

# UNDER THE ORACLE

Excavations at the Oracle Shopping Centre site 1996-8:  
the medieval and post-medieval urban development  
of the Kennet floodplain in Reading



Ben M Ford, Daniel Poore, Ruth Shaffrey and  
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by

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and David R P Wilkinson

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Thames Valley Landscapes Monograph No 36

2013

The publication of this volume was generously funded by Hammerson UK Properties plc

Published for Oxford Archaeology by Oxford University School of Archaeology as part of the Thames Valley Landscapes Monograph series

Edited by Anne Dodd, with Ian Scott and Jon Hiller

Front cover image: artist's impression of the Reading Abbey cookhouse on Oracle Site 29 (Peter Lorimer)

Back cover image: E H Buckler's bird's eye view of Reading, 1850

This book is part of a series of monographs about the Thames Valley Landscapes – which can be bought from all good bookshops and Internet bookshops.

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ISBN 978-1-905905-27-0

Design by Production Line, Oxford

Printed in Great Britain by Berforts Information Press, Eynsham, Oxford

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including metal finds, worked bone, worked stone, vessel glass, clay tobacco pipes and leather and textiles, and wooden objects. Digital Chapter 10 comprises the full reports on the animal remains and marine shell. Digital Chapter 11 has the full reports on plant remains and dendro-chronology.

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- Introduction**
- Analytical methodology**
- Fabrics**
- Chronology**
- Fragmentation analysis**
- Cross-fits**
- Spatial analysis and discussion**
- Vessel types**

### **POST-MEDIEVAL POTTERY** *by Duncan H Brown and Robert Thomson*

- Methodology**
- Catalogue of Fabrics and Forms**
- Chronology**
- Sites**
- Discussion**
- Catalogue of illustrated post-medieval pottery**

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- Project Phase 4: mid 13th to late 14th century**
- Project Phase 6: c 1500 – c 1600**
- Project Phase 7: 1600 - 1680**
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- Test Pits 301, 302, 303 and 304**
- Demolition and re-use of building materials in Reading**
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### **BRICK** *by Terence Paul Smith*

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- Early Flemish type bricks (Project Phase 6)**
- Red bricks of pre-19th-century date**
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**STRUCTURAL TIMBER** *by Steven J Allen*

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**CERAMIC BUILDING MATERIAL** *by Alan Vince and Kate Steane*

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**COINS, TOKENS AND JETTONS** *by Martin Allen*

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**OBJECTS OF COPPER ALLOY** *by Leigh Allen*

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**THE IRONWORK** *by Ian Scott*

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**WORKED BONE OBJECTS** *by Leigh Allen*

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**VESSEL GLASS** *by Hugh Willmott*

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**WORKED STONE** *by Ruth Shaffrey*

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**CLAY TOBACCO PIPES** *by David Higgins*

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- Methodology**
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## Summary

Between April 1996 and August 1998, Oxford Archaeology carried out extensive archaeological investigations in advance of the development of the Oracle shopping and leisure complex in central Reading. The area investigated covered some 8 hectares on the floodplain of the river Kennet, immediately south of the town centre, with five key excavations targeted on the earliest known historic buildings, water channels and mills.

A long sequence of development at the edge of the floodplain was identified at site 29, starting with timber buildings that may have formed part of the minster of St Mary's during the late 11th and early 12th centuries. During the 12th century an elaborate stone building containing many large hearths and ovens was built on the site, and greatly extended during the later 13th century. It is suggested that this may have been a cookshop belonging to Reading Abbey. During the 16th century the site was in use as a tannery, and the excavations located numerous rows of tanning pits and vats and associated structures. The Oracle workhouse was constructed on the site in the early 17th century, and results from the OA excavations add to existing knowledge of the 200-year development and use of this building from documentary and cartographic sources.

Site 150 investigated the historically attested Minster Mill. Remains from grain and malt processing of probable 12th-century date were excavated, and evidence was recorded for management of the Minster Mill Stream. The most extensive remains found were associated with the rebuilding of the mill in timber and brick during the 17th and 18th centuries. The development of the floodplain for craftworking and industry was studied at site 12, where active management of the river channels

accompanied the construction and use of a sequence of waterfronts, structures for industrial processes and tanning pits. Following extensive land reclamation during the 16th century, the building later known as the Yield Hall was constructed on the site. The excavations traced the development of this house in detail over a period of mixed domestic and craft use during the 17th and 18th centuries, until its incorporation in Wilders Iron Foundry during the 19th. Excavations at site 101 revealed the progressive southwards migration, management and varied uses of the historically attested channel known as the Back Brook.

South of the Kennet site 300 investigated the historically attested St Giles, or Town, mill. Important remains of the medieval mill were recovered, including a complete pitwheel of 12th-century type, along with other early elements of the mill's machinery. Extensive remains survived of a timber mill frame installed in the early 14th century and the timber revetments installed and repaired throughout the medieval period in the channels carrying water to and from the mill itself. Substantial remains were also recovered from major extensions of the mill during the 18th century and its conversion to steam power during the 19th.

A programme of dendrochronological dating was undertaken on numerous timbers recovered from the waterlogged conditions of the site, allowing unusually precise dating of certain structural elements. Amongst large collections of finds, those of particular interest include the medieval pottery, shoes, leatherworking and cobbling waste, glass vessels and a small number of fragments of textile. In addition, the recovery of the largest group of clay pipes yet found in Reading has allowed the development of a bowl-form typology for the town.

# Acknowledgements

Oxford Archaeology (OA) would like to thank The Oracle developers Hammerson UK Properties PLC not only for their patience and understanding, but most significantly for the funding they provided to conduct all the fieldwork, the subsequent analysis and research, and this monograph. In particular we are grateful to Jon Emery who was heavily involved during the excavation phases and the early stages of the post-excavation analysis, along with Robin Dobson, and more recently Victoria Maleski of Hammerson Operations Ltd who has helped enormously during the last stages of the production of this monograph. Also thank you for the support we received from Reading Borough Council and particularly their Archaeological Advisor, Peter Fasham of Babbie, the then Head of Development, Ian McCauley, and Dr Jillian Greenaway from Reading Museum Service. We are grateful for the opportunity to work on such a great site which was first introduced to OA by Tim Tatton-Brown who was acting as the archaeological consultant. On-site management, attendance and assistance was provided by Norwest Holst, Bovis, Keltbray, Swifts, and Moulds Demolition.

The Oracle Project has been a very large undertaking, with 3 years of fieldwork that took place in the late 1990s, post-excavation analysis during the 2000s and final publication in 2013. Such a long-running and large project has involved many people and hopefully most will get a mention below.

All the fieldwork and much of the post-excavation work was managed by DRP Wilkinson with the later stages of the publication work coordinated by Anne Dodd with Ben M Ford and Daniel Poore. Fieldwork was directed on-site by Adam Brossler, Richard Brown who led the 1996 Evaluation that 'discovered' the sites, Ben M Ford, Daniel Hicks, Geoff Muir, Daniel Poore, David Score, and Andy Mayes.

This monograph and the archaeology it describes and discusses is founded upon the 'primary record' that consists of the records generated and material culture collected over the 3 years of the various fieldwork stages, often in adverse conditions, by a large number of dedicated, skilled and hard-working field archaeologists. The authors would like to extend their thanks and gratitude to these individuals - who were in alphabetical order:

Luke Adams, Mike Anderton, Nick Armour, Rachel Barton, Anthony Beck, Janet Berry, Glen Bailey, Cheryl Bishop, Chris Bloor, Leon Bracelin, Kayt Brown, Bridgette Buss, Lindy Casson, Derek Cater, John Chandler, Beth Charles, Phil Chavasse, Natalie Clark, Guy Cockin, Sean Cook, Robert

Court, Pete Crawley, Louisa Diccilia, Niall Deas, Mike Edwards, Liz Gawith, Mark Gocher, Cornelia Grabner, Simon Greenslade, John Hart, Richard Hewitt, Luis Huscroft, Nigel Jeffries, Phil Jeffries, Rob Johns, Richard Jones, Steve Kelly, Pat Kent, Mark Lacy, Hugo Lamdin-Whymark, Jo Lee, Neville Redvers-Higgins, Paul Mann, Jon Martin, Brian Matthews, Kirstin Miller, Nick Mitchell, Simon Mortimer, Jim Mumford, Paul Murray, Charlie Newman, Andy Norton, Neil Palmer, Miles Perigo, Jim Peters, David Platt, Jamie Preston, Greg Price, Andre Pydyn, Chris Richardson, Gavin Robinson, Pete Robinson, Nick Sambrook, Matthew Sharpe, Andy Simmonds, Liz Stafford, Dan Sykes, John Tait, Dave Thomason, Sadie Watson, Mike Simms, Jo Wainwright, Glen Walton, Gwilym Williams, Matthew Williams, Tom Wilson, and Lucy Wood.

The authors would also like to thank the office based staff at Oxford Archaeology who helped organise other important aspects of the project, including the finds team Leigh Allen, Kay Proctor, Bob Bailey, and Geraldine Crann, the archives work by Nicola Scott, and logistics support from Steve Laurie-Lynch and Graham Walton.

DRP Wilkinson would like to thank Ben M Ford, Daniel Poore, Ruth Shaffrey and Anne Dodd, who played major roles in the project, particularly Ben who was involved from the first turn of the shovel to the final full stop in the book. Ben M Ford is particularly grateful to Richard Hewitt and Niall Donald for helping to realise the post-excavation digital GIS and database resource (which was at the time 'ahead of the curve' but now 'comes as standard'), Professor Grenville Astill for comments and guidance on an early draft of this publication, the late Alan Hankin of Reading Central Libraries Local Studies Section who was always so encouraging and helpful, Dr Peter Durrant of Berkshire Records Office, Jonathon Farmer for the photographic reproductions, Martin Watts expert molinologist for all his advice, and Graham, Les, and Mick of Miles and Co for all the on-site dendrochronological sampling. Dr Dan Miles of the Oxford Dendrochronology Laboratory also provided much help and advice. Professor Mark Jones and staff at the *Mary Rose* Trust conserved the leatherwork and wooden items, including the unique 'pit wheel' gear from St Giles Mill. The conservation of the textiles was undertaken by the York Archaeological Trust and the x-raying of the metal finds was undertaken by Dana Goodburn-Brown. Dr Richard K Morris advised Jamie Preston on the architectural stone. Thanks also to Nick Mitchell for his early work on the wooden finds.

**Picture credits**

Figs 1.1, 1.2, 1.3, 2.1, 2.3, 2.4-2.11, 2.13, 2.14, 2.16-20, 2.22, 2.23, 3.1-3.9, 3.11 and 3.13 contain Ordnance Survey data reproduced on behalf of the Controller of Her Majesty's Stationery Office © Crown Copyright, Licence No. AL 1000005569; Plates 3.1 and 3.30 (R/vol 578), Plate 3.38 (R/AT7 uncat) reproduced by permission of Berkshire Record Office; Plate 5.3 The J Paul Getty Museum, Los

Angeles © The J Paul Getty Museum; Plate 3.2 Science Museum (SCM.541/69); Plates 1.2-1.9, 3.3, 3.4 (Ill 1017/A R/KP), 3.32 (i is from a cutting of a newspaper article in 1935 under the headline 'Should Yield Hall be saved from Demolition?'), 3.36, 3.39, 3.40, 3.41 copied with permission from Reading Local Studies Library

# Chapter 1 Introduction

## PROJECT LOCATION AND METHODOLOGY (Figs 1.1-1.3; Pl. 1.1)

Between April 1996 and August 1998, Oxford Archaeology (OA; formerly Oxford Archaeological Unit) carried out extensive archaeological investigations on behalf of Hammerson UK Properties plc on the site of the Oracle shopping and leisure development in Reading, Berkshire (centred at NGR 7160 7320). The town of Reading has grown up around the lower reaches of the river Kennet, close to its confluence with the Thames, and the old core of the medieval town sits on a ridge of gravel above the floodplains of the rivers (Figs 1.1, 1.2).

The Oracle development (covering an area of some 8 ha) lies on the floodplain of the Kennet, immediately south of the town centre (Plate 1.1 and Fig. 1.3). The development area is bounded by Gun Street and Minster Street to the north, Bridge Street to the west, Duke Street to the east and Mill Lane to the south. It is bisected by the Kennet, and crossed by numerous small river channels that were historically important, but nowadays mostly survive in underground conduits. The most northerly of the channels is the Holy Brook, which flows along the edge of the floodplain and formerly fed the Abbey Mill. Some 20 m to the south, and roughly parallel, was the course of the Minster Mill Stream, which fed the Minster Mill. A third channel, the Back Brook, lay approximately halfway between the edge of the floodplain and the modern main course of the Kennet. South of the Kennet were the channels associated with the Town, or St Giles, Mill.

The archaeological investigations were mostly located on the floodplain, on river silts over the floodplain gravel terrace. At the north edge of the development, silts give way to terrace gravels and the underlying chalk, as the ground rises from 37.30 m OD on the floodplain to 41.50 m OD on Minster St. The archaeological investigations were carried out in two phases, one to the north and one to the south of the Kennet. North of the Kennet, a number of area excavations were designed to recover evidence for some of the earliest known historic buildings, water channels and mills in the area. Site 29 was located to investigate the 17th- to 19th-century Oracle workhouse, site 150 the Minster Mill, site 12 a 17th-century building known as the Yield Hall that had been demolished in 1935, site 101 the water channel known as the Back Brook and site 22 the George Hotel. The watching brief was given the general designation of site 28, with each individual observation allocated a Test Pit (TP) number. A single area excavation, site 300, and a

large-scale watching brief were carried out south of the Kennet to investigate the historically attested St Giles, or Town, mill. A fuller account of the project methodology can be found on the accompanying CD-ROM.

The results of the excavations and the most significant watching brief observations are described in the present volume. The results from site 22, the George Hotel, were not sufficiently promising to justify further analysis at post-excavation stage and this excavation is not further reported here. The records for site 22, and all other excavations and watching briefs from 1997-8 and the evaluation in 1996, can be found in the project archive, which has been deposited with Reading Museum. A microfiche copy of the archive has been deposited with the National Archaeological Record.

## HISTORICAL AND ARCHAEOLOGICAL BACKGROUND (Plates 1.2-1.9)

Archaeological surveys and excavations suggest that the lower Kennet Valley may have been quite intensively settled as early as the mid to late Bronze Age (in the centuries around *c* 1000 BC), with evidence for intensification of land use and the establishment of ditched fields, and settlements of post-built roundhouses that may have attained the size of small villages (Lobb and Rose 1996, 81 and fig 15). Evidence from the earlier part of the Iron Age (from *c* 750 BC) suggests there may have been some shift and retrenchment of settlement, but by the end of the 1st century BC it is clear that the river valley supported dense occupation, with a structured system of settlements, often in rectangular enclosures surrounded by fields and approached by trackways (*ibid.*, 84). Lobb and Rose draw attention to the number of Iron Age coins found in the area of the Kennet/Thames confluence at Reading, and suggest this could mean a site of some importance in the area (*ibid.*, 85). Occupation intensified during the Roman period (AD 43-410), and the area will have come under the influence of the major Roman town at Silchester (Calleva Atrebatum). The nature and extent of Roman occupation at Reading itself remains unclear. Many of the known finds were made during the 19th century, and much of the area is now built-over. It seems likely that the area was occupied, not by a town, but by a number of farmsteads throughout the Roman period (*ibid.*, 86 and fig. 17). Most Roman finds at Reading have come from the areas south and east of the Kennet (Astill 1978, 77).

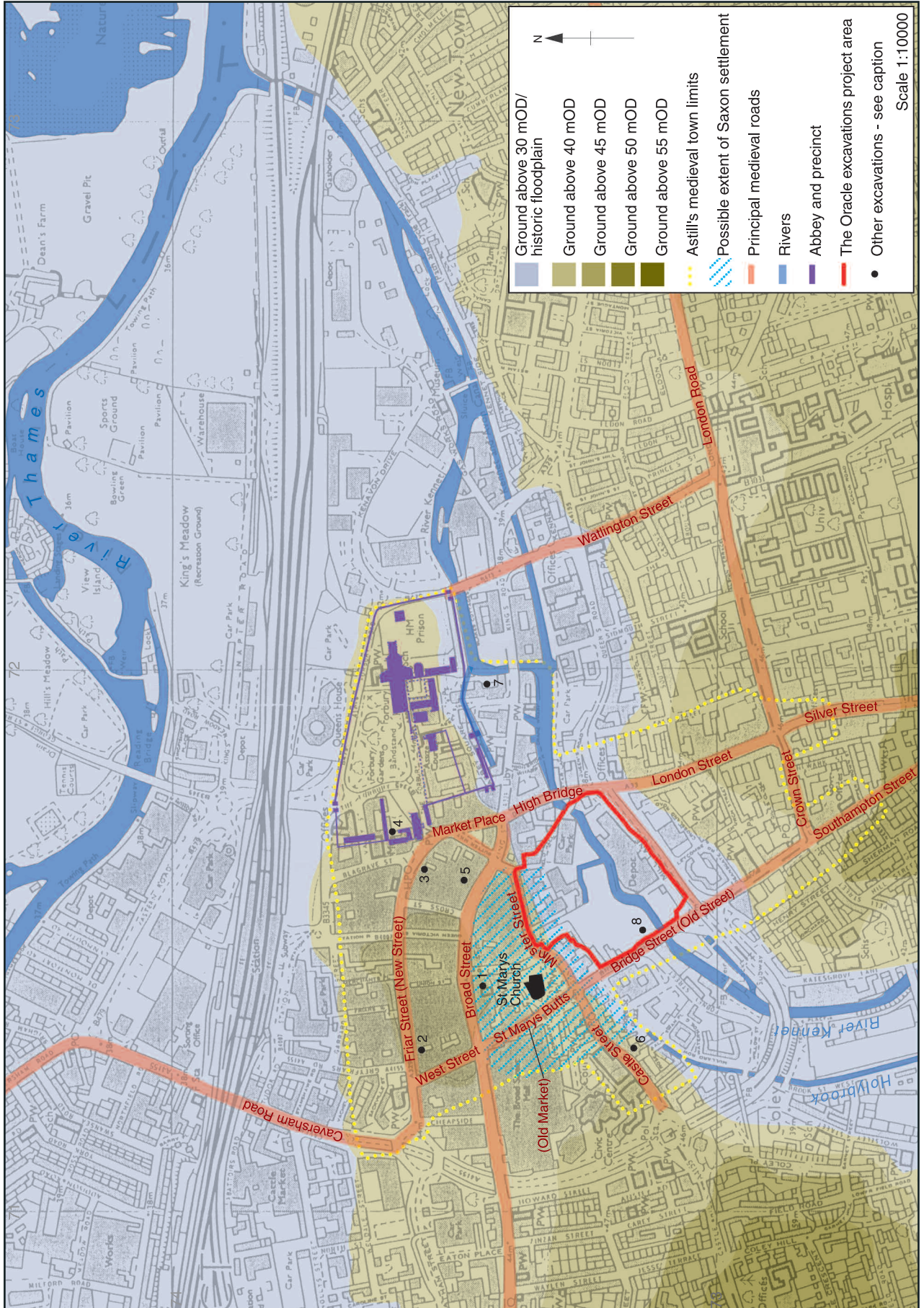


*Plate 1.1 General view of the project area looking W with excavations of Yield Hall on Site 12 in the foreground*



Fig. 1.1 National, regional and local location of the Oracle site, Reading

Under the Oracle





Following the withdrawal of the Romans from Britain in the early 5th century AD the evidence for occupation in the lower Kennet Valley becomes very sparse once again. The confluence of the Kennet and the Thames may, however, have been something of a focal point (see Lobb and Rose 1996, 93 and fig.18). Early to mid Saxon pottery and metalwork (c AD 450-850) was found in excavations of early levels beneath Reading Abbey (Slade 1975-6, 61, 63 and fig. 14), and a mixed inhumation and cremation cemetery of 5th- to 6th-century date was found during gravel digging in 1891 at Earley, a few hundred metres to the east of the Thames/Kennet confluence. Early to mid Saxon pottery occurs quite frequently on excavations within the centre of Reading, with 26 sherds found during Wessex Archaeology's waterfront excavations (Hawkes and Fasham 1997) and 18 sherds in OA's recent excavations at Broad St (Blinkhorn 2007a, 12-4). Early to mid Saxon pottery found during the Oracle excavations is noted by Paul Blinkhorn in Chapter 5, below. There is therefore good evidence that an early Saxon settlement existed in the vicinity of the later medieval town, but to date no structural evidence of it has been discovered. The name Reading is of a type associated with Anglo-Saxon settlements, and is thought to mean 'the people of Reada'.

The earliest documentary reference to a settlement at Reading dates from AD 870-871, when the Anglo-Saxon Chronicle records that the Viking army wintered there and repulsed the attacks of King Ethelred of Wessex and his brother Alfred (later King Alfred the Great). In his biography of King Alfred, Asser records that the Vikings built a rampart between the rivers Thames and Kennet 'on the right hand side of the royal vill' (Astill 1978, 75). Astill (ibid.) has suggested that the royal vill mentioned by Asser could have been situated around the area of St Mary's Church, where a coffin containing a hoard of 9th-century coins was found, and it is interesting that a sherd of Ipswich ware pottery, which tends to be associated with high status sites of the mid Saxon period in the region, was recovered during the recent excavations nearby at 90-93 Broad St (Blinkhorn 2007a, 13-4). Unfortunately there is very little evidence for the Viking winter camp itself, although it might plausibly have been near the site of the later abbey, at the east end of the wedge of gravel ridge, with its defensive rampart reflected in the western precinct wall of the abbey (Astill 1978, 77). Astill notes that the water meadows on the north side of the abbey precinct by the Thames are known as the Vastern, an Old English word meaning stronghold. The skeletons of a horse and a man with a 9th-century

Viking sword were found in this area in 1831 during the digging of a railway ballast pit (ibid.). A nunnery may have been in existence at Reading by the 11th century, possibly founded during the reign of King Edgar (959-75). Domesday Book records that Abbess Elveva held a church in Reading with an estate of 8 hides in 1066; the church (almost certainly St Mary's) and its estate were subsequently granted by William the Conqueror to his new foundation of Battle Abbey in Sussex in 1071.

By the time of Domesday Book there were two manors at Reading, one manor of 43 hides held by the king in demesne, and the other (assessed at 8 hides in 1066, but only 3 in 1086) was held with the church by the Abbot of Battle. Domesday Book also records the existence of a small borough at Reading; the king and the Abbot of Battle held 29 properties each, and a single property was held by Henry de Ferrers. Edward the Confessor seems to have been associated with the initial development of the borough, and the existence of coins minted at Reading between c 1044 and 1046 shows that a mint was operating there during his reign. Astill (ibid.) suggests that the late Saxon borough was probably focused on the Old Market and Old St (now Bridge St), where two major long-distance routes crossed (from Oxford to Winchester and from London to Bath). St Mary's Church stands at this crossroads, facing onto the market (see Fig. 1.2).

One of the most significant events in the history of Reading was Henry I's foundation of a Benedictine abbey on the land between the Thames and the Kennet in the early 12th century (see Fig 1.2). The act of foundation restored to religious use three former minster estates, at Reading, Cholsey and Leominster, that had fallen into lay (in fact royal) hands, and the king also recovered St Mary's Church from Battle Abbey to form part of the grant (Kemp 1986, 16-17). Work was begun on the abbey in 1121. The foundation charter of 1125 states that the abbey was to have Reading, Cholsey and Leominster, with their appurtenances, woodland, arable and pastures, meadows and waters, mills and fisheries, also with the churches, chapels, cemeteries and offerings and tithes, and a mint and moneyer at Reading

*...Et donavi eidem monasterio ipsam Radingiam, Chelseiam quoque et Leoministram cum appendiciis suis cum silvis et agris et pasturis, cum pratis et aquis, cum molendinis et piscariis, cum ecclesiis quoque et capellis et cimiteriis et oblationibus et decimis, cum moneta et uno monetario apud Radingiam* (ibid., 33).

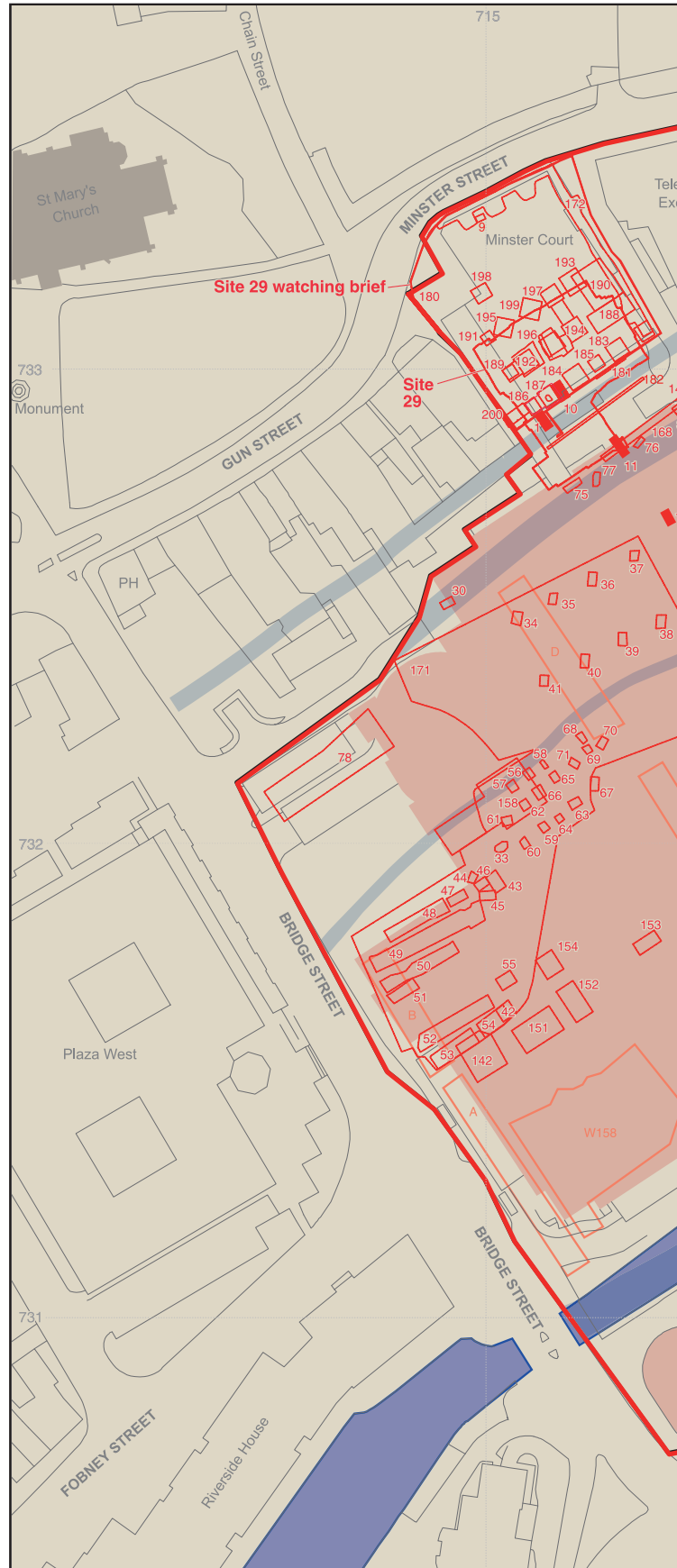
The main conventual buildings were completed by c 1126, and the church was consecrated in 1164.

Fig. 1.2 (opposite) The Oracle site located within the modern town centre (prior to the Oracle redevelopment) and modern topography, showing the conjectured medieval town limits after Astill 1978. Other excavations: [1] – 90-93 Broad St (Norton and Poore 2007); [2] – 99-105 Friar St (Ford and Ford 2005); [3] – Friar St (Atherton 1999); [4] – 1 Friar St (Pine 2005a); [5] – 7-8 Broad St (Scott and Hardy 2007); [6] – 31-37 Castle St (Pine 2005b); [7] – Abbey Wharf (Hawkes and Fasham 1997); [8] – Bridge St East (Hawkes and Fasham 1997)

The arrival of this prestigious and highly favoured royal foundation brought the little town great new opportunities for expansion, but also, as Astill points out, sowed the seeds of future conflict. Henry granted a 4-day fair at Reading, a source of income for the abbey but also presumably for the townspeople as traders and buyers would have come to stay in the town from far around. The abbey also built up an important collection of relics during the 12th century, the most famous of which was the hand of St James the Apostle, which was said to have been given to Henry by his daughter the Empress Matilda, and given by him to the abbey (Kemp 1970, 1-4; Kemp 1986, 39-40, no. 5 and note). The hand was widely promoted as possessing formidable powers of healing, and it made the abbey an important focus for pilgrimage, which was also encouraged by a series of grants of indulgences by bishops throughout England and Wales to those visiting the abbey for the saint's feast day (Kemp 1986, 148-156 nos 184-201). An additional 4-day fair was granted by Henry II and subsequently also by King John. However, there was to be much conflict between the abbey and the town in the future as the leading townsmen sought to create a measure of independent town government and defend their own rights and interests.

The 12th and 13th centuries were a period of rapid growth in towns, and Reading Abbey seems to have acted quickly to enhance the value of its borough, creating a new triangular market place outside its own main gate, with two curving, parallel streets (Broad St and New St) running westwards to the old main thoroughfare (Fig. 1.2). New St (now Friar St) is first documented in 1186. These streets are likely to have been laid out with new tenement plots for rent to attract settlers into the town. Probably around the same time the abbey seems to have been developing what is today London St, with wide burgage plots for rent to either side, as an alternative to the old route into the town from the south. A new bridge (later High Bridge) was built over the Kennet by 1186, bringing traffic directly to the abbey's gates (Astill 1978, 78). A serious quarrel broke out between the abbey and the townspeople during the decade from 1244 to 1254, and the terms of settlement suggest that the location of markets was a major source of contention. In the short-term, the townspeople gained a concession that the cornmarket would continue to be held in the Old Market outside St Mary's (ibid.), but in the end the abbey won. By the 14th century the area between the abbey's market place and the banks of the Kennet, where the town and abbey wharves were located had taken on a distinctly commercial character.

One of the other matters in dispute between the town and the abbey at this time was the attempt by the leading townspeople to establish a merchant guild to regulate trade in the town, with its own elected officers and hall. The dominant medieval trade guilds were associated with the major industry



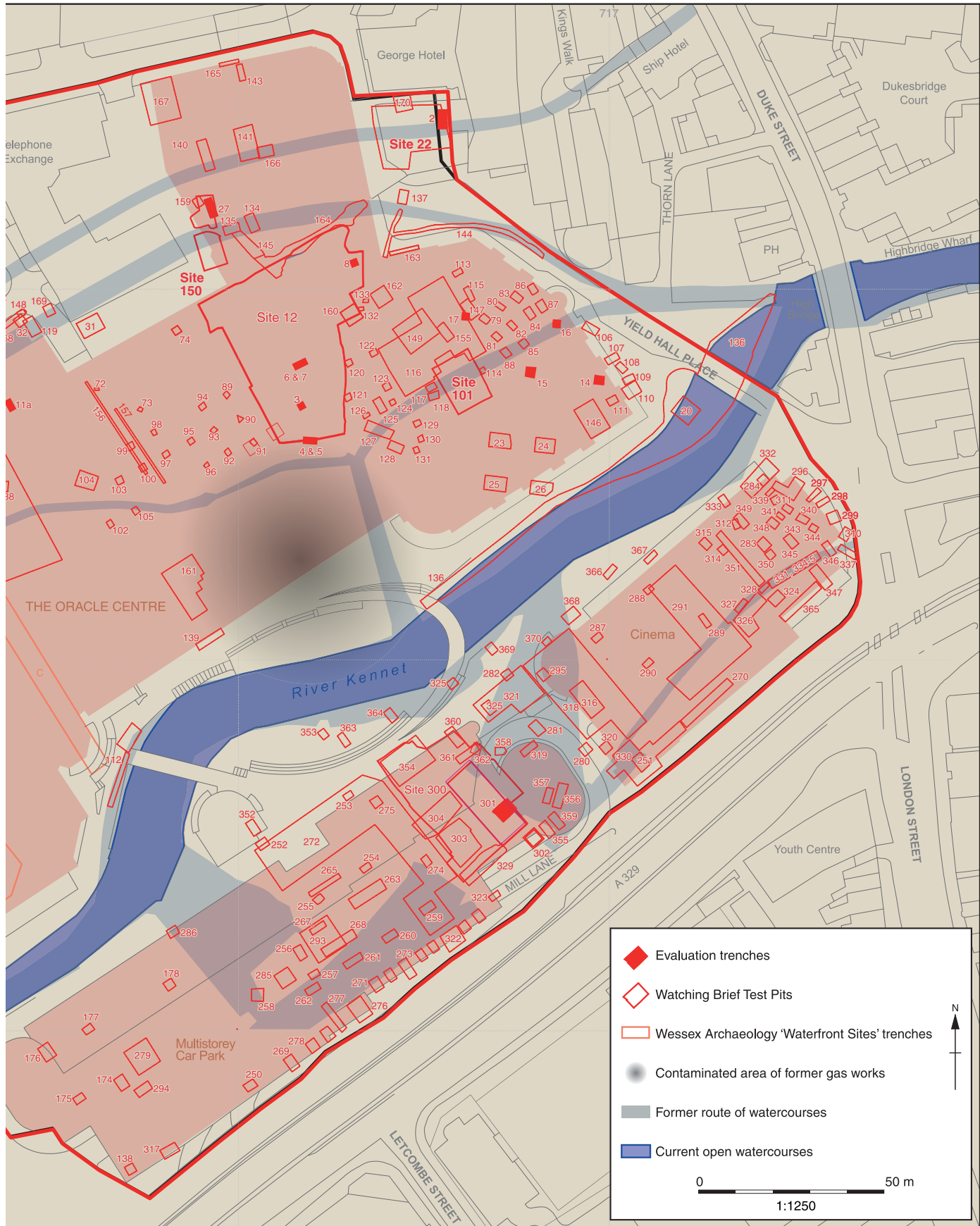


Fig. 1.3 Detailed plan of the project area showing the locations of all area excavations (Sites), evaluation trenches, and watching brief observations, superimposed on the buildings of the Oracle development

of the town, which was cloth working (ibid., 75); there was a gild of drapers by 1242 and later organisations for weavers, fullers and shoemakers. The gildhall is mentioned in a land grant of the period 1204-1220 and the agreement reached between the townspeople and the abbey in 1254 allowed that they should keep their gild and hall, but that the abbot should nominate the officers, the warden and bailiffs (ibid.). Numerous references to the gildhall in documents of the 14th, 15th and 16th centuries show that it stood on the floodplain, on an island between the Kennet and the 'Millbrook', and was accessed by a bridge and a lane (see Chapter 4, below). This was clearly not an ideal location for the town's most important civic building. Following the dissolution of the abbey in 1539, Dr London, one of the commissioners, wrote to Thomas Cromwell, asking that the town should be granted the church of the former Franciscan friary in New St to make a new gildhall, since 'ther town-hall ys a very small

house and stondith upon the ryver wher ys the comon wasching place of the most part of the town' (Coates 1802, 305). The new site was soon granted, and thereafter the old building was leased out. At the time of the Oracle excavations, it was unclear whether a house thought to be of 17th-century origins, which had come to be known as the Yield Hall and had been demolished in 1935, was in fact the successor of the original medieval gildhall on its floodplain site. The excavations at site 12 were designed in part to investigate this, and the results are described in Chapter 2, below; the medieval documentary evidence for the gildhall is reviewed by Joan Dils in Chapter 4.

The Kennet channels crossing the floodplain were an important resource both for the abbey and for the medieval town. At least three of them are definitely known to have powered mills during this period. Six mills at Reading are recorded in Domesday Book, but there is no information about their location and

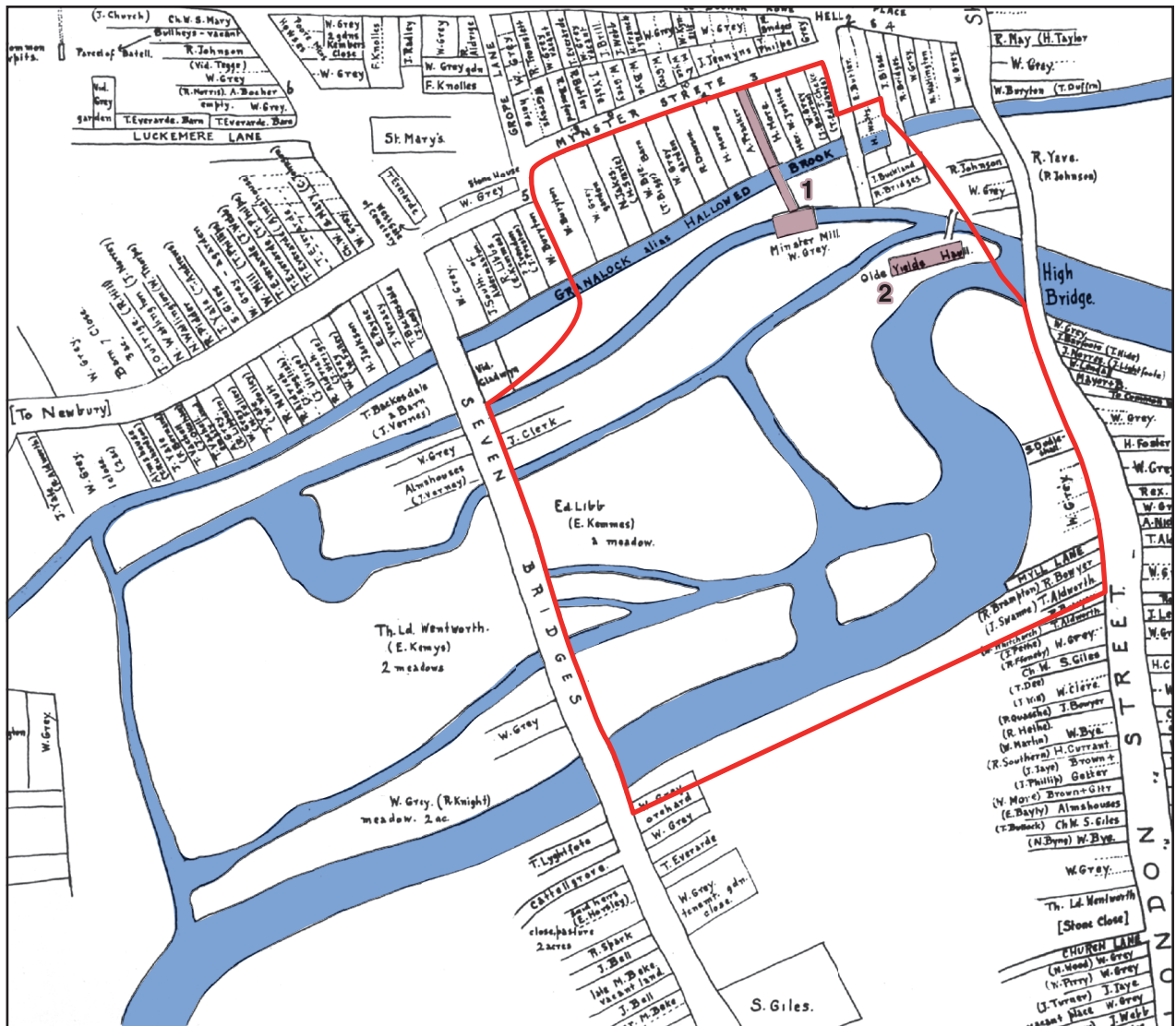


Plate 1.2 The project area shown on a detail of Amyce's survey of 1552 (drawn by S A Peyton in 1919): with [1] Minster Mill (Site 150) and [2] Yield Hall (Site 12) highlighted

they need not have been within the borough itself. Henry I's foundation charter gave all the mills of Reading to the abbey, which continued to control them until the Dissolution. The most northerly channel, the Holy Brook, powered the Abbey Mill, which was located on the south edge of the abbey precinct. Previous excavations on the site of this mill have been published in the *Berkshire Archaeological Journal*, and the mill seems to have been in continuous use from the 12th century to 1959 (Slade 1971-2; Hawkes 1991; Chandler 1997, 180). The channel may have been deliberately cut to bring water to the abbey's mill, and an abbey lease of the period 1173-1186 refers to a new ditch (*novum fossatum*) in this area (Kemp 1987, 115-6 No. 834). The Minster Mill was powered by the Minster Mill stream, and may have been one of the mills referred to in Domesday Book. The mill stream clearly had an early origin, as it marked the line of the parish boundary between the parishes of St Mary and St

Laurence to the north and St Giles to the south (see Plate 1.5). Minster Mill was certainly in operation in 1250, when it is mentioned in a land grant to the merchant gild (see Chapter 4, below). St Giles Mill was located south of the Kennet, and may be the mill mentioned in an abbey lease of 1173-1186; in the later 13th century it was being used to full broadcloths, one of Reading's major products (Chapter 4, below). After the dissolution of the abbey, Minster Mill and St Giles Mill were sold to William Grey, a wealthy citizen of the town, for the huge sum of £720. At the time of the sale (1545) both were described as two corn mills and a fulling mill, which probably means that two sets of grinding stones and a set of fulling stocks would have been present at each mill. One of the main aims of the Oracle excavations was to investigate the sites where these mills had stood. The resources of the Kennet floodplain were also extensively exploited by numerous other trades requiring water, and medieval and 16th-

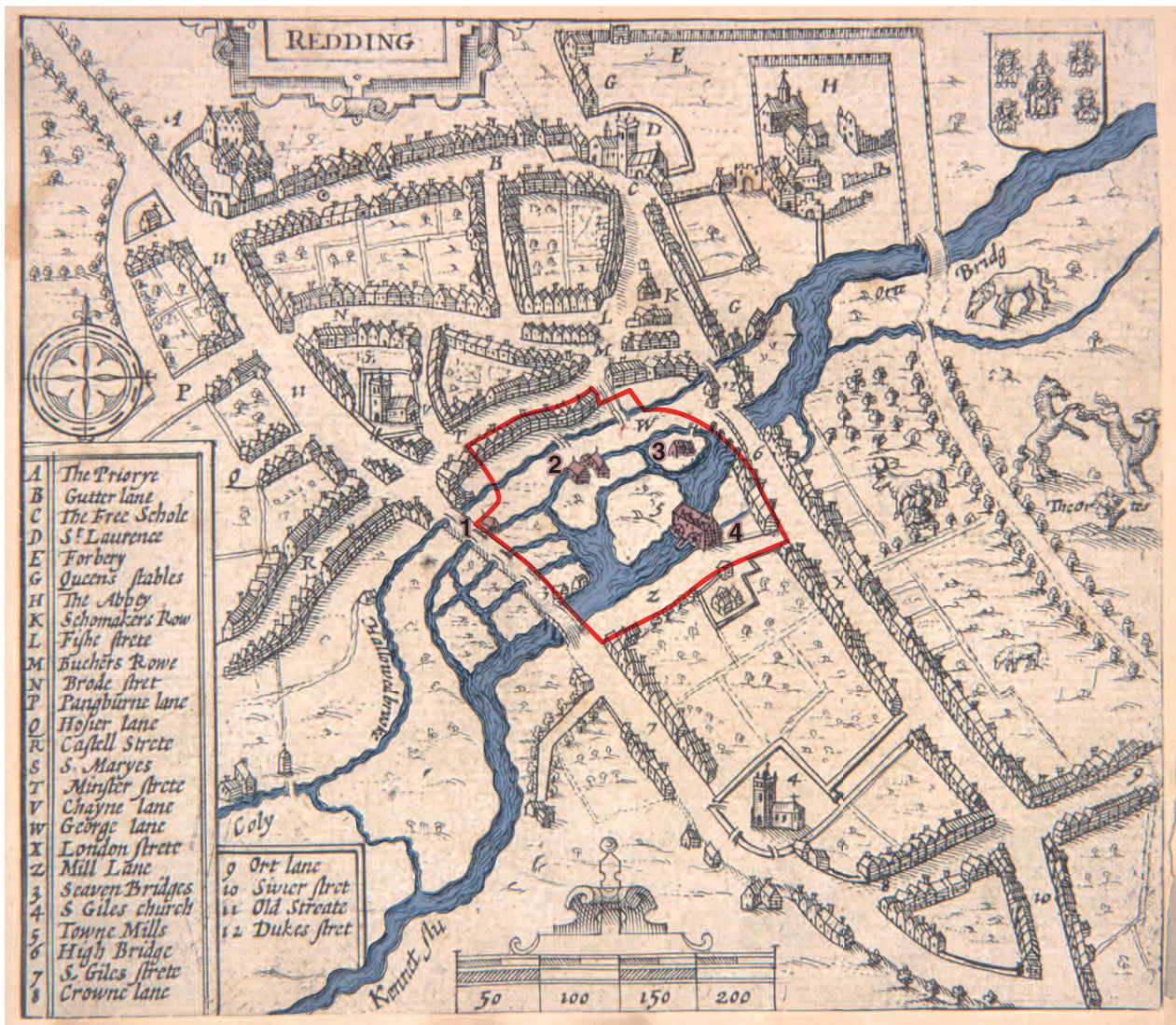


Plate 1.3 John Speed's map of Reading, 1611, with [1] the Dyehouse (Site 78), [2] Minster Mill (Site 150), [3] Yield Hall (Site 12) and [4] St Giles Mill (Site 300) highlighted

century documentary sources show that the area was being used for the tanning of leather, the dyeing and tentering (stretching) of cloth, for brewing and for fishing. Evidence for these activities was recovered during the excavations.

Astill comments (1978, 76) that Reading had become established as the major town in Berkshire by the 15th century, having long overtaken its earlier rival, Wallingford. The evidence for the town's increasing population in the later medieval

period is reviewed in Chapter 6, below, but it seems to have been accommodated by the subdivision of existing properties rather than expansion of the town into the surrounding countryside (*ibid.*, 76, 78). The scope for expansion was certainly limited by the existence of the abbey precinct and the Thames/Kennet confluence to the east, and the Thames water meadows to the north.

The dissolution of the monasteries, which took place across England in the late 1530s, must have

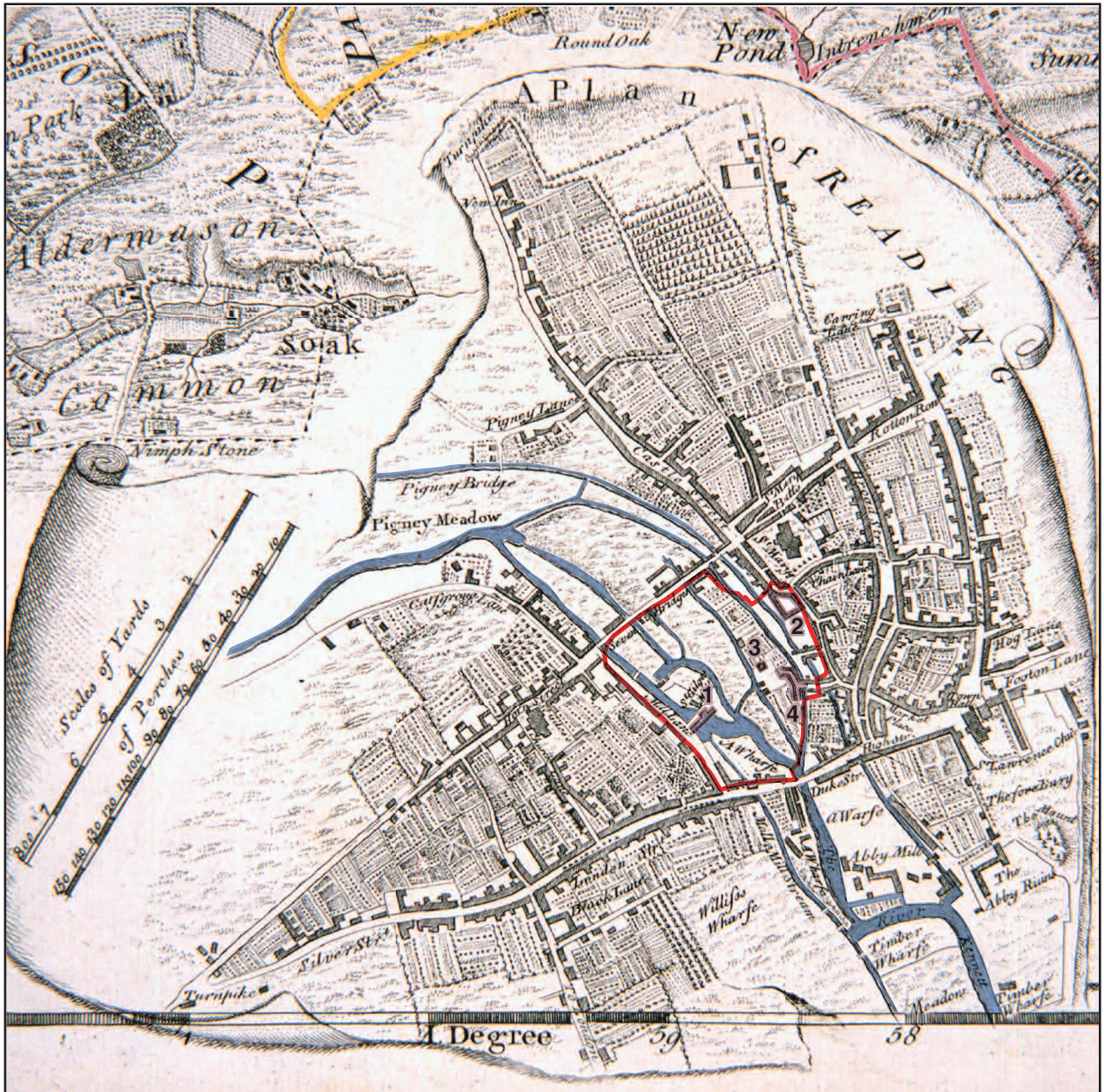
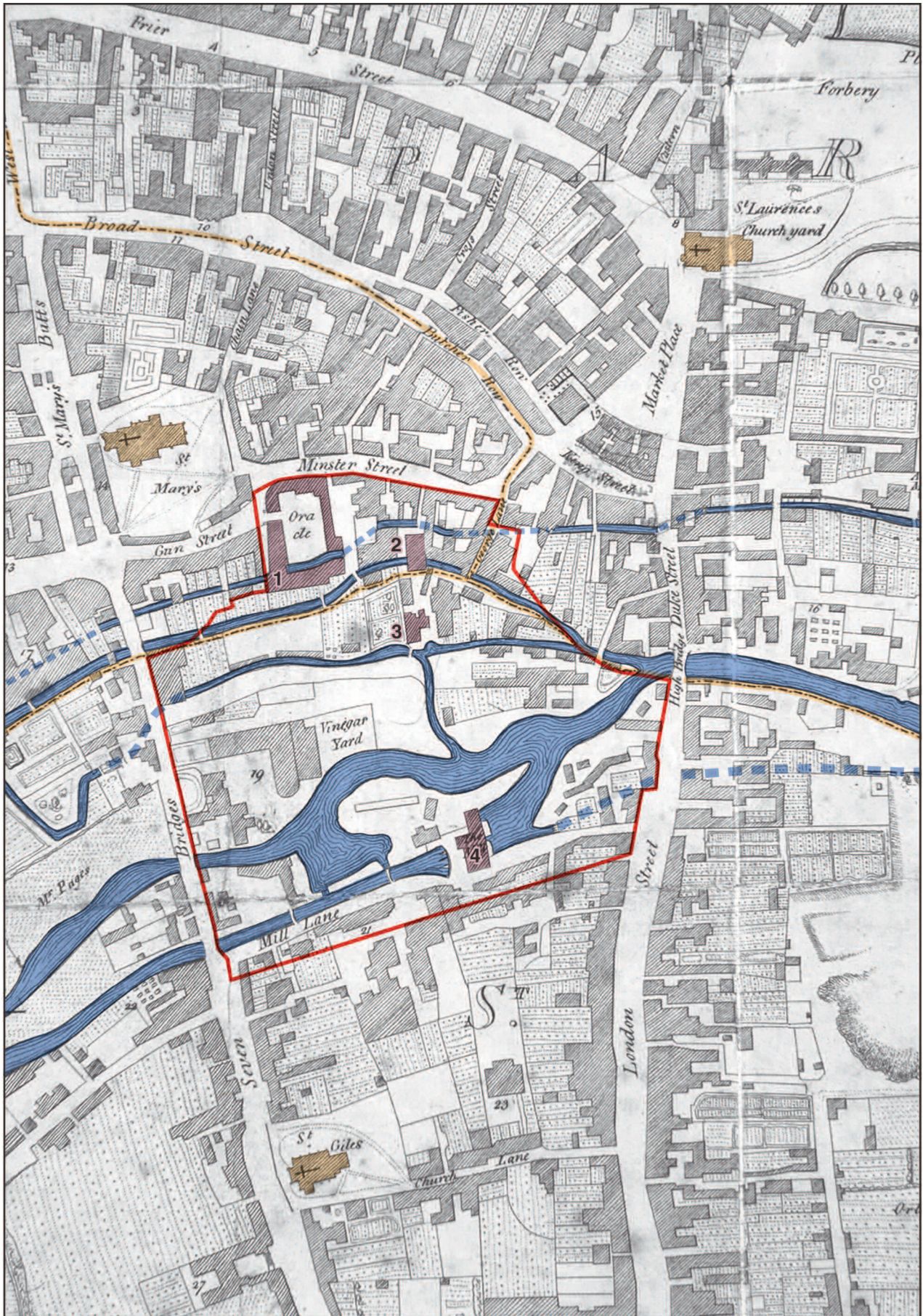


Plate 1.4 John Rocque's map of Reading, 1761, with [1] St Giles Mill (Site 300), [2] The Oracle (Site 29), [3] Minster Mill (Site 150) and [4] Yield Hall (Site 12) highlighted

Plate 1.5 The project area shown on a detail of Charles Tomkins' map of Reading, 1802 (published in C Coates *The History and Antiquities of Reading*) with [1] The Oracle (Site 29), [2] Minster Mill (Site 150), [3] Yield Hall (Site 12) and [4] St Giles Mill (Site 300) highlighted



had a major impact at Reading, which had existed in the shadow of the abbey for four hundred years. After 1539, although the abbey's assets were initially transferred to the Crown before sale, the control that the abbey had exercised over the town centre and the Kennet floodplain was lifted, and properties soon found their way into the hands of local entrepreneurs, particularly William Grey. This makes Reading a particularly interesting case-study for the local effects of the Dissolution, and there was a massive rebuilding of parts of the town during the 16th and early 17th centuries (Astill 1978, 76). In 1624, John Kendrick (a successful Reading cloth merchant) left the sum of £7500 to the borough for the construction and maintenance of a strong brick house with a garden, where the poor could be

provided with work producing high-quality cloth. A plot of land fronting onto Minster St was bought from Kendrick's brother in 1626, and the workhouse was constructed between 1627 and 1628; the production of cloth began immediately. The excavations on site 29 were located to investigate the workhouse, which had been demolished in the mid 19th century.

From the 16th century onwards, documentary sources become more abundant and these, together with maps, present increasingly detailed evidence for the changes that took place in the town. A survey of the town was compiled in 1552 by Roger Amyce (NA Misc. Bks. Land Rev vol. 187), and this was drawn up as a map by Peyton in 1919 (University of Reading, LMC 671). Part of the map, showing the project area, is reproduced as Plate 1.2;



Plate 1.6 The project area shown on a detail of the Board of Health map, 1853, highlighting [1] Minster Mill (Site 150), [2] Yield Hall (Site 12) and [3] St Giles Mill (Site 300)



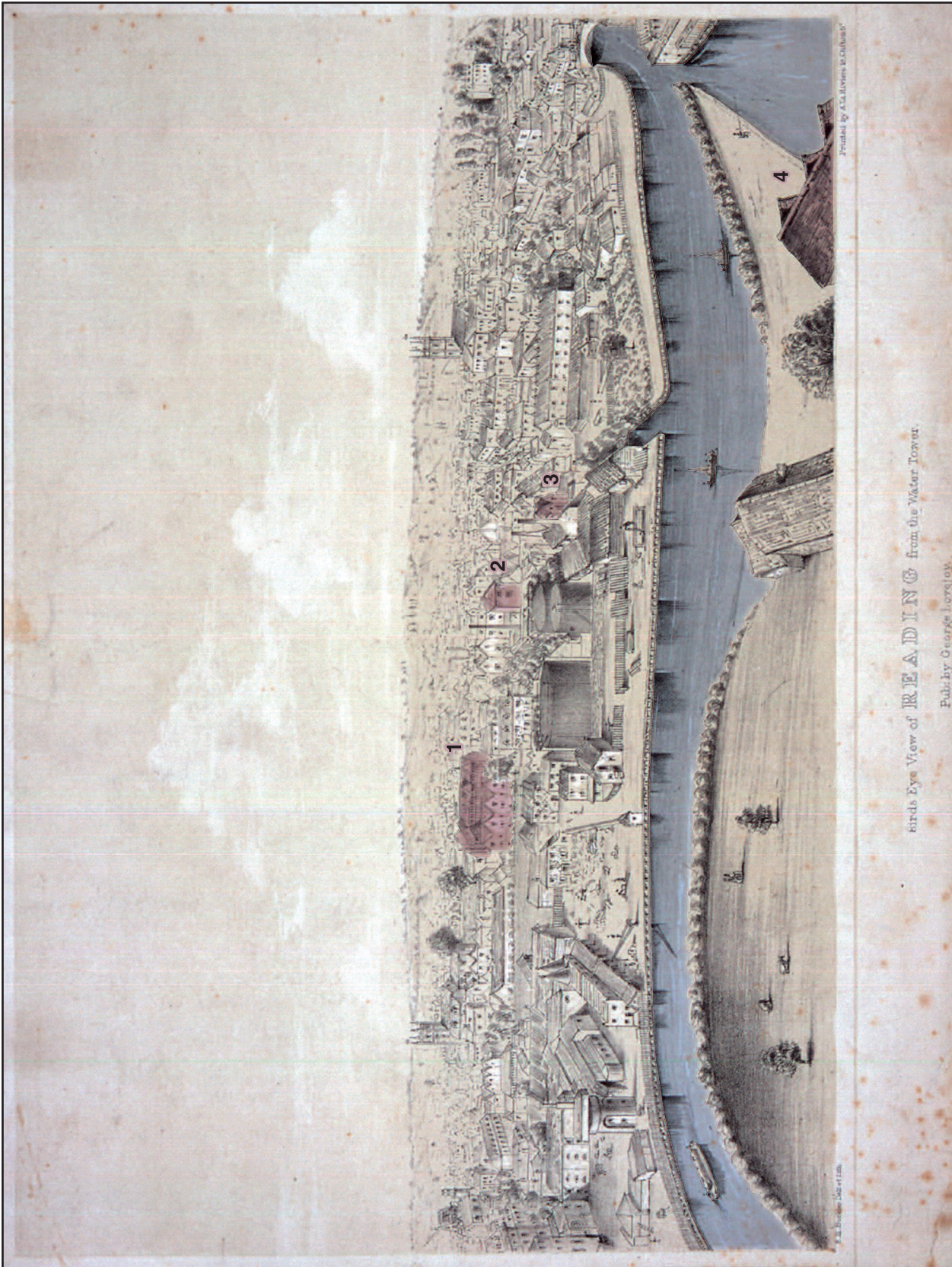


Plate 1.7 E H Buckler's bird's-eye view of Reading from the water tower, c 1850 (compare with Plate 1.6) with [1] The Oracle (Site 29), [2] Minster Mill (Site 150), [3] Yield Hall (Site 12) and [4] St Giles Mill (Site 300) highlighted

3

ST. MARY'S PARADE MINSTER S

GUN ST.

EARLEY PL.

8

9

SEE SHEET N° 2

BRIDGE ST.

GAS LANE

H. SEVE & CO. LTD. THOMAS'S BREWERY

10

RIVER KENNET

Meadow

12

BAYNES & BEARD

WATER WORKS DEPT.

