpots (?Flowerpot) and might include other types of horticultural vessel.

Figurines, ornaments and toys

A small number of figurines, toys and other items were noted amongst the assemblage although the total number was small and certain distinctive classes of non-functional wares (notably holiday souvenirs) were absent, possibly because of the early date of substantial parts of the assemblage. Knurr balls were rare being represented by only two fragments (contexts 1566). Figurines and toys were limited to a small number of items from contexts 151, 177, 1000, 1503, and 1522=1523. A small rectangular lid from context 1000 appeared to be part of a toy. The numbers of such items from sites in Sheffield varies considerably and it is often hard to distinguish ornaments from toys, particularly in the case of figures such as the bulldog from context 1000. A particularly unusual item in the D-Campus assemblage is the small squatting figure with bare buttocks from context 1000. No parallel is known to the author although the nature of the piece perhaps recalls the popular tradition of the bawdy seaside postcard.

Pot discs

The site produced a number of pot discs in a variety of wares. Examples are shown in Plates 11, 12, 13, 14 and 15. The purpose of these objects and their sub-rectangular variants remains obscure.

Other wares

In addition to the major classes of ware described briefly above a number of other items were also identified which require mention.

A rare but regular find on sites in Sheffield (including but not limited to Sheffield Riverside and Upper Allen Street) are fragments of small hollow ware vessels with thick dark blue glaze internally and unglazed but striated white surfaces externally. The example from D-Campus, paralleled by one from Upper Allen Street (Cumberpatch 2008), has a tazza-like form with a bowl shaped body on a pedestal base (context 497). The purpose of these small vessels is unknown. The unglazed exterior surface with its characteristic horizontal striations does not seem to be characteristic of a decorative vessel and the purpose of the very thick blue glaze is likewise obscure.

A number of bone china vessels bore silver or red-gold lustre decoration and were classified as Lustre ware rather than being included with the Bone China items. Decoration was generally curvilinear and often resembled stylised floral motifs. Dating of such wares is difficult as they were popular throughout the 19th century.

The assemblage also included a number of unidentified objects. Illustrated examples are a tear-drop or pear-shaped object with one side ground flat after firing (Plate 17).

Ceramic components and industrial items

The pottery assemblage included a number of items that lay outside the scope of this report. These included crucible fragments that appeared to have been included with the pottery in error and rather more objects of ambiguous character which were unfamiliar to the author as, although they were made of various kinds of ceramic body, they were essentially industrial in character and therefore might be better considered as part of the industrial component of the finds assemblage. These objects included ceramic electrical fittings, often with brass components still attached, a series of ceramic cones and bungs, presumably from industrial containers (possibly ones that had originally held reactive or corrosive chemicals), sewer pipe fragments, brick and tile (CBM) fragments, sanitary fittings and entirely anomalous items including glass, plastic and clay tobacco pipe fragments. These objects require examining by someone with appropriate experience and expertise before they can be considered to have been properly reported on.

The site

Area A/D

The pottery assemblage from Area A/D is summarised in Appendix 4, Table 1.

Palaeochannels

A small number of contexts were identified as palaeochannels formerly occupied by the River Sheaf (1917, 2011, 2094 and 2187). These contexts produced only small quantities of pottery but this varied widely in age. The earliest sherd identified was a small piece from the rim of a Cistercian ware cup (context 1917), with a sherd of late 17th or early 18th century Redware from context 2187. Context 2127 appeared to be of a similar date and produced a small group of later 17th or 18th century date. The pottery from the remaining contexts (2094 and 2011) was of a much later date (mid to later 19th century) and was comparable with

sherds from the later phases of the site. In no case did any of the sherds show any sign of abrasion in a water course, a contrast with occasional sherds elsewhere on the site. On this evidence, it seems unlikely that the sherds were contemporary with the active phase of the river channels and were probably deposited after the end of their active life.

The question of the sherds of water-worn pottery sherds remains to be answered. These were noted throughout Area A/D and did not seem to be concentrated in any specific type of feature or phase. Similar sherds were noted at Suffolk Road (Cumberpatch 2003a) and have been found occasionally on other sites in Sheffield. Given the proximity of active and fast-flowing rivers to many excavated sites, their presence may be no more than chance and it may even be possible that they were deliberately collected and used in the same ways as the ubiquitous pot discs although this would not explain the care put into manufacturing the latter from broken pots. The evidence here clearly distinguishes them from the contents of former river courses and so for the present their occurrence must remain unexplained.

Phase 1

Linear features

Seven contexts amongst the linear features (LinFt) identified in Phase 1 produced pottery. Context 2144, fill of gully 2143, contained two sherds of 18th century date and while both were small they were identifiable as White Salt Glazed Stoneware and Mottled Coarseware. Sherds of pottery from contexts 2177 and 2185 (ditch 2178) consisted of 18th century Mottled ware, Mottled coarseware and URE. Pottery from ditch 2193 (contexts 2173, 2174 and 2176) consisted of 18th century Late Black ware, Red ware, Mottled ware, BCGW and three sherds of TP Pearl ware dated to between 1780 and 1840. The fill of gully 2043 (2044=2066) included a range of 18th century including BGCW, BGFw, slipware, YGCW, URE, Fine Redware, Mottled ware, Slip Coated ware and Tin Glazed earthenware.

Pits, postholes and stakeholes

A series of pits and post holes attributed to Phase 1 produced small assemblages of pottery with a significantly larger group from one of the pits (2125). Post holes 2102, 2105, 2162, 2113, 2115, 2078, 2079 and 2086, Pit 2101 and Cut 2169 all produced small groups of pottery dating to the later 17th and 18th centuries, suggesting the backfilling of these features in the first half of the 18th century. The absence of White Salt Glazed Stoneware might indicate an early 18th century date but the quantities are so small that this should not be relied on.

Pit 2125 produced a much more substantial assemblage than did the other features, notably from context 2131. This included substantial groups of Tin Glazed Earthenware, White Salt Glazed Stoneware and Creamware sherds together with contemporary vernacular tablewares (Late Blackware, Mottled ware, Slipware and Brown Salt Glazed Stoneware). Utilitarian wares included Redware, Brown Glazed Coarse and Fineware. Earlier, presumably residual, material included a sherd of Green Glazed Sandy ware and sherds of Midlands Purple type

ware. While the exact origin of the pottery remains unknown, it is of considerable interest to find formal tablewares deposited alongside vernacular tablewares. The question of whether these two distinct classes of pottery were in use in the same households or whether the former displaced the latter has yet to be resolved, but this evidence might point to their use within the same household, although documentary and historical evidence would seem to suggest that they were employed in separate social contexts.

Structure 009

The fill of structure 009 produced a substantial assemblage of pottery from contexts post-dating the abandonment of the structure (contexts 2071 and 2109) with smaller quantities from associated contexts (2122, 2133, 2134 and 2142). The pottery from contexts 2071 and 2109 was overwhelmingly of 18th century date and included substantial quantities of formal tablewares (Tin Glazed Earthenware, White Salt Glazed Stoneware and Creamware with a smaller amount of Pearlware and Edged ware) alongside vernacular tablewares (Late Blackware, Mottled ware and Slipware). Individual sherds dated to the 19th century are most probably of early 19th century date (perhaps contemporary with the Edged wares) and suggest a date for the infill within the first two decades of the 19th century. This conclusion, provisional though it must be, given the absence of corroborative data from other classes of finds is also applicable to the pottery from the other contexts associated with Structure 9. While the quantities of pottery are smaller and the range less diverse, the general pattern is similar suggesting an 18th century date for the feature as a whole. The presence of a small number of sherds of Blackware (contexts 2109 and 2133) and perhaps the Type 1 Slipware (context 2071) might indicate earlier activity on or close to the site, something suggested by earlier excavations on the site of the Old Queens Head.

Structure 010

Structure 10 produced a useful assemblage of pottery from two contexts; 2072 and 2075, the majority from the former. In general terms this resembled the assemblage from Structure 9, being dominated by 18th century wares including White Salt Glazed Stoneware and Creamware. The early 19th century component noted in the case of Structure 9 was absent, perhaps implying a slightly earlier date for this group than for that from Structure 9 (although the effects of chance factors in the process of deposition should not be overlooked). The group also included a sherd of probable medieval pottery, two sherds of porcelain, perhaps imported, and a reused sherd with edges ground to a triangular shape (Plate 16). Sherds of the same Slipware jug or jar occurred in contexts 2072 and 2134, linking these contexts and context groups 9 and 10.

Surface 11

Three contexts forming part of Surface 11 produced pottery. The small groups from contexts 2013 and 2015 resembled those from Structures 9 and 10 in that they included pottery of mid to later 18th or early 19th century date. In contrast the sherds from context 2028 were more mixed. Two were of mid to later 19th century date while one, a piece of Midlands Purple type

ware, was of later medieval or post-medieval date. This would appear to suggest that there was some difference between these contexts although what this might be is not clear from the pottery evidence alone.

Other contexts from Phase 1

A number of contexts attributed to Phase 1 were associated with a variety of pits, post holes, drains and gullies. The majority of these produced small to medium sized assemblages of pottery. Details are given in Appendix 4, Table 1. With the exception of occasional sherds of post-medieval Midlands Purple ware (context 2089), Blackware (context 2189) and possibly Type 1 Slipware (context 2089), these contexts produced assemblage of varying size but all generally datable to the 18th century. The absence of Pearlwares and Edged wares and the presence of White Salt Glazed Stoneware and Tin Glazed Earthenware suggest a date range in the earlier to mid 18th century rather than in the later part of the century although this remains to be verified with reference to other more closely datable classes of object. The Phase 1 archaeological remains were sealed by the made ground deposit 2069 which produced a pottery assemblage indistinguishable in all respects from the context groups described in the case of other Phase 1 features. It should be regarded, therefore, as the last element of Phase 1.

Discussion

The evidence from Phase 1 is of considerable interest as the contexts concerned appear unaffected by the process of dumping and redeposition which are common on sites in Sheffield and which are also a factor in the upper levels of the D-Campus site. Coherent context groups of this date are relatively rare in Sheffield as the majority of 18th century pottery occurs as part of mixed groups dating to the early to mid 19th century. They are consequently of considerable general significance and should at some stage be compared with the small number of similar assemblages from sites elsewhere in the city. In terms of the wider site, the best comparison for Phase 1 in Area A/D is context 507 (Evaluation Trench 3, Area E), unphased contexts 1799 and 1801 (Area E) and possibly 1625. These contexts are discussed further below.

Phase 2

The pottery assemblage from Phase 2 of Area A/D differed significantly from that attributed to Phase 1. Although 18th century material was present in individual contexts and context groups in varying but generally small amounts, it was almost invariably accompanied by pottery dating to the mid to later 19th century.

Context group 12

Context group 12, the eastern range of tenements, consisted of only two contexts which produced pottery; 1926 and 2111. Context 1926 produced only three sherds from two Slip Banded Cane Coloured ware vessels of 19th century date. In contrast the assemblage from context 2111 was somewhat larger and possibly slightly earlier although the imprecision

around the dating of Cane Coloured wares makes it unwise to be overly dogmatic on this point. The presence of transfer printed Pearlwares alongside Creamware and the absence of Whitewares suggests that this context falls somewhere between Phase 1 and the majority of the Phase 2 contexts which are characterised by the presence of Whitewares and other mid to later 19th century types. Whether this is an over interpretation based on an unreasonably small group of sherds must await the evidence of other classes of finds, notably the clay tobacco pipes and glass.

Of the remainder of the phase 2 contexts, context 1692 was the closest in character to 2111 and only the presence of a small sherd of Whiteware precluded it from being grouped together with 2111 as possibly representing an earlier sub-phase within Phase 2. If compatible with the stratigraphy and the evidence of other artefacts, this might remain a possibility, if the sherd of Whiteware were to be deemed intrusive.

Other contexts

The remaining contexts attributed to Phase 2 were all characterised by the typical mid to late 19th century assemblages containing a variety of wares with a predominance of Whiteware (plain, sponged, sponge printed and transfer printed), Bone China (plain and transfer printed), Banded wares, Cane Coloured and Mocha wares and various stonewares. Small numbers of earlier sherds accompanied these and are considered to be residual in character. These deposits varied in character and included levelling layers and areas of 'made ground' (1692, 1690 and 1688). Others, including 1713 and 1915, formed the fill of various pits and other cut features. There was little in the character of the pottery groups to distinguish one from the other and all can be seen as broadly contemporary.

Phase 3

Context group 014

The western row of buildings forming context group 14 produced a surprisingly small pottery assemblage given the size of the area involved (contexts 1545, 1549, 1556, 1565, 1567, 1568, 1617, 1619, 2022 and 2105). While the pottery assemblage from these contexts included a small number of sherds dating to the 18th and later 18th to early 19th century (in contexts 1545, 1549 and 1617), the majority was of a general 19th century date with a large proportion of mid to later 19th century date. This is consistent with the late cartographic date for the buildings of 1889 and contrasted to some degree with the slightly earlier date suggested for the buildings forming the eastern range (Phase 3) and presumably reflects the interpretation of the two ranges as falling into two distinct phases. The range of wares and vessel types is consistent with the pattern seen on other sites in Sheffield and it may at some stage be possible to characterise the range of wares owned and used in typical Sheffield households, perhaps with reference to historical records.

Context 1566 was associated with a set of foundations, context 1563. Its overall profile was broadly similar to that of other contexts in Group 14 although the proportion of Brown and Yellow Glazed Coarseware was probably somewhat higher than in other contexts. How far this is significant is open to question. The context also produced one of the few knurr balls from the site.

The brick-lined drains beneath the cellar floors produced only a very small quantity of pottery. Context 1914, the fill of drain 1913 produced a small, mixed group of pottery that included both 18th/early 19th century wares and later types but was not otherwise distinctive. Context 1947, also part of the north/south drain system was filled by contexts 1962=1973 and by context 2023, the latter being devoid of any pottery. Only one small sherd of Colour Glazed ware was identified as coming from 1962=1973. The pottery recorded as coming from 1973=1974 and 1974=1973 (as listed in Table 1) is notably homogeneous in its character, consisting almost entirely of mid to later 19th century tableware with only a small utilitarian ware component. The mechanism by which such material found its way into the drain fill is obscure; no unusual abrasion or discolouration was noted on the majority of sherds, suggesting that it was not carried into the drain by the flow of water but whether it was part of a later fill is not clear.

Other contexts in phase 3

The fill of Drain 1664, context 1665, produced a substantial pottery assemblage which consisted principally of mid to later 19th century tablewares with an unusually small utilitarian ware component (a profile also seen in the case of context group 14, discussed above). The normal range of tablewares was represented with Whitewares predominant alongside Banded wares and Cane Coloured wares. Given that the feature is a drain, presumably cut into earlier layers, the presence of a small quantity of 18th and later 18th to early 19th century wares (Tin Glazed earthenware, Creamware, Edged ware) may be explained as evidence of residuality rather than of the dumping of mixed material as has been demonstrated elsewhere and is suggested for some areas of the site (as discussed below). It is also possible that a small number of vessels remained in use, surviving everyday wear and tear either by chance or because they had some value as heirlooms.

Contexts 1620 and 1621, the fills of feature 1623, appeared broadly similar in composition to those from Pit 1664 although a sherd of utilitarian Whiteware (1620) seemed to be somewhat later than the accompanying material.

A number of contexts were associated with the construction of kerbs (contexts 1611 and 1719). In both cases these produced small assemblages of mid to later 19th century tablewares, with one Creamware sherd from context 1719.

In addition to the drain fills described above in connection with context group 14, two other contexts were also identified as drain fills (contexts 1746 and 1955). In the first two cases the

pottery assemblages resembled those from other phase 3 contexts in consisting principally of mid to later 19th century tablewares

Context 1526 was the beneath the floor layer in building 6 and conformed to the general pattern seen in Phase 3 with a predominance of mid to later 19th century tablewares with only one sherd of Pearlware.

Contexts 1554 and 1972=2024 were described as a demolition deposit and levelling deposit respectively. In spite of this they showed little divergence from what appeared to be the norm for Phase 3 with tablewares forming the commonest component of the assemblage with very little Brown Glazed Coarseware and a small Brown Salt Glazed Stoneware component.

In summary, the bulk of the groups are characterised by a preponderance of tablewares and a surprising absence of Brown Glazed Coarsewares. The emerging picture from Sheffield is of a range of types of deposit with rather subtle differences which have yet to be fully explained. Some of the differences are clearly chronological while others relate to the practice of large scale dumping (as seen elsewhere on this site and on ones in the same immediate area).

Phase 4

There was little in the character of the pottery from Phase 4 to distinguish it from that associated with the Phase 3 contexts. A small number of sherds dating to the later 18th or 19th centuries were present throughout the contexts comprising the phase but these were insignificant in number and far less common than are such wares in many of the dumped deposits elsewhere in the city.

Context group 13

Only one context in group 13 produced any pottery, 1858. The single sherd of Brown Salt Glazed Stoneware was no more closely datable than the 19th century.

Context group 15

Contexts 1503, 1505, 1506, 1509, 1510, 1511, 1537, 1546, 1558 and 1962 = 1973 all represented the deliberate backfilling the cellars referred to in the site narrative, prior to the levelling of the site between 1923 and 1935. The range of wares represented was of mid to late 19th century character and the numbers of sherds identifiable as of early 20th century date were few and seemingly limited to context 1511. This might imply that older deposits were being exploited to provide material for the backfill but whether this was derived from the immediate vicinity of the site or from further afield (as seems to have been the case elsewhere on the site and on neighbouring sites) is unclear.

Other contexts

A considerable number of other contexts in Phase 4 produced pottery assemblages and these were, in some cases, of substantial size (as set out in Appendix 4, Table 1). The majority appear to have been interpreted as demolition or levelling deposits, backfill or 'made ground'. Some distinctions between contexts might be made on the basis that the proportions

of later 18th and early 19th century wares vary somewhat between contexts but it is difficult to determine how significant such relatively minor variations are. In more general terms the overall profile of the groups resembles those associated with Phase 3 with the greater part of the assemblage being made up of tablewares with a much smaller proportion of stonewares. The general profile of the individual context groups was compatible with a domestic origin and included a small number of figurine and ornament fragments alongside the normal range of Whitewares, Cane Coloured wares, Bone China and variants. Kitchen wares were represented by sherds of Brown Salt Glazed stoneware and included jars, stewpots and similar vessels. Loaf pots and nappers, a common find on some sites, were absent. The unusually small proportion of Brown Glazed Coarsewares, a recurrent feature of Area A/D, is also repeated in Phase 4 and remains as yet inexplicable.

Modern phase /Phase 5

The final phase of activity on the site, produced assemblages from two contexts, the fill of pit 1547 (context 1548) and a layer (1609) beneath the tarmac surface 1610. In both cases these assemblages consisted largely of mid to later 19th century wares with occasional sherds of 18th and later 18th to early 19th century wares. These were somewhat commoner than sherds of later 19th to early 20th century date and in all respects these groups were similar to those from Phase 4. Full details are given in Appendix 4, Table 1.

Unphased contexts

A small number of contexts were not assigned to phases. These included the fill of two cut features (contexts 1624 and 1667), the fill of a robber trench (RT), context 1747, an area of made ground, context 1624 and contexts 2027, 2056 and 2121. The overall profile of most of these assemblages was closely similar to those described above in Phases 2 to 5. Occasional sherds of early 19th century date occurred alongside much later material but the numbers were extremely low. The pottery from the 'made ground' context, 1624, showed signs of burning and discolouration, suggesting that the area or the source of the material had been one in the vicinity of a fire. Whether this was on the site or somewhere else is unclear.

Area E and Trench 3

The details of the pottery assemblage from Area E and Trench 3 are summarised in Appendix 4, Table 2.

Palaeochannels

The earliest features identified in Area E / Trench 3 was a series of palaeochannels formerly occupied by the River Sheaf. The fill of one of these, context 1970, produced a small assemblage of 17th and early 18th century pottery, as set out in Appendix 4, Table 2. This is consistent with the results from the excavation of similar (and presumably connected) palaeochannels in Area A/D.

Phase 1

Only one context attributed to Phase 1 produced any pottery, this was context 1880 from which a sherd of 18th century Mottled ware was recovered.

Phase 2

Only one context attributed to Phase 2 produced any pottery. This was context 1850, the upper fill of a gully. Observation of the character of the context suggested that it had formed under wet conditions and this was borne out by the character of some of the sherds (noted in Appendix 4, Table 2) which showed signs of abrasion in a water course. The date range suggested by the clay tobacco pipes of between 1700 and 1800 was generally supported by the character of the pottery which was of later 17th to 18th century date. None of the sherds were precisely chronologically diagnostic and an early 18th century date is entirely possible.

Phase 3

Two contexts in Phase 3 produced small groups of pottery, 1849 and 1866. Context 1849 formed the lower fill of a drainage channel or watercourse and was dated by the clay tobacco pipes to between 1750 and 1800. This date range is consistent with the character of the pottery which is predominantly of 18th century date. Some of the utilitarian wares are of types which originated in the 17th century but seem to have continued in production into the 18th century. The abrasion on some of the sherds is consistent with deposition in a water course.

The pottery from context 1866 was similar in most respects to that from context 1845 and some sherds showed a similar pattern of water-related abrasion. Eighteenth century sherds predominated and the date range represented is most probably broadly similar to that of context 1849.

Phase 4

Context 1845 of Phase 4 produced a large and mixed group of sherds. This included sherds of transfer printed Whiteware dating to the mid to late 19th century alongside sherds of formal and vernacular tablewares dating to the 18th and 18th to early 19th century. It is unclear how this compares to the evidence from other classes of artefact but when compared with other context groups from the area, context 1845 seems to have more in common with the pottery groups from Phase 5 (discussed below) than it does with Phase 4.

Phase 5

Only three context of Phase 5 produced pottery. Sandstone foundations 1782 produced a mixed assemblage with some sherds dating to the mid to late 18th century but the assemblage was dominated by early 20th century pottery. The fill of construction cut 1784 (1786) contained sherds of Late Blackware of 18th century date whilst the made ground layer 1863 which sealed the Phase 4 remains contained 17th to 18th century Blackware and Redware.

Phase 6

Phase 6 consisted of 34 contexts only two of which produced pottery. Context 1757 produced only Unglazed Red Earthenware whilst context 1644 produced one sherd from the rim of a Cistercian ware cup. As noted above, Cistercian ware was present in several contexts across the site and while it is possible that context 1644 dated to the period between the mid 15th and later 16th century, it is also possible that the sherd is residual in a later context.

Phase 7

A large group of pottery came from context 1613 and this was of mixed character with sherds of later 17th to 18th century and 18th century type associated with a sherd of transfer printed Whiteware of mid to later 19th century date and a sherd of Relief Banded ware of 19th century date. It is unclear whether this implies that context 1613 is substantially later than other contexts in this phase or whether there is evidence of later disturbance which could account for the presence of intrusive material in an earlier context. One sherd which is of particular note in context 1613 is the rim of stoneware jar. This appears to be of German origin and has a counterpart from context 420 (and unphased and unassigned context discussed in greater detail below). Although the sherds do not join, their very similar form and character suggests that they are from the same vessel or from two virtually identical vessels with wide flanged rims and sprigged and impressed decoration.

Phase 8

Only one context containing pottery was assigned to Phase 8, 1792. This produced a sherd of Brown Glazed Coarseware and a small fragment from the rim of an Edged ware plate dating to the early 19th century.

Unphased and unattributed contexts

A small number of contexts were not attributed to any specific phase. These were 435, 438, 475, 493, 1625 and 1805. Context 1625 included a small sherd of Cistercian ware alongside a larger group of Brown Glazed Coarsewares, probably datable to the 18th and 19th centuries. As noted above, the presence of Cistercian ware in a number of contexts across the site would seem to indicate some form of earlier activity in the area although the character of this is unclear. The same situation has been noted on other sites across the city.

Contexts 435, 438 and 475 of Trench 4 all produced small groups of sherds of mid to later 19th century date, somewhat later than the majority of contexts identified in the area. The same applies to the sherds from unstratified contexts which include the base of a large carver or server bearing the transfer printed 'Willow' pattern.

Discussion

The early phases, 1 to 3 inclusive, represented in Trench 3 /Area E appear to be broadly contemporary with Phase 1 in Area A / D but the pottery assemblages differ in that there is a

notable absence of formal tablewares in Trench 3 / Area E. Given the small size of the assemblages this may be a chance factor but it is worthy of note.

Overall, the pottery assemblage from this area lacks the later component seen in Area A/D, presumably reflecting the damage done to the archaeological strata by the construction on the Sheaf Island Works. Although the assemblage from Trench 3/Area E is small, it is of interest in that it seems to relate to types of deposition which differ from those seen on many sites in Sheffield (including certain phases of activity on the D-Campus site and in the Ponds Forge/Railway Station/ Sheaf Square area) which are dominated by the large scale dumping of domestic and industrial waste. The deposits discussed here appear to have accumulated as a result of less dramatic interventions and as such are a useful indication of the range and type of wares in regular use in the city in the 18th and early 19th century and, at least in part, in somewhat earlier periods.

Area F

Area F produced a very small assemblage of pottery from three contexts (1001, 1010 and 1069) in addition to context 1000, discussed below. Context 1001, a wall, produced the largest group of sherds, all most probably of mid to late 19th century date although the sherd of Brown Glazed Coarseware could be somewhat earlier. The single sherds from contexts 1010 and 1069 were both of 19th century types and have numerous parallels from elsewhere on the site. The details of the assemblage are summarised in Appendix 4, Table 3.

Trench 1

Trench 1 produced only a small assemblage of pottery, much of which was unstratified (Appendix 4, Table 4). Two stratified contexts produced pottery, 158 and 187.

The group from context 158 was of mid to later 19th century date and consisted principally of tablewares. These were unremarkable in character and domestic in origin. The chief object of note in this group was a shallow stoneware bowl with an inturned rim. This was most probably a dog bowl with the inturned rim intended to limit the spillage of water.

The pottery from context 187 was somewhat more diverse in character than that from context 158 and included later 18th century wares alongside 19th century types. Such mixed deposits are common on sites in Sheffield and have in some cases been shown to relate to the reuse of domestic refuse as a building material. It is possible that such an interpretation would cover this case, but given the lack of evidence for such a process in context 158 and the apparent heterogeneity of the deposits on the site as whole, this cannot be any more than a suggestion in this case. Other mechanisms can result in significant degrees of residuality and it would be unwise to assert one specific reason for the situation without further evidence.

The unstratified pottery from Trench 1 consisted principally of 19th century wares, including the lid of small pot which had contained anchovy paste (Plate 18). The earliest sherds were those from an edged ware plate or plates dating to the early 19th century but the majority were Whitewares of mid to later 19th century date.

Trench 2

The following notes are based solely on the evidence of the pottery itself despite the author being supplied with a context concordance and a trench matrix. A series of *ad hoc* ceramic phases have been suggested based on the characteristics of the pottery (summarised in Table 5). It should be noted that these have no necessary relationship to the stratigraphic record and must be evaluated with reference to it rather than being assumed to have a stratigraphic reality. The phases are as follows:

- C-Phase 1 18th century pottery only
- C-Phase 1+ Mid to later 18th or early 19th century pottery
- C-Phase 2 19th century pottery with mid to later 18th century pottery
- C-Phase 3 Mid to later 19th century pottery only

The earliest groups of pottery came from contexts 192, 263, 265 and 272 (ceramic phase 1) and were of 18th century date, comparable with the earlier phases in Area A/D and Trench 3 / Area E. While sherds of a comparable date were present in other contexts, they seemed to represent residual elements within later contexts. The four contexts in C-Phase 1 produced a similar range of material to that seen in the early phases in Area A/D and Trench 3/Area E including both formal tablewares and vernacular tablewares. A small utilitarian ware component was represented by the sherds of Brown Glazed Fineware and Brown Glazed Coarseware. The presence of a White Salt Glazed Stoneware sherd in context 192 pointed to the presence of earlier 18th century wares alongside the later Creamwares in contexts 192, 265 and 272.

C-Phase 1+ was represented by only two contexts, 161 and 170. These produced a small group of Creamware sherds single sherds of transfer printed Pearlware, Brown Glazed Coarseware (a pancheon) and Unglazed Red Earthenware (a flowerpot).

Phase 2 consisted of those contexts which produced groups characterised by the presence of small quantities of 18th and early 19th century wares alongside mid to later 19th century material. On some sites in Sheffield this has been suggested to indicate the deliberate use of domestic and other refuse as building material (Cumberpatch 2004) and while it may be that this is the case here it cannot be assumed without further evidence as to the nature of the contexts concerned. Residuality is, after all, a common feature of urban sites and can have numerous causes. The contexts attributed to ceramic phase 2 were 148, 163, 164, 165, 171, 172 and 205. Contexts 163 and 164 were linked by a cross-context join between two sherds from a Pearlware vessel with an oval base. The range of wares in these contexts was wide and Brown Glazed Coarseware appeared to be somewhat commoner than in other parts of the site although the quantity was still unusually low in comparison with other sites in the area. The 18th and early 19th century wares were limited to formal tablewares (Creamware and Pearlware) and the vernacular tablewares typical of 18th century contexts were notable by

their absence. Nineteenth century wares were represented by a range of types common on sites across Sheffield; Whiteware, Blue Banded ware, Mocha ware, Cane Coloured ware etc.

The latest ceramic phase defined in Trench 2 consisted of just two contexts, 175 and 177. These produced 19th century wares only but, unlike the final phases on other areas of the site (notably Area A/D) no early to mid 20th century wares.

Trench 5

Only one context in Trench 5 produced any pottery; 197 (Appendix 4, Table 6). One of the two sherds was the rim of an Edged ware plate of early 19th century date (c.1810 – c.1830) and the other, the rim of a pie dish in Cane Coloured ware, might be contemporary with it. In the absence of other evidence it is suggested that this context dates to the first half of the 19th century.

Trench 6

The pottery assemblage from Trench 6 was unstratified and consisted of only six sherds (Appendix 4, Table 7). All were of a general 19th or a mid to later 19th century date and the types represented were common across the site.

Contexts unassigned to features

A considerable number of contexts excavated during the evaluation phase of the project were not assigned to specific features but were listed on an early version of the context register according to their relationship to the areas defined during the main phase of the excavation. Because of their doubtful status and that of the list used, these contexts have been listed in a separate table (Appendix 4, Table 8) and are discussed here, subdivided by the area of excavation. In view of this and of the evident importance of these contexts for a full understanding of the site and of the development of the Ponds Forge / Railway Station / Sheaf Square area an *ad hoc* procedure similar to that adopted for Trench 2 has been followed here. The following provisional ceramic phases have been defined and are intended to be evaluated with reference to the stratigraphic information pertaining to the site as and when this is feasible.

C-Phase 1 18th century pottery only

C-Phase 2 19th century pottery with mid to later 18th century pottery

C-Phase 3 Mid to later 19th century pottery only

C-Phase 4 Dumped deposits incorporating significant amounts of imported material

Ceramic phase 1 Area A/D

Contexts 193, 194, 420 and 489 produced pottery assemblages of 18th century date with a sherd of 17th century Blackware from context 193. Formal and vernacular tablewares were both well represented with a smaller utilitarian ware component. The date range of the Creamwares extends into the early decades of the 19th century but the presence of White Salt

Glazed Stonewares seems to suggest a date in the 18th century for these groups. Without adequate context information it is impossible to provide any sort of interpretation of this material but from the pottery evidence alone it would seem that these are orthodox archaeological deposits relating to activity on and around the site and are not the result of the dumping of refuse. This gives them some considerable importance in the wider context of archaeology in Sheffield where such deposits are relatively rare.

The similarity between the sherd of German stoneware from context 420 and the larger sherd from context 1613 has been noted above and may provide a link between these two contexts.

Ceramic phase 2 Area E

In contrast to the assemblage from ceramic phase 1, the much larger assemblage from ceramic phase 2 consisted of early 19th century wares with only a small 18th century component. The contexts comprising this phase in Area E (contexts 442, 478, 490 and 497) produced a substantial pottery assemblage consisting largely of tablewares but with a larger utilitarian ware component than that found elsewhere on the site. Some caution must be exercised in considering the transfer printed Whitewares. While the appearance of these vessels (mainly but not exclusively plates) was that of conventional transfer printed Whiteware, the evidence of the stamped Brameld marks, indicating that the marked vessels at least originated in the Rockingham Pottery near Swinton (Cox and Cox 2001), suggested that they date from the period between c.1820 and 1842, placing them in the period of Pearlware production. As noted in the type series above, the distinction between Pearlwares and Whitewares can be a difficult one to substantiate (particularly where sherds are discoloured or crazed), based as it is on the presence of a slight blue tint in the otherwise white glaze. The extent of bluing varies both over time and between factories and in this case it would seem that what should be considered as Pearlwares from a chronological point of view resemble Whitewares in terms of their typology. This explains the apparent contradiction between the description of the wares as 'TP Whiteware' and the proposed early to mid 19th century date. The presence of sherds with the distinctive 'Flow Blue' decoration does suggest a date closer to the mid 19th century than the early years of the century as this technique appears to have become popular (particularly in export markets) from around 1830.