MILL WATER MILL LANE

ENT. STR. HALL

LOTHIERS



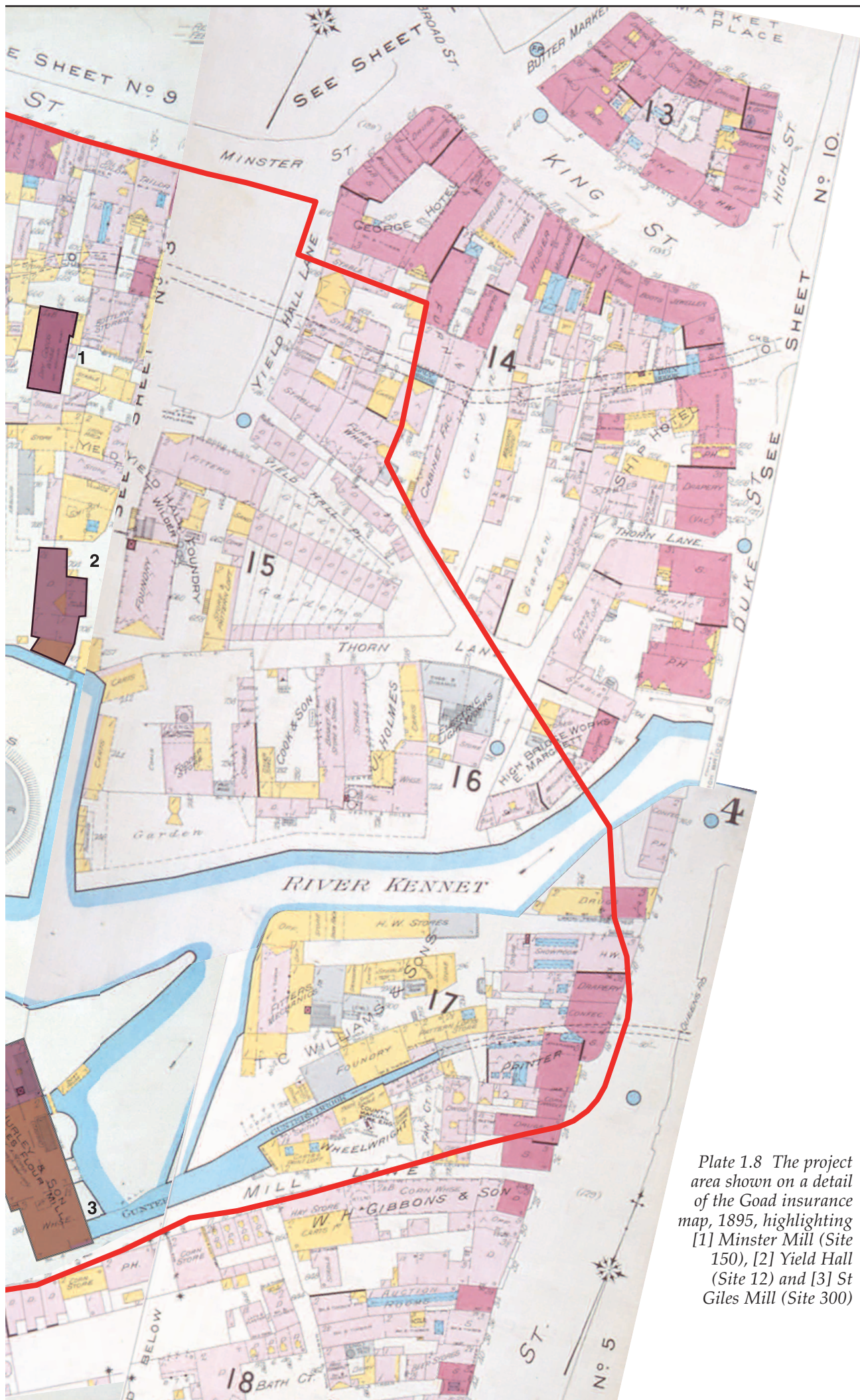


Plate 1.8 The project area shown on a detail of the Goad insurance map, 1895, highlighting [1] Minster Mill (Site 150), [2] Yield Hall (Site 12) and [3] St Giles Mill (Site 300)

although it cannot be relied on to locate properties precisely, it gives a good general indication of the final stage of medieval development of the town. The subdivision of properties into innumerable small holdings is very clear, especially in the crowded area north of Minster St, and along suburban London St. Within the Oracle project area, only the Yield Hall and Minster Mill are shown. Joan Dils has published a number of additions to Peyton's map (Dils 1980, 30-31), including St Giles Mill, and a former dyehouse located just east of Seven Bridges (now Bridge St) in the vicinity of the property marked 'J Clerk' by Peyton. One other point of interest on Peyton's map is the number of properties owned by William Grey (see above). Grey purchased a total of 197 former Reading Abbey properties in 1545 for the sum of £2133; he had no children, and on his death his fortune passed to his stepson, John Blagrave (see Chapter 4, below, for more detail).

The most famous early depiction of Reading is John Speed's map of 1611 (Plate 1.3). This shows the frontage of Minster St completely built up, and the Holy Brook, Minster Mill Stream and Back Brook dividing the floodplain into a series of small islands north of the main channel of the Kennet. The Minster Mill (depicted as two buildings with two waterwheels) is shown by Speed on the Minster Mill channel, and he also shows what is probably a schematic, rather than an accurate, representation of St Giles Mill built across the main channel of the Kennet. The large building shown on an island between the Minster Mill Stream and the Kennet is probably the Yield Hall. The small building Speed shows on the east side of Bridge St (called by him Seaven Bridges), at the point where the Minster Mill Stream emerges from under the bridge, may represent the early 17th-century dyehouse noted in this area by Dils (see above). The dyehouse was found in this location during the Oracle excavations (see Chapter 3 below).

Roque's map of 1752-3 (Plate 1.4; drawn with west to the top) shows that by the mid 18th century Reading had hardly grown beyond its medieval limits. Within the project area itself he shows the familiar St Giles Mill building, and the channels crossing the area are still unculverted. A small building to the west of St Giles Mill is probably the failed water pumping station constructed in the mid 1690s (Plates 3.38-9). The floodplain is mostly meadow and gardens. Yield Hall Lane can be seen crossing the Holy Brook and Minster Mill Stream (as on Speed's map), but on Roque's map it then divides into two branches, one leading east to an area that appears to be in cultivation, and the other running west to give access to an apparently uncultivated area containing three small buildings. This area corresponds to site 12 of the Oracle excava-

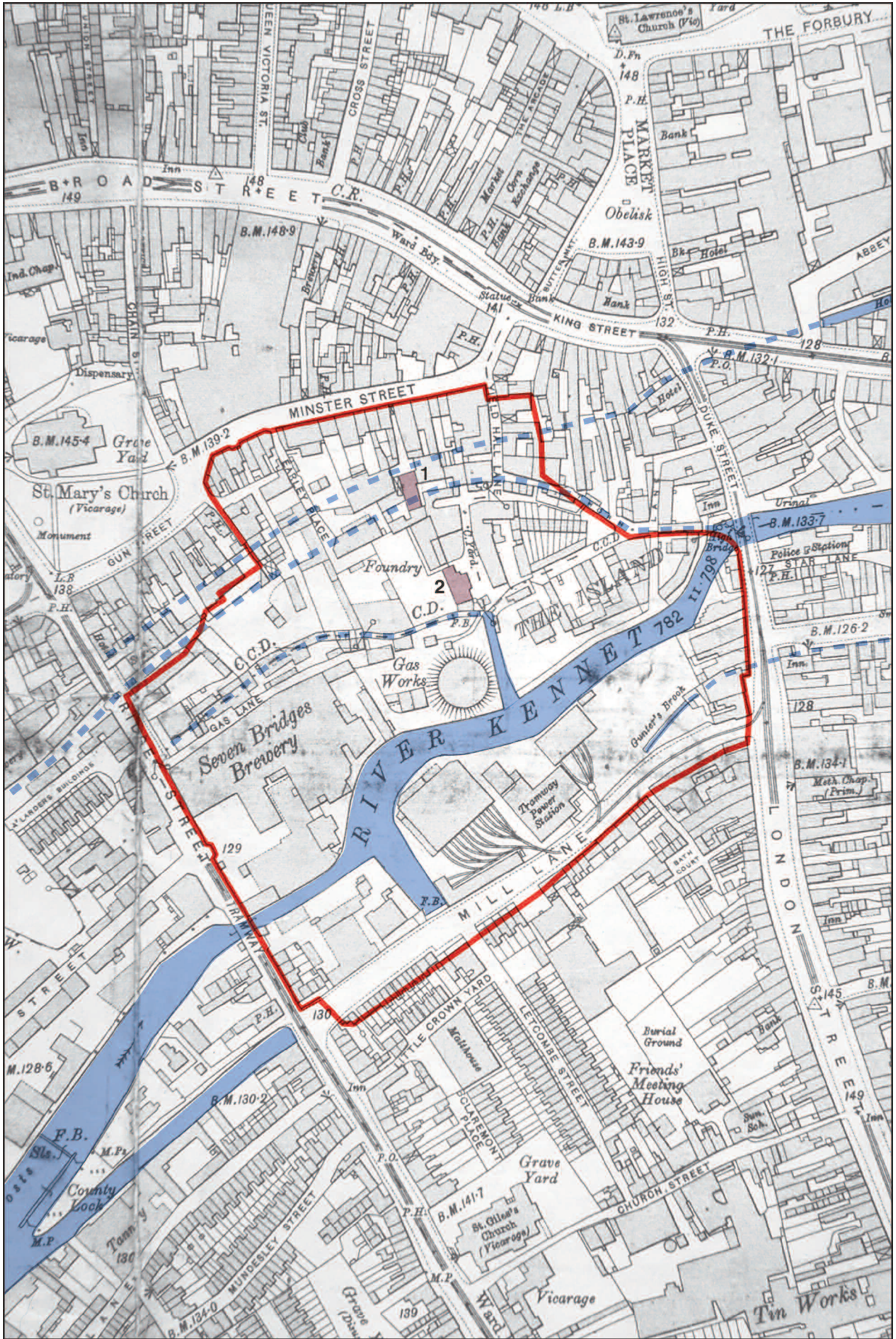
tions. Roque also provides the first evidence for a wharf upstream of High Bridge (Chandler 1997, 185), and this may reflect the improvements to the navigability of the Kennet undertaken between 1715 and 1723. Navigation through Reading apparently remained 'most intricate and dangerous' and 'a disgrace to the town' as late as 1816 (*ibid.*).

By 1802 Tomkins' map (Plate 1.5) shows the beginnings of the process of permanent build-up of the project area. On the west side of the project area, Seven Bridges Rd (now Bridge St) provided good access to the valley floor, and Simonds Brewery (established on the site by 1794) is shown here clearly with its Vinegar Yard behind. To the south are what appear to be warehouses around a courtyard, perhaps a precursor of Baynes and Beard's Timber Yard seen on the Goad Insurance Map of 1895 (see below). Within the project area, Tomkins shows the foundry at the end of Yield Hall Lane (here called George Lane), established immediately to the east of the Yield Hall itself. Minster Mill and St Giles Mill are both shown, and we have the first clear depiction of the Oracle workhouse on a general map.

The Board of Health Map of 1853 (Plate 1.6) and Buckler's bird's eye view of Reading from the water tower (Plate 1.7) show the landscape of the valley floor beginning to change, as the channels were increasingly buried in culverts. This opened up areas for smaller scale businesses, as well as for the already established brewery, foundry and wharves. Buckler shows the Oracle workhouse (see Plate 3.3 for detail), but it was demolished in 1850 and the Board of Health Map of 1853 shows the Minster St frontage developed for small shops (see Chapter 3, below). The most significant new features on this map are the three dark circles of the gas towers belonging to the Reading Gas Works Company. A row of terraced houses with gardens and detached privies can be seen next to the foundry.

By 1895, the Goad Insurance Map (Plate 1.8) gives the first clear indication of the detailed nature of the industries on the valley floor, with the function of each building labelled. During the 19th century Reading became an increasingly important centre for trade between the west country, the midlands and London, and it had a major role in servicing its agricultural hinterland. The familiar Holy Brook and Minster Mill channels have all but disappeared underground, and a huge variety of small-scale businesses have spread over this area. These include a tobacco factory, a dyehouse, a paint mill, furniture makers, stables, cartsheds, a coach builder, corn dealers, store-houses and a bottling store, in addition to the established brewery, gas works, timber yard and foundries. The eastern branch of the Back Brook (in

*Plate 1.9 The project area shown on a detail of the 25 inch:1 mile Ordnance Survey map of 1909-10, with [1] Minster Mill (Site 150) and [2] Yield Hall (Site 12) highlighted*



the area of site 101) has disappeared, to be replaced by an extension of Thorn Lane. The map also shows the last plan of St Giles Mill, labelled 'steam power only' only 6 years before its demolition for the creation of the Tramways Depot. Minster Mill has been decommissioned and is shown as a dry goods warehouse.

The final historic map, the Ordnance Survey 1:2500 plan of 1909/10 (Plate 1.9) marks the point at which the old, open character of the floodplain, with its water channels and meadows, has been completely masked by industry and housing. The west and south parts of the project area are dominated by the brewery, the gas works and the new Tramway buildings, which have replaced St Giles Mill, and the foundry dominates the area of site 12. The area south of Mill Lane is covered in high density terraced housing.

### Previous excavations

At the time of Astill's survey of Reading's archaeological potential (1978), only the abbey had been subject to any archaeological excavation. Work here had been carried out by Cecil Slade during the 1960s and 1970s (Slade 1971-2; Slade 1975-6), and Alan Vince undertook trial excavations in 1979 to investigate part of the cloisters and an area south of the refectory (Vince *et al.* 1981-2). Elsewhere there had been extensive redevelopment within the historic core of the town, but no archaeological recording had taken place.

The situation changed in the early 1980s, when the town was facing substantial redevelopment. A total of eight town centre sites were investigated between 1981 and 1988 by the Berkshire Archaeological Trust and the Trust for Wessex Archaeology (now Wessex Archaeology) (Hawkes and Fasham 1997, esp. 6 and fig. 5), together with two sites on the Holy Brook further to the west. Five of the sites clustered in the area south of the abbey precinct, and along its Kennet wharf frontage. These revealed evidence of historic water channels, waterfront structures, timbers and occupation remains, and demonstrated that the floodplain had quite unexpectedly good archaeological potential. The results from the most significant trenches, at the Abbey Wharf, are discussed further in Chapter 6 of the present volume (for location, Fig. 1.2 No. 7). Only one of Hawkes and Fasham's sites, Bridge St East, was located within the Oracle development zone, in the western part formerly occupied by Simonds Brewery, and recently vacated by their successor Courage's Brewery in favour of an out of town site (see Figs 1.2 and 1.3). The excavations, which took place from 1985 to 1986, revealed a former channel of the Kennet with evidence for a series of timber revetments, beginning in the 11th century. The main channel was deliberately realigned in the 12th or 13th century, and thereafter seemed to have been made narrower. By the 18th century the former channel had been infilled and

the area reclaimed for wharfage. Industrial activities included hide processing (Hawkes and Fasham 1997, 193). Various borehole and trial pit investigations were carried out by Wessex Archaeology on the Oracle development site at around the same time, but the results were limited (Tatton-Brown 1996, 3).

A number of other excavations have taken place in the centre of Reading both before and since the Oracle fieldwork in the late 1990s, and have revealed information about the nature and chronology of the town's development. These are discussed further in Chapter 6 of the present volume, and the locations of the sites are shown on Figure 1.2.

### THE REPORT (Table 1.1)

A programme of post-excavation assessment was carried out following the completion of site work (Ford *et al.* March 1999; Ford *et al.* April 1999). The potential of all sites and data for further analysis was considered, and a programme of post-excavation analysis leading to the publication of the present volume was drawn up. The results of the excavation are described on a site by site basis in Chapters 2 (medieval) and 3 (post-medieval) of this volume, followed by a discussion of documentary sources (Chapter 4). Chapter 5 reviews the evidence from the finds and environmental assemblages for trade and craft working in medieval and early post-medieval Reading, and Chapter 6 presents a synthetic overview and discussion. The full reports on the finds and environmental assemblages and the programme of dendrochronological dating can be found on the accompanying CD-ROM (Chapters 7-11).

Each of the main sites had its own phasing sequence. The site phase reference numbers have been retained in this report principally in order to allow cross-referencing with specialist reports and are identified as 'site sub-phase'. Site sub-phase numbers are identically structured, starting with the site number, followed by the site phase number, which is in some cases then followed by a further subdivision denoted by letters of the alphabet. Thus, for example, site sub-phase 2904a is site 29 (the Oracle workhouse site), phase 4, subdivision a. During the post-excavation analysis the site sub-phases were subsumed into ten Project Phases, which provide an overarching chronological framework for all sites taken together. Not all sites had evidence for all Project Phases. Table 1.1 provides a summary of the chronology and development of the Oracle excavations sites, with a concordance of Project Phases and major site sub-phases.

### Dating

The dating is based primarily on the evidence of stratigraphy, pottery and dendrochronology. Some additional information is available from historical

## Chapter 1

Table 1.1: Summary of project chronology

<i>Project Phase and date</i>	<i>Site</i>	<i>Site sub-phases</i>	<i>Sub-phase description</i>
<b>1: before the mid 11th century</b>			
	All	1200 1201 2900 10100, 10101a 15000 3000	Natural chalk  Natural chalk and gravel and early river channels Natural chalk, silts and gravels Natural chalk Natural riverine sands, silts and gravels
<b>2: mid 11th to mid 12th century</b>			
	29	2901 2902a 2902b 2902c 2902d 2903a 2903b 2903c 2903d 2904a 2904b	3 large latrine pits on N side of site. Quarrying on S side of site Short-lived timber structures Second short-lived timber building Building goes out of use. Soil dumped or formed on site Pits cut through soil Construction of large timber-framed Building 5830 aligned on possible lane to west of site Maintenance/repair of Building 5830 Building 5830 destroyed by fire Soils form on the site Construction of Building 5820 using chalk and timber Addition of Building 5825 to S of Building 5820, using chalk, with wattle-fenced yard
	150	15001a 15001b 15001c, d 15002a 15002b 15002c	Man-made channel edges of Minster Mill Stream Flooding over the channel edges Minster Mill Stream channel edges recut, banks raised and revetted Pits and postholes on later mill site, one containing charred germinated oats and barley Surfaced lane created leading S from Minster St to site of mill Lane resurfaced with chalk and gravel
	300	3001a	A pond with associated channels and a consolidated bank surface suggest an early mill. An early 12th-century type of pitwheel found in pond silts
<b>3: mid 12th to mid 13th century</b>			
	29	2905a, b	Construction of Building 5840; occupation, development and maintenance
	12	1202 1203a, b	Revetment and cutting of channels on the floodplain Reclamation of floodplain land; first construction of Building 7410 with hearths and working surfaces; reclamation and construction observed elsewhere
	101	10101b, 10102a	Drain and boardwalk adjacent to Back Brook
<b>4: mid 13th to late 14th century</b>			
	29	2905c	Construction of Building 5860 as extension to Building 5840
	12	1204 1205	Establishment and use of tanners/tawyers pits on floodplain Demolition and reconstruction of Building 7410
	101	10102b	First observed revetment of Back Brook
	300	3001b 3002a	A new bypass channel created; revetments of mill leat and tailrace channel observed St Giles Mill reconstructed after c 1308
<b>5: 15th century</b>			
	29	2905e 2906a, b	Building 5860 demolished Area of site 29 left unoccupied, with dumping and possible cultivation
	12	1206	Revetment of channels; continuing use of waterside structures and tanning/tawying pits; continuing use and maintenance of Building 7410
	101	10103	Revetment of Back Brook; construction of fish holding tank
	300	3002b and c	Maintenance of mill structures and channels
<b>6: 16th century</b>			
	29	2907 2908a-d	Construction of new sandstone house, Building 5835 Establishment and use of tanning/clothworking complex
	12	1207a	Backfilling of medieval watercourses; reclamation of additional land and cutting of new channels; tanning complex goes out of use

*Under the Oracle*

*Table 1.1: Summary of project chronology (continued)*

<i>Project Phase and date</i>	<i>Site</i>	<i>Site sub-phases</i>	<i>Sub-phase description</i>
		1207b	Construction of the Yield Hall (Building 7412)
		1208a	Additions to the Yield Hall
		1208b	Reconstruction of Building 7410 with hearths
	101	10104a, b	Initial cut of formalised Back Brook; silting
		10105	Revetment of Back Brook
	300	3002d	Continued repairs and maintenance
<hr/>			
<b>7: c 1600-1680</b>			
	29	2908e	Decommissioning of the tanning/clothworking complex
		2909a	Construction of the Oracle Workhouse
	TP 78	7802a	Construction and use of dyehouse
	150	15006a	Realignment and revetting of Minster Mill stream
		15006b	Construction of new tailrace channel at Minster Mill
	12	1209a	Pits containing horncores and pottery on floodplain
		1209b	Extension of Yield Hall
		1209c-e	Modifications to Yield Hall
	101	10105c	Brick revetment added to Back Brook
		10106	Wooden platform built adjacent to Back Brook
		10107a, b	Wooden platform rebuilt in brick; ground level raised
	300	3003a	Reconstruction of St Giles Mill
<hr/>			
<b>8: c 1680-1750</b>			
	29	2909b	Occupation and restoration at the Oracle Workhouse
	150	15006c, 15007a-c	Reconstruction of the Minster Mill
	12	1209f	Modifications to Building 7410
		1210a	Rebuilding of Yield Hall
		1210b	Minor modifications to Building 7410
	101	10108a-c	New revetments to Back Brook
	300	3003b	Construction of water pumping mill west of St Giles Mill
<hr/>			
<b>9: c 1750-1850</b>			
	29	2909c	Occupation and minor repairs at Oracle Workhouse
	150	15008a, b;	
		15009a, b	Repairs to Minster Mill
	12	1211; 1212a	Occupation and modifications to the Yield Hall
	101	10109a, b	Flooding and strengthening of Back Brook revetment
	300	3004a	Major expansion of St Giles Mill
<hr/>			
<b>10: after 1850</b>			
	29		Demolition of the Oracle Workhouse by 1850 and subsequent use of the site
	150	150010,	
		150011a, b	Final use of Minster Mill; decommissioning and change of use by 1895
<hr/>			
<b>20th century</b>			
	12	1212b	Mixed domestic and industrial use of Yield Hall; demolition of Yield Hall in 1935
	101	10111; 10112	Silting and backfilling of the Back Brook channel
	300	3005	St Giles Mill converted to steam power by 1879; the mill demolished for the building of the Tramways Depot; Mill Lane Bus Garage



sources, such as the known date of construction of the Oracle workhouse in 1627-8.

Most of the earliest pottery at the site consisted of relatively undiagnostic sandy wares, which are thought to have come into production during the mid to late 11th century; these formed a large proportion of the pottery in contexts of Project Phase 2. Earlier pottery was only present in extremely small quantities, suggesting that the development of the project area began in the period *c* 1050-1075 at the earliest.

Project Phase 3 spans the period from approximately the mid 12th to the mid 13th centuries. The pottery assemblages of this phase are characterised by the appearance of Ashampstead and London-type wares, and smaller quantities of Surrey Whitewares. Project Phase 4 is dated from the later 13th century to the end of the 14th. This period sees major construction events at both site 29 and site 300, where a consistent group of dendrochronological results date the construction of Building 5860 to *c* 1270 and the reconstruction of St Giles Mill to shortly after 1308 with continuing modifications through the 14th century.

The pottery of Project Phase 4 shows an increase in Surrey Whitewares and the first appearance of 'Tudor Green' wares in very small quantities.

Project Phase 5 covers the 15th century. This sees a marked change in the composition of the pottery assemblage, with the disappearance of earlier types and their replacement by Surrey Whiteware, 'Tudor Green' wares, German stonewares and later medieval redwares. A number of 15th-century felling date ranges were obtained from timbers associated with revetments of the Minster Mill stream and with St Giles Mill. On site 29, Project Phase 5 is associated with the demolition of Building 5860 and the use of the site for gardens and/or animal pens. Significant quantities of pottery were present in the garden soils.

Project Phase 6 covers the 16th century, in which the character of use of some of the sites changes significantly once again. A number of timbers from the Back Brook and St Giles Mill gave 16th-century dendrochronological dates, and the pottery assemblage for Project Phase 6 includes the first appearance of post-medieval redware, Surrey border ware and characteristic continental imports. The main

expansion of the tanning complex on site 29 is dated to the third quarter of the 16th century by a series of dendrochronological dates from timbers in a strengthening of the Holy Brook channel revetment. At site 12, Project Phase 6 sees the backfilling of the medieval water channels with dumps containing late 15th- and early 16th-century pottery, followed by the construction and expansion of the building that came to be known as the Yield Hall.

Project Phase 7 is dated to the 17th century based on a variety of indicators at different sites. The Oracle workhouse on site 29 is known from documentary sources to have been built in 1627-8, and timbers used in constructions on sites 78, 150 (Minster Mill) and 300 (St Giles Mill) gave early 17th-century dendrochronological felling date ranges. English tin-glazed pottery first appears in contexts of this phase, and clay pipe is present from *c* 1610 onwards.

Project Phase 8 is dated to the period *c* 1680-1750. The rebuild of the Minster Mill (site 150) was dated to 1701 by dendrochronology, and the water pumping mill located in test pits upstream of St Giles Mill is known from documentary sources to have been constructed in the period 1694-6. Other dating evidence for contexts of this period came from assemblages of late 17th- and early 18th-century vessel glass, clay pipe and pottery, with numerous clay pipes datable to the years around the turn of the 18th century, and the first appearance of English stoneware, manufactured from *c* 1690 onwards.

Project Phase 9, *c* 1750-1850 is characterised by increasing quantities of English stonewares and refined earthenwares typical of the period, and clay pipes datable to the later 18th and early 19th centuries. Timbers from new mill races at St Giles Mill gave felling date ranges in the 1740s and 1750s, dating the substantial extension of the mill to the start of this phase, and continuing maintenance of the mill into the early 19th century was confirmed by a further dendrochronological date from a timber used to reinforce the channel structures. The mill is known from cartographic evidence to have been converted to steam power by 1877 at the latest. The Oracle workhouse is known from documentary and cartographic sources to have been demolished by 1850.



# Chapter 2 The Medieval Period

## INTRODUCTION

This chapter describes the evidence for the development of this area of central Reading up to the turn of the 17th century, Project Phases 1-6. An overview of the very earliest evidence for the form of the floodplain is given first. This is followed by the evidence for the development of the northern edge of the site and the Holy Brook and Minster Mill streams (site 29, the Oracle, and site 150, the Minster Mill), the evidence for the development of the floodplain (site 12, the Yield Hall, and site 101, the Back Brook), and finally the evidence for the development of St Giles Mill (site 300). Chapter 3 presents the evidence from the 17th century onwards.

## PROJECT PHASE 1: THE EARLY VALLEY FLOOR AND RIVER CHANNELS (Figs 2.1, 2.2) (site sub-phases 1200; 1201; 2900; 10101a; 15000 and 3000)

The majority of the area covered by the project is situated on the floodplain of the river Kennet. Its northern limits extended just beyond the northern edge of the valley floor, but its southern limits did not extend as far as the southern edge of the valley floor. Chalk bedrock overlain by gravel was encountered at the extreme northern limits of the project area where it rose from the valley floor. The gravels of the floodplain (or first) gravel terrace were seen on the valley floor during the excavations, although much of it had been eroded. The second terrace was observed at the north edge of the project area and its southern edge runs parallel to, and some 20 m to the south of, the current line of Minster Street. Much of the floodplain gravel terrace was covered by large units of alluvial silt, which had been deposited by the river during seasonal floods. A number of river channels crossed the valley floor, running broadly from south-west to north-east, and this made the area prone to seasonal flooding. Evidence was encountered to suggest that many of the archaeologically recorded west-east channels were aligned on the ancient courses of relict natural channels that probably flowed seasonally.

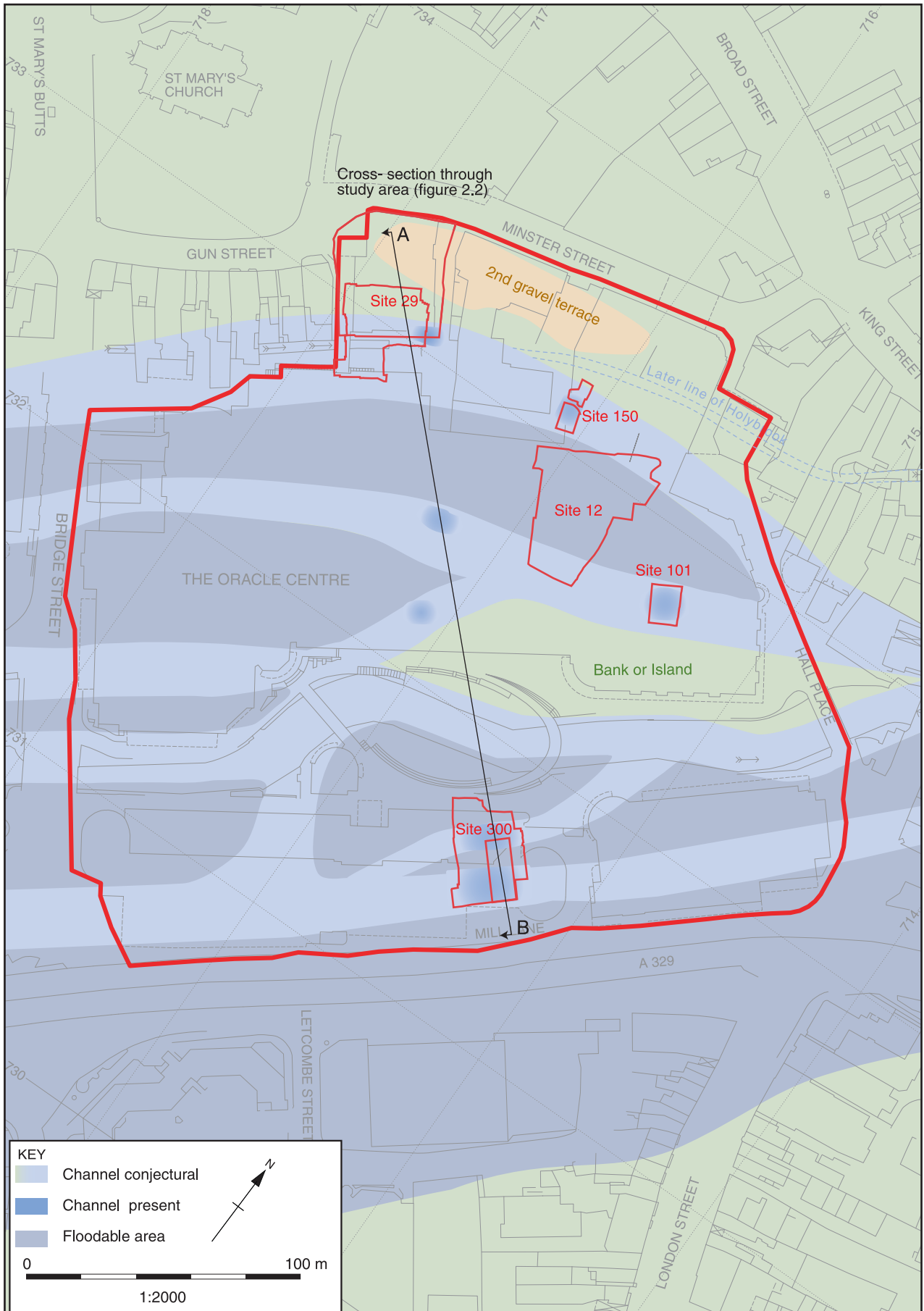
Early channel and valley floor deposits were sampled and studied by Mark Robinson as part of two separate evaluation exercises, 1996 (Tr 1-10) (OAU 1996), and 1997 (Tr 14-17 and 20) (OAU 1997). The results suggested that although useful information might be obtained, the comprehensive study of early natural deposits would be beyond the scope of the excavation programme, and priority was therefore given to the understanding of human intervention in the landscape. Some information, however,

was collected regarding the natural landscape and this is briefly reviewed in the present section and illustrated in Figures 2.1 and 2.2. Figure 2.1 shows a conjectural reconstruction of the floodplain as it may have appeared prior to the first major human interventions recorded in the excavations. Figure 2.2 shows a cross-section through this landscape. Information for these illustrations was taken from archaeological and engineering results.

Starting at the northern limits of the project area, the Oracle and Minster Mill sites (site 29 and site 150 TP 27) revealed the edge of the second gravel terrace and its interface with the floodplain. Chalk bedrock and the overlying gravel were observed at both locations. Chalk and gravel were observed at a height of 39.8 m OD immediately south of Minster St on site 29, and at 39.7 m OD in TP 167 (60 m to the east). After an initial limited drop in height, the gravel sloped gently down to the south, forming a relatively level *c* 20 m-wide shelf at a height between 39.40 and 39.20 m OD, at which point the gravel was up to 2 m thick. Just to the north of the present line of the Holy Brook, the chalk and gravel gave way to a boundary with the riverine alluvium at a height of 36.8m OD. This gravel/alluvium boundary was also observed for a short distance east-west across TP 183, and at site 150 TP 27 to the east. Here the slope of the chalk bedrock was again revealed. It was seen to slope downwards to the south at a gradient of approximately 1:10, from a height of 36.70 m OD to 36.30 m OD, before dropping more steeply at a break of slope to 35.90 m OD. This corresponds to the level at which the break of slope in the underlying chalk was observed on site 29 to the west.

The evidence from both sites suggests that this was the edge of the valley floor. The evidence for a possible early channel system around this edge suggests that an early watercourse may have existed here, which was later developed into two discrete channels, the Holy Brook and the Minster Mill Stream. The channel edge observed on site 29 corresponds with the position of the later Holy Brook, and the channel edge observed on site 150 corresponds to the position of the later northern edge of the Minster Mill Stream. This implies that the medieval and present alignment of the Holy Brook east of site 29 may have been an artificial construction, to take water off from this system to power the mill at the abbey (see Chapter 6, below).

South of these channels, on the floor of the floodplain itself, a very large number of Test Pits were observed and recorded. A principal aim of this work was to map the base of the floodplain and identify the



course of early river channels by observation of the underlying gravel, and the river silts deposited over the top of it. Many of the Test Pits revealed a sequence of alluvial silts (deposited by the river channels during floods), and some encountered the first gravel terrace, although none was deep enough to reveal the chalk bedrock beneath. The floodplain has an uneven floor and the horizon between the gravel and the overlying alluvial silts varied across the site as a result of the changing water flow in past watercourses.

The level of the gravel/alluvial interface fell across the floodplain with the direction of water flow through the valley floor (engineering studies of the water table showed that this also falls in the

same direction). A gravel bank or island was identified to the north of the current main course of the canalised Kennet. This suggests that the river in the past split into two broad areas to the north and south of this bank or island. Later, the river became established in the main course it occupies today. Figure 2.2 shows the alluvium and later made ground rising either side of this channel, indicating that this had been the river's main course before canalisation in the 18th and early 19th centuries. The periodic flooding of the valley floor formed broad and higher banks of alluvium, while lower-lying land carried numerous smaller channels, both north and south of the Kennet, and continued to be liable to flood.

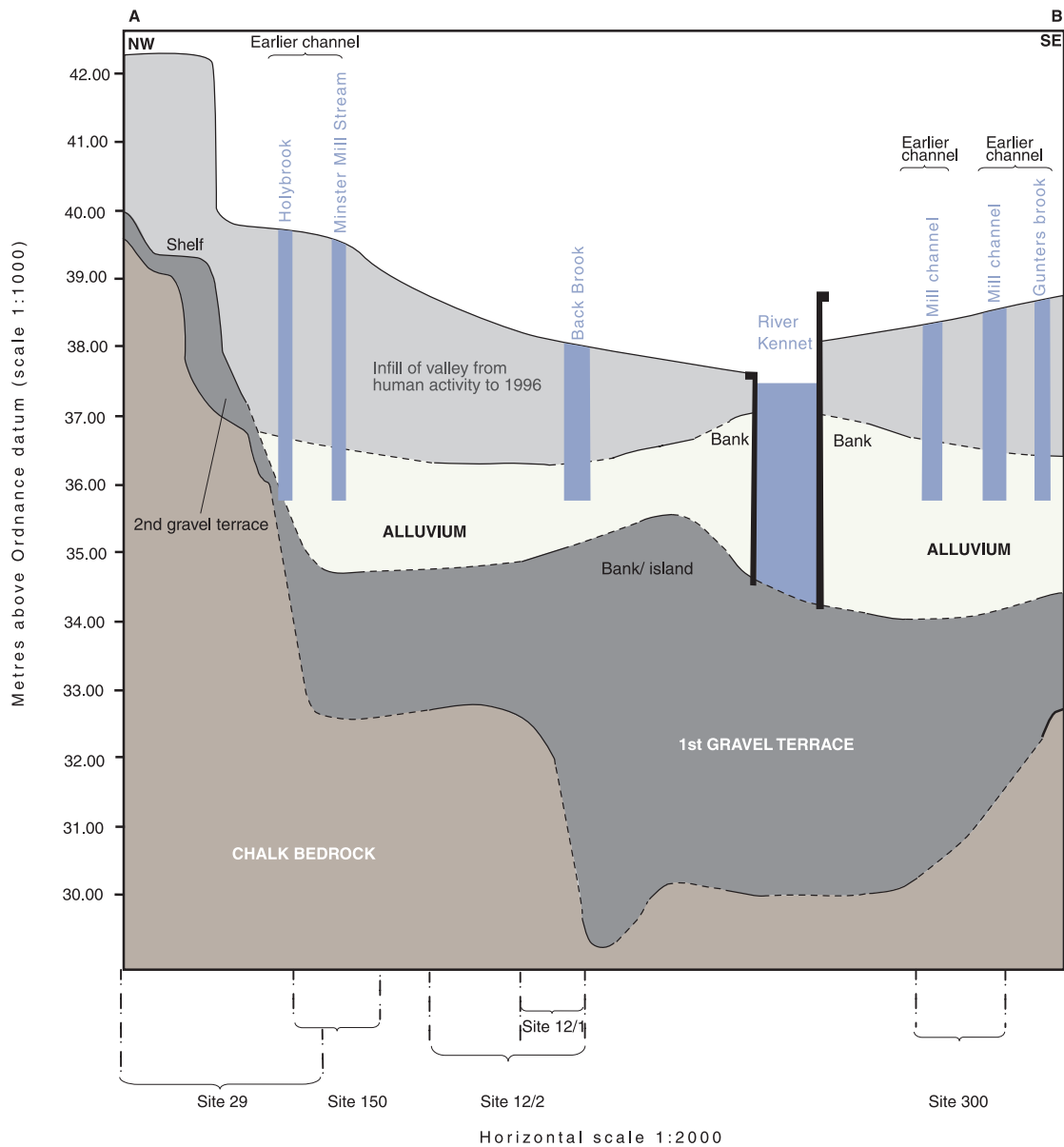


Fig. 2.2 Conjectural north-south cross-section A-B through the floodplain within the project area

Fig. 2.1 (opposite) Conjectural plan of the floodplain water regime prior to evidence for human activity, with location of the principal area excavations and cross-section A-B, Fig. 2.2 (Project Phase 1)

Only limited studies of the deposits within the river channels themselves could be carried out, and most of this work was undertaken during the preliminary evaluation of the site (TPs 4/5 and 6/7, TPs 14, 15, 17, and 20). A common sequence was revealed, with the latest stages of channel sedimentation represented by sterile inorganic deposits (at a height of 35.88m OD in TP 14). This was followed by overbank alluviation (upper height of 36.28 m OD in TP 14) as a result of periodic flooding in a floodplain environment that would have remained dry for most of the year. Mark Robinson (OAU 1997) suggests this transition could be of Saxon or earlier date, but is unlikely to be as early as the start of the Holocene, 11,500 BP. The silt/clay/sand sequences observed over the valley floor during the main phase of fieldwork in 1997 and 1998 are likely to reflect this transition.

In addition to the early precursor of the Holy Brook and Minster Mill Stream (see above) a number of other potential water courses predating identifiable human activity were recognised further into the valley floor (Fig. 2.1). None of these channels was fully revealed in width or length, and they could not be comprehensively sampled. They all ran in a characteristic south-west to north-east direction, and were later developed into more formalised channels and mill leats. An early channel was apparent on site 101 (7091) predating the historical Back Brook, and two channels were identified running through sites 300-304, that later became Mill Water/Gunters Brook and Mill Tail, carrying water to and from St Giles Mill.

A general picture emerges that two, possibly extensive, water courses once ran through the valley floor within the project area. Over time these large channels silted up and became a number of smaller channels, some of which then themselves silted up and ceased to flow. These were in turn buried beneath the seasonal overbank flood deposits laid down by the channels that did survive. It is likely that by the late prehistoric to Saxon period a true floodplain landscape had developed and that the valley floor was seasonally flooded. It has been suggested that overbank alluvial deposition increased with increasing rainfall during the late Saxon period (c AD 850-1066) and continued to worsen until around 1300 (Hawkes and Fasham 1997).

## SITE 29 (THE ORACLE SITE)

**Project Phase 2: mid 11th to mid 12th century**  
(site sub-phases 2901; 2902a-d; 2903a-d; 2904 a and b); 15001a-d; 15002a-c; 3001a)

### *Quarrying and latrine pits on the Minster Street frontage* (Fig. 2.3)

The northern slopes of the valley floor were the highest, and therefore the driest, area investigated. The area north of the Holy Brook (site 29, TP 167) was located on the edge of the second gravel terrace

with its south-facing slope down to the floodplain (see above), and would have been above the level affected by seasonal flooding. This area is likely to have been on the southern edge of the existing late Saxon settlement, although its nature and extent remain very unclear (Chapter 6, below). The excavated area lay to the south of Minster St, which is likely to have existed in some form during this period but is first documented in 1250–1275 (discussed further in Chapter 6, below).

The earliest evidence for human activity in the area was consistent with a marginal location, on the edge of the contemporary settlement to the north. Two distinctly different groups of pits were found on site 29 (Fig. 2.3; Plate 2.1). Those located on the southern half of the site were very large, up to 1.4 m deep with irregularly shaped plans, and possibly up to 10 m across in some cases (pits 6827=11326 and 6849=11337), although none was fully revealed. Their fills mainly consisted of homogeneous sandy gravel loams with very few finds, as if the unwanted soil from each newly excavated pit had simply been thrown into the disused adjacent pit. Single sherds of Roman pottery (fill 6898, pit 6849) and Anglo-Saxon pottery (primary fill 6822 in pit 6827) that were found in the pit fills are not thought to be contemporary with the digging of the pits, and were probably redeposited from pre-existing activity. The remainder of the pottery from these pits is datable to the late 11th century or later, suggesting that they were initially excavated during, or shortly after, this time. The location of the pits over the southern half of the area corresponds to where the underlying gravel formed a thick natural shelf (see above) suggesting they were excavated to extract gravel and chalk probably for construction in the adjacent settlement. The density of these pits suggests extensive quarrying in the area, and further quarry pits from this phase were observed 60 to 70 m to the east in site 150, TPs 27 and 167 and indicate that the area in between may have been exploited in the same manner (see Fig. 2.11).

North of the quarry holes were three distinctly different pits which were very large, sub-rectangular in plan, and deep (11047, 11060 and 11038). They were equally spaced, 7 m between centres, and aligned south-east to north-west, parallel and immediately adjacent to the current line of Minster Street. The central pit (11060) was the largest, measuring 3 by 3.5 by over 3.8 m deep, with two only slightly smaller flanking pits, 11047 (2 by 2.5 by over 2.3 m deep) and 11038 (2 by 2.5 by over 4.0 m deep). All three were half-sectioned using a mechanical excavator and the resulting spoil was monitored for finds, which were also taken from individual contexts revealed in the sections. Each pit had vertical or undercutting sides; in pit 11038 this undercutting was probably a result of collapse due to the instability of the unretained sides (Fig. 2.3). The fills of each pit were similar, with a mixture of greenish silts characteristic of cess, and more loamy deposits mixed with distinctive tips of ash and

Sections through cess pits on Minster Street frontage

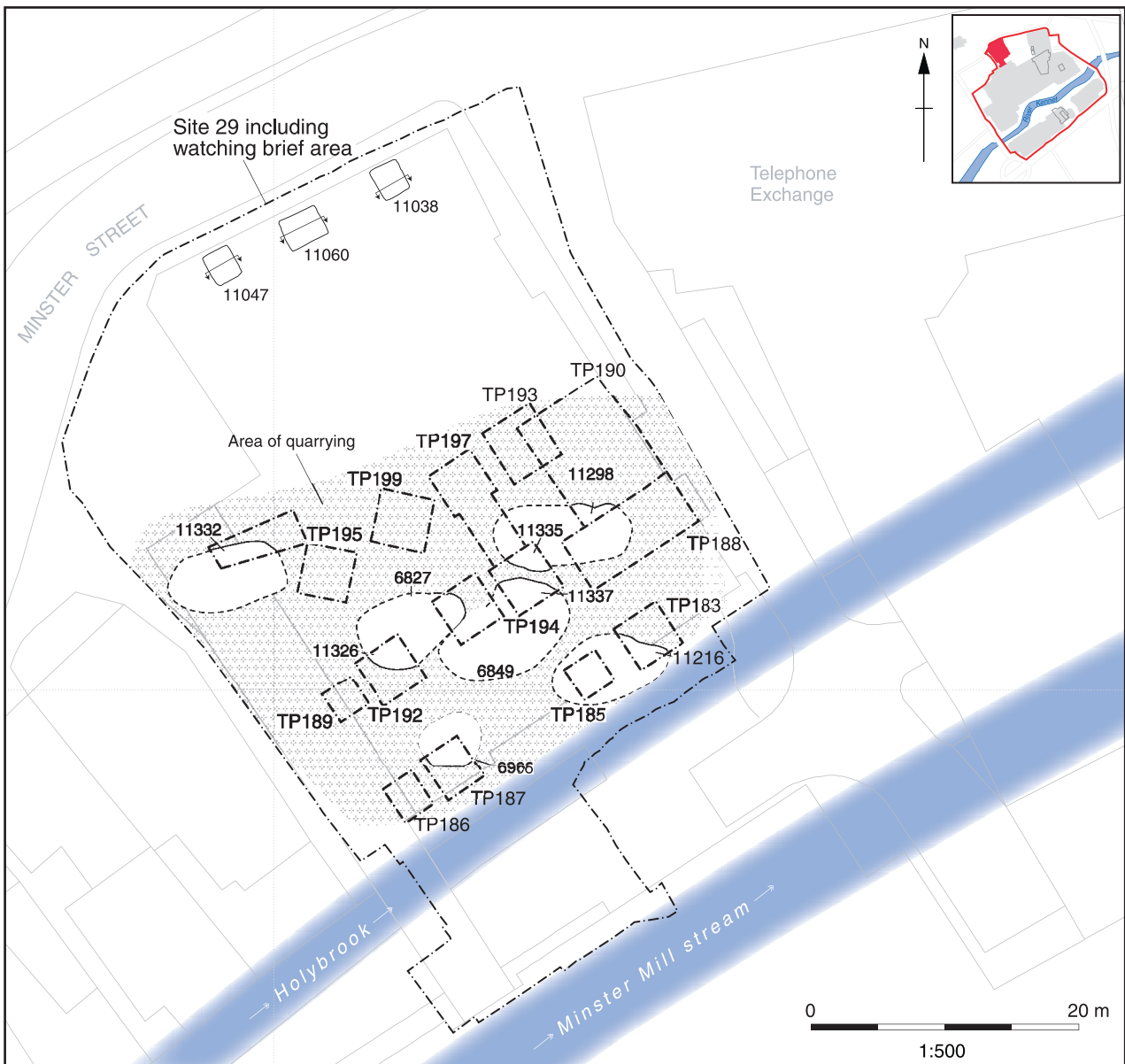
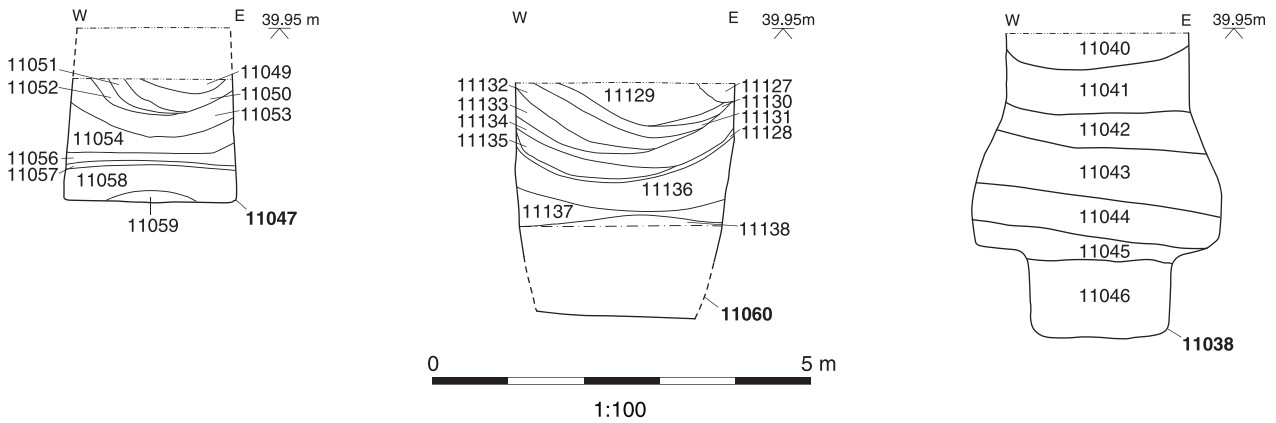


Fig. 2.3 Site 29: plan of quarrying and latrine pits, showing sections above (Project Phase 2)



Plate 2.1 Site 29: view looking W of quarry pits at the base of the medieval sequence with St Mary's Church in the background (Project Phase 1)

charcoal resulting from the cleaning of hearths. Unlike the quarry pits, these fills produced larger quantities of finds. The small assemblage of animal bone recovered contained a significant proportion of cattle and sheep's jaws and skulls, and goat horncores. The goat bones along with a single horse bone showed cut marks characteristic of skin or hide craft working activity. One of the earliest horseshoes found on the site came from 11132 a fill of 11060.

A single sherd of pottery from pit 11060 dated to 750+ and is probably residual. All the pits contained pottery dating to 1050+, with slightly later material (1075+) also present in 11038 and 11060. The consistency of the group suggests the pits were contemporary but there is no evidence for the form of the buildings with which they were associated. It is possible that they were part of a single building set parallel to the street and divided into bays – perhaps a latrine block associated with the Minster complex suggested to be immediately to the north around St Mary's Church. A contemporary pit (10240) seen in TP 167 contained general refuse

including charcoal, bone and pottery of late 11th-century to 12th-century date. The latrine pits remained in use throughout Project Phase 2, although the quarried area to the south was soon redeveloped (see below).

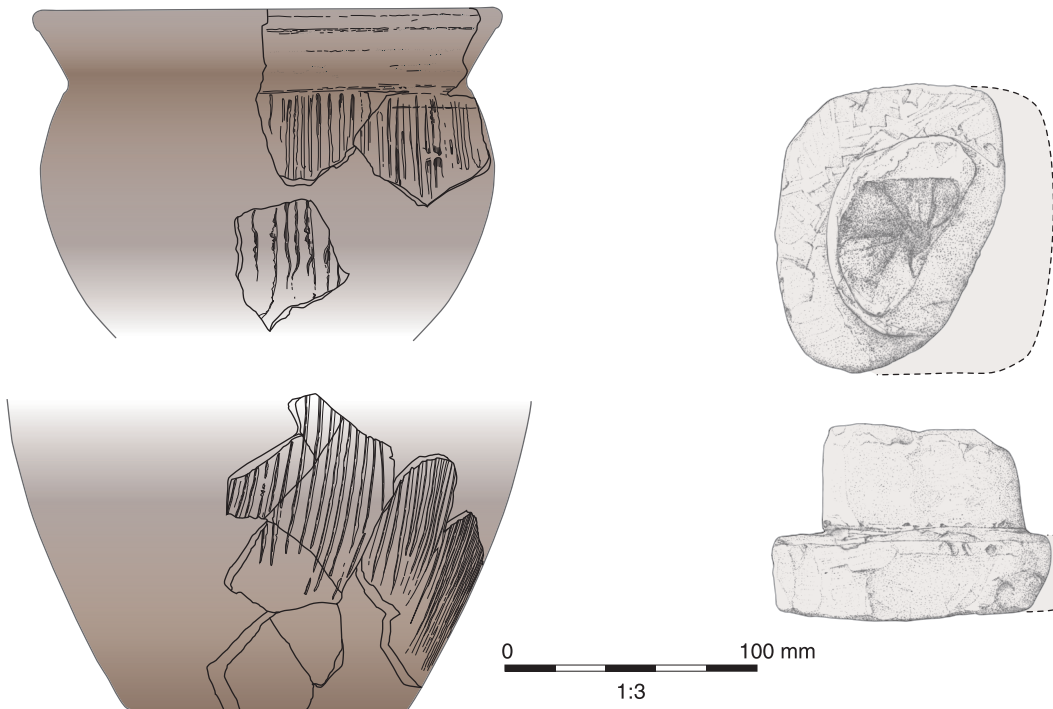
*The first timber structures* (Fig. 2.4)  
(site sub-phases 2902a-d)

Soils formed or were dumped over the northernmost infilled quarry holes, and the limited remains of two timber structures were identified cutting into them (site sub-phase 2902a – not illustrated). These were some distance apart, and no coherent building plan could be identified. Surviving elements included a beam slot (10521), and a posthole (6807). There was limited evidence for subsequent possible surfaces (chalky silt 6645 and sandy gravel 6520=6823) and a possible occupation deposit (6521). These were not associated with structural features, but do indicate further occupation activity. The use of this building was probably relatively short-lived because the area was then again overlain with deliberately dumped deposits of sand, gravel, chalk and silts, which raised the ground level in preparation for further construction work. Pit 6966 lay to the south-east of these structural remains and occupation deposits. This pit was only partly revealed but was probably at least 3 m across, 1.2 m deep, and very similar to the quarry pits (see above). Its fills contained artefacts including Roman tile, pottery, and animal bones that included sheep, goat, and cow, and a considerable quantity of charcoal. These finds are indicative of waste from domestic activity, and suggest that the associated structure to the north was probably a dwelling. It is probable that this was originally a quarry pit, which was left open and re-used as a convenient rubbish pit initially during the occupation of the structure described above and probably also during the life of the building that replaced it, described below (sub-phase 2902b).

A second earthfast structure was constructed on top of these dumps (site sub-phase 2902b) although only a very small area of the surviving remains could be excavated (Fig 2.4). Two partially revealed surfaces were seen, one of gravel (6896=6881) and one of a chalky mortar (6961=6897). There was a clear boundary between the two, on the line of which was posthole 6958; a possible internal division was indicated by a nearby posthole 6960 within floor 6961. This division was later replaced by a timber beam represented by beamslot 6975. It is probable that these were surfaces within a structure for which no further evidence was revealed. Part of surface 6896 was heavily scorched and overlain by a deposit of ash and charcoal (6882) which had resulted from *in situ* burning, and was probably a hearth. Within 6882 was a clear circular indentation that showed the position of an object – perhaps a

Fig. 2.4 (opposite) Site 29: plan showing occupation activity with contemporary ceramic cooking vessels and stone lamp (St. 815) below (Project Phase 2)







*Plate 2.2 Site 29: circular indentation in hearth 6882 where a large cooking vessel had stood (Project Phase 2)*

ceramic vessel (Plate 2.2). A large quantity of pottery was recovered from the occupation layer that surrounded the hearth (6883=6806=6992). Many pieces fitted together to form the rim and upper body and the base and lower body of two large jars. Both were made in the local fine sandy ware tradition (F1) and had deposits of soot on their outer surfaces, and either of them could have been the vessel that occupied the void in the hearth. A short distance from the hearth was a further scorched area, in the centre of which was part of a stone lamp (ST. 815; Fig. 2.4). This type of lamp is considered rare and is a relatively high status object (Shaffrey, Chapter 9). Two fragments of re-used Roman tegula (roofing tile) were also recovered from the occupation layers.

This evidence seems to represent a glimpse of life within a short-lived timber domestic dwelling. The hearth was probably used for cooking and heating; the fire on this hearth, combined with the stone lamp, would also have lit the structure. It would appear that this structure was abandoned, and given the evidence described above, this probably happened rather quickly, and potentially unexpectedly, perhaps because of an accidental fire caused by the stone lamp.

Once the building was abandoned the area may not have been immediately redeveloped. A series of silt and loam rich soils up to 0.20 m deep either formed, or were dumped, over the general area of the burnt-out building (site sub-phase 2902c; contexts 6509/6824, 6952, and 6955). This suggests the area

went through a period of time during which it was devoid of structures, although some form of activity may have continued, as it remains a possibility that these soils were cultivated. Pottery with a date range starting from the end of the 11th century was recovered from these deposits. Two pits (site sub-phase 2902d: contexts 6876 and 6904) cut these abandonment/cultivation layers. The fills of these pits were not fully excavated and although they yielded a limited amount of pot and bone their function was unclear. They do however confirm that limited activity was taking place on the site before a further building was constructed in the following phase.

***Building 5830: a major timber-framed building***  
(Fig. 2.5)  
(site sub-phases 2903a-d)

A number of structural elements for an extensive earthfast timber-framed building (site sub-phase 2903a, Building 5830) were identified in a series of sondages excavated across the area north of the Holy Brook (Fig. 2.5: Plate 2.3). The building was up to 12.5 m long and 9 m wide, enclosing an internal space of 112.5 m<sup>2</sup>. Its long axis was orientated parallel to the later lane on the west side of site 29, which suggests that the lane itself may first have been laid out at this point. Surviving remains of the foundations showed that the building had been constructed using a combination of timber ground beams and vertical posts. The north wall was formed by beamslot 6465; the east wall comprised

posthole 6440 (at the north-east corner) and beam slot 6670/6666. Beam slots 6571 and 6640 formed the western extent. The south wall was not evident, although its foundations could have been the same structure of substantial flint nodules and chalk rubble that formed the lower element of the south wall of later building 5840 on the same plot (6674, part of Building 5840, see below). If this was the case it would have formed a retaining structure immediately adjacent to the Holy Brook.

Stakeholes and beamslot alignments (6518 and 6742) within the floor surface suggest that the eastern side of the structure had been divided into three small rooms or bays. From north to south, these measured 2.0 by 4.5 m; 2.5 by 3 m; and 2.5 by over 4.0 m respectively. It is possible that the western side of the structure was a single space, although the area excavated was limited and any internal divisions could easily have been missed. Compacted chalk and mortar surfaces 6501 = 6770 measuring



Fig. 2.5 Site 29: plan of Building 5830 (Project Phase 2)



Plate 2.3 Site 29: view looking NE of partially revealed internal floor 6501 with hearth within Building 5830 (Project Phase 2)

between 0.04-0.08 m thick were noted throughout the internal area of the building, including the rooms/bays. A discrete scorched area, representing the position of a hearth, was located centrally in the southern half of the main internal space. To the south of this hearth, within an area where the floor surface became markedly rougher and more worn, was structure 6878. This was roughly oval in plan and comprised chalk lumps and flint nodules, a single course high, enclosing an area of 1 x 0.55 m. The stones had been scorched by fire suggesting the structure was a deliberately constructed hearth or small scale working hearth/furnace. Deposits within the structure had a rusty hue, perhaps representing iron-working activity.

To the rear (east) of the building the earlier abandonment deposits were sealed below a compacted gravel yard surface (6565 and 6465). A thin layer of silty sand (6993) that overlay this surface has been interpreted as an occupation layer, although it yielded no finds. The eastern extent of this yard was defined by a shallow linear feature 6657, a ditch or gully that may have marked a property boundary.

Evidence was recovered for the maintenance and repair of both internal and external surfaces. A series of intercutting postholes may have functioned as structural roof support posts, centrally placed close to the southern gable end of Building 5830. This indicates a potential weakness in this part of the structure, perhaps due to subsidence into earlier features and the soft, waterlogged conditions of the

underlying ground. The absence of other posts along the central spine of the structure is probably due to the limited nature of the excavation, as the roof in a building with a span of 9 m would surely have required such support. Very little occupation evidence was recovered suggesting the floors would have been kept clean. The function of the building therefore remains unclear although the presence of a possible metalworking hearth indicates that it may have had a mixed use with an element of craft production.

Like its predecessor, Building 5830 was probably destroyed by fire (site sub-phase 2903c). Beamslot 6670 contained a burnt timber *in situ*, and beam slot 6571 contained a thin charcoal layer. Fill 6519, of beamslot 6518, contained fragments of charcoal that suggest the beam was burnt *in situ*. Floor 6501 was covered by layers containing large amounts of charcoal, and a significant number of iron nails perhaps used in the building's construction (layers 6500 and 6507 respectively). However, although there was a high percentage of charcoal concentrated within the beamslots and over the floor, there was no evidence of significant quantities of burnt daub, which can be expected from a structure of this period that had burnt down. The absence of this type of deposit suggests that the area had been at least partly cleared prior to the next phase of activity.

The charcoal rich layer 6500 was sealed by a series of loamy soils which together measured up to 0.26m thick (site sub-phase 2903d: contexts 6444,

6095, 6353, 6591, 6623 and 6826). It is probable that these layers represent a period of abandonment but the soils could have been cultivated.

*The first stone buildings* (Fig. 2.6)  
(site sub-phases 2904a-b)

This phase is characterised by a change from timber to flint nodules and chalk lumps for building construction. The buildings continue to front onto the lane to the west of site 29, and possibly for the first time there is evidence for distinct property divisions, orientated east-west, running at right-angles to the lane and parallel to the line of the Holy Brook to the south.