There are strong indications that some of the contexts are linked with each other. Definite cross-context joins were noted between contexts 442 and 490 and between 478 and 490. Other possible links between sherds bearing particularly distinctive designs are noted in the relevant data table.

The origin of this major assemblage of pottery (perhaps amongst the most interesting and significant of its date to have been excavated in Sheffield to the present time) is unclear and without contextual and stratigraphic information will probably remain so. In terms of its composition it shows some similarity with the much larger and later assemblage from Upper Allen Street (Cumberpatch 2008). The apparent homogeneity of the composition of the assemblage argues against an origin as domestic or mixed refuse with only the two fragments

of saggar (perhaps intrusive?) linking it with the ceramic Phase 4 assemblage discussed below while the quantity of material perhaps indicates that it was not the product of a single household. The range of vessel types is wide and includes carving and serving vessels as well as plates of various sizes. The quantity of Brown Glazed Coarseware is atypical of the rest of the site with substantial numbers of vessels from contexts 442, 478 and 490. In the case of Upper Allen Street it has been suggested that the assemblage could represent damaged stock from a warehouse or a retailer, something that has been established for a site in Hull (Griffin, pers. comm.) and it is possible that this could also be the case here. Pottery is, of course, inherently fragile and risks would have attended any movement of crates in both wholesale and retail contexts. It would be of some interest to examine the street directories and commercial directories to determine whether any such establishment existed in the area of the site as well as considering the possible implications of the proximity of the railway in this respect. A programme of refitting might be of relevance here as the incidence of complete or substantially complete vessels would be a useful indication of how complete the vessels were when they were discarded.

Ceramic Phase 2 Area A/D

The pottery assemblage from context 151 has been ascribed to ceramic Phase 2 in view of its similarity to the assemblage from ceramic Phase 2 in Area E although the dating evidence provided by the Brameld stamped sherds is absent. It is possible that this assemblage is slightly later than that described above but the lack of chronological resolution makes this difficult to assess from the pottery evidence alone. It might be that the clay tobacco pipe and glassware evidence will resolve this matter. Broadly speaking the profile of the assemblage resembled that from Area E with a small number of Edged ware and possible Creamware sherds alongside a much larger group of transfer printed Whitewares (or possibly light Pearlwares, as discussed above) and a larger group of Brown Glazed Coarsewares than seen elsewhere on the site. The single sherd of Tin Glazed Earthenware is unusual in being particularly thick and robust and might conceivably have remained in use either as part of a complete vessel or, more likely, serving in a secondary role as a paperweight or something similar.

Ceramic phase 3

Ceramic Phase 3 was represented by such a small assemblage of pottery (context 100) that there must be room for doubt as to whether it really exists or is actually part of the following ceramic Phase 4.

Ceramic phase 4 Areas A/D, E and Trench 2

Contexts 101, 102, 104 and 105 which covered Areas A/D and E and Trench 2 produced an extremely distinctive assemblage that differed markedly from all others on the site. A substantial part of it consisted of waste from pottery manufacture including biscuit fired wares, biscuit fired wares with unfired transfer prints in place, saggar fragments, pieces of clay rod and strip and tripod stilt fragments. As there were no potteries producing tablewares

in Sheffield during the 18th and 19th centuries it is clear that this material must have been brought in from elsewhere and deliberately deposited on the site. The date of the material is unclear. The use of bitstone in Staffordshire is not chronologically diagnostic and is attested both archaeologically and through documentary sources in the 18th and 19th centuries (Barker 1998:329). The presence of a hand-made stilt fragment in context 101 might suggest an 18th century date as these appear to have been introduced from around the middle of the century but continue in use into the mid 19th century. Similar stilts are known from the Top Pottery in Rawmarsh which operated between 1790 and 1853 but a comprehensive overview of the exact process of development in South Yorkshire is lacking and, given the fact that such matters were to some extent regional (Barker pers comm.), means that it is scarcely possible to use the stilt as evidence of the date of the material. None of the transfer printed designs or vessels forms were chronologically diagnostic and maker's marks were unfortunately absent. A small number of sherds of finished pottery were associated with the manufacturing waste and these suggested a 19th century date.

Excavations in Sheaf Square produced an assemblage of clay pipe manufacturing waste dating to c.1855 – c.1860, apparently brought from Leeds and used to fill part of the mill pond which formerly existed on the site (West 2005). While there is no evidence of a direct connection between the filling of the pond and the deposition of the pottery waste on the D-Campus site, the similarity in the processes, including the acquisition of the material from an industrial source some miles from the site of deposition (and possibly the use of the newly built railway to transport the bulky material) is interesting and may be of relevance. There is certainly nothing to rule out a mid 19th century date for the material.

Context 1000

The pottery from context 1000 is listed in Appendix 4, Table 9, subdivided by area. Much of this material was of a late date (later 19th to early/mid 20th century) with smaller components of later 18th to early 19th century date. The range of wares resembled that from the site as a whole even as far as the relatively small Brown Glazed Coarseware component. The group also included a small number of figurines and toys, including an unusual squatting bare-buttocked figure from Area A/D. Other figurines included a dog, an unidentified hairy animal (Area A/D) and Area A/D also produced a small lid from a miniature or toy vessel.

Discussion

Overall the pottery assemblage from the D-Campus site is one of the more important to have been excavated in Sheffield in recent years. It combines evidence of what might be termed 'normal' forms of archaeological site formation processes, particularly in the early phases of the site with some of those which have contributed to the unique profile of sites in the city, including the dumping of waste material prior to building work and includes a single deposit which may derive from a single catastrophic episode of pottery breakage.

It is strongly recommended that the pottery assemblage be retained in its entirety in the appropriate museum or archive depository until such time as further attention can be devoted

to it. It would also be highly desirable to review the assemblage alongside those from Sheaf Square, Suffolk Road, the Old Queens Head and, indeed, any sites excavated in the immediate vicinity with a view to establishing parallels between them and to producing a coherent account of the area during the 18th and 19th centuries which takes account of the depositional history and archaeology as revealed through excavation.

Clay tobacco pipe by Dr S D White

Introduction

A total of 1,219 clay tobacco pipe fragments were recovered from 147 different pipe-bearing contexts and a three unstratified groups, comprising 151 bowls, 1055 stems and thirteen mouthpieces. These fragments include 38 makers' marks (four moulded and 34 stamped) but a surprisingly small number of mould-decorated examples, just 27 fragments. More than three-quarters of the pipe-bearing contexts only produced ten or less clay pipe fragments, most of which are plain stems. In most cases this means that the pipe groups from this site are either too small or too mixed in nature to provide particularly reliable dating for these contexts. As with many of the sites excavated in Sheffield, the majority of the pipes recovered date from the late 18th or 19th century. What is significant about this assemblage, however, is that a number of the contexts include earlier pipes, reflecting use of the site during the late 17th and 18th centuries. These fragments also make an important addition to the available evidence for early pipe use in the city, and so form the focus of this report.

Methodology and treatment of the material

The pipe fragments from D-Campus have been individually examined and details of each fragment logged on an Excel spreadsheet. The layout of the spreadsheet has been based on the draft pipe recording system, which has been developed at the University of Liverpool (Higgins and Davey, 1994). Stem-bores of the bowl fragments and marked stem have been measured to the nearest 64th of an inch, using a ruler. In the case of the plain stems, only the surface treatment and a count have been given. Where more than one bowl occurs in a single context a simple sequence of letters, A, B, C etc. has been pencilled on to the bowl so that it can be traced in the catalogue. This reference letter code (Ref.) appears in the catalogue and in the illustration captions. A plaster cast has been made of the stamped marks and details have been entered into the National Clay Tobacco Pipe Stamp Catalogue (NSC), a copy of which is held by the National Pipe Archive at the University of Liverpool.

The pipes as archaeological evidence

Clay tobacco pipes are probably the most useful dating tools for archaeological deposits of post-medieval date. They are found almost everywhere, were short-lived and subject to rapid change in both size and shape. They can often be tied to a specific production site or, at the very least, to a regional centre. Subtle differences in their style and quality enable them to be used as indicators of social status as well as a means by which trade patterns can be studied.

As noted above, the pipes themselves were principally found as small or mixed groups, which do not provide particularly reliable dating evidence by themselves. Only 23 of the 147 contexts produced more than ten fragments of pipe, these range between eleven and 58 pieces, with a single context containing 149 fragments (Context 2131). The context summary below gives both the overall date range and the most likely deposition date, based on the pipe evidence, for each context group (Table 1).

Table 1. Clay pipe context summary

Ctxt	Area	B	S	M	Tot	Mkd	Dec or modified	Date Range	Dep. Date	Comments
1000	A	2			2			1800-1910	1800-1910	Plain stems one with traces of pale green glaze.
1000	A	4	27		31			1800-1900	1800-1900	C19th group with plain bowls and stems. Two of the stems are glaze (one green, one brown).
1503	A	2			2			1800-1900	1800-1900	
1505	A	2			2			1800-1900	1800-1900	
1506	A	6	1		7			1800-1900	1850-1900	Plain C19th stems and one nipple type mouthpiece.
1509	A	2			2			1800-1900	1800-1900	
1510	A	3			3			1800-1900	1800-1900	
1511	A	7			7			1800-1900	1800-1900	
1515	A	1	15	1	17			1800-1900	1800-1900	
1522	A	1	17		18	WILL WILD stem x1	Milled heel x1	1660-1770	1750-1770	Mixed group of mainly stems, one of which is marked WILL WILD from Rotherham. The only bowl fragment appears to be late C17th and has a milled band across the heel.
1525	A	1	2		3			1800-1900	1800-1860	
1537	A	6			6			1800-1900	1800-1900	
1545	A	1	11		12	FC x1	Coil x1	1750-1900	1800-1850	All stems are plain and of late C18th or C19th type. The bowl fragment is a very stylish coil from under the base of the bowl with the moulded initials FC.
1548	A	3	22		25	TW bowl stamp x1	Leaf decorated seams x1	1650-1880	1830-1860	Mixed group with fragments from the C17th through to the C19th. Group includes a nice C18th bowl with the letters TW stamped on the bowl facing the smoker.
1549	A	3	15		18			1780-1900	1830-1860	
1554	A	24			24			1780-1910	1780-1910	Group of plain stems of late C18th or C19th type. Three have traces of green glaze.
1565	A	4			4			1800-1900	1800-1900	
1566	A	6			6			1800-1900	1800-1900	

Ctxt	Area	B	S	M	Tot	Mkd	Dec or modified	Date Range	Dep. Date	Comments
1609	A	2	26		28	THE TROOPER x1	Baden Powell x2	1800-1910	1870-1910	All stems are plain and are rather small but of C19th type. The exception is a chunky stem with the moulded lettering THE TROOPER. The two bowl fragments join (fresh break) an have an image of Baden Powell with moulded milling.
1611	A		3		3			1780-1900	1780-1900	Plain stems late C18th or C19th type.
1617	A	3	5		8			1800-1900	1800-1900	Small scrappy fragments of C19th type.
1620	A		5	1	6			1800-1910	1800-1910	Plain stems and a mouth piece with green glaze.
1624	A		4		4			1800-1900	1800-1900	
1665	A	1	20		21	SMITHEMAN stem x1; MAN.....stem x1		1800-1920	1850-1920	Group of quite small and scrappy fragments includes a stem with the lettering SMITHEMAN & CO BROSELEY, and a second fragment with traces of a moulded mark reading MAN, possibly Manchester. The bowl is a plain spur form of C19th type.
1668	A		1	1	2			1800-1900	1800-1900	Single plain stem & burnt mouthpiece
1683	A	1			1			1800-1900	1800-1900	
1692	A	1	1		2			1800-1900	1800-1900	
1699	A	1	4		5		Segmented bowl	1800-1900	1800-1900	C19th fragments
1703	A		1		1			1800-1900	1800-1900	Single plain stem
1719	A		1		1			1800-1900	1800-1900	Single plain stem
1734	A	1	8		9	W bowl mark x1; WILL WILD stem x1; H stem mark x1		1700-1800	1750-1780	Good C18th group with nice bowl and contemporary stems.
1746	A		1		1			1800-1900	1800-1900	
1747	A		2		2			1800-1910	1800-1910	Plain C19th stems one with traces of green glaze.
1856	A		3		3			1780-1900	1780-1900	Three plain stems - one C18th type the other two most likely C19th
1863	A		1		1			1700-1800	1700-1800	
1914	A		1		1			1700-1800	1700-1800	
1963	A		1		1			1800-1900	1800-1900	

Ctxt	Area	B	S	M	Tot	Mkd	Dec or modified	Date Range	Dep. Date	Comments
1973	A	1			1		Unidentified decoration x1	1800-1900	1800-1900	C19th spur fragment with traces of moulded decoration
1974	A		1		1			1800-1900	1800-1900	
2000	A		3		3			1700-1900	1800-1900	Two C18th and one C19th stem
2013	A	1	2		3			1800-1900	1800-1900	
2017	A		1		1			1800-1900	1800-1900	
2028	A		3		3			1800-1900	1800-1900	Plain stems of C19th type
2044	A	3	5	1	9	WILD stem x1		1660-1770	1750-1770	Mixed group. The bowl, two joining fragments, is clearly C17th but the stem all appear to be C18th including a Wild stem.
2056	A		3		3			1700-1800	1700-1800	
2069	A	5	43		48		Masonic x1; flutes with moulded milling x1	1650-1900	1830-1880	Mixed group with fragments from the C17th to the mid to late C19th. One of the bowl fragments has traces of a Masonic design which is the same as those from Context 2106 (may be even from the same pipe).
2071	A		1		1			1700-1800	1700-1800	Single plain stem.
2076	A	1	2		3			1640-1800	1750-1800	Spur fragment that is most likely to be C18th but the two plain stems could be as early as the C17th.
2080	A		5		5			1650-1750	1650-1750	Late C17th or C18th stems.
2089	A	5	45		50	WILD stem x1	cut heel x1	1660-1750	1700-1750	Late C17th to C18th group. Some of the bowl forms are C17th types but the group includes a WILD stem mark that could be as late as the c1770s. All the stem fragments are good C17th or C18th types. Group includes a piece of bone.
2103	A		1		1			1700-1800	1700-1800	
2106	A	9	11		20	W bowl mark x1; WILD stem with midland border x1; WILL WILD stem x1	Masonic x2	1650-1860	1800-1860	Mixed group with fragments from the C17th to the mid to late C19th. Marks include an C18th bowl with a W facing the smoker together with two Wild stems. Four of the bowl fragments join to make one bowl and two join to make a second (all fresh breaks). Similar Masonic design from Context 2069 - may even be from the same pipe.
2109	A			1	1			1800-1900	1800-1900	

Ctxt	Area	B	S	M	Tot	Mkd	Dec or modified	Date Range	Dep. Date	Comments
2109	A	1	4		5			1650-1900	1650-1900	Only four fragments but include C17th, C18th and C19th material.
2114	A	1	6		7			1700-1800	1700-1800	
2118	A	1	2		3			1650-1700	1650-1700	Very small fragments but all appear to be C17th types.
2121	A		4		4			1800-1900	1800-1900	
2123	A		1		1			1700-1800	1700-1800	Single plain stem
2131	A		2		2			1680-1780	1680-1780	
2131	A		2		2			1700-1800	1700-1800	
2133	A	2	5		7		Flutes x2	1780-1900	1780-1900	Small group of fragments. The stems are all plain and of late C18th or C19th type. Both bowl fragments have fluted decoration.
2149	A	1	3		4			1700-1900	1700-1900	Very small scrappy fragments.
2176	A		2		2			1700-1800	1700-1800	
2211	A	4	2		6		Milled heel x1	1690-1800	1750-1800	Four joining bowl fragments from what appear to be a Transitional period pipe with a milled heel. The stems both seem to be late C18th
1522	A/D	2	24		26			1800-1900	1800-1900	C19th group. All stems plain.
2069	A/D	1	5		6	W? bowl mark x1; Midland border x1		1620-1770	1750-1770	Mixed group. Four of the plain stems are clearly C17th types and one could be quite early c1620-1640. The other stem is C18th with a Midland border. The only bowl is a mid to late C18th type with the letter W stamped on the bowl facing the smoker.
2071	A/D	4	43		47	SV stem x1; IH bowl X1		1660-1910	1660-1910	Mixed group of pipes. Earliest bowl is a spur form from c1660-1680 with SV across the stem; the other substantially complete bowl is a transitional form with an IH mark facing the smoker. The other two bowl fragments are too small to date accurately. All the stems are plain and range in date from the C17th to C19th on has traces of brown glaze.
2083	A/D		1		1			1800-1900	1800-1900	Single plain stem
2088	A/D		2		2			1700-1800	1700-1800	
2089	A/D	2	8		10			1640-1750	1640-1700	Group of what appears to be C17th fragments.
2106	A/D		2		2			1700-1800	1700-1800	

Ctxt	Area	B	S	M	Tot	Mkd	Dec or modified	Date Range	Dep. Date	Comments
2109	A/D		1		1			1800-1900	1800-1900	
2111	A/D		3		3			1800-1900	1800-1900	
2131	A/D		3		3			1700-1800	1700-1800	
2145	A/D	3	9		12			1660-1750	1660-1750	Very small group of scrappy bits, but likely to be late C17th or C18th.
2173	A/D	2	5	1	8			1690-1750	1690-1720	Good Transitional period group.
2174	A/D	1			1			1690-1730	1690-1730	
2176	A/D	1		1	2			1660-1750	1660-1750	Bowl fragment that appears to be C17th based on its fabric. Mouthpiece is also likely to be either C17th or early C18th.
2177	A/D	1			1			1700-1800	1700-1800	Very small bowl fragment which may well be C18th based on the fabric.
2180	A/D		1		1			1700-1800	1700-1800	Single plain stem
2185	A/D	1	1		2			1660-1800	1690-1720	Transitional period bowl with stem that is likely to be contemporary.
2229	A/D			1	1			1750-1900	1750-1900	Mouthpiece
1000	C	1	1		2			1800-1900	1800-1860	C19th bowl and stem.
1000	D	1	8	2	11			1800-1900	1800-1900	Two nipple type mouthpieces from short stemmed pipes; all the stems are plain C19th types. The bowl fragment is possibly part of a Cadger (giant) bowl.
1522	D	4	24		28		Flutes x1	1800-1900	1800-1900	Four of the stems have traces of green glaze.
1972	D		10		10			1650-1900	1650-1900	Mixed group of plain stems ranging from C17th to C19th types. One appears to be water-worn; another has green glaze.
2072	D	2	11		13			1750-1880	1750-1820	Group of mainly C18th types with one or two plain C19th stem fragments.

Ctxt	Area	B	S	M	Tot	Mkd	Dec or modified	Date Range	Dep. Date	Comments
2131	D	23	125	1	149	TW bowl stamp x2; IH bowl stamp x2; TC bowl stamp x1; TW? Bowl stamp x1; WILL WILD stems x2; WILD stem x1	Fluted bowls x3; ground stem x; milled heel x1	1700-1820	1760-1820	C18th and C19th material including a number of marked fragments. Although the majority of the material in this group appears to be C18th there are clearly some stem fragments that are C19th types.
2144	D		2		2			1700-1800	1700-1800	
2149	D	1	4		5	IH bowl mark x1		1700-1800	1740-1780	
2151	D		1		1			1700-1800	1700-1800	
2170	D	1			1			1700-1800	1700-1800	
2189	D	1	8		9	WILD stem x1		1720-1780	1720-1780	
2217	D		6		6			1700-1900	1700-1900	Mixed group of plain stems of C18th and C19th type.
2219	D		2		2			1700-1800	1700-1800	Joining fragments (fresh break)
2221	D	1			1		Scallops x1	1760-1800	1760-1800	
1000	D/A		11		11			1680-1900	1680-1900	Mixed group of plain stems one of which appears to have been water rolled.
1000	E		3		3			1800-1900	1800-1900	
1456	E		1		1			1680-1780	1680-1780	Single plain stem
1633	E		2		2			1700-1800	1700-1800	
1644	E		3		3			1660-1900	1660-1900	Group of mixed date with a fragment from C17th, C18th and C19th.
1754	E		1		1			1700-1800	1700-1800	Single plain stem
1782	E		4		4			1750-1850	1750-1850	
1799	E		2		2			1750-1900	1750-1900	
1801	E	5	3		8			1740-1780	1740-1780	C18th group; two of the bowl fragments join.
1802	E		2		2			1700-1800	1700-1800	
1812	E		4		4			1780-1880	1780-1880	C18th and C19th forms.

Ctxt	Area	B	S	M	Tot	Mkd	Dec or modified	Date Range	Dep. Date	Comments
1845	E	1	9		10		Royal Arms x1; stem with cut end	1700-1900	1850-1880	Most of the stems are plain and contemporary with the Royal Arms (c1850-1880) but one is an C18th type and has cuts on one broken end, possibly the result of doodling. one of the stems has pale green glaze.
1849	E		5		5			1750-1850	1750-1850	
1850	E	3	5		8	TC bowl stamp x1		1700-1800	1750-1800	Very small a scrappy bits of pipe but they include a rim fragment with a stamped TC mark facing the smoker. Stems are plain and worn but appear to be C18th.
1866	E		1		1			1750-1850	1750-1850	Single plain stem
1970	E		3		3			1750-1850	1750-1850	
1972	E	1			1			1830-1860	1830-1860	Plain spur bowl mid C19th
1000	F	3	1		4		Royal Arms x3	1800-1900	1850-1880	Plain C19th stem fragment but the bowl fragments all join (fresh break) and form a very nice bowl with the Royal Arms.
158	Tr 1	2	7		9			1800-1900	1800-1900	Plain bowl and stem fragments almost certainly C19th.
187	Tr 1		3		3			1800-1900	1800-1900	
U/S	Tr 1		2		2			1800-1900	1800-1900	
U/S	Tr 1	1	2		3		Acorn x1	1800-1900	1840-1860	
172	Tr 2		1		1			1800-1900	1800-1900	Single plain stem
192	Tr 2	1	1		1			1750-1850	1750-1850	Single plain stem
193	Tr 2		1		1			1800-1900	1800-1900	Single plain stem
194	Tr 2	1	7		8	THO WILD stem x1; unident stem x1		1700-1850	1750-1780	Bowl appears to be an C18th type, but only the rim survives; two marked stems both C18th rest of the stems most likely to also be C18th.
205	Tr 2	1	7		8			1800-1900	1800-1900	C19th group one of the stems appears to be water rolled.
265	Tr 2		1		1	THO WILD stem x1		1750-1780	1750-1780	Single plain stem
399	Tr 3		1		1			1800-1900	1800-1900	Single plain stem
420	Tr 3		1		1	WILL WILD stem x1		1750-1780	1750-1780	Single plain stem

Ctxt	Area	B	S	M	Tot	Mkd	Dec or modified	Date Range	Dep. Date	Comments
507	Tr 3	1	6		7			1700-1800	1720-1780	
438	Tr 4		1		1			1750-1850	1750-1850	Single plain stem
475	Tr 4		1		1			1800-1900	1800-1900	Single plain stem with traces of green glaze.
497	Tr 4		1		1			1800-1900	1800-1900	Single plain stem
503	Tr 5		1		1			1750-1850	1750-1850	Single plain stem
294	Tr 6		1		1			1750-1850	1750-1850	Single plain stem
U/S	Tr 6		1		1			1800-1900	1800-1900	Single plain stem with traces of green glaze.
U/S	U/S		2		2			1800-1900	1800-1900	Two stems loose in the bottom of the box from WYAS.
148			1		1			1800-1900	1800-1900	Single plain stem
149			7		7			1800-1900	1800-1900	
151			15		15			1800-1900	1800-1900	
161			4		4			1800-1900	1800-1900	
163			1		1			1800-1900	1800-1900	Single plain stem
171			3		3			1700-1800	1700-1800	Plain stems C18th type.
177			2		2			1800-1900	1800-1900	
442		1	34		35		Ground stem x1	1750-1850	1750-1850	Single C19th bowl fragment. Stems all plain and of C18th or early C19th type. One stem has a ground end.
459			1		1			1700-1800	1700-1800	Single plain stem
478		10	44	1	55	DEE x1	Grape vines x1	1800-1900	1830-1850	Three of the bowl fragments join (grape vines) with the moulded lettering DEE on the smokers left. Joseph Dee is known to have been working in Sheffield from c1834-1852. The rest of the bowls are plain. All stems are plain and would appear to be contemporary.
484			1		1			1700-1800	1700-1800	
489			2		2			1700-1800	1700-1800	
490		6	52		58		Leaf decorated seams x1	1750-1880	1830-1860	Group includes one piece of pot. Reasonably fresh, contemporary looking group.
2066			4		4			1700-1800	1700-1800	

Ctxt	Area	B	S	M	Tot	Mkd	Dec or modified	Date Range	Dep. Date	Comments
2072		3	41		44	Midland border x1; WILD stem x1; THO WILD stem x1	Ground stem x1	1750-1900	1750-1780	Majority of the stems and bowl fragments would appear to be late C18th with the inclusion of two WILD stem stamps (one definitely Thomas Wild, the other possibly William Wild). Both Thomas and William Wild are known to have been working Rotherham at the end of the C18th. There is also part of a Midland Border mark which may be associated with one of the Wild makers. The bowl fragments are quite small but would also appear to be C18th. Most of the stems would appear to be contemporary but there is one that has traces of brown glaze that is most likely to be C19th. Group includes a piece of bone.
2129			3		3			1700-1900	1800-1900	One C18th and two C19th
2171			1		1			1790-1850	1790-1850	
2187			1		1			1750-1850	1750-1850	Single plain stem
<i>Totals</i>		151	1055	13	1219					

Approximately 86% of the assemblage is made up of stem fragments and the vast majority of those are plain, which are particularly difficult to date accurately. The general appearance of the stem fragment and the size of the bore, however, can often give an indication of the likely century in which it was produced. Stem dates should always be used with caution since they are much more general and less reliable than the dates that can be determined from the more diagnostic fragments such as the bowls or marked fragments.

All of the context groups produced pipe fragments that had clearly been mixed and turned around with fragments that are generally quite small and abraded. This is perhaps not surprising given that many of the contexts from which the larger groups of pipes were recovered have been identified as being made ground or parts of demolition layers.

By far the largest group of pipes from the site was recovered from Context 2131 in Area D, comprising 23 bowls, 125 stems and a single mouthpiece, 149 fragments in total. All of the fragments from this particular context would appear to be either 18th or early 19th century in date and includes a number of 18th century marked bowl and stem fragments.

Having considered the pipes as archaeological evidence, the pipes themselves will now be discussed under two headings – ‘The bowls’ and ‘The marked and modified stems’.

The bowls

A total of 151 bowl fragments were recovered from the excavations. The majority of these, 66 (44%) were 19th century types, but the assemblage includes a reasonably number of 18th century bowl forms (43 or 29%) a number of which are marked. A breakdown of the number of bowl fragments by broad century is given in Table 2 below.

Table 2. Century range for bowl fragments

Bowl Fragments <i>(Broad Century Range)</i>	Qty	%
17th Century	12	7%
Late 17th – early 18th Century	16	11%
18th Century	43	29%
Late 18th – early 19th Century	12	8%
19th Century	65	44%
Date uncertain	2	1%
<i>Totals:</i>	<i>151</i>	<i>100%</i>

The excavations produced only a small number of 17th century bowl fragments, just twelve in total accounting for just 7% of the entire assemblage. Seventeenth-century bowls in South Yorkshire are dominated by heel types (Fig. 1, Appendix 7), which is typical of the Civil War Period (ie. c1640-1660). Spur forms are much less common in Yorkshire generally but particularly in the south of the county. It is therefore, unusual to find two spur forms in this assemblage (Fig. 2 and Fig. 5, Appendix 7), which may well represent products from outside

of the county. Figure 2 is interesting because it is stamped with the initials SV on the stem, the S having been reversed by the die cutter. Pipes of this type have a very strange distribution pattern across the county and have been found as far afield as Plymouth in the south and Newcastle in the north. For the mid to late 17th century the concentration appears to be centred around South Yorkshire and into Lincolnshire, although odd examples do turn up in East Yorkshire and down into the Midlands. There has been much debate over the use of this type of SV mark. It has been suggested that the mark may be some sort of quality mark. Although marks used in this way are known on the Continent, motifs used purely and simply as a mark of quality are not known on any English pipes of this period and so it would seem unlikely that the SV mark was used in that way. What is more likely, given the chronological as well as geographical distribution of these marks, is that they represent the products of at least two or three generations of a prolific pipe-making family with the surname initial V. At present that family remains unidentified.

The Transitional Period, c1690-1720, is represented by sixteen pipe bowls accounting for approximately 11% of the total assemblage. Bowls of this period develop into long, narrow and forward leaning forms (Figs 3, 4, 6 and 7, Appendix 7). In the east and parts of the south of the county this forward lean becomes very pronounced. Two of these transitional forms, and one of the later 18th century bowls, are marked with the initials IH on the bowl facing the smoker (Fig. 7, Appendix 7). To date there are no known makers of the right date in Yorkshire with these initials, but other examples of this particular bowl form marked with the similar IH stamp have been recorded in Doncaster (White 2004, 384). It is therefore possible that the Doncaster examples and the two examples from D-Campus were produced by a previously unrecorded maker in the Sheffield/Doncaster area.

By the 18th century pipe bowls gradually become more upright and the bowl walls become thinner, which means that they are much more prone to breaking and crushing as a result, and few survive well in the archaeological record. The assemblage from D-campus, however, produced a good number of 18th century bowls many of which are marked. It is interesting to note that of those 18th century bowls that are marked almost all are also burnished. The process of burnishing was carried out once the pipes had been trimmed and prior to firing or marking. This was a time consuming part of the manufacturing process and resulted in a more expensive pipe. The presence or absence of burnishing and its quality may, in some production centres, be used as an indicator of status. Analysis of marked and burnished pipes in Yorkshire would indicate that during the 18th century only a small number of pipes will be burnished but between 60%-90% of them will also have a stamped mark.

A total of ten 18th century bowls from D-Campus had stamped marks, seven of those bowls were burnished. Details of these marked bowls are given in Table 3 below together with a suggestion as to who may have produced them.

Table 3. Marked bowls

Mark	Qty	Contexts	Possible Maker	Die	Fig. No.
TC	2	1850; 2131 (Ref. B)	Thomas Crew, Sheffield	2052	15 & 16
IH	1	2071 (Ref. B)	Previously unrecorded maker from Doncaster/Sheffield area	2026	9
TW	4	2131 (Ref. A, B & D); 1548 (Ref. A)	Thomas Wild, Rotherham	2055	11, 12 & 13
W	3	1734; 2069; 2106 (Ref. B)	A member of the Wild family, Rotherham	473 & 2149	10

The 19th century is represented by the majority of the bowl fragments, 65 fragments or 44% of the total assemblage. Approximately 43 of these fragments are plain and all are typical of the period. Just three of the plain bowls have been illustrated to give an indication of the range of forms present on the site (Figs 26, 27 and 28). The rest of the 19th century bowls are mould decorated and the different decorative schemes and motifs are discussed below in alphabetical order.

Acorn (not illustrated).

One example of an acorn pipe was recovered from an unstratified deposit in Trench 1, dating from c1840-1860. Only the lower half of the bowl survives but it appears to have a large oak leaf on the seam away from the smoker with the spur moulded in the form of a small acorn. The acorn motif was popular in the 19th century and a number of makers, throughout the country, produced pipes with an acorn theme.

Baden Powell? (Fig. 34).

Context 1609 produced two joining bowl fragments from a pipe with moulded milling at the rim and a military figure in a wide-brimmed hat on the right hand side of the bowl. There would almost certainly have been an identical bust on the other side of the bowl and these probably represent Baden Powell. Although best remembered today for founding the Scout Movement in 1907, Powell had previously become a national hero in 1900 when he was Lieutenant General of the British Army during the Siege of Mafeking in 1899/1900. The style of this pipe is typical of examples produced in London and it was almost certainly imported from there, c1900-1910.

Coil (Fig. 30).

Only the lower part of the bowl survives with a coil motif in place of the spur. This fragment was recovered from Area A, Context 1545 and is likely to date to c1830-1860. Although only a small fragment of the bowl survives it is interesting in that it is marked with the makers initials FC on either side of the coil, in crisply executed letters. There is only one known maker with the initials FC working in Sheffield at this date, Frederick Cartwright. He appears in the 1851 census as a pipemaker living with his mother Anna, also a pipemaker, and three siblings. The last reference to him as a pipemaker is in White's Trade Directory for 1852. There is no trace of him in the 1861 census, but by 1871 he re-appears with a wife and a

young family living at 6 West John Street, Sheffield. His occupation is given as a steel maker so he has clearly given up pipe making.

Faceted (Fig. 29).

A single bowl fragment from Area A, Context -, which is designed to look as though the bowl has been faceted. Each side of the bowl appears to have four “facets” and the spur is decorated and is most likely to date from c1800-1880.