Immediately to the east of the lane were the remains of a rectangular building, Building 5820 (site sub-phase 2904a), that had been constructed on the abandonment/cultivation layers of the previous phase (Fig. 2.6). Its southern wall (6219) was built of chalk with a dressed flint external face. This also acted to retain a raised construction platform to the north, which was formed from dumps of chalk rubble, 6441 and general trample 6388. The eastern or back wall was formed by two beam slots 6224 and 6012 (with postholes set into the base of their cuts), the gap between these indicating the position of a rear, east-facing entrance. The north wall lay outside the excavated area, and the west wall was removed by later rebuilding. The interior probably measured *c* 4.0 by over 7.2 m long, and as no internal divisions were observed, it is considered to

have been a single-roomed building. Two successive internal floors were identified. The first (6387) consisted of rammed gravel, overlain by 6386, a silty occupation layer. The second (6136) was made of rammed chalk, and was also overlain by occupation deposits (5977, 6128, and 6093). These were rich in charcoal, which was more concentrated in the north of the building especially above a heavily fire-scorched part of the floor that indicated the position of an internal hearth (Plate 2.4). Identifiable bones from pig, cattle, sheep and goats, hare, partridge, duck and others from unidentifiable domestic fowl and other birds were retrieved from occupation layer 5977. This is an exceptional range of bone to find in a deposit of this nature, and it seems very likely that this building was a kitchen, perhaps for Building 5840 to the south (see below).

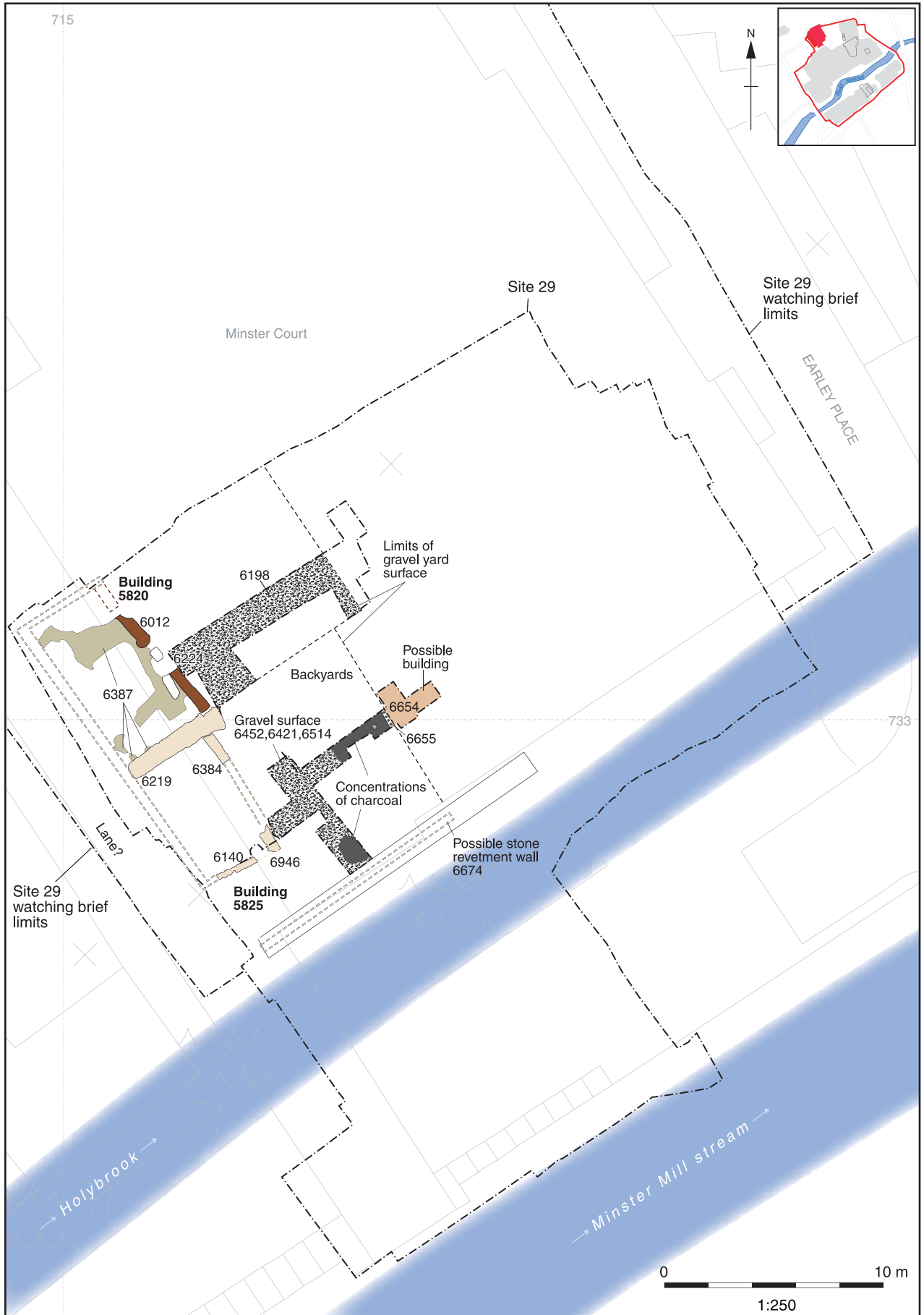
To the east of this structure was an extensive metallised gravel yard (6198) covering an area of at least 8.25 x 5.2 m. The south-eastern edge of the yard surface coincided with the alignment of the south wall of the building itself (6219). Pottery dated the building's construction and occupation to the late 11th- to early 12th century.

*Construction of Building 5825 and development of Building 5820*

Development extended southwards down the lane on the western side of site 29 with the construction of Building 5825 (Fig. 2.6) immediately south-east of Building 5820, which remained in use (site sub-



Plate 2.4 Site 29: view looking SW of the heavily fire-scorched hearth area within Building 5820 (Project Phase 2)



phase 2904b). The southern and eastern walls (6140, 6384/6496 respectively) were built using chalk. The east wall was keyed into the south wall of Building 5820. Unlike its earlier neighbour to the north there is no evidence of ground raising from dumps of rubble prior to construction, the walls having been constructed immediately on top of the abandonment/destruction deposits from Building 5830 (see above). The interior of Building 5825 measured 5.75 by *c* 3 m, and again the lack of internal divisions suggests this structure consisted of a single room. Minimal evidence for internal flooring and occupation was recovered.

Deposits of sandy gravel up to 0.12 m thick to the east/rear of Building 5825 probably formed a back yard area covering an area of 7.5 x 6 m (contexts 6452, 6421, and 6514). Charcoal-rich deposits were found on the eastern (6659; 6664) and southern areas of the yard (6351), which probably represented the debris from activities carried out there. The east edge of the yard seems to have been marked by a wattle fence (6655), or possibly a wattle-built wall of another building further east. This had burnt down. The evidence for this comprised a 0.25 m-wide strip of brickearth within which were a series of regularly spaced concentrations of charcoal. To the east of this was a chalky/sandy surface 6654, which was not investigated further than the limited sondages shown on Figure 2.6.

### Project Phase 3: mid 12th to mid 13th century (site sub-phases 2905a-b; 15002c)

#### *A new stone building, 5840, and associated features* (Fig. 2.7)

Stone and timber structure Building 5820, which had been in use from the first half of the 12th century (see above) appears to have remained in use for at least some of this phase probably going out of use towards the later part. To the south, Building 5825 either collapsed, or more likely was deliberately demolished. Some of the resulting debris of chalk pieces and chalk dust was left *in situ*, presumably to help prepare the ground for subsequent construction work. The new development was on an unprecedented scale with the construction of Building 5840, a significant stone house (Fig 2.7; Plate 2.5). This structure was rectangular in plan and measured 8.4 x 15.8 m externally, enclosing an internal space of 6.5 x 13.7 m, an area of 89 m<sup>2</sup>. The long axis of this building was parallel with the Holy Brook, which flowed against its southern wall.

The foundations for the building were substantial and constructed in two distinct ways. Those immediately adjacent to the Holy Brook consisted of very large flint nodules overlain with chalk rubble, and the south-eastern elevation, which was exposed to flowing water, was faced in dressed flint.



Plate 2.5 Site 29: view looking S with Building 5840 in the mid-ground and the Holy Brook in the background

Fig. 2.6 (opposite) Site 29: plan of Buildings 5820 and 5825 (Project Phase 2)

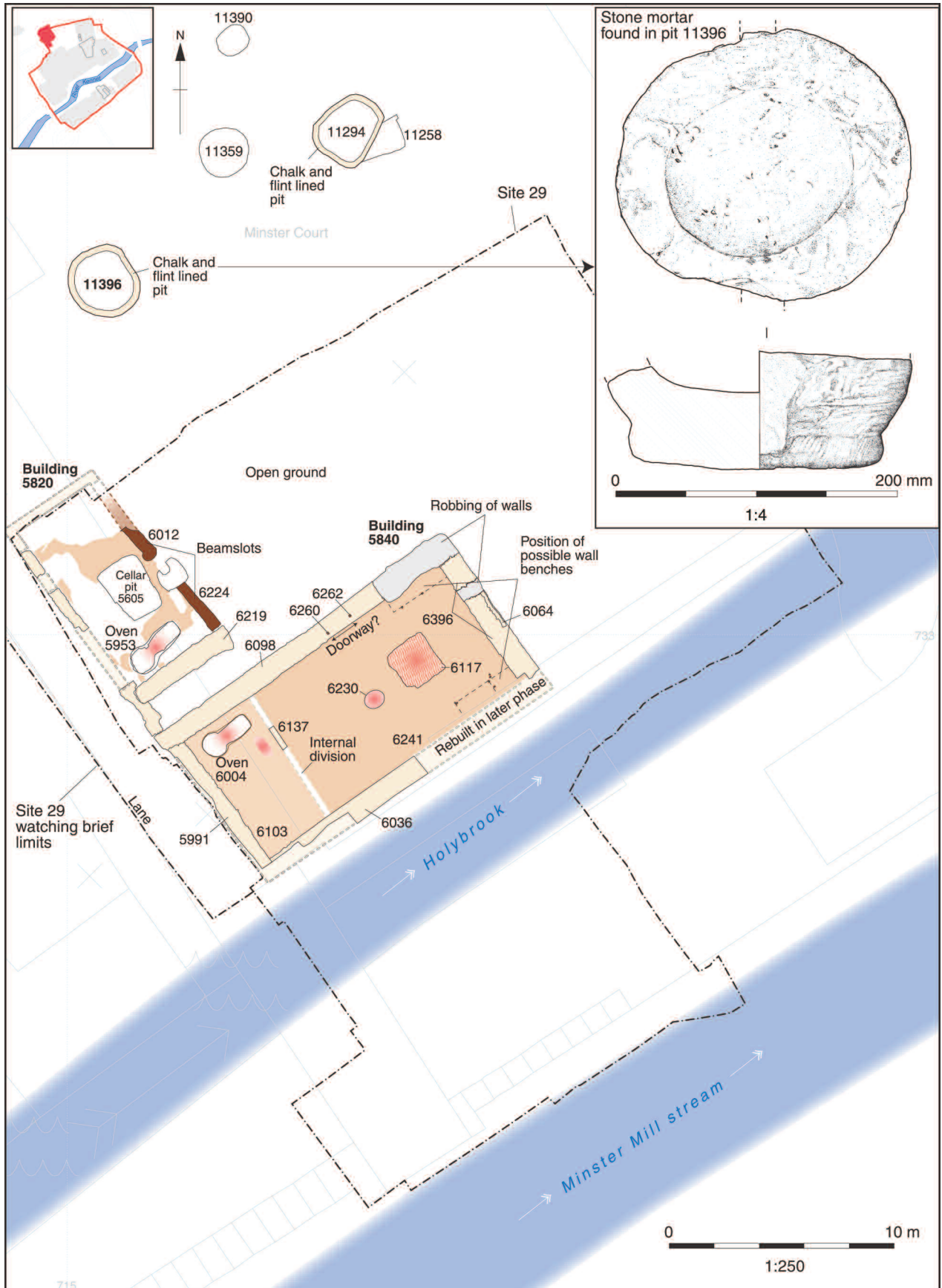


Fig. 2.7 Site 29: plan of Buildings 5820 and 5840 and cess pits (Project Phase 3)



(As discussed above, this wall may have re-used elements of an earlier retaining wall 5743 associated with Building 5830 or 5825.) The foundations for the remaining three sides were laid in large vertically-sided trenches, measuring 1.2-1.4 m wide and up to 1.5 m deep. These foundations, which were dug into solid but soft and waterlogged ground, were not exposed to flowing water, and consisted of alternating layers of rammed chalk and gravel (up to 0.10 m thick) (Plate 2.6). Once the foundations were established the footings were laid. Those for the northern wall (6098) were constructed first, then the height of the internal area of the building was raised and levelled with chalk-rich dumps, before the remainder of the footings for the east and west gable end walls (5991 and 6396 respectively) were built. The footings measured *c* 1.2 m wide, and the overlying walls consistently measured *c* 1.0 m wide. Larger, roughly-dressed chalk lumps were used to form both faces of the footings, which had a chalk rubble core. Dressed flint nodules were used for the external face from the contemporary ground level upwards. A sandy lime mortar bonded all the stone elements. Within the southern wall there were a number of circular postholes, which may represent the position of temporary scaffolding during construction or during the later rebuild. Located within the northern wall were two square postholes (6260 and 6262), 1.15 m apart, which may indicate the position of a doorway. No other evidence for

entrances was found, due to the later removal of much of the walls below the level of the thresholds.

Within the building a number of the initial floor surfaces of rammed mortar and chalk had survived. Chalk-rich floor surface 6297 = 6291 = 6303 was scorched indicating the position of a floor-set hearth in the eastern side of the building (this was later replaced, see below). Within this surface were two groups of stakeholes, suggesting some form of division or structure, possibly side-benches against the walls, in the south-east and north-east corners. Silty occupation layers 6296 and 6298 remained *in situ* under the locations of the suggested benches. The primary floor was heavily eroded, and had been replaced by floor 6241, which sealed the stakeholes and was significantly thicker, and made of sandy lime mortar. A small shallow depression (6230) was cut into this floor; its sides and base had been affected by temperatures high enough to have vitrified the sand content of some of the surrounding deposits, but its function is unknown. In the north-west corner of the building the high mortar content of floor 6241 gave way to a more chalky area of the surface, 6108. This change in flooring material coincided with a 1.2 m length of chalk rubble wall (6137). On the western side of this wall the floor surface was scorched, indicating the position of a hearth. Together this evidence suggests the presence of an internal division at the western end of the building, perhaps separating a larger



Plate 2.6 Site 29: view looking N showing detail of the foundations and footings at the south-east corner of Building 5840 (Project Phase 3)



Plate 2.7 Site 29: view looking N of partially excavated stone-lined cess pit 11294 located on Fig. 2.7 (Project Phase 3)

living space to the east from a smaller area with a different function, perhaps a kitchen to the west. Further occupation deposits (6240, Sample 1078; and 6383) overlay this floor; these were high in charcoal content that probably derived from the use of the hearth.

This sequence of floors and overlying occupation deposits contained a very limited number of finds, mainly small fragments of pottery (in fabrics F1, F2, F361, F358, see Chapter 7) indicating that the internal space was kept clean. The pottery from these deposits and from the backfilled construction trenches suggests a date for the construction and initial use of this building no earlier than the middle of the 12th century.

Evidence for activity in other areas of the site was limited to the construction of substantial stone-lined cess pits Group 11294 (Plate 2.7) and 11396 to the north of Building 5840. The pit shafts were 2 and 2.5 m in diameter respectively. The walls were founded on the undulating contour of the chalk bedrock (created by the quarrying activity in Project Phase 2, see above), and therefore acted to retain the softer ground above this level. They were constructed using chalk rubble and flint nodules bonded with lime mortar. Of special note within pit wall 11396 was a large fragment of a stone mortar from a pestle and mortar set (Fig. 2.7). The pits were positioned some 20 m south of Minster Street, to the rear of the second gravel terrace, adjacent to the break of slope, and the northernmost limit of the earlier quarrying activity. This location was probably to the rear of

properties orientated north-south that had frontages at right-angles to Minster Street. These new pits possibly replaced the latrine pits adjacent to Minster Street and may indicate that redevelopment was taking place on the street frontage.

#### *Later development of Building 5840*

Some time after construction of Building 5840 and the initial occupation sequence, described above, a purpose built rectangular hearth, 6117, replaced the original hearth in the same location. This structure was made from flat roof pegtiles set on edge within a cut that measured 1.9 x 2.0 m (Plate 2.8). It was positioned equidistant from the north and south walls, towards the east end of the building. Vince suggests (Chapter 8, below) that this hearth could have provided light and heat within the building rather than being used for cooking purposes. Again this adds weight to the argument that the larger eastern part of the building was partitioned off in some way, and served as a living area, with the kitchen to the west. The hearth showed signs of heavy use, with damage to the tiles concentrated towards its centre. There was no evidence for any superstructure such as a smoke hood, and the smoke would have been allowed to rise into the roof space, indicating that at least in part of the east end of the building there was no second floor.

Both buildings on the site (Building 5840 and the earlier Building 5820) were modified by the construction of semi-sunken keyhole shaped 'oven'



Plate 2.8 Site 29: detail of central hearth 6117 from Building 5840: (above) looking SW before excavation and (below) looking NW after partial excavation (Project Phase 3)





*Plate 2.9 Site 29: details of oven construction: (left) looking NE showing oven 6004 in Building 5840 and (below) looking N showing oven 5953 in Building 5820 (Project*



structures. The two structures (Plate 2.9), 6004 within Building 5840 and 5953 within Building 5820, were very similar in size, form, orientation, and construction technique and materials. Their position within each building was also similar, both neatly positioned within the corners. Only the structural elements that were below the contemporary ground level survived. The initial construction cuts were keyhole shaped and *c.* 0.60 m deep. At the south-western end of each were sub-circular firing chambers that measured *c.* 1.1 m in diameter at ground level narrowing to *c.* 0.70 m at the base. These were joined to rectilinear intake flues, both *c.* 1.2 m long and 0.75 m wide, which ran to the north-east. Spanning the entrance to both fire chambers from their respective intake flues were arches constructed solely of ceramic roofing pegtiles (see Vince, Chapter 8). The sides or lining of both the firing chamber and intake flue for each structure were built from different materials. In Structure 5953 they were completely lined with roughly hewn chalk lumps and flint nodules bonded with sandy lime mortar, forming a wall. In Structure 6004 only a layer of sandy lime mortar remained, with a single re-used Roman brick adhering to the east of the arch, suggesting the flue and fire chamber had originally been completely lined with this material. Although much of the original lining in structure 6004 had been removed, evidence remained for heat scorching on the tile arch, floor and sides of the sub-circular fire chamber, although this was limited probably due to the original presence of a brick lining. In Structure 5953 flints within the walling of the fire chamber, the lower courses of the tile arch, and the flooring all showed signs of the effects of heat. Overlying the floors of the intake flues were charcoal-rich deposits that probably derived from *in situ* fires (6004 = 6193).

The similarities between these structures indicate that they were probably contemporary and integral to life within these buildings and probably served a domestic function, such as baking/cooking ovens. Structure 6004 was inserted into an area that was partitioned from the rest of the internal space of Building 5840, a possible separate kitchen area, and probably replaced the cruder hearth from the previous phase. Within Building 5820 the addition of the oven seems to have occurred at the same time as the construction of a small cellar 5605 (seen cutting the earlier occupation layers within Building 5820 on Plate 2.4). The cellar was located towards the centre of the rear wall of the building, and consisted of a vertically-sided rectangular pit measuring 3 x 1.9 m, and 1.05 m deep. The sides and floor of the pit were probably constructed in timber, which had decayed to form rich silts against the sides of the cut. The cellar probably functioned as a cool storage space, although no archaeological evidence was retrieved to suggest what had been stored.

The possibility remains that the oven structures discussed above were contemporary with the expansion of Building 5840 seen in the following

phase, and may have acted as temporary lime burning kilns, where limestone or more probably chalk would be heated to temperatures above 900° C to form quicklime. However the position of these structures within the buildings seems an unlikely location for such an activity when there was a large open space to the north and east of these structures that would have more suitable.

#### Project Phase 4: mid 13th to late 14th century

##### *The development of a new large hall and associated features, AD 1271+ (Fig. 2.8) (site sub-phase 2905c)*

Building 5820 did not remain in use in this phase, having gone out of use probably towards the very end of Project Phase 3. The cellar pit (5605) in Building 5820 was finally infilled with deposits suggesting a rapid large scale dumping episode during a period of demolition and contained building material fragments such as ceramic roof-tile, flints, and chalk lumps. There was a limited amount of pottery from this infill, of which the latest date range was 1250-1350. This was also the case for oven 5953. Oven 6004 has a slightly later range of 1250-1450 for the latest pottery and therefore could have gone out of use at a later date. One other find of note came from these fills: a metal octofoil mount that would have decorated a shoe or perhaps a horse fitting; these first appeared in the 13th century but proliferated in the 14th and 15th centuries (Fig. 5.33 No. 9).

The next phase of activity saw a major redevelopment and extension of Building 5840, to form Building 5860 which more than doubled the internal floor area of its predecessor (Fig. 2.8 and Plate 2.10). A series of precise felling dates were obtained on timbers from a channel revetment and a series of piles underlying the south wall of this building, dating the start of the redevelopment to the period *c.* 1271 (see Chapter 11; Table 11.7). This change commenced with the construction of the well-built timber revetment, Structure 5422 (Plate 2.11), along the north bank of the Holy Brook. It consisted of a substantial horizontal timber baseplate into which were tenoned vertical uprights that retained a wall of horizontally edge-lain timber planks. The baseplate (sample 5423) was sampled for dendro-chronology and gave a precise felling date of the winter of 1268/9. The revetment served to separate and protect the stone south wall of Building 5840 from the flowing water of the stream. The failure to do this originally may have led to the need to rebuild it in this phase. The area between the stone wall and the revetment was filled in, and provided a base for a level platform which served as a walkway, and possibly even as a jetty or 'wharf', alongside the building.

Building 5860 was formed by the expansion of Building 5840 to the north and east. The southern wall of Building 5820 (wall 6219) was used to form

the west end of the new north wall of Building 5860. The eastern length of the north wall was newly built (5778), and abutted the eastern end of wall 6219. The point at which this wall returned to the south was particularly interesting; the north-eastern corner was canted at 45 degrees, before meeting a

projecting return. The northern and eastern wall foundations (much of which had at a later stage been robbed) measured 1 m wide and were made up of chalk and flint nodule rubble laid in rough courses within large construction trenches up to 1.8 m deep (Plate 2.12).

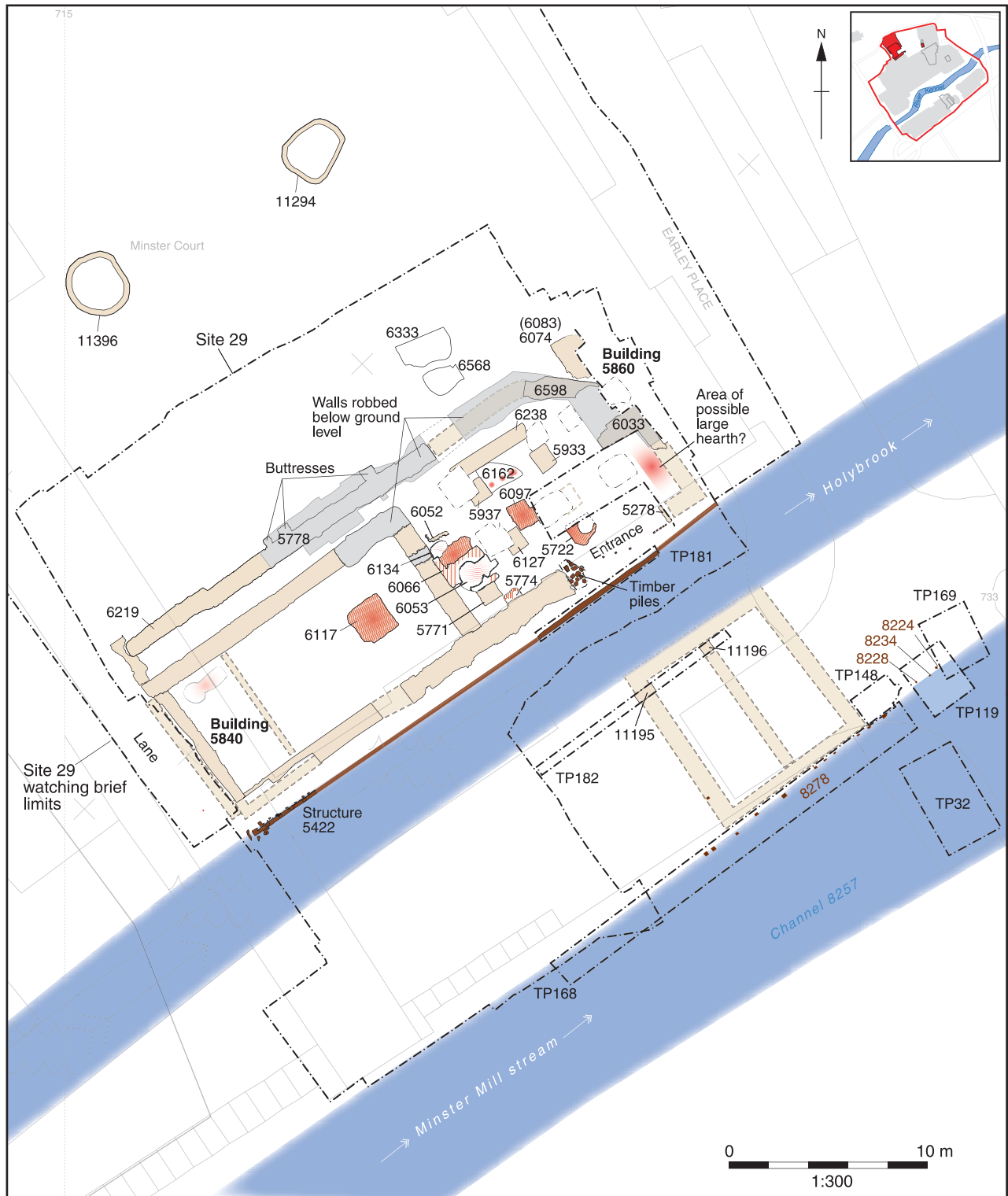


Fig. 2.8 Site 29: plan of Building 5860 (Project Phase 4)



Plate 2.10 Site 29: view looking SW showing Building 5860 (highlighted, along with Building 5840) (Project Phase 4). It is interesting to note that the northern wall of this building (partially robbed) is on the same alignment as the boundary between the two standing buildings immediately beyond the site



Plate 2.11 Site 29: view looking N showing detail of timber revetment, Structure 5422, running between the Holy Brook and Building 5860 (Project Phase 4). The baseplate was tree-ring dated to the winter of AD 1268–9



*Plate 2.12 Site 29: Building 5860: view looking NW showing the substantial and partially robbed foundations of the buttressed north wall 5778 (Project Phase 4)*

The southern wall had two distinct elements; firstly the rebuilding of part of the original southern wall of Building 5840, and secondly the extension of this wall eastwards. A substantial part of the southern wall to Building 5840 was rebuilt. The rebuilding involved removing some elements of the original foundation and shoring the remaining foundation stones with timber piles driven along the outer edge of the wall. The new foundation stonework, where it overlay the retained elements of the old, used a chalk rubble core with a dressed flint nodule southern face. The extension of this wall beyond the south-east corner of Building 5840 had a rather different foundation design more suited to the softer ground immediately adjacent to the Holy Brook. Vertical oak piles had been driven into the silts at the base of the construction trench (Plate 2.13). The piles acted to form a stable foundation

upon which the chalk rubble foundations and the overlying wall rested. Of note within the structure of the above-ground element of this wall (5743) was the use of flat ceramic roofing tile, not set horizontally to level a stone course, but paired and at angles to each other, serving perhaps as an additional strengthening device (Plate 2.14). A fragment of 12th-century hoodmould that may have come from the demolished wall of Building 5840 was recovered from this wall and its significance is discussed further below (Chapter 6; Preston, Chapter 8, Stone Type No. 10). Within the southern elevation of Building 5860 was a gap 5.7 m wide, where the stone foundations were absent. Further timber piles (Group 11224) had been positioned within this gap between the two wall ends, and dendrochronological dating showed these to have been contemporary with the other piles. These piles were sawn off at a higher level than





Plate 2.13 Site 29: view looking SE showing timber foundation piles underlying the footings of the southern wall of Building 5860 (Project Phase 4). The piles were tree-ring dated to the period AD 1267-71



Plate 2.14 Site 29: view looking SW showing the unusual method of setting stones and tiles on the diagonal in the footings of the southern wall of Building 5860 (Project Phase 4)

those in the foundation trenches suggesting that although there was no wall foundation to support at this point they were needed possibly to stabilise the ground or support some form of superstructure. A total of 13 dendrochronological samples from piles gave felling dates ranging from the winter of 1267/8 to the winter of 1270/71 (see Chapter 11; Table 11.7). On the southern side of the Holy Brook immediately opposite the gap in the south wall foundations, were two parallel chalk rubble foundations (11195 and 11196) that also rested upon timber piles. These were parallel and *c* 3 m apart orientated SE-NW. Only very short elements of these walls were observed and no northern or southern walls or floor surfaces were excavated.

The western part of a probable slaking pit (6568) was revealed, much of which had been destroyed by later activity. The pit was set into the ground, with straight, vertical sides that had been lined with roughly hewn chalk lump walls bonded with clay. A deposit of hardened lime, up to 0.17 m thick, lined the base and extended more thinly up the inside of the chalk walls. The floor of the pit narrowed to the east before extending beyond the site limits; at this narrow point were two opposing stakeholes, which were probably part of a timber superstructure. The structure had a specialised function, but the lack of evidence for scorching excludes the use of fire.

#### *The form and function of Building 5860*

In its finished form the maximum external dimensions of Building 5860 measured 29 x 11 m (Fig. 2.8). It is considered that the majority of the former walls to Building 5840 were retained. Therefore the extensions created a 16 m long passage along the north of the building. This led to a large roughly square internal space (measuring 8 x 10 m internally) with an angled north-east corner, a projecting return that enclosed an additional area of 4 x 1 m at the eastern end, and a large opening in the southern wall. This new internal space contained three 1 m square chalk and flint-nodule foundations (5933, 5937 and 6127; the fourth lay outside the excavated area); these were for vertical columns, probably of timber, but possibly stone, to support the roof.

Not all of the internal space was investigated, as some of it lay outside the excavation area and approximately 20% had been destroyed by large 20th-century concrete foundations (see Project Phase 10, below).

Most notable within this space was the variety of different firing structures and surfaces, and the charcoal rich deposits that were seen in association with them. Abutting the eastern side of wall 6396 (the east wall of Building 5840) was a large circular hearth with a linear stoke hole to the north-east, structure 6053 (Plate 2.15 i). The floor (6067) of this structure was of pitched tile. The firing area and stokehole were defined by walls, constructed using a significant amount of re-used Roman bricks (see Chapter 8, CD Rom), which survived to a height of *c* 0.3 m. Possibly associated with activities taking

place at this circular hearth and located to the south of it in the south-west corner of the extension were two incomplete raised 'working surfaces'. An area measuring 1.0 x 0.8 m, of small compacted stones (5771), abutted the south wall of the hearth. Immediately south of this and adjacent to wall 5743 lay 5744, a small pitched tile surface. A further small open pitched tile surface 5722, with evidence for *in situ* burning, was located immediately north of the gap in the southern wall. Immediately to the north of the circular hearth was a small pitched tile surface 6134 (Plate 2.15 ii) which showed signs of *in situ* burning; this was later enlarged (see sub-phase 2905d below). To the north and east of these abutting hearths was a substantial patch of charcoal rich material (6162) which showed three discrete patches of more intensive burning within its surface indicating three separate firing areas. Located to the north of this were the almost entirely robbed away remains of a linear flint and chalk nodule built structure, 6238. It was *c* 1 m wide and 5.3 m long, orientated NE-SW in line with (but 3 m to the east of) the northern wall of Building 5840 (6098). Its size and position suggest it is the remains of a wall/internal division (probably not standing to any great height or bearing any structural load). It may have served to extend the line of the passage into this room, the gaps at its west and east ends allowing access to different working areas within the space.

Taken together this evidence suggests that there were probably three distinct areas of activity perhaps representing different processes which involved fire, taking place in this new room. In some way, and for an unknown purpose, this building and the processes therein were linked via an opening within the southern wall to the Holy Brook and to an associated building on the opposite side of this watercourse.

A sub-rectangular pitched tile hearth (6066), also defined by low walls, was subsequently added to the northern side of the circular walled hearth structure (6052; site sub-phase 2905d). This hearth appeared to have been open to the north and incorporated an earlier small tile surface 6134. Deposits 6124 (SS 1062), 6111, and 6096 and 6058 (SS 1051) which derived from the use of this hearth were rich in charcoal. Deposit 6124 was rich in animal and fish bones, which included plaice and flounder, woodcock, domestic fowl and other unidentifiable bird bones, as well as pig, sheep/goat and cattle. Overlying this was a further deposit, 6096, within which there was a significant amount of charred grain including free threshing wheat, oats, barley and rye chaff. Other plant remains included broad beans and fig (the only likely import). The sample was dominated by weeds, some of which are typical of medieval cornfields and show that the grain was brought in from a number of different locations including areas on heavy soils as well as lighter well drained soils (Pelling Chapter 11, below).

A small and simple square shaped pitched tile firing surface 6097, which had no associated walls,



Plate 2.15 Site 29: details of hearths in the eastern end of Building 5860: (above) view looking SW showing large 'key-hole' hearth 6053 and (below) view looking SE showing rectangular hearth 6066 with earlier hearth 6134 in the immediate foreground (Project Phase 4)



was added to the structures grouped in the northern part of the extension. Deposits 5738=6100, 6099, 6125, 6150 that derived from the use of this hearth were rich in charcoal. Deposit 6125 contained charred remains of free threshing wheat, hulled barley, oats, pea/bean/vetch, hazelnut shell, and oak which was presumably the fuel wood. Deposit 6150 contained shell, free threshing wheat, barley, indeterminate grain, fodder vetch, pea/bean/vetch, hazelnuts and oak.

### **Project Phase 5: 15th century**

#### ***The abandonment of Building 5860***

(site sub-phases 2905e, 2906a-b)

The activities that took place within Building 5860 appear to have ceased, and the building went out of use (site sub-phase 2905e; not illustrated). There was no significant accumulation of deposits over the internal occupation layers, which suggests that the building did not stand empty for long before it was demolished. The entire roof and the majority of the upstanding walls were dismantled and the stone elements of the foundations were robbed away by varying degrees. The foundations for Building 5860, consisting of useful chalk and flint rubble, were more heavily robbed than the crushed chalk and gravel foundations of Building 5840. The foundations on the east side of the site were more heavily robbed (to a depth of 1 m below ground level) than those on the west. The reclaimed building materials were removed from the site for re-use, presumably elsewhere in the town. The remaining structural elements of the walls and foundations, the internal floors, the pitched tile hearths and their associated superstructures, were overlain with chalk dust, sandy lime mortar, and small chalk, ceramic tile and flint fragments (5571, 5572) resulting from this demolition and robbing activity. Context 5571 contained an off-white Flemish brick of 14th- or 15th-century date, imported from the Low Countries.

The area was not immediately redeveloped and a period of abandonment followed the demolition and robbing (site sub-phase 2906a). On the surface of this abandonment deposit there was evidence for possible occupation activity on the west side of the site. A row of postholes (5510, 5512, 5514 and 5516) was orientated NW-SE and measured 2 m in length. This probably formed part of a fence line that ran parallel with the lane to the west, and perhaps indicates that the area was once again being divided up. This activity occurred immediately prior to the extensive loams that covered the entire area in the next sub-phase.

A number of dark-brown, and greenish brown, silty clay deposits were identified across the entire area of site 29 to the north of the Holy Brook (site sub-phase 2906b). Together they covered an area of 21 x 15m and were 0.30 m in depth. The thickness and extent of these deposits, and the presence within them of significant quantities of pottery,

suggests that some of the material had been deliberately imported onto the site. These deposits had the appearance of garden soils and indicate that the area may have been used as a market garden or for penning animals during this period.

### **Project Phase 6: 16th century**

#### ***Redevelopment for a new cobbled yard and sandstone house*** (Fig. 2.9)

(site sub-phase 2907)

Following a period of abandonment and probable use for cultivation, the area of site 29 was again redeveloped, with the construction of Building 5835 and an associated cobbled yard. Dating evidence suggests this activity occurred sometime after 1500.

As in earlier phases the redevelopment of this area started adjacent to the north-south lane on the western side of the excavation where the remains of the foundations of a new structure, Building 5835 (5303 (Plate 2.16), 5183, 5494, 5294) were located (Fig 2.9). Much of this building, including the floor levels, had been destroyed by the construction of later Victorian cellars, which left only very limited elements of the foundations remaining (see Chapter 3, below). These were 0.6 m wide and characterised by the first use on the site of sandstone, which was used in combination with flint nodules. The building measured 4.25 m (SW-NE) by c 11 m (SE-NW) with the long axis parallel to, and fronting, the lane on the west side of site. Its southern wall was adjacent to the Holy Brook.

It is interesting to note that the length of this building (SE-NW) corresponds very closely to the width of the previous structure, Building 5860. This could mean that although the area had been abandoned, certain property divisions, although slightly shifted, were still relevant. The initial function and construction date of the structure are uncertain, but the western wall of the Oracle workhouse was constructed directly on top of its western wall, demonstrating that it must have been built and demolished prior to the construction of the workhouse in 1627-8.

An interesting group of features survived in the north-east part of site 29. These are interpreted as remains from a temporary builders' yard associated with the construction of Building 5835. They included an area for mixing lime-based mortar, a possible saw pit (5195) and a large rubbish pit 5049. The mortar mixing area was represented by layer 4422, an extensive layer of a hard light greyish lime mortar up to 0.20 m thick that covered over 10 square metres. This spread was limited to the west by a 2 m long alignment of four rectangular postholes (5062, 5064, 5066, and 5068), and extended 5 m to the east where it thinned out. The postholes indicated the position of a timber wall against which mortar mixing activity would have taken place.

After the sawpit and the mortar mixing area went out of use, their associated timber structures

were dismantled. The postholes and sawpit were rapidly infilled with sand deposits containing chalk flecks and tile pieces. Pit 5049, which was cut into deposit 4422 and the initial fills of 5195, was filled with more waste from the construction event. The general area was overlain and filled in fairly rapidly with deposits of silty-sand, flint and chalk nodules, presumably building materials that proved surplus to the requirements of the construction process.

Immediately to the north-west and north-east of the builders' area were the remains of a backyard represented by two discrete patches of the same small rounded stone or 'cobbled' surface, 3750=4545. In combination the area covered by these surfaces was c 16 x 12 m. A linear depression was seen that would have acted as an open drain running southwards with the slope of the surface towards the Holy Brook. The cobbled surfaces were overlain by a number of clayey-silt occupation deposits (5172, 5173, 4810, 4987) that contained a

number of sherds of imported European pottery, including maiolica, Frechen and Rouen stonewares.

*The Tannery/clothiers works, mid 16th century to 1628 (Fig. 2.10)*  
(site sub-phase 2908)

Following the construction of Building 5835, which continued in use, the area of site 29 was occupied by a tannery or clothier's works. This is suggested to have functioned from about the middle of the 16th century until just prior to the construction of the Oracle workhouse in 1628. The majority of the features belonging to this complex were recovered from the north side of the Holy Brook, although there was also limited evidence for the complex extending into the area south of the Holy Brook.

In preparation for the construction of the features associated with the tannery/clothier's works, the ground was raised and levelled with a series of dumped deposits (site sub-phase 2908a).



Fig. 2.9 Site 29: plan of Building 5835, re-building in the 16th century (Project Phase 6)



*Plate 2.16 Site 29: view looking SW showing the heavily truncated remains (4594/5303) of early 16th-century Building 5835 (Project Phase 6)*

The principal features that survived from the complex were the pits that held the wooden vessels that were set into the ground (Plate 2.17). The process of construction for these features was similar throughout all phases. Firstly, a flat-bottomed pit was dug; the base of the pit was then covered in a layer of clay upon which was set a wooden vessel, either a barrel/cask or trough. The entire outside of the vessel was then ‘puddled’ in a thick layer of the same clay, before the void between the outside of the clay proofed vessel and the construction pit was backfilled. The clay functioned as a waterproofing layer, which prevented leakage of the liquids contained within the vessels. A rough working surface of stones and broken ceramic tiles was laid around the top of each pit. It is possible that the barrels protruded, but to an unknown height, above this level.

Although initially the barrels were set one to a pit, later expansion of the complex saw more than one barrel placed in each pit (Plate 2.17i). In addition to the barrels there were a number of shallower rectangular troughs, which appear to have been set into the ground in a similar way.

In almost four centuries since this complex was in operation, the wooden barrels and troughs had decayed, and all that remained upon excavation in the majority of cases was the clay-proofing layer. This preserved the negative shape of the vessels with impressions of the ‘round-wood’ hoops that had bound the staves together, and the batten which joined the boards of the base or headpiece together, (Plate 2.17ii). In a few cases the wood had not decayed completely and elements of the boards and the batten that formed the base were well enough preserved to show the grain of the wood.



*Plate 2.17 Site 29: the dyeing/ tanning complex (Project Phase 6): (left) view looking S of the clay lining to pit 4741 with the impression of the batten that held the base together, and (below) view looking S showing the clay lining for 4735, with impressions of the wooden barrel and binding hoops that sat inside it.*



*The sequence of development and use of the tannery/clothier's works*

Evidence suggests that the operation started on a small scale (Fig. 2.10a and c; site sub-phase 2908b), with the construction of four sunken circular wooden vessels (4720, 4721, 4722, and 4726). These were set within four individual and separate pits (5128, 5115, 5055 and 5037 respectively). These vessels were in use simultaneously and were located to the north of the Holy Brook on the east side of the site, a location which allowed later expansion westwards (see below). The dating evidence indicates only that this initial activity occurred after AD 1500. The next phase of development saw a significant increase in the scale of the complex (Fig 2.10b and c; site sub-phase 2908c), which expanded westwards of the initial four vessels. These are considered to have remained operational. A large pit (5040) was excavated, within which were set eight circular vessels (4723, 4724, 4725, 4727, 4728, 4729, 5123, 4743, 4737), laid out in two rows of four on an SW–NE alignment. Vessel 5123/4743 seems subsequently to have been replaced by vessel 4730 in pit 4996. Further vessels were added immediately to the north and south of the western end of pit 5040. To the north, pit 5111 received two circular vessels (4734 and 4735), and to the south pit 5133 housed a further two (4740 and

4741). All the wooden vessels measured from 1.00-1.40 m in diameter.

Immediately to the south, and contemporary with the main sunken vessel complex, a very large pit (4817) was excavated (Plate 2.18). The pit measured 9 m long (SW–NE) by 4.8 m wide (SE–NW). Its base was lined with clay, but no trace of individual vessels was seen, suggesting that this feature remained as one large purpose-built tank. The clay sealed an isolated timber (5466), thought to be related to the modification of the Holy Brook (see below). This was submitted for dendrochronological dating, and gave a felling date range of 1526-?58 (see Chapter 11; Table 11.7).

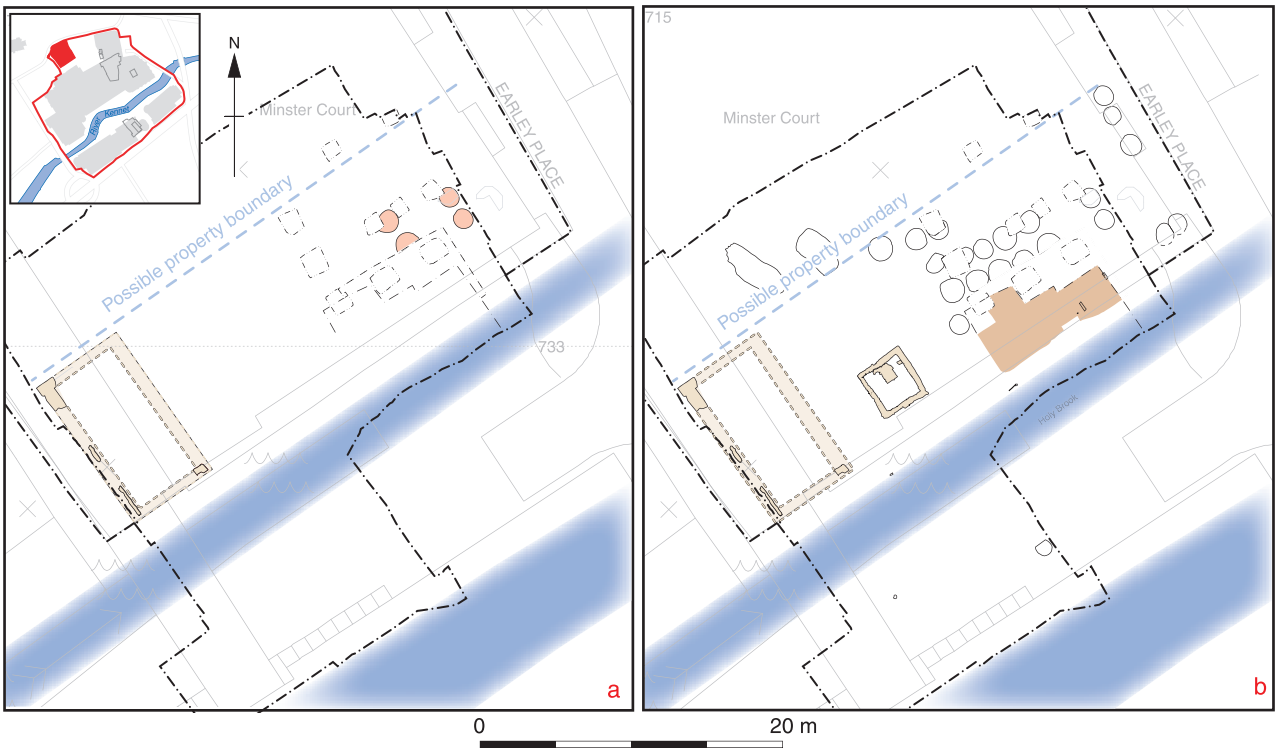
Other developments on site 29 associated with the main expansion of the industrial complex include the strengthening of the north bank of the Holy Brook, which had fallen into disrepair since the demise of Building 5860. The south-western corner of the site produced the best evidence for modifications to the channel. The evidence comprises an east-west cut, at the base of which a series of small posts retained a plank (structure 4585). Only a 9 m length of the remains of this revetment was recorded, but it probably continued further to the north-east (Fig. 2.10c). Three of the timber posts from Group 4585 were dated, and gave the following felling date ranges: Post 5348 – 1553-76;



Plate 2.18 Site 29: view looking NW of clay-lined tank 4817 (Project Phase 6)

Fig. 2.10 (opposite) Site 29: plan showing the development of the tannery/clothiers' works during the 16th and early 17th century (Project Phase 6)





1:500



Post 5349 – 1566-85; and Post 5350 – c 1566 (see Chapter 11; Table 11.7). Therefore the revetment was constructed after c 1566. This was the last in the sequence of wooden revetments before the introduction of brick wall revetments in the later phases (described below). The dating evidence from the revetment agrees with the date from isolated timber 5466 which gave a date range of AD 1526-758, and strongly suggests that the main expansion of the industrial complex occurred just after the middle of the 16th century.

A small building, Structure 5186, which formed a single nearly square room that measured 2.80 x 2.60 m internally was constructed immediately to the south-west of the main group of sunken vessels (Plate 2.19). The foundations, which consistently measured c 0.40 m wide, used a combination of flint nodules (dressed on the internal face which was roughly plastered), tile and brick fragments, bonded by a silty-clay brick-earth. The floor of the room (5311) was formed of brick-earth. A hearth platform (5309) was built within the structure, located centrally against the internal face of the north wall. The north wall immediately adjacent to the hearth was heavily scorched, presumably from a flue (SS 1013). The hearth was made from flint nodules, tile, and brick fragments bonded by brick-earth, and measured 1.2 x 0.8 m. It was heavily scorched from *in situ* burning, and overlain with deposits rich in charcoal. The building may have been a furnace house or a drying room, probably

associated with the industrial processes that took place in the sunken vessel complex.

A single sunken vat pit (Group 4927), that had been re-cut, was noted to the south of the Holy Brook. All that remained of the primary pit was part of the initial cut and part of the clay cladding. Evidence for decayed wood was evident on the clay cladding of the secondary pit. No dating evidence was recovered from the feature. A collection of horn cores was recovered from Test Pit 11 on the bank of the Minster Mill stream, some 20 m to the south.

Additions and replacements to the vats continued during the 16th century and probably the early part of the 17th century (Fig 2.10c; site sub-phase 2908d). A further 5 vats were added. Two were placed as a pair (4732, 4733) to the north of the main pit (5040). Vat 4730 replaced two earlier vats (4713 and 5123). The majority of the vats in this phase follow the original alignment. One exception was a long narrow clay-lined vat (4739), located adjacent to the furnace house or drying room, Structure 5186. The feature was orientated SE-NW and measured c 3.50 m long and c 0.40-50 m wide. The extent of the remains of the entire complex can be seen on Plate 2.20.

Eventually the vats went out of use and were backfilled (Plate 2.21) (site sub-phase 2908e). The pottery evidence can only indicate a date-range of 1500-1700, but the last possible date for the decommissioning of this complex must be 1627-8 when the Oracle workhouse is documented as having been constructed on the same site.



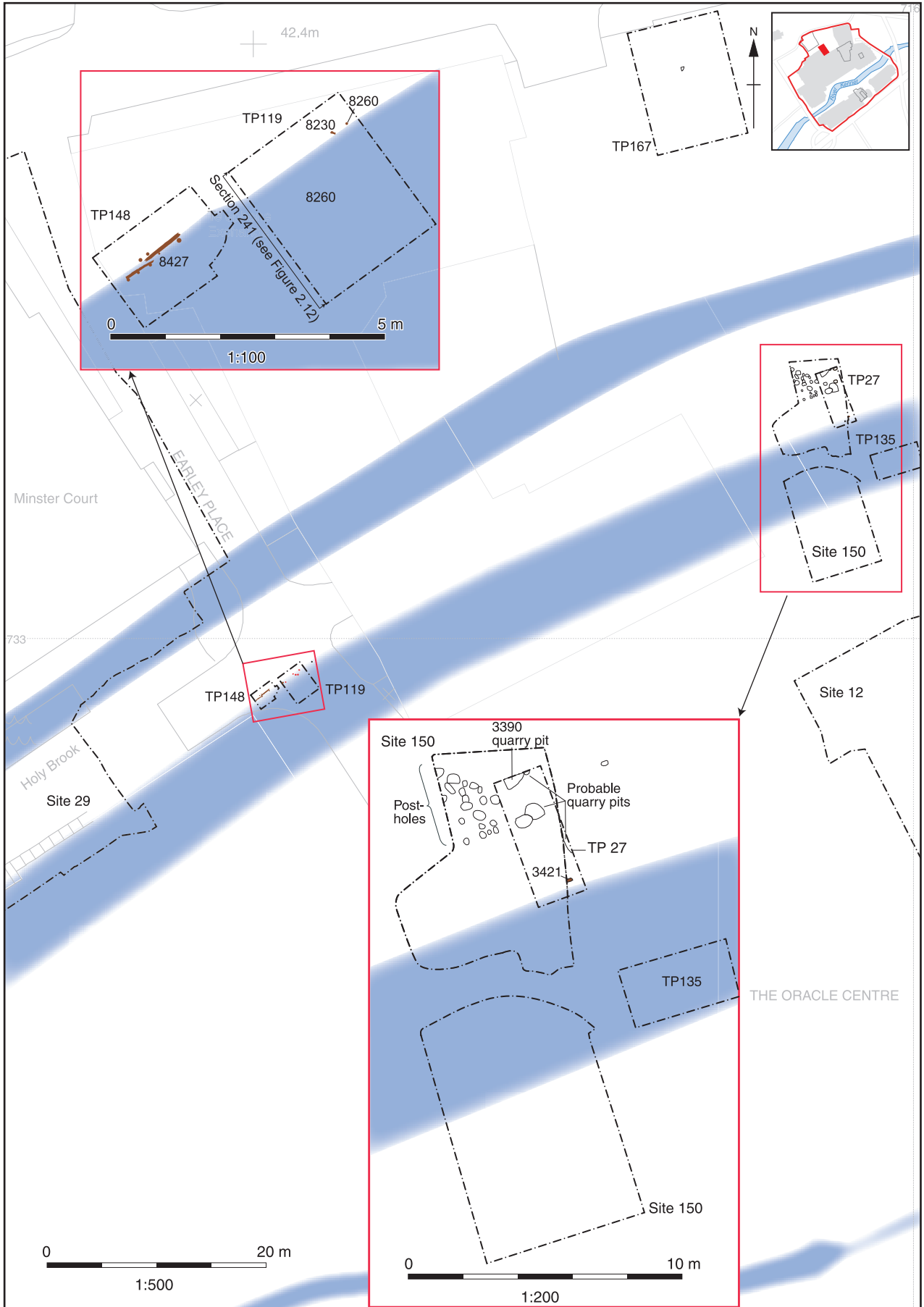
Plate 2.19 Site 29: view looking NW showing the remains of the square furnace house or drying room, structure 5186 (Project Phase 6)



Plate 2.20 Site 29: general view looking SW of the dyeing/tanning complex under excavation (Project Phase 6)



Plate 2.21 Site 29: view looking S of the 17th-century cobbled courtyard surface of the Oracle workhouse slumping into the compressed fills of a decommissioned and backfilled barrel from the tannery/dyeing complex



**SITE 150: THE MINSTER MILL**

**Project Phase 2: mid 11th to mid 12th century**

*The Minster Mill and the Minster Mill stream*  
(Figs 2.11-2.12)  
(site sub-phases 15001, 15002)

Some 15 m to the south of site 29 and the Holy Brook was a second water channel, the Minster Mill stream. The Minster Mill and its millstream were investigated in a series of trenches and test pits. These were located along the line of the stream channel (TPs 148 and 119), on the site of the mill itself (site 150 and TP27), and along a lane providing access to the mill from Minster St (TP 167) (Fig. 2.11).

The earliest evidence for the Minster Mill stream was seen in the southern area of site 150, where a series of silty deposits formed its southern bank at a height of approximately 35.1 m OD (site sub-phase 15001a; not illustrated). The earlier deposits sloped at an angle of about 5 degrees, the later deposits at about 20 degrees, and all appeared to have been dumped behind a man-made channel edging, or revetment, which had subsequently rotted away leaving a near-vertical edge. This bank was in

approximately the same location as the southern bank of the later Minster Mill Stream. Evidence for the northern bank of the channel was visible, although less clear, at the southern end of TP 27, where there were several sloping dumped deposits of gravelly loam. A single water-worn timber stake had been driven into the chalk in the same part of the trench and may be evidence for early attempts at revetment, mirroring those on the southern bank.

Evidently this early attempt at channel management had been inadequate. Several layers of alluvial material had been deposited over the chalk natural to the north of the channel, and covering the stake itself (sub-phase 15001b). This shows that the channel was flooding, and pottery from two of these layers (10230 and 10229) dates this flooding activity to the late 11th or early 12th century.

During the 12th century, the mill stream channel edges were recut and the banks were raised. The cutting of the channel was very clearly seen in TP 119 (8260; Fig. 2.12) where the cut extended into the underlying chalk (8261), and the material removed when clearing the channel was subsequently used to create the banks. This process was also observed on site 150 where a raised bank was created on the north side of the channel by the dumping of a series

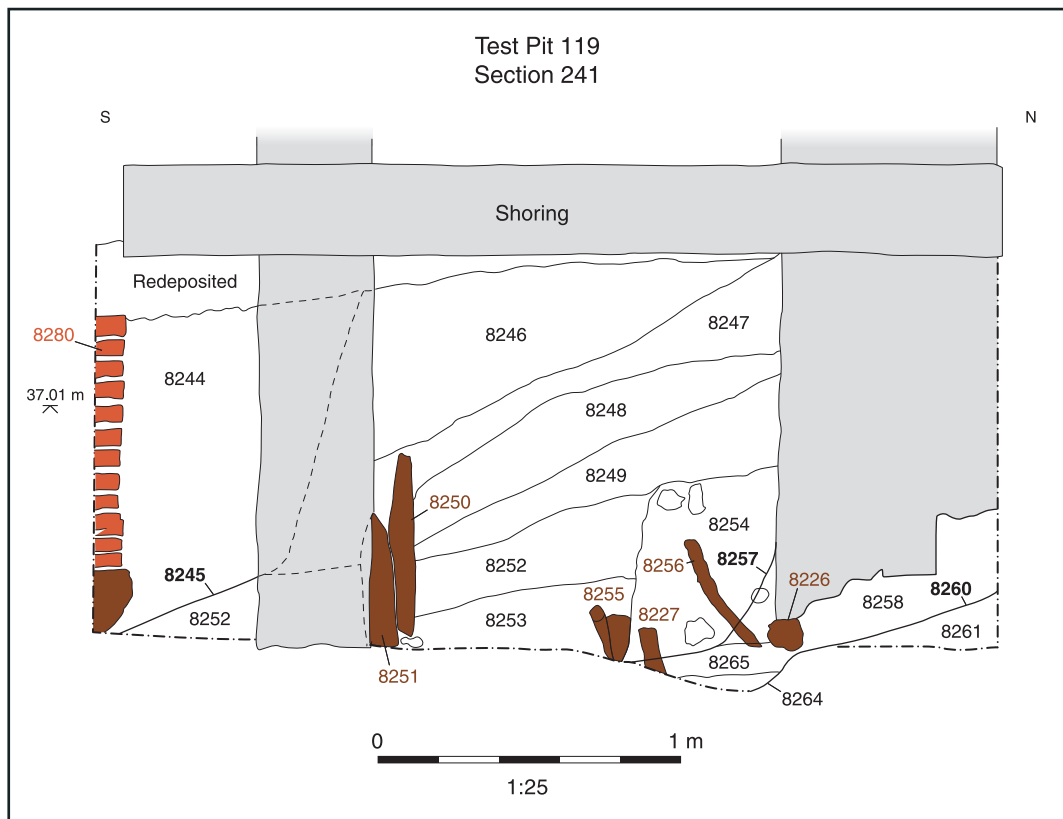


Fig. 2.12 Test Pit 119: NE facing section 241, showing the full sequence of development of the north bank of the Minster Mill Stream

Fig. 2.11 (opposite) Site 150 and other test pits: showing evidence for the Minster Mill and Minster Mill Stream (Project Phase 2)



Plate 2.22 Site 150 Test Pit 167: general view looking NE showing multiple resurfacing of the lane leading from Minster Street (left) to the Minster Mill (right) (Project Phases 2–8)

of clay and chalk deposits above the earlier flood horizons. No dating evidence was associated with the cut seen in TP 119. The new bank of the recut on site 150, however, overlay the late 11th- to early 12th-century flood deposits, and a 12th-century date is therefore considered likely for this phase of activity.

Revetments retaining the northern bank of the Minster Mill stream were identified at the extreme southern limits of site 29, and in TPs 148 and 119. A

revetment structure of which several posts and staves survived was associated with the recut northern bank of the stream in TP 119 (cut 8260; timbers 8230, 8231, 8237, 8238, 8239). In TP 148 this revetment survived in the form of two horizontally lain planks held in place by stakes and posts (Revetment Group 8427). Two packing deposits formed a bank immediately behind this revetment, one of chalk rubble (8428) and the other a silty clay

containing much chalk and gravel (8429). Similar deposits were also seen behind timber revetments at the base of the sequence at the south edge of site 29 (5107, 5108; not illustrated). In neither place was the chalk deposit dated, although in TP 119 deposits that sealed the revetment structure contained pottery manufactured from the late 11th century to the 14th century. The two sections of revetment identified on site 29 were different in construction and comprised vertical posts with angled braces (5106, 5099/5100) perhaps indicating a later construction date.

Associated with the increased millstream management was the introduction of a formalised access point to the land. At the north edge of the site, just south of Minster St (TP 167), a lane was established, leading southwards from Minster Street to provide access to the Minster Mill. The lane consisted of a compacted surface (10228) of sand, gravel and very small pieces of fired clay (possibly broken up Roman tile), that overlay the earlier possible quarry pits in this area (see description of Phase 2 for site 29) (Plate 2.22). This lane continued to be maintained and resurfaced during the 12th century. The earlier surface was replaced (site sub-phase 15002c) with one comprising compacted chalk and gravel in a sand matrix. No dating evidence was associated with this surface, but the surfaces were overlain by a layer that contained pottery of mid 13th-century or later date.

At the mill site itself (site sub-phase 15002a), five pits were cut through the earlier flood layers in TP 27. One of these was a partially revealed cut (3421) that measured 0.26+ m long x 0.38 m deep; it contained a deposit of almost pure charred grain (3418) dominated by oats and free-threshing wheat, with smaller quantities of barley and rye (see Pelling, Chapter 11; also Chapters 5 and 6). The high percentage of germinated grains suggests that the oats and barley were being used in the production of malt for brewing. In association with the pits were a number of postholes indicating the presence of structures that probably represented an early phase of the Minster Mill although they cannot be reconstructed into a coherent form. A sequence of intercutting postholes suggests that this underwent a series of repairs. Dating evidence was very scarce, although pottery of a mid 11th- to 12th-century date was recovered from one of the pits/postholes. The group was sealed by layers datable to the 13th century, suggesting that they went out of use at that time.

**Project Phase 3: mid 12th to mid 13th century and Project Phase 4: mid 13th to late 14th century**  
(site subphases 15003, 2803a)

The pits, cut features and road surfaces of the earlier 12th century remained in use through most of Project Phase 3 but were sealed by silty deposits representing their disuse, dated by pottery to the latter half of the 13th century. With the expansion

that was being experienced elsewhere onto the floodplain, a period of abandonment or disuse at Minster Mill and along the approaches to it seems unlikely; however, no observations datable to Project Phase 4 were recorded in relation to the Minster Mill Stream and mill site.

**Project Phase 5: 15th century and Project Phase 6: 16th century**

A phase of revetment of the Minster Mill stream is probably datable to the 15th century. The north bank of the channel was recut through earlier waterlogged deposits (cut 8257, Fig. 2.12; cut 5107 on site 29, not illustrated). The revetment for the recut was identified in TPs 168, 148 and 119 (see Fig. 2.8). Behind the revetment was a substantial bank (8254, Fig. 2.12) with a vertical edge that would have been flush with planks before they rotted or fell away. A similar cut was identified in section at the southern edge of site 29 and revetments had also been placed in it (5102, 5103). These could not be directly related to the cut on site but they were in similar positions and had similar material dumped behind them to form the bank. The revetment on site 29 post-dated an earlier revetment (see above), and its backfill contained pottery indicating a 15th-century or later date for this phase of revetting.

Towards the end of the 15th century the lack in maintenance of the lane leading to the site of the Minster Mill that was identified in TP 167 came to an end, and a new road surface of gravel and broken ceramic building material (8486) was laid. No activity dating to Project Phase 6 was identified.

**THE FLOODPLAIN: SITE 12 (THE YIELD HALL) AND SITE 101 (THE BACK BROOK)**

Two area excavations (sites 12 and 101) and associated test pits produced evidence for the development of low-lying land towards the centre of the floodplain, between the Minster Mill stream to the north, and the Back Brook to the south. It is likely that this area was developed from the late 12th century, following the laying out, or extension southwards, of the road later known as Yield Hall Lane. Site 12, which is considered first, was located to investigate the development of the area eventually occupied by the building that came to be known as the Yield Hall. Evidence for the management of water channels, in conjunction with land reclamation and the building of apparently industrial structures, suggests that this may have been developed as an area for crafts and trades that relied on a good water supply. Site 101 was located to investigate the development of the channel known as the Back Brook, which crossed the floodplain approximately halfway between the Minster Mill stream to the north, and the main channel of the Kennet to the south. No evidence was found for human intervention in this area in Project Phase 2 (mid 11th to mid 12th century).

**Site 12: Project Phase 3: mid 12th to mid 13th century**

*The development of Yield Hall Lane frontages: land reclamation, channel management and the establishment of a craft/industrial workshop* (Figs 2.13-2.15)

(site sub-phases 1202-3)

During the second half of the 12th century activity began to expand onto the marginal land of the valley floor. The evidence suggests there was a substantial effort to develop and exploit this boggy and floodable land, beginning with the creation (or southwards expansion) of the north-south road later known as Yield Hall Lane. The lane lay just outside the eastern limit of site 12 and was therefore not identified by excavation, but its existence at this time is implied by the construction and land reclamation taking place to either side of its line. Yield Hall Lane formed the parish boundary between the parishes of St Mary's and St Laurence's, with the Minster Mill stream forming a common boundary with St Giles's parish to the south. The laying out of the lane was followed by land reclamation, and enhancement and regularisation of the water regime was seen on site 12.

Two channels were investigated on site 12 (Fig. 2.13). The first (channel 9269) was aligned broadly north-west to south-east. The southern edge of this

channel had been strengthened by a post and plank revetment (9747), but there was no evidence for cutting of the channel edge and the northern edge was not seen. The alignment of this channel suggests that it functioned as a simple bypass or overflow for the Minster Mill, leaving the Minster Mill channel upstream of the mill and carrying surplus water away at times of high water or floods.

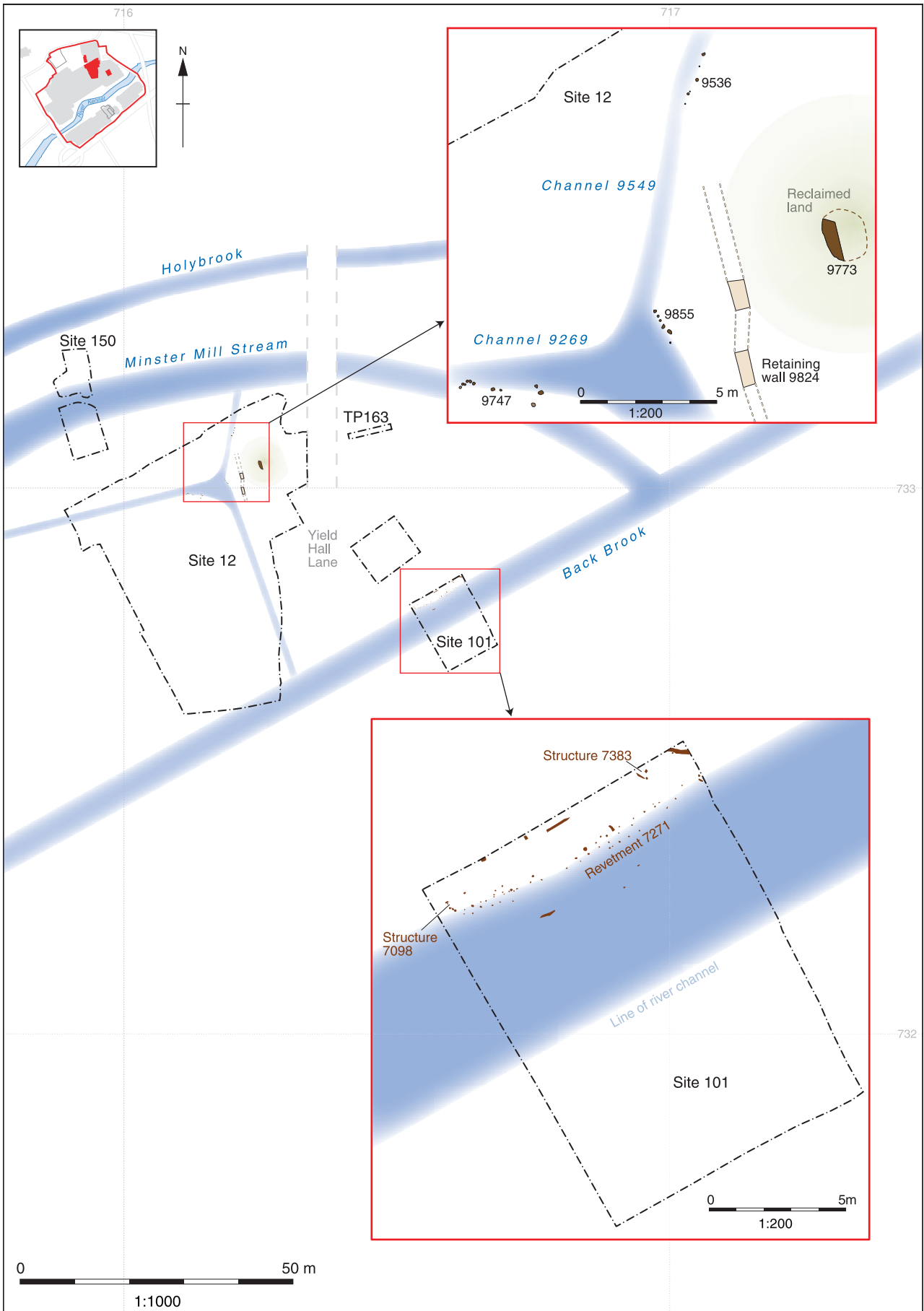
More effort was put into the creation and management of the second channel investigated (the eastern channel 9549), probably cut in the latter half of the 12th century. This was aligned north-south and appears to have been a deliberately man-made channel taking water from the Minster Mill Stream downstream of the mill. This would have ensured a more regular supply of water, and would not have interfered with the operation of the mill itself. A clear cut was seen on the eastern side of the channel. The channel was cut through flood deposits of mid 12th-century date and was edged with post and plank revetments (9855 and 9536). The creation of channel 9549 was almost certainly part of a more general initiative to exploit this area of the floodplain. At the same time as the channel was dug, considerable effort was being put into reclamation of the land immediately to the east of the confluence of these channels. Here a substantial flint nodule wall (9824), at least 5 m long and 0.5 m wide, was built to retain a series of dump deposits

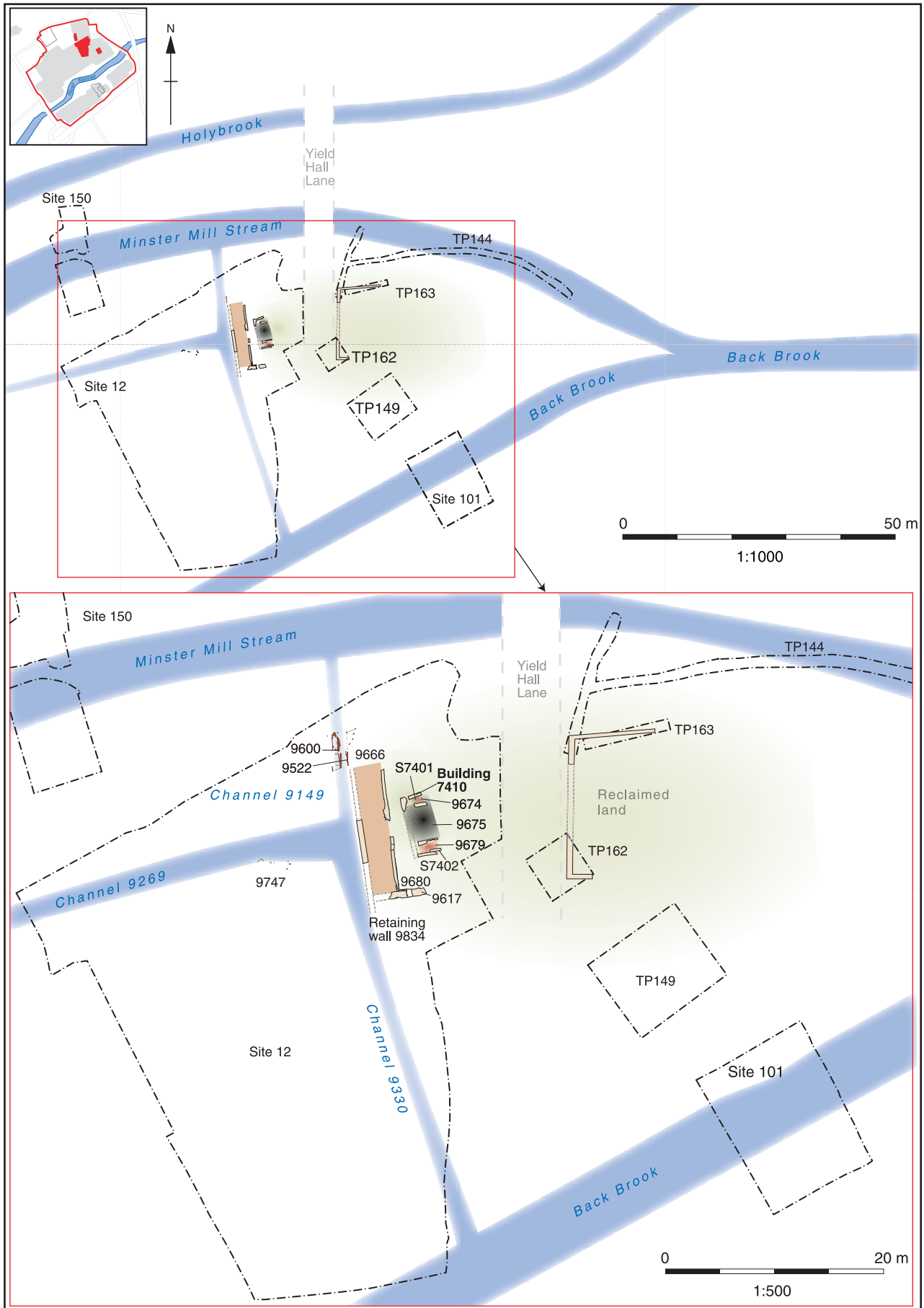


Plate 2.23 Site 12: view looking SE of successive revetments on the eastern bank of channel 9549/9149 (Project Phase 3)

Fig. 2.13 Site 12: showing the Minster Mill bypass channel (9269) and channel (9549) in relation to the reclaimed land; Site 101: the earliest revetment structures for the Back Brook (Project Phase 3)







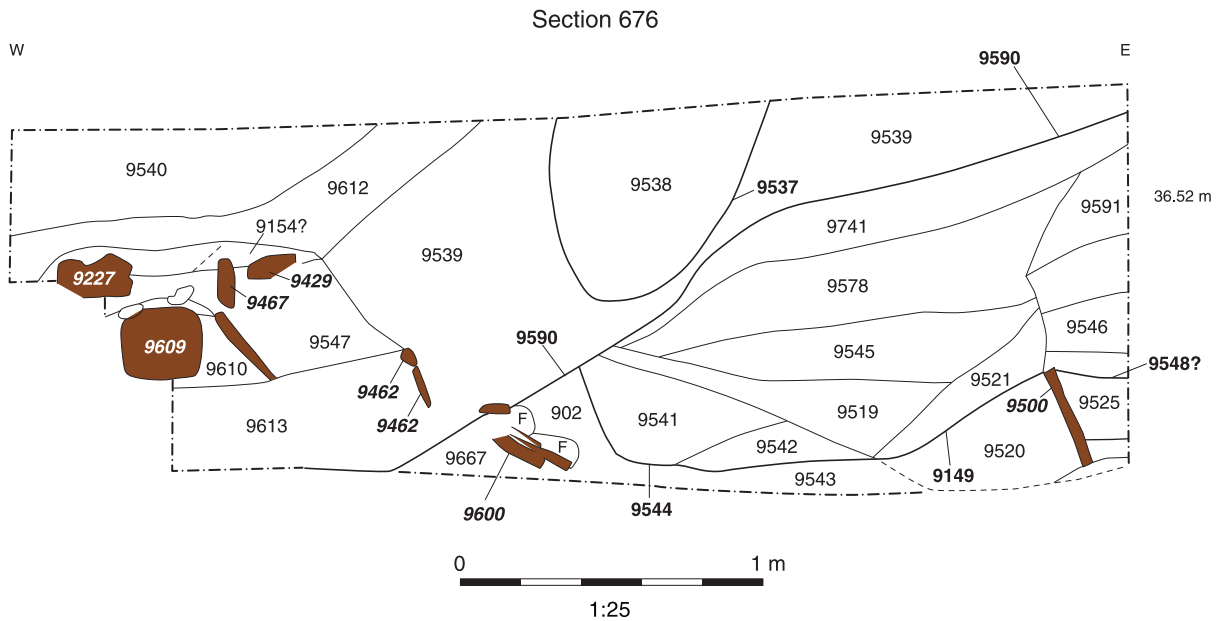


Fig. 2.15 Site 12: South facing section 676, showing sequence of development for channel 9149

comprising mainly crushed chalk and gravel. Two intercutting pits (9827, not illustrated, and 9773) were recorded on the land east of the retaining wall. One of them (9773) contained a high concentration of charcoal, and may have been a hearth-pit operated during the construction of the wall.

Channel 9549 was re-cut, possibly during the late 12th or early 13th century, approximately 0.50 m to the west, as channel 9149 (Figs 2.14-2.15; Plate 2.23) (site sub-phase 1203a). Channel 9149 was 1 m wide and in excess of 0.60 m deep, and was revetted on both sides with post and plank structures. Most of the timbers that survived were vertical roundwood posts or horizontal planks of 1-1.5 m in length. At least one timber appeared to have been re-used from an earlier structure, bearing the remains of a tenon joint at one end. No dating evidence was recovered from the new channel cut or the revetments, but their relationship to the preceding structures suggests a date in the late 12th or early 13th century.

At the same time, the earlier retaining wall (9824) was demolished and dumps of gravel were laid in its place. A new retaining wall of large chalk blocks and orientated north-south (9834) was constructed approximately 0.40 m to the west. This was observed for over 10 m and probably extended further to the north and south. To the south was a short section of east-west wall 9680, which may have been the eastern return of this wall defining the southern limit of the reclaimed land. A second wall (9666), of flint and chalk, was constructed 2 m east of the new retaining wall 9834 (Plate 2.24). Its

southern end abutted 9680. A circular pit (9823, not illustrated) measuring 0.7 m diameter x 1.6 m deep and located just to the south contained 60% chalk blocks and 40% flint nodules, material likely to be the debris from the demolition of 9824 and surplus after the construction of 9834.

Much of the surrounding area had been heavily truncated by later activity, and the relationship between wall 9834 and wall 9666 could not be determined; no evidence of return walls that might have formed a closed structure was seen. The two walls were parallel to each other and the space between them was surfaced with chalk. However, at only 2 m in width, this space appears too narrow for a building, and the likeliest interpretation is that it functioned as a corridor (if roofed) or a walkway (if unroofed), along the side of the water channel. This interpretation is strengthened by the fact that wall 9666 was clearly built in two sections, with a gap of approximately 1-1.5 m in the middle, forming a doorway that would have given access to the corridor or walkway.

Wall 9666 is interpreted as the west wall of a building or working area, Building 7410, constructed on the reclaimed land between the channel and Yield Hall Lane. Within Building 7410 were two small, probably industrial, open rectangular structures formed by the remains of stone walls enclosing hard surfaces (Structures 7401-2). The better preserved of these, Structure 7402 (Plate 2.25), measured at least 2 x 1.5 m and comprised walls constructed of chalk and flint (9676 and 9677). Between these walls lay two probable surfaces, one

Fig. 2.14 (opposite) Site 12: recut of channel (9149) and the construction and use of Building 7410 and other structures on the reclaimed land in the late 12th to early 13th century



*Plate 2.24 Site 12:  
view looking S across  
Building 7410 with  
tank or vat bases 7401  
(foreground) and 7402  
(background), charcoal-  
rich deposit 9675 in  
between them and wall  
9666 to the right  
(Project Phase 3)*

*Plate 2.25 Site 12,  
Building 7410: view looking  
SW of detail of tank or vat  
base 7402 (Project Phase 3)*

a spread of tiles (9678) and the other a cobbled surface (9679) forming the floor to a probable working area. Structure 7401 was located 3.4 m to the north (7401). This comprised walls of similar chalk and flint construction (9670, 9671 and 9672) enclosing a hard surface made from chalk fragments, flint and pea gravel (9674). Between the Structures 7401 and 7402 was layer 9675, 0.22 m thick, which consisted of 80% charcoal; sheep and goat bones were recovered from this layer. Neither structure produced any finds that help interpret their function, although it is clear that this must have required both water and heat and their form suggests that they were perhaps the bases for vats, or possibly the remains of stone tanks.

Yield Hall Lane lay approximately 5 m to the east, but the intervening area had been heavily truncated by later activity and no further evidence for Building 7410 and the extents of the features described above could be recovered.

To the east of Building 7410, and the suggested line of the lane that led to it, further structural remains were recovered. The north and south corners of a very substantial stone wall of the same flint and chalk construction were located in TPs 163 and 162 respectively (site sub-phase 1203b). The wall was 1 m wide and 13 m long, orientated north-south, and returned to the east at both ends. The southern return is on virtually the same alignment as wall 9680 to the west. This structure was probably a retaining wall for contemporary reclamation activity on the eastern side of the access lane, and may even have formed part of a building similar to building 7410. Unfortunately no internal evidence was recovered.

Test Pit 149 was located further down the east side of Yield Hall Lane, some 5 m back from the modern street frontage (Fig. 2.14). Reclamation dumps similar to those seen on site 12 were observed in this test pit, along with a wall orientated roughly east-west (8438/8453, not illustrated) of similar chalk rubble and flint nodule construction to retaining wall 9834. Associated finds evidence only suggested a date after the late 11th century, but the similarity of construction materials suggests that the laying-out of Yield Hall Lane may have been associated with quite widespread development of its frontages during the late 12th and early 13th centuries. Whether this was all industrial in nature is unfortunately not apparent from the remains that survived.

**Site 12: Project Phase 4: mid 13th to late 14th century**  
(site sub-phases 1204 and 1205)

*The tanning complex on site 12* (Figs 2.16-2.17)

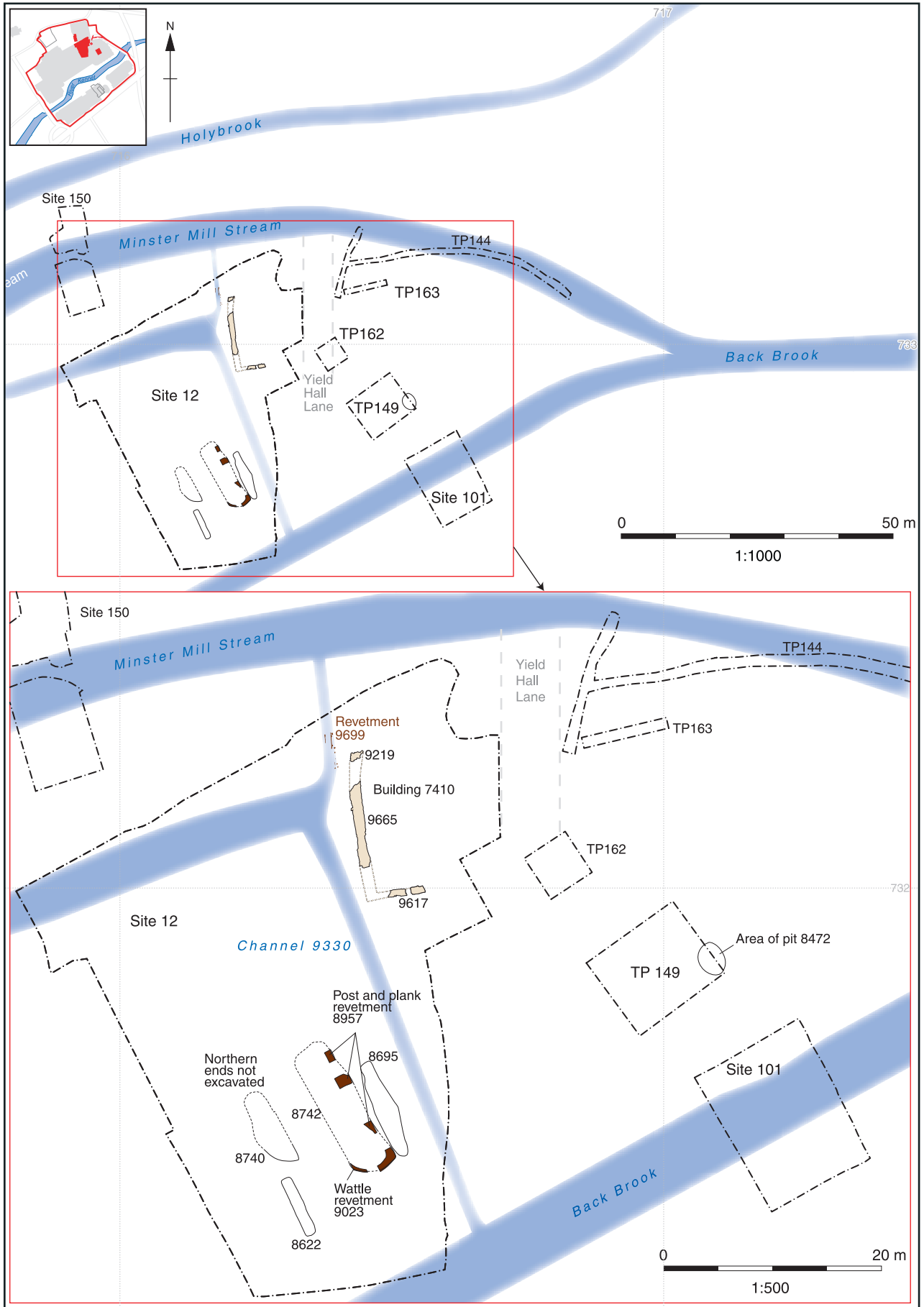
Over the course of the ensuing 250 years, much of the land in the south of site 12 was in use as a tannery or a tawery (Fig. 2.16). A number of large pits, some with substantial timber linings, were laid

out across the area. As before, there was evidence that site 12 was showing only a keyhole glimpse of widespread development. A very similar pit was also identified in TP 149 (pit 8472), on the opposite side of Yield Hall Lane, and contained pottery of mid 12th-century or later date.

The complex of pits remained in use until the very end of the 15th century (Project Phase 5) and they were not finally backfilled and decommissioned until a major episode of land reclamation in the early 16th century (Project Phase 6). The earliest in the sequence were pits 8742, 8740, 8622 and 8695, and associated pottery supports a date range from the 13th to the late 14th century. It is not clear whether they were used continuously over this period, but it seems probable, given that there would have been a need for useful facilities for the industry of leather preparation that was so important to the town. Pit 8740 appears to have been recut at least twice (8722=8768/8721; Fig. 2.17). Dating evidence suggests that the final recut, 8721, remained in use as late as the end of the 15th century, at which point the very large pit 8742 may also have been infilled.

None of the pits was fully excavated, but there was evidence for structures that revetted and thus strengthened their sides. Pit 8742 for example, which measured at least 12 m long x 4 m wide, had a wattle revetment (9023) on its west side, and a post and plank/board revetment (8957) on its east side (Plate 2.26). The wattle revetment consisted of 60 mm-wide stakes with large branches of 40-50 mm diameter woven between them. The post and plank/board revetment was represented in the excavated section by two large vertical posts and horizontal planking, which supported a deposit of chalk rubble. The floor of the pit was puddled with clay, which would have made it waterproof. Towards the end of the 15th century, the final recut of the central pit, 8721, showed limited evidence in the form of posts (8780-8783; 8678), at its northern terminus, that its sides had been revetted.

The pit fills contained considerable quantities of material associated with hide processing and leather working (see Chapters 5 and 9). Unfortunately, the main episode of backfilling took place when the complex was being decommissioned and the area reclaimed for building, in the early 16th century (see Project Phase 6, below). It is clear that the fills included material brought from elsewhere, and so no definite link can be made with the earlier phase of use of the pits. Nevertheless, it seems very likely that the waste identified from the primary stages of skin processing originated somewhere in the vicinity, and casts some light on the range of activities that had been carried out in this area of the floodplain during the later medieval period. An early fill of pit 8742 (fill 8852) was particularly notable, since it contained calf hair, a waste product of the tawing trade. A wide range of material was found in fill 8894 of pit 8721, including goat hair (probably from two kids), sheep/goatskin and



pigskin, as well as waste bovine leather including primary waste material such as udder. This would suggest that both the tanning and the tawying trades were operating in the area.

**The channels and Building 7410** (Figs 2.16-2.17)

Evidence was recovered for continued channel management and land reclamation during Project Phase 4. The retaining wall 9834 and industrial structures 7401 and 7402 in use during the previous phase were demolished. Their remains were sealed below well-compacted deposits of chalk fragments and flint nodules probably resulting from the demolition. This material was used to raise the ground level by approximately 0.4 m and contained pottery indicating a date after the middle of the 13th century.

This was followed by the rebuilding of the retaining wall and re-cutting and revetment of the north-south man-made water channel. The evidence for this was very fragmentary and has

proved difficult to interpret. A new channel revetment wall, 9665 (= 9219) of flint nodule construction was built on the west of the reclaimed land (Fig. 2.16; Plate 2.27). It is not clear how long this wall was in place (see below). Wall 9665 may have formed the west wall of a new building, and two short sections of a second flint wall (9617) which lay to the south and at right-angles to wall 9665 may have been associated with an eastern return; however, the remains were too insubstantial for this to be certain.

Channel 9149 was then re-cut (9330=9590=9304) and revetted by a timber post and plank structure (9699). This cut and structure post-dated the construction of, but co-existed with, the new retaining wall (9665=9219).

A number of dump deposits were recorded respecting wall 9665, and were therefore laid down at some point after the wall had been constructed. These included two flint deposits dumped on the channel side of the wall to form an artificial bank,

*Plate 2.26 Site 12: view looking NE showing sondage through tanning pit 8742 (foreground) revealing post and plank revetment 8957 (Project Phase 4). The tile floor of the Yield Hall cellar in Room 2 from Project Phase 7 is visible to the right*



*Fig. 2.16 (opposite) Site 12: plan of the tannery/tawery (Project Phase 4)*

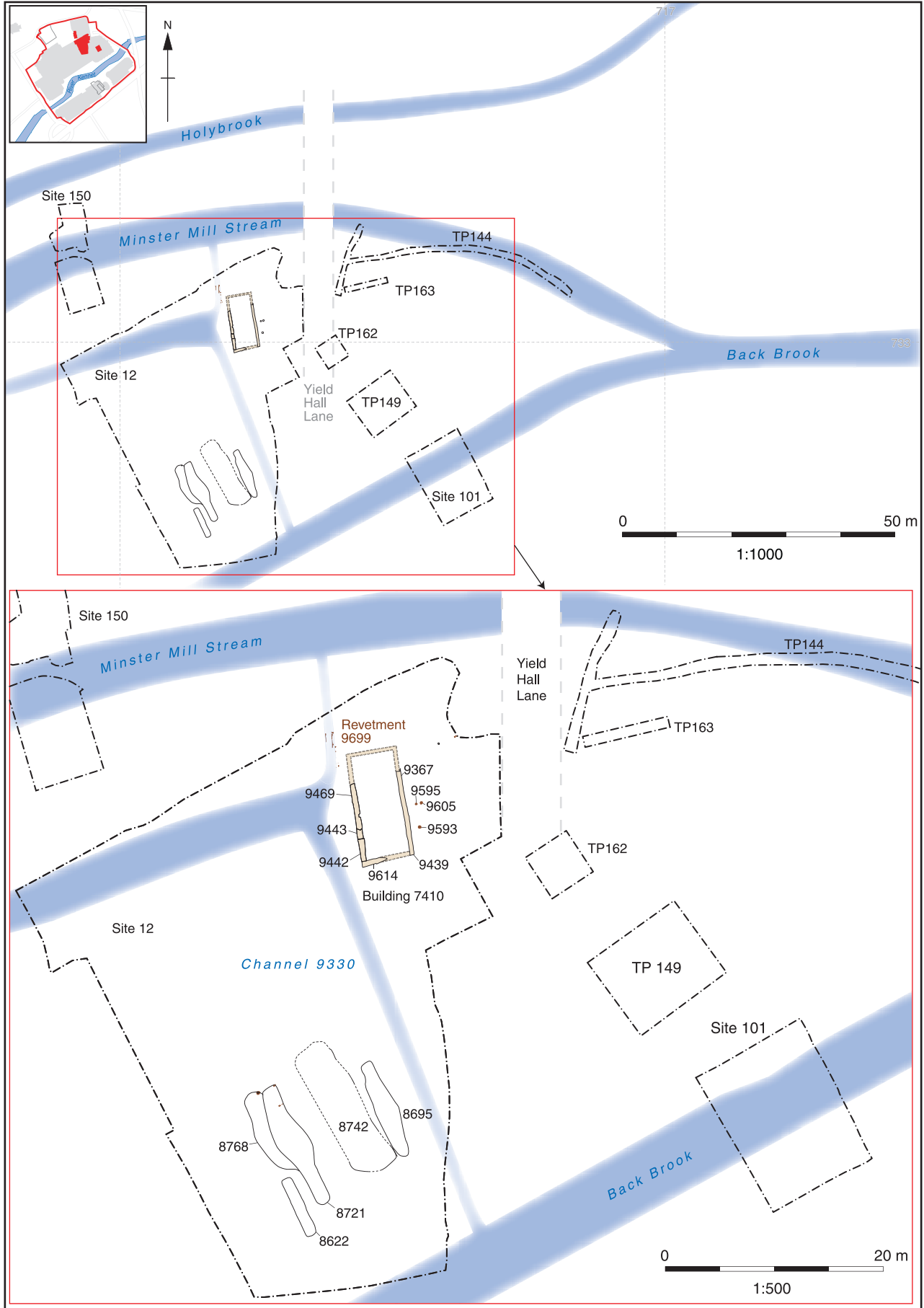






Plate 2.27 Site 12: view looking E with chalk bank 9497 in the foreground abutting wall 9665 behind (Project Phase 4)

and an extensive chalk hardcore deposit (Plate 2.27) (9497, 9552, 9626, 9530), which overlay these dumps and the walls of Project Phase 3, and underlay most of the succeeding structures. This suggests activity in preparation for a new phase of building. The only datable material within this deposit was a fragment of used decorated floor tile of a late 14th- or 15th-century type, suggesting that the dump may date towards the end of Project Phase 4 or the start of Project Phase 5.

A new phase of development then took place, beginning with the demolition of revetment wall 9665 (site sub-phase 1205b), which is hard to explain except as part of a project to construct a new building on the site with access to the channel via the newly formed artificial banks (Fig. 2.17). The west wall (9469/9443/9442) of the new building (building 7410) was constructed on the foundations of the demolished wall 9665; the remaining walls were represented by a number of surviving fragments (9367 on the east; 9614 on the south and 9439 in the south-east corner). Together these appear to form a building measuring 4 x 10+ m. The new walls were built in several stages and comprised variously flint, chalk and flint, and chalk, flint and tile. Only the eastern wall (9367) of the building was constructed entirely of flint nodules. This suggests a more makeshift approach to building than in earlier phases and a greater emphasis on the use of whatever was available, with more haphazard

construction when time, materials or finances would allow.

The building was heavily truncated by modern foundations, and it has proved very difficult to reconstruct its medieval form with any confidence. A small timber structure comprising two small shallow postholes (9595 and 9605) and a single post pad to the south (9593) was located next to the eastern side of wall 9367. This was of unknown function. However, Building 7410 was extended to the east during the 15th century (see below), and these early post settings may bear some relation to this.

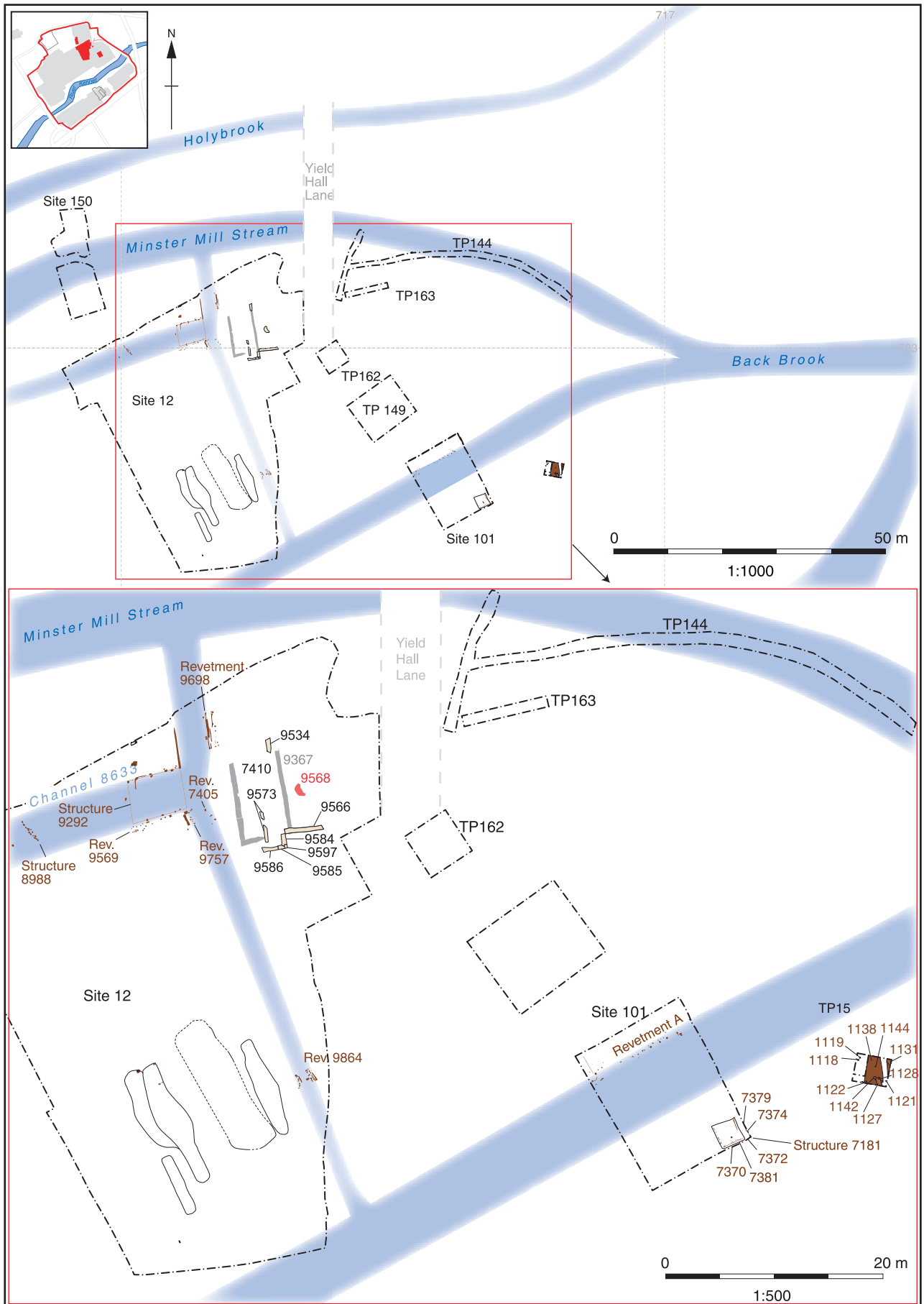
#### Site 12: Project Phase 5: 15th century

##### *The Yield Hall Lane frontage* (Fig. 2.18) (site sub-phase 1206)

During this phase, the hide-processing pits at the southern end of site 12 continued to be used. Most of the evidence for change was related to the channels themselves, and building on the reclaimed land that fronted onto Yield Hall Lane to the east (Fig. 2.18).

The bypass or overflow channel first seen in Project Phase 2 (9269) was realigned slightly to the south (8633) and revetted with an alignment of small roundwood and larger squared posts (9569), which probably acted to strengthen its confluence with the artificial channel to the east (channel 9149). No

Fig. 2.17 (opposite) Site 12: showing the rebuilding of Building 7410 (Project Phase 4-5)



planking was associated with the vertical posts but the banks were consolidated with wattle hurdling (9668). Adjacent to revetment 9569 was a square structure (9292) measuring approximately 4 x 4 m which may have been a holding tank. The banks of the possible holding tank were consolidated with the same wattle hurdling (9668) found in association with the revetment. A plank from structure 9292 (timber 9267) was dated by dendrochronology, and gave a felling date after 1447, and probably between 1447 and 1479 (see Miles, Chapter 11).

Adjacent to the probable holding tank were two well-consolidated surfaces consisting of brick, tile, sandstone and flint nodule fragments in a matrix of silt, sand and mortar (9682 and 9508). These surfaces measured 0.89 x 0.93 m and 1.6 x 0.7 m respectively and formed an approach to the holding tank. One of these was dated to 1500+ and was therefore slightly later than, but probably contemporary with the later use of, the holding tank. At the western end of the investigated section of channel 8633 was a line of 17 timbers (8988; Plate 2.28) orientated across the channel. The gaps between the posts measured between 0.07 m and 0.14 m suggesting it may have served as some sort of fish trap or water control.

At the same time, the channel south of the confluence was also relined, with revetment 9757 along the western edge (comprising 11 timbers including one horizontal plank) and revetment 7405 along the

eastern edge. Together they revetted a channel that was approximately 2 m wide and of unknown depth. The eastern revetment was also identified further north (9698) where it was the fourth in the sequence of revetments seen in this position (see above). A post (9468) from revetment 9698 gave a felling date range of 1429-59 (see Miles, Chapter 11). The revetment post-dated silting containing pottery of late 15th-century or later date, which could suggest post 9468 had initially been used elsewhere. A final timber revetment (9523) was put in place after this and was sealed by mixed deposits containing pottery of late 15th-century or later date indicating that it was close in date to the previous revetment. A recut of channel 9149 was also identified towards the south-east edge of site 12 (8825; Plate 2.29). This formed a narrow channel just over a metre wide which was revetted on both sides (9864), and the presence of two alignments of timbers on the eastern bank suggest that there were two phases of revetting. An early fill of this cut (8802) dated to 1490+.

#### *Alteration to Building 7410 (Fig. 2.18)*

During the 15th century, and coinciding with the concentration of activity at the channel confluence, Building 7410 underwent a series of modifications, none of which has left very substantial or interpretable remains but which seem to imply that the



Plate 2.28 Site 12: view looking E showing fish trap 8988 built across channel 8633 (Project Phase 5)

Fig. 2.18 (opposite) Site 12: realignment and revetting of channels and extension to Building 7410; Site 101: late 15th-century revetment A of the Back Brook (Project Phase 5)



Plate 2.29 Site 12: view looking W showing revetment 9864 marking the banks of channel 8825 near its confluence with the Back Brook

building was extended, certainly to the east and south, and possibly to the north. The eastern extension (Building 7411; Fig. 2.18) was represented by the addition of a new walled, or part-walled, area. There is not enough evidence to suggest whether this can be interpreted as a roofed room, the only surviving remains being a short length of flint, tile and chalk wall apparently returning eastwards from the southern end of wall 9367 (9566). A hearth, 9568, had been constructed in this area; this comprised 50% charcoal, and contained a French jetton of 15th-century date. There was some evidence for a short extension to the north (9534). A southern extension (9584, 9586) was built in several stages, and may have formed a porch area on the southern end of the building or a fireplace. A further three 14th- to 15th-century jettons (Nos 1825, 1830 and 1832; see Chapters 5 and 9) and an Edward III halfpenny of 1355-61 (No. 1829) were found in dump layers and a posthole fill of this site sub-phase.

#### Site 12: Project Phase 6: 16th century

*The Yield Hall Lane frontage, channel engineering and land reclamation* (Fig. 2.19)  
(site sub-phases 1207a, b; 1208a, b)

During the early 16th century there were large-scale changes to the area of site 12. A major phase of channel engineering was undertaken, which involved the backfilling of the two medieval water channels in the area (8633 and 9149), and the cutting of a new channel some 16 m further west (channel 8634), linking the Minster Mill stream to the Back Brook (Fig. 2.19; the disused medieval channels are shown with a dotted outline). This extended the usable area on the Yield Hall Lane frontage and presumably created the configuration of channels that is visible on Speed's map of 1611. The medieval complex of hide-processing pits was decommissioned, and the pits backfilled. After a phase of

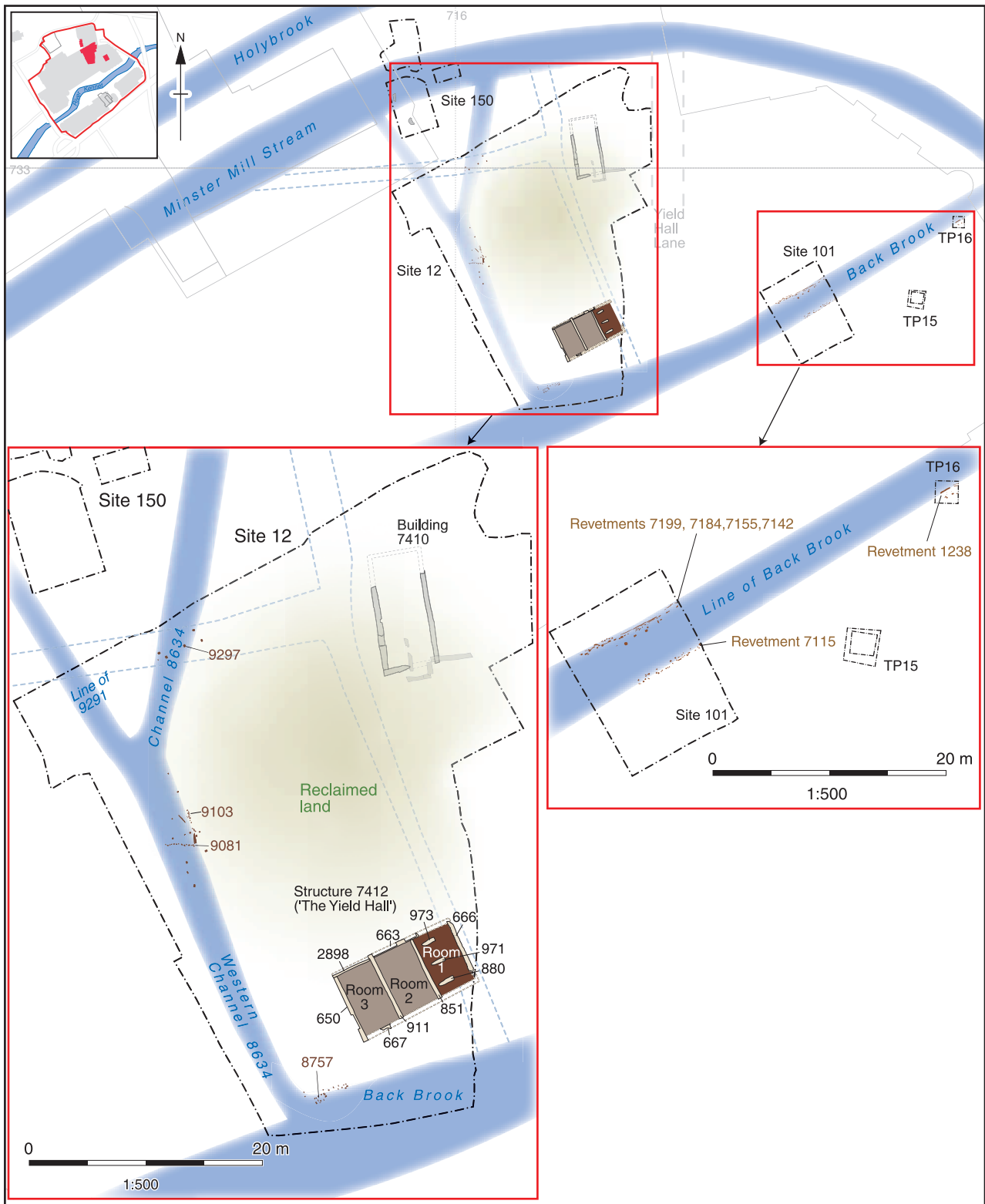


Fig. 2.19 Site 12: plan showing the early-mid 16th-century redevelopment of the area, with new channels and primary phase of the Yield Hall; Site 101: revetment of the Back Brook (Project Phase 6)



*Plate 2.30 Site 12: view looking NE of revetment 9103 marking the eastern bank of channel 8634 (Project Phase 6)*

dumping to raise the land, a new building was constructed on the reclaimed site; this building is the one that subsequently came to be known as the Yield Hall, and with numerous adaptations and extensions it survived on this site until it was demolished in 1935.

A new channel was dug from the Minster Mill stream to the Back Brook (channel 9291), replacing the old bypass channel (channel 8633), which was filled in. The fills of channel 8633 contained dumped deposits of a variety of materials including large dumps of leather and fragments of knitting, the craft of which was established in England during the 15th century (see Chapters 5 and 9).

A new channel (8634) was also created to bring water from downstream of the Minster Mill. It was at least 1 m deep, but of unknown width. Its construction is datable to the early 16th century, as it post-dated many late 15th-century deposits and its lowest fills were early 16th-century in date.

These changes resulted in the creation of a new western channel (also called channel 8634), some 20 m to the west of the medieval alignment. Its banks were supported with a post and plank structure (revetment 9103 (Plate 2.30)) comprising at least 12 vertical timbers and at least one horizontal plank. A further revetment was also identified at the confluence of the new channel with the Back Brook, where a series of posts and planks (8757) were found; these were not directly dated, but their position suggests they were contemporary with the channel cut.

Several timber structures were associated with the new channel. To the north, four square timber

posts (9297) were aligned across the width of the channel. These are unlikely to have contributed to water control as they were not at a junction and it is more likely that they functioned as some sort of fish trap. A similar alignment of 17 timbers (9081, Plate 2.31) was positioned SE-NW across the channel in a more southerly position and may have functioned as another trap. Less than 1 m to the north of structure 9081 (phase 1207a), and post-dating it was an additional timber structure comprising three rectangular timber posts tapered to a point and orientated E-W across the channel (9091). This also post-dated many channel fills including some dated to 1530+. It may have been associated with management of the flow of water in the channel.

The redundant medieval man-made channel (channel 9149) was infilled with all sorts of industrial refuse, including a deposit of bell mould (8644). A brick conduit found in the area (9683, see Smith, Chapter 8 below) may have been an early attempt to deal with ensuing drainage problems after the channel had gone out of use. Following the realignment and backfilling of the channels, the whole area was reclaimed. The hide-processing pits of earlier phases were filled in with stable waste and subsequently with general rubbish such as tile, bone, shell, charcoal and pottery dating to the late 15th to early 16th centuries.

Material was then dumped across the whole area to raise and level the ground surface; this contained frequent occupation debris such as broken ceramic building material, oyster shells, charcoal, chalk and stones. Several contexts contained large dumps of



Plate 2.31 Site 12: view looking S of a timber fish trap built across the new channel (8634) (Project Phase 6)

waste leather (Mould, Chapters 5 and 9, below) excavated both under watching brief conditions and on site 12 (8395). This material was deposited at the edge of the disused bypass channel 8633 and included fragments with hair still attached, which suggests that tanning was taking place nearby. Amongst the general trade detritus and hard core were occasional fragments of much more unusual objects, including a late 13th- to early 14th-century colourless stemmed goblet, unique to this country and probably originating in France (Willmott, Chapters 5 and 9, below). The likeliest point of origin for such a vessel is the abbey itself, and it is possible that some of this material came from the abbey after its dissolution in 1539. Two of the levelling deposits contained pottery dating to the late 15th and early 16th century or later (1475+ and 1520+).

***The occupation and use of the area in the first half of the 16th century*** (Fig. 2.19)  
(site sub-phase 1207b)

*Construction of the Yield Hall*

The first elements of the building that subsequently became known as the Yield Hall (Building 7412) were constructed in the very southern part of the reclaimed land, overlying the now disused medieval channel and tanning pits. The underlying deposits date the construction of the building to some time after 1520 but probably before the mid 16th century, given the dating of the first phase of

extensions (see below). For ease of reference, this building will be called the Yield Hall from this point, although this name was only applied to it at a much later date. The building underwent several phases of expansion and rebuilding throughout its life, and seems to have been badly affected by subsidence. Its 16th-century development is set out below; from the 17th century onwards its development can be followed in Chapter 3.

The first phase of the Yield Hall measured 11 m by 6.5 m (Fig. 2.19) and comprised four external walls (663 and 2298 on the north; 667 on the south; 650 on the west and 666 on the east), and two internal walls (911 and 851) dividing the building into three rooms (Rooms 1, 2 and 3). The walls were of flint stub construction, 0.3 m wide, and the external walls had been topped with a layer of tiles to support timber framing above (seen on walls 650, 2898 and 666). The walls varied slightly in their surface treatments; walls 911 and 2898 were rendered on both faces while wall 663 was rendered on the outer (north) face only. No evidence survived of rendering on any other walls. A doorway existed in the south-eastern corner of the building in wall 666, forming an entrance to the building via Room 1.

Levelling deposits containing brick, tile, mortar, shell and bones were subsequently laid down within the building to raise the surface to beam level for the insertion of floors. Room 1 (the entrance room) was floored with wood, indicated by the presence of a series of E-W orientated linear beam slots containing wood fragments in the cut edges and evenly spaced across the bay (880, 971,



Plate 2.32 Site 12, Building 7411: view looking W of wall 9482 showing the mixture of building materials used (Project Phase 6)

973). They each measured approximately 1.3 x 0.25 x 0.15 m. There was no evidence for earlier floor surfaces, which suggests this timber floor was contemporary with the construction of the building. Room 3 seems to have had a compacted earth floor (2763) while no evidence of the floor survived in Room 2. Immediately above the floor in Room 3 was an occupation deposit 692 which contained much in the way of debris such as broken pins and other copper alloy fragments.

#### *Building 7410/7411*

Some changes to Buildings 7410/7411 seem to have taken place during the first half of the 16th century, but the evidence is very fragmentary. The 15th-century south wall of the east extension (Building 7411; wall 9566) appears to have been rebuilt, using ceramic building material and flint, as wall 9482 (Fig. 2.20; Plate 2.32). A short length of uncoursed flint and tile stub-wall (9571) was recorded south of

the eastern extension; in line with this wall, and 1 m to the north was a flint post-pad (9572) (Fig. 2.20). The function of these alterations is unknown.

#### *Mid to late 16th century* (Fig. 2.20)

##### *The Yield Hall* (site sub-phase 1208a)

During the second half of the 16th century, the Yield Hall was extended with the addition of a new room to the west and a corridor running the length of the south side (Fig. 2.20). The corridor (16.5 by 2 m) appears to have been constructed first, and was composed of walls of a mixture of brick, flint, tile and stone set in mortar and roughly coursed. The southern wall of the corridor appears to have been constructed first and was built in a construction trench that contained pottery dating it to the mid 16th century (2700, 2817). The new internal space



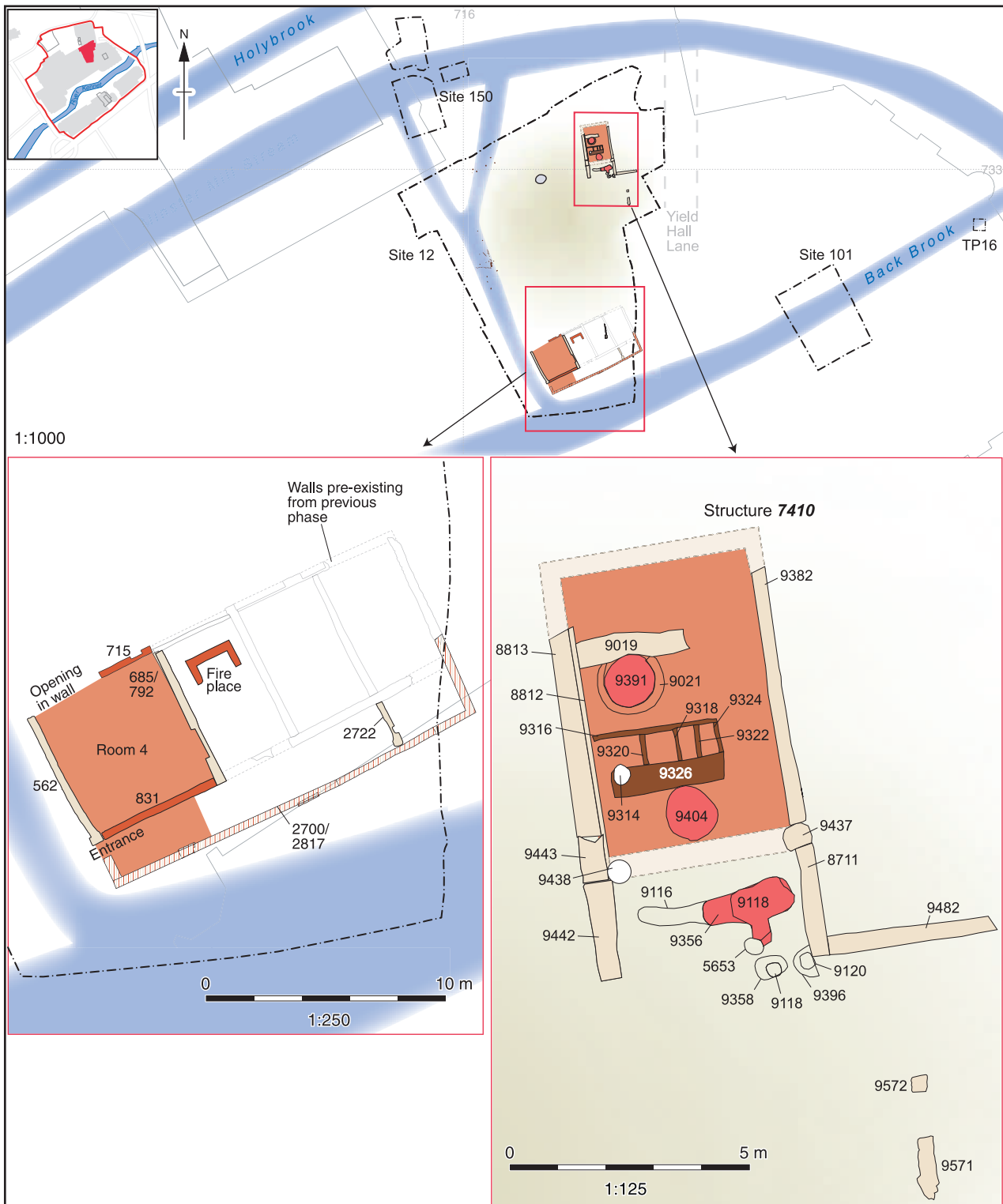


Fig. 2.20 Site 12: later 16th-century extensions to the Yield Hall, and modifications to Buildings 7410/7411 (Project Phase 6)

created to the north of this wall was levelled with broken ceramic building material and gravel (2773) and the remaining corridor walls (2812) and those of Room 4 were built upon this deposit.

The new room, Room 4, was added to the west of Room 3. It measured 5.6 x 5.7 m. Its external walls were of differing construction; the west wall (562) was built of uncoursed flints, and the north of coursed brick. The former external west wall of the building (wall 650), which had previously been a flint stub wall with timber framing above, was rebuilt in coursed brick (685/792) to form the partition between Room 3 and the new Room 4. Wall 831, of broken bricks in a sandy mortar, divided Room 4 from the corridor. The northern wall of Room 4 (715) was heavily truncated by later activity, but the evidence indicates that there was a wide opening within the wall.

The variety of materials employed in the construction of Room 4 and the corridor suggests that it may have been a staged construction, with walls being added as the resources became available, probably locally. Much of the building material may have been obtained from demolished buildings elsewhere, including those of the former Reading Abbey (dissolved in 1539), which would also account for the mixed nature of the building materials used.

The west end of the corridor contained an entranceway and this may correspond to the blocking of the doorway in the eastern end wall (666). An internal division within the corridor and

in line with the dividing wall between Rooms 1 and 2 was also probably inserted at this time (2722). It seems most likely to have functioned as a partition and possible support for stairs to a loft level.

At the same time as the extension to the building, a large U-shaped brick fireplace measuring 2 m x 1.1 m was inserted into Room 3 (2821, 2820) (Plate 2.33). The foundations of this hearth (695) comprised flint nodules set in mortar above which a layer of tile and mortar supported a brick fireplace (of which one course survived). The fireplace is not directly dated but the presence of an occupation deposit and possible early floor surface underlying it suggests that the fireplace was not an original feature of the room. A compact mortar floor surface (2743) was laid in and around the fireplace and replaced the earlier compacted earthen floor.

The western end of the corridor (770) and the whole of Room 4 (708) were floored with brick, although only the imprinted mortar bedding survived. At this time the wooden floor surface was removed from Room 1 and it was floored with a compact very pale yellow mortar (634); similar floors appear to have been laid in Rooms 2 and 3.

The function of this building is unclear but its location on the floodplain, an area used primarily for industry, indicates that although it may have functioned as a dwelling place, it is likely to have been in addition to its function as a workplace. The presence of a substantial hearth in Room 3 and a wide open entrance to Room 4, suggests some sort of industrial function to the building.



*Plate 2.33 Site 12: view looking NW showing the remains of fireplace 2821 added to Room 3 of the Yield Hall (Project Phase 6)*

*Building 7410*  
(site sub-phase 1208b)

During the later 16th century, the whole area associated with Building 7410 was levelled and the building was substantially altered. The walls were mostly rebuilt and features of an industrial nature including a possible vat base and two hearths were constructed, both inside and outside the building (Fig. 2.20).

The ground was stabilised with dumped material (50% of which was flint) and then levelled with brickearth deposits. This episode probably dated to the latter half of the 16th century as the associated dumps and levelling layers significantly post-dated deposits of mid 16th-century date. The east wall of the building (formerly 9367) was rebuilt in two sections (9382 and 8711), north and south of the south wall (see below). Both new sections were constructed from roughly coursed flint nodules but 8711 included tile courses and was capped by a double layer of red tile, which would have provided a base for a timber framed structure above. The west wall of the building retained the earlier walls 9442/3 at its southern end, with a rebuild to the north (wall 8812) constructed of regularly coursed tiles and a few flints. A large irregularly coursed wall (8813) of crudely knapped flint nodules was built along the west side of wall 8812, probably in order to strengthen the west side of the building, which lay along the edge of the infilled former channel course. The central section of the south wall had been robbed

out, so its form was unknown; the west and east ends survived where they butted the west and east walls, and suggest that the south wall was of similar flint and tile construction. Modern foundations had destroyed the remains of the building to the north.

Inside Building 7410 were a number of industrial features including a timber structure comprising a series of beam slots (9316, 9318, 9320, 9322, 9324 and 9326) and a posthole (9314). Two long beam slots (9316 and 9326) were orientated E-W and measured 2.25 x 0.17 x 0.12 m and 2.5 m x 0.6 m. The remaining four beam slots were positioned between these and at right-angles to them. A posthole located in the south-western part of this structure contained pottery of mid 16th-century or later date confirming that the first structures built on the brickearth had an earliest mid 16th century date (9314).