Flutes / Flutes and Dots / Scallops (Fig. 25).

Flutes were one of the first and most common forms of decoration on bowls of the late 18th and 19th century. Wider, broader flutes, or scallops, often with dots or enclosing loops tended to be more common at the end of the 18th century with narrow flutes becoming more common in the mid 19th century.

The excavations at D-Campus produced nine bowl fragments with flutes or scallops – two with narrow flutes, one of each from Contexts 1522 and 1973; two with scallops, one from Context 2069 (Ref. B) and from Context 2221; five with flutes and dots, three fragments from Contexts 2131 and two fragments from Context 2133.

The majority of the fluted bowls recovered from the site are small and fragmentary, but the one example from Context 2069 is substantially complete (Fig. 25). This particular example has a distinctive floral motif on the seam away from the smoker, as well as the wide scallops on either side of the bowl. This arrangement can be most closely paralleled with pipes that were being made in Lincoln and Boston at the end of the 18th century and into the early 19th century, by makers such as James Naylor of Boston (*fl.* 1761-1775), William Turpin of Boston (*fl.* 1790-1823), and a maker called Robinson of Lincoln, who appears to have been a contemporary of Naylor but who is only known from his pipes (Walker & Wells, 1979, 15).

In addition, this particular example has a distinctive mould line around the rim, which would suggest that the mould itself has been repaired. During the manufacturing process a knife was pushed across the top of the pipe, whilst it was still in the mould, in a slot specially design for this purpose. This gave the pipe its clean-cut rim, but the continual action of the knife on the slot itself eventually caused the mould to become slightly dished at this point. This wear was repaired by inserting a new piece of metal into the mould, but often this new insert left a tell-tale line around the top of any pipes that were subsequently produced from it.

Leaf Decorated Seams (Fig. 32).

Just three small bowl fragments with traces of leaf-decoration on the seams were recovered; one from Context 442, one from Context 490 (Ref. D) and one from Context 1548 (Ref. C). All three date from c1830-1860.

The example from Context 490 (Fig. 32) has two interesting additional features. The first is a production flaw on the side of the bowl on the smokers left. This is similar to a feature that has been noted on a number of bowls of this period from Sheffield (Plate 1).

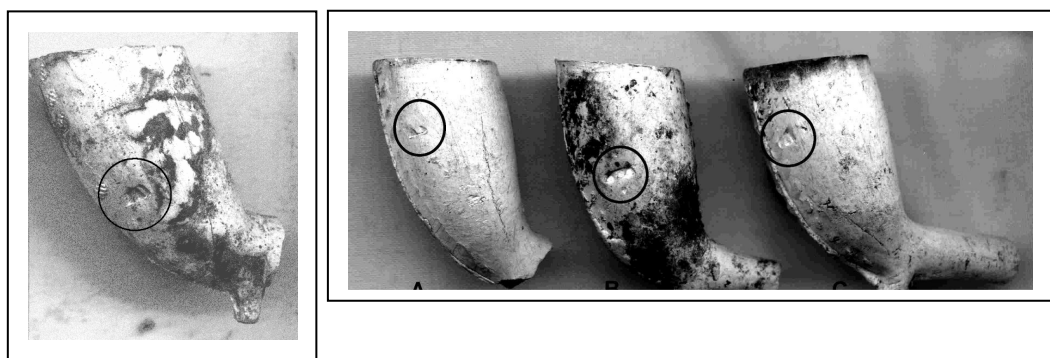


Plate 1: Post-moulding flaws (circled). The pipe on the left is an example from Sheaf Square, Sheffield. The three bowls on the right (A, B and C) are examples from Suffolk Road, Sheffield

One of the results of producing clay pipes in a metal mould is that the clay took up any small nicks, scratches or surface defects on the mould's surface, thereby producing a unique 'fingerprint' for that particular mould. Identification of these mould flaws can help to identify the pipes produced in the same mould and, by studying marked pipes or kiln groups, this can give some indication of the number of moulds an individual pipemaker may have been using. The flaw identified on one of the pipes from D-Campus, and which matches some of those from Sheaf Square and Suffolk Road in Sheffield, is different in that it was not introduced to the pipe from the mould itself but appears to have been caused by something being pressed or knocked against the pipe bowl during the manufacturing process.

When comparing the known examples it is clear that the position and exact nature of the flaw varies slightly, therefore whatever created the mark is not being pressed into the bowl side in exactly the same way each time. It would appear that whoever was finishing the pipes was knocking or catching the pipe on something that left a distinctive impression prior to firing. The similarity of these marks clearly links the D-Campus example and the Sheaf Square and Suffolk Road examples to the same workshop.

The other interesting feature about this particular bowl from D-Campus is the fact that it has an internal bowl cross. Internal bowl crosses, or marks, are formed by a cut or a mark on the end of the stopper that was used to form the bowl cavity during the manufacturing process. In his study of bowl crosses found in pipes from London, Jarzembowski suggested that one of the purposes of these marks was to prevent the stopper from sticking when pressed into the bowl (1985, 394). In Jung (2003) an account is given of the manufacturing process employed by the pipe maker Gordon Pollock of Manchester. When describing the stopper Gordon Pollock refers to 'roughing up scars' on the tip of the stopper which were produced by 'firm taps of a crisp heavy steel file' (*ibid* 11). The account presented by Jung goes on to explain that these 'scars' were to help prevent the walls of the pipe being sucked in when the stopper was removed, and the internal bowl crosses may well have served the same function.

Only two of the bowls from D-Campus have an internal bowl cross, but both appear to be of an unusual type with a triple cross bar (Fig. 32). Similar types of internal bowl cross have also been noted in bowls from a number of sites in Sheffield including Riverside Exchange, Nursery Street, Suffolk Road and the Ring Road. Although no systematic survey has been carried out on the internal bowl crosses nationally it does appear that this particular type, with either a double or triple cross bar, is a feature used by a maker, or makers, from Sheffield during the 19th century.

Manchester Ship Canal (not illustrated)

Context 1665 produced a very small stem fragment with traces of moulded decoration and some partial lettering reading MAN. It is possible that this would have read Manchester originally, although the placing of this lettering would normally be reserved for either the maker's name or the pattern name. Given that the traces of moulded decoration could represent water, it is possible that this pipe commemorates the Manchester Ship Canal. A number of pipes with this decorative motif were produced in the 19th century but this particular example bears closest similarities to a design registered by John Blenkin Smith of Manchester in 1885 (Hammond 1992, 28).

Masonic (not illustrated)

Three small bowl fragments with traces of Masonic motifs were recovered from the excavations; one from Context 2069 (Ref. A) and two from Context 2106 (Ref. C & D). All three fragments date to c1830-1860.

Royal Arms (Fig. 33)

A total of four fragments, three of which join, representing two individual bowls decorated with the Royal Arms were recovered from the excavations. The three joining fragments came from Context 1000 (Fig. 33) and the single fragment from Context 1845. Both bowls are likely to date from c1850-1880. The designs of both examples are very similar, although the detail on the one from Context 1000 is perhaps a little crisper. The seam away from the smoker is decorated with leaves. On the smoker's right is a unicorn and on the smoker's left a lion. Below the supports is a banner with the motto *DIEU ET MON DROIT*. The roundel facing the smoker contains a simple cross and bears the motto *HONI SOI QUI MALY PENSE*.

Vine Leaves (Fig. 31)

Context 478 produced three joining fragments from a bowl decorated with vine leaves, c1830-1850. The design comprises a central panel decorated with a grape vine, bordered on both sides by leaf-decorated seams. Below the rim, which is decorated with moulded milling, is the letter DEE. The other side of the bowl at this point is missing but would almost certainly have had the lettering SHEFFIELD. Joseph Dee was a pipe maker working in Little Pond Street, Sheffield c1833-52.

The marked and modified stems

In addition to the marked bowl fragments a total of 21 marked stems, and three ground/modified stems, were recovered. These are discussed below in alphabetical order followed by the ground/modified stems.

H (Fig. 24)

Marked stem fragment recovered from Context 1734, bearing the relief stamped initial H across the stem. The stem is burnished and has a stem bore of 5/64" and is most likely to date from c1650-1700, maker unknown.

R. Smitheman (not illustrated)

A single stem fragment marked R SMITHEMAN & CO BROSELEY was recovered from Context 1665. Rowland Smitheman founded The Crown Pipeworks in King Street, Broseley, Shropshire in 1881. Following Rowland's death in 1903, the business passed to his son, also called Rowland, and his widow Clara Ann. The last known reference to the firm is in a directory of 1917 (Higgins 1987, 488-489). This particular stem from D-campus could therefore date from anywhere between 1881 and c1917.

Tho Wild (Figs 19 and 20)

Six stem fragments representing two different roll-stamped marks of Thomas Wild of Rotherham were recovered from the excavations. Three examples of the first type of mark (Die No. 1832 – Fig. 20) were recovered - two from Trench 2, Contexts 194 and 265, and one from Area A/D, Context 2072. In all three instances the stem fragments are burnished and have a stem bore of 5/64". There were also three examples of the second type of mark (Die 1833 – Fig. 19) were recovered – two from Area A/D, Contexts 2069 and 2072, and one from Area A, Context 2044. This second mark is much more elaborate and includes elements that are similar to a Midland type border. The Midland Borders comprise a series of incuse, hatched ovals or circles, interspersed with dots and dashes, and usually a border of horse-shoe shaped motifs. Variations of this type of decoration can be found over a very wide area from the North-East, through Nottingham, Leicester and Cambridge.

There are possibly three recorded makers by the name of Thomas Wild, all working in Rotherham in the 18th century (White 2004, 185). Thomas Wild (1) is mentioned in the apprenticeship records when his son Robert is taken on as an apprentice to a file smith in Attercliffe in 1716. Thomas Wild (2) appears in a marriage register in the year 1718. It is unclear if this is a different Thomas Wild, or if it is Thomas Wild (1) marrying for a second time. Finally, Thomas Wild (3) appears in the Quarter Sessions Registers in 1777. Stylistically the marks from D-Campus can be dated to c1750-1790 and so they are most likely to have been produced by Thomas Wild (3).

Will Wild (Fig. 21)

A total of ten roll-stamped WILL WILD marks were recovered from the excavations – one from Trench 3 Context 420; four from Area A, which yielded one each from Contexts 1522,

1734, 2089 and 2106; one from Area A/D, Context 2072; three from Area D, Context 2131 and one from Area D Context 2189. All of these marks appear to have come from the same die, No. 1925.

There is only one known maker with the name William Wild (White 2004, 185). He was working in Rotherham and is almost certainly from the same family as Thomas, discussed above. William appears in the records in 1764 when he married Sarah Marsden who may well have been related to another Rotherham pipemaker Benjamin Marsden. William then turns up again in 1774 when he is mentioned in Guest's *History* (Oswald 1975, 202).

Wild (Fig. 22)

A single stem fragment with an unidentified Wild mark was also recovered from the excavations (Area A, Context 2106). Only the surname WILD is clearly legible so it is impossible to tell if this is a product of Thomas or William. What is certain is that the die is clearly a different type and this has been identified as Die 2181 (Fig. 22). As with one of the Thomas Wild dies discussed above, this example includes a Midland Border type element in the design. In this particular instance the lettering WILD appears inside the small ovals.

Trooper (not illustrated)

Area A, Context 1609 produced a stem with the moulded pattern name THE TROOPER in incuse lettering along the stem. This would almost certainly have come from a heavy Irish style pipe originally. A number of the larger 19th century pipe manufacturers would have produced this particular pattern of pipe such as Holland's of Manchester, their pattern number 445. Also, Pollock's also of Manchester, although their example of the Trooper pipe does not appear to have had lettering on the stem.

Unidentified (Fig. 23)

In addition to those stem marks that have been discussed above, the excavations included an unidentified stamped stem fragment, from Trench 2, Context 194. Unlike some of the other stamped marks from the site, this particular example does not include any lettering and therefore any hint as to who the maker might have been. This particular example is purely decorative and appears to consist of a roundel containing a floral motif. This has been recorded in the National Clay Tobacco Pipe Stamp Catalogue as Die No. 2182.

Ground/Modified Stems (Appendix 7, Figs 17 & 18)

The modification of stems can take a number of forms but usually occurs for one of two main reasons. Firstly the grinding or scraping of the stem for reuse after the original mouthpiece has broken off. This type of modification is characterised by even grinding around the end of the stem and, occasionally, by the appearance of tooth wear on the stem. Context 2044 produced a mouthpiece fragment that appears to have been ground slightly. In this particular instance it is possible that the mouthpiece was chipped or rough and that it was simply ground down a little to make for a more comfortable smoke.

The second type of modification is when the stem has been used as a medium with which to draw or write graffiti resulting in the formation of distinct facets at one, or both ends of the stem. Two stem fragments from the D-Campus site have this second type of modification. The first fragment was recovered from Context 442 (not illustrated) and has been ground at one end only. The second fragment, from Context 2072, has been ground at both ends (Fig. 18).

The assemblage from D-Campus is interesting because it includes a stem that has been modified in a more specific way. Context 1845 produced an 18th or early 19th century stem that has had one of its broken ends cut in a spoke-like pattern (Fig. 17). There is evidence to suggest that stem fragments modified in this way may have been used as a stamp to mark pipes although star or wheel patterns of this type would be more typical of the 17th century. What is more likely is that this is an example of some idle doodling in much the same way as one might whittle away, or work, a piece of wood to pass away some spare time.

Conclusions

The excavations at D-Campus produced one of the few substantial groups of 18th century pipes from Sheffield. Although the presence of 18th century pipes in the form of marked stems is known from many other sites in Sheffield this is the first time that the associated bowls have been found. This may in part be due to the nature of 18th century pipe bowls, which on the whole often have very thin walls that crush easily and which therefore do not survive well in the archaeological record. Many of the 18th century bowls recovered from D-Campus appear to be slightly more robust than might be considered the norm. This could be a feature that is peculiar to the Sheffield area and may well have contributed to their survival. What is useful is that they give some indication as to the bowl forms that may have accompanied the elaborate stem stamps that were being produced by members of the Wild family in Rotherham. Although there is no conclusive proof that the Thomas Wild stems go with the bowls stamped TW it is considered highly likely that they do.

The later material is also interesting and adds to the growing picture of pipe production and consumption in Sheffield. It provides further evidence for individual pipemakers such as Frederick Cartwright and Joseph Dee, as well as for workshop practises and techniques in the form of the manufacturing flaws and internal bowl crosses.

Metal alloy by Ken Hawley

The majority of these finds were from the levelling type deposit, context 1000 which covered most of the site.

Table 4: Metal alloy finds from context 1000

Context	Area	Description
1000	A	Ceramic rectangular U shaped vessel (3¾ inch long, 9/16 inch wide, 5/16 inch deep), one rounded end and one square end with a central indentation. It contains a red brown coke like residue. The vessel has warped and shows that it has been subject to intense heat. We are unable to identify what process this may have been used for. This artefact was sent to Jennifer Jones for further investigation and is reported on below.
1000	A	One piece of sheet lead gasket, outer diameter 83mm inner diameter 58mm. Possibly for an outlet drain that may have been used with acids.
1000	A/D	Three pieces of metal: one 1¼ inch tack, one piece of spun of stamped brass with outer diameter of 45mm, possibly from a piece of hollowware, one rectangular piece of brass plate 36mm x 10mm x 1mm.
1000	D	Three pieces of off-cuts from stainless steel plate: two pieces of sheared plate scrap, 162mm x 5 mm at widest end tapering to a point and 26mm x 6mm. One piece of perforated sheet, 18mm x 3mm at widest point, possibly strainer from hollowware manufacture.
1000	D	Three pieces of non ferrous wire, most likely brass, lengths 100mm, 100mm and 50mm. They have been shaped to make circular loops possibly for use to suspend objects in an electroplating process
1000	E	Four pieces of disc grinding wheel, broken. These are early examples of machine grinding wheels. They have no reinforcing and so date to 1930s. One rosewood handle scale (5¼ inch long and 1½ inch wide) for a butcher or pallet knife.
1000	E	Eight stainless steel table knife blades: seven straight and one scimitar pattern. Five complete blades, two tips of blades, broken and one base and bolster.
1000	E	Eleven stainless steel table knife blades: six straight, ground and five scimitar, ground and unground. One piece of ferrous strip 3½inch long
1000	E	One broken table knife blade, straight. Too hard.
1000	E	Eight table knife blades: seven straight, one scimitar. Two complete blades, six broken blade tips – four too hard and two too soft.
1000	E	Four pieces of disc grinding wheel, broken. Examples of early machine grinding wheels, no reinforcing so dating to 1930s. One rosewood scale (5¼ inch long and 1½ inch wide) for a butcher or pallet knife.
1000	E	One table knife blade, broken, straight blade.
1000	E	Seven table knife blades. One shaped piece of brass, possible one piece of flatware tongs before shaping.
1000	E	Four table knife blades, ground, three scimitar shape.
1000	E	One nickel silver teaspoon, Old English pattern. Length 128mm.
1000	E	Part of a round ceramic light switch with brass and iron switch fittings, dating to no later than the 1930s.

The following finds were unstratified.

Table 5: Unstratified metal alloy finds

Context	Area	Description
u/s	T4	Eleven knife blades: ten straight and one scimitar
u/s	TR1	One piece of steel scrap, the end of a steel bar 54mm, 44mm, 20mm, machined on four sides before being cut to length.
u/s	T1	Two discs

The following finds were from numbered contexts.

Table 6: Metal alloy finds by context

Context	Area	Description
197	T5	Two pieces of cast aluminium pieces, bars with square U shaped end pieces. Length 118mm x 30mm x 24mm. Most probably used within the electroplating process.
197	T5	One piece of ferrous metal, length 42mm, probably relating to electroplating process.
280	TR6	One oval shaped piece scrap from stamping process, 36mm x 33mm at widest points. It is possibly nickel silver and most likely relates to flatware or hollowware production.
357	T4	One table knife blade, 5 ½ inch straight blade, egg waterloo bolster and round tang.
490		One piece of circular brass, dished diameter of 35mm with a rectangular central hole 6x3mm. Most likely an end cap for a large knife handle. One piece of ferrous plate, length 55mm, heavily corroded.
1862	A	One coffee spoon, length 125mm, Old English Pattern.
1972	A	One piece of corroded ferrous material, length 148mm, curved and possibly rectangular in section, heavily corroded.
2072	E/D	Tang and bolster from a table knife.
2131	D	One piece of ferrous material, length 48mm, corrosion indicates that it possibly relates to the electroplating process.

Conclusion

The pieces of disc grinding wheel are early examples of machine grinding wheels dating to about the 1930s. This date is indicated as the grinding wheels do not have internal reinforcing to prevent the wheel from ‘flying’ (breaking and coming away from the machine at speed).

Some of the knife blades have been ground and the curved grinding marks indicate that these were machine ground. The presence of broken blades indicates that the hardening process was not always carried out satisfactorily. Some blades were too hard and some too soft.

The rest of the finds are not particularly significant but do show that metal working was taking place on the site in the early-mid 1900s. This metal working included grinding of cutlery and electro-plating with some potential evidence for flatware and hollowware production.

Ceramic building material by Alan Vince and Kate Steane*Introduction*

A collection of 227 fragments of ceramic building material, weighing in total 222.506 Kg, was submitted for identification and assessment. The finds are probably all of late 19th century and later date and include several architectural features which are consistent with use in a late 19th century factory building.

Factual Data

The 227 CBM fragments were recovered from 35 contexts and provide broad dating evidence for the deposition of these contexts. All material of mid/late 19th century or later date is classed in Table 7 as “MOD” and all others as “PMED”. It should be noted, however, that much of the latter consists of unfrosted bricks and pantile fragments which could easily be of similar date, but could potentially be earlier.

Table 7: Ceramic building material by context

Context	MOD	PMTIL	Total
103	1		1
105		2	2
150	1		1
159	1		1
193		1	1
194		5	5
197	3		3
205	2		2
266		7	7
272		4	4
311	4		4
442		2	2
473	4		4
490		4	4
497		1	1
507		2	2
1000	5	2	7
1010		1	1
1503	3	2	5
1506	2		2
1511	1		1
1523		1	1
1537	3	3	6
1545		1	1
1546	1	2	3
1553		1	1
1558	3	4	7
1561		1	1

Context	MOD	PMTIL	Total
1569		1	1
1699	2	1	3
1715	1		1
1757		2	2
1802		5	5
1862		1	1
1869		1	1
1914		1	1
1926		1	1
1976		3	3
2012		1	1
2015		2	2
2018		2	2
2026		1	1
2071		23	23
2074		3	3
2109		63	63
2114		1	1
2116		1	1
2118		1	1
2131		4	4
2133		2	2
2134		5	5
2149		1	1
2151		1	1
2170		1	1
2229		5	5

The fabric was examined visually and 34 fabrics were identified. In addition, fragments of stoneware drainpipes, sinks and drains were present and some fragments could not be assigned a fabric (Table 8).

Table 8: Ceramic building material by fabric

Subfabric	NoSH	NoV	Weight
ENGS	9	8	11813
FAB01	2	2	3725
FAB10	1	1	216
FAB11	1	1	413
FAB12	2	2	7546
FAB13	2	2	3977
FAB14	1	1	3471
FAB15	1	1	3993
FAB16	1	1	4026
FAB17	3	3	1014

Subfabric	NoSH	NoV	Weight
FAB18	1	1	162
FAB19	1	1	776
FAB02	6	6	6298
FAB21	1	1	3396
FAB22	1	1	4370
FAB23	1	1	3572
FAB24	2	2	7636
FAB25	1	1	4341
FAB26	2	2	8612
FAB27	1	1	3210
FAB28	1	1	2943
FAB29	1	1	2000
FAB03	34	32	75153
FAB03	3	3	17
FAB30	1	1	2809
FAB31	1	1	1123
FAB32	1	1	3976
FAB33	1	1	591
FAB34	2	2	440
FAB04	54	49	18494
FAB05	23	22	4612
FAB06	3	3	10767
FAB07	3	1	2453
FAB08	1	1	3725
FAB09	49	49	10405
PMTIL	2	2	14
Total	220	209	222089

The fragments could almost all be assigned to a form (Table 9). In several cases, the exact manner in which the object was used cannot be determined without examining standing structures incorporating the same forms, or by examining photographs of such structures.

Table 9: Ceramic building material by form

Form code	Description	NoSH	NoV	Weight
No form	No form	1	1	413
BRICK	Brick	95	88	168401
BRICK/SKIM	Brick with plaster skim	2	1	7
BULLNOSED BRICK	Bull nosed brick	2	2	3888
CHIMNEY POT	Chimney pot	1	1	776
CURVED BRICK	Curved brick	1	1	3572
DRAIN	Drain	3	2	770
FIRE BRICK?	Fire brick?	2	2	4809
GROOVED BRICK	Grooved brick	1	1	1123
GUTTER/DRAIN	Gutter or drain	2	1	600

Form code	Description	NoSH	NoV	Weight
PANT	Pantile	97	96	21206
PENTANGULAR BRICK	Pentangular brick	1	1	3993
RIDGETILE	Ridge tile	1	1	642
SEMI-CIRCULAR BRICK	Semi-circular brick	4	4	3768
SINK	Sink	6	6	7905
SURROUND	Surround	1	1	216
Total		220	209	222089

Thirteen bricks have manufacturer's names or other inscriptions impressed or moulded into the surface (Table 10). The named manufacturers were mainly located in Sheffield but include one Leeds brickworks. With some research, it should be possible to establish the location of each brickworks, its period of activity and, possibly, the date range of individual dies.

Table 10: Ceramic building material with lettering

Form	Description	NoSH	NoV	Weight
BRICK	Frogged top and bottom, KAYE & DARWIN WINCOBANK moulded into brick, Sheffield Brickworks.	1	1	3725
	Frogged top only with rect scoop, ROBINSON SHEFFIELD.	2	2	8612
	Frogged top with ROBINSON SHEFFIELD and slightly frogged base	1	1	4026
	Oval frogging with WOODSIDE in raised lettering	1	1	4070
	Oval scooped frogging with ROBINSON SHEFFIELD in raised lettering, slight scoop in base	1	1	4341
	Rect frogged brick with bar across, FARNLEY stamped diag one part, IRONCo diag other with LEEDS moulded across bar. Other side same frogging etc.	1	1	3300
	Rect frogging 12 deep top with ROBINSON SHEFFIELD stamped into it, slight frog base	2	2	7636
	Rect frogging top and bottom, W 2 2 S along and INO:I across	1	1	3471
	Rect frogging GREGORY impressed in it	1	1	3977
Bullnosed brick	Bullnosed with 100 dia, frogging with GREGORY impressed	1	1	0
Curved brick	Slight curve for over a door/window, frogged with 24 impressed, LGTH 185-220	1	1	3572
Total		13	13	47030

Statement of Potential

There is clearly considerable variability in the D-campus ceramic building material and further study could establish how the various forms were used, their sources and periods of use. In addition, that characterisation of the clays used in the various brickworks would be

useful both to enable bricks and other products which were not marked to be assigned to a brickyard and, more generally, as a means of establishing the character of clays in Sheffield and Leeds for comparison with ceramics of unknown origin. Therefore, characterising the fabric of the stamped bricks certainly has potential for further study on a local/regional scale (given that bricks from Leeds were used on this site). It would also be possible to compare a sample of pantiles with the marked bricks to see whether or not these were made in the same brickyards.

Mortar and plaster by Alan Vince and Kate Steane

Introduction

Seven samples of mortar and plaster, recovered during archaeological investigations of the D-Campus site were submitted for identification and assessment. From the character of the associated finds and stratigraphy, the finds are probably all of late 19th century or later date.

Factual Data

Four samples of mortar and three samples of plaster were submitted for assessment (Table 11). They come from six contexts (context 1605 produced both mortar and plaster samples).

Table 11: Plaster and mortar by context

Context	Mortar	Plaster	Total
205		69	69
1577	63		63
1604		44	44
1605	91	39	130
1606	87		87
1508 lower wall	24		24
Total	265	152	417

The mortar was examined at x20 magnification. All four samples appear to be lime mortars. Most are disaggregated, powdery samples which are probably contaminated with the sediment matrix in which they were found but lumps large enough for analysis survive in each case. Muscovite, sandstone, chert, coal and probable slag were noted in the mortars.

The plasters include a fragment from context 205 which has a thick lime plaster skim on a backing of grey cement containing abundant coal and slag sand. Context 1604 produced a fragment with a lime mortar similar to the other mortars with a thin lime plaster skin (with a light grey colour, perhaps from post-burial staining). A similar fragment, with a less pronounced stain, was recovered from context 1605.

Industrial residues by Jennifer Jones

Quantification

Industrial residues with a total weight of 24.476kg were received for examination and identification. There were 87 pieces from 27 contexts across the site, including one unstratified sample. The assigned date range of the material was post-medieval to early modern. Contexts, weights and identifications of all samples can be found in Appendix 8.

Examination

The material was examined visually and under x16 magnification, and classified by morphology, density, colour and vesicularity. The aim of the assessment was to characterise the residues and identify the type and scale of the industrial processes from which they originated. Category criteria are based on the English Heritage Centre for Archaeology Guidelines on *Archaeometallurgy* (Bayley et al, 2001). In addition, EDXRF (energy dispersive X-ray fluorescence) analysis was undertaken on a few selected samples and sub-samples.

EDXRF Methodology

Analysis was carried out on freshly broken surfaces or on sub-samples. The aim of the EDXRF analysis was to look at the elements present to assist with or to confirm identifications. An EDXRF method designed to detect the full range of major and trace geological elements was used, and results were normalised to 100%.

Identifications

Cinder (45 pieces)

Cinder was the most frequently identified material. Fragments, which had clearly once been plastic or molten, were generally lightweight and similar in appearance, with dull red and black surfaces. Inside, the material was found to be vesicular and grey/brown. Many pieces were agglomerated with burnt fuel fragments or other types of detritus. The cinder material was identified as fuel ash slag, the identification confirmed on a fragment from context (2080) by EDXRF detection of a range of common earth elements, including silica, iron, aluminium, sodium, phosphorus and potassium. Fuel ash slag is a lightweight, vesicular material, of varying colour, formed during combustion, when the non-organic components of fuels react with silicates present in earth, stone or ceramic.

Iron-rich cinder/burnt fuel fragments (seven pieces)

This was the heaviest component of the assemblage (12505g), comprising shaped pieces, some large, of iron and sulphur rich, slaggy cinder agglomerated with highly vesicular burnt fuel fragments. Though too lightweight and low in iron to be considered ironworking slag, this material is clearly associated with industrial activity involving iron. The pieces may

represent the build-up of iron slag, fuel ash slag and burnt fuel which were regularly removed from around the workings of the furnaces to keep them clean and ensure their smooth operation.

Compressed cinder/iron-rich material/earth (six pieces)

Several pieces of agglomerated compressed cinder fragments, iron-rich material and earth were identified. These probably formed on well-trodden surfaces where such materials proliferated. The pieces may have become agglomerated through heat or by compression alone. Formation of this material suggests industrial activity in the vicinity involving iron.

Glass (five pieces)

Three sizeable chunks of black glass, plus two other fragments of glass waste or melted glass were identified. The quantity of material was small, but the form and appearance of the black pieces suggests glass production.

Ironworking slag (four pieces)

Only four pieces of residue with a total weight of 3413g could be identified as deriving from ironworking, and it was not clear exactly which ironworking processes had produced them.

Other materials

Other materials identified included burnt and un-burnt fuel, possible fragments of worked geology, iron corrosion fragments and wall plaster.

Discussion

The assemblage was smaller than might be expected, considering the level and the nature of the industrial activity known to have occurred in the area, and the scale of dumping and re-use of materials encountered on the site. In particular it is significant that so few pieces of ironworking slag were identified. As a very large amount of such slag must have been produced in the vicinity of the site during the height of its industrial activity, it seems probable that these particular residues were being selectively removed from site for use or disposal elsewhere.

The examination and analysis of a combustion boat by Jennifer Jones

Summary

A single object from Area A context [1000] was examined and analysed using light microscopy, EDXRF (energy dispersive X-ray fluorescence) and scanning electron microscopy (SEM). It was identified as a ceramic combustion boat with the remains of its burnt contents, which analysis found to contain iron, chromium and lead.

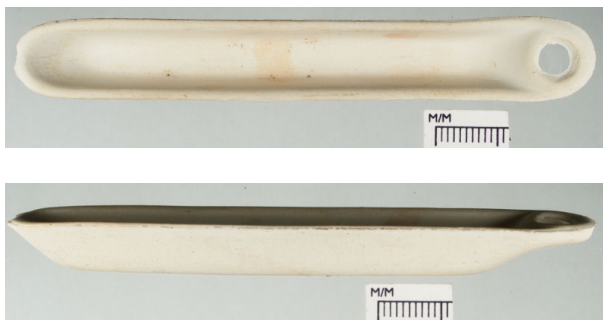
Examination

The object is 96mm long x 14.5mm wide x 13.5mm deep. It is made from a very hard, unglazed, highly fired off-white ceramic, now unevenly stained cream/brown, probably from use and from the burial environment. The ceramic is 3mm thick and has one rounded and one squared-off, notched end. The underside is flat and quite roughly finished.



Top, side and underside views of the combustion boat from ECA07 context [1000]

The object was identified as a ceramic combustion boat, as used in chemical laboratories, very similar in shape and size, though less streamlined, to modern examples still in use (see below).



Modern ceramic combustion boat

Adhering to the inside of the boat are the burnt remains of its (presumed) contents. This forms a thin, discontinuous layer of flaked, mainly dark grey/black, slightly lustrous material, with iron staining its surface in places. When viewed under x16 magnification, the burnt surface appears wavy and linear where intact. Where broken, the interior can be seen to be highly vesicular.

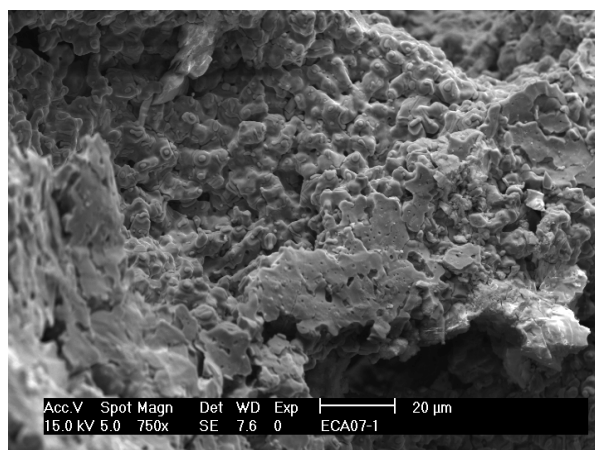


Detail of burnt combustion boat contents

Analysis

A sample of the burnt material was detached and analysed by EDXRF, using a method designed to detect a wide range of major and trace geological elements. The material was found to contain significant levels of iron, chromium, lead, sodium, aluminium and silica, with a further range of earth elements also present as traces.

Another fragment was mounted and viewed using SEM, to determine whether any structure had survived combustion. Magnifications up to x750 failed to detect an identifiable structure. The material appeared as an agglomeration of minute ‘blobs’, which probably represent the burnt and melted remains of its original composition (SEM image below).



x750 SEM image of the burnt material.

Discussion

The combustion boat, as with modern examples, was made from refractory porcelain, a type of ceramic which can withstand extremely high temperatures without expansion or deformation. Unglazed combustion boats like this one can be used to higher temperatures (up to 1400°C) than glazed examples (1000°C).

The combustion boat was probably used in a laboratory or testing facility of a manufacturing or research company. Presuming the burnt contents of the boat to be original, there would have been no prospect of their removal following combustion, as the material has adhered firmly to the ceramic. The boat was possibly being used to assay the quality or composition of the material it contains. As today, this would have been done by weighing the boat plus contents before and after combustion in a furnace, possibly to calculate organic mass lost from the contents during combustion.

It is possible only to speculate on the nature of the combustion boat contents and the possible purpose of the assay. Chromium is probably the most unusual of the elements found in the EDXRF analysis of the burnt material. Though hazardous and now a known carcinogen, chromium was and is widely used in industrial processes; as part of leather tanning, as a metal corrosion inhibitor and in the manufacture of paint, amongst other uses.

As the combustion boat was a solitary example recovered from a context of made ground or overburden, with no immediate documentary or archaeological evidence to pinpoint its likely origin, its purpose and the exact nature of its contents must remain obscure. Such chemical apparatus is likely to be a product of fairly recent, industrial, factory-based manufacture, but beyond that its dating is also uncertain.

Glass by Gail Hama

Introduction

A substantial volume of bottle glass, window glass and fragments were recovered from the excavation. This assessment report summarises the assemblage and provides a statement of potential. Recommendations for further work, retention and discard are based on the intrinsic interest of the finds themselves and the site synopsis.

Methodology

A total of 544 items of glass from 113 contexts were submitted for assessment. Only seven of these finds were unstratified. The glass recovered from context 1000 is discussed in isolation below. All the finds were visually examined, quantified and weighed. All complete dimensions were measured. The results were recorded onto an Access database and forms part of the site archive.

Discussion

Bottle glass

The majority of the assemblage is comprised of bottle glass with 401 items having been recovered from 71 contexts. Of these, ten are complete bottles. In addition, two fragments of bottle glass were unstratified finds. Most of the sherds and fragments have been loosely dated

to the modern period and are likely to have a date range from the 19th century up to the late 20th century. Some more complete items could be closely dated. Of particular interest were a small number of sherds from 17th century spherical wine bottles. Three sherds came from context 193 (Trench 2) during the evaluation stage of the project and may have derived from the tenements revealed at that time. Pottery dating to this period has also been found in this area. Four other fragments came from contexts 1548 and 2089 in Area A and could also be associated with the tenement buildings. Mineral, beer and condiment bottles with embossed lettering were relatively few in number. Those that were found bore details of local manufacturers and dated to between the 19th and early 20th century, for example six complete or near complete bottles (context 1926) of Henderson's Relish, Sheffield Company that continues to supply this superlative condiment today. Other manufacturers included Thomas', Bird and Fenby, and Redfearns Brewery in Barnsley.

Window glass

A total of 61 fragments came from 22 contexts, including one unstratified sherd. The majority came from Area A. Only eleven pieces could be identified as late 19th -early 20th -century by the decoration and thickness of the glass. These came from contexts 205 and 1548 (with similar examples being found in context 1000), and were decorated with a broad etched geometric design. The remainder were of clear glass some with moulded decoration.

Drinking glasses and vessels

Fifteen fragments from four contexts were retrieved from Areas A and D, and one unstratified sherd. Only one item could be closely dated; a decorated rim sherd from a tea cup or tea bowl (context 1609) which was early 20th century in date. The remainder are too fragmentary for further comment.

Miscellaneous

Six objects came from six contexts in Area A and D. A black glass faceted button from context 1719 is likely to date to the first half of the 20th century. A fragmentary modern "Bovril" jar came from context 1713. An earlier item, a heavy decorative glass stopper, came from context 1558 and dates to the 19th century.

Glass fragments

Fifty-five fragments were recovered from ten contexts. All were non-diagnostic and ranged from tinted clear glass to opaque white lattimo glass. All were considered to be modern; 19th to 20th century in date.

Context 1000

This assemblage comprises bottles, window glass, miscellaneous items and fragments. A total of 52 items of bottle glass were recovered, nineteen of these being complete. Some of these

bear trade names of local Sheffield companies, for example Wheatley and Bates Ltd, and Henderson's Relish. Where dating is possible they are of late 19th to early 20th century manufacture, though one complete Tizer bottle is of a design registered in the 1950s. Two complete milk bottles, a half pint and one pint, are of early 20th century date and quite rare finds from an archaeological site. None of the remaining bottle glass appears to date before the 19th century.

Sixteen fragments of flat window glass were found. Only one sherd is of 19th or early 20th century date and bears an etched geometric design. Similar fragments also came from Contexts 205 and 1548.

A magnifying glass, glass stoppers (one with embossed lettering) were of 19th to 20th century date. Various fragments of modern milk or lattimo glass were recovered along with a complete modern Bovril jar.

Conclusions

As with the glass assemblage from context 1000, the majority can be discarded following consultation with the recipient museum. Some consideration should be given to retaining complete examples of modern bottles and other items of interest if there was a use for these in a reference and/or handling collection or local history display. A short note for publication should be produced incorporating context information.

Worked bone, shell, jet and wood by Gail Hama

Introduction

A total of 82 objects of bone, antler, ivory, shell, wood and jet were recovered from the excavation, mainly from Areas A and E. These have been divided according to material type as follows: 67 bone items; five antler; three ivory; four shell, one wood object, a single jet fragment and one of unidentified material (recorded as bone). This assessment report summarises the assemblage and provides a statement of potential. Recommendations for further work, retention and discard are based on the intrinsic interest of the finds themselves and the site synopsis.

Methodology

All the finds were visually examined, quantified and, with the exception of bulk waste items, measured. The results were recorded on an Excel spreadsheet which will form part of the site archive.

Discussion

A total of 65 bone finds were retrieved from seventeen contexts, of which 47 came from Area E. Two bone finds were unstratified and one possibly misidentified bone object came from

context 158. Two of the three ivory handles came from levelling layer 1000 and one was an unstratified find. The five antler items were also unstratified. There are only six finished objects: a turned bone handle (context 151); a bone spoon (context 1511); a bone button (context 1506); two ivory handles (context 1000 and U/S) and one bone handle (U/S). The turned handle from context 151 is well made and has a patina indicating frequent use. It is likely to have been a handle from either a button hook (for gloves rather than boots or shoes) or a stiletto (a needlework tool). The style is early 19th century in date. The bone spoon from context 1511 shows no sign of wear and does not appear to have been in regular, if at all any, use. No firm dating could be found for this item. The unstratified bone and ivory handles could be of late 19th or early 20th century manufacture. The remaining items, including a complete bone button, button making waste and scale handle blanks provide evidence for fast growing 19th century industries. They are comparable to the material recovered from Sheaf Square, Sheffield.

Shell, wood and jet

Four mother of pearl shell objects and one jet fragment came from four contexts in Area A. None were complete and, as with the bone objects, they represent button and handle making waste. An incomplete turned wooden handle came from context 1609. As with the bone handle noted above it is likely to derive from a needlework tool or buttonhook. It dates to the 19th century.

Metal, slag and stone by Gail Hama

Methodology

A total of 178 finds (excluding context 1000) were submitted for assessment. The material from context 1000 is discussed separately below. All the finds were visually examined, quantified and weighed. Some of the complete items were measured. The results were recorded on an Access database which forms part of the site archive.

Discussion

Iron

A total of 94 objects came from 28 contexts. Another five finds were unstratified. The range of items is summarised Table 12.

Table 12: Iron finds by type

Object	Quantity
Tools	9
Bolts	2

Object	Quantity
Scissors	1
Bracket	1
Nails	17
Wire	4
Strips	5
Fittings	4
Unidentified objects	53
Fragments	3
Total	99

The majority of items could not be identified due to corrosion products and/or fragmentary condition. Where identification was possible the assemblage represents machine parts, nails, tools and structural fittings. Corrosion products obscured detail in most cases. However, the iron files were in good condition and five of these were found to be complete (contexts 101,107 and U/S). The assemblage has been dated to the modern period (19th to 20th century). The majority of the finds came from Area A/D and could represent demolition debris from the tenement buildings.

Non-ferrous metal and slag

A total of 79 objects from 22 contexts were submitted for assessment. Two of these finds were unstratified. Seven items were of lead and the remainder copper alloy. The range of the objects is summarised in Table 13.

Table 13: Non-ferrous metal and slag finds by type

Object	Quantity
Coin	2
Button	2
Wheel	1
Pipe	1
Slag	1
Nails	50
Wire	4
Cu alloy strips	2
Fittings	4
Unidentified objects	3
Cu alloy fragments	4
Pb musket ball	1
Pb window came	3
Pb strip	1
Pb fragments	2
Total	79

The assemblage could not be tightly dated and appears to be modern (19th to 20th century), with the exception of the post-medieval musket ball. X-radiography of the coins could reveal some detail which may be of use for dating purposes. Again, the majority of objects came from Area A.

All the nails were of the same type with flat heads and square shanks, and lengths between 26 and 40mm, the majority being 30-33mm long. They are likely to have been woodworking nails and may have been associated with some internal wood structure.

Stone

A fragment of possible agate came from context 1747.

Context 1000

A total of eight copper alloy objects and 34 iron objects came from this context. Only one item (a door handle and lock mechanism) has been dated to the late 19th or early 20th century. Although a copper alloy or steel fish knife may also date to this period. The door fitting and a possible punch should be X-rayed to show further detail.

The majority of items are nails, edging strips, wire and cable fragments, bolts and miscellaneous fragments. None are of intrinsic interest or importance but a short summary for publication will be produced.

Ceramic material by Gail Hama

Introduction

Nine ceramic and fired clay objects were retrieved from the excavation, three of these from levelling layer 1000 and the remainder from contexts 101, 399, 1699 and 1858.

Methodology

All the finds were visually examined, quantified and measured. The results were recorded on an Excel spreadsheet which will form part of the site archive.

Discussion

Seven of the nine items were white ceramic marbles, two with plain glaze (contexts 1699 and 1858) and one with painted criss-cross decoration (context 1000). These porcelain marbles or “chinas” were made during the 19th century in German factories specialising in the production of china (Barrett 1994, 22). In addition one marble (context 1000) was crudely fashioned from fired clay. A ceramic cup-shaped support is of interest and appears to neatly hold a marble in place. The kiln rest from context 101 is of white glazed earthenware and dates to the 19th century. It would have been used as a spacer within a pottery kiln.

Wood by Steven J Allen*Introduction*

Thirty-four pieces of waterlogged wood were delivered to the Wet Wood Laboratory 2008 for assessment. The material derived from both the evaluation and excavation stages of investigation. The wood pieces were cleaned with running water, examined and an assessment of their condition was made.

Condition

The wood has been preserved through burial in a waterlogged anoxic environment. It appears that these conditions were maintained in all contexts in which the material survived up to the time of excavation. The upper ends of several stakes had eroded away, suggesting these were at the upper limit of the local water table. Many pieces had soft surfaces, suggesting a loss of moisture and hence a possible change in the water table. Layers of hard pan formed on the surfaces of the wood are derived from mineral leaching through the burial environment and precipitating out on the interface between soil and waterlogged wood. This had led to the obscuring of some surfaces and damage to the wood.

Listing

Wood species identifications follows Schweingruber (1982). All dimensions are in millimetres.

Table 14: Wood samples by species

Identification	Description	Species identification
Trench 6, u/s	Fragment of tangentially faced inlay or applied mount. Sawn conversion. Slot through face at wider end with trefoiled indentation. End broken across cut feature. Through hole in face towards other end with staining from small rivet head on face. Edges curved and bevelled in plan. Both ends broken and missing. 49 l, 20 w, 05 th.	<i>Prunus avium L.</i>
Context 490	Offcut from tangentially faced board or stave. Both ends eroded. 241 l, 69 w, 22 th.	<i>Pinus sylvestris L.</i>
Context 490 (1)	Cork. Cylinder cut from thick bark. Some damage to faces towards one end. 47 l, 25 dia.	not identifiable
Context 490 (2)	Cork. Cylinder cut from thick bark. Much surface damage, one end broken away and missing. 38 l, 18 dia.	not identifiable
Context 507	Offcut from tangentially faced board. Ends hewn away. Surface damage to one face. Heavily mineralised. 92 l, 34 w, 18 th.	<i>Quercus spp.</i>
Context 507	Roundwood offcut, no bark present. Both ends hewn through. Highly mineralised. 96 l, 27 dia.	? <i>Salix spp.</i>
1000, u/s	Fragment of roundwood, bark present. Both ends broken and missing. Dried and dessicated. 79 l, 19 w, 10 th.	<i>Salix spp.</i>
1000, u/s	Fragment of roundwood, bark present. Dried and dessicated. 37 l, 18 w, 12 th.	<i>Salix spp.</i>

Identification	Description	Species identification
1000, u/s	Fragment of roundwood, bark present. Dried and dessicated. 34 l, 08 w, 04 th.	<i>Salix spp.</i>
Area A, Context 1509	Bark fragment. Dried and dessicated. 58 l, 22 w, 02 th.	not identifiable
Area A, Context 1515	Fragment of radially faced board. Fe nail driven into one end. Heavily mineralised. 54 l, 17 w, 10 th. Nail c.67 l, 11 dia, heavily corroded.	? <i>Quercus spp.</i>
Area E, Context 1841, sample 20	Fragment of radially faced board or offcut from stave. One edge hewn to help create irregular cross section tip. Other end and opposing edge broken away and missing. Woodworking very poorly preserved. 251 l, 57 w, 18 th..	<i>Quercus spp.</i>
Area E, Context 1853, sample 18	Stake, cut from radially faced board. Both edges and both faces hewn to create sub rectangular cross section tip. Several split through knots present on face/edge. Good axe signatures present on facets. One face eroded at upper end. Upper end itself eroded an missing. 671 l, 106 w, 45 th.	<i>Quercus spp.</i>
Area E, Context 1875, sample 22	Offcut from radially faced timber. Eroded taper towards one end. No working marks. 297 l, 61 w, 41 th.	<i>Quercus spp.</i>
Area E, Context 1897	Large bark chipping. In five refitting fragments. 354 l, 71 w, 20 th.	not identifiable
Area E, Context 1929a	Roundwood pile point, no bark present. Four hewn facets cut to create sub rectangular cross section tip. Mineral pan on worked faces and adjacent areas of roundwood surface. Other surfaces soft and degraded. Upper end eroded. 434 l, 112 dia.	<i>Quercus spp.</i>
Area E, Context 1929b	Roundwood stake, no bark present. Four hewn facets cut to create sub rectangular cross section tip. Fairly knotty with trimmed away side shoots at mid point of length. Upper end eroded. In two refitting sections. 739 l, 56 dia.	<i>Quercus spp.</i>
Area E, Context 1929c	Roundwood pile, no bark present. Four hewn facets cut to create sub rectangular cross section tip. Some surface damage at mid point of length. Mineral pan on worked faces and adjacent areas of roundwood surface. Other surfaces soft and eroded. Upper end broken away and missing. 1.004m l, 111 dia.	<i>Fraxinus excelsior L.</i>
Area E, Context 1929	Section of roundwood, bark present, both ends broken and missing. 352 l, 30 dia.	<i>Quercus spp.</i> , 12 annual rings, summer cut.
Area E, Context 1929	Section of roundwood, bark present, both ends broken and missing. Very knotty. 412 l, 27 dia.	<i>Fraxinus excelsior L.</i> , 11 annual rings, summer cut.
Area E, Context 1929	Section of roundwood, bark present, both ends broken and missing. Very knotty. In four refitting sections. 482 l, 29 dia.	<i>Fraxinus excelsior L.</i> , 11 annual rings, summer cut.
Area E, Context 1929	Section of roundwood, bark present, both ends broken and missing. Several stubs of side branches. 484 l, 27 dia.	<i>Fraxinus excelsior L.</i> , 8 annual rings, summer cut.
Area E, Context 1929	Section of roundwood, bark present, both ends broken and missing. Several stubs of side branches. 592 l, 25 dia.	<i>Fraxinus excelsior L.</i> , 8 annual rings, summer cut.
Area E, Context 1929	Section of roundwood, bark present, both ends broken and missing. Very knotty. 629 l, 30 dia.	<i>Fraxinus excelsior L.</i> , 12 annual rings, summer cut.

Identification	Description	Species identification
Area E, Context 1929	Section of roundwood, bark present, both ends broken and missing. Very knotty. 214 l, 25 dia.	<i>Fraxinus excelsior</i> L., 11 annual rings, summer cut.
Area E, Context 1929	Section of roundwood, bark present, both ends broken and missing. Very knotty. 215 l, 32 dia.	<i>Quercus</i> spp., 11 annual rings, summer cut.
Area A, Context 2049	Stake or offcut, from tangentially faced heartwood. Eroded taper towards one end, no definite working marks. Both ends broken and missing. 344 l, 41 w, 30 th.	<i>Quercus</i> spp.
Area A, Context 2109	Offcut from radially faced board. Both ends cut. Both faces very eroded. 86 l, 52 w, 09 th.	<i>Pinus sylvestris</i> L.
Area A/D Context 2132 Sample 54	Section of tangentially faced board. Both ends sawn, some surface damage to one face. 178 l, 145 w, 09 th.	<i>Pinus sylvestris</i> L.
Area A/D Context 2132 Sample 55	Section of tangentially faced board. Both ends and one edge broken away and missing. Very soft and abraded. In three refitting sections. 376 l, 118 w, 13 th.	<i>Taxus baccata</i> L.
Area A/D Context 2132 Sample 56	?Stake or offcut, split from tangentially faced timber. One face split away to form crude sub rectangular cross section tip. Abraded surfaces. 339 l, 71 w, 28 th.	<i>Pinus sylvestris</i> L.
Area A/D Context 2132 Sample 58	Section of roundwood, no bark present. Knotty and twisted along length. No working marks. Both ends and all surfaces very eroded. Several longitudinal fissures present. 1.524m l, 110 w, 84 th.	<i>Quercus</i> spp.
Area A/D Context 2132 Sample 59	Slab cut from side of trunk, no bark present. Stump of side branch present with several small side shoots partially rotted out. 238 l, 254 w, 189 th.	<i>Ulmus</i> spp.
Area D Context 2182	Handle from socketed tool. Roughly trimmed from roundwood. Carved axial tang at thinner end with crushed shoulder. Good tool signatures present. 95 l, 22 w, 20 th. Tang 27 l, 08 dia.	<i>Pinus</i> spp.

Key

<i>Fraxinus excelsior</i> L. -	Ash.
<i>Pinus</i> spp.-	Pine. Sub species not determinable
<i>Pinus sylvestris</i> L.-	Scots Pine
<i>Quercus</i> spp.-	Oaks. Sub species not determinable
<i>Salix</i> spp. -	Willows. Sub species not determinable
<i>Taxus baccata</i> L.-	Yew
<i>Ulmus</i> spp.-	Elm, Sub species not determinable

Discussion

The wood derived from the evaluation appears to be fragments of waste material discarded as being of no further use, even as firewood. Though waterlogged, much of the material seems to be of recent date. The piece of wood inlay is the most interesting piece of the assemblage but has no stratigraphic context. The two corks are typical of those which would be found

stopping the necks of glass or earthenware bottles. As both are simple cylinders it is unlikely that they come from containers of effervescent liquids.

Wood derived from the excavation also appears to be fairly recent. The amount of softwood and the woodworking technology present would suggest an 18th century or later date with a 19th or early 20th century date being probable. The wood used to make up the wattle fence is quite knotty and has the characteristics of branch wood rather than coppiced rods from a managed woodland. All the wattles are summer cut and 8-12 years old. It is possible most are from the same branch, subsequently broken. The three stakes have minimal working and serve to retain the wattle rods woven around them with no further attachments. While these and other timbers are clearly part of a simple revetment, other board fragments may have fallen into the feature after disuse. The degree of abrasion the timbers have suffered on all surfaces is characteristic of wood deposited within an active water channel rather than material which has been laid to line or floor such a channel, where the abrasion would be confined to one face.

Leather by Quita Mould

Methodology

The leather was identified and diagnostic pieces dated; textile was also noted. A basic record (as defined in the RFG & FRG Guidelines 1993) of the assemblage was made, including measurement of relevant dimensions and species identification where possible. All measurements are in millimeters (mm). No allowance has been made for shrinkage. Any shoe size has been calculated according to the modern English Shoe-Size scale from complete insole measurements. Continental sizes are given in brackets.

Leather species were identified by hair follicle pattern using low powered magnification. Where the grain surface of the leather was heavily worn identification was not always possible. The grain pattern of sheep and goat skins are difficult to distinguish and have been grouped together as sheep/goat when the distinction could not be made. All shoe bottom components are assumed to be of cattle hide unless stated otherwise.

Condition

Some of the material was dry/damp, some was wet. It was necessary to wash the waterlogged material and to wash a proportion of the damp material to remove the soil to allow examination. The leather and textile is currently stored in double, self-sealed, polythene bags. If it is kept cool and light excluded it may be allowed to slowly dry out completely to permit permanent storage if desirable but its condition should be regularly checked for any microbial action.

Table 15: Organic finds by context and type

Context	Trench	Area	Objects
435			Balmoral boot, welted
478	Trench 4		Welted shoes x 2, textile
490			Welted shoe sole, textile
508	Trench 3		Strap, narrow
1000		Area A/D	Strap; ladies high-heeled Oxford shoe, riveted
1000		Area E	Belt; stitched and nailed shoe; waste trimming
1515		Area A/D	Brass riveted shoe
1844		Area E	Half sole; waste trimming
1845		Area E	Middle packing
1856		Area A/D	Brass riveted shoes x 2
1952		Area A/D	Iron riveted shoe, textile
2133		Area A/D	Textile, compacted organic
u/s	Trench 1		Disc

Summary

Footwear

Leather was recovered from Areas A, A/D and E. The remains of at least nine shoes and a sole repair were recovered. Most were highly fragmentary so that details of the styles represented was limited but none appear to date before the mid Victorian period. A man's Balmoral boot, from context 435, is of a long-lived style popular from Victorian times through to the 1930s. A ladies front-lacing shoe of black suede leather with decorative trim of patent or glaze leather and a high heel, from backfill of a cellar, context 1000, in Area A/D is likely to date to the late 1920s to 1930s. Features on an adult man's shoe from context 1000 in Area E may suggest a date in the second half of the 20th century.

Five shoes were of riveted construction a construction, commonly used from the second half of the 19th century onward. Another, apparently modern, appears to have a stitched lasting margin with iron nailing to attach the sole. The remaining shoes were of welted construction. Two shoes had remains of low ($\frac{1}{2}$ inch) stacked leather heels. Where uppers survived to any extent they were front-lacing through a series of lace holes with brass eyelets. Metal eyelets were patented in 1823 and have been used since this time (Swann 1982, 32). Textile was found associated with leather shoe components in contexts 478, 490 and 1952 and with a possible shoe component in context 2133. The textile certainly represented the upper or lining of the shoe from context 478, and may well derive from the shoe uppers or their linings in the other examples.

Straps

Three straps of cattle hide were found. A piece cut from a belt was found in context 1000 in Area E while a strap of thick, inflexible, leather was found in context 1000 in Area A/D. A narrow strap, torn at each end, was found in context 508 in Trench 3.

Leatherworking waste

Two small, narrow trimmings, from trimming a pattern piece to size during manufacture or repair, were found in Area E indicating that leatherworking waste was being thrown away in this area. The waste from making a leather washer was found unstratified in Trench 1.

Flint by Martin Lightfoot

Three flints were submitted for assessment. The largest (2221), a small core weighing 22g with about 30% mottled light brown and cream coloured cortex, was possibly casually used as a hammer stone. The second flint was a brownish-yellow flake with some buff coloured cortex (1975), weighing 2g. The third, a flake (2071), also weighed 2g and was unmodified though very burnt. None of these flints are diagnostic, and all probably derive from riverine pebbles, probably locally.

It is likely that some of the most attractive and densely exploited areas throughout prehistory are the same areas now covered by modern towns and cities including Sheffield. Any flints which may have originated in the prehistoric period are therefore of significance; these flints though not of intrinsic importance will be retained with the site archive.

7 Environmental Record

Animal bone and shell by Jane Richardson

Introduction

In total, 290 animal bones and shells were recovered from 69 deposits. Most deposits contained only a few fragments (<10), with just four (1000, 1522, 1926 and 2131) containing over twenty fragments. Given the small assemblage, all fragments were recorded but diagnostic element zones, which by definition are easily identifiable and non-reproducible, were also noted. Only 38% of the bones were classified as zones and this reflects the fragmented nature of the assemblage. The assemblage falls well below the minimum reliable sample size of around 500 (with reference to a number of statistical parameters after van der Veen and Fieller 1982, 296).

Methodology

Bones were identified to taxa wherever possible, although lower-order categories were also used (e.g. sheep/goat, cattle-size). The separation of sheep and goat bones was routinely attempted, using the criteria of Boessneck (1969) and Payne (1969, 1985), but in the apparent absence of goat, the sheep/goat bones are assumed to be of sheep. For age-at-death data, epiphyseal fusion (after Silver 1969) and the eruption and wear of deciduous and permanent check teeth were considered. Dental eruption and wear were recorded using the letter codes of Grant (1982).

Bone condition, erosion, fragment size and fresh breaks were recorded in order to assess bone preservation, while gnawing, burning and butchery marks were noted to determine bone treatment. Butchery was routinely differentiated into chop and cut (knife) marks and the position and direction of these marks were noted in order to identify dismembering, filleting and skinning activities. Given the fragmented nature of the assemblage, the recovery of biometrical data was not attempted. Pathological bones were noted.

Results

The assemblage is fragmented but otherwise is in reasonable condition with few eroded bone surfaces. Very few bones are burnt (6) or gnawed (9) but butchery marks are much more frequent (59). Butchered bones were recovered from all phases of activity at Area A/D and Area E (with the exception of Area E, Phase 2) and are restricted to the main domestic animals, cattle, sheep and pigs. This reflects patterns of domestic consumption.

Despite the small size of the assemblage, numerous taxa are represented. Bones of cattle, sheep, pig, dog, roe deer, rabbit, rat and domestic fowl are present, in addition to oyster, mussel, cockle and crab shells. Regardless of phase, cattle (and cattle-size) and sheep (and sheep-size) dominate, presumably accounting for the majority of the meat-diet of those living and working in this part of Sheffield. Roe deer was represented by a complete metacarpal bone.

Table 16: Animal bones and shells by phase and area (excludes unstratified and unphased material)

	Areas A+E Palaeochannel	Area A/D Phase 1	Area A/D Phase 2	Area A/D Phase 3	Area A/D Phase 4	Area E Phases 2-7
Cattle	1	7	2	1	1	4
Cattle-size		13	16	5	3	
Pig			3			
Pig-size			2			
Pig		2				
Pig-size				1		
Sheep		17	12	2		2

	Areas A+E Palaeochannel	Area A/D Phase 1	Area A/D Phase 2	Area A/D Phase 3	Area A/D Phase 4	Area E Phases 2-7
Sheep-size	1	14	10	8	6	3
Dog						1
Roe deer			1			
Rabbit		1	1	2	4	
Rabbit-size				1	1	
Rat			1			
Domestic fowl			1	2		
Bird spp.			1	3	2	
Undiagnostic		4				
<i>Bone total</i>	2	58	50	25	17	10
Oyster		1	2	1	11	
Mussel				2	1	
Cockle				1	6	
Crab				1		

Age data are extremely limited and are of little potential. No neonatal or juvenile bones indicative of localised production are present, although this is unsurprising in an urban context. One pathological bone, a sheep humerus displaying bony changes indicative of a sprained elbow, was noted from Area A/D Phase 2.

Assessment of biological remains by Alexandra Schmidl, John Carrott, Deborah Jaques and Alex Beacock

Introduction

Excavations were undertaken in six areas designated Areas A to F. Most of the archaeological features and structures of the site related to post-medieval and later industrial activity and tenement buildings, some of the latter with cellars. However, all of the sediment samples considered in this assessment were recovered from underlying palaeochannel deposits in Area A/D which was located to the south of a 'triangle' of land between two mill ponds (Mill Pond and Forge Pond), and north of an area marked as 'Upper Dam' on Fairbank's 1790 map and as 'The Ponds' on his 1808 map.

Sub-samples from four bulk sediment samples ('GBA'/'BS' *sensu* Dobney *et al.* 1992), one spot find of beetles and a single hand-collected fish bone, were submitted to Palaeoecology Research Services Limited (PRS), County Durham, for an assessment of their bioarchaeological potential

Methods

Sediment samples

The sediment samples were inspected in the laboratory and their lithologies were recorded using a standard *pro forma*. Sub-samples were taken from each and processed, broadly following the techniques of Kenward *et al.* (1980), for the recovery of plant and invertebrate macrofossils. Before processing the sub-samples were disaggregated in water and their volumes recorded in a waterlogged state.

Plant and invertebrate remains in the processed subsample fractions (residues and wash-overs) were recorded briefly by scanning using a low-power microscope, identifiable taxa and other biological and artefactual components being listed on paper. Where the wash-overs and residues were primarily mineral in nature, or composed largely of charred remains, they were dried prior to recording. If the fractions contained a significant percentage of waterlogged organic material they were kept wet for examination. During recording, consideration was given to the identification of suitable remains for radiocarbon dating by standard radiometric technique or accelerator mass spectrometry (AMS).

Nomenclature for plant taxa follows Stace (1997) and wood identifications were attempted with reference to Schoch *et al.* (2004). Insects follow Kloet and Hincks (1964-77).

Small sub-samples from each context were examined for microfossils using the squash technique of Dainton (1992). Although originally developed for the detection of parasitic nematode eggs, the squash technique routinely reveals other microfossil remains and here the primary purpose of the subsamples was to determine the presence/absence of microfossils such as pollen and diatoms, and, if present, assess their state of preservation. Assessment slides were scanned at x150 magnification, with x600 used where necessary.

Spot find

The small collection of well preserved remains of fairly large beetles recovered from within the soil matrix in a bottle was examined and the individuals identified as closely as possible.

Hand-collected vertebrate remains

Only a single small fragment of fish bone was recovered by hand-collection. This was examined and identified as closely as possible.

Results

Sediment samples and spot find

The results are presented below in context number order. Archaeological information provided by the excavator is presented in square brackets. A brief summary of the processing method and an estimate of the remaining volume of unprocessed sediment follows (in round brackets) after the sample number.

Context 1505 [organic spot find of beetle remains from within the soil matrix in a bottle; undated]

The submitted remains comprised a minimum number of ten individuals of *Blaps* sp. (The Churchyard Beetle). Most represented more or less intact (though legs and antennae were always separated) single body sections, heads, pronota and abdomens, but occasionally these were found paired (e.g. head and pronotum, pronotum and abdomen).

Context 1924 [fill of a palaeochannel; undated]

Sample 28/T (3.5 kg/4 litres sieved to 300 microns with washover and microfossil squash; approximately 0.25 litre of unprocessed sediment remains)

Moist mid to dark orange-brown, to mid to dark grey to very dark blue-grey (almost black), crumbly to soft (working soft and slightly plastic), locally slightly clay, silt. Sulphide blackened 'straw'/roots were present and there was a strong sulphide odour when the lid of the sample tub was first opened.

The rather large wash-over (~350 ml) consisted almost entirely of organic material including decayed unidentifiable plant fibres, bud scales and rootlets, with a few twiglets (to 10 mm) and a little charcoal, but there were also numerous invertebrate remains—cladoceran (water flea, including *Daphnia*) ehippia (resting eggs) and insect cuticle fragments.

Overall, the plant assemblage was dominated by moderate numbers of decayed waterlogged seeds and fruits of wild species. The identifiable component was principally of aquatics and waterside taxa, including floating/submerged and emergent plants (e.g. pondweed – *Potamogeton*, water-milfoil – *Myriophyllum*, branched bur-reed – *Sparganium erectum* L., floating sweet-grass – *Glyceria fluitans* (L.) R. Br.). In addition, other wild plant species such as dock (*Rumex*), meadow/creeping buttercup (*Ranunculus acris* L./*R. repens* L.), rose/bramble (*Rosa/Rubus*, prickles), thistle (*Carduus/Cirsium*) and violet (*Viola*) were represented in small numbers.

Most of the invertebrate remains (other than ehippia) were heavily fragmented pieces of lightly sclerotised insect cuticle, including occasional 'delicate' remains such as wing fragments. Many of the remains were, perhaps, of larvae but there were occasional poorly preserved adult beetle sclerites (all very fragmented and/or eroded). Only one of the fragments seen could be, somewhat tentatively, identified as part of an elytron of *Helophorus* sp. but a few others could, perhaps, be identified given more time than available to an assessment.