The timber structure was associated with two hearths, one just to the north and one to the south. Hearth 9391 was a large circular tile feature (9021) consisting of four surviving courses set in brick earth and measuring 1.35 m diameter (Plate 2.34). A possible working surface of tiles, 3 tiles wide and 17 tiles long, was positioned across the northern edge of the hearth (9019). This floor was of the same build as wall 8812. A further smaller hearth (9404) was positioned immediately to the south of the timber structure and the very close proximity of the three features suggests their function was linked. The presence of large circular hearths for heating and an associated platform may indicate that these structures were part of a dyehouse with



Plate 2.34 Site 12: view looking W showing partially excavated hearth/vat base 9391 in Building 7410 (Project Phase 6)

dye being heated over the two hearths and the cloth or yarn being processed between them.

In addition to the internal features of Building 7410, a substantial hearth or furnace (9116, 9356) was constructed in the subsidiary area to the south of the main building. This area appears to have been timber-framed above a flint and tile base (see wall 8711, above), and there may have been a timber wall across its south end. The hearth or furnace survived as a linear feature 3 m in total length and 0.6 m wide with a N-S arm 1.2 m long. There was an area of burning at its east end. A number of postholes seem likely to have been associated.

A total of three coins and four jettons of broadly 14th- to 15th-century date were found associated with surfaces and make-up layers of this phase. Although all must clearly be redeposited, the composition of the group is very similar to those of sub-phase 1206b, suggesting a common source.

### **Site 101: Project Phases 3 and 4: mid 12th to late 14th century**

#### ***The Back Brook***

(site sub-phases 10101b, 10102a)

At the base of the excavated sequence in site 101 lay a wide shallow channel of the river Kennet containing waterlain deposits, a precursor of the channel later known as the Back Brook (Fig. 2.1). At this stage, there was no evidence for organised management or revetment of this channel. It was orientated NE-SW but its precise dimensions were unknown. To the south, between the channel and the main course of the Kennet, was an island composed of clay layers (7292, 7324, 7330) containing many wood fragments. Extensive mixing had taken place in the channel between the latest silty gravel deposits (7291, 7290, 7113) and the early fills of the formalised Back Brook that overlay them, but the majority of the pottery (94 of 102 sherds) suggests that the natural channel was silting during the 12th century. A wooden drain and a boardwalk of probable 12th-century date were found on the northern side of the channel and represent the earliest activity identified (see Fig. 2.13). The drain (7383) emptied into the channel and was made from a single timber (7095) aligned SE-NW, from which the heartwood had been removed to create an item with a flat base and raised sides measuring 0.5 x 0.28 m by 0.15 m (see Allen, Chapter 8). The top of the drain was covered with two slats of oak (7248 and 7249) and adjacent to it was a pile-driven square post which may have been associated.

A further timber structure (7098) may have formed part of a boardwalk at the water's edge. It consisted of a timber plank (7099) measuring 0.21 x 0.15 x 0.03 m, which was deliberately angled up to the north at 30 degrees. A large square shanked post (7100) measuring 0.24 m x 0.045 x 0.055 m, was driven into the gravel fill 7113 through a hole in the plank. The southern end of this plank (which was

no longer present) was secured to the gravel with 4 large pegs (7101-7104). The angled plank probably acted as a brace for a large upright to the north (outside the limits of excavation) supporting the boardwalk. Both these structures overlay 12th-century deposit 7113 and were sealed by a thick organic clay of mid 13th-century or later date (7090), suggesting that they were of late 12th- or early 13th-century date.

Over time, the early Back Brook channel gradually migrated, or was moved, southwards. The first clear revetment structure associated with the channel (7271, site sub-phase 10102b; Fig. 2.13) was approximately 1.5 m further south than the drain and boardwalk, which marked the channel edge at an earlier point. The surviving elements of the revetment consisted of 70 mainly roundwood timber posts measuring approximately 0.10 m in diameter and 0.90 m in length. They were orientated east-west along the north bank of the channel. The revetment was not directly dated but the silts overlying the drain and boardwalk were of mid 13th-century date or later, implying that the north bank of the channel had moved southwards by this date.

A later revetment of the north bank of the channel (see Project Phase 5, below) was identified a further 1 m to the south, and this revetment was dated to the late 15th century (revetment A, see below). The north bank of the Back Brook must therefore have been in the position indicated by revetment 7271 at some point between the mid 13th and late 15th century. Timber posts identified to the east in TPs 82 and 84 aligned with revetment 7271, and may represent the same phase of revetting, although they were not directly dated.

### **Site 101: Project Phase 5: 15th century**

#### ***Late medieval structures***

(site sub-phase 10103)

Following the early wooden structures of phase 10102 there was a long period with no dated activity on the banks of the Back Brook, although the channel itself had migrated further south. During the late 15th century, the area saw renewed activity with the installation of a major revetment along the northern bank and the possible construction of a fish holding tank on the southern side (see Fig. 2.18).

The northern channel bank was strengthened with a series of 31 large revetment posts and horizontal planking (Revetment A), and associated dumped material. The posts were positioned in shallow scoops before being pile driven through the gravel channel fill 7113 (phase 10101) and surrounded by a sandy silt deposit containing flint, tile, and pottery dating the construction to the late 15th century (Fig. 2.21). A large rubbish pit (7210, Phase 10103c, not illustrated) was cut and filled at the same time (the lowest fill dated to the late 15th century) and represents the activity associated with

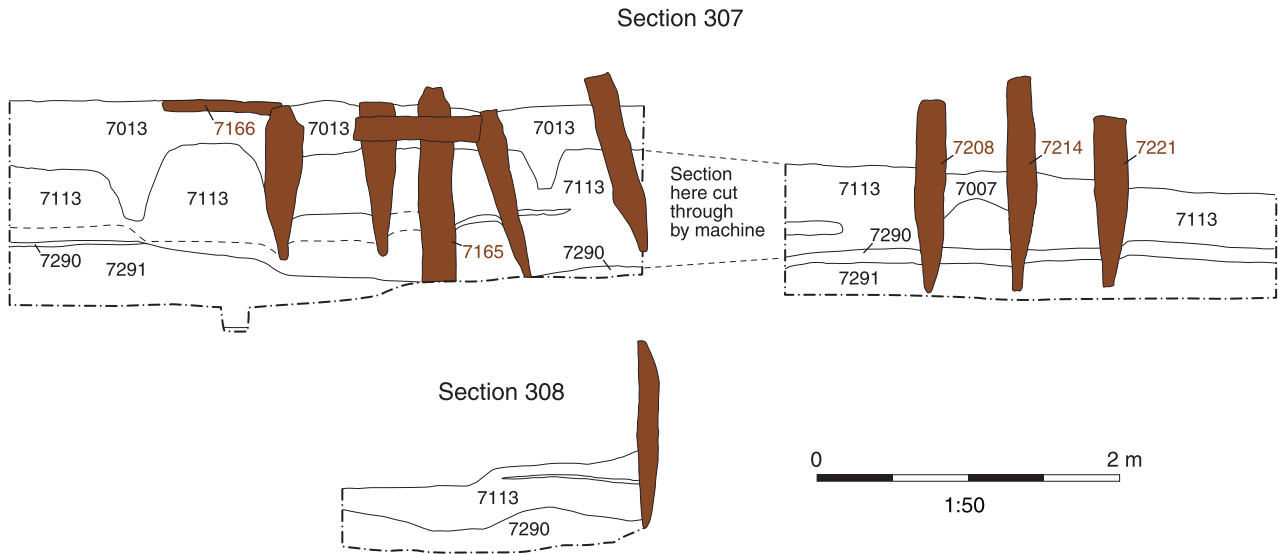


Fig. 2.21 Site 101: South facing section 307 showing construction of Back Brook revetment A

the construction of Revetment A. It measured at least 1.03 x 2.3 x 0.8 m (though was not fully visible in plan) and was deliberately backfilled with various rubbish deposits of charcoal, bone, mortar, tiles and leather.

The southern side of the channel was not revetted at this time and continued to suffer from periodic flooding during the 15th century. Use was made of the available water on that side however, with the construction of a square, timber post/plank structure measuring 2 m x 2 m (7181), which may have functioned as a fish holding tank. Three sides of the tank were made of a post and plank construction while the fourth (northern) side comprised a small segment of wattle fencing (7121) made from approximately 20 pieces of coppiced willow each 0.4 m long woven alternately around upright slats. The wooden sides consisted of 14 timber posts driven through the natural clay, that measured approximately 0.5 m long x 0.2 m across with the exception of four posts in one corner which were each a metre in length. These secured planks laid directly against a vertical construction cut seen on the eastern, western and southern sides of the feature. The planks (7370, 7372, 7374, 7379) were approximately 0.3 m–0.4 m wide and over a metre long and they were waterproofed on the outside with pitch and horsehair.

The natural clay floor of the structure sloped down 30 degrees towards the channel. In the centre of the clay floor a 0.2 m square cut (7381) extended vertically approximately 0.46 m to the water table thereby creating a 'spring'. Following removal of the deposit filling the structure, a constant flow of clean water was produced while the area remained exposed. This, combined with the partially submerged wattle side acting as an outflow, suggests the structure was a fish holding tank or served some industrial purpose. Later deposits to

the west of the structure which butted its timbers were alluvial and indicate that the structure was partially submerged during use (up to 0.5 m below the alluvial deposits). The date of the structure is unclear as it overlay sediments which have not been securely dated but the dumped material which filled the structure (7182, phase 10106a) had a TPQ of 1600+ (3 sherds). This fill also contained a rare example of sackcloth made from plant fibres (SF 1327, Walton-Rogers, Chapter 9, below). This may have been imported from India or south-east Asia but an exact match could not be found. It was probably used for the transport of goods to and from the site.

Unfortunately, a late medieval date for this structure is brought into doubt by 19th-century map evidence which reveals an osier pit in the same location. There is no indication that an earlier feature was reused or recut and it is therefore difficult to assign this feature with any confidence to either phase although for discussion purposes it has been assigned to the current phase.

Further activity near the south bank of the Back Brook was identified in TP 15 (Phase 10103d). This activity consisted of a possible drainage ditch and boardwalk across the silts, neither of was directly dated but which were sealed by silts containing shoes of mid 16th-century design (1126, phase 10104c) suggesting they were contemporary with Revetment A.

The drainage ditch was located 6 m south of the river channel and was only partially exposed but it was orientated north-south and the base of the cut sloped southwards into a deeper section, possibly a sump. Associated with this possible drainage ditch were a beam slot and timbers (1130, 1131, 1127) which appeared to form a boardwalk across the silts. The main timber (1127, partially exposed) was supported by a further timber (1142) at its southern

end which protruded 0.25 m from underneath it. It was also secured at its northern end through a slot with a square cut peg measuring 0.1 m across (1128). Eight timber piles (1118-1123, 1143, 1144) were also visible and were probably associated but their exact function is difficult to interpret. One of the timbers (1121) showed signs that it had supported a horizontal plank and they may all have been part of some sort of bridge or walkway across the wet ground.

**Site 101: Project Phase 6: 16th century**

*The cutting of the Back Brook*  
(site sub-phases 10104, 10105a)

Between the late 15th century and the mid 16th century, the initial cut of the formalised channel historically known as the Back Brook was made (10104a). This was a large E-W linear feature, 12 m wide and at least 1.5 m deep (but not fully excavated). After a period of silting (phase 10104b) of unknown, but probably short duration the channel was revetted on both sides (phase 10105a; Fig. 2.19; Plate 2.35). The northern revetment contained two timbers sampled for dendrochronology, one (sample 7216) giving a reduced felling date range of 1537-41 (see Miles, Chapter 11). The correspondence between this date range and the dating of the major channel realignments on site 12 (see above) suggests that they may have formed part of the same operation.

Most of the timbers identified were posts made from lengths of quartered timber but two planks were also recovered. The revetment on the southern side of the channel (7115) comprised 42 posts surrounded by a rubble fill containing pottery of mid 15th-century or later date. Further evidence for the revetting of the southern side of the channel was also identified in TP 16 approximately 20 m to the east (Phase 10105b). This consisted of a line of 11 substantial squared timber posts or smaller roundwood posts and two horizontal planks (revetment 1238) which aligned with 7115 in site 101. No dating evidence was directly associated with it although it dates to the 17th century or earlier because it was superseded by another revetment at about 1700 (phase 10108b below). Further posts suggest additional phases of revetting not identified on site 101.

**SOUTH OF THE KENNET: SITE 300  
(ST GILES MILL)**

The area south of the Kennet was the subject of a separate phase of investigations in 1998. Four trenches were targeted on the known location of the historical St Giles Mill: site 300 (including Test Pit 301) and Test Pits 302, 303 and 304. Elsewhere, a watching brief was carried out on engineering and construction works across the width of the floodplain (various test pits, see Figs 1.3 and 2.22a) to investigate the development of channels



Plate 2.35 Site 101: view looking NE of 16th-century revetments of the northern bank of the Back Brook (Project Phase 6)

upstream and downstream of the mill, and the reclamation of land on the London Street frontage at the east end of the site. The preservation of wooden structures in the vicinity of the mill and mill streams was excellent, and allowed the recovery of unusual detail from a variety of elements of successive mill structures, supported by a large number of good dendrochronological dates. A discussion of the Reading mills can be found in Chapter 5, below.

### **Project Phases 2 and 3: mid 11th to mid 13th century**

#### *Fragmentary evidence for the first mill structure and its immediate landscape* (Figs 2.22, 3.14) (site sub-phase 3001a)

The excavations recovered evidence from the St Giles Mill site for the existence of managed channels and a pond, and for the presence of a watermill, by the late 11th or early 12th century. No evidence for the mill building or the location of its waterwheel, or for the channels carrying the water to and through the mill, was directly observed, and their precise location at this date remains conjectural. The features observed in the excavations are thought to represent successive early bypass channels leading surplus water northwards away from the mill and back towards the main channel of the Kennet. A man-made clay bank consolidated with plant matting seen in Test Pit 302 is likely to mark the southern edge of the tailrace channel, which carried water away from the mill after it had passed through the wheel.

Within site 300 the southern and eastern edges of a large irregularly shaped feature, 13448, interpreted as a possible pond, were cut into the natural alluvial/fluvial silts and clays. The northern edge of an east-west channel (13813), and the western edge of a possible north-south channel (13949), ran from its downstream end. A number of timber stake and post alignments (none of which could be dated) appeared to be associated with these features and probably represent the remains of bank revetments. A channel leading to the west side of the possible pond was observed in TP 303. The south side of the channel was strengthened with a timber revetment. Although the revetment may not have been constructed until the late 13th century (see Project Phase 4, below), the channel itself must have been contemporary with the pond.

The near-complete remains of an oak wheel 13385 (Fig. 5.51; Plate 2.36) rested on a gravel deposit (13444) at the base of a sequence of waterlain silts within the pond. This object is a pitwheel from the gearing of a watermill. It would have been mounted on the horizontal axle that was turned by the waterwheel, and would have driven the 'lantern pinion' attached to a vertical shaft on which the millstones were mounted (see Chapter 5,

below). The wheel's outer diameter measured 1.35 m (4 1/2 ft), and was constructed from four separate but jointed segments of curved oak known as felloes, which were 0.15–0.18 m (or 6-7 in) square. On the inner face of the wheel were four empty joints spaced at 90° intervals around the wheel; these would have held the four spokes that provided bracing to a central hub around the axle. Thirty-six large, empty holes were located equally spaced around the wheel and drilled from the centre of one flat face through to the other. These holes would have housed the driving teeth or cogs. It can be compared in both size and form to the single felloe found at Bordesley Abbey which, like the Reading example, has headed pegs with small wedges hammered in to one end to tighten the joint (Astill 1993, 216-17). The pitwheel showed signs of use and failure, suggesting that it had been deliberately discarded into the pond. Dating evidence from the fills of the pond suggest that it filled up from as early as the late 11th century through the 12th century.

The technology of the wheel, combined with the dating evidence from the pond fills, suggests the object can be dated to the 12th century, and probably to the period AD 1100 -1150. Analysis of the silting sequence within the pond indicates that the water it contained was fairly clean and slow-flowing, with occasional plants present around its banks. There was no evidence for any significant build-up of organic deposits or rotting vegetation at the edge of the feature. Occasional cereal waste (rye) indicates possible settlement or milling activity nearby.

To the south of the pond and within the structural remains of the later mill of Project Phase 4 (see below), was a single timber pile (14041). This was dated by dendrochronology to c 1131, ten years after the foundation of Reading Abbey (see Miles, Chapter 11). Although no other timbers could be dated to this phase it remains possible that other timbers in this area (assigned to site sub-phase 3002) were also contemporary.

In TP 302 to the south of site 300 a man-made clay bank orientated south-west to north-east was consolidated with layers of deliberately laid plant matting (Plate 2.37). This probably represents the southern bank of a man-made channel, which, from its location, seems likely to have been the tailrace channel of the mill, taking water away once it had turned the waterwheel.

Taken together this rather fragmentary but compelling evidence indicates a working mill of significant size on this site during the late 11th and early 12th century. This raises the strong probability that the position and course of the upstream feed channel or leat (later known as Mill Water) and the downstream channel that returned water to the river (later known as Mill Tail) had already been established. The first conclusive evidence of these features comes in the following Project Phase.



*Plate 2.36 Site 300: view looking SW of the fully excavated remains of (above) complete pit wheel 13385, with (below) a detail showing the joint between two of its felloes (Project Phase 2)*







Plate 2.37 Site 300, Test Pit 302: view looking SE of the plant matting placed to consolidate the south bank of the mill tail (Project Phase 2)

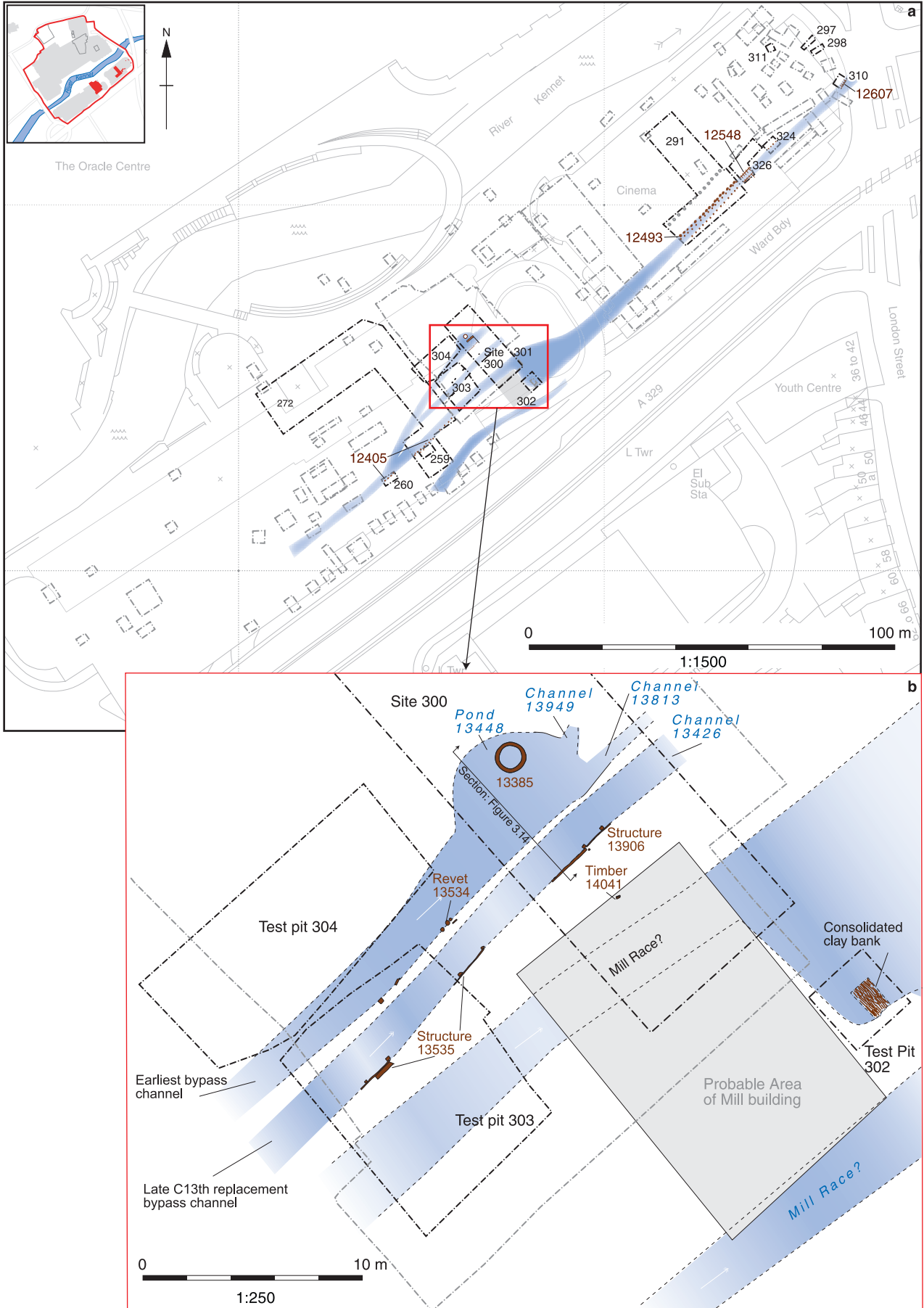
#### Project Phase 4: mid 13th to late 14th century

*St Giles Mill: maintenance of the old mill, channel engineering and development on the London Street frontage* (Figs 2.22, 3.14)  
(site sub-phases 3001b, 3002a,b)

During the late 13th century the old mill seems to have been approaching the end of its useful life. The pond was silting up, and a new channel was cut immediately to the south, probably intended as a replacement bypass channel to ensure that surplus water continued to be carried away from the mill and returned to the Kennet. Evidence for this channel, which was lined with timber revetments, was seen within TP 303 and site 300 (Fig. 2.22b). Upstream, what was probably the revetted south side of the mill leat, bringing water from the Kennet towards the mill, was recorded in TPs 259, 260 and 272 (Fig. 2.22a). Downstream, evidence was

recorded for the maintenance and revetment of the mill tailrace channel. The existence of a tailrace channel was inferred in Project Phases 2-3 (above) from the presence of a man-made reinforced clay bank in TP 302. In Project Phase 4, a channel lined with post and plank revetments was traced downstream as far as 80 m from the site of the mill itself (Fig. 2.22a).

London Street, incorporating a new bridge over the Kennet, had been laid out by the abbey during the late 12th century as part of a deliberate attempt to divert trade, from the area of the old Minster to a new market outside its own west gate (see Chapter 1, above). London Street was laid out with burgage plots to either side, in order to attract new tenants and raise the abbey's rent revenues. Plots along the London Street frontage would have backed onto the floodplain, offering all the advantages of access to its water resources. This probably attracted crafts and trades that needed ample supplies of water into



the area. Although the London Street frontages were not subject to controlled excavation during the project, the watching brief on the east side of the project area, adjacent to London Street, found evidence for this occupation and exploitation of the floodplain.

*In the immediate vicinity of the mill*

In TP 303, immediately upstream from the position of the mill, the southern side of a channel that led to the pond (described in sub-phase 3001a) was associated with a simple post and plank revetment 13534. A number of these timbers yielded tree-ring dates but only plank 13533, which dated to AD1257-77, proved to belong to this phase. This may represent the primary attempt to strengthen and formalise the earthen banks of an already existing channel. Other timbers gave early 14th-century date ranges (see below).

A second channel, orientated SW to NE and measuring 2 m wide and 0.8 m deep, was constructed between the south side of the silted-up pond and the area of the 12th-century timber pile (see above). The channel (cut 13426 on Fig. 3.14) was observed to run for a total of 19 metres, through TP 303 and site 300. The southern bank was strengthened and retained with a simple post and plank revetment structure, Structure 13535 in TP 303 and

Structure 13906 on Site 300 (Plate 2.38); the northern side however was left as a simple earthen bank with no associated timber-work. A number of different timbers belonging to the revetment yielded dendrochronological dates, which collectively suggest a construction date no earlier than 1277 (see Miles, Chapter 11, below). The channel then filled with fairly clean alluvial silts with generally low levels of organic remains; fragments of oak (see Allen, Chapter 8, below) may represent two separate episodes of construction waste entering the channel. Late 13th- and early 14th-century pottery from the fills of the channel concurs with the dendrochronological dates.

This channel was created in the last decades of the mill's life. The addition of this channel suggests remedial measures were necessary, perhaps due to failures in the old mill, or some change in the water regime in the valley floor.

*In the surrounding landscape – upstream from the mill*

In TPs 259, 260 and 272 a SW-NE orientated timber post alignment (Structure 12405) was identified, and ran for a distance of approximately 15 m (Fig. 2.22a). Although a number of timbers were sampled, none yielded a tree-ring date. This structure sat between the historically known northern and southern sides of the later mill leat called Mill

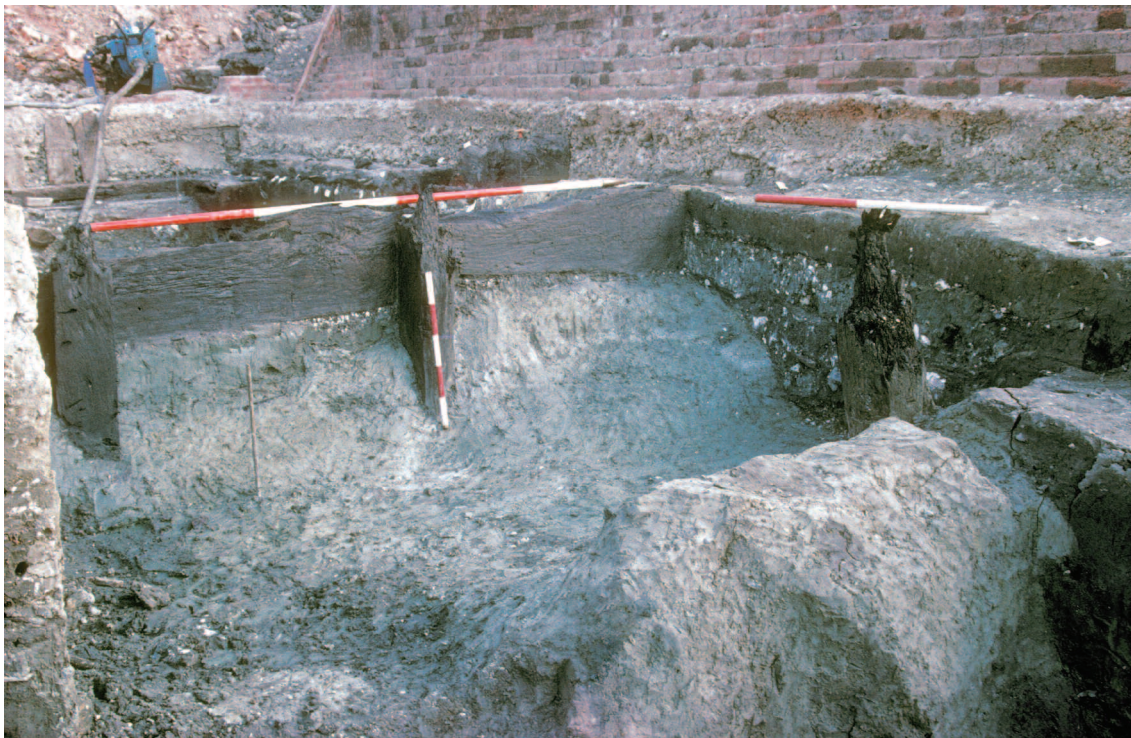
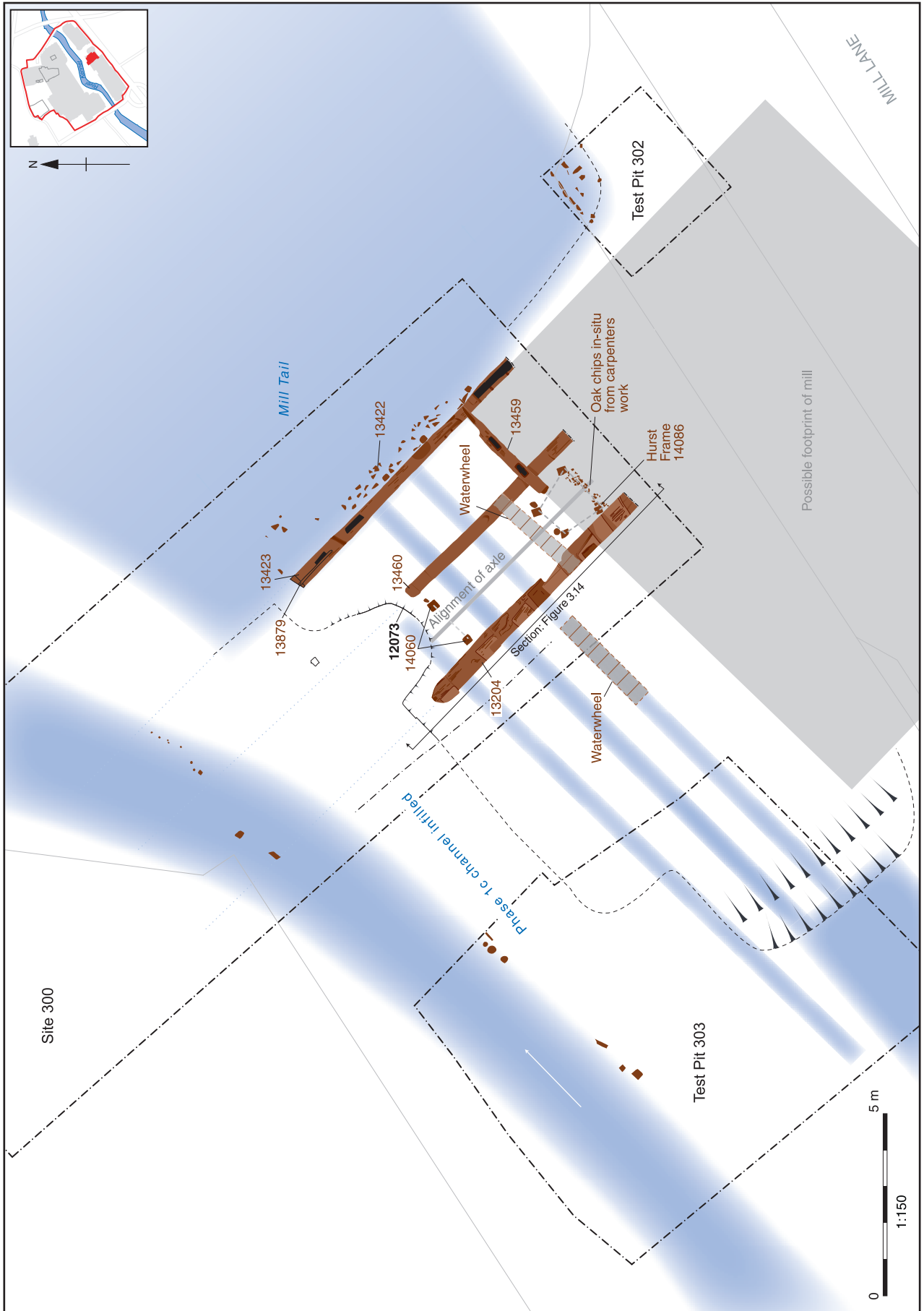


Plate 2.38 Site 300: view looking S of post and plank revetment 13906 of the southern bank of the bypass channel; the timbers were tree-ring dated to AD 1278 or after (Project Phase 4)

Fig. 2.22 (opposite) Site 300 and neighbouring test pits: showing the mill features of the 12th and 13th century in relation to the general plan of all investigations south of the Kennet showing the location of mill channels of the later 13th century (Project Phases 2–4)



Water, and therefore probably predates this water course. The remains were similar to the mill tailrace structure 12493 in test pit 291 (see below) and therefore it may belong to this phase and probably acted to retain the southern edge of the principal mill leat itself.

#### *The surrounding landscape – downstream*

Downstream, evidence was seen for a channel that was probably the mill tailrace channel, taking water away from the mill (Fig. 2.22a). An alignment of timber posts was revealed within four test pits, from west to east TPs 291 (structure 12493), 326 (Structure 12548), 324 (not numbered), 310 (structure 12607). In TP 326 the posts were associated with planks, and probably represent a revetment structure. These alignments were closely associated with the remains of a SW to NE orientated channel, which survived as a strip of dark organic silts overlying the natural blue-grey alluvial deposits (of site sub-phase 3000). Dendrochronological date ranges from the timbers in these structures span the duration of this phase (see Miles, Chapter 11, below). These date ranges indicate that re-used timbers were incorporated into the structures and/or that there was constant maintenance and repair of this landscape feature.

#### *The London Road frontage*

On the east side of the project area, to the north of the mill tailrace channel discussed above, was a concentration of activity attributed to this phase. A variety of features and deposits were recovered from TPs 297, 298 and 311 (test pits are located on Fig. 2.22a but the features are not illustrated). TP 311 located another SW-NE orientated timber alignment, 12492, dated by dendrochronology to the summer of AD 1272. Evidence from TPs 297 and 298 was fragmentary but indicates significant activity, including timber structures and other probable man-made channels that had filled with silts containing well preserved organic remains. This shows clear evidence for development of the valley floor associated with the rear of plots probably fronting onto London Street as it crossed the valley floor from the south towards the market area established by the abbey outside its west gate.

#### ***The new mill: 1308-1600*** (Figs 2.23-2.24, 3.14) (site sub-phase 3002)

This phase has clear evidence for the construction, and subsequent use and modification of a substantial vertical watermill. Elements recovered included the timber ground frame, wheel races, mill tail and probable 'Hurst Frame'. These structural remains were constructed to the south of the former pond, which was re-dug. This phase has a number of sub-phases which represent later modifications to the

mill. There is also evidence for reclamation of the valley floor to the east of site. An explanation of mill terminology can be found in Chapter 5, below.

#### *Construction c 1308+* (site sub-phase 3002a)

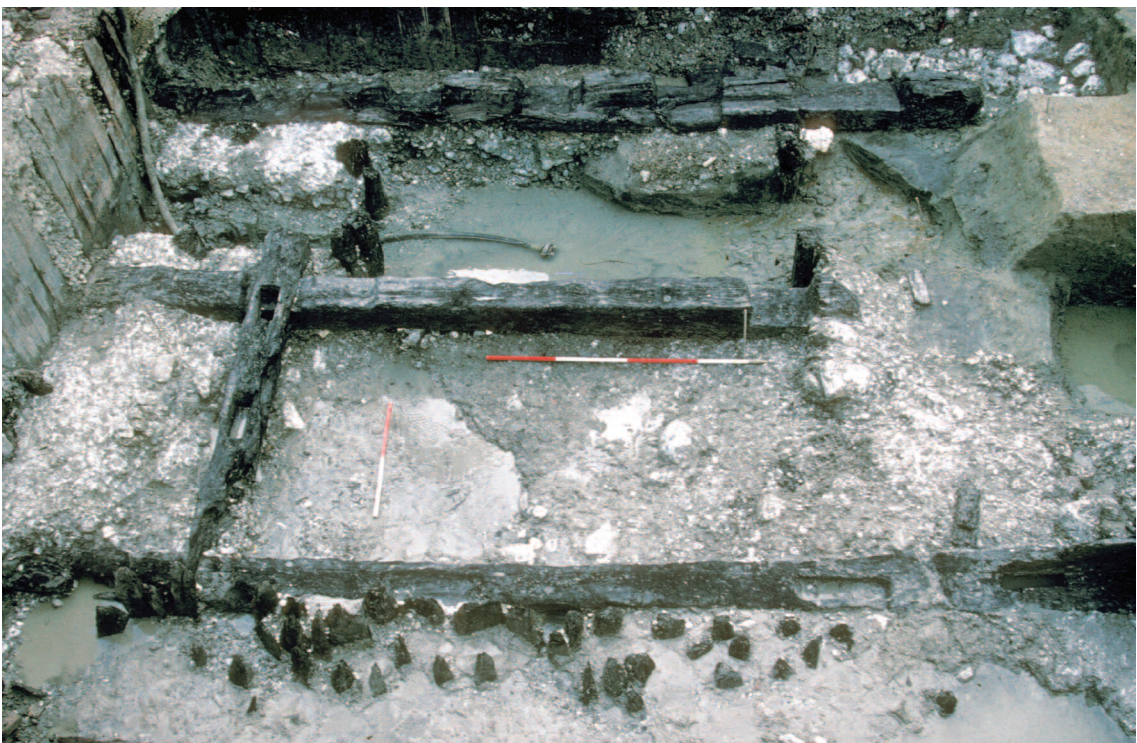
The northern and western edges of a very substantial cut, with near vertical sides, were revealed on site 300 and in TP 303 (Fig. 2.23; cut 12073 on Fig. 3.14). The cut measured over 7 m NW-SE by over 17 m SW-NE and was 1.0-1.2 m deep. The eastern and southern extents of the feature lay beyond the site limits. The northern edge had an irregularly shaped plan, which had been tailored to the differing lengths of the timber foundation elements it was designed to receive. Its primary fill (on site 300 and TP 303) was a substantial dump of large chalk and flint nodule rubble which acted to consolidate the soft alluvial silts at the base of the cut, and therefore formed a solid foundation deposit and construction platform (Plate 2.39). Within the construction cut on site 300, and set upon this foundation deposit, were the remains of a timber foundation for a vertical-wheel undershot water mill. The foundations comprised beams laid horizontally on the rubble foundation forming a large horizontal frame, and associated vertical posts and piles (Plate 2.40). The main horizontal frame, Structure 13461, consisted of three large beams set parallel and orientated NW-SE, that is, transversely or at right-angles, to the direction of waterflow (Fig. 2.23). These beams were all dated by dendrochronology; from west to east timber 13204 dated to 1302-?34; timber 13460 dated to 1289-1312; and timber 13423 dated to after 1267. A single ground beam, 13459, orientated SW-NE, did not date. Vacant mortise holes and other joints showed the positions of missing vertical and horizontal elements of the foundation and superstructure (Fig. 2.24). Ground beam 13204 had three large vacant slots or trenches in its upper face; two measured 0.55 m wide and the third 0.47 m wide; all had vertical sides and a flat base (Plate 2.41). Ground beam 13423 had two vertical posts jointed into the upper face of its northern end. These retained the remains of a large vertical plank 13879, dated to 1308-40 (Plate 2.42). Combining these tree-ring dates suggests the structure was built after 1308.

Vertical timbers that belong to this phase of construction were driven into the deposits at the base of the construction cut. In total there were three distinct groups. The two smaller groups (14060 to the north and 14086 to the south) sat opposite each other, and were located between the western (13204) and central (13460) transverse beams of the ground frame. Also present was a very large linear group of piles (13422) on the downstream side of the easternmost transverse ground beam (13423). The interpretation of these is discussed below.

*Fig. 2.23 (opposite) Site 300, St Giles Mill: detailed plan of structural foundation timbers of the early 14th-century mill (Project Phase 4) and later additions (Project Phase 5)*



*Plate 2.39 Site 300: view looking NE showing oak chip waste lying on the chalk foundation deposit, as a result of the on-site trimming of the oak frame by carpenters during construction of the early 14th-century mill (Project Phase 4)*



*Plate 2.40 Site 300: general view looking SW of the foundation frame of the early 14th-century St. Giles Mill (Project Phase 4)*

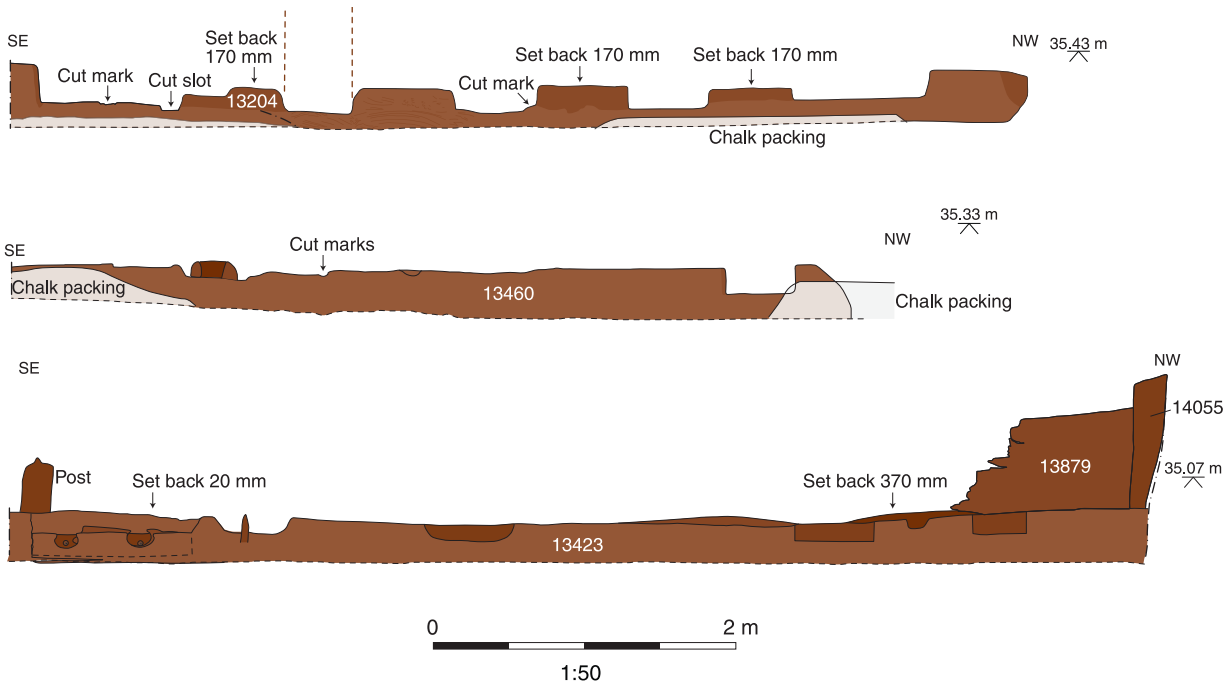


Fig. 2.24 Site 300, St Giles Mill: details of timber joints in the foundation timbers of the 14th-century mill (Project Phase 4)



Plate 2.41 Site 300: view looking SW showing the slots and jointing in beam 13204 which gave a dendrochronological date of AD 1302-?34 (Project Phase 4)



Plate 2.42 Site 300: view looking NW of beam 13423 showing vacant mortises for vertical posts and in-situ planking. The beam was tree-ring dated to after AD 1267 (Project Phase 4)

The ground beams allow us to reconstruct the probable form of this part of the mill, starting with beam 13204 at the upstream end. The three large trenches in the upper face of this timber probably each held timber plank-built trough-like chutes or channels, known as races. The upstream end of the races probably sat in these vacant trenches, directing the water into the races to drive one or possibly two waterwheels, which rotated within them (the third race possibly acted as a spillway or bypass channel or a fish/eel trap). The wheels may have rotated on the same axle (equally it is possible that another wheel sat in the central race upstream of the wheel in the southern race). This axle would have been supported on a Hurst Frame, the remains of which are probably represented by the two groups of opposing posts, 14086 and 14060, situated between the western and central ground beams. The trapezoidal arrangement of the southern group 14086 suggests that this would have been the location of the pitwheel.

Remains of a probable paddle/float (13967) from a water wheel were recovered from channel 14050 (Fig. 5.53 Nos 15-16) and were probably discarded during the demolition of the mill in the early 17th century. The paddle/float was 0.35 m wide and could have operated within a narrow wheel-race conforming to the dimensions of those described above.

The tailrace would have started from the position of the central ground beam, 13460, and the end of the tailrace corresponded to the easternmost ground beam, which would have formed the beginning of the tailrace channel.

These structures were probably outside a mill building that lay on the bank to the south, where the supports for the pitwheel, and therefore the mill stones, would have been located.

Once the timber structure described above had been installed, further chalk and clay waterproofing deposits were packed around it, and the area to the north (where the bypass channel of the late 13th century had been) was reclaimed as solid ground.



Immediately to the north of this reclaimed ground, the very early pond 13448 (see above) was re-established by cut 13297, and the post and plank revetment on the southern side of the channel leading to it had been repaired. Two of these posts were datable by dendrochronology: post 13643 dated to 1294-?1326 and post 13620 dated to 1317-1349.

The remains of a lantern wheel or pinion were found in TP 303, within the chalk and flint rubble foundations (context 13628). A lantern wheel was a gear wheel that meshed with the pitwheel and allowed rotation to move from the vertical turn of the horizontal main shaft to the horizontal turn of the vertical shaft (Fig. 5.52). It is possible that it worked with the pitwheel found in the nearby pond (see above).

The primary structural timbers laid on the rubble foundation deposit in TP 303 used forms of jointing and iron nails that suggest a post-medieval date (see Chapter 3, below). It is possible that remains of the early 14th-century mill frame did not extend into this part of the construction cut, or perhaps they had been removed altogether when the mill was demolished and rebuilt in the 17th century.

It is very likely that the rebuilding of the mill would have been associated with significant works on the channels both upstream and downstream. However, no evidence was recovered from the archaeological observations to confirm this. It is probable that the existing mill leat and mill tailrace channel described above continued in use. Maintenance of the mill tailrace channel during the later 14th century is shown by two timbers from revetment group 12493 originating from the same parent tree, which gave a felling date range of AD1358-90 (site sub-phase 3002b).

The Hurst Frame was repaired or strengthened in the middle of the 14th century, when a timber post, 13897, was added to the northern posthole group of the probable Hurst Frame, 14060. This timber, which would have supported the far end of the axle or main shaft, was dated to winter 1356/7 and suggests that remedial work was needed within 50 years of the initial construction.

#### *The London Street frontage*

From TPs 312, 314, 315, 333, and 349 in the north-east corner of the site a distinct horizon of dumping/reclamation was recognised. The deposits contained a significant amount of leather and other more common material such as pottery and building materials. The pottery suggests an extended period of similar activity in this area throughout the 15th century. These deposits were probably related to activities associated with properties fronting London Road, or utilising the water from the tailrace channel.

### **Project Phase 5: 1400-1500**

#### *Mid 15th century additions to the 14th-century mill (site sub-phases 3002b and 3002c)*

A number of structures associated with the mill contained timbers that gave dendrochronological date ranges within this phase, suggesting that a series of strengthening works were necessary to the downstream end of the mill building, the downstream limit of the tail races that ran through it, and the reclaimed land upon which its northern element was constructed.

Immediately to the east of the mill ground beam 13423 (Fig. 2.23) was a group of piles, 13422. These acted to retain the beam, and are thought likely to be contemporary with the construction of the mill frame at the start of the 14th century. Three of these piles were tree-ring dated to the mid 15th century, however, suggesting that strengthening works were needed. Pile 13410 dated to 1457-74, whilst piles 13406 and 13413 both dated to winter 1459/60, as they both originated from the same tree (see Miles, Chapter 11). The group of timber piles extended to the south into TP 302 (Group 12235), although none dated to this phase.

Extending to the north of the above group of piles on site 300 was a north-south alignment of three timber posts/piles, two of which gave 15th-century dendrochronological dates: timbers 12122 and 12123 both originated from the same parent tree, with a date range of 1427-?59. These had been driven into the eastern side of the man-made tailrace channel bank, and acted to strengthen the side of this bank, rather than belonging to some form of superstructure that has not survived. A timber tie-back structure, Group 13298, may have anchored the retaining posts but the actual tying-back beam 13251 did not extend far enough to make this connection clear.

No evidence was recovered for activity datable to Project Phase 6, 1500-1600.

### **Project Phase 6: 1500-1600 continued repairs and maintenance (site sub-phase 3002d)**

A small number of timbers were dated to this phase of activity, and attested to the maintenance of revetment structures associated with waterchannels rather than the mill building itself. A single timber from post and plank revetment 12540 dated to the first half of the 16th century giving a range of 1512-?44. Post revetment Group 12235 in Test Pit 302 was repaired or strengthened during the latter half of the 16th century, with the installation of two posts: 12236, which gave a felling date of winter 1549/50, and 12247 which yielded a slightly later felling date range of 1565-92.



# Chapter 3 The Later Development of the Site from c 1600 to the Present Day

## SITE 29: THE ORACLE WORKHOUSE

### Project Phase 7: c 1600-1680

#### *The decommissioning of the 16th-century tannery or clothiers' works* (site sub-phase 2908e)

The wooden vessels that belonged to the tannery/clothiers works (see Chapter 2, Project Phase 6, above) were left in the ground, filled in, and then buried below a thick layer of numerous dumped deposits (site sub-phase 2908e). These dumps were relatively large-scale indicating that this activity probably occurred over a short space of time. It is not possible to say in what order the disused vessels were backfilled, although practical considerations of access would suggest that the vessels to the outside of the complex were infilled first, and that this probably occurred from north to south. The evidence demonstrates that the area had been deliberately covered over, possibly to mask the stench that a disused tannery would have exuded or to reclaim and raise the ground level in preparation for construction of the Oracle workhouse (see below). The presence of significant quantities of broken roof tile and mortar suggests that some of the dumps derived from the demolition and clearance of buildings, possibly those that belonged to the tannery/clothiers' complex on the site. The absence of stone in these deposits indicates that this building material was reclaimed for re-use. The localised subsidence of the later Oracle courtyard in the locations of each former vat (see Plate 2.21) also suggests that there was much organic waste in these dumps that did not survive.

#### *The workhouse*

In the latter half of the 16th century there were very few establishments outside London that provided for society's poor and infirm. This had been an important function of the country's great religious institutions, such as Reading Abbey, until they were dissolved by Henry VIII in the late 1530s. In 1578 the Corporation of Reading established a 'hospital' in the former Greyfriars Church in Friar Street (Phillips 1980, 40). By 1591 this had been 'converted to a house of correction, as well as for setting of the poore people to work' (Guilding 1892-96, vol 1,

403). *Ad hoc* institutions like this did not really address the problems of poverty and 'idleness' either nationally or locally, and these became a focus of Elizabethan and later legislation. In 1623 an Act of Parliament encouraged charitable donations to assist in the construction of new establishments for the poor (Morrison, 1999). In the following year John Kendrick a very successful local clothier and Master Draper and Merchant Adventurer of the City of London died. In his will he left the sum of £7500 to the Corporation of Reading to 'build a strong house of Bricke fit and commodius for the setting of the poore on worke therein', thus making him one of the 'great charitable benefactors' of the period (Jackson 1994, 44, 45).

Three years later, in 1626, the Corporation bought a house and land located on Minster Street from John Kendrick's brother William, who ran his cloth making business from the site where 'all the major cloth making processes were carried out in workshops on the Minster Street site' (*ibid.*, 30). An inventory of the purchase lists a dyehouse within which were 'three furnaces, a flat vat, two woad vats and racking hurdle and frame' (*ibid.*). Some of the remains of the wooden vats, troughs and furnace house on site 29 described in Project Phase 6 (Chapter 2, above) may well be the remains of Kendrick's cloth workshops. An adjacent plot of land was bought from Anthony Blgrave. It is possible that it was at this time that the wooden vessels were infilled and the tannery, possibly Kendrick's cloth works, was demolished and infilled.

A clear plan of the layout of the Oracle is shown on Tomkins' map of 1802 (Plate 1.5) and in a Reading Corporation Terrier of 1807 (Plate 3.1; the plan is drawn with south at the top). The general layout represented on these plans had probably altered very little from when the workhouse was first built. In 1850 when the building was sold it was fully described in the *Reading Mercury*. The structure comprised a large courtyard, or quadrangle, with the Holy Brook running as an open water course along its southern edge, surrounded on all sides by ranges of buildings. Entry was provided from Gun Street through substantial wooden gates flanked by Ionic stone columns and housed in a stone gatehouse (Plate 3.2). South of Gun Street, the west edge of the workhouse complex was formed by the long-lived lane first seen in Project Phase 3 (labelled 'Passage' on the Terrier, Plate 3.1).

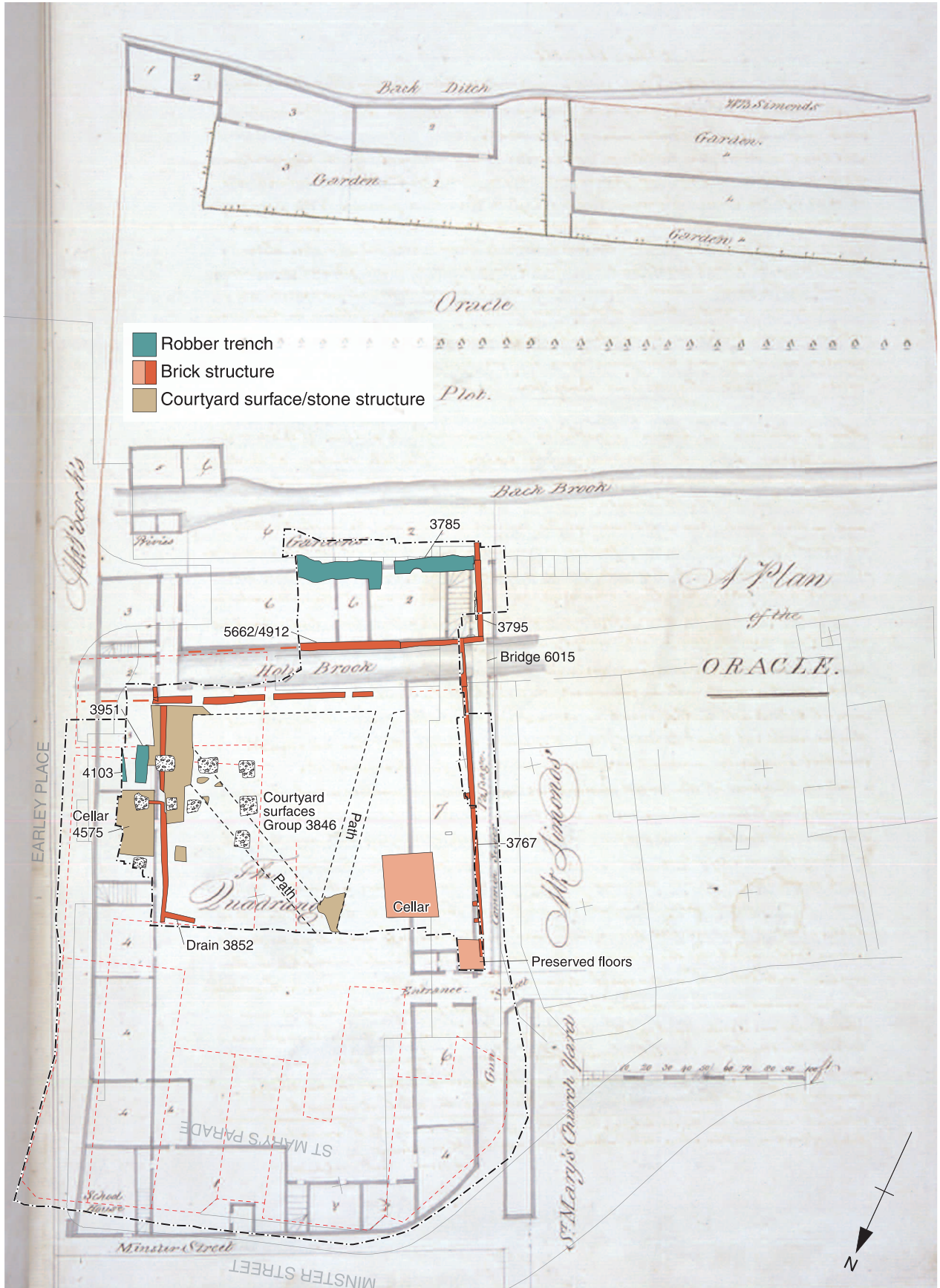


Plate 3.1 Reading Corporation Terrier of 1807 showing the Oracle workhouse, with the location of the excavated remains superimposed

### Chapter 3

The east, west, and southern ranges were constructed from new, in bricks that had been locally supplied by William Brockman of Tilehurst (see Smith, Chapter 8 below). Various views show these ranges were two storeys high, with a further storey in the loft. In addition they show that the brickwork was patterned, probably using overfired vitrified

bricks to pick out a loose checkerboard appearance, which was interrupted by small but frequently spaced leaded glass windows. The loft space was lit from windows within regular gable projections. A sketched view of this structure can be seen in the landscape presented in Plate 1.7, here shown as a detail (Plate 3.3). Plate 3.4 shows a view of the north-



Plate 3.2 Calotype by William Henry Fox-Talbot of the Oracle workhouse entrance, Gun St, in the 1840s (Science Museum SCM/541/69)

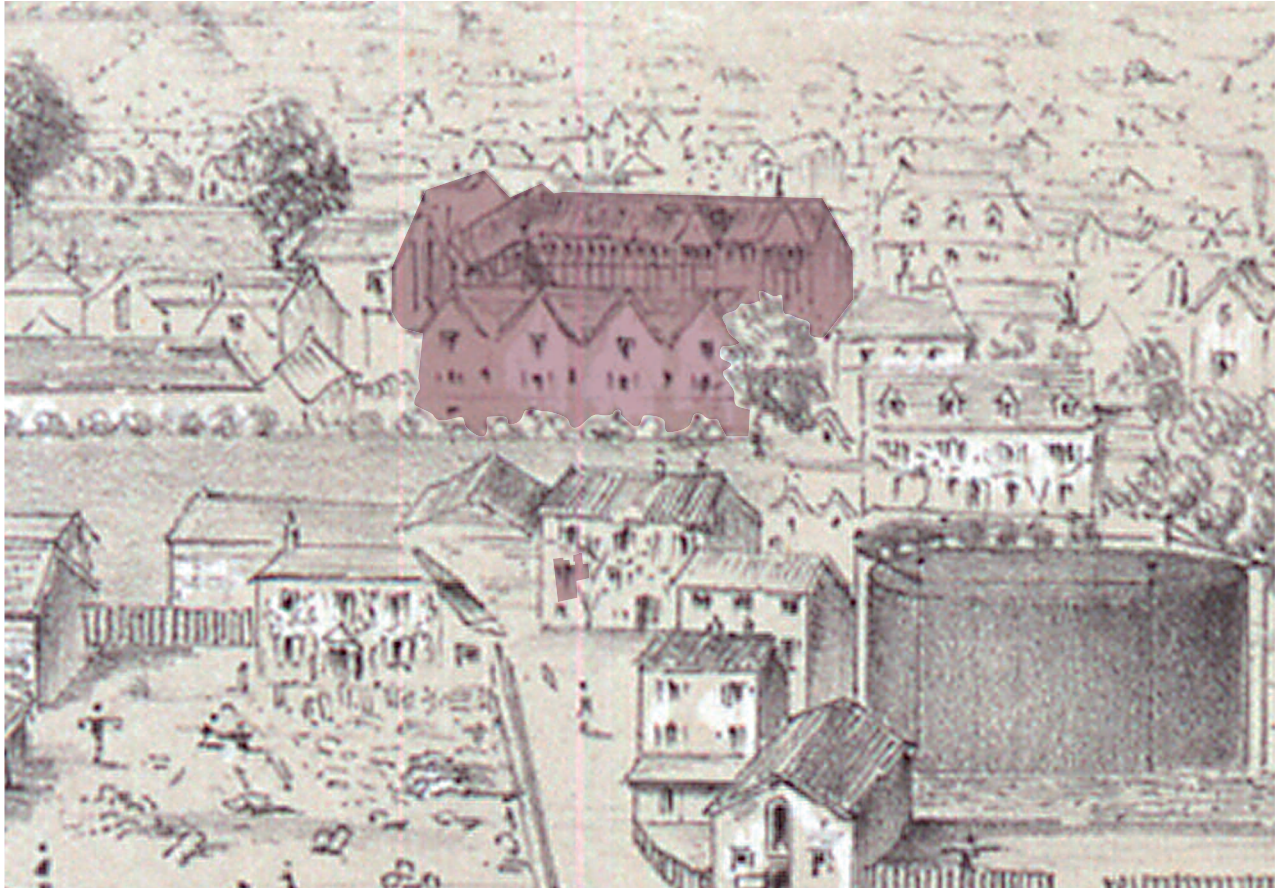


Plate 3.3 A detail from the E H Buckler view of Reading, looking north-west (see Plate 1.7), as seen from the water tower with the Oracle highlighted



Plate 3.4 'The Oracle and Minster St 1628', an artist's impression looking NE

western corner of the Oracle from the west, with elements of the north and west ranges as well as the gateway. The northern range incorporated late medieval jettied timber-framed structures, one of which was probably William Kendrick's house.

The complex extended across the Holy Brook, and the south range was built against the south bank of the channel. Beyond the south range was a large plot of open land on the valley floor. This area also belonged to the Oracle, and is probably the plot of land bought by the Corporation from Anthony Blagrave.

*The archaeological evidence* (Plate 3.1)

*The construction of the workhouse*  
(site sub-phase 2909a )

Archaeological remains from the construction, occupation and use of the workhouse were

limited. Large basements had been dug into the area of site 29 during the 19th century (see below), and these had destroyed much of the evidence. Some structural fabric of the east, west and south ranges remained, and a new revetment on the north bank of the Holy Brook. The central courtyard partially survived and three semi-cellaried rooms not represented on historic maps were discovered.