A few stones (to 15 mm) were present but no separate residue fraction was produced.

The microfossil squash sub-sample was mostly inorganic, with some organic detritus. There were just a few fragments of plant tissue and a single *Polypodium* spore but there were many

diatoms of at least four distinct forms. Preservation of the diatoms was variable with some being in good condition whereas others were broken.

Context 1931 [fill of a palaeochannel; undated]

Sample 31/T (4 kg/3.5 litres sieved to 300 microns with wash-over and microfossil squash; approximately 0.25 litre of unprocessed sediment remains)

Just moist, mid yellowish-grey to mid to dark orange, brittle to crumbly (working soft in places), sandy silt. Some fragments of root/twig were present.

There was a fairly small wash-over (62 g, dried) which was mostly of sand and unidentified charcoal (to 15 mm; deformed, orange-coloured). Identifiable botanical remains were restricted to a single nut of sedge (*Carex*) – probably a modern contaminant in this deposit.

The very small residue (dry weight 0.474 kg) was mainly sand, with some stones (to 24 mm) and unidentified charcoal (to 20 mm; 3 g).

The microfossil squash sub-sample was mostly inorganic, with a little organic detritus and a few fragments of fungal hyphae. No other identifiable microfossils were seen.

Context 2032 [fill of a palaeochannel; undated]

Sample 42/T (2.8 kg/3 litres sieved to 300 microns with wash-over and microfossil squash; approximately 0.25 litre of unprocessed sediment remains)

Just moist, mid yellow-brown to mid to dark brown (with some light to mid grey-brown patches and a slight ginger cast throughout), brittle to crumbly (working slightly soft and somewhat plastic), slightly silty sandy clay. Charcoal or black ash was common.

The small wash-over (26 g, dried) was of sand and charcoal (to 12 mm; orange-coloured); some of the larger charcoal pieces could be identified as alder/birch/hazel (*Alnus/Betula/Corylus*).

The microfossil squash subsample was mostly inorganic, with some organic detritus. There were a few fragments of fungal hyphae, a single diatom and one possible pollen grain/spore; the diatom was very poorly preserved (both eroded and broken) and the grain/spore in such poor condition as to be only tentatively recorded.

The very small residue (dry weight 0.190 kg) consisted largely of sand, with some indurated sediment lumps (to 26 mm), stones (to 30 mm) and orange-coloured deformed charcoal of a deciduous wood (to 21 mm; 3 g).

Context 2061 [fill of a palaeochannel; undated]

Sample 35/T (4 kg/3.5 litres sieved to 300 microns with wash-over and microfossil squash; approximately 0.25 litre of unprocessed sediment remains)

Just moist, externally mid to dark grey (flecked with mid to dark orange) to light grey (with light to mid orange veining) internally, brittle to crumbly (working soft and somewhat plastic), silty clay (more silt than clay in places). Some charcoal/black ash was present.

The fairly small wash-over (72 g, dried) was mostly of unidentified charcoal (to 10 mm; orange-coloured) and sand, but there were also three charred fragments of hazel (*Corylus avellana* L.) nutshell.

The small residue (dry weight 0.133 kg) consisted mainly of sand, with some indurated sediment lumps (to 12 mm) stones (to 13 mm) and unidentified orange-coloured charcoal (to 8 mm; 1 g).

The microfossil squash sub-sample was mostly inorganic, with a little organic detritus. No identifiable microfossils were seen.

Hand-collected vertebrate remains

The single piece of hand-collected bone was recovered from Context 399 (Trench 3). Preservation was recorded as 'fair' although the bone was a little fragile and there was some fresh breakage damage evident. The bone was a fragment of a ?cleithrum, probably from a gadid (member of the cod family) and representing a large fish of over one metre in length.

Discussion

Ancient biological remains recovered from the sub-samples were largely restricted to charcoal fragments most of which were too small to be identified; some larger fragments were alder/birch/hazel (*Alnus/Betula/Corylus*). A few charred fragments of hazelnut shell were found in Context 2061 which probably represented human food waste, but were too few to be of any real interpretative value.

Waterlogged ancient plant and invertebrate remains were recovered from Context 1924. Most of the plant taxa indicated aquatic and waterside habitats – e.g. emergent and floating/submerged plants, such as branched bur-reed, floating sweet-grass, pondweed and water-milfoil, representing the littoral zone of a slow river or channel. There were also lesser quantities of remains of wild plant taxa typical of areas of waste and wet ground within and around the river/channel and probably reflecting the immediate surroundings at the time of the formation of the fill. There were also interpretatively valuable microfossils within this context in the form of diatoms, detailed analysis of which might provide additional information regarding the depositional environment; no useful microfossil remains were observed from the other three palaeochannel fills.

No remains of crops were recovered, and there was no evidence for domestic activity in the immediate vicinity. It would seem, therefore, that, at the time of the formation of these deposits, human impact on the vegetation was low, although there were small amounts of, mostly unidentified, charcoal from each sample.

All of the beetles collected as a spot find from Context 1505, the soil matrix within a bottle, were of the same species, namely a *Blaps* sp. These, The Churchyard Beetle, are often also referred to as the Cellar Beetle as they inhabit such locations, as well as sheds and barns, where they can often be found in large numbers. These flightless beetles are strongly synanthropic (i.e. favoured by human activity – Kenward 1997) and are members of the ‘house fauna’, a group of synanthropes regarded as particularly typical of buildings of various kinds, as defined by Kenward and Hall (1995). It seems highly likely that these animals were living in one of the cellars encountered at the site and that the bottle acted as a trap for them (perhaps deliberately placed but more likely accidental). It appears that the bottle, perhaps in combination with its former contents, has also acted to preserve these remains in excellent condition.

The charred fragments of hazelnut shell from Context 2061, waterlogged seeds and fruits from Context 1924 and the beetle remains from Context 1505, could provide suitable material for radiocarbon dating (via AMS), if required.

8 Discussion

Area A/D

The northern part of Area A/D consisted of the brick, stone and concrete footings of the Central Hammer Works that were once situated between River Lane and Creswick Walk (Fig. 25). In addition to brick footings, a series of brick and stone flagged surfaces were revealed, previously investigated in Trench 3 during the evaluation. Some of the surfaces incorporated disused grinding stones. The remains of the mid to late 19th century works included part of a possible furnace, originally exposed in the evaluation trench. More of this structure was revealed during the excavation, but full excavation could not take place as it was situated in the extreme north-west part of the site and lay partly outside the permitted limit of excavation.

The earliest historical reference so far identified to the Central Hammer Works is in Kelly’s 1881 Directory of the West Riding of Yorkshire where the premises is referred to as *River Street Forge & Hammer Works Co.* the White’s Directories of Sheffield and Rotherham 1901 and 1905 list the works as being occupied by Fredrick James Brindley & Sons, manufacturers of cast steel hammers.

Cartographic evidence indicates that the site of the Hammer Works was an open plot in 1853 but by 1890 the Works had been constructed. A half-page advertisement in White’s 1901 directory indicates Brindley’s company was established in 1864 but there is no evidence to suggest that the buildings on River Lane were the company’s first premises.

Examination of the detailed Goad Insurance Plan of 1896 indicates that the structures excavated immediately to the north of the western range of tenements were the grinders shop

and the engine house that presumably powered the grinding wheels whilst the structure located parallel to River Lane housed the remains of the forges.

To the south of the Central Hammer Works footings were the remains of two ranges of tenement buildings. The cartographic record has revealed that the eastern range and the two southernmost of the western range formed two sides of Mate's Square (Fig. 9). The western range of tenements that fronted on to Mate's Square fell outside the excavation. The square was later filled in by the construction of six further dwellings to the north and on the same alignment as the two dwellings of the earlier western range (Fig. 10). Care appears to have been taken in the construction of these later additions in that the design and materials used matched those of the earlier tenements.

All the tenement shared a similar floor-plan with cellars to the west and a living space to the east. The cellars were constructed of sandstone blocks for the walls and flags for the floors. The cellars originally had brick vaulted ceilings and it is thought that access was gained via wooden stairs. These stairs were superseded by stone-built staircases. This is particularly apparent in the later cellars where the stone stairs were shown to be cut in to the dividing cellar walls necessitating the patching up of the walls. The cellars were serviced by a system of brick-lined, stone-capped, culvert drains.

Prior to the demolition of the tenements, the cellars were backfilled with un-bonded stacks of flagstones and bricks, the latter possibly derived from the demolition of the vaulted ceilings. The tenement remains were then inundated with considerable quantities of large iron slags, clinker and cinders to raise the local ground level. It is likely that the cellars were packed with bricks and flags in order to avoid soft spots in this newly created made ground.

Previously, in the evaluation report, the remains of the tenements were taken as evidence for back-to-back buildings; however, given the findings of the excavation this interpretation can now be refuted. Analysis of the cartographic records, particularly the Goad Insurance Plan of 1896, confirms the findings of the excavation; that the tenements constitute the remains of two-up-two-down terraced housing.

All of the cellars were dug through a series of layers of re-deposited, yellowish, mottled clay that appeared to have been deliberately deposited across this part of the site, raising the ground level by between 1.00m and 1.50m, and covering earlier archaeological remains. Removal of these deposits between the tenement ranges revealed a culvert that ran down and away from a rectangular, stone-lined tank, which contained the remnants of a timber surface. The function of this feature is not known but it may have been either a saw pit or wheel pit for a overshot water wheel, or perhaps it might have been associated with laundering or some other industrial process requiring water. After the tank fell out of use, the stone walls were partially robbed, and it was then backfilled with rubble prior to the deposition of a made ground layer across the entire feature.

The stone tank was immediately adjacent to and parallel with a north-east/south-west orientated metalled trackway or path formed of bricks and stone cobbles, many showing clear evidence for wear, and with traces of camber and kerbing surviving. This feature had been partially exposed during the evaluation in Trench 2. Unfortunately, although much more of it was exposed in Area A/D, it was still not possible to determine where it led from or to, other than that the 'tank' had been built on its eastern side. A shallow ditch ran parallel to it on its eastern side, and this was probably a drainage feature. Pottery recovered from the fill of the ditch and from the makeup deposits of the trackway surface dated to the later 18th century suggesting that the surface was contemporary with the tank and culvert.

The clay pipe and pottery recovered from deposits associated with the construction of the culvert and tank, indicate a probable later 18th century date for the building of the structures, whilst the assemblages obtained from the deposits that backfilled the tank following its disuse, date to the early decades of the 19th century. When this evidence is combined with that from the cartographic record it is possible to suggest the industry with which the tank, culvert and associated surface were associated. Fairbank's map of 1771 (Fig. 4) does not record the presence of any structures within the area of the site, however, the same cartographer's map of 1797 indicates the presence of a colliery within the development area (Fig. 5). On the map, a coal yard is identified within the eastern side of site whilst a range of north-north-east/south-south-west aligned buildings occupies the western side. This alignment also supports the theory that the tank is associated with the colliery as it, the culvert and the associated surface were similarly aligned in contrast to the later north/south aligned tenements. The working life of the colliery was obviously short as Fairbank's map of 1808 records that the southern half of the range of buildings had been demolished with the area featureless and relabelled *The Ponds*. This short timeframe is in accord with the pipe and pottery evidence further strengthening the link between the colliery and the tank, culvert and surface.

North of these features were a series of shallow pits, postholes, stakeholes and gullies. Some of the postholes and stakeholes appeared to form part of fence-lines. On early maps such as Fairbanks' of 1766, this area is immediately south of a series of gardens and tenements owned by the Duke of Norfolk and leased to others, and just north of an area of what appear to be garden plots on Gosling's 1736 and Fairbanks' 1808 maps. Many of the features were probably associated with similar gardens and small plots. The assemblage of pottery and clay pipe retrieved from many of these features suggest their origin in the first half of the 18th century thereby predating the foundation of the colliery and supporting the theory that they are related to the garden plots evident on maps of this age.

Underlying all of the shallow pits, ditches and gullies, and cut by the substantial westernmost cellar complex, were a series of alluvial silt and clay deposits from what was probably a palaeochannel of the River Sheaf. That this area had been low-lying and boggy in the past is also suggested by the various drainage features, and perhaps even by the thick layer of re-

deposited clay that may have been deposited to raise the ground level of the entire area. Some of the silt and clay deposits seemed to have formed in shallow depressions within the underlying natural alluvial clays, and one of these had dark grey-black mottling from decayed organic material including leaves and twigs. No finds were associated with these silt deposits.

These palaeochannel deposits were not associated with the mill ponds, which seem to have lain outside of all of the excavated areas to the north. Areas A/D and E were to the south of the 'triangle' of land between the two mill ponds (Mill Pond and Forge Pond), and north of the area marked as 'Upper Dam' on Fairbank's 1790 map and as 'The Ponds' on his 1808 map. No post-medieval or early modern finds were recovered from these deposits, potentially revealing negative evidence, and elsewhere several worked prehistoric flints were recovered from the surface of them. This strongly suggests that these deposits were of earlier prehistoric date, potentially from the Pleistocene to Neolithic periods.

Area B

Due to the logistical difficulties of machining this area in what was effectively the main access corridor on to the site, it was left until relatively late in the project, and was later downgraded to a watching brief by Dinah Saich. When it was finally machine-excavated by the contractors, extensive disturbance was revealed caused by the basements of the later cutlery works. Large concrete machine bases and white-tiled walls from these late 19th and 20th century buildings were observed, but only a few photographs of these structures were taken due to the difficulties (and dangers) of gaining access to this area. Part of a possible concrete capped mine shaft was also present in this area.

Part of a substantial east/west aligned stone masonry wall was, however, photographed and this wall may have originally formed the boundary wall between the cutlery works to the north and the Sheaf Saw Mills to the south and/or the southern end wall of the cutlery works complex. It had probably been re-incorporated in later structures.

Area C

This trench was located on the far eastern side of the site, adjacent to Sheaf Street. Only a small area could be investigated, as the sides of the excavation area had to be stepped in several times due to the considerable depth of overburden (*c.* 3m) in this part of the site. The presence of a large vertical access shaft leading to the massive underground culvert containing the River Sheaf also restricted the area on the southern side. Grouting for these underground works had extruded into the below-ground deposits in places.

Underneath the made ground, a series of east/west and north/south mortared stone walls with remains of brick vaulting were uncovered, forming part of what was either a vaulted cellar, or possibly some form of structure underneath a furnace (for coal storage?). A gap in the surviving east/west wall indicated a possible access doorway leading to/from the north, but this was in the side of the trench and could not be investigated further. Another similar gap

led off to the east, but was once again in the side of the trench and could not be explored. This structure was partly demolished and backfilled with loose rubble, but had also had concrete extruded into it under pressure. The floor of this cellar or structure was not reached, as this would have been beyond a safe depth of excavation, however, probing suggested that at least 1.0m of rubble lay below the limit of excavation. This cellar structure was probably 19th century in date, and may have formed part of the Sheaf Island Cutlery Works.

Area E

This area contained some of the most recent but also possibly the oldest structures found on the site. A large stretch of the old River Street/River Lane was exposed, consisting of well-dressed, pink, rectangular granite sets, with longer granite kerbstones surviving on the western side of the street. It had a fine cambered surface, and a wear hollow on its eastern edge indicated an old goods entrance into the Sheaf Island Cutlery Works, marked on the 1935 OS map. The street had unfortunately been truncated during the machining of Trench 3 during the evaluation.

Analysis of the cartographic sources, the census data and several trade directories has revealed that River Street was renamed River Lane between 1871 and 1876. This appears to have been done in order to avoid confusion with the now defunct River Street that was located in Darnall.

To the east of River Lane (Area E) were the basements associated with the Sheaf Island Cutlery Works, and which had later been used as a print works. They had been backfilled with loose rubble and metal debris following the demolition of the works. The deep north/south orientated basement had brick and concrete walls and floors, the latter approximately 3m below the street level. There was a buttressed angle to the wall on the western side adjacent to River Lane, and deep light-wells extended down from street level. These had led to window recesses, some of which still had window frames in place. Other recesses contained storage heaters. On the eastern side of the deepest basement were further light wells and storage heater recesses, some of the latter still intact and plugged into the walls.

Concrete steps led through to further basements and also to brick buildings that had probably fronted onto an external yard surface, shown on the 1905 and 1935 O.S. maps. Knife blanks, knife wasters and grinding wheels were recovered from the rubble in this part of Area E, the only evidence for cutlery working from the whole site. Crisp packet and chocolate wrapper typologies suggested that these buildings had been demolished into the basements and levelled between 1984-1986.

The industrial development of the eastern side of River Lane began in or shortly after 1889 when the previously undeveloped land to the south-west of River Lane was purchased by Joseph Rodgers and Sons; at the time one of the largest and longest established Sheffield cutlery silverware firms (Bayliss 2002). The eastern side of the northern half of River Lane

was at this time occupied by domestic dwellings. The new factory buildings were recorded on the OS map of 1890 (Fig. 10), with further building and alterations recorded on the Goad Insurance Plan of 1896 (Fig. 11). The OS map 1905 records further development in the south of the works and that the domestic housing to the north was still extant. The OS map of 1923, however, records the expansion of the works northwards resulting in the demolition of the domestic housing along River Lane as well as the dwellings and shops along Pond Hill to the north.

Removal of the concrete floor raft and westernmost basement wall along the line of River Lane revealed a series of palaeochannel deposits, partly below the existing water table. No finds were recovered from these lower deposits, perhaps suggesting that they were post-glacial or earlier prehistoric in origin.

The 20th century cutlery works buildings had truncated an earlier cobbled yard surface, which was probably the remains of the large, open yard to the rear of the domestic dwellings and shops fronting on to River Lane and Pond Hill apparent on the Goad Insurance Plan (Fig. 11). Underneath this were a series of makeup deposits which contained 18th century pottery which in turn sealed several small postholes and stakeholes and deposits that contained 18th century clay pipe.

In the far corner of this area were the truncated remains of a stone-walled and brick-vaulted culvert, completely filled by silt deposits. The culvert was a replacement for an earlier series of stream or river channel revetments. Initially, these consisted of a series of wattle fences, in one case held in place by large pointed posts covered in pitch and then driven into the channel deposits. These were later replaced with the stone walling of the brick-vaulted culvert. Several of the large waterlogged posts that had been deeply driven at least 1m into the underlying natural channel deposits were retrieved.

Pottery associated with the revetments suggested an 18th or 17th century date. It is not clear how these structures were related to any of the 18th century mill channels, if at all. These seem to have been mostly north/south aligned, and to the north of Pond Hill Street. The timber revetment(s) may pre-date these mill channels, as they were not depicted on the early Fairbank maps of 1766 and 1771 (Fig. 4). However, it is possible that they might represent several phases of a broadly east/west channel depicted on the 1736 Gosling map (Fig. 3).

Area F

This area in the north-east corner of the site had been severely disturbed by recent drainage works associated with the storm drains constructed as part of the bus station, and other large-scale demolition and truncation events. This activity left a series of isolated stratigraphic blocks surviving from earlier phases. Great difficulties were encountered in investigating these due to the need to leave large areas of modern services undisturbed.

A series of tarmac surfaces were associated with brick and stone walls and drains which were probably part of the Sheaf Island Cutlery Works and therefore of a probable late 19th to early-mid 20th century date. Some of the larger blocks of dressed sandstone masonry had clearly been re-used from an earlier structure, and/or reflected re-modelling of the buildings.

Although they could not be directly linked to these buildings because of later truncation, a series of stone and brick walls probably pre-dated this activity. These were associated with makeup deposits, a grindstone-capped drain and possible floor surfaces from relatively insubstantial structures that might reflect 19th century buildings and activities.

Site development and social history

In the 17th century Sheffield was a market town at the centre of a hinterland known as Hallamshire with a population of less than 3,500 (Scurfield 1986). The predominant industry in the region was cutlery production which generally took place on the outskirts of the town and further afield close to rivers that powered the forges and grinding wheels (Belford 2001). As demand for steel products grew the trade rapidly expanded and in 1624 the regulatory body *The Corporation of Cutlers in Hallamshire* was established that went on to hold control of apprenticeships and trademarks throughout the 17th and 18th centuries. By 1672 population of Sheffield had tripled and 46% of households had a forge or smithy attached (Hey 1991).

Much of the development was *ad hoc* in nature and predominantly centred on The Crofts in the north-west of the town but more regular urbanisation was taking place along the banks of the river Don, which flows west to east through what was then the north end of the town. The river Sheaf, a tributary of the Don that flows south to north, was also developed and Gosling's 1736 map records the presence of Pond Mill, the Mill Dam a water powered tilt hammer at a forge located between the river and Forge Hill and several artificial water courses and/or culverts immediately to the north and partially within the site (Fig. 3).

The population of Sheffield continued to increase apace reaching 10,000 by 1730 and upwards of 30,000 by 1800 (Belford 2001). In an attempt to attract some of the industrial activity, and thereby rent payments, the Duke of Norfolk developed Alsop Fields (Fig. 3) located immediately to the west of site with access to the rivers Sheaf and Porter. This development is first apparent on Fairbanks' 1771 map which records the proposed street grid layout (Fig. 4). Building began in the 1790s and by Fairbanks' 1797 map the street grid appears completely built up (Fig. 5). The 1771 map also records that a second dam had been constructed adjacent to, and as a power supply for, the forge on Forge Hill.

Fairbanks' 1797 map indicates that the above mentioned colliery had opened which also had an associated dam that covered most of the southern half of site (Fig. 5). The goit is also recorded for the first time on this map running northwards away from the colliery dam. It is also recorded that Pond Mill had now become Lower Forge.

Fairbanks' later map of 1808 indicates that the range of buildings to in the west of site and the dam had been removed, that the goit and some of the pit-head buildings were extant and that a new structure, possibly with associated gardens, had been built between the goit and the Sheaf at the eastern edge of site (Fig. 6). No changes within the site are recorded on Leather's map of 1823 but by 1832 Tayler's map showed that the site had been partially developed (Fig. 8). Tayler's map is the first to represent River Street and it also indicates the presence of buildings along the western side of the street and buildings on the northern end of River Street at its junction with Pond Hill.

Although the detail is not particularly in-depth on Tayler's map, it is likely that the buildings recorded within and adjacent to the site are those that are apparent on the First Edition OS map of 1850 (Fig. 9). These buildings consisted of domestic dwellings and commercial premises fronting on to River Street and Pond Hill as well as further domestic dwellings around three sides of Mate's Square to the west of River Street and accessed via a gennel towards the southern end of River Street. River Street and Pond Hill were likely developed as part of the Duke of Norfolk's ongoing building projects.

The six tenements of Context Group 14 that were built thereby infilling Mate's Square are not apparent on the 1850 OS map but they do appear on the 1890 OS map. Unfortunately, no OS maps were issued between these dates and no local town plans have come to light. In an attempt to narrow down a date range for the construction of the six later tenements and to identify occupants of these and the earlier dwellings the census records were consulted. This was done in conjunction with the Goad Insurance Plan of 1896 which provided house numbers with the caveat that number sequence may have changed over time.

The census returns of 1841 contains only entries for Pond Hill and River Street with no mention of Mate's Square and perhaps more surprisingly, as it appears to be present on Tayler's 1832 map, Creswick Walk. There are, however, several entries for River Street and Pond Hill and so it is possible that the sub-divisions of Creswick Walk and Mate's Square had not yet been recognised and named. To add weight to this theory, some of the census entries are headed '*River Street Cont'? Pond Hill*' indicating the enumerator was not sure where he was himself. It should also be noted that house numbers in at least this area were not recorded on the census negating investigations along those lines. However, cross referencing the names held on the 1841 census with those on the 1851 census has identified the following matches:

Possible Address	Name	Age	Relation to head	Occupation
32 River Street	William Harwood	30	Head	Edge tool maker
	Harriet Harwood	25	Wife	
	Ann Harwood	5	Daughter	
	Elizabeth Harwood	4	Daughter	
	William Harwood	1	Son	
30 River Street	Joseph Slack	75	Head	(Illegible)
	Isabella Slack	70	Wife	

Possible Address	Name	Age	Relation to head	Occupation
26 River Street	Richard Milner	40	Head	Currier
	Sarah Milner	35	Wife	
	Mary Milner	15	Daughter	
	William Milner	10	Son	
	Richard Milner	8	Son	
	Sarah Milner	5	Daughter	

The 1851 census is much more enlightening. This contains twelve entries for Mate's Square as well as the house numbers 1 to 12. The 1850 OS map records twelve dwellings arranged around Mate's Square with properties 1 to 3 to the south (houses 1 and 2 being within the excavation) and properties 4 to 12 forming the western range of tenements that fell outside the excavation area. If these tenements were numbered in the sequence recorded on the Goad plan then it is possible to introduce the first identifiable tenants of the houses excavated in Mate's Square, they were:

Address	Name	Age	Relation to head	Occupation
1 Mate's Square	Manasseh Wright	35	Head	Commercial book fellow
	Rebecca Wright	35	Wife	
	Mary Elizabeth Wright	14	Daughter	
	John Robert Wright	12	Son	Scholar
	William Henry Wright	6	Son	Scholar
	Walter Thomas Wright	4	Son	Scholar
	Eliza Jane Wright	1	Daughter	
2 Mate's Square	Jonathan Gould	75	Head	(Illegible)
	Elizabeth Oates	52	Daughter	(Illegible)
	Mary Day	26	Daughter	Nail maker
	Sarah Wray	19	Daughter	Nail maker

The tenements thus far identified as Context Group 12 fronted on to River Street and if the numbering sequence gleaned from the Goad plan is again to be trusted then the six excavated cellars represent the remains of house number 26 to the north through to 36 in the south. The occupants of these dwellings recorded during the 1851 census are as follows:

Address	Name	Age	Relation to head	Occupation
26 River Street	Richard Milner	51	Head	Leather currier
	Sarah Milner	47	Wife	
	Richard Milner	20	Son	Boiler marker
	Sarah Milner	18	Daughter	Nail cutter
28 River Street	John Short	61		Table blade forger

Address	Name	Age	Relation to head	Occupation
30 River Street	Ann Short	49		
	Samuel Short	34		Table knife cutler
	Isabella Slack	80	Head	
	George Slater	33	So-in-law	Butcher
	Elizabeth Slater	28	Daughter	
	Henry Slater	7	Grandson	Scholar
	George Slater	4	Grandson	Scholar
32 River Street	William Slater	1	Grandson	
	George Sass	59	Lodger	Cutler
	William Harwood	38	Head	Edge tool maker
	Harriet Harwood	37	Wife	
	Ann Harwood	15	Daughter	(Illegible) burnisher
	Elizabeth Harwood	13	Daughter	Do
	William Harwood	11	Son	Button clipper
34 River Street	George Harwood	9	Son	(Illegible) spinner (?)
	Harriet Harwood	2	Daughter	
	Sarah Ann Rollinson	29	Head	School mistress
	Henry Gates	21	Lodger	(Illegible) roller
	Hannah Gates	21	Lodger's wife	Nail maker
36 River Street	Elizabeth Shaw	20	Lodger	Nail maker
	No record			

Examination of the 1861 census indicates that, by that time, the six tenements that constitute Context Group 14 had been constructed in Mate's Square as there are seventeen households recorded. Unfortunately, only the house numbers 1 to 3 are recorded alongside the relevant household suggesting perhaps that the dwellings had recently been constructed and had not yet adopted a house number. This theory might also explain why there are only seventeen entries when the Goad Plan suggests eighteen dwellings constituted Mate's Square. Those households that can confidently be identified are as follows:

Address	Name	Age	Relation to head	Occupation
1 Mate's Square	Not occupied			
2 Mate's Square	Francis Butler	39	Head	Cooper
	Eliza Butler	37	Wife	Warehouse woman
	Cathrine Roddiss	18	Daughter	Burnisher
	James Henry Roddiss	11m	Grandson	
	George Yeates	31	Lodger	Cutler
26 River Street	Clayton Lynn	26	Head	Furnace man
	Ann Lynn	28	Wife	
	John Lynn	10	Son	Scholar
	Robert Forrest	75	Lodger	Labourer
	William Forrest	26	Lodger	Furnace man
28 River Street	Unoccupied			
30 River Street	Joseph Wild	45	Head	Table blade grinder

Address	Name	Age	Relation to head	Occupation
32 River Street	Harriet Wild	43	Wife	
	Hiram Wild	17	Son	Table blade grinder
	Sarah Maria Wild	16	Daughter	Pupil teacher
	Charles Wild	14	Son	Table blade grinder
	George William Wild	5	Son	
	William Henry Brown	12	Nephew	Table blade grinder
	William Harwood	48	Head	Edge tool forger
	Harriet Harwood	47	Wife	
	Elizabeth Harwood	23	Daughter	Silver burnisher
	Harriet Harwood	12	Daughter	Scholar
34 River Street	Mary Harwood	9	Daughter	Scholar
	Matthew Jepson	28	Head	Carter
	Elizabeth Jepson	31	Wife	
	John Joseph Jepson	8	Son	
	Matthew Amos Jepson	2	Son	
36 River Street	Ann Goulding	39	Lodger	Dress maker
	James Parkin	69	Head	White metal smith
	Lydia Parkin	68	Wife	
	Louisa Blackwell	39	Daughter	Dress maker
	Louisa Butler	13	Granddaughter	Servant
	James Forbes	35	Lodger	Comb maker

With regard to the households of Mate's Square in 1871 the census is rather confused. Tenements 1 to 12 are recorded but strangely there are two entries for Number 4. There is an entry for 16 Mate's Square and one for 24; an address that does not appear on any other census or map. There are then a further two households recorded in Mate's Square but the house numbers are omitted. Those households that can be confidently regarded are recorded here:

Address	Name	Age	Relation to head	Occupation
1 Mate's Square	Mary Cross	63	Head	Warehouse woman
	Hannah Tandy	21	Boarder	Warehouse woman
	Florence Tandy	3	Daughter	
2 Mate's Square	Joseph Mitchell	49	Head	Carter
	John Mitchell	69	Lodger	
	Sarah Atkin	45	Lodger	
	Elizabeth Atkin	15	Lodger	Cabinet case liner
2 Mate's Square	James Norcliffe	24	Head	Upholsterer
	Mary Norcliffe	29	Wife	
	James E. Norcliffe	9m	Son	
26 River Street	William Else	47	Head	Spring painter
	Sarah Else	39	Wife	
	James Else	14	Son	Errand boy scholar
	Samuel Else	11	Son	Scholar

Address	Name	Age	Relation to head	Occupation
28 River Street	William Else	9	Son	Scholar
	George Else	7	Son	Scholar
	Elizabeth Else	4	Daughter	Scholar
	Thomas Else	2	Son	
	Mary Else	2m	Daughter	
	Edward Shelton	52	Head	Cast maker
	Harriet Shelton	29	Wife	
	John Shelton	12	Son	Scholar
	Harriet Shelton	5	Daughter	Scholar
30 River Street	Charles Shelton	2	Son	
	Joseph Borrell	28	Head	File striker
	Mary Borrell	25	Wife	
	Rueben Borrell	5	Son	Scholar
	Herbert Borrell	1w	Son	
	Charles Nartcliff	39	Lodger	Spring knife maker
	Elizabeth Nartcliff	28	Lodger	
	Arthur Nartcliff	1m	Lodger	
	George Shillits	25	Lodger	Grinder
	Mary Shillits	25	Lodger	
	Sarah Ann Keeling	28	Lodger	No trade
	George Keeling	8	Lodger	Scholar
	Henry Keeling	4	Lodger	Scholar
	Jane Keeling	2	Lodger	
32 River Street	Harriet Harwood	57	Head	
	Elizabeth Harwood	33	Daughter	Silver burnisher
	George Harwood	29	Son	Steel melter
	Mary Harwood	19	Daughter	Silver burnisher
	Harriet Harwood	7	Granddaughter	Scholar
34 River Street	Joseph Langton	40	Head	Carter
	Elizabeth Langton	40	Wife	
	Joseph Langton	10	Son	No trade
	Rose Ann Langton	8	Daughter	Scholar
	Harriet J Langton	4	Daughter	Scholar
	James Langton	8m	Son	
	Mary Cooper	84	Lodger	
36 River Street	Henrietta Sayner	46	Head	Chain woman
	Mary Ann Sayner	20	Daughter	Warehouse woman

By the time the 1881 census was taken the house numbering system appears to have been well established enabling for the first time positive identification of households occupying Mate's Square numbers 13 to 18 (Context Group 14). These households and those occupying River Lane (as it had been renamed) tenements are listed here:

Address	Name	Age	Relation to head	Occupation
1 Mate's Square	Robert Longmuir	40	Head	Compositor
	Margaret Longmuir	38	Wife	
	John Longmuir	15	Son	
	Mary Ann Longmuir	13	Daughter	Scholar
	Margaret A. Longmuir	9	Daughter	Scholar
	Robert Longmuir	11	Son	Scholar
	James Longmuir	8	Son	Scholar
	Elizabeth Longmuir	7	Daughter	Scholar
	Patrick Longmuir	4	Son	
	Winifred Longmuir	1	Daughter	
2 Mate's Square	Catherine Longmuir	1	Daughter	
	George Millard	46	Head	Table blade grinder
	Lucy White	28	?	Domestic servant
	Emily White	8	Daughter	Scholar
	Lilly White	5	Daughter	Scholar
13 Mate's Square	George White	1	Son	
	Henry Cotterill	35	Head	Table blade grinder
	Martha Cotterill	30	Wife	
	William H. Cotterill	11	Son	Scholar
	Mary Cotterill	8	Daughter	Scholar
	Ann Cotterill	6	Daughter	Scholar
	Martha Rothwell	28	Head	Glass blower
	John Rothwell	27	Wife	
14 Mate's Square	Eliza Rothwell	35	Daughter	
	Walter Drabble	36	Head	Labourer on line
	Ann Drabble	29	Wife	
	Alfred Drabble	11	Son	Scholar
	Walter Drabble	9	Son	Scholar
	William H. Drabble	6	Son	Scholar
	Sarah Ann Drabble	2	Daughter	
	Lucy Lucas	21	Boarder	Scratch brusher
	Syer Lloyd	46	Head	Iron puddler
	Ann Lloyd	44	Wife	
15 Mate's Square	Joseph H.J. Cutts	13	Grandson	Dray boy
	Phoebe A. Walters	59	Head	
	Charles Fox	59	Boarder	
	Mary Jackson	73	Head	
16 Mate's Square. On 1871 census but at No. 12	Samuel S. Berry		Head	Bone flat cutter
	Martha Berry	45	Wife	
	John Berry	17	Son	Button maker
	Samuel Berry	13	Son	Scholar
	Rose Berry	10	Daughter	Scholar
	Frederick Berry	7	Son	Scholar
	Willie Berry	4	Son	
	Jane Raves	20	Boarder	Wire worker

Address	Name	Age	Relation to head	Occupation
17 Mate's Square	George Forggil	20	Head	Furnaceman
	Sarah Forggil	17	Wife	Warehouse woman
	Joseph Willey	57	Head	Brass turner
	Elizabeth Willey	51	Wife	
	Henry Willey	23	Son	Shovel maker
	Arthur Willey	15	Son	Errand boy
	Sarah Willey	11	Daughter	
18 Mate's Square	Martha Downs	31	Daughter	
	Elizabeth Downs	8	Granddaughter	
	John Walker	32	Head	Bolster grinder
	Mary J. Walker	23	Wife	Warehouse woman
26 River Street	George Cotterill	72	Father in Law	
	Charles J. Cotterill	17	Brother in Law	Cutler
	Harriet Kay	53	Head	Shop keeper
	Albert Kay	26	Son	Pork butchers assistant
	Fanny Kay	12	Daughter	Scholar
28 River Street	William Arthur	55	Boarder	Landscape gardener
	John Grantham	31	Head	File cutter
	Elizabeth Grantham	25	Wife	Case maker
	William Grantham	6	Son	Scholar
30 River Street	John A. Grantham	5	Son	
	Joseph Grantham	2	Son	
	John Jenkinson	27	Head	Poultry dealer
	Lucy Jenkinson	28	Wife	
	Eliza A. Jenkinson	5	Daughter	
32 River Street	Elizabeth Shackley	26	Sister in Law	Scissor filer
	Adam Bishop	37	Head	Labourer in timber yard
	Hannah Bishop	31	Wife	
	Amelia Bishop	7	Daughter	Scholar
34 River Street	Joseph Bishop	10	Son	Scholar
	William Rose	43	Head	General labourer
	Elizabeth Rose	41	Wife	
36 River Street	Robert Slack	67	Head	General labourer (unemployed)
	Hannah Slack	66	Wife	
	Elizabeth Slack	29	Daughter	Charwoman
	Alice Slack	14	Granddaughter	Warehouse girl
	George Slack	4	Grandson	Scholar
	Sarah Ann Slack	2	Granddaughter	

The census returns for 1891 are again a little confused with no mention of Mate's Square at all. All the addresses are given as River Lane but some prefixed with *Ct. 4*, taken here as to indicate Court No. 4 as apparent on the 1896 Goad plan (Fig. 11). This appears to be the most plausible explanation and some correlations between households in the previous census

seem to support the supposition. Those households confidently identified are listed here as well as what appears to be two entries for 26 River Lane:

Address	Name	Age	Relation to head	Occupation
Ct. 4 No. 1	James Hallam	40	Head	Labourer
	Mary Ann Hallam	31	Wife	
	John Hallam	11	Son	Scholar
	James Hallam	9	Son	Scholar
	Jane E. Hallam	6	Daughter	Scholar
	Albert E. Hallam	4	Son	
	Anni (?)Hallam	2	Daughter	
	Catherin Ratican	20	Head	Buffer
Ct. 4 No. 2	William Ratican	14	Son	
	Henry Dixon	29	Head	Hotel porter
	Anne Dixon	27	Wife	
	Joseph Henry Dixon	4	Son	
	Sarah A. Dixon	2	Daughter	
	Maria Dixon	27	Sister	Living on (Illegible) means
	Henry Dixon	52	Brother-in-law	Porter
Ct. 4 No. 13	Thomas Clarke	52	Head	(Illegible) metal smith
	Elizabeth Clarke	52	Wife	
	Joseph William Clarke	27	Son	Carter
	Charles Henry Clarke	20	Son	Carter
	Florence Clarke	18	Daughter	(Illegible)
	Arthur Thomas Clarke	15	Son	(Illegible)
	Annie E. Clarke	9	Daughter	Scholar
Ct. 4 No.14	Thomas Lindly	86	Head	Edge tool (Illegible)
	Elizabeth Lindly	76	Wife	(Illegible)
Ct. 4 No. 15	Ann Walters	76	Head	
	Jane M. Donald	71	Boarder	
	Thomas Clarke	79	Head	Nailmaker pauper
Ct. 4 No. 16	Samuel S. Berry	56	Head	Bone flat cutter
	Martha Berry	56	Wife	Fine metal (Illegible)
	Samuel Berry	25	Son	Leather (Illegible)
	Frederick Berry	15	Son	Belt maker
	Willie Berry	10	Son	Shop boy
Ct. 4 No.17	William M. Denton	38	Head	Iron worker
	Mary A. Denton	32	Wife	
	Anne M. Denton	8	Head	
	Edwin Dudby	74	Father-in-law	Roll turner
	William Rippson	24	Boarder	(Illegible)
Ct. 4 No. 18	George Jepson	46	Head	Collier
	Brigit Jepson	49	Wife	
	Sarah A. Walsh	4	Granddaughter	
26 River Lane	George Mellard	50	Head	Table blade grinder
	Lucy Mellard	37	Wife	
	George Mellard	11	Son	Scholars

Address	Name	Age	Relation to head	Occupation
26 River Lane	Sarah J. Mellard	7	Daughter	Scholars
	Rose Ann Mellard	2	Daughter	
	Thomas Mellard	4m	Son	
	Edward Barratt	30	Head	Labourer
	Mary Barratt	30	Wife	
	Edward Barratt	12	Son	Scholar
	Fred Barratt	7	Son	Scholar
28 River Lane	Harry Barratt	4	Son	
	Joseph Louth	37	Head	Table blade maker
	Christiana Louth	37	Wife	
	John Thomas Wylde	43	Brother-in-law	Labourer
	Joseph W Louth	10	Son	Scholar
30 River Lane	Lillian Louth	8	Daughter	Scholar
	Joe Brice	54	Head	General labourer
	Sarah A Brice	58	Wife	
	Jane Brice	22	Daughter	
	Walter Brice	20	Son	Bricklayer's lad
	John Brice	18	Son	General labourer
	Nellie Brice	15	Daughter	
	Ada Lacy	4	Granddaughter	
32 River Street	George Parkin	48	Head	File cutter
	Emma Parkin	44	Wife	
	John W. Parkin	14	Son	
	Lillie Parkin	11	Daughter	Scholar
	Harry Parkin	6	Son	Scholar
	William Moss	67	Boarder	File cutter
34 River Street	Isaac Melbourn	40	Head	Labourer
	May Melbourn	38	Wife	
	Julia Melbourn	15	Daughter	
	John Melbourn	11	Son	Scholar
	Sarah A. Melbourn	8	Daughter	Scholar
	Kate Melbourn	4	Daughter	
	Thomas Melbourn	11m	Son	
	John McHugh	40	Boarder	Labourer
36 River Street	William Layman	65	Head	Railway labourer
	Elizabeth Layman	58	Wife	
	Elizabeth Layman	20	Daughter	Surgical instrument finisher
	Robert Haigh	24	Boarder	
	Edward Kirkby	56	Boarder	

The name Mate's Square appears to have been well and truly abandoned by the time of the 1901 census. The name does not appear in the census returns and it has also gone from the 1905 OS map. Instead, the addresses given are for Court No. 4. the occupants of the excavated tenements are listed here:

Address	Name	Age	Relation to head	Occupation
Ct. 4 No. 1	Walter Temporal	48	Head	Labourer
	Annie Temporal	56	Wife	
	John Bradley	40	Boarder	Labourer
	Edward Slates	35	Boarder	Labourer
	George Stacey	35	Boarder	Labourer
Ct. 4 No. 2	Lucy Mellard	50	Head	Char woman
	George Mellard	21	Son	Table knife grinder
	Rose Mellard	12	Daughter	
	Harry Mellard	8	Son	
Ct. 4 No. 13	Elsie Mellard	6	Daughter	
	Benjamin Hartley	39	Head	Goods yard labourer
	Clara Hartley	39	Wife	
Ct. 4 No. 14	Horace Hartley	17	Son	Steam engine driver
	George H. Patkin	58	Head	File cutter
	Emma Patkin	56	Wife	
	Harry Patkin	17	Son	File cutter
Ct. 4 No. 15	Walter Cattel	18	Boarder	Edge tool sticker
	William Chantler	33	Head	(Illegible) labourer
	Elizabeth Chantler	32	Wife	
	Alice H. Chantler	13	Daughter	
Ct. 4 No. 16	Mary E. Chantler	11	Daughter	
	Harry Pinder	26	Head	File forger
	Susannah Pinder	35	Wife	File cutter
	Harry Pinder	11	Son	
	Beatrice Pinder	8	Daughter	
	Lilly Pinder	5	Daughter	
Ct. 4 No. 17	Ruth Pinder	6m	Daughter	
	James Hannigan	42	Head	
	Julia Hannigan	62	Wife	
Ct. 4 No. 18	George Griffith	47	Head	Labourer
	Sarah A. Griffith	40	Wife	
	Florence Sharman	17	Stepdaughter	Assistant in fruit market
	Sarah A. Sharman	14	Stepdaughter	Domestic servant
	John Sharman	12	Stepson	
	Lucy Sharman	9	Stepdaughter	
	Leonard Sharman	7	Stepson	
	Olive Griffith	4	Daughter	
	George Griffith	2	Son	
	Mary Earnshaw	50	Boarder	Bricklayer
	William Brown	22	Boarder	Bricklayer
	William Lake	40	Boarder	Bricklayer
	James Taylor	45	Boarder	(Illegible)
	26 River Lane	Arthur Godson	38	Head
Ellen Godson		41	Wife	
Beatrice Godson		19	Daughter	Domestic servant
28 River Lane	Edward Smith	56	Head	Fish hawker

Address	Name	Age	Relation to head	Occupation
	Sarah A. Smith	45	Wife	
	Frederick Smith	21	Son	Fish hawker
	Sarah A. Smith	18	Daughter	Domestic servant
	John Smith	13	Son	
	George Smith	11	Son	
	Minnie Smith	8	Daughter	
	Ernest Smith	5	Son	
	Esther Smith	1	Daughter	
30 River Lane	Sarah Bryce	68	Head	
	John Parr	50	Boarder	
	Edward Pallet	48	Boarder	Navvy
32 River Street	John Tomlinson	44	Head	Pork butcher
	Esther Tomlinson	43	Wife	
34 River Street	Isaac Melbourne	49	Head	Timber yard labourer
	Julia Melbourne	24	Daughter	Confectionary (illegible)
	John Melbourne	21	Son	Steel mill roller
	Sarah A. Melbourne	17	Daughter	Domestic servant
	Thomas Melbourne	10	Son	
	William Melbourne	8	Son	
36 River Street	James Ennis	53	head	Night watchman

The people that inhabited the excavated dwellings on River Street/Lane and Mate's Square/Court No. 4 over the years would today be likely described as blue collar workers. The majority of the men and some of the women worked in the steel industry or allied trades such as bone cutters. Several bricklayers came and went over the years as did men simply described as labourers. A few people worked in the food supply industry as a pork butcher, a pork butchers assistant, a poultry dealer and fish hawkers are recorded. The sons of the households often followed in their father's footsteps to the doors of the factories where they were taken as apprentices to their father's trade. Some of the daughters also went in to the factories to become toll 'grinders' or 'finishers', many more went into domestic service.

The two-up-two-down houses with a cellar and perhaps an attic were a little more spacious than the one-up-one down back to backs that were built elsewhere in the town but, judging by some of the census entries, space was at a premium. For example, the 1881 census records that Robert and Margaret Longmuir lived at number 1 Mate's Square with their nine children.

Whilst modesty may not be of too great a concern within the family setting it may be more of an issue in a house full of unrelated people. The 1871 census records Joseph and Mary Borrell and their two young children residing at 30 River Street. A house they shared with lodgers Charles and Elizabeth Nartcliff and their baby; with George and Mary Shillits and with Sarah Ann Keeling and her three children.

The housing remained in use until the first third of the 19th century when many of the Sheffield slums were cleared. The OS maps of 1890 (Fig. 10), 1905 (Fig. 12) and 1923 (Fig. 13) show the tenements still standing but by the 1935 OS map they are gone (Fig. 14). These maps also chart the development of Joseph Rodgers' Cutlery Works and the Sheaf Island Works.

The 1890 map records that the Sheaf Island Works were fully constructed, adding to the more disparate buildings recorded on the 1850 OS map. Several buildings of Joseph Rodgers' Cutlery Works are recorded on the 1890 map with further additions on the 1905 map. However, by the time the 1923 OS map was produced Rodgers' works had expanded northwards resulting in the demolition of the tenements and shops on the eastern side of River Street and the south side of Pond Hill. The works buildings remained standing until the early 1980s when they were finally demolished.

9 Conclusions

The excavations at D-Campus, Sheffield have located several structures identified in the cartographic record. Elements of the Sheaf Island Cutlery Works were identified in Areas C, E and F, and a probable dividing wall between these premises and the Sheaf Saw Mills to the south was identified in Area B.

Areas A/D uncovered more of the Central Hammer Works remains previously located by Evaluation Trench 3. To the south of the works boundary, tenement dwellings to the south and east of Mate's Square were identified. At a later date, the tenements to the south were extended northwards, effectively filling in Mate's Square. This was probably in response to demand for housing towards the end of the 19th century. The cartographic evidence has supported the archaeological findings in that they were single terrace dwellings rather than back-to-backs as previously speculated.

The Phase 1 features in Area A/D (the tank and culvert) were likely the remains of a water powered wheel associated with the colliery that occupied the site for a period of time between 1771 and 1808. The artefactual evidence from deposits associated with the construction of the tank and culvert and their ultimate destruction fits this time frame well strengthening the link between them and the colliery.

The earliest features encountered on site were probably the drainage ditches located in Area E. Two phases of the ditches were augmented wattle fences likely placed to consolidate the banks. The latest phase consisted of a brick built culvert. Seventeenth to 18th century clay pipe and pottery was recovered from the drainage features suggesting they may have served a similar function to those water courses noted on Gosling's map of 1736.

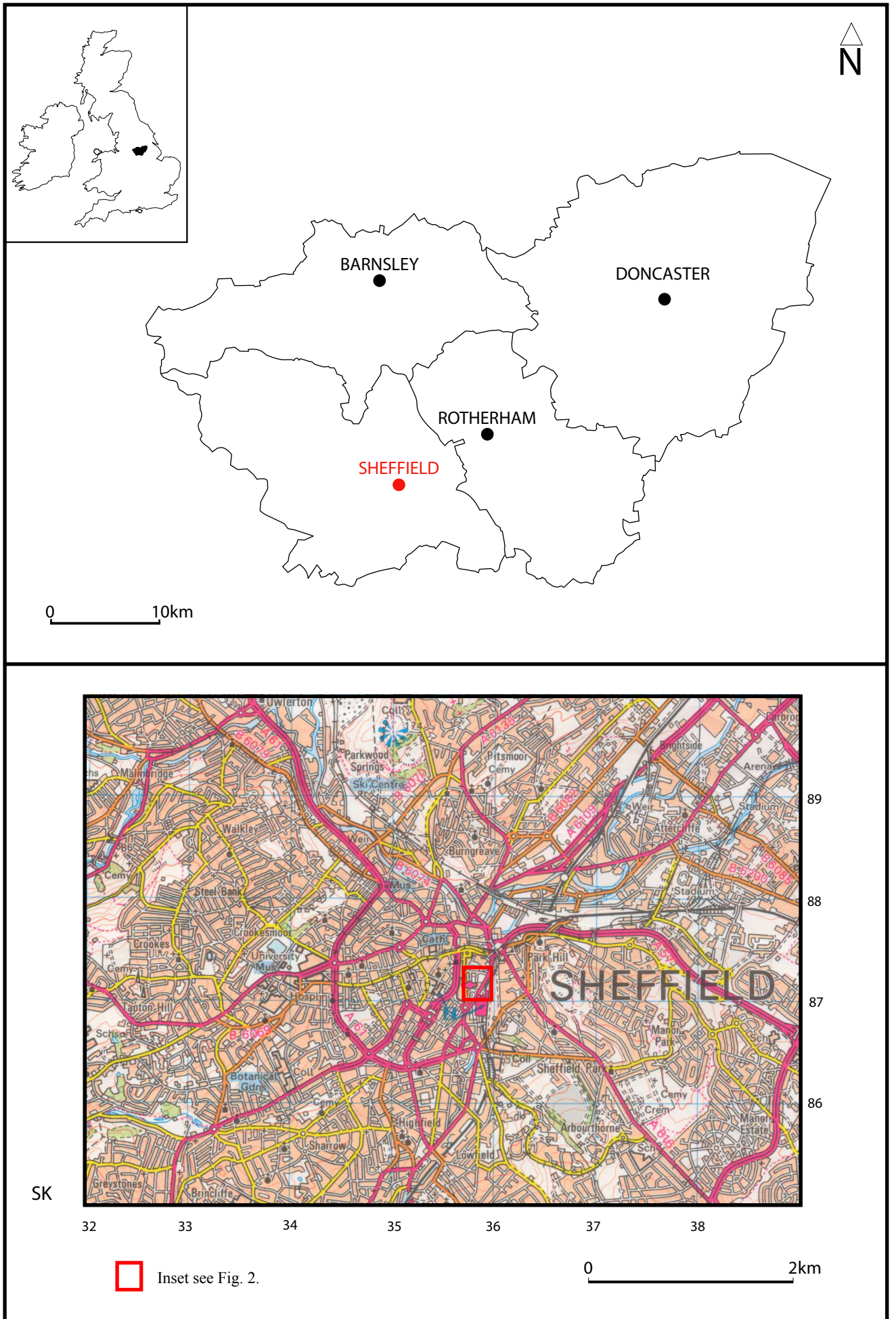


Fig. 1. Site location

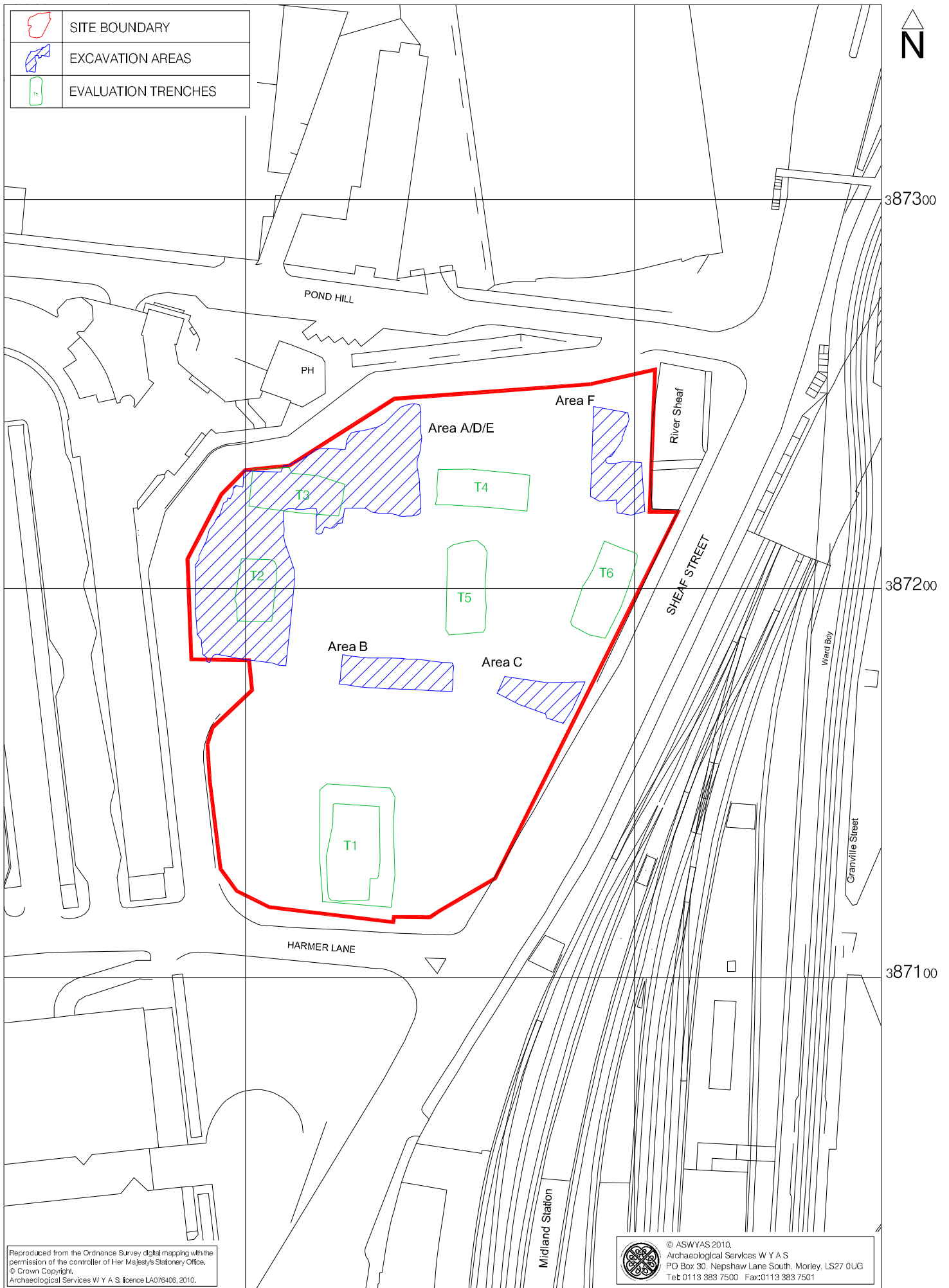


Fig. 2. Plan of site showing excavation areas and evaluation trenches (Scale: 1:1250 @ A4)

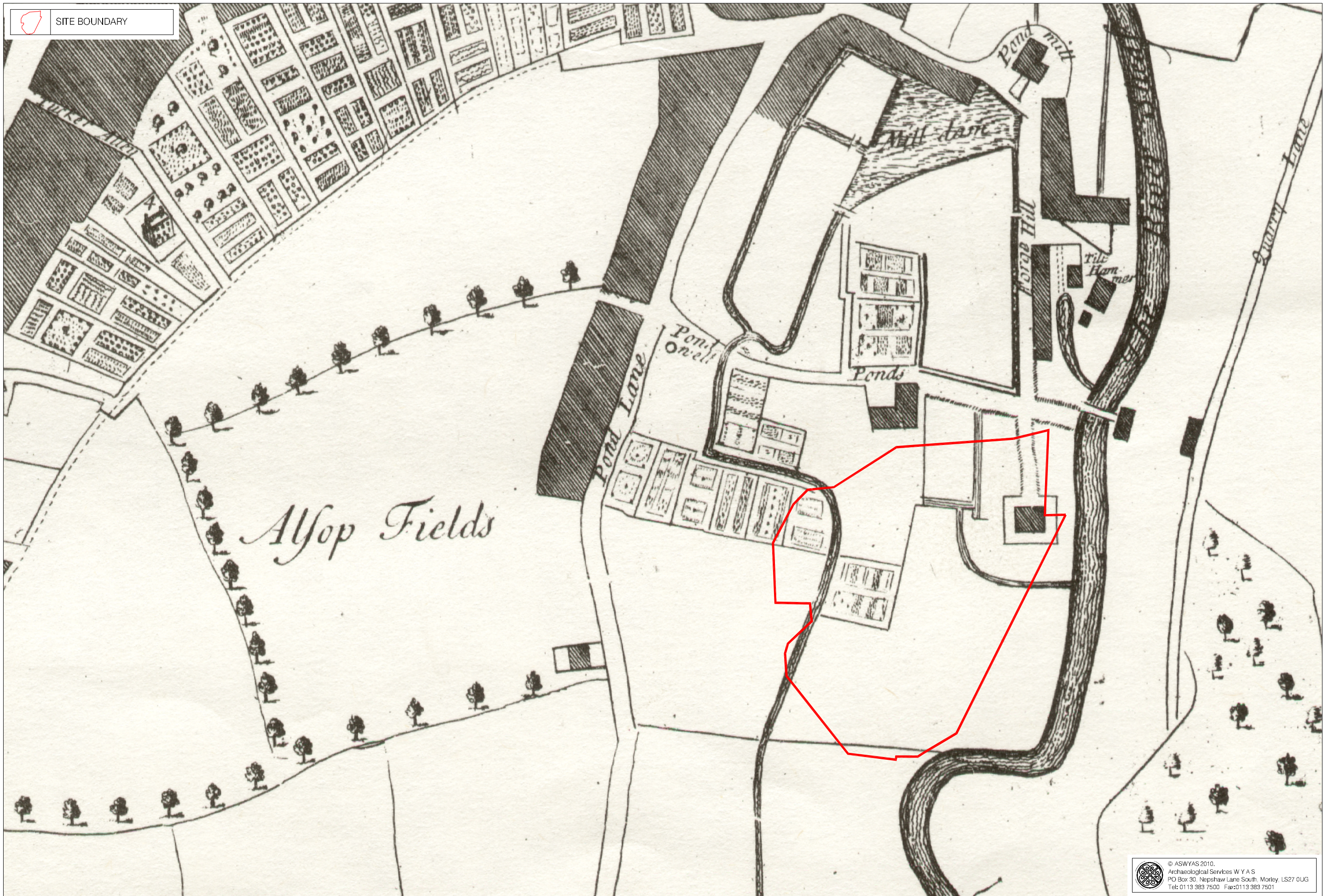


Fig. 3. Gosling's 1736 map of Sheffield showing the approximate location of site (Scale c. 1:1500 @ A3)

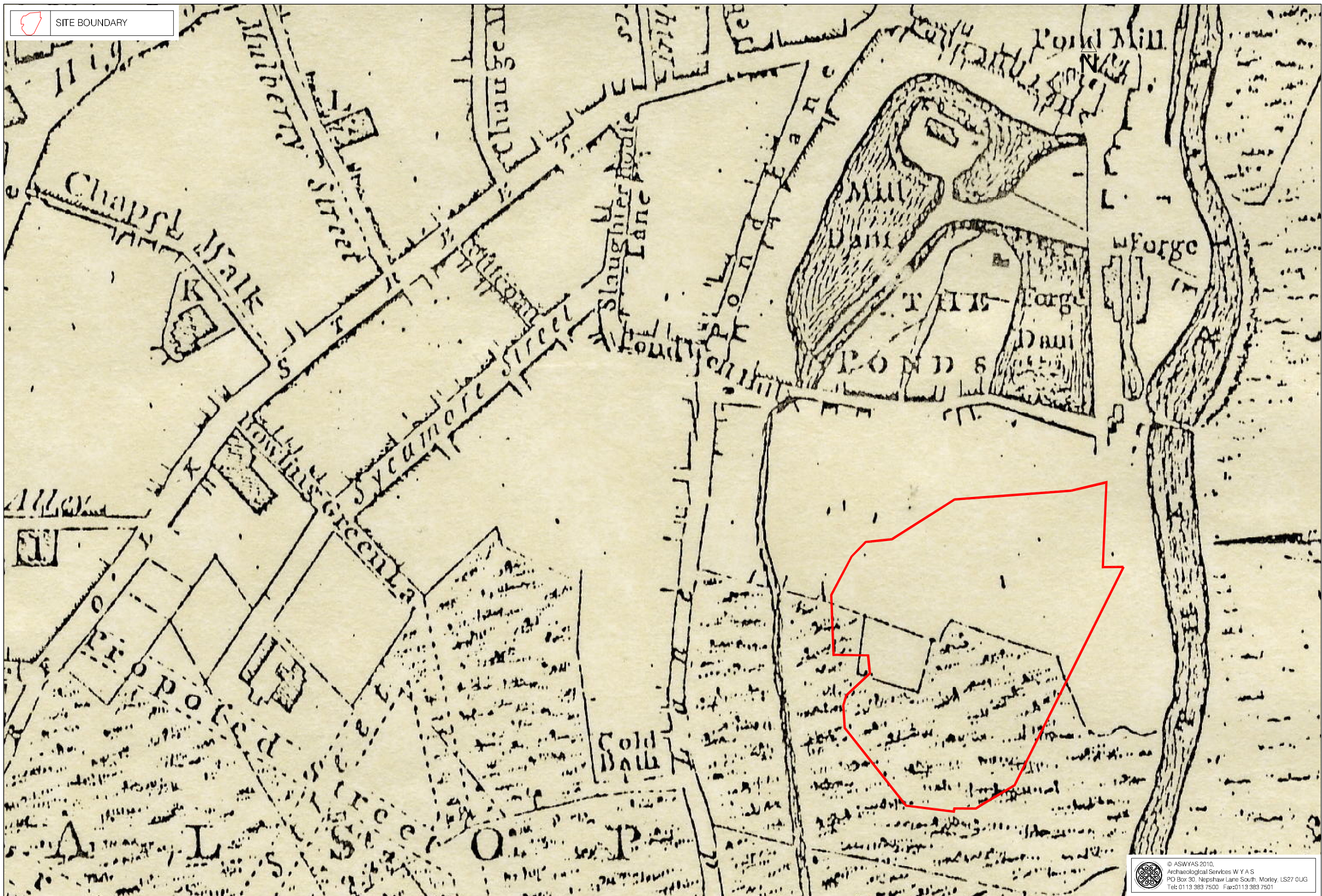


Fig. 4. Fairbank's 1771 map of Sheffield showing the approximate location of site (Scale c. 1:1500 @ A3)

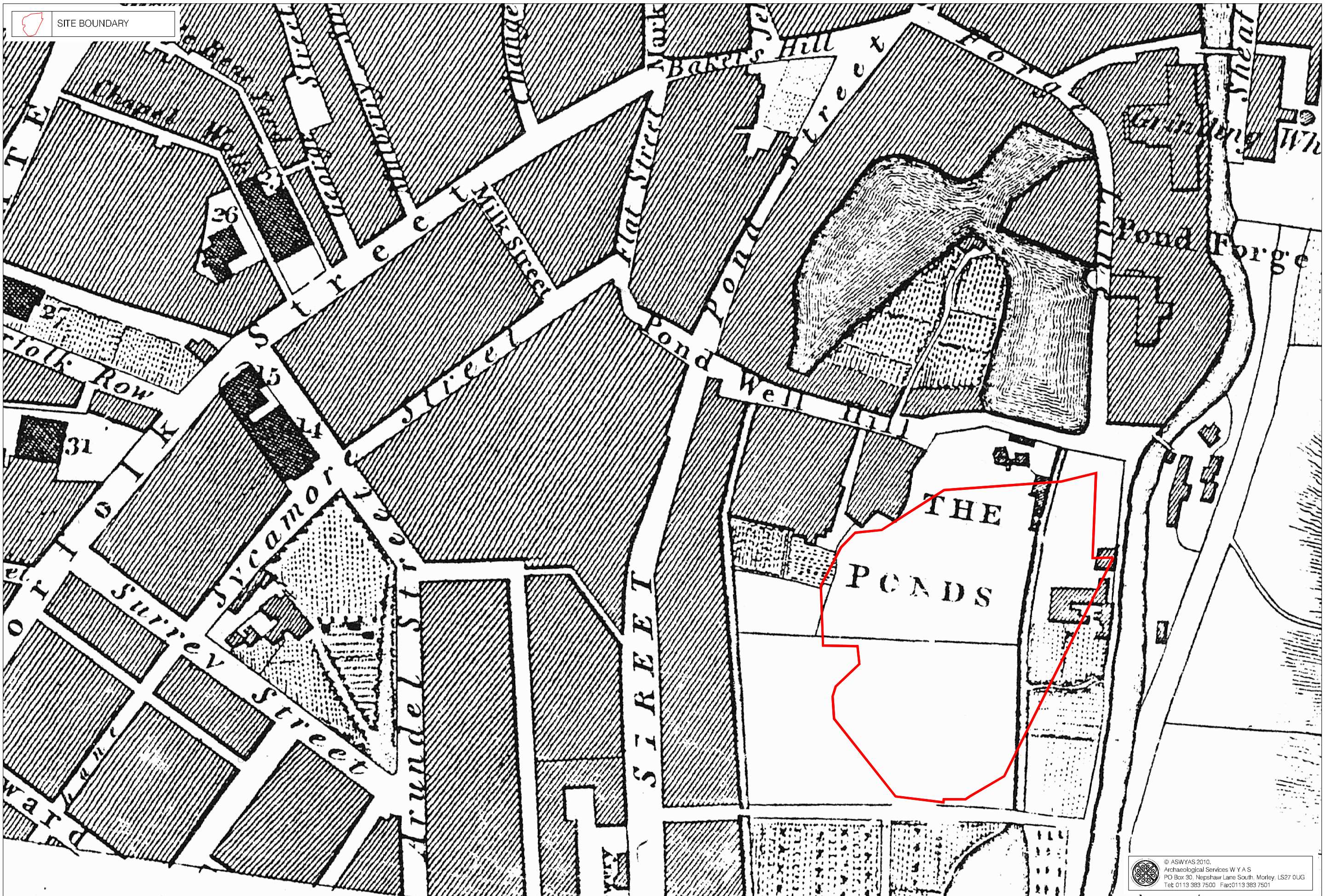


Fig. 6. Fairbank's 1808 map of Sheffield showing approximate location of site (Scale c. 1:1500 @ A3)