Two adjacent pits (4326 and 4410), probably saw-pits (Plate 3.5), show that the area that had first been used as a builder's yard in the 16th century (see Chapter 2 Project Phase 7) was probably used again in this way during the construction of the workhouse in 1627 and 1628. The primary courtyard surfaces 3755=3743, 4207 and 4621 sloped gently down to the south and consisted of rubble fragments and small stone cobbles. They survived only in patches, some of which had slumped into the softer infills of the



*Plate 3.5 Site 29 the Oracle:  
view looking SE of the saw  
pits (Project Phase 7)*

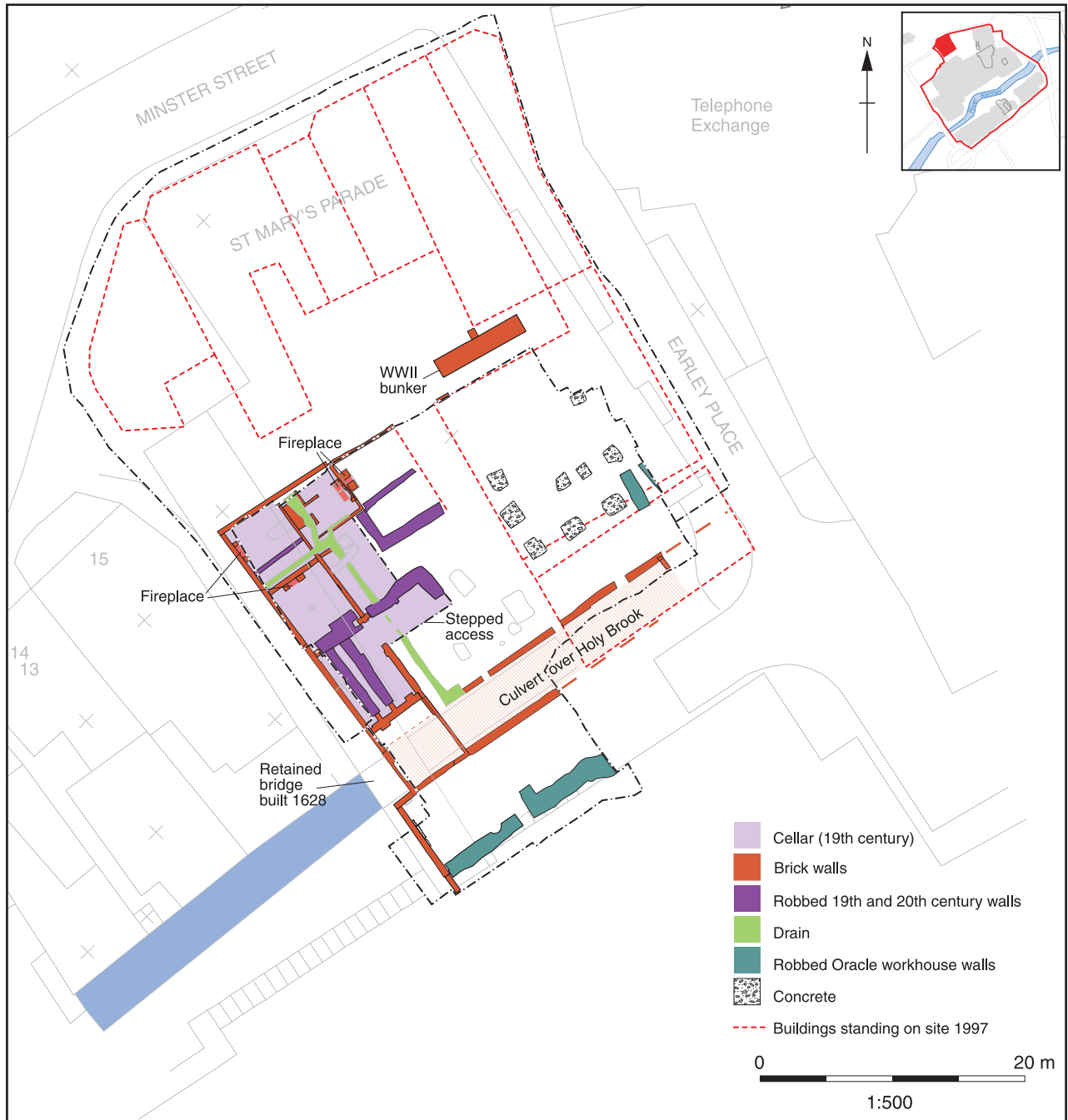


Fig. 3.1 Site 29: plan showing the 19th- and 20th-century archaeological features, and standing buildings on the site at the time of the excavations in 1997

vats from the tannery / dyehouse (see Plate 2.21). In the south-east corner a cobbled surface (4455/4456) had a central drainage gully that was floored with bricks set on edge. There was a distinct lack of finds from the occupation deposits that overlay these surfaces, suggesting that the courtyard was kept relatively tidy.

*The east range*

Some structural evidence survived for the east range, although its eastern edge lay outside the limits of the excavation. The position of the main

western wall of the east range was represented by robber trench 3951 and/or 4103 in the south-east corner of the site. The west part of a cellar (4575) was found in the southern half of the courtyard, on the east side, some 8 m north of the Holy Brook (Plate 3.6). It was built within a large pit 4973 which measured 5.2 m (N-S) by 3.2 m+ (E-W). The lower element of the walls was constructed from re-used masonry, some of which seems to have come from Reading Abbey (see Preston, Chapter 8). The upper elements of the walls were constructed of brick, and were keyed into a brick-built drain, 3852, which ran





*Plate 3.6 Site 29: view looking NW of cellar 4575 in the east range of the workhouse (Project Phase 7)*



*Plate 3.7 Site 29 the Oracle: view looking SE along drain 3852 (Project Phase 7)*

towards the Holy Brook (Plate 3.7). Access via a set of steps (that did not survive) was provided from the north end. The cellar floor consisted of large well-laid cobbles, 4604, around a brick hearth setting, 4605, in the northern half of the room. The hearth and to some extent the surrounding floor was overlain by charcoal-rich occupation deposits 4790 and 4510, although there were no finds. It is unclear whether this hearth was purely for heat, or whether it had some function in a production process.

*The south range*

Only the western third of the south range, beyond the Holy Brook, fell within the excavated area. Construction began immediately adjacent to the channel, where a substantial brick river wall (5662/4912) was built upon flint foundations (10568). This wall also acted as the structural north wall for the southern range. A brick bridge (6015, see below) was sprung across the Holy Brook (Plate 3.8) from a point six courses high within this wall. The entire length of the western wall (3795) survived to just above floor level and formed a corner with the southern wall (3785), which survived as only a short length but to a similar height. These walls showed similar construction methods and were achieved in a series of stages. Flint foundations lined the base of the construction cuts, with substantial brick footings above, raised in stages much like the north wall. This method appeared to be linked to episodes of ground level raising within the space enclosed by the walls, prior to the laying of the floors. The range was 6 m

wide from north to south. On the western side (in the south-west corner of the complex) there was a greater height of made ground and floor levels were higher than those to the east. This suggests a division of the internal space for which no partition wall survived. To the east of this area, evidence for flooring from this phase was restricted to isolated patches of crushed chalk and mortar, probably the remains of a bedding layer for a brick surface. Two burnt deposits belong to this phase, 5610 and 5581, and there was one oval pit and a slot whose functions are unknown.

*The west range*

The western wall of the west range, and its foundation, were revealed. This wall (3967) was 0.40 m wide and was constructed of brick laid in a random bond. To the south it was founded upon the remains of the 16th-century sandstone building that had previously occupied the site (see Chapter 2, Project Phase 6, above); however to the north of this it sat upon a contemporary foundation of reused bricks, tiles, flint, chalk and limestone (4181) (Plate 3.9). The eastern wall and the majority of the internal occupation levels of the west range had been removed when the floor levels for almost the entire range were lowered to provide a new basement in the mid 19th century (see below). The later basement did not extend to the full northern limits of the west range, and it was in this location that a comprehensive sequence of construction, repair, re-use and finally disuse of the interior of



*Plate 3.8 Site 29 the Oracle: view looking SW at original brick bridge 6015 which carried the western range of the workhouse over the Holy Brook (Project Phase 7)*



Plate 3.9 Site 29: view looking SW at the west wall (3967) of the west range of the workhouse (Project Phase 7)

the range was preserved. Here it was seen that the original floor (4200) had been repaired (4199) and subsequently needed complete replacement (4122) due to subsidence. Each re-laying consisted of a mortar bedding layer for a brick surface, which was all that remained, the bricks having been removed.

Towards the northern end of the west range and off-set from its alignment so as to be positioned half projecting into the courtyard and half under the range were the partial remains of a brick lined cellar which measured 4.5 m square. The brick floor and any occupation deposits were absent although the mortar bedding remained. The relationship between this cellar and the western range had been destroyed by later demolition and remodelling work, but it was probably built during this primary construction phase.

#### *The bridge over the Holy Brook*

Bridge 6015 (Plate 3.8), of four-centred arch design, was 2.4 m wide and constructed entirely of non-vousoired brick. It had a centre span of 3.30 m between the two east-west orientated brick walls with flint foundations that acted as abutments on either side of the Holy Brook. The apex of the arch sat 1.2 m above the uppermost level of the flint foundations. Until its demolition to make way for the shopping centre this was the oldest surviving bridge in Reading and the only surviving element of the Oracle Workhouse from which the shopping centre took its name.

#### **Project Phases 8 and 9: 1680-1850: The later development of the workhouse**

##### *The remodelling of the Oracle Workhouse c 1690–1710+ (site sub-phase 2909b)*

In the event, Kendrick's original intention that the Oracle workhouse would offer gainful employment for the poor of Reading in the cloth industry was never realised. There were a number of reasons for this failure. On the local level there was a certain amount of mismanagement of the workhouse, but the problems were in essence due to greater forces. The declining popularity of English cloth on the international markets during the later 16th century and the first half of the 17th century had led to a persistent fall in demand and a decrease in price, putting pressure on the industry nationally. This trend was further exacerbated in the 1640s by the English Civil War, which severely disrupted productivity and trade in many goods including cloth, and by the outbreak of infectious diseases including typhus (Dils in Petyt 1993, 76). As a consequence the Oracle had already diversified into other activities. In the 1720s, while John Watts was Mayor of Reading, the Oracle was partially restored to improve the accommodation for the poor and provide for activities such as pin making, silk weaving and sailcloth manufacture which took place there (see Chapter 4, below).

Limited archaeological evidence was recovered to add to our knowledge of these activities. A small brick furnace and an associated quench pit in the east range were perhaps used for the small-scale production of metal objects, and may represent a pin maker's workshop. However, there was more evidence that the complex underwent some major structural alterations and repair. The courtyard was furnished with new cobbled paths/carriageways, the two cellars were infilled, and significant internal renovation occurred in the west range. Finds associated with these changes date to turn of the 18th century and probably represent the documented restoration project of the 1720s.

### *The archaeological evidence*

#### *The courtyard and the Holy Brook*

A new, formal courtyard layout was established (Group 3846) represented by a series of paths or carriageways. The evidence, although heavily damaged by later activity especially in the central and western side of the courtyard within the excavated area, clearly showed the layout and organisation of the courtyard. The pathways were constructed of closely packed rounded pebbles laid upon a bedding layer. Some pathways had a central drainage channel (the two sides sloping to the middle) whereas in others this feature was absent. The path edges were marked by limestone or flint nodule kerbs. The pattern that was revealed showed a major N-S path running down the eastern side of the courtyard

(4145=3879, 3.9 m wide and over 13 m long; Plate 3.10). At its south end, it joined an east-west path (4161 and 4267) that ran parallel, and adjacent to, the open Holy Brook. A third, narrower path (4129, 1.82 m wide) joined 4145 just north of its junction with path 4161/4267, and ran in a north-westerly direction. Its line was picked up again around 20 m to the north-west (4160), and it continued out of the excavated area towards the location of the entrance gateway. Path 4160 was joined by a further cobbled path (3964, 1.9 m wide) which ran in a south-westerly direction for over 3 m (its make-up layer ran for a further 3.5 m). These remains suggest that the complete pattern of pathways would have formed a square of wide paths around the outside of the courtyard, enclosing narrower paths forming a 'X' shape inside.

#### *The east range*

The 17th-century cellar towards the south end of the east range (4575) and its hearth went out of use, and the cellar was backfilled (Plate 3.11). The initial dumps of sand and brickearth-rich mortar suggest they were the product of demolition activity, probably within the Oracle, and they included broken medieval tiles and post-medieval brick with occasional metal fittings such as hinges and metal straps. Later infilling included material indicative of more domestic activity, such as pottery, animal bones, shell, clay pipes (including locally-made examples, see Higgins, Chapter 9, below), pins and two fragments from an attractive maiolica tile (Plate 3.12). Some of these finds probably derived from the



*Plate 3.10 Site 29 the Oracle: view looking NW along the main NW-SE pathway of the Oracle Courtyard (Group 3846) (Project Phase 8)*



*Plate 3.11 Site 29 the Oracle: view looking SW showing the back-filling in the cellar in the east range of the workhouse (Project Phase 8)*



*Plate 3.12 Site 29 the Oracle: a maiolica tile from the backfill to the eastern cellar, perhaps from an original wall of the workhouse*



*Plate 3.13 Site 29 the Oracle: vertical view of the furnace (Project Phase 8)*

domestic quarters in the Oracle; the maiolica tile might have been used in a tiled floor, wall or fire-surround, and demonstrates the quality of internal decoration in the better-appointed rooms. The pottery is typical of the period and includes standard English wares such as Surrey borderwares, and locally produced post-medieval redwares. Imports included Frechen and Westerwald stoneware from the Rhineland in Germany, and small quantities of decorative tinglazed wares. The pottery from these traditions was used for the consumption and storage of food and drink. Animal bones included domestic fowl, sheep, and cow and indicate a varied meat diet. One of the tips (4463) was rich in ash and charcoal, which suggests that the building (and perhaps more specifically the domestic quarters) were cleared of rubbish which was first burnt before disposal. The significant numbers of pins present in these later fills suggest that activities involving some form of fabric processing took place at the Oracle, or indeed that pin manufacture had taken place prior to 1720. The former access doorway to the cellar, in the north wall, was blocked (4390) and access from the courtyard was moved to the west wall. Once the cellar had been filled up, a new floor of rammed chalk (4394) was laid. Within the new floor a brick-built sub-circular structure (internal diameter 0.7 m) was constructed adjacent to the southern wall, with a brick-built trough measuring *c* 1.1 m square to its north (Plate 3.13). These structures were probably a small-scale furnace and quenching pit and represent small-scale industry, possibly for the manufacture of metal items, such as pins.

#### *The south range*

Within this structure, major resurfacing commenced on the ground floor with the deposition of a preparation layer of clay (5525). The use of clay may indicate that this structure had experienced a significant damp problem after it was first constructed. These later flooring episodes were similar to the previous sub-phase, with isolated patches of crushed chalk, sand and mortar possibly suggesting that no formal brick floor had been laid in the area east of the corner. Occupation deposits were characterised by ash and charcoal (5533, 5508, 5384, and 5447). There was a significant lack of finds that related to domestic activity in these deposits. This absence may indicate that the area was kept clean or, probably more likely, that this part of the ground floor of the southern range housed some aspect of the production processes documented to have taken place on the site. The small number of clay pipe fragments that were recovered from these deposits dated to the last decades of the 17th century and the beginning of the 18th century.

#### *The west range*

This sub-phase saw major remodelling of the north end of the western range. Echoing changes seen in the east range, the brick-built cellar described in the previous phase in the west range went out of use. Its brick walls were almost totally dismantled, and the resulting hole infilled with material derived from demolition activity (Plate 3.14). The fills contained significantly fewer finds than the backfilled cellar in



*Plate 3.14 Site 29 the Oracle: view looking E showing material dumped into the cellar (3967) in the west range of the workhouse (Project Phase 8)*



*Plate 3.15 Site 29 the Oracle: view looking NW at a detail of demolished or collapsed workhouse wall and ceiling plaster showing the impressions of laths in the untruncated northern part of the west range (Project Phase 8)*

*Under the Oracle*



*Plate 3.16 Site 29 the Oracle: fire places: (above) view looking SW at the western fireplace 3721 and (below) looking NE at the eastern fireplace 3775 (Project Phase 10)*





the east range. Some pottery was recovered, with the majority of the sherds from the pottery traditions already described, although there was also a sherd of Chinese Porcelain, a luxury import. At the same time, the floor in the north end of the west range was removed, and a substantial dump of internal wall and ceiling plaster and other material deriving from demolition works then accumulated. The dumped plaster retained the impressions of the wooden laths to which it had been applied (Plate 3.15). As a result of these works the new internal floor level in this part of the range was raised by 0.30 m. Only a very small section of the make-up for this floor was excavated as it had subsequently been removed by further internal changes.

***The demise of light industry and limited remodeling at the Oracle, 1750-1850***

(site sub-phase 2909c)

No evidence for new works or changes during the later 18th century was revealed in the courtyard, the revetment walls to the Holy Brook or the west range. In the east range the small brick furnace and quench pit that were built in the previous sub-phase went out of use and were partially dismantled and

buried under further dumped deposits. In the south range limited work was undertaken to correct the worn and uneven nature of the earlier floors. Large spreads of chalk-rich dump deposits (3859 and 5273) were laid to prepare for a new brick floor 3857.

(site sub-phase 2909d)

Apart from limited localised patching of the Holy Brook river walls no further major changes occurred to any of the main surviving structural elements of the workhouse, and evidence from this sub-phase is limited to deposits and small features datable to the period after 1830. These comprised small postholes with no particular pattern, and worn areas in the courtyard, demonstrating that activity was still taking place but that little effort was put into maintenance.

**Project Phase 10: 1850-1900: Demolition of the Oracle and other 19th- and 20th-century activity**

This phase represents activity on site 29 after the demolition of the Oracle workhouse around 1850, and the subsequent episodes of redevelopment of the area up to 1998.



*Plate 3.17 Site 29 the Oracle: view looking NW of herringbone brick floor 3812 (Project Phase 10)*

*The map evidence*

A new centrally positioned crossroads divided the area of the former workhouse into quarters. The Board of Health map of 1853 shows the amount of construction that had taken place since the Oracle's demolition in 1850 (Plate 1.6). The map suggests that certain elements of the west and south ranges were retained. Significant lengths of the Holy Brook and the Minster Mill Stream ran under the newly raised ground within brick-built culverts. The Minster Street frontage was developed into ground floor shops called St Mary's Parade. The south-western quarter was developed by 1853, and subsequently underwent remodelling and additions. The south-eastern quarter was partially developed by 1853 with further development later extending southwards. All these structures were later demolished, those in the south-western quarter in the 1960s, those in the south-eastern quarter immediately prior to excavation, and St Mary's Parade immediately after excavation.

*The archaeological evidence*

No archaeological record was made of St Mary's Parade and its later additions, although the outline of the buildings as they were immediately prior to demolition in 1998 can be seen on Figure 3.1. Excavation to the south revealed the remains of a concrete underground bunker, with access provided centrally from the north. This probably dated to World War Two and provided shelter for people who worked in St Mary's Parade and the other properties nearby.

The foundations and west wall of the west range of the Oracle were retained (probably only up to the level of the lane that ran on its western side). This element was reused to form the retaining wall for

the new basement for buildings that ran down the west side of the site in the south-west quadrant. Construction of this basement removed all the floor levels associated with the use of the west range of the workhouse, except in the location of its extreme northern end (see above). The new building, with additional rooms to the east of its northern end, one of which had a basement, was L-shaped and extended into the area of the former workhouse courtyard. At a later date, probably in the 20th century, further buildings were added extending the area covered by basements southwards, that is, adjacent to the original basement. A stepped access was built into the basements at the southern end of these additions. The new structures were built in brick with the walls on concrete foundations; an element of reused undiagnostic architectural stone was also present, which may have come from the Oracle Gateway. The two northernmost basement rooms retained their brick-built fireplaces (Plate 3.16).

The far western corner of the south range of the Oracle was also maintained and it is likely that the latest brick herringbone flooring (3812; Plate 3.17) inside this part of the building served as the floor until it was demolished in the mid 20th century. The brick culverts covering the Holy Brook and Minster Mill Stream were recorded. The south-east quadrant did not have basements in the initial or later redevelopment, although foundations for the structures built there comprised large and deep square concrete bases, which removed the archaeology from all the previous phases. The culvert enabled the building north of the Holy Brook to be extended southwards over the watercourse to meet the building in the south-west corner. To the west of this, the bridge that had been constructed in 1628 was retained to provide access over the stream.

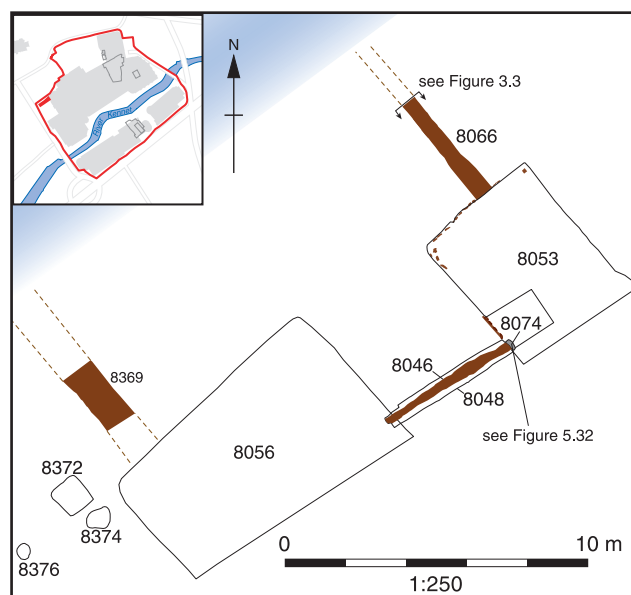


Fig. 3.2 Site 28 Test Pit 78: plan of features related to the dyehouse (Project Phase 7)

## A 17TH-CENTURY DYEHOUSE: TEST PIT 78

### Project Phase 7: 1600-1680 (Figs 3.2-3.3) (site sub-phase 7802a)

During the general Watching Brief on construction works (site code site 28), significant archaeological remains were identified in an area at the west edge of the project area, on the Bridge Street frontage, and just north of the building known as Seven Bridges House. A small area excavation was undertaken to expose the remains of a post-medieval dyehouse dated by dendrochronology to 1611-1612; this was allocated the site number Test Pit 78. Dils' map of Reading in 1540-1640 (1980, 30-31), produced with the aid of deed information, indicates this site was a 'former dye house' but the archaeological evidence suggests that it was in use throughout the 17th century.

The remains (Fig. 3.2) consisted of two roughly square pits positioned 4.5 m apart and cut into a series of alluvial deposits below. The western pit (8056) was of unrecorded depth and the eastern pit (8053) was at least 1.5 m deep; its sides were vertical for the first 0.55 m from the top and then sloped inwards at an angle of about 50°. The pits were linked by a channel (8048) containing a hollowed-out oak timber 0.3-0.45 m wide (8046). This channel sloped slightly from pit 8056 into pit 8053, being 0.08 m lower at the eastern end which was covered with a sheet of perforated lead (8074, Fig. 5.32 No. 5) suggesting that liquid was filtered on its way into pit 8053. Timber channel 8046 and beam 8288 were

dendrochronologically dated to late summer 1611 and found to have been felled from the same tree as w301 (12580) from structures at St Giles Mill suggesting an organised supply of timber to the town, if not a direct link and possible common ownership between the two properties (see Miles, Chapter 11, below).

The eastern pit (8053) was lined with a timber revetment (8052) comprising vertical planks measuring 0.15 m wide x 0.04 m thick x 1.1 m long (Plate 3.18). They were positioned flush with the vertical section of the pit but went through the lower angled part and into the underlying deposits so that the lower part of the pit was not lined. It is likely that the pit would have held a large vessel to contain the liquid and that only the upper part of the pit needed to be protected and lined. Two silty clay fills were deliberately packed around the timbers to keep them in place (8076, 8078) and in each of the two visible corners was a pair of more substantial posts. The function of these posts is not clear but they are most likely to have supported the vessel in the pit. The structure of the pit at Reading is highly reminiscent of Structure 791 at Beverley where a wooden vat was set into a pit in the ground and fed by a wooden pipe. Around the top part of the square pit at Beverley was wooden shuttering, similar to that identified here, and posts to support the vat (Evans and Tomlinson 1992, 29-30). This pit may have been used for cooling liquid, with the coolness of the surrounding earth helping to bring the temperature down (Evans and Tomlinson 1992, 284).



Plate 3.18 Site 78: view looking SE showing the construction detail of the eastern dyeing vat pit 8053 (Project Phase 7)

The liquid from pit 8054 appeared to have drained out through a north-south orientated linear channel adjoining the northern side of pit 8053 (8066). This was lined with thin planks (Fig. 3.3) and at the junction between the channel and the pit, the timber planks of 8053 had gaps between them suggesting that this may have been some kind of sluice gate controlling the outflow of liquid. This channel could have fed back into the Minster Mill Stream which was positioned approximately 5-10 m to the north (the precise location at this time is unknown).

Three pits located just to the north-west of pit 8056 were not excavated because they were below impact levels and were therefore not directly dated but they were cut into the same main deposit as the other features on site 78 (8045) and may have been associated with them.

A second north-south linear feature was recorded during a strip and record operation but not excavated (8369). It could not be traced as far south as pit 8056 but may, from its position, have functioned either as an inflow or outflow channel between the pit and the Minster Mill Stream.

It is not clear precisely when the dyehouse went out of use because the pits were backfilled with dumped material including leather such as Tudor shoe SF 3025, a dagger (Fig. 5.36 Iron 004), oyster shell and pottery, while the timber channel accumulated residual 15th- and 16th-century pottery. The uppermost fill of pit 8053 (8051), however, contained post-medieval pottery of 1700+ suggesting that the pit probably was finally infilled by the early 18th century at the latest.

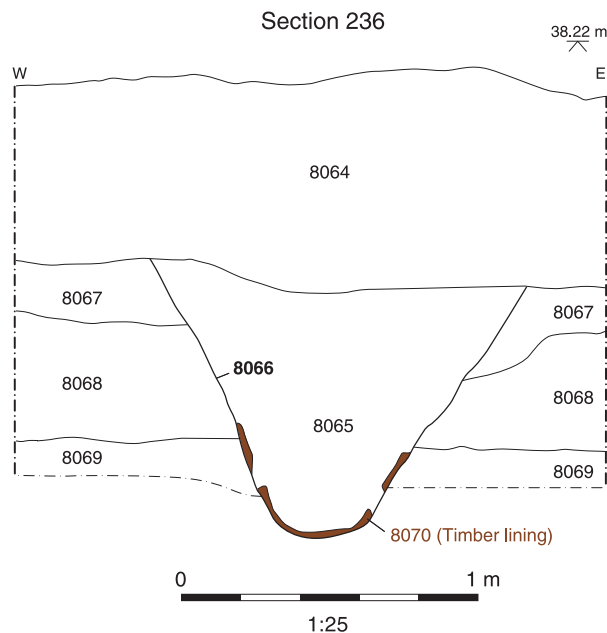


Fig. 3.3 Site 28 Test Pit 78: SE facing section 236, showing timber-lined drainage channel 8066

## SITE 150: THE MINSTER MILL

### Project Phase 7: 1600-1680

#### Millstream revetments (Figs 3.4) (site sub-phase 15006a)

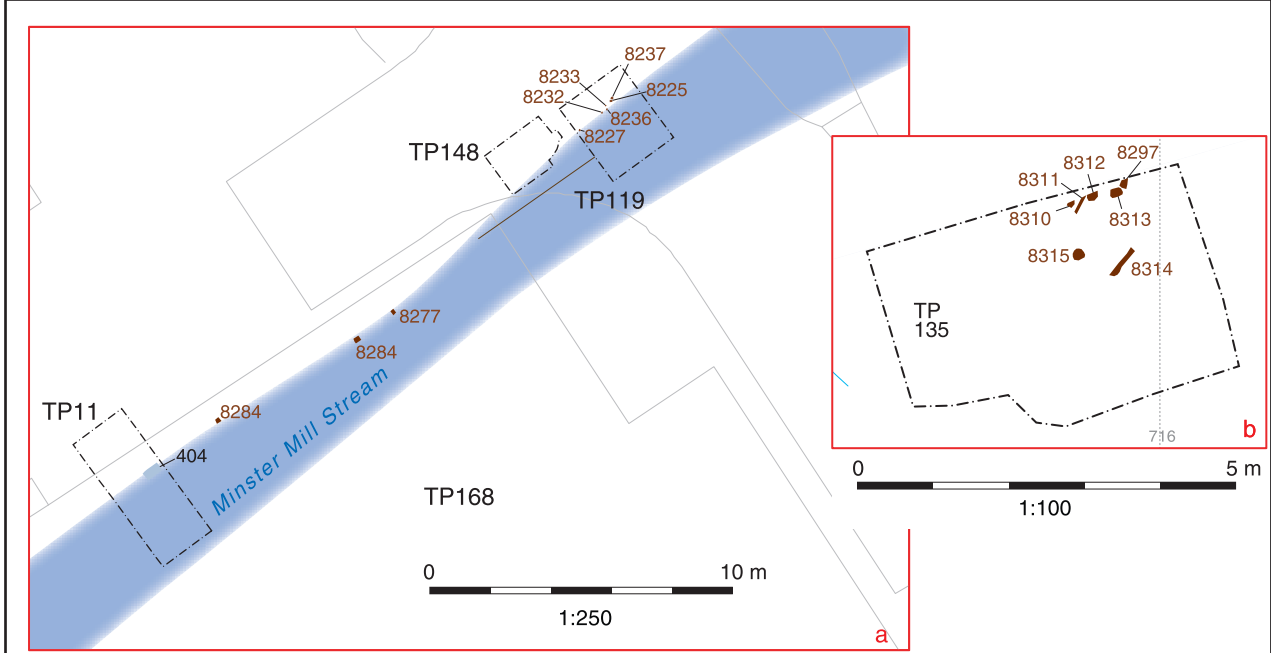
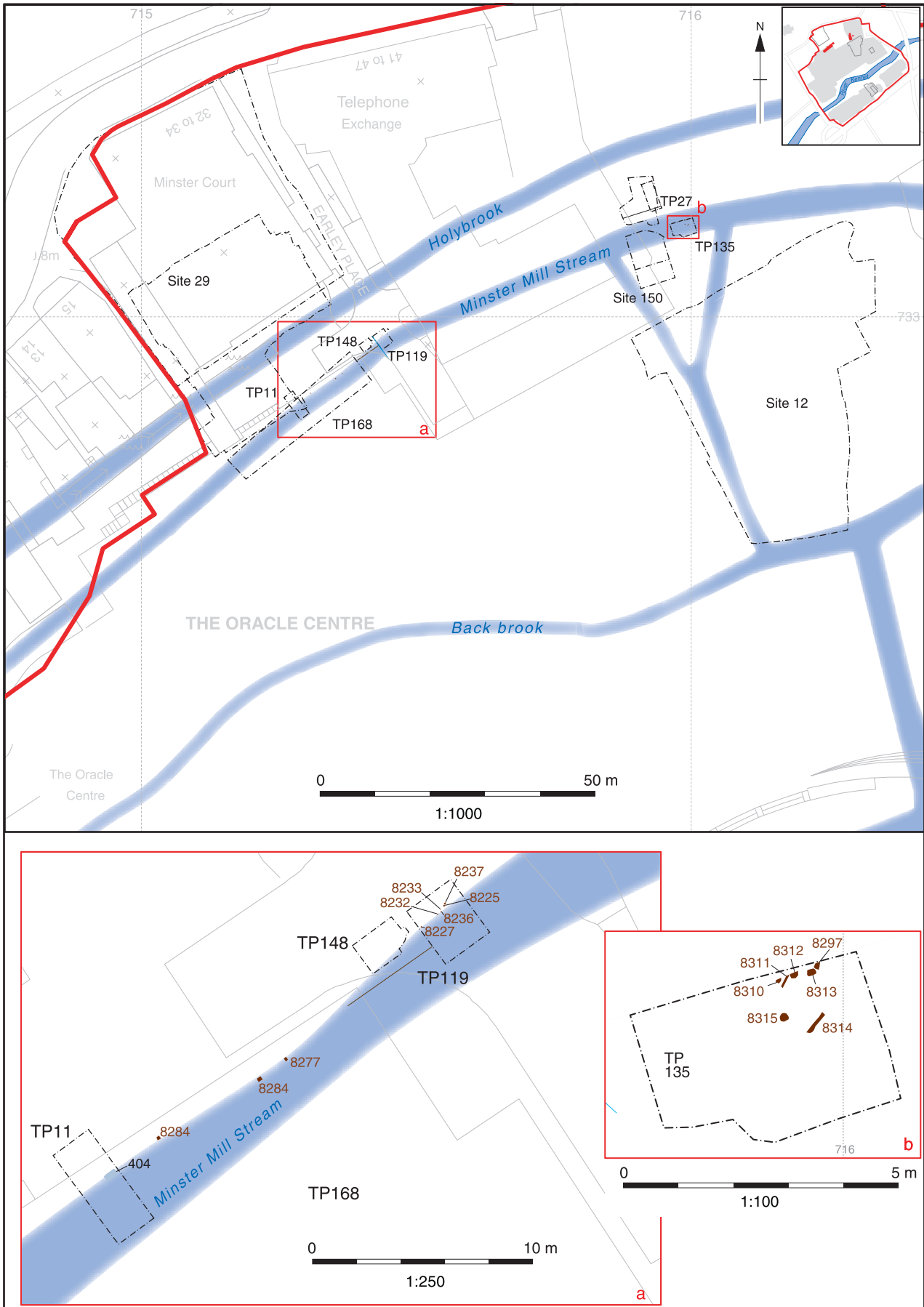
During the very late 16th and early 17th century, there is evidence that the Minster Mill stream was recut and revetted on an alignment approximately 1 m south of the 15th-century revetted channel edge 8278 (Project Phase 5). This was identified in a number of Test Pits including (from west to east) 11, 168, 119, and 135 (Fig. 3.4). In TP 11, located just to the south of site 29, evidence for a recut of the Minster Mill Stream was found (404). No revetment timbers were associated with this cut because they would have been below the excavated levels (timbers visible at the base of the cut in TP 119 were at 36.3 m OD and below the base of TP 11). Within this cut and possibly functioning as a deliberate backfill behind the revetment (which was not excavated) were two deposits of horn cores and bones which were dumped into the edge of the channel and which date to the later 16th century or very early 17th century. This refuse may have related to possible tanning activity on site 29 (see Chapter 2 Project Phase 6, above) and if this were the case it indicates that the waste from the tannery was being dumped immediately to its south.

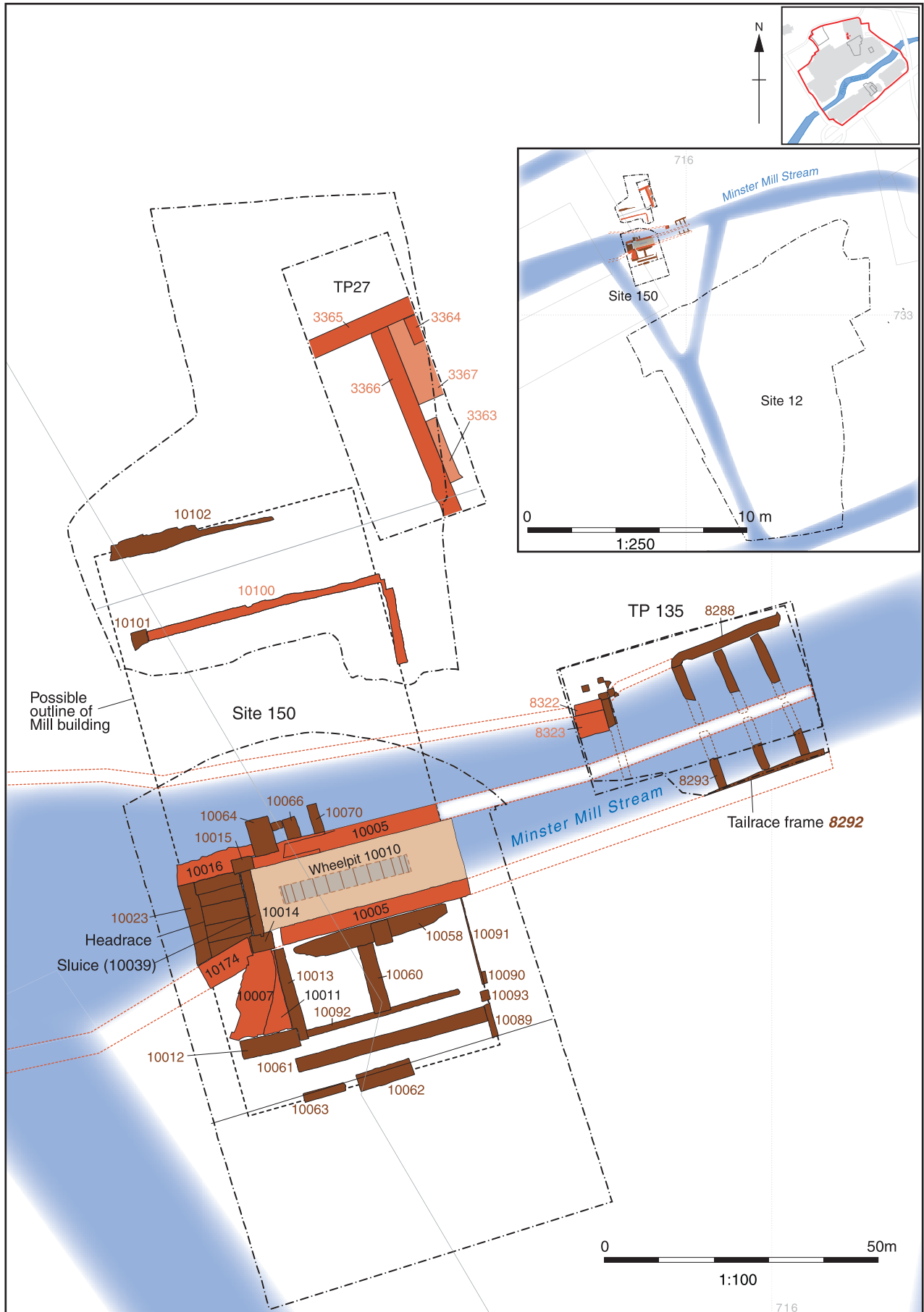
Evidence for a revetment of similar date to the recut was found in TP 135, just to the east of site 150 (section 135). This consisted of four vertical posts (8310, 8312-8313, 8315) and two planks (8311, 8314) which were not *in situ* but which were probably associated. The timbers were packed into place with gravel, broken brick and tile and subsequently with packing of clay and rammed chalk; the latest of these contained a jetton of 1586 (or earlier)-1603 suggesting a construction date around the turn of the 17th century. Further revetment structures were also identified in TPs 119 and 168, south of the line of the 15th-century revetment 8278. The 16th- to 17th-century revetment seen in TPs 119 and 168 was not closely dated, but was associated with a deposit of rammed chalk comprising large blocks and crushed material forming a solid bank at the edge of the channel (8248, 8249), which was strongly reminiscent of the chalk packing seen in TP 135.

#### The 17th-century Minster Mill (site sub-phase 15006b, c) (Fig. 3.5)

This phase produced the earliest excavated structural evidence of the Minster Mill. The evidence from TP 135 (Fig. 3.5) suggests that shortly after the phase of re-cutting and revetment of the Minster Mill stream described above, a more elaborate structure was put in place to formalise the mill tailrace channel. The excavated structures comprised a horizontal wooden foundation frame (8292) (Plate

Fig. 3.4 (opposite) Site 150: 17th-century revetment of the Minster Mill Stream (Project Phase 7)





3.19) measuring 3.25 m wide, observed for 3 m of its length. It had been constructed upon a series of deposits that had been dumped into and around the edges of the channel in order to raise and stabilise the ground surface prior to construction. The frame comprised 8 horizontal timbers of which four were north of, and four south of, a modern sewer that bisected them. Two longitudinal timbers formed the external limits of the structure, within which the transverse timbers were jointed to form a rectilinear lattice work (as at St Giles Mill, see Site 300 Fig. 3.11, below). The timbers were all rectangular in section and joined together with nails through mortise and tenon joints, the tenon on the transverse timber and the mortise on the longitudinal timber.

Dendrochronological dates were provided by two timbers within the structure: post-1595 (timber 8293), and late summer 1611 (timber 8288). These, in combination with the late 16th-century date of the underlying deposit 8300 (site sub-phase 15006a), suggest an early 17th-century date for the construction of the frame. From the form and position of this structure it is possible that it supported a planked deck to form a tailrace, or alternatively that it was put in place to limit damage from erosion within the tailrace channel immediately downstream of the mill.

Roughly 2 m to the west within TP 135 was a structure comprising a brick-floored channel (8323) with a brick wall (8322) on its north side. Only part of the brick floor of the channel had survived later

truncation, and comprised a double course of bricks laid face up. Its eastern limit was defined by a horizontal beam and a number of associated posts. None of these timbers yielded a dendrochronological date, and this structural use of brick for a channel floor is unparalleled elsewhere within the project area. The only indication of date comes from the use of thin bricks suggestive of a pre-18th-century date (see Smith, Chapter 8, below), and its possible association with the dated frame to the east. Whether these two were contemporary constructions is unknown, as the physical link between them had been removed by modern intrusion. If contemporary, these two structures would have created a water channel with water flowing from the higher level of the brick surface over a drop of approximately 0.43 m onto the timber deck that would originally have been supported by the excavated timber frame. This drop was from 36.07 m OD on the brick-floored channel to 35.64 m OD on one of the main timbers at the lower level. The position of the waterwheel itself was not identified in this phase, but if this drop was to enable water to drain away rapidly after passing through the waterwheel, and to reduce the effect of erosion on the downstream side of the mill itself, it can be assumed that the waterwheel was located to the west of TP 135. If this interpretation is correct, then frame 8292 would have sat outside the footprint of the mill, a position that needs some further expla-

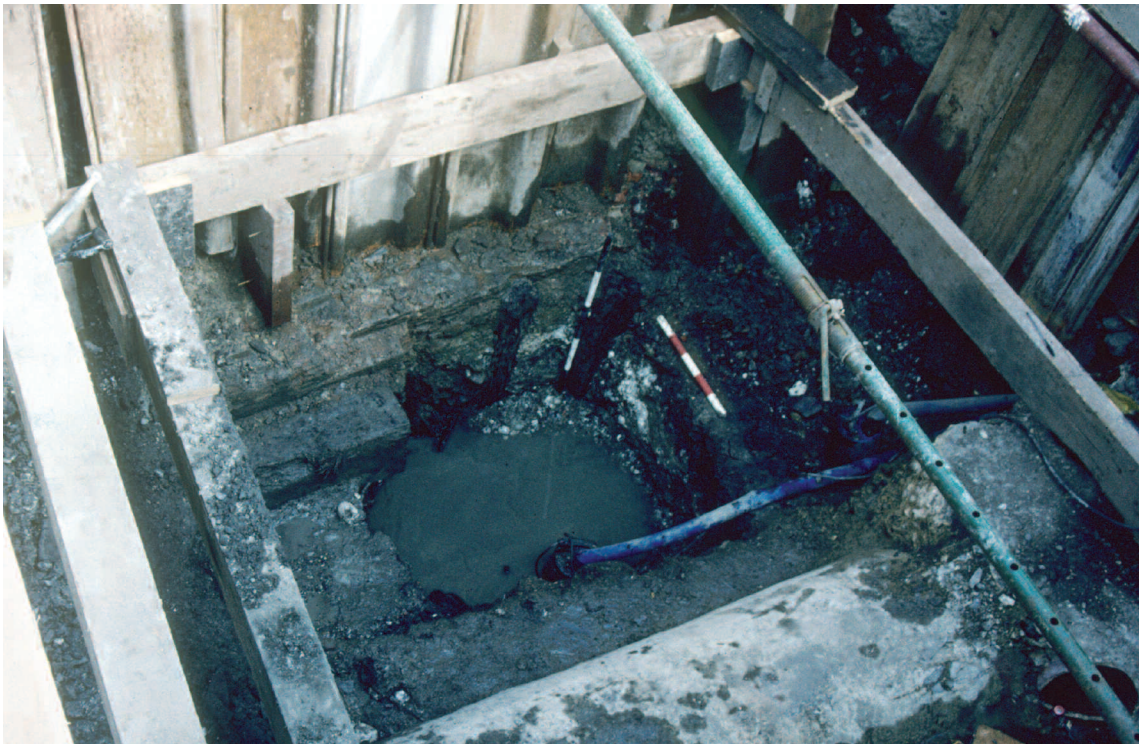


Plate 3.19 Site 150 Minster Mill: view looking NE of the wooden platform in Test Pit 135 (Project Phase 7)

Fig. 3.5 (opposite) Site 150: the archaeological evidence for the Minster Mill, 17th to 19th centuries (Project Phases 7-9)

nation, as no such structure was seen to be required at St Giles Mill. It is possible that this was a result of the siting of Minster Mill, which was located on the sloping northern edge of the valley floor, above the recently reclaimed area of the floodplain (see site 12, Project Phase 6, Chapter 2 above). The course of the Minster Mill stream tailrace flowing above this area would have presented a flood risk, and the platform may have been required to strengthen the channel and minimise the risk of it bursting its banks. It is worth noting that channel 8634 (see Fig. 2.19) is suggested to have flowed from the Minster Mill stream immediately to the east of this platform.

However, the evidence of Speed's map of 1611 (Plate 1.3) suggests an alternative explanation. Speed shows two adjacent buildings, each of which is represented with a waterwheel symbol, and this raises the possibility that there were two adjacent mills on the Minster Mill stream. The evidence from TP 135 may represent the headrace and wheelpit of the easternmost of these buildings.

#### **Project Phase 8: 1680-1750**

##### ***Construction of the 18th century Minster Mill*** (site sub-phases 15007a-c) (15007a and b)

Project Phase 8 revealed a series of significant structures on site 150 that were part of the early 18th-century Minster Mill (Fig. 3.5). The excavated remains comprised a headrace and sluice leading into the wheelpit of the mill (Plates 3.20 and 3.21).

These were contained within a major cut at least 1 m deep (10054), and built upon a substantial clay foundation deposit that contained pottery providing an earliest construction date of 1680. To the north and south of these clearly defined mill features were other longitudinal and transverse timbers which were parallel and/or at right-angles to these remains, and therefore probably belonged to the foundation of the mill building. However, they were too fragmentary for their function to be confidently identified. Some of these timbers contained large empty mortises attesting to the former presence of a substantial superstructure.

The Board of Health Map of 1853 (Plate 1.6) clearly shows the stream flowing through the centre of the building and narrowing from approximately 5.75 m to 4.10 m as it approached the mill.

The mill was based on a large timber foundation frame, comprising three timber beams joined together to form a rectangle open to the south (10013, 10059 beneath wall 10005 and 10091 seen only in section). Timber 10013 was felled in the winter of 1700-1701, agreeing with the very early 18th-century construction date suggested by the pottery. Beam 10091 formed the base for a coursed brick wall built up against post 10090 (10094). Associated with the frame, although not jointed to it, were three further timbers (10058, 10060, 10092); timber 10058 was at the base of the brick wall and may have been inserted to strengthen it in Project Phase 9 (see below).

Immediately adjacent to the north side of the timber frame and measuring 1.14 m wide lay the



*Plate 3.20 Site 150 Minster Mill: a general view looking N of the 18th-century remains (Project Phase 8)*



wheelpit (10010). This ran east towards the brick and wooden floors identified in TP 135 (see above), which were probably still in use during this phase. The channel consisted of a slightly concave brick surface covered with a thick layer of mortar (10068) and substantial brick walls remaining up to 1 m in height on either side (10005). The bricks used were narrow (50 mm thick) suggesting that they were pre 18th-century in date.

Immediately to the west of the wheelpit lay the headrace and sluice gate which controlled the flow of water into it. This consisted of two upright posts (10014 and 10015) and a layer of five horizontal E-W planks (10024-10028) laid directly on the clay foundations 10036. The posts were angled and contained central recesses in their inner faces (for boards not present), and are most likely to have been the guides for the sluice gate itself. Behind the sluice gate lay the planked headrace floor measuring 1.5 m long and tapering in width to 1 m wide at the sluice gate; this was covered at its eastern end by a long beam (10039) connected to the sluice gate posts via mortise and tenon joints. This form of water delivery to the wheelpit is known as a penstock and sluice.

The water in the penstock was contained by brick walls, the northern of which (10016) was aligned exactly with the northern wall of the wheelpit while the southern (10174) was offset slightly so that it was angled in towards the sluice gate. This narrowing of the water channel just before the waterwheel was common practice. Associated with the southern penstock wall 10174

and post 10014 (see above) was a single course brick floor (10011) which directly overlay the mill frame beam 10013.

Immediately adjacent to the north side of channel 10010 was a substantial wooden structure comprising three large posts (10064, 10066 and 10070) of unknown function.

To either side of the wheelpit and other structural evidence described above was fragmentary evidence indicating the larger superstructure of the mill building. Brick wall 10100 to the north was the same distance from the central brick wall 10005 as two reused horizontal beams 10062 and 10063 to the south, which probably formed the foundations for an equally aligned brick structure and were therefore probably contemporary. Other timbers, such as horizontal beam 10061 with its three vacant mortise holes, suggest that the mill superstructure had elements of timber framing as well as brick wall within it.

#### Project Phase 9: 1750-1850

##### *Structural alterations to the Minster Mill* (site sub-phases 15008a/b, 15009a/b)

The 18th-century Minster Mill suffered from subsidence and during Project Phase 9 it was necessary for repair work to be carried out to some parts of the building (Fig. 3.5). Although this structural work was not directly dated, the brick sizes recorded on site were of slightly larger dimensions and may have belonged to the period 1784-1850, when a



Plate 3.21 Site 150 Minster Mill: view looking E showing detail of the 18th-century penstock (Project Phase 8)

brick tax was introduced and before it was repealed; this suggests the alterations may have happened in the latter half of Project Phase 9.

During this phase several walls were replaced due to the subsidence which affected the building. The original southern wall of the wheelpit was removed and replaced with 10056 built directly on the wooden beam 10059. Timber beam 10058 and post 10086 may have been inserted at this stage in order to buttress the wall (phase 15009a). The walls of the head race were also altered, with wall 10174 replaced by 10007 which curved to the south-west and which was also supported, on the southern side, by a large timber beam (10012), which was joined to frame beam 10013. This timber, like others used in the mill structure, was re-used; it contained a series of tenon joints often associated with roof frames and not part of its function here. This rebuild was mirrored on the northern side of the concrete ducting, by a wall of the same build and using the same size bricks (10099) which also truncated earlier structures. This curved away from the place where a spillway channel would have been and its position supports the interpretation of the central section of the mill as a spillway.

Further evidence of probable mill structures was present in adjacent TP 27 (site sub-phase 15009b) where a building measuring greater than 2 m x 3.6 m was found. This consisted of an E-W orientated wall (3365) greater than 2 m long (extending under both baulks) and a N-S wall (3366). These walls were associated with two floor surfaces of mortar and brick (3367, 3363) separated by a probable internal wall (no number). The dating of these structures is unclear, but their general position and orientation suggests they were later than the main 18th-century mill phase. A wall (3364) was subsequently constructed on top of brick floor surface 3367. It may have been the remains of a chimney breast as it was positioned very close to wall 3365.

#### **Project Phase 10: 1850-1900**

##### ***19th- and 20th-century disuse and demolition of Minster Mill***

(site sub-phases 150010, 150011a/b)

The 19th and 20th century saw continued maintenance and changes to the Minster Mill. During the 19th century the mill race (10005) was repaired (10006), suggesting that the mill channel continued in use until this time. This rebuild/extension may be associated with cut 10022 (not seen in plan) and a floor surface made of sandy silt mortar (10018). Both features indicate a further stage of activity on the site of the mill and may be contemporary.

In Test Pit 135 there were episodes of dumping from 1850 onwards after which wall 8299 was constructed. Where the brick sluice structure (8323)

had been built, a small brick culvert (8320: TP 135; 8245, 8244: TP 119) was constructed, probably during the 19th century, followed by an arch and bridge (8319, 8317) over the stream.

A series of deposits accumulated on site 150 against the mill footings and indicate that the mill went out of use (15011a). They contained no datable material but may correspond to the late 19th-century features seen in Test Pit 135. The Goad Insurance map of 1895 (Plate 1.8) shows that the mill had been decommissioned, and was in use as a dry goods warehouse. The old mill buildings were demolished, probably during the early 20th century, and new buildings (10004, 10002) were constructed (15011b). This constitutes the final phase of the Minster Mill, which was eventually demolished in the 1940s.

#### **SITE 12: THE YIELD HALL**

##### **Project Phase 7: 1600-1680**

(site sub-phase 1209a-e)

##### ***Building 7410*** (Fig. 3.6)

During the early 17th century the layout of Building 7410 remained unchanged but alterations took place to the room or walled area to the east (Building 7411; Fig. 3.6). These were not closely dated but the stratigraphy suggests they probably occurred during the early 17th century. In its new form, Building 7411 consisted of two coursed tile and large flint nodule walls with a tile course on top that would have supported a timber framed structure above. The dimensions of this building were not fully determined because it was truncated to the north and east by modern foundations. The main north-south wall (8967) was built along the eastern side of wall 8711/9382 (phase 1208b) while the southern wall (9393) was built on top of the remains of wall 9482. This butted the southern end of 8967, extending eastwards for at least 3.58 m. Inside Building 7411 was a feature of 17th-century date which appeared to be contemporary with the walls. This comprised two small rectangular postholes (8949, 8947) and a shallow rectangular feature (8951) measuring 1.5 x 0.5 m. The fill of one posthole contained a sherd of 17th-century or later pottery suggesting a possible 17th-century date for the structure. These may have combined to form a small processing structure with a wooden frame suspended over the shallow pit below.

##### ***Other features (not illustrated)***

In the central part of site 12 between Building 7410 and the Yield Hall, in an area of land apparently otherwise undeveloped, a series of pits were cut and filled with refuse. These pits were not drawn on site and most were unexcavated, but one which was investigated (8513) contained a densely packed deposit of horn cores (8515; Plate 3.22)

indicating the probable de-horning of raw animal hides by a tanner for the initial stages of leather production. This provides an indication that the leather processing of earlier phases continued in the general area. The pottery from this pit represents one of the most coherent groups of early post-medieval pottery from the site, and included Surrey border ware, brown-glazed redware and plain white tinglazed ware, suggesting a date after *c* 1630 (see Brown and Thomson, Chapter 7, below). General refuse including bone, tile and oyster shells was found in other pits in the same area.

**Extension of the Yield Hall (Fig. 3.6)**  
(site sub-phase 1209b)

During this phase, the Yield Hall was extended into an L-shaped building with the addition of a fifth room along the northern side of Room 4 (Fig. 3.6; Plate 3.23). The walls (517, 705 and 774) were built upon the dumped deposits (see above) and were constructed entirely using coursed brick (Plate 3.24) with the exception of a single piece of architectural stone of 12th-century date salvaged from Reading Abbey (Preston, Chapter 8). Although the bricks were laid in an inconsistent pattern, the use of brick

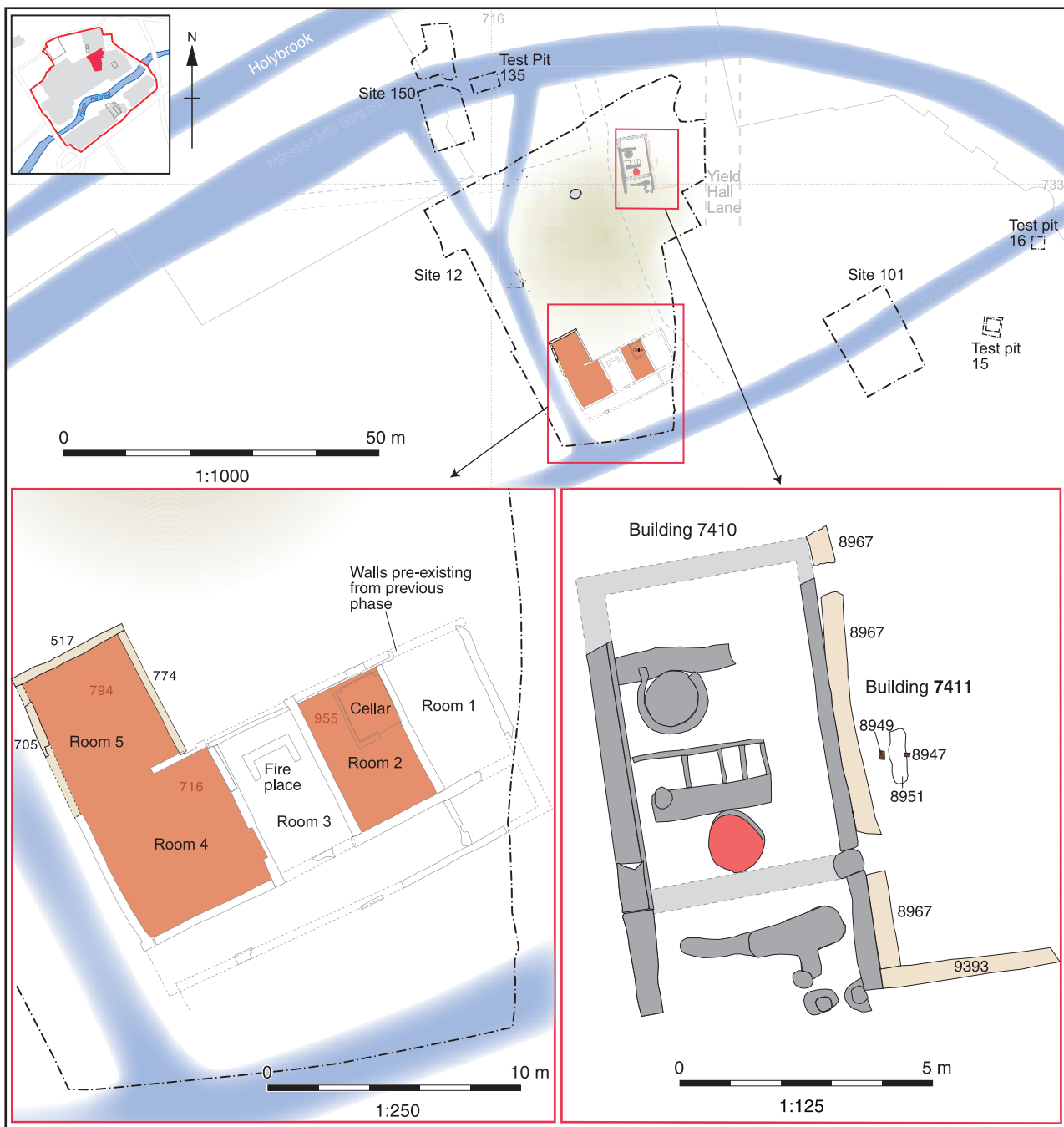


Fig. 3.6 Site 12: extension of the Yield Hall and Buildings 7410/7411, 1600-1680 (Project Phase 7)



*Plate 3.22 Site 12 the Yield Hall: view looking E showing a deposit of horncores (Project Phase 7)*

*Plate 3.23 Site 12: the Yield Hall, view looking SE showing the addition of Room 5 (Project Phase 7)*





Plate 3.24 Site 12: the Yield Hall view looking NE of brick wall 705 forming west wall of Room 5 (Project Phase 7)



Plate 3.25 Site 12: the Yield Hall, view looking NW showing mortar bedding layer with the impressions of ceramic tiles or bricks for floor 716 in Room 4 (Project Phase 7)



Plate 3.26 Site 12: the Yield Hall (above) view looking NE showing cellar 967 with a later brick reflooring, and (below) with original flooring of reused ceramic rooftiles (Project Phase 7)



for all the walls demonstrates a marked difference from the construction of the earlier rooms, which had used a combination of materials. This may correspond to the beginning of the brick industry in Reading; bricks are known to have been made from the 17th century in Katesgrove, part of St Giles parish, just to the south of the floodplain (Smith, Chapter 8).

An entrance into the Yield Hall was possibly provided by a doorway at the western end of the northern wall of Room 5 (see Plate 3.23). This may have coincided with blocking of doorway 2812 (with 2811) at the western end of the corridor which was not directly dated but must have occurred before the wing was demolished and rebuilt in the early 18th century (phase 1210 below).