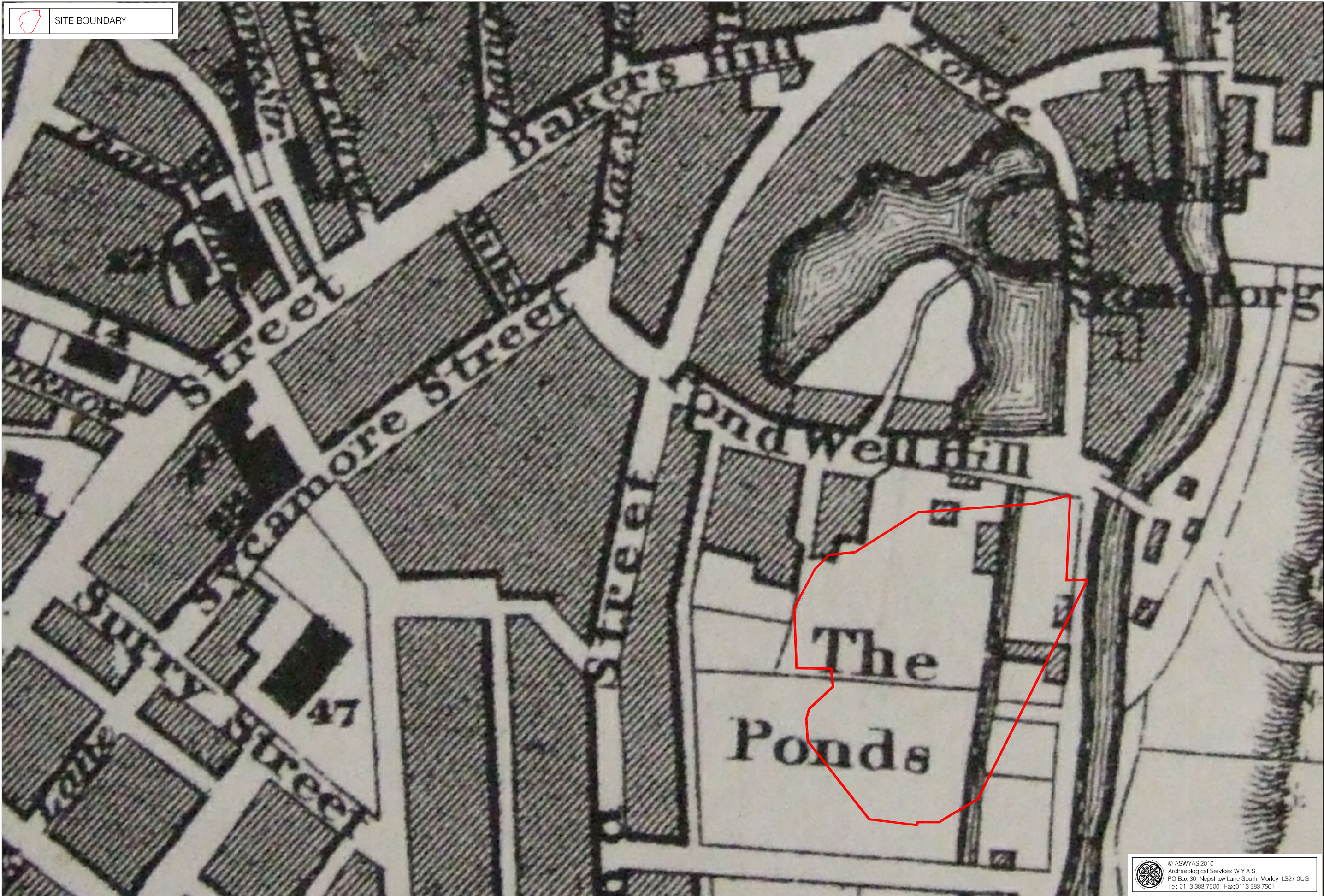


Fig. 7. John Leather's 1823 map of Sheffield showing the approximate location of site (Scale c. 1:1500 @ A3)

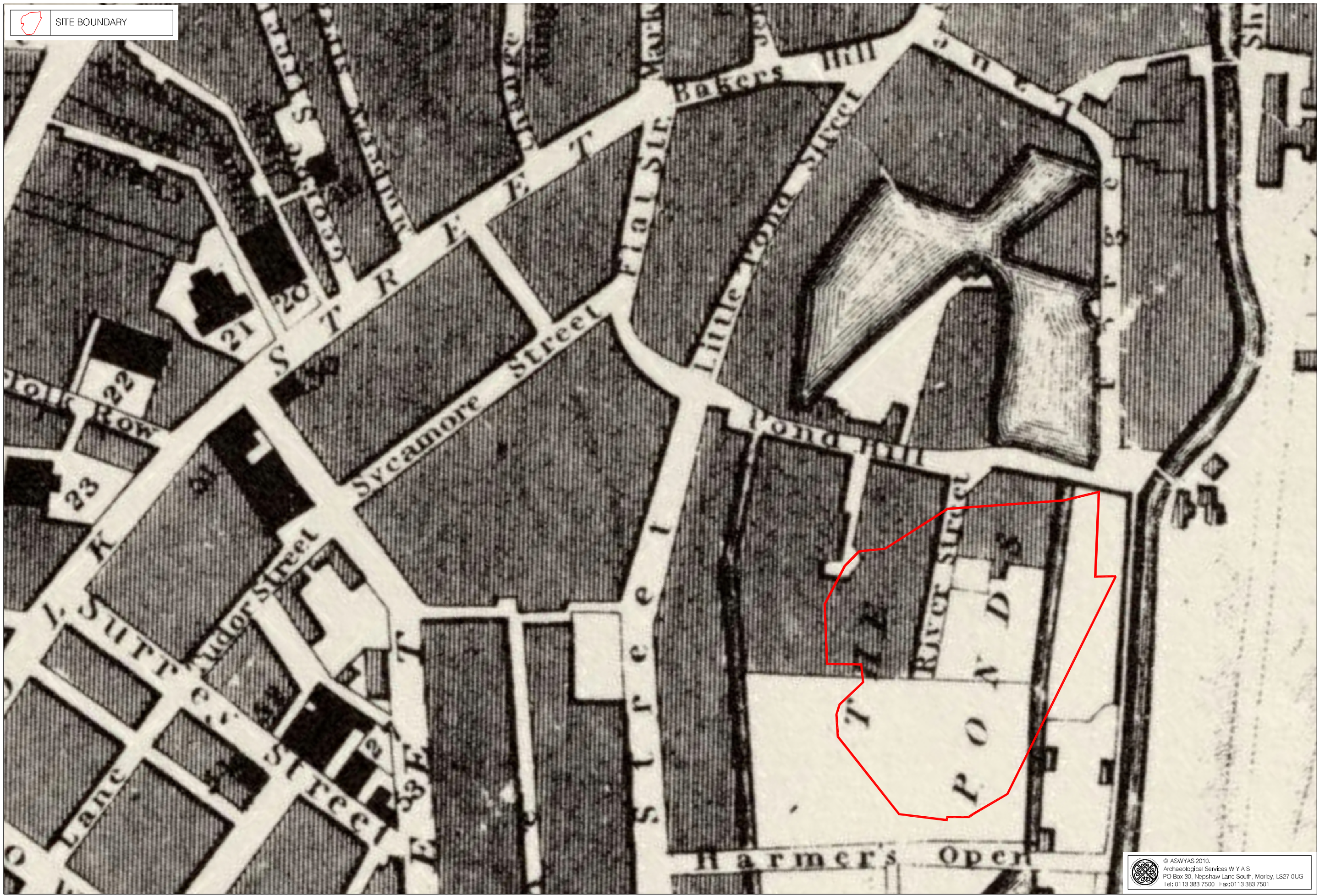


Fig. 8. Tayler's 1832 map of Sheffield showing the approximate location of site (Scale c. 1:1500 @ A3)



Fig. 9. OS 1850 map of Sheffield showing location of site and archaeological remains (Scale: 1:750 @ A4)



Fig. 10. OS 1890 map of Sheffield showing location of site and archaeological remains (Scale: 1:750 @ A4)



SITE BOUNDARY

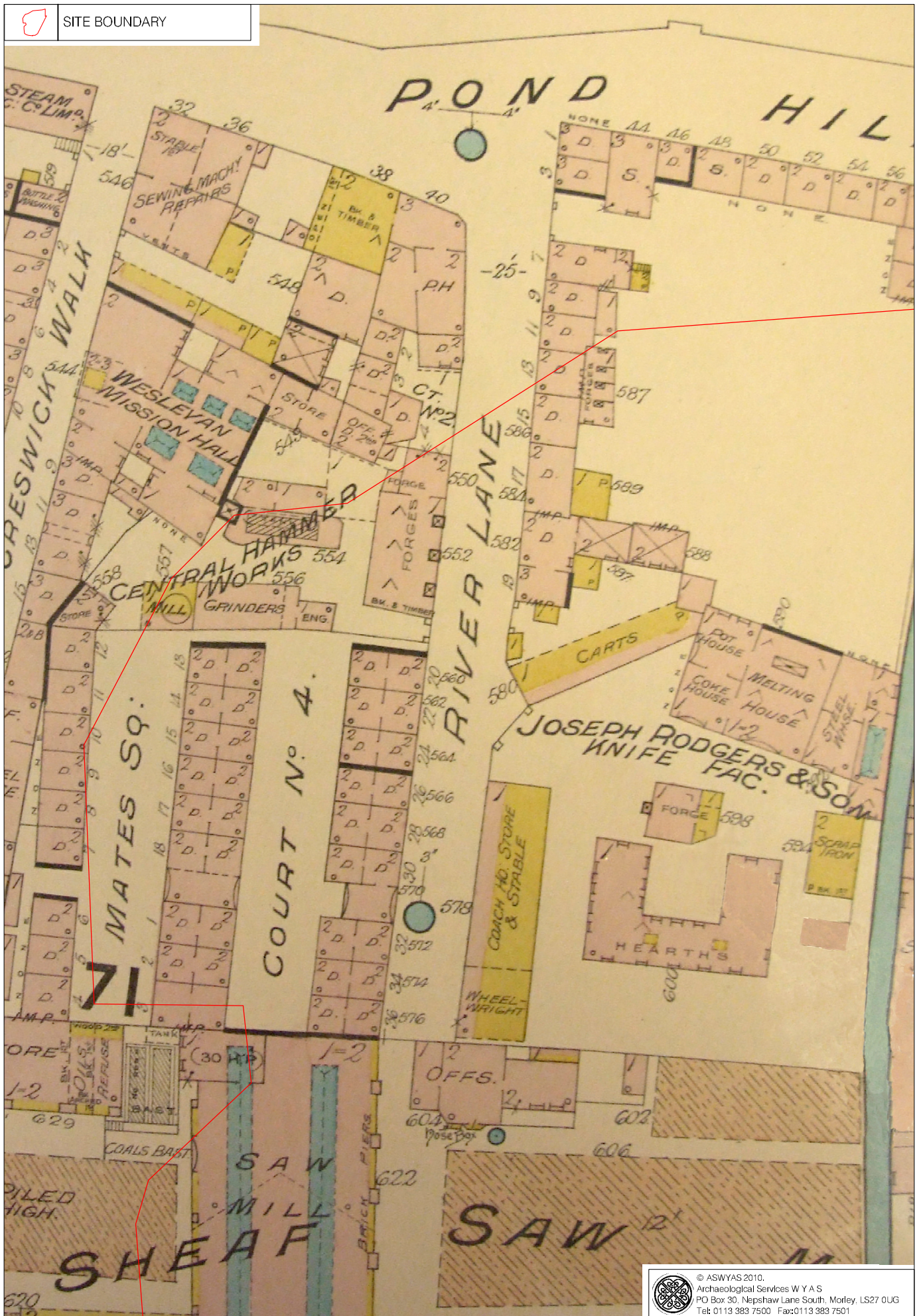


Fig. 11. Goad's Insurance Plan of 1896 showing location of site (Scale: c. 1:500@ A4)



Fig. 12. OS 1905 map of Sheffield showing location of site and archaeological remains (Scale: 1:750 @ A4)



Fig. 13. OS 1923 map of Sheffield showing location of site and archaeological remains (Scale: 1:750 @ A4)



Fig. 14. OS 1935 map of Sheffield showing location of site and archaeological remains (Scale: 1:750 @ A4)

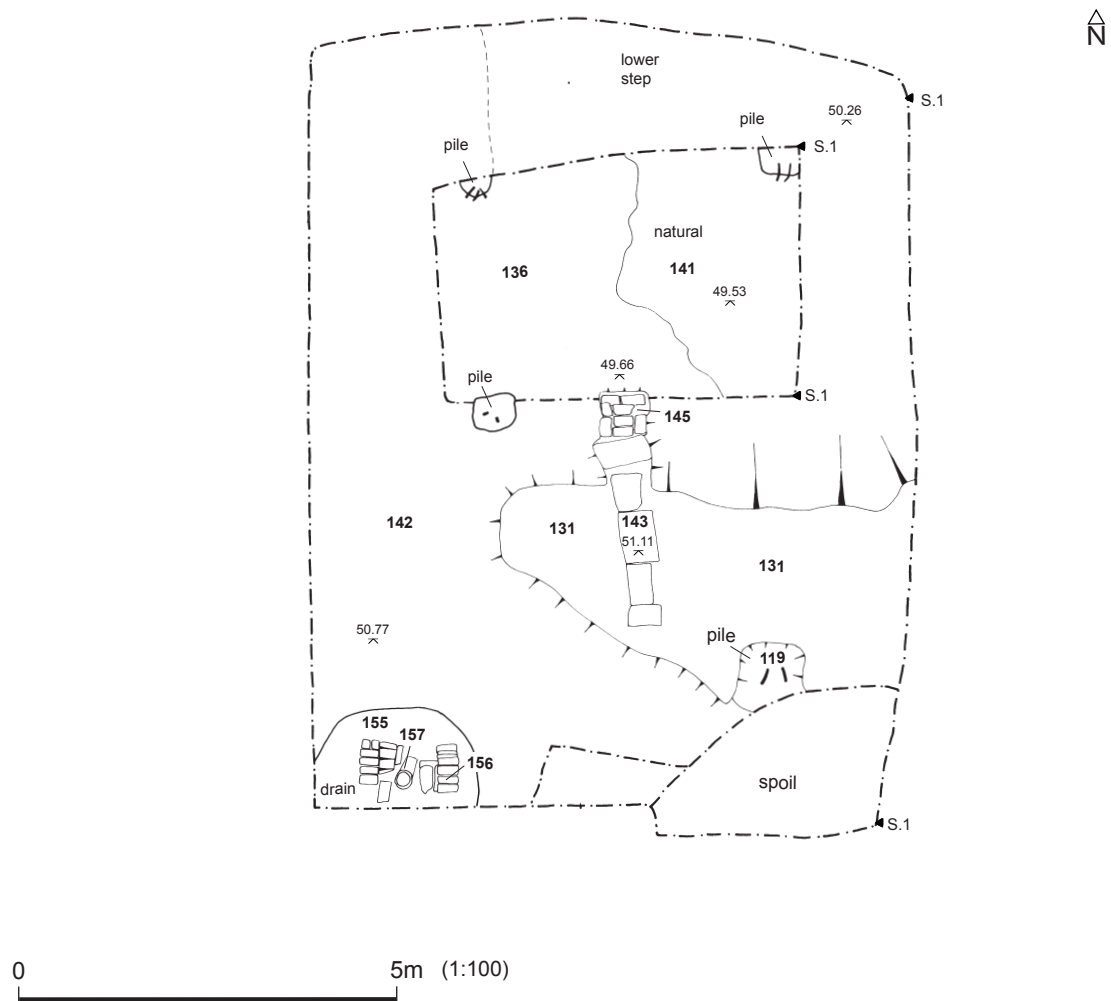
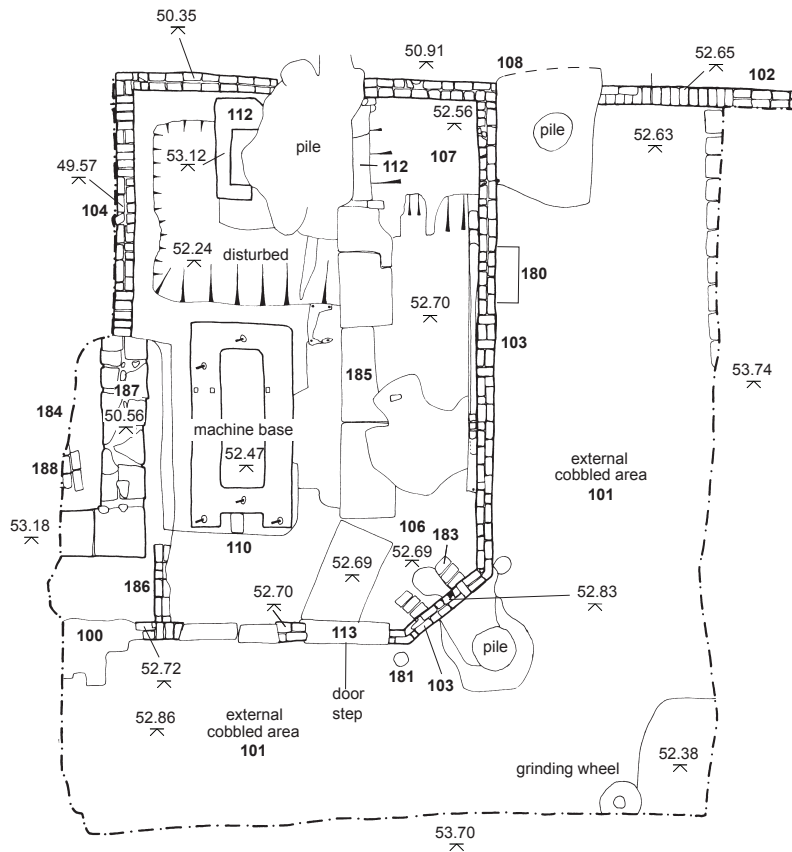


Fig. 15. Plan of Trench I, northern section, lower level (Scale 1:100)



0 5m (1:100)

Fig. 16. Plan of Trench 1, southern section, upper level (Scale 1:100)

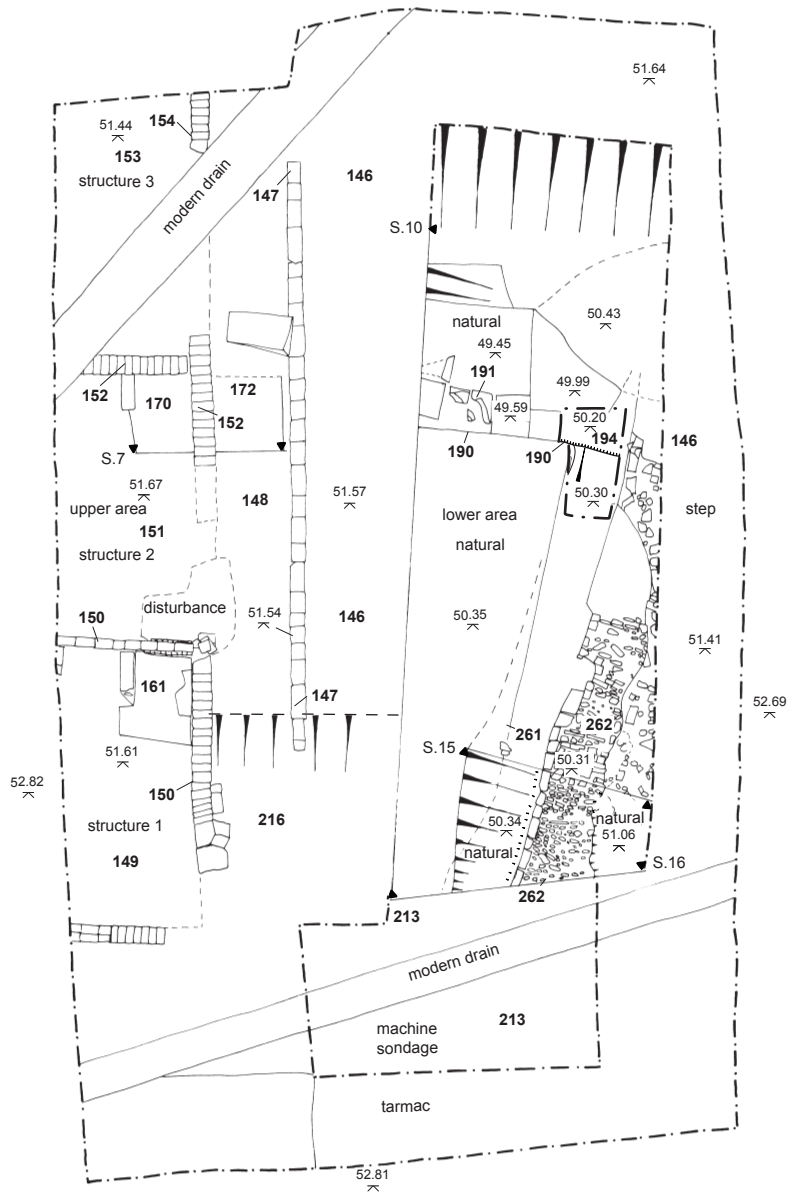


Fig. 17. Plan of Trench 2 (Scale 1:100)



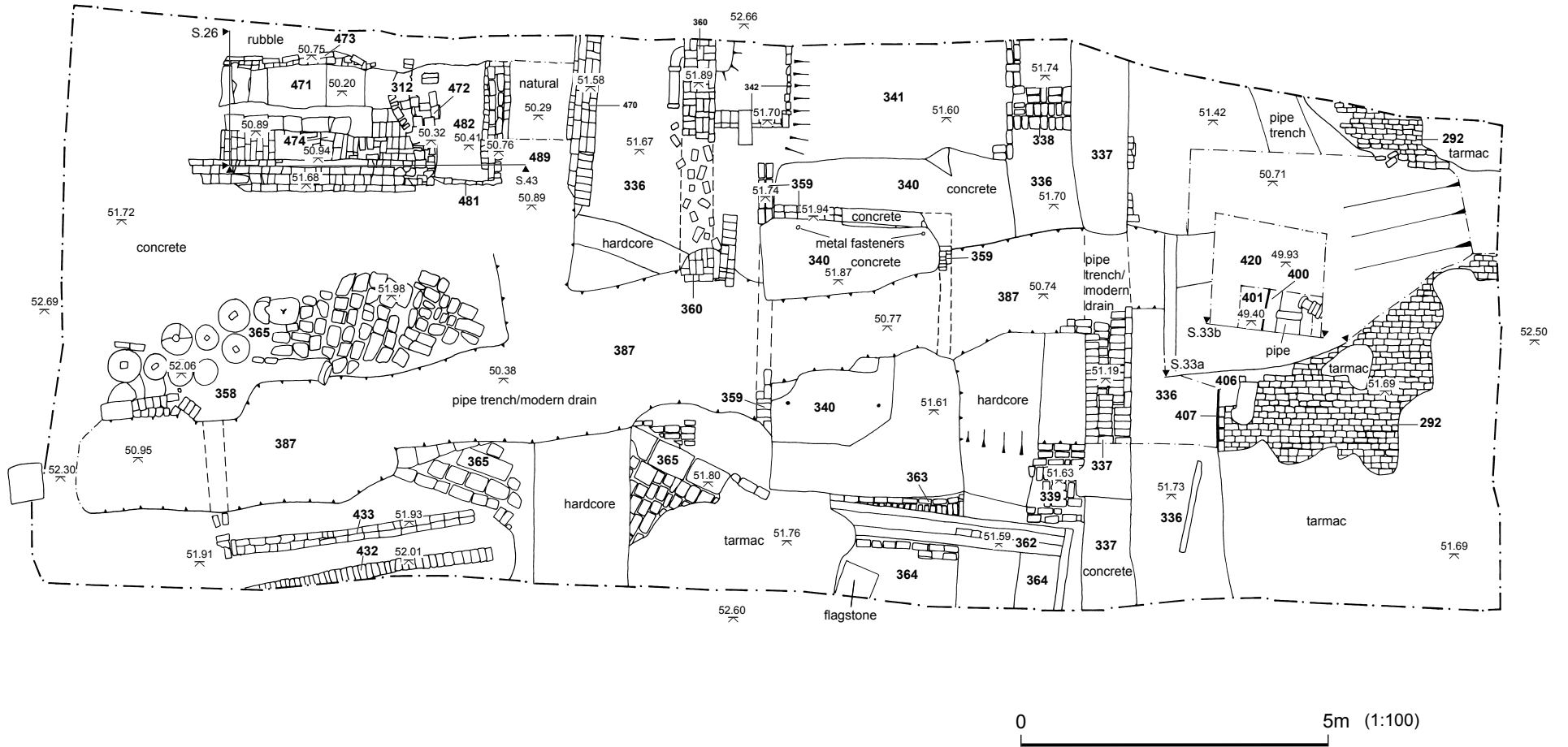
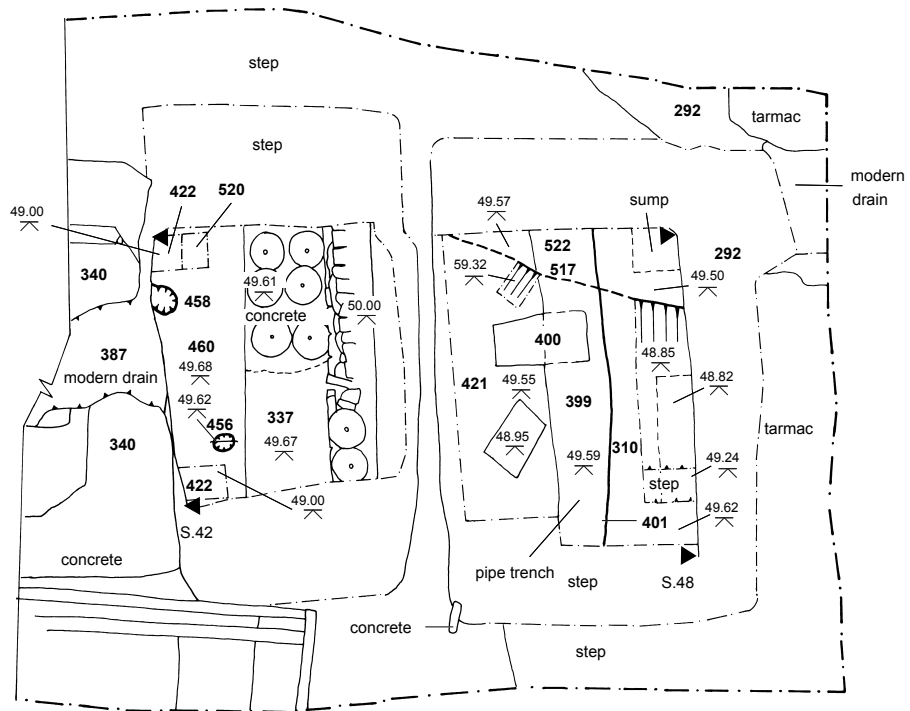


Fig. 18. Plan of Trench 3 (Scale 1:100)



0 5m (1:100)

Fig. 19. Plan of Trench 3: Phase II excavations, eastern end (Scale 1:100)

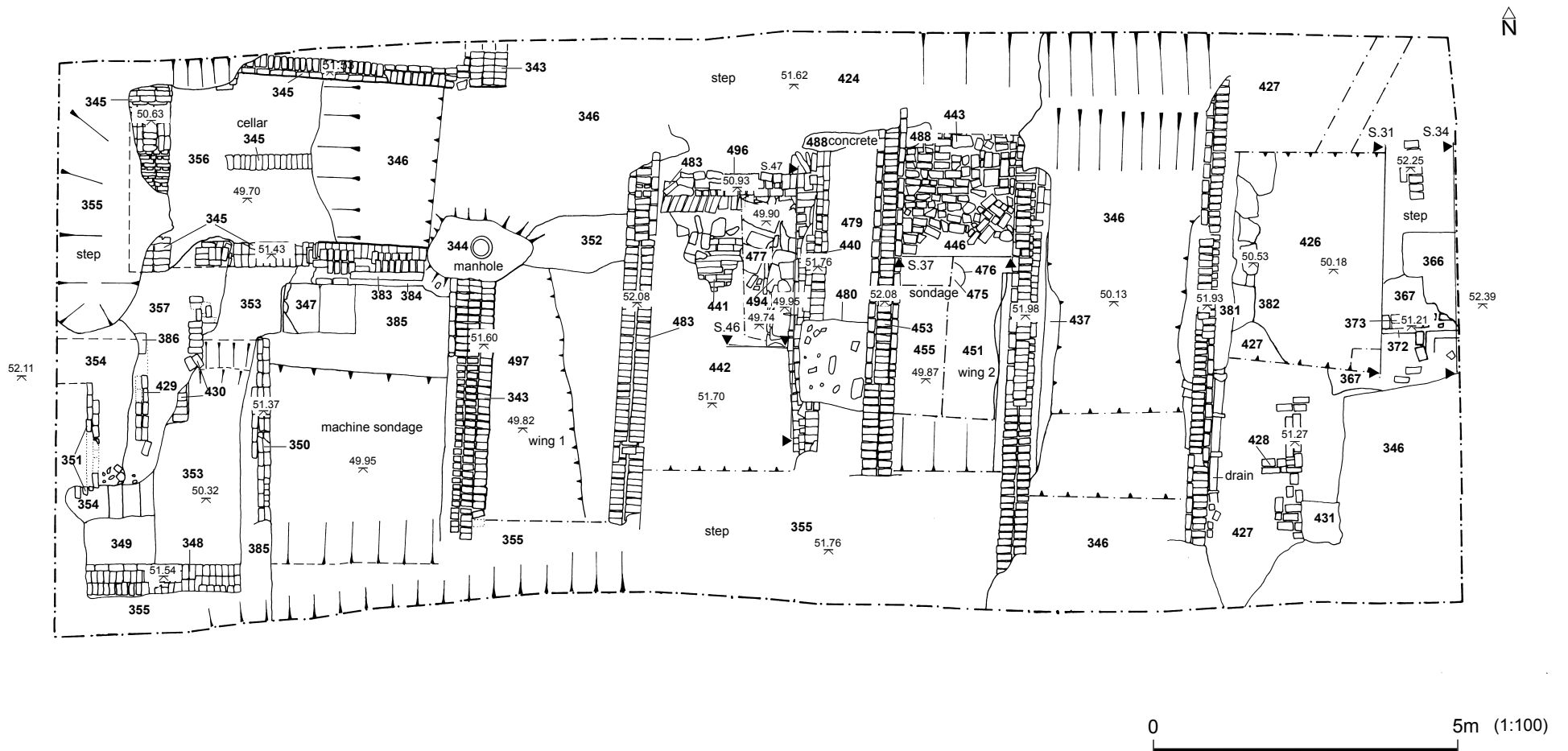


Fig. 20. Plan of Trench 4 (Scale 1:100)

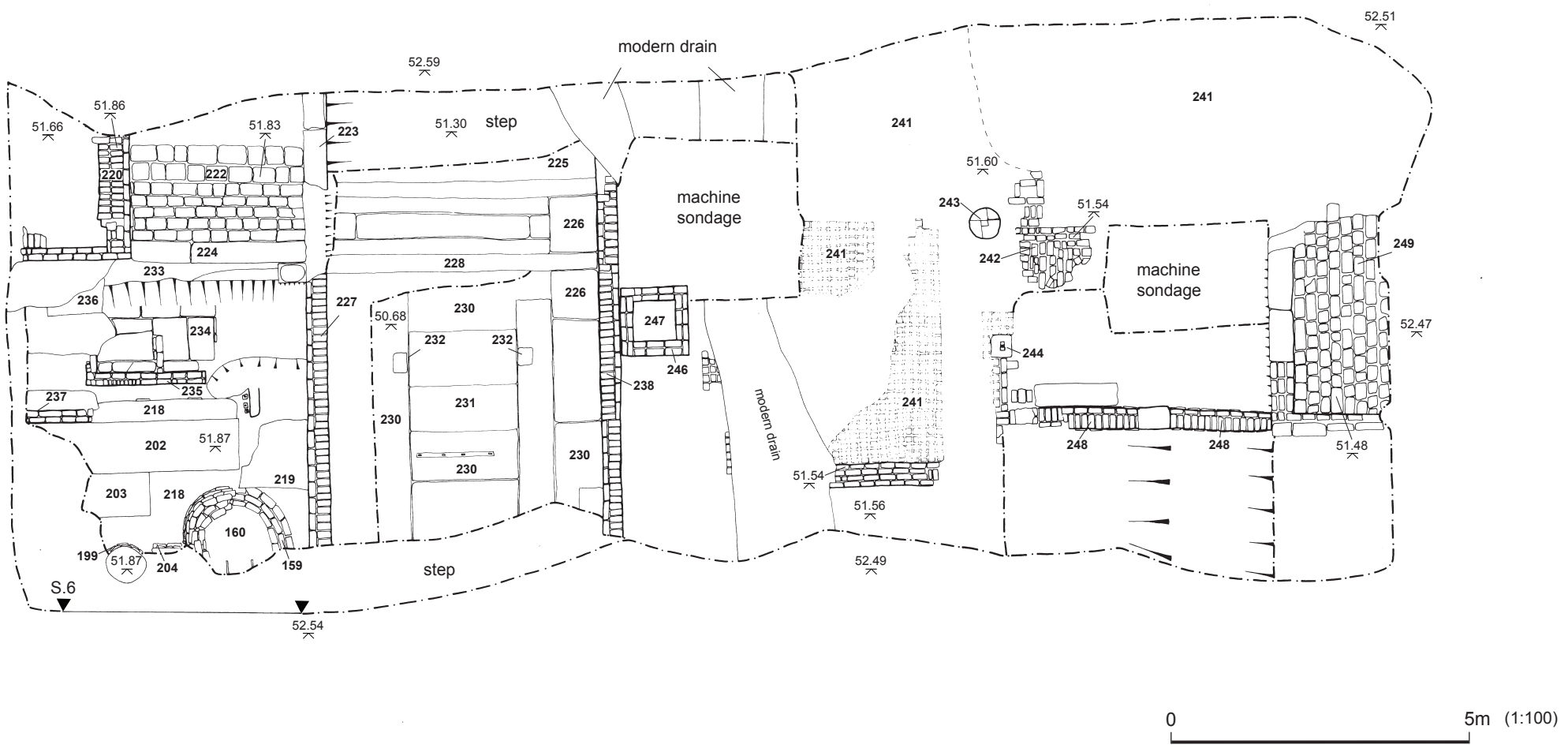


Fig. 21. Plan of Trench 5 (Scale 1:100)

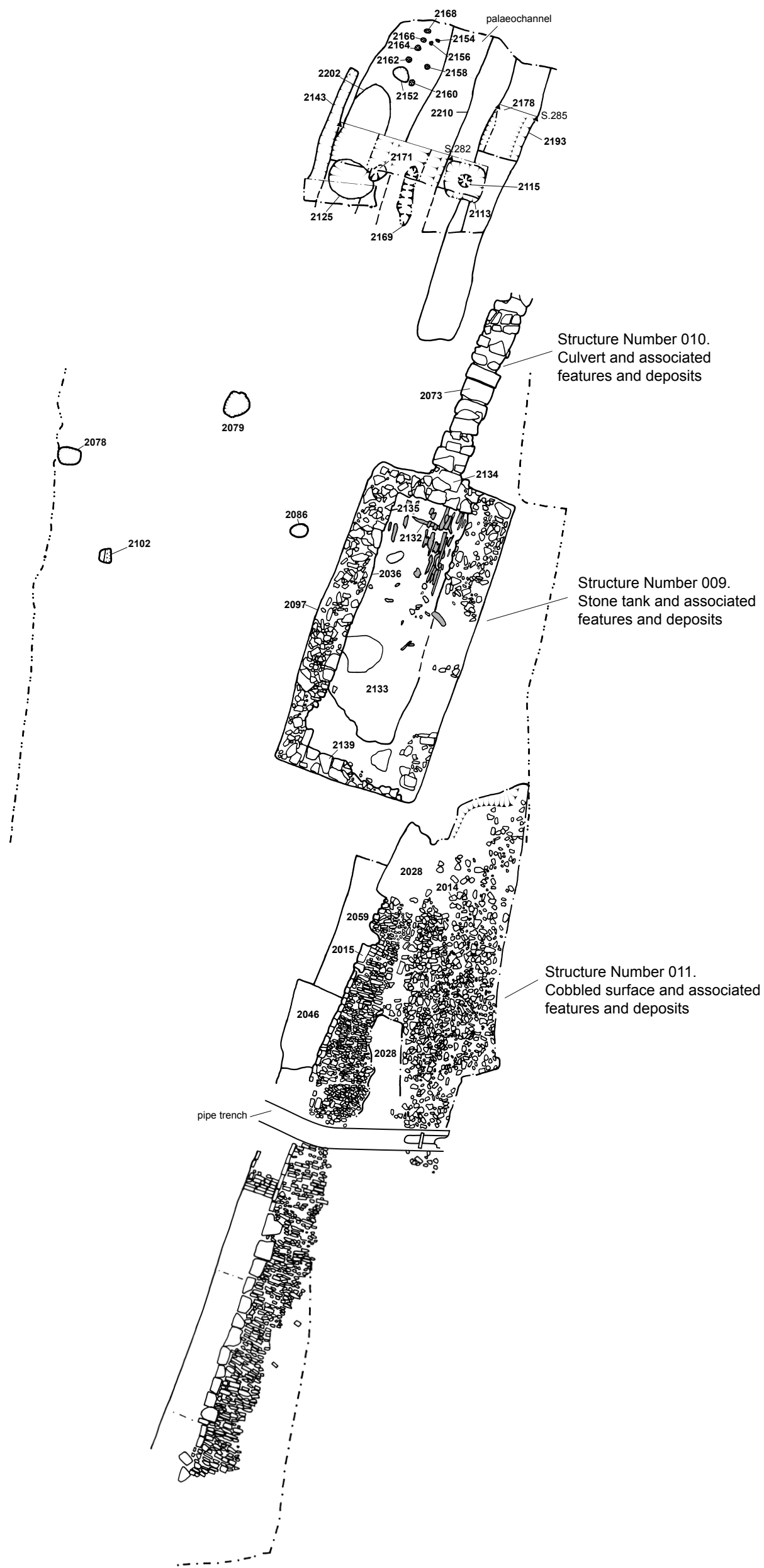
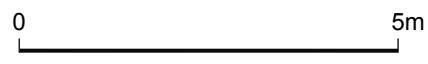


Fig. 23. Area A/D, Phase 1 Features (Scale 1:100)



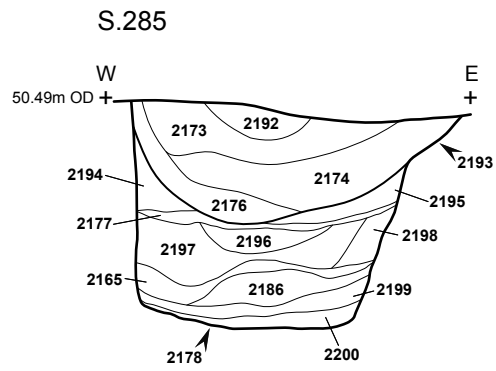
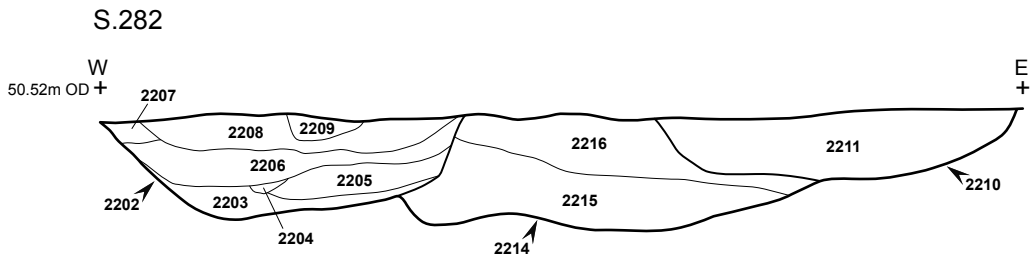


Fig. 24. Areas A/D, Phase 1 sections (Scale 1:20)



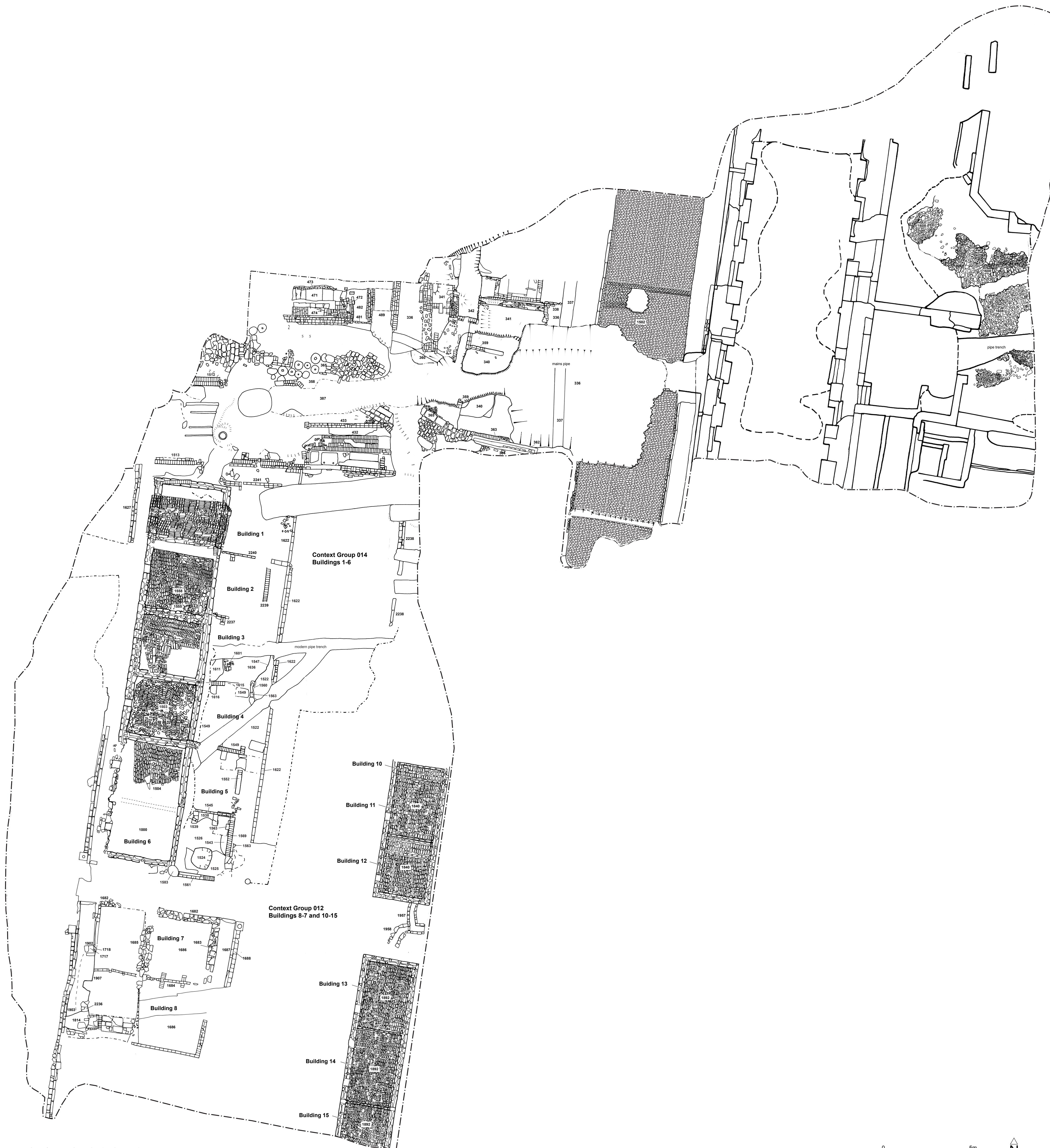


Fig. 25. Plan of Areas A/D and E (Scale 1:100)

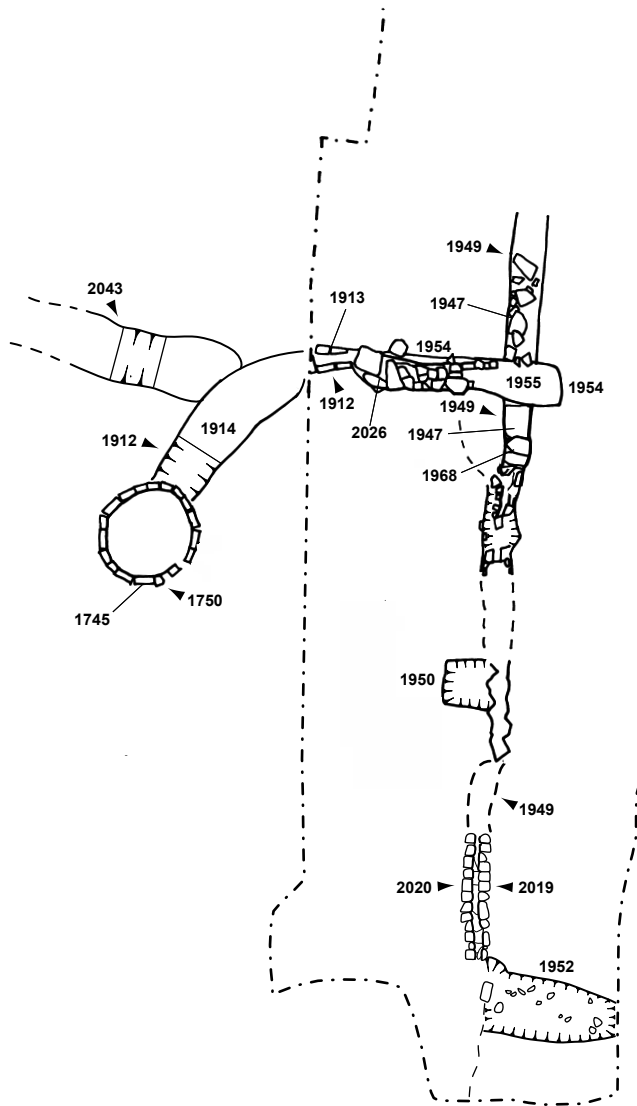
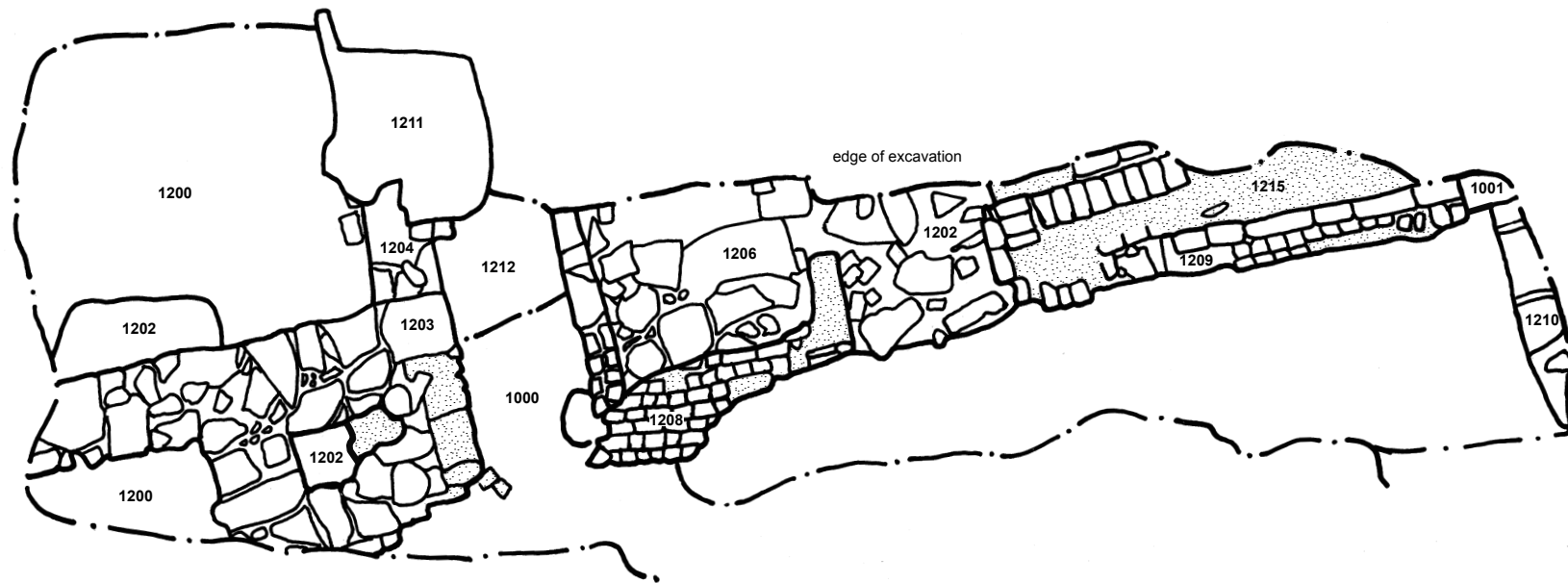



Fig. 27. Area A/D, the 'Well' feature and associated drains (Scale 1:100)



 ash mortar

0  2m

Fig. 28. Plan of Area C (Scale 1:50)

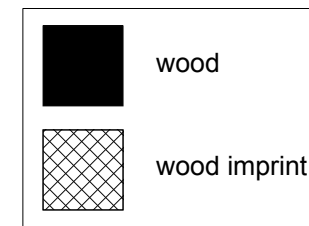
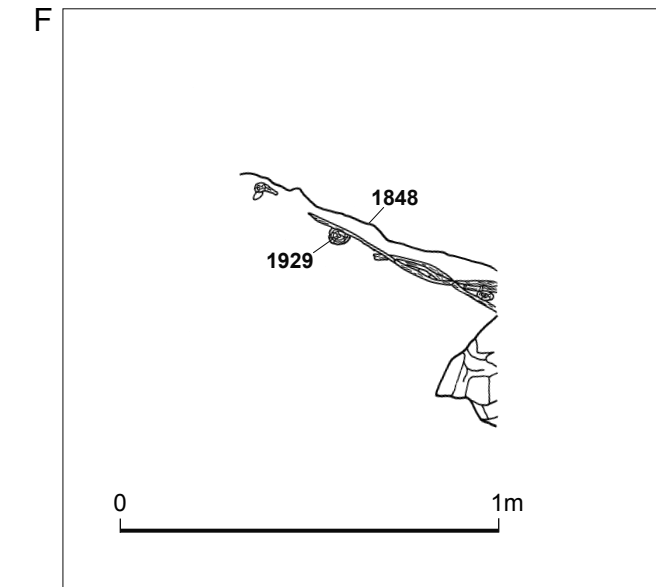
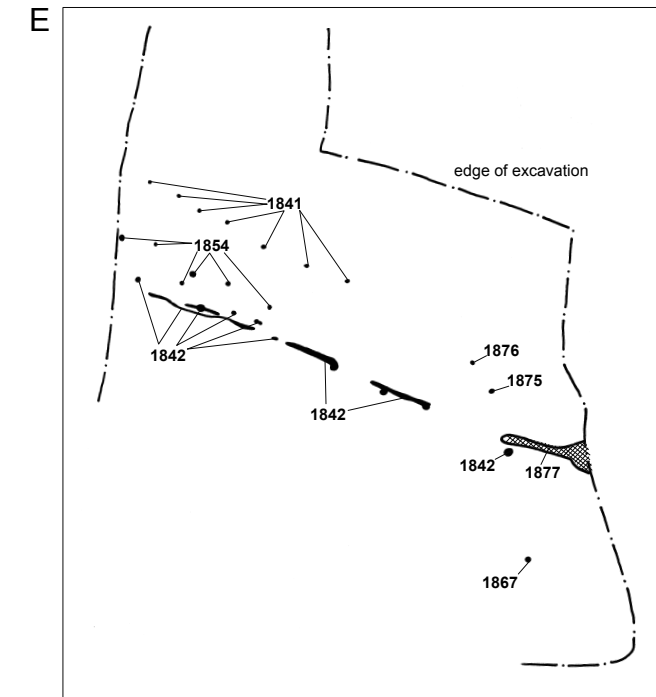
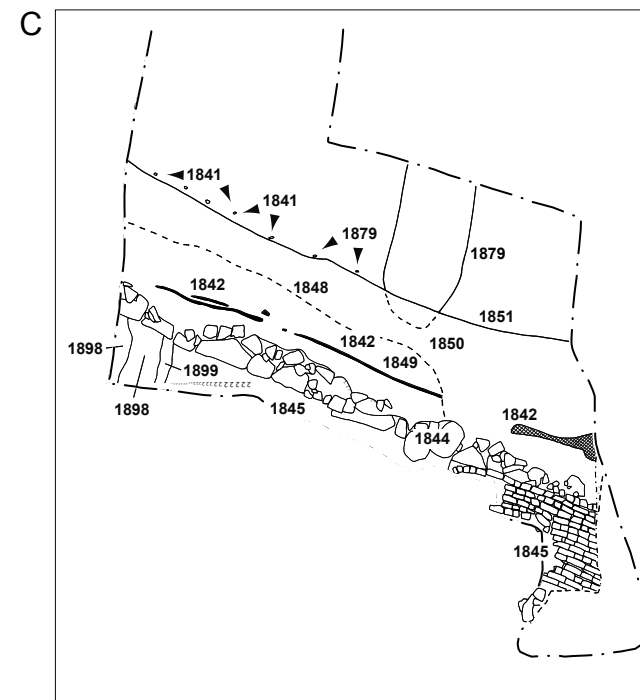
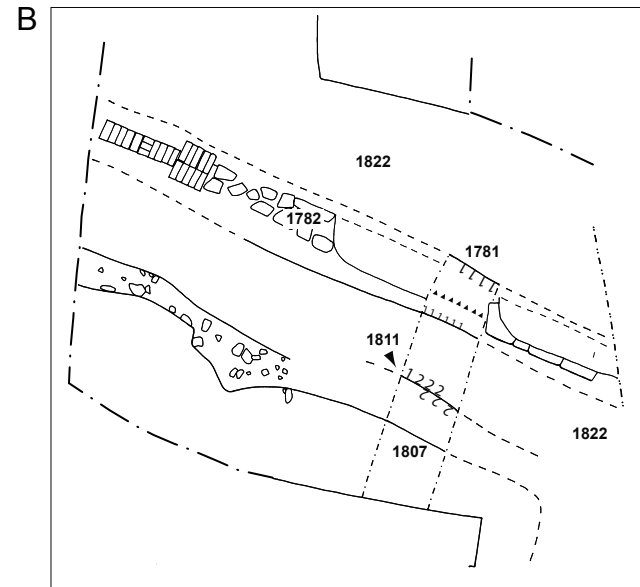
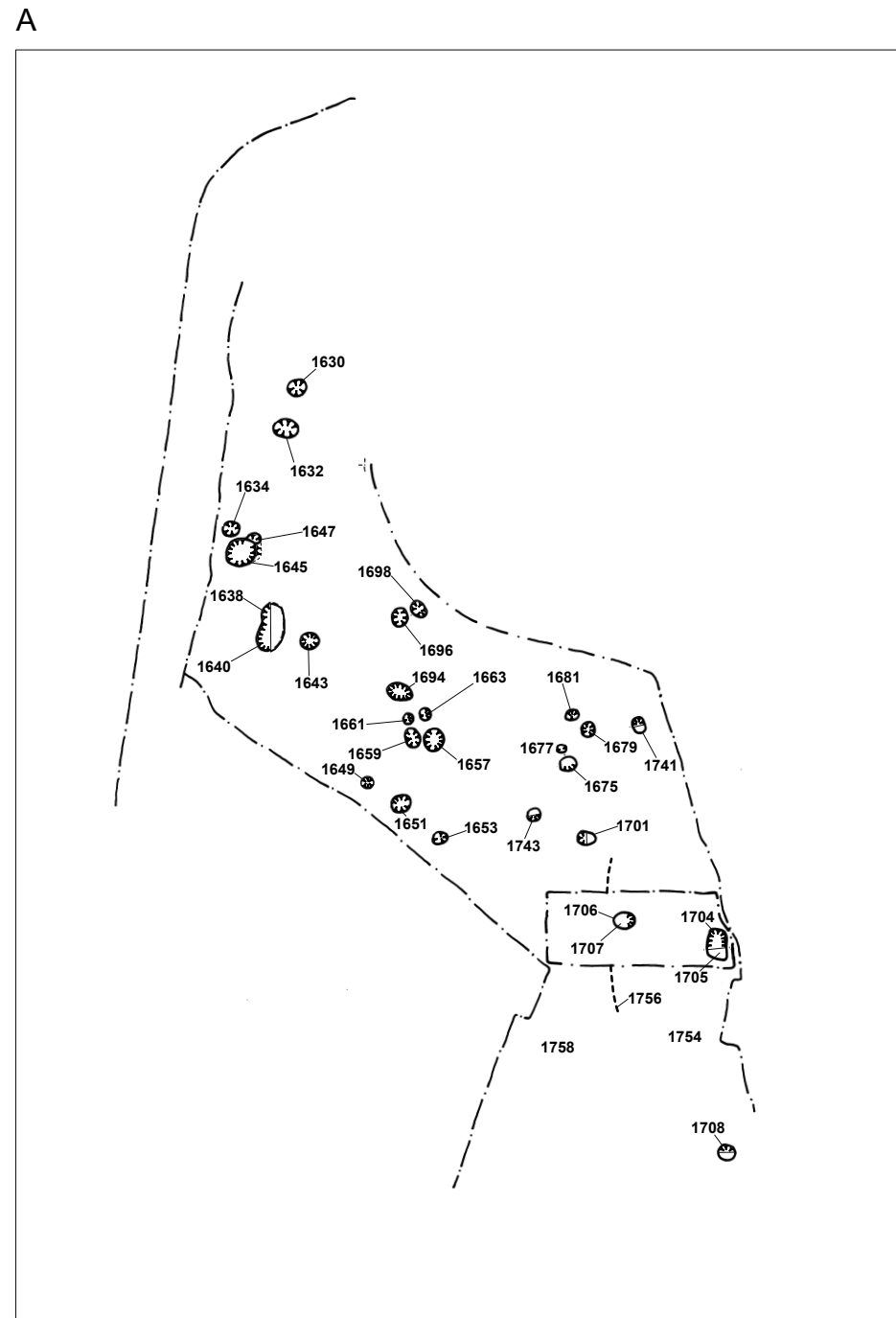


Fig. 29. Overlay plans of Area E (Scales 1:100 and 1:20)

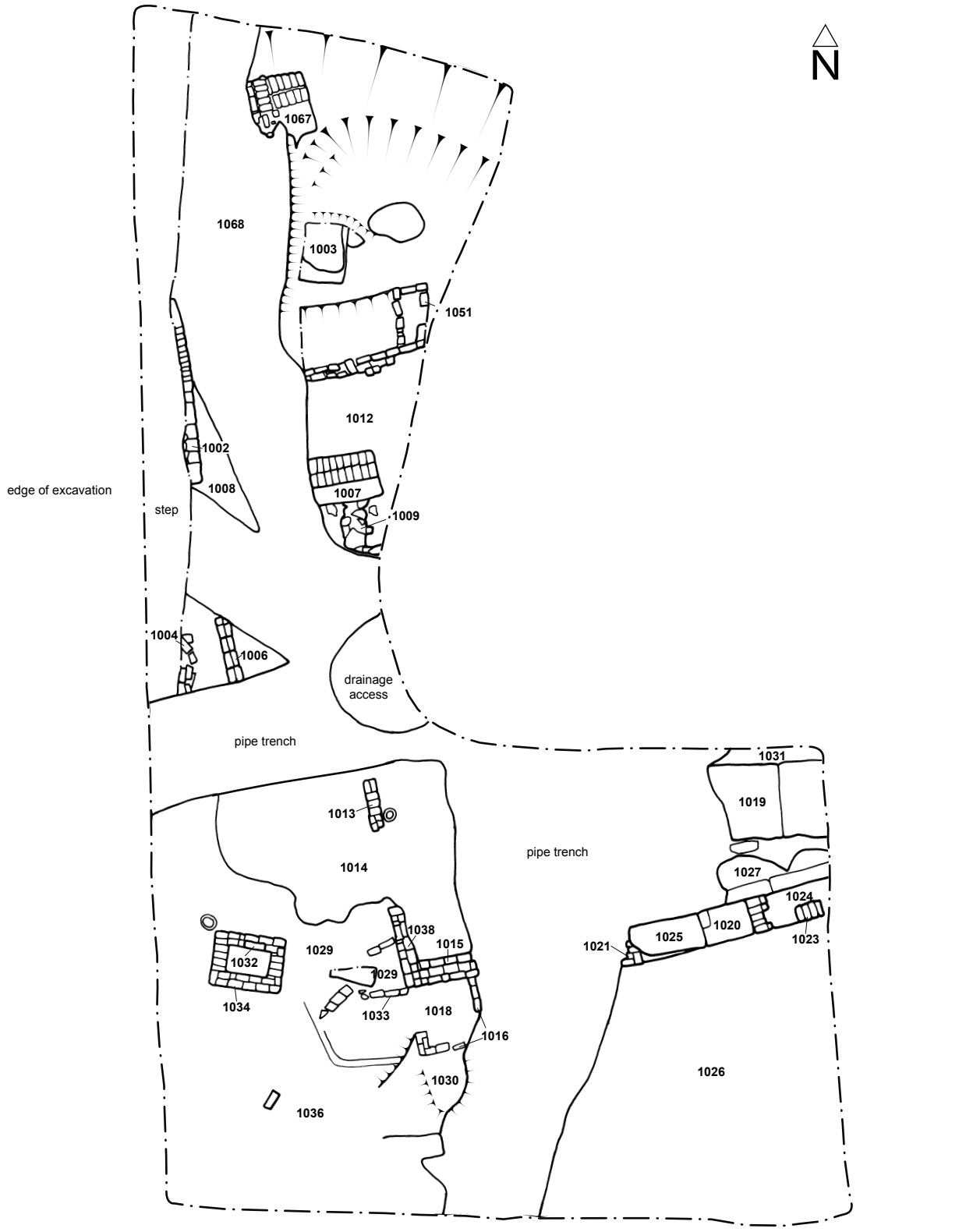


Fig. 30. Plan of Area F (Scale 1:100)



Plate 1: Area A/D. Structure 009, the stone tank



Plate 2: Area A/D. Northern wall of stone tank (009), mouth of culvert (010) and waterlogged timbers (2134)



Plate 3: River Street



Plate 4: Area A/D. Excavation of buildings 1-6. View south-west



Plate 5: excavation of buildings 1-7 showing gennel between buildings 6 and 7 in the foreground. View north-east



Plate 6: Area A/D. Feature 1862, possible retaining walls for staircase in cellar 8



Plate 7: Area A/D. Dividing wall between the yards/living spaces of structures 7 and 8 showing the fireplace/sink plinths



Plate 8: Area A/D. Coal chute in cellar 14, typical of cellars 1-8 and 10-15



Plate 9: Area A/D. Stairs cellar 13



Plate 10: Area A/D. West facing wall of cellar 14, showing the bottom four courses of a brick vaulted ceiling to the left and the scar of the dividing wall between cellars 14 and 15 by the scale



Plate 11: Area A/D. Cellar steps cut in to existing wall, typical of those in cellar 1 to 6



Plate 12: Area A/D. Cellar 10 backfilled with stacked bricks and flagstones



Plate 13. Area A/D. Cleaning up the Central Hammer Works remains



Plate 14: Area B. Scar of vaulted ceiling associated with the Sheaf Saw Mill



Plate 15: Area E. The Sheaf Island Works basements



Plate 16. Area E. Excavation of the Sheaf Island Works basements



Plate 17: Area E. Culvert and wattle revetments



Plate 18: Area E. Culvert



Plate 19: Area E. Cobble surface



Plate 20. Area F. General view of walls 1015, 1016, 1033 and 1038



Plate 21: Area F. Culvert