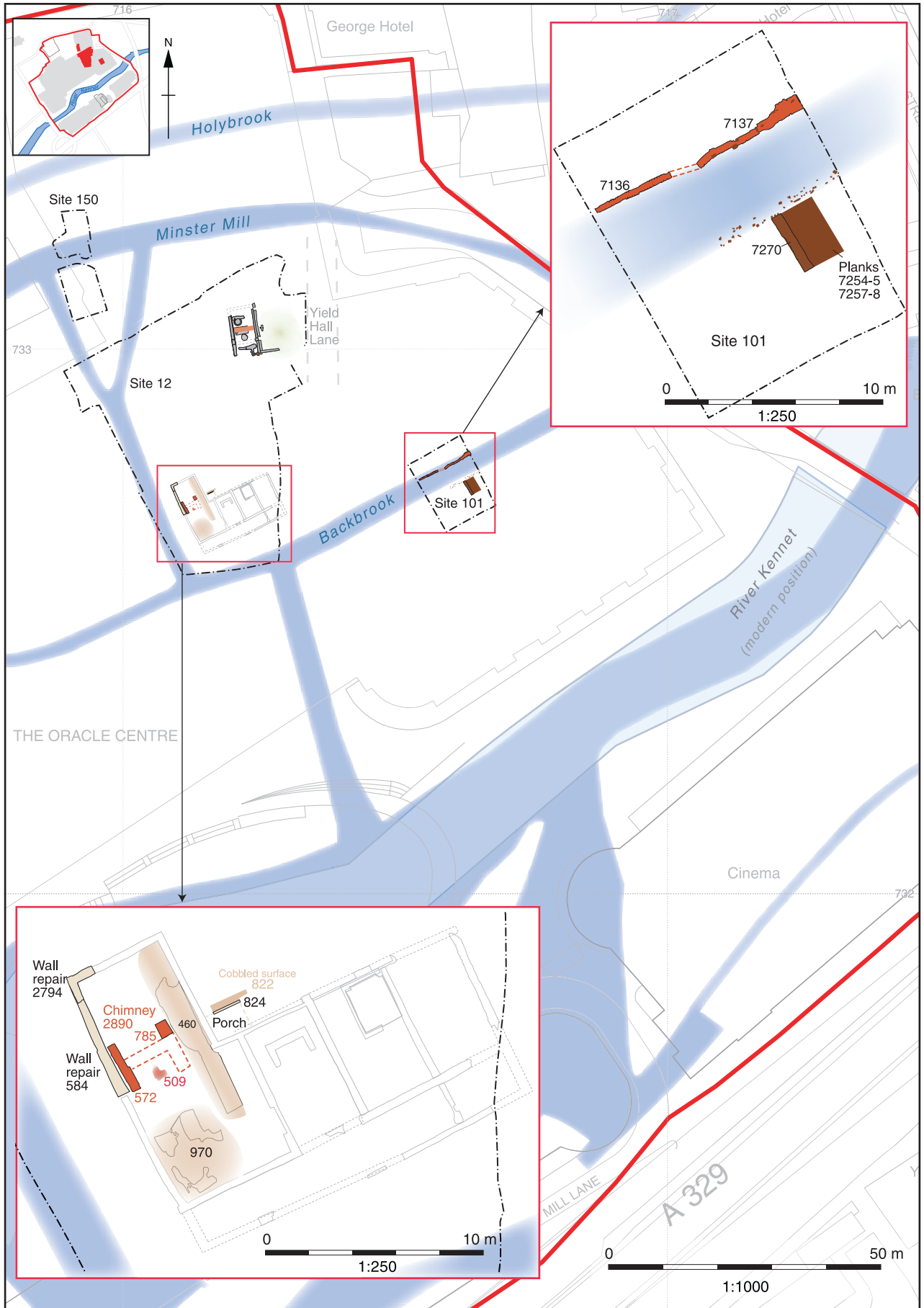
Inside Room 5, the floor was surfaced with tile or brick (the mortar bedding 794 survived) probably at the same time as a similar floor was laid in Room 4 to the south of wall 715 before the insertion of a fireplace and subsequent floors (Plate 3.25). Interestingly, not all the rooms were given tiled floors at this time; a brick floor surface (955) was laid in Room 2 in the early part of the 17th century

(1610+) but there is no evidence that the floor surfaces in Rooms 1 and 3 were changed. At the same time as the brick floor was laid in Room 2, a half cellar (967) was installed in the north-eastern corner of the room. This cut through the foundation deposit 709, forming a cellar 0.7 m deep, with a floor constructed from roof tiles laid in a random pattern. Plate 3.26(i) shows the cellar with a later floor; Plate 3.26(ii) is a detail of the original cellar floor, revealed at a later stage of excavation. In the south-east corner of the cellar and embedded in the floor up to rim height was a complete ceramic vessel measuring 0.32 m diameter x 0.51 m deep. It had been broken and stapled together before being deposited with a weight inside it and capped with brick fragments. A large number of early wine bottles were found in this cellar (see GL 19-35, Chapter 9; for illustrated examples see Chapter 5 and Plate 3.27). These date to the late 17th or early 18th century, and both the type of bottle and the period during which the cellar was used predate the general practice of the ageing of wine (Willmott, Chapter 9) making it unlikely that wine was stored for long periods of time in the cellar.

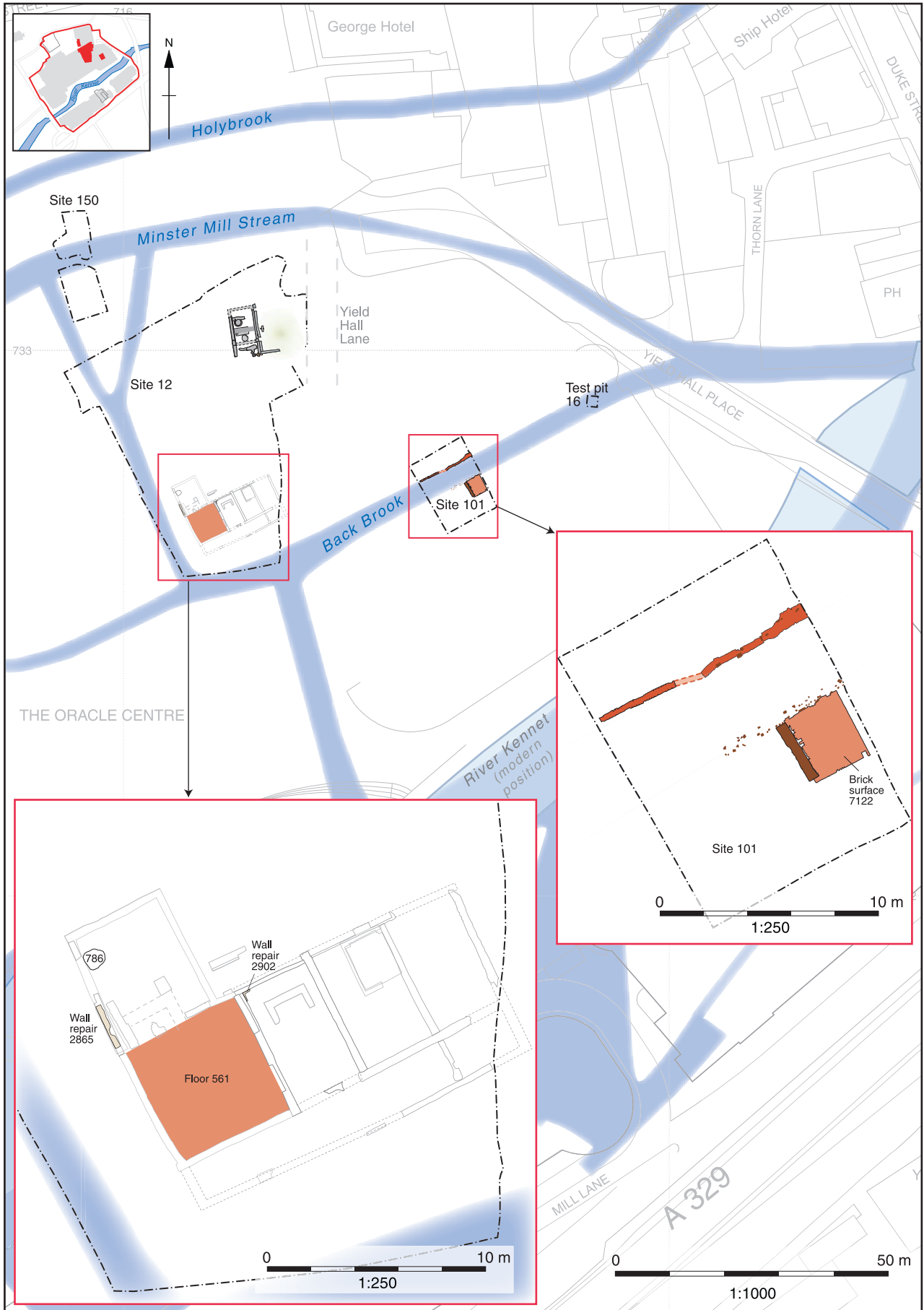


Plate 3.27 Site 12: the Yield Hall, some of the bottles from cellar 967 (Project Phase 7)

Fig. 3.7 (overleaf) Site 12: alterations to the Yield Hall during the second half of the 17th century; Site 101, 17th century brick infill reinforcement of the 16th-century timber revetment on the north bank of the Back Brook, with wooden platform 7270 on the south bank (Project Phase 7)







**Alterations and repairs to the Yield Hall**  
(Figs 3.7-3.8)

During the mid 17th century alteration and repair work was carried out to the structure and floors of the Yield Hall including the addition of a chimney between Rooms 4 and 5 and repair work to the walls and floors of this western 'wing' of the building (Fig. 3.7). The additions contained pottery dating them and the subsequent floors in the western wing to the second half of the 17th century.

The western wall of Room 5 started to suffer from subsidence during the mid 17th century and was repaired with the addition of rough flint nodules at the base (584) and above with mainly broken bricks and further knapped flints. Shortly afterwards, a brick chimney comprising two fireplaces was inserted in Room 5 (2890) butting against the repair work 584. The hearth in the southern fireplace was represented by a roughly circular area of burnt bricks (509). The north-west corner of Room 5 was subject to further subsidence and was rebuilt with large ashlar blocks (2794) closing off the possible doorway in the northern wall 705. One of these blocks was a piece of jamb from a large aperture, presumably a portal. This is of 12th-century design and probably originated in the abbey. At the same time, problems of subsidence led to the replacement of the tiled floors in Rooms 4 and 5.

Outside the building in the corner between walls 748 and 663, a wooden porch was constructed in the latter half of the 17th century and survived as an insubstantial wall formed by a single line of bricks (824). A cobbled surface (822) outside the building was associated with this porch. The porch and building were entered from the eastern side through wall 748 to face the chimney 2890, and because of this the eastern wall of the chimney 2890 was more carefully finished than other faces.

Despite the repair work already carried out to the western wing of the Yield Hall, the subsidence continued and the very late 17th century saw further repair work to the floors and walls (site sub-phase 1209e; Fig. 3.8). In Room 4 the floor was levelled once again with the addition of a rubble deposit which was used as the base for a brick floor surface (561 comprising 887-890 and 951). The chimney in Room 5 was reinforced on its western side (2865) but the floor in Room 5 did not appear to have been repaired or replaced at this time. Instead a pit was cut into it (786) and filled with rubble of brick and tile (possibly from the damaged floors); this may have been an exploratory hole to investigate the severity of the subsidence.

The internal corner of walls 650 and 2898 (Room 3) also demonstrated signs of damage and was repaired with brick work (2902); this was not directly dated

but must have occurred before the structure was substantially altered in the next phase (1210).

**Project Phase 8: 1680-1750**

**Buildings 7410/7411** (Fig. 3.9)  
(site sub-phases 1209f, 1210b)

Some of the industrial features of Building 7410 went out of use in the late 17th century suggesting a change in function of the building. The timber base went out of use (after 1680) and was covered by a compact chalk floor surface (8843) which was laid inside the building up against the existing walls. Meanwhile, the circular hearth to the north and the furnace to the south were still present. No changes seem to have been made to Building 7411 in the late 17th century

During the early 18th century only minor changes occurred in buildings 7410 and 7411 (site sub-phase 1210b). A second compacted chalk floor surface was laid inside Building 7410 (8761) and a short wall of uncertain function (8958) was built on top. Wall 8958 was a flint stub wall and butted against the eastern wall of Building 7410 (8967). A group of three Hans Krauwinckel Nuremberg jettons of the period 1586-1635 were found in make up layer 8760, associated with these repairs.

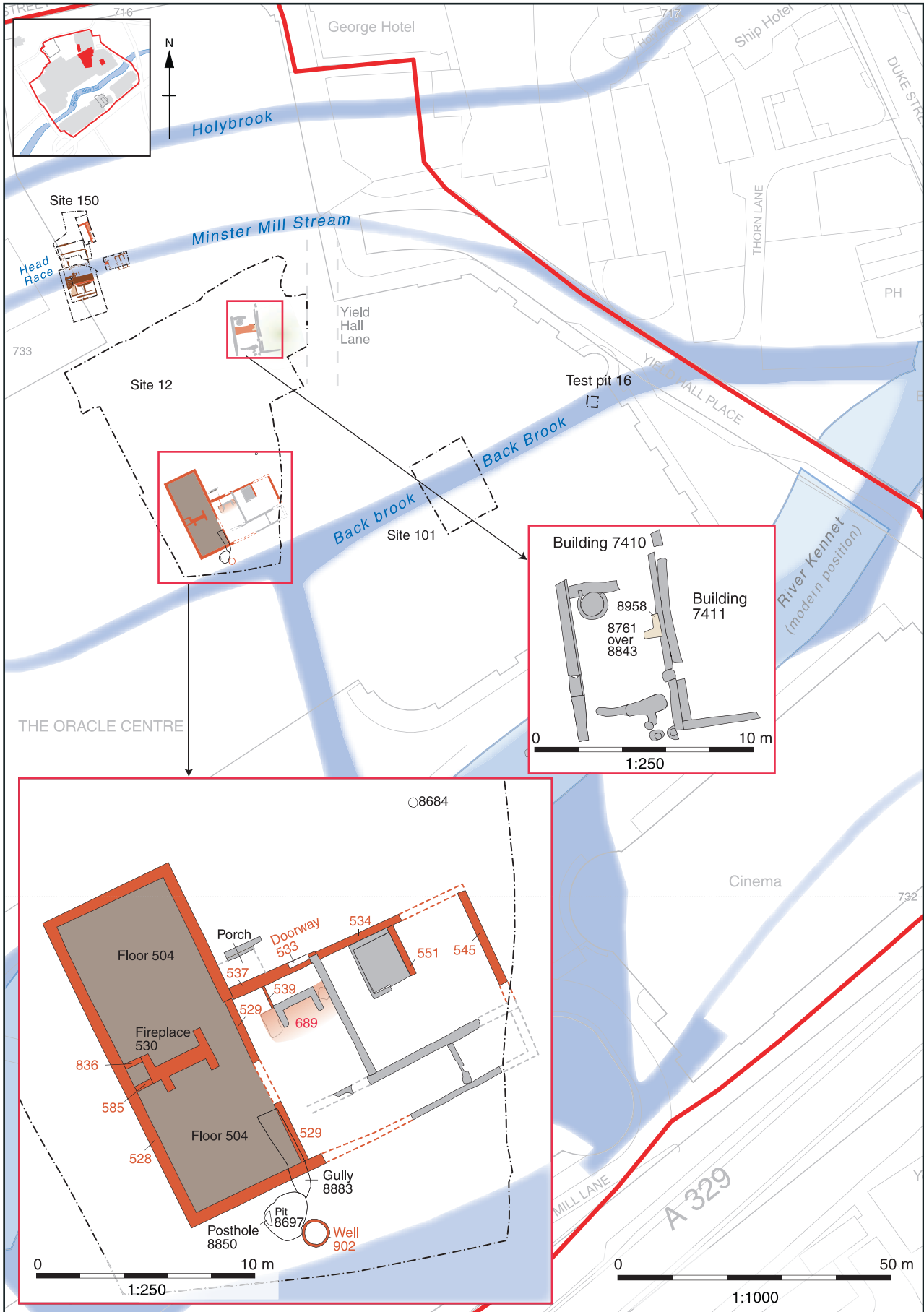
**Major rebuilding of the Yield Hall** (Fig. 3.9)  
(site sub-phase 1210a)

During the early 18th century, the subsidence that had necessitated repair work to the Yield Hall throughout the 17th century finally led to the demolition and rebuilding of the western 'wing' of the building. During the same phase, the eastern wing of the building, which had not suffered as extensively from subsidence, underwent some modification and repair (Fig. 3.9). Plate 3.28 shows the substantial brick walls of the rebuild encasing the slighter 16th- and 17th-century foundations. Unfortunately the rebuilding did not solve the problems of subsidence, and Plate 3.29 shows the effects on walls of both builds. The 16th-century water channel just to the west of the Yield Hall disappears from historic maps during this period (compare Speed, 1611, Plate 1.3 with Roque, 1761, Plate 1.4) and it is possible that the rebuilding of the Yield Hall and the infilling of the channel may have been associated events.

Prior to this phase of rebuilding, material was deposited across large parts of the area (8700, 8676) to stabilise the ground for the foundations of the new building. These deposits contained pottery of 1700 or later indicating an early 18th-century date

Fig. 3.8 (previous page) Site 12: late 17th-century repairs to the Yield Hall; Site 101, brick surface 7122 on the south bank of the Back Brook (Project Phase 7)

Fig. 3.9 (opposite) Site 12: rebuilding of the Yield Hall during the early 18th century (Project Phase 8)





*Plate 3.28 Site 12: the Yield Hall, general view looking W (Project Phase 8)*



*Plate 3.29 Site 12: the Yield Hall: view looking NW showing the problems of subsidence affecting two phases of walls (Project Phase 8)*

for the rebuild. A shallow N-S gully (8883) which probably functioned as a drainage channel for this building was cut into this deposit.

In the west wing, a new chimney was built 2 m south of its 17th-century predecessor, and with fireplaces in each of the two rooms (530). The fill of the construction cut for this fireplace contained a piece of architectural stone from Reading Abbey, a voussoir with plain chamfer dated to the 12th to 13th century (Preston, Chapter 8). A mortar floor (504) was laid down shortly after the fireplace was built and contained pottery providing an earliest construction date of 1690. The entire western wing was rebuilt with a single continuous wall (528), extending to form the southern wall of Room 3. This wall was constructed in a rough Flemish bond with half bricks breaking the pattern in a random fashion, and it probably continued to the east as far as wall 911, although the relationship between these walls was destroyed by later activity. The external wall 528 was joined to the chimney 530 with two small internal walls (585, 836) positioned 0.9 m apart and creating the southern and northern limits to the two rooms west of the fireplace. A further wall (529) created an internal wall between the newly built west wing and the partially rebuilt east wing (529). There was no clear archaeological evidence for the removal of the internal wall of the former corridor. However, as this had clearly been removed from Rooms 1 and 3 by 1807 (see Plate 3.30, below), it seems reasonable to suggest that it could have been undertaken during this phase of major alterations.

At the same time the east wing underwent more minor changes including the installation of a brick floor surface (689) in Room 3 around the fireplace (2821, site subphase 1208a) at the start of the 18th century (1700+). Probably at around the same time, the old north wall (663) was rebuilt in two stages. First, the east end was rebuilt as a coursed brick wall (534). Subsequently, more material was added to the foundations of the west end of the wall, and it was rebuilt as a more substantial, wider structure (537). A doorway, in the form of a low step in the wall, was constructed here. A small internal lobby was formed by a short N-S stretch of narrow wall (539) butting the southern face of wall 537.

The east end of the building was rebuilt (wall 545), and the internal partition wall between Rooms 1 and 2 was also replaced (wall 551) on the original foundations. These alterations were probably of the same phase of activity as the events described above. A posthole (8684) located 4.4 m to the north of, and directly in line with, wall 545 suggests a fence or structure positioned in line with the eastern end of the building.

Just to the south of the building, a large pit 0.56 m deep was cut into levelling deposit 8676/8700 (8697); there was a small posthole in the corner of this pit (8850). The pit contained deposits of almost pure ash containing extremely burnt bone, which could have been cooking waste or manufacturing

debris (8696, 8698, 8699). A well (902, 8667) was also cut into the levelling deposit immediately adjacent to the pit. The internal diameter of the well was approximately 1 m. Both the pit and the well were post-dated by late 18th-century structures (phase 1211).

### Project Phase 9: 1750-1850

#### *Industrialisation*

(site subphases 1211 and 1212a)

A comparison between Roque's map of 1761 (Plate 1.4) and Tomkins' map of 1802 (Plate 1.5) shows that the area was subject to a considerable degree of development during the later 18th century. Tomkins shows a new rectangular building north of the Yield Hall, and a large new complex laid out just to the east. A detailed survey of the area, which was still in the ownership of the Corporation, was made for the Reading Corporation Terrier of 1807 (Plate 3.30). The Yield Hall, with its contemporary internal arrangements, is clearly shown in the south-west corner of the site, adjacent to a loop in the Back Brook (here labelled 'Back Ditch'). (Confusingly, the Minster Mill stream, which formed the northern boundary of the site, is labelled 'Back Brook', as on the contemporary Terrier plan of the Oracle, Plate 3.1). Building 7410/7411 seems to have been incorporated into the north-west corner of the large complex to the east of the Yield Hall. The three small rooms labelled '9', with a trapezoidal outshot to the north and a large open room to the east, must be our first contemporary pictorial representation of these structures. When the Terrier was drawn up, the Yield Hall site was also known as Hill Hall. The site was leased to various tenants (see Dils, Chapter 4, below). James Hayes, floorcloth manufacturer, had six houses with warehouses or workshops bordering the 'Back Brook'. Charles Benwell, cabinet maker and upholsterer, had four workshops, a warehouse and a sawpit. Two other tenements and a coach house in the centre of the site were also let, as was a large dwelling house, workshops, offices and stables. On the north side, next to a passage through the estate, was part of Talfourd's brewhouse.

The Yield Hall itself looks like the only probable candidate for the dwelling house on this plan, with fireplaces clearly shown in three rooms, and a number of internal staircases. The location of the principal doorway is not at all apparent. A bay window appears to have been incorporated into the west wall of the former Room 4, overlooking a garden, and the fireplace has been relocated to the south wall. The evidence of the Terrier shows that the eastern part of Room 4, and an adjoining small area in the north-west corner of Room 3, were occupied by stairs. This was not apparent in the archaeological record.

The archaeological evidence for alterations to the Yield Hall during Project Phase 9 (1750-1850)

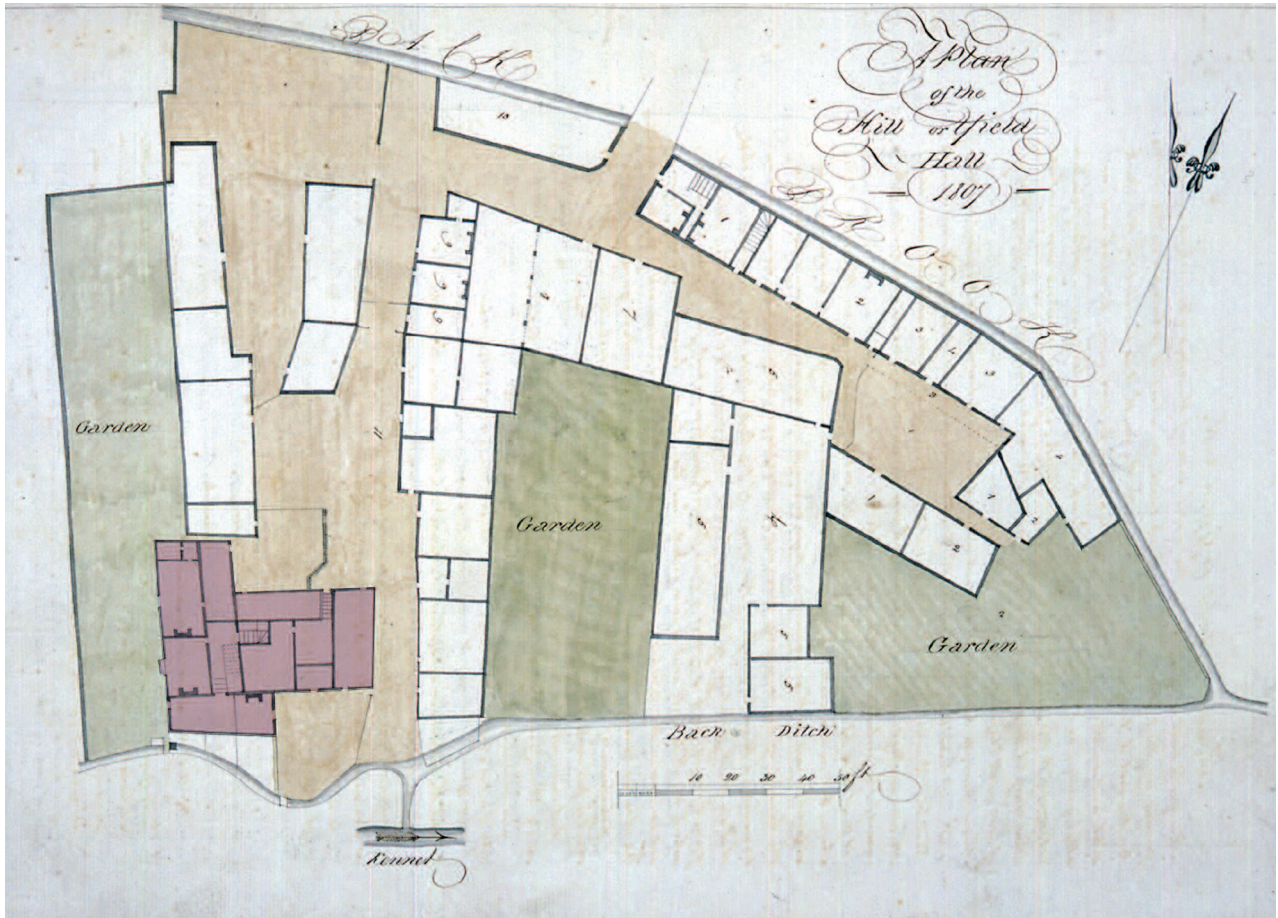


Plate 3.30 Plan of The Yield Hall in a Reading Corporation Terrier of 1807

can be compared with this survey. At some point after 1770, the wine cellar in Room 2 was filled in with rubble and decayed timbers from its structure (see Plate 3.26), and a new floor (707) was laid throughout the room. A staircase is shown on the Terrier in the area where the cellar had previously been. The evidence of the Terrier suggests that the original wall between Rooms 2 and 3 was partially dismantled, and a new wall installed, to form a long, narrow room across the north side of the building. The new wall can be equated with a partition wall (542) identified in the excavations in the north part of the former Room 2. There was a distinct step up of 0.17 m at this point. A division in brick floor surface 707 indicates that a partition may have existed in the southern half of the room along the same alignment at some point, although apparently not when the Terrier survey was undertaken.

Alterations also occurred in Room 3 to the west, presumably as part of the same phase of works. Doorway 533 (Fig. 3.9) was blocked. A gap shown in the wall at the foot of the stairs in the former Room 2 may be a replacement door, or possibly a window. The floor and fireplace of Room 3 were removed, and a new brick floor surface (678) was laid. From the evidence of the Terrier, a narrow beamslot (693)

identified in this area should probably be interpreted as a continuation of partition wall 542 (see above).

The Yield Hall was also extended southwards with the addition of a two-roomed extension. This addition predated 1802, when it appears on Tomkins' map (Plate 1.5), and survived until the whole building was finally demolished in 1935. The Terrier survey shows that this area has direct access to the main part of the house via a door and steps, and there is a fireplace in the north-east corner. A further enclosed area to the south, probably a yard or garden, runs down to the Back Brook ('Back Ditch'). It seems very likely that this was a kitchen. The Board of Health map of 1853 (Plate 1.6) shows the garden or yard as still open in the middle of the century.

#### Project Phase 10: 1850-1900

##### *The foundry* (site subphase 1212b)

New floors were laid within the main building around 1850. Prior to the laying of the new floors, a number of pits had been cut through the late 18th- or early 19th-century floor 678 (pits 863, 865, 868),

apparently to dispose of building rubble, as the pits each contained a single rubble fill comprising a sandy silt with frequent tile, brick, charcoal and mortar fragments. Floor 646 was subsequently laid in Room 3 (Plate 3.31), floors 765 and 789 to the south and east in Rooms 2 and 3, and floor 2705 in Rooms 1 and 2. A large number of pins were associated with floor 646. These probably fell between the cracks in the brick floor in the early stages of its use. A cut had also been made into the floor 646 into which a bowl (dated 1800+) had been inserted. The southern outshot of the building was rebuilt after the original part of the building was altered. In the east room, a large chimney (625) straddled the southern wall of the main building creating fireplaces in both the original building and in the outshot. This chimney incorporated a large corbel consisting of two simple human heads, which is of 12th-century date and probably originated in Reading Abbey (Preston, Chapter 8). In the western room of the extension, the fireplace and chimney (767) that were inserted at this time butted the southern edge of wall 528. The fireplace measured just over 3 m in length and comprised a central hearth with a small recess to either side, and was probably a cooking range. Brick floors were laid in both rooms, floor 587 in the west room, and floor 672 in the east. A water bottle (8668), measuring approximately 1.2 m in diameter, was cut into the surface of the eastern room. This was positioned 1 m east of the earlier well. A brick and cobbled yard surface (788) was recorded in the angle between the extension and Rooms 1 and 2. Historic map

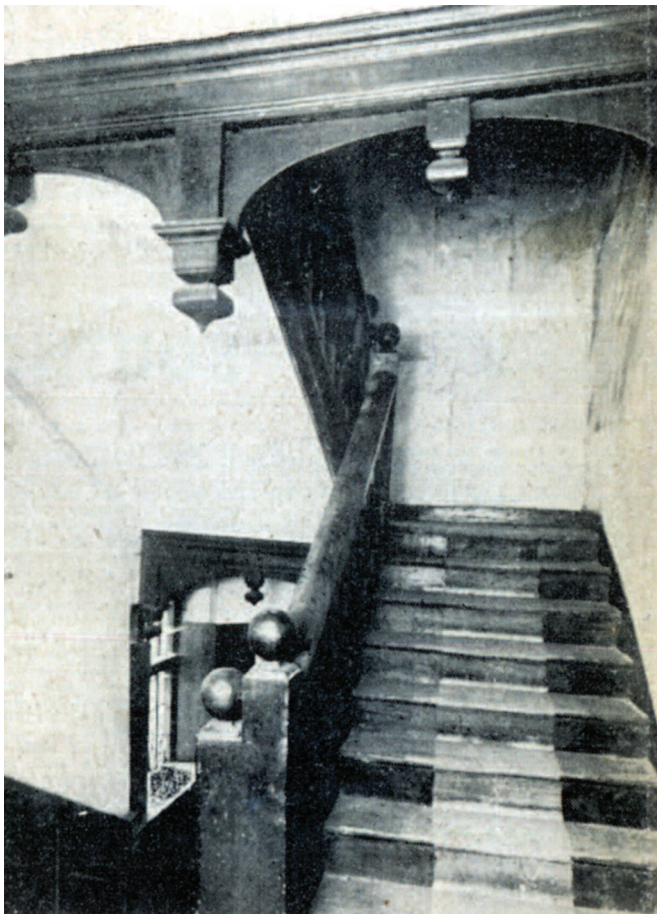
evidence suggests that a further extension was built over the area of the garden or yard between 1853 and 1879.

James Wilder, an iron founder, is recorded occupying property at Hill Hall (the Yield Hall site) in 1821. His business prospered, and eventually covered much of the area (see Plates 1.6-1.9). By 1867, James and his son John had expanded their product range and were described as engineers, brass and iron founders, smiths and agricultural implement makers. The firm was still in existence on the site in 1932, but had transferred to other premises on the Caversham Road by 1938. Other businesses also at Hill Hall in the late 19th century were carpenters, a coal merchant and an ironmonger's workshop (see Chapter 4, below). During the excavations, ironworking remains were found in the south-east corner of Room 2. A deposit of slag was found together with further features (854) containing waste of an industrial nature such as slag and hammerscale. Although this is not securely dated, it provides compelling evidence for the replacement of domestic occupation by industrial use at this site at some point during the later 19th century.

The Yield Hall building was substantially altered during the later 19th century, and at some point between 1879 (1st edn. Ordnance Survey plan) and 1895 (the Goad Insurance map, Plate 1.8) Rooms 1 and 2 were demolished, leaving only the former Rooms 4 and 5 (now apparently a single large space), Room 3 to the east, and the southern extension. It survived in this form until its final demoli-



Plate 3.31 Site 12: the Yield Hall, view looking NW showing a ceramic vessel set into surface 646 (Project Phase 10)



*Plate 3.32 Site 12: the Yield Hall (above) the southern and eastern elevations of the Yield Hall, shortly before demolition in 1935 and (left) a view of the internal staircase*



tion in 1935, for the creation of the car park that was on the site when the excavations began. Plates 3.32(i) and (ii) are photographs of the Yield Hall taken shortly before demolition.

## SITE 101: THE BACK BROOK

### Project Phase 7: 1600-1680

#### *Post-medieval consolidation of revetments and activity on the banks of the Back Brook* (Fig. 3.10) (site subphases 10105c, 10106, 10107a)

Coursed brick walls were placed within the mid 16th-century timber revetments on the northern side of the Back Brook in order to strengthen them (7136 and 7137 Figs 3.7 and 3.10). The fill of the wall construction trench 7137/7009 (7007) contained a mixture of silty clay with broken tile, flint and quartz pebbles and pottery of mid 16th-century or later date, but this was dumped material and likely to be residual. It is therefore difficult to date this phase precisely but a 17th-century date seems reasonably likely given the activity which was occurring on the opposite bank at this time.

The south side of the channel continued to be retained by revetment 7115 (see Fig. 2.19, Project Phase 6, above). A wooden platform was constructed immediately adjacent to the Back Brook (site subphase 10106; Fig 3.7). This consisted of a series of wooden planks laid directly on top of

dumped deposit 7316, which dated it to the early 17th century. The first four planks (7254, 7255, 7257, 7258) were laid alongside one another and the fifth was laid across their western ends. The four lower planks measured approximately 2 m long by 0.3–0.55 m wide and formed a wooden surface measuring approximately 2 m x 2.75 m. Plank 7270 which lay on top was 2.75 m long and had a bevelled outer edge suggesting access to this floor was from the west.

During the late 17th century (site subphase 10107a), this wooden floor surface was replaced by one of brick (7122: Fig. 3.8 and Plate 3.33). This was laid directly on top of the series of wooden planks of phase 10106 and against the revetment, with some evidence for plaster/pitch waterproofing against the revetment. It contained no dating material but may have been late 17th-century on the basis of the style of bricks used. No metallised external surface was associated with the floor but plank 7270 remained *in situ* along the western side of the floor suggesting access was still from this direction. Neither Speed nor Roque shows any structures on the south bank of the Back Brook during the 17th and 18th centuries, and the purpose of this platform remains unclear.

In other Test Pits along the banks of the Back Brook, there was evidence for some deliberate raising of the ground level during Project Phase 7 (10107b). This was particularly evident in TP 114 some 28 m to the east, where a deposit comprising



Plate 3.33 Site 101: the Back Brook, view looking NW showing the well-built brick surface 7122 constructed on the southern bank of the Back Brook (Project Phase 7); the Back Brook and its substantial revetment can be seen in the background

Section 305

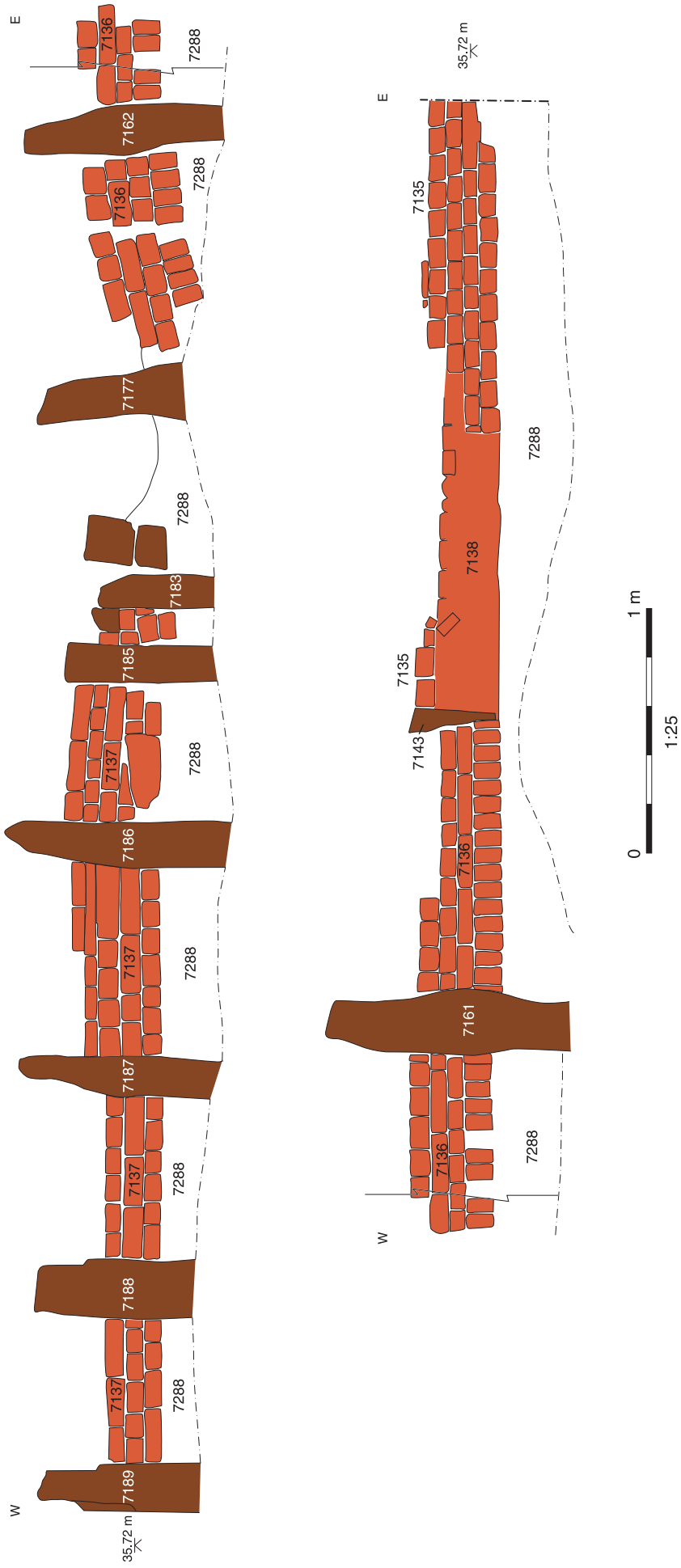


Fig. 3.10 Site 101: Section 305 along the north bank of the Back Brook showing the ongoing brick reinforcement of the timber revetment (Project Phases 7 and 8)

layers of clayey silts divided by thin layers of mortar and containing a mixture of brick and tile fragments and mortar chunks was laid down (1009). Clay pipe dated this deposit to the mid 17th century or later.

### **Project Phase 8: 1680-1750**

#### *Late 17th- and 18th-century revetments* (10108a,b)

A revetment (1247; not illustrated) identified in TP 16 was probably of late 17th-century date, being surrounded by silts of early 18th-century date. It was made up of 14 mainly roundwood or boxed heart posts measuring between 0.04 and 0.15 m across and up to 1.1 m in length constructed on deposit 1254. Some horizontal planking was also found *in situ* (1232, 1235, 1237, 1239, 1248, 1251, 1252, 1255-1258). Revetment 1247 was located 0.7 m to the north of the 16th-century revetment 1238 (Fig. 2.19), further into the channel. This suggests either that the Back Brook channel was being deliberately narrowed by this stage, or that the remains in TP 16 represent alteration to a particular section of the banks. A fine clay silt accumulated against revetment 1247 (10108b) and contained pottery dating to 1700 or later. A timber structure (1260, not illustrated) was constructed at the water's edge, consisting of a series of horizontal timber beams and planks laid perpendicular to the channel, and spanning the superseded revetment 1238. This provided a surface along which to transport material to the edge of the channel for the purposes of dumping it between the two revetments 1238 and 1247 to strengthen the banks.

The brick revetment (7137) of Project Phase 7 (see above) was rebuilt as wall 7135 (site subphase 10108c). Wall 7135 was of header bond with some tile, one course wide and surviving to a height of 0.86 m where it extended into the eastern baulk. It was constructed around two roundwood posts approximately 0.1 m in diameter. Wall 7135 was in turn supported by the addition of a crude wall of large chalk pieces and flint nodules measuring 0.15 x 0.25 m (7139, not illustrated: site subphase 10108d). There was no independent dating evidence for the construction of these walls. No evidence for activity during this phase was identified south of the Back Brook in the excavation of site 101 or any of the Test Pits.

### **Project Phase 9: 1750-1850**

#### *19th-century flooding and reclamation and consolidation of revetments* (site subphases 10109a,b)

During this phase the revetments identified in TP 16 went out of use. They were sealed by waterlogged clay silt dated to 1830+ and subsequently by dump

deposits comprising silty clay with gravel and brick fragments used to level the ground where the channel had been. These may correspond to similar silty gravels deposited above the 'Back Brook' structures on site 101.

On the southern side of the Back Brook on site 101 there was evidence for extensive overbank flooding where a sequence of alluvial silts covered the brick floor 7122 (Project Phase 7, see above). These were not dated but they predated the addition of a brick wall to the southern revetment (phase 10110a).

Following the overbank flooding of phase 10109, the revetment on the southern side of the Back Brook was strengthened with the addition of a brick wall (7294, section 310, project subphase 10110). This predated deposits of mid 19th-century date but was otherwise undated. It was a coursed brick wall built directly on top of the wooden revetment 7115 and running the entire length of the channel visible in the excavated area. Unfortunately none of the deposits later than 7122 contained any dating evidence, but the southern revetment wall was also identified in TP 88 (not allocated a context number) where it was post-dated by sediments of mid 19th-century or later date.

### **Project Phase 10: 1850-1900** (site subphases 10111, 10112)

#### *Silting up of the Back Brook and construction on the land*

Eventually the Back Brook silted up and went out of use; the latest fill was a notable silt deposit containing numerous small finds of copper alloy including fine pins, a ring, and dress fastenings together with three coins of the late 17th century or later. The stratigraphy of this deposit suggests it was of 19th-century date and that the material included was residual.

A coursed brick wall, which was the remains of a cellar, was built directly on top of the revetting wall 7008. The backfill of the construction trench contained construction debris from the wall itself and was dated to 1860 or later suggesting that the wall was of mid 19th-century or later date.

The disappearance of this arm of the Back Brook can be followed on the historical maps. It is still clearly present on the Board of Health map of 1853 (Plate 1.6). Here it is bordered on the north side by a line of what are presumably privies at the bottom of the long, narrow yards belonging to a row of terraced houses laid out to the east of Wilder's foundry. This suggests that the privies drained straight into the channel. It is interesting to note that there had been a highly critical report on the state of public health in the Borough shortly before this time, and the Corporation became the Local Board of Health in 1850. One of their duties was ensuring a pure and constant water supply (Dils, Chapter 4, below). If this arm of the Back Brook was func-

tioning as an open sewer, it must have been exactly the kind of public health hazard that the Board was charged with eradicating. By 1895 (Plate 1.8) it has disappeared completely, and Thorn Lane has been extended westwards over its former course. By 1909/10 (Plate 1.9) a small structure is shown built over the former channel course just east of the point where the Back Brook channel turned south towards the Kennet.

### **SOUTH OF THE KENNET: SITE 300 (ST GILES MILL)**

#### **Project Phase 7: 1600-1680**

#### ***Demolition of the medieval mill and construction of a new mill***

(site subphase 3003a: c1600+)

The evidence suggests that the medieval mill constructed at the start of the 14th century was dismantled. The structural elements described in Chapter 2, Project Phase 4, above, were left *in situ*, and a new mill was constructed upon them, with the new northern races being in the same location as those from the earlier structure.

In TP 303 the partial remains of an elm plank deck were recovered (Plate 3.34), which was joined using metal nails to an oak latticework frame (utilising wedged mortise and tenon joints). Together the deck and frame formed Group 13713, which was

constructed on the previously laid 14th-century chalk rubble foundation deposit (site subphase 3002a). This deck was angled up relatively steeply towards its upstream end. The upstream end of the frame was jointed to transverse ground beam 13706 which in turn was jointed at its northern end to 13705, a 0.4 m-square horizontal longitudinal ground beam, which was orientated east-west and ran out of the eastern site limits towards site 300. The timber deck is considered to represent the head race (its incline raised the height of the water prior to its fall on to the waterwheel), and the ground beams are part of a large Hurst Frame. None of these timbers yielded a tree-ring date.

On site 300 remnants of a latticework frame, Structure 13453, were recovered. It was located within a re-cut (12073) of the original large 14th-century construction cut (site subphase 3002a). It comprised two principal longitudinal foundation ground beams (or baseplates) 12063 and 13806 which had been positioned on the north and south sides of the cut. Jointed square to the south face of the northern ground beam were three transverse ground beams, 13467, 12057, and 13476. These had all been broken off near to their northern end by later rebuilding (Plate 3.35) but originally would have extended to the southern ground beam. No planked decking that would have sat upon this frame survived. The surviving timber elements had been packed around with clay, acting as a water-proofing agent. None of these timbers could be dated by dendrochronology.



Plate 3.34 Site 300 St Giles Mill: view looking SE showing the exposed 17th-century elm plank deck of the head race (13713) (Project Phase 7)



Plate 3.35 Site 300 St Giles Mill: view looking NW showing ground beams 13467, 12057, 13476 overlying the early 14th-century mill timbers (Project Phase 7)



Plate 3.36 Site 300 St Giles Mill: photograph looking SW of the east elevation of the mill taken c 1900; on the left is the 17th-century mill, with the more substantial buildings of the 18th-century rebuild to the right (Project Phase 7)



Plate 3.37 Site 300 St Giles Mill: detail of Speed's map (Plate 1.3) showing the 17th-century St Giles Mill (Project Phase 7)

Elsewhere on site 300 there were indications of other activity belonging to this phase. The medieval mill pond and its approach channel had completely silted up by this time. It is possible that this channel was re-established further to the north. Within an east-west orientated cut 13849 (at the extreme north end of site 300) were two longitudinal timber ground beams: 13151 (tree-ring date after AD 1594), and 13802 which dated to after AD 1605. Immediately to the west of this, in TP 304, were two un-stratified timbers which also tree-ring dated to this period: 12580 (late summer AD 1611), and 12651 (AD 1602-34). In combination the dates yielded from these timbers indicate that structures were probably built in this area *c* AD 1611-12. It is possible these structures were revetting the north side of a bypass channel north of the main mill structure.

*In the surrounding landscape – downstream*

The alignment of timber posts first established during the 13th century (Project Phase 4, site subphase 3001b) and maintained during subsequent phases contained a timber that gave a felling date range of 1604-36, which concurs with the evidence for a new mill. It is therefore probable that

this channel was maintained (repaired) during the present phase of activity. No other timber structures in the surrounding landscape can be assigned to this phase.

Stratigraphically the archaeological evidence for this phase of construction is placed firmly between the 14th-century medieval build of Project Phase 4 and the mid-18th century rebuild of Project Phase 9. There is however a distinct lack of datable finds and a lack of dendrochronological dates from structural timbers, which leaves a wide time period within which this activity could have taken place. Photographic images and historic maps can supplement the archaeological evidence for this phase as it is considered that the mill components first constructed in this phase remained as part of the mill complex until its demolition in 1901.

Early 20th-century photographs of the mill complex immediately prior to demolition show a structure consisting of two principal elements (Plate 3.36) with the larger 18th century mill (see Project Phase 9, below) abutting an older structure to the south (on the left of the plate). The southern element is entirely clad in weather-boarding, some elements of which have fallen away to reveal the timber frame beneath. Architecturally this element

is probably of early 17th-century construction (J Munby pers. comm.), and is likely to be the mill represented on Speed's map of 1611 (Plate 3.37). It is considered that this map and the photograph show the newly constructed mill from this phase.

It is clear that Speed presents a schematic view of the mill as the wheels are positioned on its upstream face; however, it is probably accurate in that the mill is likely to have had at least two water-wheels. The question remains as to where the water-wheels were located. Using a combination of the map and photographic evidence, it is possible to place the footprint of the latest mill complex as shown on the late 19th-century maps (for example the Goad Insurance map of 1895, Plate 1.8), including its 17th-century southern element, over the plan of the excavated remains. This clearly indicates that the northern end of the earlier southern element was located immediately south of the race to which the partial remains of the timber deck described above belonged, therefore strongly suggesting this to be the position of one of the external wheels.

#### Project Phase 8: 1680-1750

The 17th-century rebuild of St Giles Mill remained in operation, and there is no evidence for alteration or modification in this phase. In the surrounding landscape a new water-pumping water mill was constructed to the west of St Giles Mill.

#### Construction of a water-pumping mill (site subphase 3003b: 1694-6)

Two test pits (268 and 293) were located to investigate the water pumping mill constructed at the end of the 17th century. The location of this building can be seen on the Goad Insurance map of 1895 (Plate 1.8), upstream of St Giles Mill in the area labelled Water Works Dept. The building in question is the square one, labelled 'Store'. The archaeological investigations here revealed the remains of a timber structure comprising a plank deck upon a lattice-work horizontal frame of ground beams supported on timber piles. This structure was orientated north-south, at right-angles to Mill Water and leading in the direction of a more northerly braid of the Kennet. Although no timbers yielded tree-ring dates this structure is considered to be the remains of the race for a water pumping mill, constructed according to documentary references in the period AD 1694-6 (Plate 3.38). Photographs taken towards the end of the 19th century show a building orientated north-south in the position of these remains (Plate 3.39). The structure is entirely clad in timber weather-board, an appearance that is very similar to the 17th-century elements of St Giles Mill. A sluice gate opening protected by a grill can be seen, positioned at water level, and central to the gable end that faces Mill Water. This would have taken water through the building, and indicates the entrance to the head race which the excavated timber remains represent.

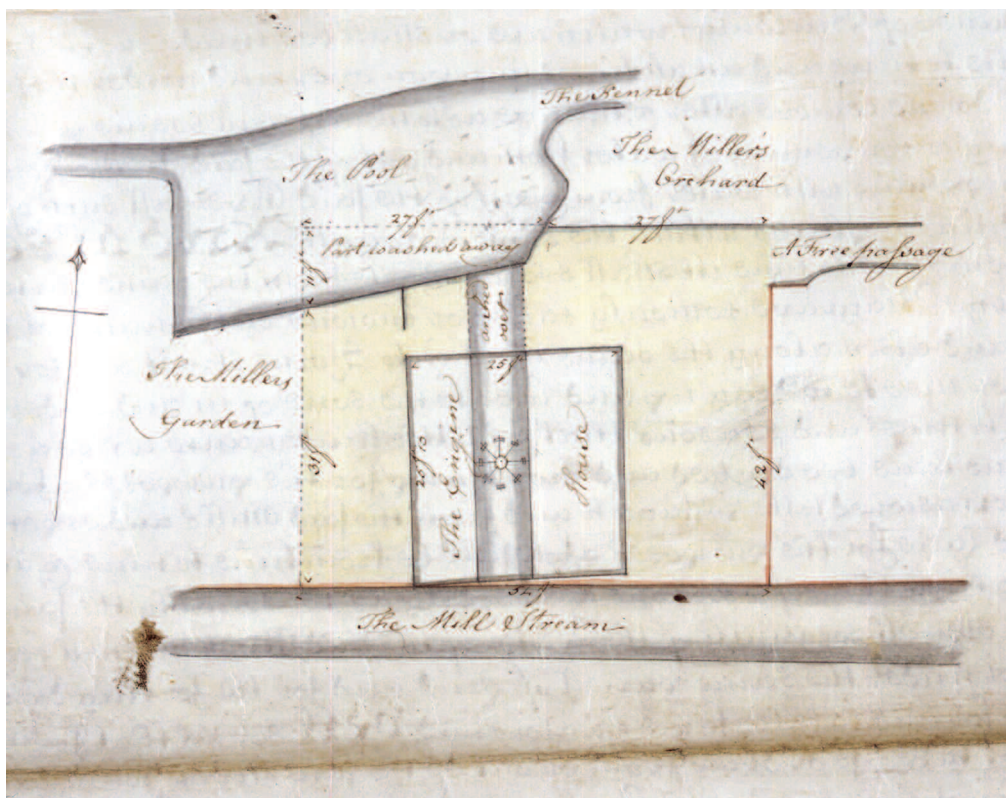


Plate 3.38 Plan of the property and building layout of the water pumping mill shown on a lease of 1697



Plate 3.39 Photograph looking NW along Mill Lane showing the water pumping mill towards the centre of the photograph, immediately behind the tree, view c 1900

The location of this structure indicates that by the late 17th century the northern bank of Mill Water had been established in this position and on this alignment, as shown on later maps.

#### Project Phase 9: 1750-1850

##### *Major expansion of St Giles Mill c AD 1750?* (Fig. 3.11) (site subphase 3004a)

The early post-medieval mill built around 1611 remained standing but underwent a massive expansion programme with the construction of a very large new mill building to house new waterwheels to its north. To enable this development to take place, new mill races were built, which required increasing the size of both Mill Water and Mill Tail. The net effect was to develop and increase the productive capabilities of St Giles Mill.

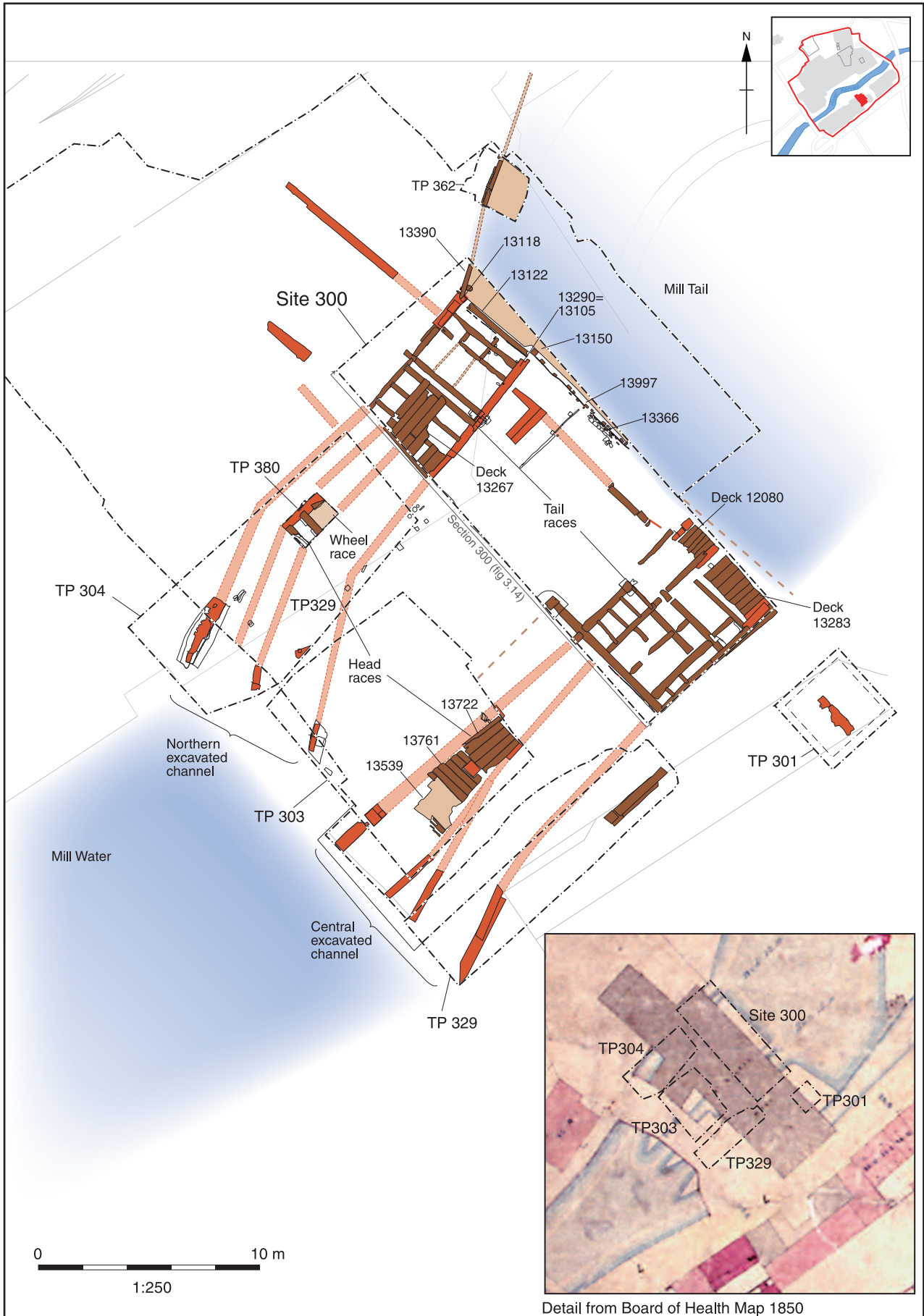
The main 17th-century mill building was retained and a new 4-storey mill building constructed which abutted its northern gable end. The main walls of the new mill were constructed in brick to the first storey which supported a timber frame clad in weather-

boarding for the remaining three storeys (Plate 3.40). The mill races that had been at the northern end of the former mill were rebuilt to house two new mill races. The new mill building extended northwards over the line of the former mill bypass channel, which was remodelled and became three mill races. The main retaining walls to these races, and the walls dividing them, were constructed in brick, but still as in previous periods these were constructed upon large timber ground beam and post foundations. The mill races ran through and under the mill building, with all the waterwheels housed within the mill structure itself; thus ended the era of the external water wheel at St Giles Mill (Fig. 3.11).

Test pits 303 and 304 were positioned to investigate the point at which the eastern end of Mill Water met the western end of the mill building. These two excavation areas partially revealed the courses of two channels, which approached the mill building from the south-west. To the south a channel ran SW-NE and to the north another ran SSW-NNE. Both these channels were constructed in the same way. A large linear flat-bottomed construction trench with near vertical sides had been dug, and timber ground beams were then laid

Fig. 3.11 (opposite) Site 300, St Giles Mill: excavated remains of the mill as rebuilt c 1750 with the Board of Health map 1853 for comparison (Project Phase 9)







*Plate 3.40 Site 300 St Giles Mill, photograph looking NE of the south-west elevation of the mill taken around 1900; the larger buildings added in the 18th century are on the left, with the smaller 17th-century buildings on the right*

along each side of the trench-base upon a water-proofing deposit of clay (Plate 3.41). These longitudinal beams formed the foundations for the brick revetment walls. The walls were 0.4 m wide and survived to a maximum height of 0.70 m. Gravel deposits formed the channel floors. The two channels led from Mill Water and delivered water to the head races, which commenced below the west-facing elevation of the mill.

*The northern channel and mill races within the Mill*

In TP 380, which was located over the northern mill races, the partial remains of the downstream end of a head race, and significantly the curved floor of a wheel race, were found (Plate 3.42). Timber remains that indicated the position of a probable sluice/control gate separated these two elements. This was the only wheel race to be located and represents the clearest direct evidence for the position of one of the waterwheels within the new mill. It strongly suggests that all the waterwheels were located to the west of the limits of site 300 and to the east of site 303, therefore within the area that was not excavated.

Further east on site 300 the full width of this channel was revealed; it was separated into three adjacent races. The races had been constructed within a construction trench, within which a timber latticework frame was constructed from oak, elm and beech (Plate 3.43). The frame was made from longitudinal beams which were again set into a deliberately laid layer of clay. A series of transverse beams were jointed into these using nailed half-lap joints. These beams were fixed into position by vertical posts to which they had been nailed. The beams were then overlain by two further longitudinal beams, which formed the foundations to the partition walls and divided the channel into three separate races. The spaces between these partition beams were planked over using tangentially split elm boards that were nailed to the underlying beams to form the floors to the three races. Only the partial remains to two of these floors survived, Group 13267. The three races were of different sizes: the northern race was 0.91 m wide, the central race was 0.74 m wide, and the southern race 1.54 m wide. The outermost retaining walls to this channel were



Plate 3.41 Site 300 St Giles Mill: view looking SW showing a section through the central mill channel and retaining wall upstream from the mill (Project Phase 9)



Plate 3.42 Site 300 St Giles Mill: view looking SE showing the curved floor of the wheel race in the northern channel (Project Phase 9)



*Plate 3.43 Site 300 St Giles Mill: view looking SW of the timber lattice framework for the races in the northern channel (Project Phase 9)*



*Plate 3.44 Site 300 St Giles Mill: view looking NW showing the mill tail revetment structure as seen in Test Pit 362 (Project Phase 9)*

constructed in brick; much of the northern wall was gone, and neither of the partition walls survived, although these were probably in brick also. The southern retaining wall 13290=13105 did however stand to a maximum height of 0.70 m. At its eastern end the brickwork was full of cracks and sloped downwards to the east where the race had started to subside. The eastern end of each of the retaining walls butted onto huge squared timber posts 13150 and 13118, which were jointed to a transverse beam 13122 to which was nailed a wall of vertical planks, Group 13264, which extended into the ground.

This 'plank wall' would have formed an anti-erosion device preventing the water that ran into the Mill Tail from eroding the ground from under the end of the tail races. Failure of this structure to work effectively could have caused the subsidence observed in the retaining wall. Where exposed, the plank floor was consistently level at a height of 35.70 m OD; where the planks were absent the beams to which they would have been nailed were also level at a height of 35.66 m OD, thus allowing for the thickness of the planks to make up the remainder of the height. This lack of gradient, together with the other evidence, indicates these are the remains of the tail races, which channelled water away from the waterwheels into the Mill Tail from which it ultimately returned to the main Kennet channel. A short stretch of the timber revetment wall Group 13390 that formed the northern bank of Mill Tail extended further eastwards from post 13118. The continuation of this wall was also

picked up in TP 362; it was constructed from horizontal planks lain on-edge retained by posts and tied into the bank with iron bolts (Plate 3.44).

One of the principal foundation beams, 13092, from the lattice work ground frame gave a tree-ring date of winter AD 1746/7 and therefore suggests that construction of this entire foundation probably occurred at, or shortly after this date.

#### *The southern channel and mill races*

The southern channel was better preserved than its northern neighbour. The channel entered TP 303 from the west; its bed was made up of a layer of gravel and broken ceramic roof tile. At a distance of 2.20 m from the western edge of site 303 the channel floor changed to a layer of well-laid water-worn granite sets, structure 13539, which measured 1.70 m long, and acted as an anti-erosion device immediately prior to the start of the head race (see Plate 3.41). The eastern limit of the granite sets abutted timber floor 13761 which was level at a height of 35.70 m OD. This floor was 1.7 m long and formed from transversely laid oak planks. It led to a further level plank floor 13722 which was set 0.30 m higher. This floor was 2.40 m long and continued beyond the eastern limit of excavation. On this floor the planks were nailed longitudinally onto a series of tangential beams. The lower floor appears to have functioned as a silt-trap allowing solid material carried within the water to fall into the lower area so it did not continue on to the waterwheels (Plate 3.45). When historic maps of the mill



Plate 3.45 Site 300 St Giles Mill: view looking SE showing a section through multiple phases of head-race structure the latest of which formed a silt trap (Project Phase 9 – also see Plate 3.34)

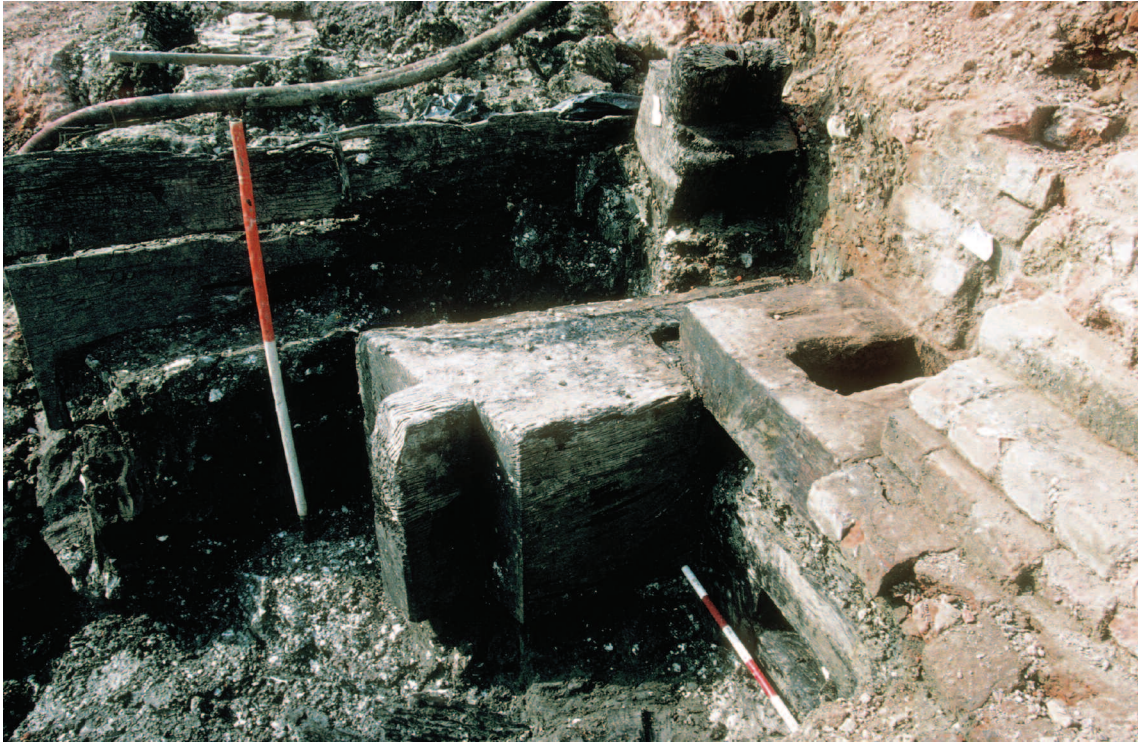


Plate 3.46 Site 300 St Giles Mill: view looking N showing the vacant mortise for one of the posts for the Hurst frame (Project Phase 9)

are scaled and overlain onto drawings of the excavated evidence it shows that the junction between the stone anti-erosion floor and the silt-trap marked the line of the western elevation of the mill building, and therefore the point at which the water ran under the mill.

These timber planked channel floors were laid over a series of deposits including large dumps of clay, silt chalk and gravel, which had been used to infill and raise the level of the head races that had been left *in situ* and dismantled from the early 17th-century mill. The overall effect was to raise the level of the head race by 0.60 m at its eastern end (see Plate 3.45).

A small element of the Hurst Frame was revealed at the eastern end of the site (Plate 3.46). Together with similar elements at the western end of site 300, this suggests that the wheel race for this central channel was located in the unexcavated and heavily truncated area between sites 300 and 303.

On site 300 the timber frame Group 13453, for the 17th-century mill race was almost completely destroyed during the rebuilding of this race (see Plate 3.35). A new timber lattice-work foundation frame was constructed to the east of the Hurst Frame. This structure became the central channel through the new mill and provided two separate mill races which were flanked by brick walls; the northern race measured 1.1 m wide (plank deck 12080), and the southern race 3.6 m wide (plank deck 13283) (Plate 3.47). It is possible that the southern race was also divided into two, although no brick partition wall survived. It is considered

that these remains in site 300 are either the tail races leading from two adjacent wheel races, or a wheel race and a bypass race. It is probable that the narrower race contained a water wheel, and this could have been the origin of the probable water wheel float 12537 found in TP 319 (Fig. 5.55 No. 20).

As noted above the principal dating evidence comes from the tree-ring evidence. The use of beech and elm in this phase of construction, rather than oak, reduced the potential of this dating technique and far fewer dates are available than for the medieval phase (which was constructed entirely from oak). Ground beam 13092 dated to winter 1746/7 and thus gives the earliest date that this frame could have been constructed. This compares favourably to the timber frame in the southern channel which dated to Winter 1742/3, and indeed to a rebuild of the Mill Tail revetment, which yielded a number of tree-ring dates of which the latest was 1755-7 for timber 12492 (w104).

Taken together this evidence suggests two possible interpretations. It is possible that the southern channel was constructed first, with the northern channel occurring a few years later, and finally the mill tail revetment was constructed. Alternatively, there could have been a single construction episode around the date of the last timber date (1755 or after), and some of the timbers used had been stored for up to 14 years. It is worth noting that the re-use of timbers was more common during this phase of construction than previously, which suggests that these dates should be interpreted with some caution.



Plate 3.47 Site 300 St Giles Mill view looking SW showing the southern race (Project Phase 9)

*In the surrounding landscape – upstream*

Evidence for major works to the retaining river/channel walls was retrieved from a number of watching brief test pits (TPs 261, 271, 272, 273, 274, 285, 294 and 317). A timber post (12458) from TP 271 yielded a dendrochronological date of AD 1741-60. This evidence suggests that the river walls to Mill Water were entirely rebuilt, in the same form as observed in sites 300, 303, and 304.

*In the surrounding landscape – downstream*

Watching brief TP 311 revealed a timber structure which yielded a single dendrochronological date of 1755-60. The function of this structure is unclear; however it demonstrates that there were works that seem to relate to separate developments at the eastern end of the site, perhaps relating to London Street properties that were not directly linked to the major works on the mill.

**Early 19th century (1815) maintenance of the mid 18th-century mill**  
(site subphase 3004b)

On site 300 a substantial number of posts, Group 13366, were driven in at the head of the Mill Tail between the northern and central mill channels immediately adjacent to the building. A single post 14058 yielded a dendrochronological date of after 1807. This group acted to reinforce the existing stabilising posts Group 13997 from Project Phase 9, which presumably had started to fail.

*In the surrounding landscape – upstream*

At this time a steam powered water-pumping house was constructed by William Cubitt. It had an engine room, chimney and water tower. It was adjacent to the defunct remains of the earlier water-pumping mill, which by this time was used as a store house (see Plate 1.6, and Chapter 4, below).

**Project Phase 10: 1850-1900**

***Modifications to facilitate the conversion to steam power*** (Fig. 3.12)  
(site subphase 3005)

*The map evidence*

The clearest evidence is gained from the maps dated to the latter half of the 19th century. The 1879 1st edition OS map at 1:500 clearly indicates for the first time the addition of a chimney on land immediately to the north of the mill complex. This chimney lies immediately to the east of other structures that have been added in this location. The chimney can be seen on photographs from c 1900. It was substantial and would have been connected to a steam engine. The 1895 Goad insurance map indicates that Hurley and Son operated the mill solely as a steam-powered flour mill using roller and stone grinding technology (Fig. 3.12). On the map there are two boiler placements indicated by hatched lines. One in the area of site 300 within the footprint of the 1755 mill building is labelled as 'disused'; this probably represents the position of the primary phase of boiler and engine,

the remains of which were found on site 300 and are noted below. On the north bank a new structure was built to incorporate the chimney and a further boiler, which would have been operational. The southern mill building of c 1600 had clearly been decommissioned, and is labelled simply as a warehouse.

There was limited archaeological evidence for the major change that occurred during this phase from water-power to coal-powered steam engines. Much of the remains from this phase had been severely truncated by the semi-cellar below the engine house for the Tramways Depot in 1900. However, remains of a sunken brick-lined rectangular pit with internal brick divisions were recorded between the positions of the two mill races to the north and south of site 300. It is considered these are the remains of the base for a boiler. A large square pit filled with concrete and probably forming a foundation to a large piece of industrial equipment indicates that the southern race was decommissioned.

**Demolition of the mill and the construction of the tram depot, 1901–present** (Fig. 3.13)  
(site subphase 3006)

*Historical background*

From cartographic, photographic and documentary evidence it is clear that the complex known as the Reading Bus Depot/Mill Lane Bus Garage as it stood prior to demolition in 1998 incorporated a number of development phases over its 100-year lifetime. The following summary is not intended to serve as a definitive description of the various phases of change of this complex, but highlights the key changes that took place.

In 1901 the Reading Corporation Tramways Depot was opened, heralding a revolution in public transport in the town (Plates 1.9, 3.48). The central Depot housed the power generation, garaging, and maintenance facilities needed for the then state-of-the-art electrically powered trams, with services to

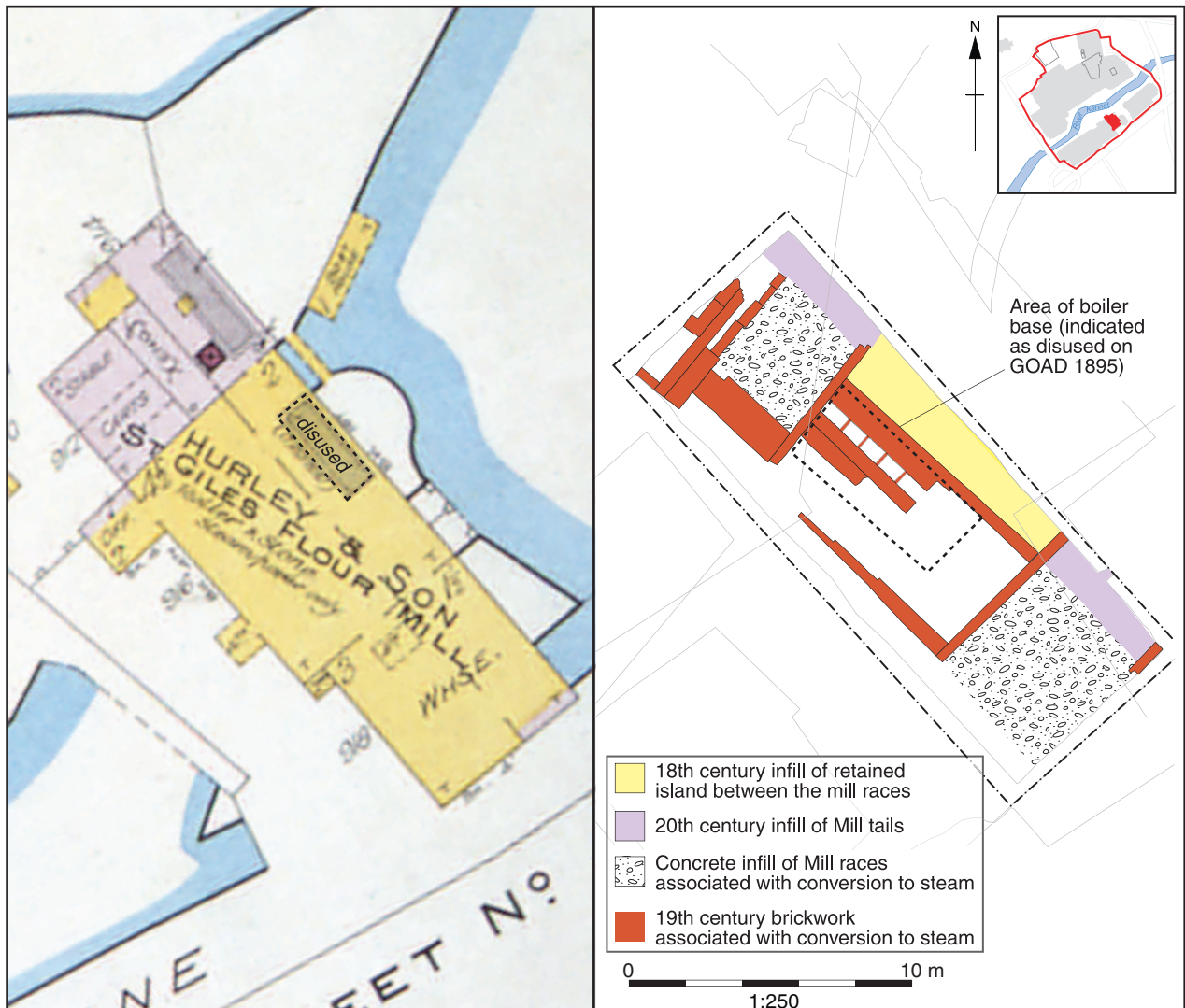


Fig. 3.12 Site 300, St Giles Mill: detail of the steam-powered mill from the Goad Insurance map of 1895 compared with the archaeological evidence (Project Phase 10)





Plate 3.48 View looking W of the opening ceremony of the Tramways Depot in 1901

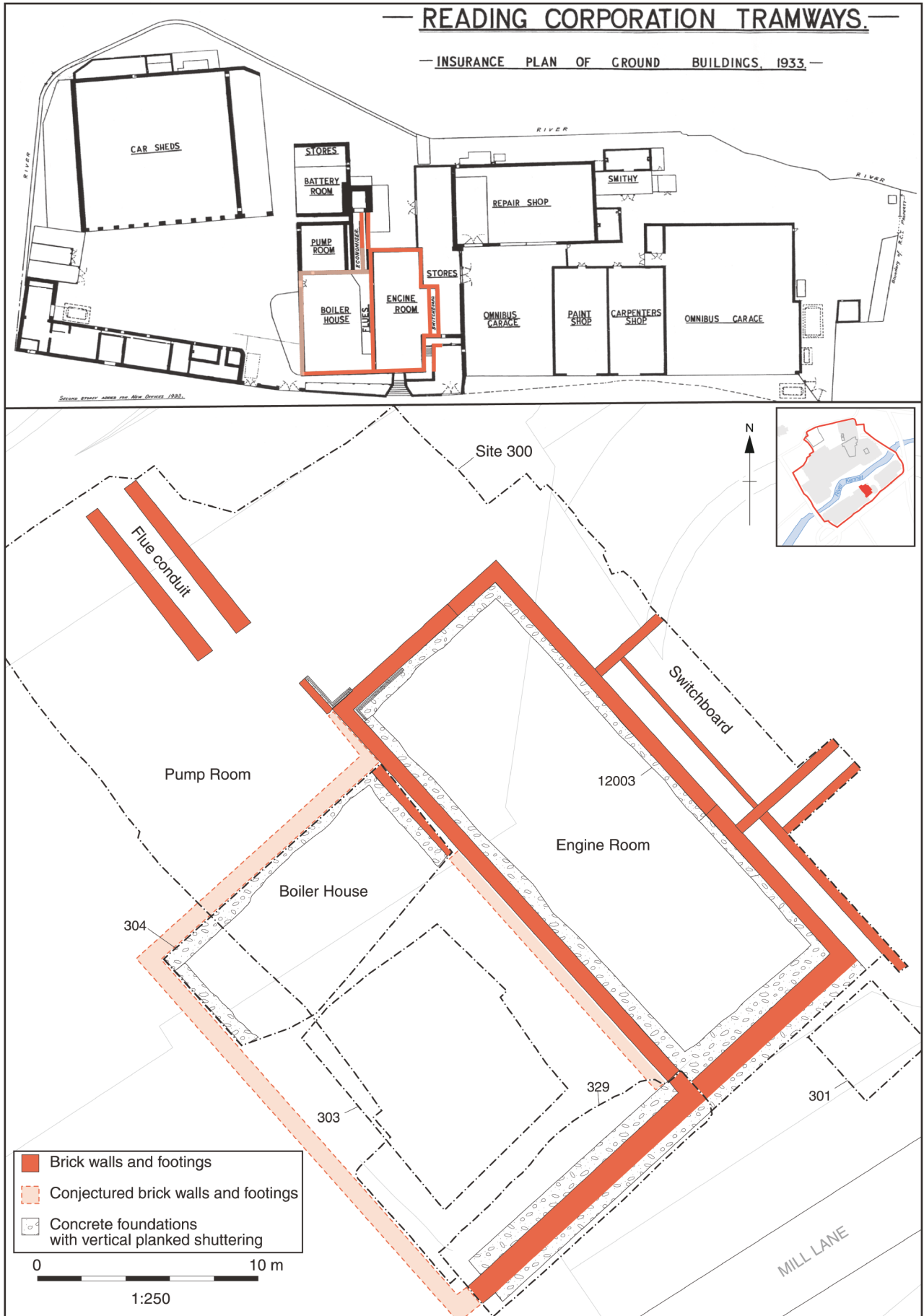


Plate 3.49 View looking W of Reading Bus Depot immediately prior to demolition



*Plate 3.50 Reading Bus Depot, general internal views (above) and (left)*

*Fig. 3.13 (opposite) Site 300, St Giles Mill: excavated remains of the Reading Corporation Tramways Depot and indicated on plan of the Tramways buildings from 1935 (Project Phase 10)*





all corners of the ever expanding Victorian town. Away from the depot a major programme of infrastructure works was necessary to install the tramlines and overhead electrical cabling. These works represented one of the largest upheavals in the town's road system.

The construction of the depot itself also witnessed the most significant changes to the topography of the site that had steadily evolved with the fortunes of successive phases of St. Giles Mill, and canalisation. Construction involved the demolition of St Giles Mill, the mill owner's house, and the Waterworks Dept. To prepare the land for development the former topography was changed dramatically with the infilling of some waterways (notably Mill Tail) using material from the demolition, and the culverting of others to run as underground channels (compare Plate 1.8 and Plate 1.9). The new Depot consisted of an Engine Room containing the switching gear, an Office, the Boiler Room, and an Economiser and Pump Room, all located on the site of the former footprint of St Giles Mill. To the north of these were the coal shed and chimney. Together these buildings formed the core structural complex of the depot. To the north-east of this core group was the Repair Shop, built over the site of the Mill Tail, and to the west lay the Car Sheds constructed on the former island where the mill owner's house had stood. The Car Sheds were approached by multiple tramlines leading from a gateway accessing Mill Lane, which was situated between the Boiler Room and the Stores and fronted onto

Mill Lane, being constructed over the former course of Mill Water and the site of the Water Tower and Store.

Over the course of the next 40 years the electric trams were decommissioned, and the site became the home of the Reading Bus Depot (Plate 3.49). Many of the buildings from the original Tramways Depot were retained and eventually the bus depot covered the entire area between the canalised river Kennet, Mill Lane, Seven Bridges and London Street. Garaging facilities had been increased, the former Car Sheds had been enlarged as the Main Garage, and other large garages for buses had also been added. Maintenance facilities had also grown with new Paint and Carpenters' Shops. These additions required more power, and to this end a new Boiler House had been constructed. With these changes the complex expanded eastwards.

*Building recording*

Mill Lane Bus Garage occupied the entire site until it was demolished to make way for the Oracle development. The Depot was subject to a building recording exercise, which was carried out by OAU in association with the Berkshire Industrial Archaeology Group and other enthusiasts. This exercise amassed a large paper and photographic record of not only the structural details of the buildings but also how the workforce used their workspaces in the last few weeks prior to relocation (Plate 3.50). These records will remain as an integral part of the archive for the project but have not been analysed for this publication.



Plate 3.51 Site 300 view looking N, the remaining unexcavated mill timbers of St Giles Mill are preserved in situ

*Below ground remains in the area of the mill*

Although it was not an objective of the excavation to examine the remains of the 20th century, by default certain construction details were recorded, and there are some interesting points that can be drawn out.

The substantial foundations to the 1901 Engine Room, which defined the area of site 300, were recorded; in addition foundations for the Boiler Room to the west, Economiser and Flue to the north and the Stores and Switchboard Room to the East were drawn (Fig. 3.13). It is interesting to note how these foundations were installed. Initial construction trenches were dug (cut 12003), and where waterlogged timber remains were encoun-

tered from previous phases of activity they were removed. This exercise was achieved not by the wholesale removal of the timbers but by the careful and labour intensive process of sawing off the timbers to the exact dimensions needed for the foundation trench. The trench sides were then lined with vertical timber planking, probably pine, which acted not only to shore up the deep faces of the trench but also as shuttering to receive the poured concrete foundation. It is as a direct consequence of this construction technique for the foundations that so much of the archaeological evidence of the former mill structures remained. It is an object lesson in preservation *in situ* (Plate 3.51).

# Chapter 4 Documentary Evidence

by Joan Dils

## SYNOPSIS

This chapter will describe chronologically the documentary evidence relating to the whole area, dealing in turn with each of the major sites: the Old Yield Hall, Minster and St Giles Mills, and Minster Street with the Oracle Workhouse. It will attempt to ascertain the most significant economic and social developments specific to the area and, where possible, to relate them to relevant aspects of Reading's history. References to 'the area' are to the whole Oracle Site; references to individual sites within the area will be so designated. A list of abbreviations, and of primary sources consulted, is given at the end of the chapter; printed primary and secondary sources are listed in the bibliography at the end of the volume.

## THE EARLY HISTORY OF THE AREA

The emergence of the area as a potential urban settlement pre-dates the documentary sources. Astill (1978, 75) has suggested that it formed the major part of the Anglo-Saxon settlement of *Readingas* which was centred on, and possibly grew up round, the royal minster church of St Mary, recorded in Domesday Book as belonging to the Abbot of Battle. The name of the street running through the area, Minster Street, first recorded in 1250-75 (Slade 1969a, 5) is additional evidence for the theory. It was presumably this settlement, called a royal vill, which was attacked by the Danes in 870 when they fortified an area between the rivers Kennet and Thames; in 1006 they returned and burned the place (*The Anglo-Saxon Chronicle* and Asser's *Life of Alfred* quoted in Slade 1969a, 2). This is the first surviving documentary evidence for the town.

By the time Reading was recorded in Domesday Book (1086) it was a royal borough with urban characteristics although, unlike Wallingford, no market or craftsmen were mentioned. The foundation of Reading Abbey in 1121 had little effect on the area except to make the Abbey the Lord of the town to whom all rents were paid.

## THE AREA BEFORE 1700

### The Yield Hall and its surroundings

By the 13th century and possibly earlier Reading had a Merchant Guild composed of the leading craftsmen and merchants. A complaint by the Gildsmen c1500 claimed they had owned a 'Gildhalle with Stablys, Gardeyns and other edificacions' to the value of £4 19s 6d before the abbey was

founded (Slade 1963-4, pp). Their Gildhall certainly existed when between 1204 and 1220 John son of John gave two islands in Reading, a large one nearest the Gildhall and a little one next to the island where the tenter-yard was, as well as a lane to give access to the large island (Kemp 1987, 147).

The Gildhall was 'the most important non-religious building in Reading'. This was where the Gild met and where the abbot's representative held the borough courts (Slade 2002, I, lxxv). New work and some rebuilding took place on at least three occasions: 1356-7, the 1440s and 1495-8 as well as frequent running repairs, an indication of the importance and heavy use of the building. Slade shows there was a major rebuilding in the 1440s including underpinning a wall and re-tiling the roof, the cost being partly met by contributions from 80 donors and the sale in 1445 of some old timber to David Gower for twenty shillings (Guiling 1892-96, I, 89). The 1490s work included inserting a brick chimney, a 'little chamber', a buttery and a new storehouse. It was probably for this work that Henry Kelsall in his will of 1493 left forty shillings towards the cost when it [the Gildhall] 'shall be new biled' (Kerry 1883, 172). The Gildhall and its adjoining buildings were timber-framed but the Hall may have acquired a tiled floor in the 1490s when several thousand tiles were also used for roofs on the site (Slade 2002, I, lxxv-lxxix). More work may have taken place in 1520 when John Russell agreed 'to make up a draught [plan] at the Gilde Hall . . . having the fundacion thereof made unto the groundsilles'. He took away the timber from the 'old hous' and some tiles (Guiling 1892-96, I, 140). Sadly the gild accounts for this period do not survive.

Some early deeds give additional details of the topography of the rest of the Gildhall site. There was a tenter-yard (for stretching cloth after fulling) in the early 13th century (see above) and various buildings and gardens plus one or more streets are recorded from time to time. In 1355 William le Catour held from the Mayor and Burgesses a lease for three lives of a house, and a vineyard on the west side of the Gildhall together with a road leading to it (Kemp and Slade, *Calendar of Medieval Deeds of Reading*/48; hereafter Kemp and Slade, *Calendar*, see Primary Sources, below). In 1363 a garden and a vinery backing onto the river Kennet and enclosed by a fence extended from the door of the Hall to a curtilage also held by William le Catour (Kemp and Slade, *Calendar*/50). By 1400 a messuage belonging to John Hunte in the street leading to the Hall on the east; between a tavern called le Vont on the north and a shop on the south

was given to the maintenance of the Gildhall (Kemp and Slade/88). William le Catour's house (now called a cottage), barns, stables and the gardens were leased throughout the 15th century, the gardens described as on the east and west side of the Gildhall.

By 1478 other buildings on the island owned by the Merchant Gild included the common latrine next to the Hall, separated from Minster Mill by a plot of land, and a stable. (Kemp and Slade/168). The stable and a garden were leased by Richard Cleche in 1483-4 at five shillings a year rent. In 1513 he renewed the lease for life with an additional property, probably the dyehouse on the south side of the hall, the combined rent being eight shillings. (Slade 2002, I, xxxvii). A deed of 1515 shows how the topography of the Gildhall site had developed. In that year William Wattis leased from the Gild a barn, garden, piggery and a vacant plot. The boundaries of the plot, possibly the same as described in 1478, were a stable of the Hall on the west, the Kennet on the south and the Millbrook on the north and east, the bounds extending up to the dyehouse. Cart horses entered the property by the road and gate next to the Hall (*ibid.*, I, xxxviii). Slade suggests that Wattis possibly converted the barn or built a dyehouse since in the rent roll of 1515-16 he is recorded as renting a dyehouse at 23/4d per annum (*ibid.*, II, 181).

The Gildhall ceased to be the meeting place of the Gild soon after the Franciscan Priory of Greyfriars was dissolved. Since Reading became an incorporated borough soon afterwards, such a move would add to the status of the town. In 1538 Dr London petitioned Thomas Cromwell for the building to be sold to the town because 'ther town-hall ys a very small house and stonidith upon the ryver wher ys the comon wassching place of the most part of the town' (Coates 1802, 305). In 1552 the 'newe Guilde Hall formerly called le ffriers' was located in New Street and the building called the 'Olde Yeld Hall' consisting of a tenement and several adjacent houses was standing by itself on an island surrounded by the Kennet (Amyce ff 321). In 1560 the Charter of Elizabeth I included a grant to the Borough of a large number of properties, among them 'a tenement and several houses inclosed by a rivulet called the Kennett called the olde Guildhall of the aforesaid Mayor and Burgesses'. The grant also included a 'corner tenement and Garden opposite the new Newyeldhall' which, from the adjoining properties, appears to have been the former Greyfriars (Pritchard 1913, 39, 41). North of the Gildhall and separated from it by a branch of the river were several properties including one formerly called The Angel and now a brew house, perhaps the Le Vont mentioned in 1400 (Amyce ff321 and 327).

From this time on, the Old Yield Hall and the other buildings were leased by townsmen. There are references to a stone house in 1616 and 1638, brick chimneys in 1628 and tiles on the houses in 1629 and a chandling house (candle making) in 1608 (Guilding 1892-96, II, 72, 400, 421, 21).

### **Minster Street and the Oracle**

Only the south side of Minster Street is included in the area. With the exception of the 1552 survey, it is impossible to locate any properties in the records to a specific side of the street so all references have been included unless the source definitely places them on the north side. The street was separated from the Gildhall by the Holy Brook but it is not possible to be sure if the Gildhall Bridge spanned the stream (Slade 2002, I, lxxxii). The first documentary evidence of the name and economy of Minster Street is in *c* 1240 when a grant was made by Walter de la Wyle to Richard Cardun of a plot of land in Minster St between land of Walter and that of John Remb, stretching from Walter's brewhouse to his tannery measuring 24ft long and 10 ft wide (Kemp and Slade, Calendar/2). Tanning and brewing, as well as clothmaking, required access to water and all produced noxious smells and effluent, hence the south side of Minster Street would have been a convenient location. It is possible that some of the three tanners named in a tax roll of 1297, each with 'goods in the tannery' (Dodwell 1962, 101-113) and the four listed in the 1377 Poll Tax worked here (Fenwick 1998, 39-41). Clothworkers, including dyers, are also named in these tax lists, though without addresses. There may also have been a smithy in Minster Street in the later 13th century (Kemp 1987, 140).

Little is known about the street from the late 14th century until the Amyce Survey of 1552. On the south side from the Old Yield Hall to Seven Bridges were a barn, a dyehouse and thirteen tenements, some with gardens. Two properties owned by townsmen had previously belonged to Colney's Chantry and two more to the Chantry of the Divine Mass, both of which had been dissolved by the Crown a few years before, and five had been bought by William Grey as part of his purchase of Reading Abbey's possessions (Amyce ff 321-322). Two of these may have been owned by the Abbey's Almoner who had used the income to provide for the poor (Kemp, Almoner's Cartulary, f 47a and 48a).

The economy and society of St Mary's parish in general in the Tudor and Stuart period are revealed by considerable numbers of probate records (wills and inventories) though it is not possible to locate many to Minster Street with any certainty. The industries were the same as in the middle ages. Most of the town's tanners lived and worked in the parish. Tanners were very wealthy and influential in the borough; one, William Brackstone owned eight houses in Reading besides a large house and farm at Sulhamstead Bannister. He served as Cofferer (Treasurer) of the borough and as an overseer of the poor for St Mary's parish. The parish register records his burial as Mr William Brackstone, a magistrate buried 4th Nov 1634 (Crawford 1913). However, effluent from the vats where the leather was tanned with oak bark polluted the streams; in Oct 1582 and again in 1584 Gilbert Aldworth was fined 3s 4d for



allowing his tan vats to run into the Holy Brook (Court Leet Books). A few other leather workers, glovers and saddlers lived in the parish but shoemakers lived and worked in Shoemaker Row in the Market Place. Leather trades played an important role in Reading's economy at this period, second only to cloth production.

Cloth, particularly high quality broadcloth was, however, responsible for Reading's wealth, particularly in the early 16th century when the town ranked tenth richest in England (Dyer 1995, 70). Weavers and other cloth workers who did not require access to water were most probably living in the area but their wills give no addresses other than a parish. Cloth certainly was produced in Minster Street; in the 1552 Survey a dye house owned by William Bye was located near the future site of the Oracle. At the junction of Minster Street and Southampton Street in 1552 was a tenement 'formerly a dye house'. Unfortunately, dyeing, like tanning, polluted the rivers; in 1571 John Brown, a dyer, was fined for allowing effluent from his woad vats to run into the Minster Stream (Court Leet). It was in an attempt to prevent this that a Commission of Sewers was appointed in 1575 'for improving and preventing nuisances on the River Kennet and Hallowed Brook'. One of its terms prohibited the setting up of tan vats by the Brook and another imposed a fine of five shillings a day on anyone allowing effluent from privies, tan vats or pigsties to flow into it. The frequent fines for breaking these rules are an indication both of the importance of industry near the stream and also of the poor quality of the water in it.

The topography of Minster Street was dramatically changed in 1628 with the construction of the Kendrick Cloth Workhouse, later called The Oracle. It was funded by a huge bequest from John Kendrick, a merchant belonging to a family of Reading clothiers but based in London, and was intended to provide work for the poor. The Workhouse which extended from Minster Street southwards beyond the Holy Brook included a house and land owned by William, John's brother, and purchased by the Corporation from the bequest (Phillips 1980, 54). Built of brick and tile, 19th-century plans show the Oracle as a series of rooms around a courtyard through which the Brook ran (see Plate 3.1); its imposing main entrance was in Gun Street (see Plates 3.2 and 3.4). Rooms with equipment were leased to various clothiers who employed poor, skilled craftsmen to produce broadcloths and Spanish cloths but within a few years it was proving difficult to make a profit. Following complaints of misuse of the Kendrick bequest in 1637, an investigation by Archbishop Laud, a native of Reading, proposed the building should be used to teach orphan children a trade, one of which seems to have been pinmaking (Jackson 1993, 218-9; Guilding 1892-96, III, 508, 510). During the Civil War it is said to have been used as a barracks (Hinton 1954, 91).

### Minster Mill and St Giles' Mill

Domesday Book records six mills in Reading but does not place any within the borough. Slade suggests that 'one or two of them' were possibly within the town but cannot be certain since its boundaries are not known (Petyt 1993, 29). St Giles' may have been the mill mentioned in a lease by the Abbey between 1173-86 (Kemp 1987, 115). Minster Mill, connected to Minster Street by a lane called Mill Lane in 1552 (Amyce ff 321), was certainly in operation in 1250 when a grant was made to the Merchant Guild of an island between the Gildhall and Minster Mill (Kemp and Slade, Calendar/2). In the latter half of the 13th century St Giles' Mill was being used to full broadcloths, one of Reading's major products (Kemp 1987, 135, 178).

The mills were given to Reading Abbey as part of its endowment, and remained Abbey property until the Dissolution. In 1545 they were purchased by William Grey along with many other properties in the town (Dormer 1923, 143-4) for £2133 3s 0d of which the mills cost a huge £720. Both mills were described as two corn mills and a fulling mill while St Giles' also had a stable and a barn. Stephen Cawood was already renting both mills and later paid Grey £36 a year rent; Grey had made a good investment. He had been in the household of Thomas Cromwell and after his master's fall he became an official in the Court of General Surveyors. In 1545 he bought Bulmershe Manor which had belonged to Reading Abbey as well as the property referred to above which made him the largest property owner in the borough. He became MP for Reading in 1547 and died in 1551. He had married Agnes Blagrove, widow of Robert, who had a son, John, by her first marriage. Grey and Agnes had no children, hence all his possessions were inherited by John and through him Blagrove descendants (Dormer 1923, *passim*). The mills were let by the Blagroves as they had been by the Abbey and continued to be used for fulling cloth. Both were usually leased to the same person, a custom which continued for some time: in 1578 John and Anthony leased both mills to Thomas Umpton (Calendar Patent Rolls Elizabeth I 1575-78 number 66/1171). In 1583 John Hooker, millwright of St Giles' Parish, had leases valued at £101 of Caversham Mill and two fulling mills, one of which may have been for St Giles' Mill. He owned tools, iron and timber as well as fulling earth and his house contained a brewhouse (D/A1/G/401).

At Minster Mill in 1604-10 there was a dyehouse and garden (Taxation Roll for Minster Ward, Reading 1604-10 (BRO R/FT HMC XLI b)) and the mill itself was used by Reading clothiers for fulling in the early 17th century (Jackson 1993, 62). The house on the site was probably small and not very comfortable; Richard Milson had only one fireplace in 1662-3 but at St Giles' Mill which he also leased he had seven (Powell 1913). Two more millers appear in probate documents, William Ricketts, 1689 and Peter

Smith, 1693 but in neither case is the parish or mill named, nor what was produced (D/A1/211/81; D/A1/122/46). By this date it is unlikely that either was involved in cloth production which was no longer important in Reading's economy.

A good supply of water, however, was needed for the growing community. An 'engine' to pump water from the Kennet up to the town was built by a group of four entrepreneurs who in 1697 took out a 1000 year lease on part of the orchard next to St Giles' Mill. It was not very successful and eventually fell into disuse.

## 1700 TO THE 20TH CENTURY

### The Yield Hall and its surroundings

A statement in *The Universal Directory* c 1795-6 could refer to the site. It reads: 'Mr. Bagnall has a sail-cloth manufactory in the Island and employs upward of forty men. Mr Wallis of London employs upward of thirty men in the like manufactory' (p. 303).

In the 19th century the Yield Hall was called Hill Hall. In 1807 it was called 'possibly the most ancient' of Reading Corporation's properties and was leased to various tradesmen. James Hayes, floorcloth manufacturer, had six houses with warehouses or workshops bordering the Back Brook; Charles Benwell, cabinet maker and upholsterer four workshops, a warehouse and a sawpit. Two other tenements and a coach house in the centre of the site were also let, as was a large dwelling house, workshops, offices and stables. On the north side next to a passage through the estate was part of Talfourd's brewhouse (Terrier).

Throughout the century trade directories give the occupiers of properties on the site, in 1821 James Wilder, Iron Founder and William Tiley, junior, brewer and James Hay, floor-cloth manufacturer (*Piggott's Directory of Berkshire*, 1821). Wilder's foundry continued for over a century on land leased from the Corporation (Statutory declaration 1997). By 1867 James [Wilder] and his son John, born in 1825, had expanded their product range and were described as engineers, brass and iron founders, smiths and agricultural implement makers (*Macauley's Directory*). John had taken over by 1891 and was living in a substantial house, Erleigh Grange in the wealthy middle-class road of the same name. *The Reading Mercury* reported his funeral on 23 March 1903. It was attended by the Mayor and other leading townsmen and a hundred employees of the Foundry preceded the cortege to Reading Cemetery. The firm was still in existence on the site in 1932 but there was also a branch at Cattle Market on Caversham Road to which the business was transferred by 1938, probably on the expiry of the latest lease of their premises in September 1934 (Letter 14 May 1992). Other enterprises at Hill Hall in the late 19th century were carpenters, a coal merchant and an ironmonger's workshop (Kelly's Directories).

### Minster Street and the Oracle

Cloth production in Reading was already in difficulties when the Oracle was built, and declined after the Civil War. By the early 18th century it was effectively dead (Defoe 1724-6). The Oracle, partly restored in 1720, was then occupied by various poor craftsmen producing pins, silk and sailcloth (Phillips 1980, 84). A failed attempt to turn it into a workhouse for all three Reading parishes in 1726, allowed manufacturing to continue. In 1795/6 Thomas Bartlett and James Bestridge, sack-makers, and John, Thomas and Robert Henry Deane, pin-makers were said to employ large numbers of men, women and children (*The Universal British Directory*). Coates, writing in 1802, described it as a range of workshops with gardens, although many rooms were shut up with old looms and broken machinery. In 1807 the ground floor consisted of nineteen rooms occupied by six tradesmen, some of whom can be traced in later records, plus five houses 'inhabited by poor people' (Terrier).

19th-century directories confirm that the Oracle continued to house sacking manufacturers including William and Thomas Bartlett sacking, rope and sailcloth manufacturers, (*Piggott's Directory of Berkshire*, 1821); other sources add the making of pins, sails, rope, and light fabrics such as satin and silk (Childs 1910, 22). William Darter (born 1803) claimed Mrs Stokes kept a parish school in the building and that the long rope walk continued in use until about 1850 (Phillips 1985, 40). In 1849 Christ's Hospital won a suit against the Borough for misuse of Kendrick's bequest and a year later the Oracle was pulled down to be replaced by a number of small shops. Minster Street in the 19th century contained a varied collection of small retail establishments, shoes and clothing being prominent among them (Directories).

### Minster Mill and St Giles Mill

In 1724 the Kennet was canalised from the High Bridge to Newbury; in 1788 Reading Corporation replaced the old Duke Street bridge with an elegant stone structure and in 1810 the Kennet and Avon Canal created a waterway between London and Bristol via Reading. An estimate of the water-borne trade of the Borough in 1835 was 50,000 tons; just 100 tons went by road (Alexander 1985, 9). Reading, at the confluence of Thames and Kennet and on a major east-west road, had always been an important commercial centre; in the 18th and early 19th centuries, this aspect of its economy became increasingly significant.

The mills continued to operate although Minster Mill would be first to stop working. No leases survive for the 18th century but the Blagraves still owned them and it is likely they were still occupied throughout. There was a millwright, Samuel Dagnall, at St Giles Mill in 1707. His house was small, just a bedchamber and a kitchen but there are

no details of the mill (Archdeaconry of Berkshire wills BRO D/A2/187/95). In 1790 Martha Blaggrave leased St Giles Mill and its appurtenances to William May (Deeds 3670 packet 9); in 1799 both mills were leased by Thomas May of Brimpton, gentleman, and occupied by Thomas Collis who is also listed as a miller in *The Universal Directory* of c 1795-6. Minster Mill was valued for the Land Tax 1799 at a mere £4 5s 5d compared to £15 10s 0d for St Giles' (St Giles' leases).

In 1821 the millers at St Giles' Mill were John and William May (*Piggott's Directory of Berkshire*, 1821) but in 1820 they leased an additional piece of ground to proprietors of Reading Waterworks for the remainder of their 1000 year lease for the erection of a water tower for the 'improvement and more effectual supply of Water to the inhabitants of Reading' who numbered almost 13,000 (St Giles' Mill leases). The pumping machinery was able to raise 250,000 gallons a day into the tower and a reservoir at Whitley. In 1826 the Company was incorporated by Act of Parliament and given powers to compulsorily purchase properties needed to improve the water supply. Ten years later they installed a steam engine but neither water pressure nor quality proved acceptable. Following a highly critical report on the state of public health in the Borough, in 1850 the Corporation became the Local Board of Health whose duties included that of ensuring a pure and constant water supply; in 1868 the Corporation bought the Company (Alexander, 1985, 4, 9, 29-31). A new waterworks was constructed at Fobney, upstream on the Kennet, to supply a large new water tower at Calcot. The steam pump at St Giles continued in use to supply the reservoir at Whitley, but it finally stopped in 1877 (Powell 1913).

Meanwhile the mill continued. In 1860 William May conveyed St Giles' Mill, a granary, an orchard and Tan Lock to Rowland Charles Hurley for £2050. Included in the sale was Minster Mill, but as part of the agreement it was not to be operated as a water mill (Reading Borough Deeds 3670 packet 9). Over the next forty years, Hurleys appear as living in the next door to Minster Mill at Willow Cottage or at the Mill House and working the flour mill; in 1890 the mill is called a steam mill (Macauley, Smith and Kelly Directories). There was also a group of six houses on the site called Mill Court (Macauley, Smith and Kelly Directories). In 1897 Reading Board of Health acquired the site, compensating Hurley for the machinery, and three years later the mill and the tower were demolished, the bricks being used to raise the level of Mill Lane (Reading Borough Deeds 3670 packet 9; card index at Reading Local Studies Library). Reading Corporation Tramways began constructing the new Mill Lane Electric Tramway Depot in 1901, the first electric tram running on 22 July 1903 and last one in 1939. In 1939 trolley buses replaced trams, to be replaced in turn by motor buses (Phillips 1980, 143-4). All operated from the Mill Lane Depot.

## SOURCES

### Abbreviations

BAJ	Berkshire Archaeological Journal
BRO	Berkshire Record Office
HMC	Historic Manuscripts Commission
BRS	Berkshire Record Society
NA	National Archives, formerly the Public Record Office

### Primary Sources – National Archives and British Library

- Kemp, Almoner's Cartulary: Almoner's Cartulary (British Library. Cott. Vesp. EV f 47a and 48a) – transcript by B.Kemp.  
 Amyce: Survey of properties formerly belonging to Reading Abbey, made by Roger Amyce 1552 (NA Misc. Bks. Land Rev vol 187).

### Primary Sources – Berkshire Record Office, Reading Local Studies Library and Reading Borough Council

- Archdeaconry of Berkshire wills, inventories and administration bonds (BRO D/A2/..)  
 Blaggrave Papers, Title Deeds to Reading Property, (BRO D/EBG)  
 Directories: *Piggott's Directory of Berkshire*, 1821; *The Universal British Directory of Trade, Manufacture and Commerce* c.1795-6 (Reading Local Studies Library); *Macauley's Directory*; *Kelly's Directories*  
 Indexes of Fire Insurance Policies of the Sun Fire Office and Royal Exchange Insurance 1775-1787 (BRO T/A86)  
 Kemp and Slade, Calendar: Calendar of Medieval Deeds of Reading (BRO R/AT1) transcript by B Kemp & C Slade  
 St Giles Mill Leases 1697-1832 (BRO RLBH/TD/B4 Acc72)  
 Orders, Acts and Decrees of the Commission of Sewers 1575 (BRO Reading Borough Records HMC Report LVII)  
 Proceedings at the Court Leet of the Borough of Reading, Elizabeth I -1830 (BRO R/MJ)  
 Reading Borough Terrier 1807 BRO R/578  
*Reading Mercury* (Reading Local Studies Library)  
 Roll of Admissions to the Freedom of the Borough (BRO Reading Borough Records HMC XLVII)  
 Reading Borough Deeds retained by Reading Borough (referred to by 4-figure number)  
 Statutory Declarations by Head of Reading Borough Legal Services 1992 and 1997

Printed primary and secondary sources referenced in the text of this chapter are in the general bibliography at the end of the volume.



## Chapter 5 Trade, Crafts and Services

During the post-excavation analysis, specialist contributors were asked to give particular consideration to aspects of their assemblages that could cast light on the nature of trade and crafts, and the way in which the project area was being used in the medieval and post-medieval periods. Not all assemblages provided sufficient suitable data for this study, but many did, and the most interesting aspects of these are presented below. The first part of this chapter looks at the evidence for goods that were used or consumed in the town but not necessarily produced there, including pottery, glass, timber, fish and the products of Reading's agricultural hinterland. This is followed by a review of evidence for the craft and other economic activities that were being carried out within the town or the project area, including cloth- and leather-working, clay pipe manufacture, the small-scale industries based in the area in the post-medieval period, fishing and stabling, and finally milling. A considerable proportion of the finds come from material dumped on the site to fill channels, stabilise revetments, raise the ground level or provide a firm base for construction. Much of this material is likely to have been brought from elsewhere in the town and in the absence of other indicators, such as the structural remains of craft working sites, we cannot reliably distinguish it from waste generated by activities on the excavated sites themselves. Nevertheless it reflects the range of traded goods and craft working within the town, and the way in which sources of supply developed and changed over time.

The full specialist reports and catalogues, from which these conclusions are drawn, can be found in Chapters 7-11, which are on the accompanying CD-ROM.

### TRADED GOODS AND SOURCES OF SUPPLY

#### **Jettons and trading tokens** (Plate 5.1; Table 5.1)

*Identifications by Martin Allen, discussion by Edmund Simons*

A full list of all coins, tokens and jettons from the excavations, identified by Martin Allen, can be found in Chapter 9 (CD ROM). The medieval coins were all redeposited in later dump and make-up layers and add no useful information about the chronology or function of the sites. By contrast, concentrations of jettons on site 29 and site 12 may be associated with activities carried out there.

The jetton (from the French 'jeter' to throw) is a counter used in mechanical calculation on a

counting table (counter or abacus), which worked in much the same way as the sliding bead type of abacus. The jettons were laid out on flat tables on either cloths (exchequer cloths) or on marked tables (counters). These were divided into rows usually representing thousands, hundreds, pounds (a sum of money used only in accounting), shillings and pence. The jettons were simply used as markers to represent units of money and/or goods and allowed for complex calculation without the use of complex Roman numerals. The increasing use of written calculation with Arabic numerals led to the decline and eventual abandonment of the abacus. The earliest jettons proper were used in the French royal household and often bear a symbol (rakes, cauldrons etc) relating to the department in which they were used. The earliest English jettons follow the French example and seem to have been exclusively for official use, and were minted by the royal moneymen using the same obverse (head) dies as silver coin. To prevent these early jettons being silvered and passed as coin each English jetton has a hole at its centre. Four of these early jettons were found at the Oracle, three at site 12 and one at site 29, but none of them in a contemporary context.

The use of jettons spread to other groups in society including monasteries, great families and merchants. During the 14th to 15th centuries jettons were manufactured in huge quantities in France and the Low Countries (particularly Tournai and Paris). These 'Jetons Banal' or Stock Jettons are well represented at the Oracle. Although they are superficially similar to French coin (usually bearing the arms of France on the obverse and a cross on the reverse) they had no intrinsic value and would have been purchased specifically for counting. Of the examples from the Oracle, three may be in near contemporary contexts in 15th-century deposits at site 12 associated with the demolition and reconstruction of building 7410/7411 (site sub-phase 1206b; see Table 5.1). The remaining ten French stock jettons were either clearly redeposited or unphased. However, three occurred in a group of four jettons and three coins associated with the later 16th-century demolition of building 7410/7411 and the subsequent reconstruction of a possible dyehouse on the site (site sub-phase 1208b; Table 5.1).

By 1500 Nuremberg had become one of the greatest trading centres in Europe and soon dominated jetton production. In England Nuremberg types remained in use until the eventual disappearance of jettons in the late 17th century. A surprising number of the Nuremberg jettons from Reading Oracle may be in approximately contem-

Table 5.1: Medieval and Tudor coins and jettons (E-English; F-French; N-Nuremberg)

Object (SF No. )	Date	Context	Context type	Site sub-phase
Site 12				
Halfpenny (1829)	1355-61	9576	makeup layer	1206b
Jetton, E (1825)	c 1350-1400	9557	soil dump	1206b
Jetton, F (1830)	14th-15th century	9574	dump	1206b
Jetton, F (1832)	15th century	9592	posthole fill	1206b
Jetton, F (1827)	15th century	9568	hearth or burnt layer	1206b
Penny (1798)	1300	9436	demolition layer	1208b
Penny (1810)	1279-1489	9475	metalled surface	1208b
Jetton, F? (1812)	?14th-15th century	9475	metalled surface	1208b
Sol coronat of Robert of Anjou (1806)	1309-43	9483	fill of construction cut	1208b
Jetton, E (1821)	c 1350-1400	9498	makeup layer	1208b
Jetton, F (1819)	15th century	9498	makeup layer	1208b
Jetton, F (1820)	15th century	9498	makeup layer	1208b
Jetton, N (1679)	1586-1635	8760	makeup layer	1209f
Jetton, N (1756)	1586-1635	8760	makeup layer	1209f
Jetton, N (1767)	1586-1635	8760	makeup layer	1209f
Jetton, F (0118)	?14th-15th century	0900	makeup layer	1210a
Halfpenny (0034)	1280-1544	0671	floor makeup	1210a
Penny (1766)	1279-1489	8814	makeup layer	unphased
Jetton, E (1600)	1280-1350	8500	makeup layer	unphased
Site 29				
Halfgroat (1068)	1351-c 1505	4545	cobbled surface	2907a
Jetton, N (1056)	16th century	5193	construction backfill	2908d
Jetton, N (0949)	16th-17th century	4532	in fill of tanning vat in pit 4515	2908d
Three halfpence (0882)	1561-82	4202	dump	2909a
Jetton, N (0879)	16th century	4202	dump	2909a
Jetton, E (1807)	1300-1310	3933	makeup	2909a
Jetton, N (0900)	1586-1635	4334	pit fill	2909a
Jetton, N (0903)	1586-1635	4338	pit fill	2909a
Jetton, N (0965)	c 1500-25	4507	metalled surface	2909a
Jetton, N (0996)	16th to early 17th century	4615	fill of tanning pit 4732	2909a
Penny (874)	1300-c 1311	4224	cellar infill	2909b
Penny (1131)	1279-1489	5304	construction debris	unphased
Jetton, F (1084)	15th century	5437	construction cut fill	unphased
Site 150				
Jetton, N (0700)	1586-1603	8300	revetment packing	15006a
Site 101				
Jetton, F (1312)	late 14th century	7007	construction layer	unphased, post-medieval
Jetton, N (1310)	16th to early 17th century	7109	dump in Back Brook	unphased
Site 300				
Jetton, F (2607)	c 1328-50?	13463	channel fill	3002a

porary contexts. Seven examples came from contexts associated with the backfilling of the 16th- to early 17th-century tanning pits on site 29 and the construction and earliest use of the Oracle workhouse (site sub-phases 2908d and 2909a; Table 5.1). One was found in the same context as an Elizabeth I threehalfpence of the period 1561-82. Three similar 'Rose and Orb' jettions were found together in a floor make-up layer from reconstruc-

tion works at building 7410/7411 in the late 17th or early 18th century (site 12, sub-phase 1209f; Table 5.1). It is not impossible that despite their age these jettions were still in use as either counters or gaming tokens at the time of loss.

The number of coins and jettions found in association with building 7410/7411 is very striking. The numerous coins and jettions in deposits of the late 15th, late 16th and early 18th century at this site

contrast markedly with the single coin and single jetton found in all other phases of all other areas of site 12 (site sub-phase 1210a; Table 5.1). This suggests that there was a real association between building 7410/7411 and activities including reckoning and accounting, although the possibility remains that the jettons could also have been used as counters in games and gambling. Both the groups from this site, and the 16th-century jettons from site 29, show that jettons were in use among people in the middle ranks of Reading society, and that such people may have used them for carrying out business-related calculations.

**Three tradesmen’s tokens (Plate 5.1)**

Joan Dils has identified three of the tradesmen whose tokens were found during the excavations (Plate 5.1). Plate 5.1 No. 1 (Token 0501/0016), dated to 1666, was issued by Edward Bowland Snr, dyer, and found in deposits relating to the 20th-century demolition of the Yield Hall. By the time of his death in 1668 Bowland may have been retired, as his will records no dyehouse or other trade goods, although the total value of his inventory was £45 1s. Plate 5.1 Nos 2 and 3 were both found in dumps in the Back Brook. No. 2 (token 7109/1314, dated 1648-72) was issued by Clement Marlow, who was an apothecary and a freeman of the town. He was prosperous, having paid 5s in the hearth tax, and the value of his inventory when he died in 1672 was £187 12s 3½d. His house had a best chamber, a low chamber, a new chamber, a passage, a herb loft, a meal loft, a garret and a jack chamber (or privy). In his shop were galley pots and glasses with syrop and distilled water, drugs, sugar, galls, spices and fruits. In his cellar were oil, logwood and other dyeing stuff, a hogshead of vinegar and some

tobacco. He left 5s to the poor of Reading who can ‘speak experimentally of the Lord Jesus’. No. 3 was issued by Thomas King, probably also an apothecary (token 7109/1302, dated 1666). King, like Marlow, paid on 5 hearths in the hearth tax and was presumably therefore also rather prosperous.

**Medieval Pottery (Figs 5.1-5.6; Tables 5.2-5.4)**

*by Paul Blinkhorn*

The pottery assemblage from Reading Oracle is one of the largest groups of medieval and later pottery ever excavated in Reading, and presents a major opportunity to enhance the understanding of pottery chronology, supply and use in the town (Table 5.2). The different medieval ceramic traditions represented at the site are discussed below in chronological sequence, and the full version of the medieval pottery report can be found in Chapter 7 on the CD-ROM.

*Table 5.2: Medieval pottery occurrence by number and weight of sherds and EVE per phase*

Project Phase	Date Range (century)	No	Wt (g)	EVE
2	mid 11th-mid 12th	396	7951	3.60
3	mid 12th -mid 13th	572	11995	8.36
4	mid 13th -late 14th	329	5266	3.78
5	15th	971	15862	14.14
6a*	1500-1540	1103	15202	14.98
Total		3371	56276	44.86

\*phase 6 groups dating to before the Post-Medieval Redware/Border ware horizon



Plate 5.1 Tokens

## Fabrics

### *Early/middle Saxon hand-built wares, AD 450–850.*

6 sherds, 98 g, EVE = 0.18 (all jars)

All the early/middle Saxon hand-built pottery was chaff-tempered. This is typical of the pottery found at sites of both early and middle Saxon date along virtually the whole length of the Thames Valley, including London (Blackmore 1988; 1989), Maidenhead (Blinkhorn 2002) and, to the west of Reading, at such places as Lechlade (Blinkhorn in archive). The vast majority of the pottery of this type comprises undecorated jars with simple globular forms and everted rims (Fig. 5.1 No. 1). Small quantities of early/middle Anglo-Saxon pottery have been noted before in Reading, mainly around the Abbey, including finds made during the 1960s excavation and at the Waterfront sites with the latter producing a total of 26 sherds; (Underwood 1997, table 16). A relatively large assemblage of 18 sherds (204 g) was also noted at excavations at Broad Street in Reading (Blinkhorn 2007a). There seems little doubt therefore that there was Anglo-Saxon activity in Reading, and the focus of this activity, if it still exists, would appear to be in the area previously occupied by the medieval abbey, although this may be simply a reflection of the activities of archaeologists rather than Anglo-Saxons. All the sherds found at the Oracle were undecorated, and thus cannot be dated other than to within the broad early/middle Saxon period (Myres 1977, 1).

### *F1: Local fine sandy ware, ?Late 11th–?14th century.*

1058 sherds, 16,594 g, EVE = 10.44 (jars = 9.78, bowls = 0.66).

A range of fine sandy fabrics, similar to those noted at the Reading Waterfront excavations (Underwood 1997, 144). This assemblage comprises a typical range of earlier medieval vessel forms, with the vast majority of sherds from jars (Fig. 5.1 Nos 2-4), but with small quantities of bowls and a few jug sherds. No jug rims were noted, but jug body and base-sherds were present. Fragments of a number of tripod pitcher bases were noted, along with a long tubular spout likely to be from such a pot. Tripod pitchers are a typical component of early medieval pottery assemblages in southern central England, being well-attested from (for example) Oxford, where they appear to have been first used in the later years of the 11th century (Mellor 1994, 66). An unusual bowl with a pouring lip was also present (Fig. 5.1 No. 6), as were two spouted examples (Fig. 5.1 Nos 5 and 7) and a bung-hole from a cistern. Cisterns are usually later medieval in date, and the presence of the sherd indicated that these sandy wares may still have been in use in the 14th century at least. It can be seen from Table 5.3 that the use of this pottery type was in sharp decline during the 14th century, and it was residual by the 15th, so the vessel is likely to date from the 14th century. Decoration was largely limited to vertical combing (57 sherds, 1223 g), although a single sherd was noted with combed wavy lines. A number of sherds (37 sherds, 944 g) had a green or orange glaze, with bowls, when thus treated, glazed internally.

Fine sandy wares such as these are found along a considerable length of the middle Thames Valley and its hinterland, and the problem of differentiating between

the numerous different wares has been noted in the past (Mellor 1994, 84). For example, Mellor (*ibid.*) has identified at least four different quartz-tempered fabrics in southern Oxfordshire and its environs, with centres such as Henley-on-Thames and Maidenhead producing very similar quartz-tempered wares. Historical sources indicate that there were potters in Henley during the 13th and 14th centuries, and perhaps even Reading itself (*ibid.*, 208, 210), and it is likely that other, non-documented sources in the hinterland of Reading await discovery. The medieval kiln at nearby Ashampstead is another possible source. Consequently, this fabric category should be regarded as a group of several similar traditions, rather than pottery from a single source; the separation of the different fabric types is simply beyond the scope of this project.

### *F2: Local coarse sandy ware, ?Late 11th–mid 13th century.* 277 sherds, 3725 g, EVE = 1.58 (jars = 1.35, bowls = 0.08, jugs = 0.15).

A range of coarse sandy fabrics, similar to those noted at the Reading Waterfront excavations (Underwood 1997, 144). The range of vessels is broadly similar to that of F1, although there is no definite evidence for tripod pitchers. This may however simply be due to the rarity of such vessels. Decoration was again largely limited to vertical combing (45 sherds, 818 g). A total of 17 glazed sherds (164 g) were noted. As with F1, it is very likely that these coarser sand-tempered wares are from a number of different sources. The ware never exceeds 8% of the site assemblage at any time, and appears to have fallen from use by 1400.

### *F3: 'M40' type ware, ?Late 11th–14th century* (Hinton 1973). 45 sherds, 913 g, EVE = 0.71 (all jars).

Hard, flint and limestone unglazed ware, with possible kiln sources at Camley Gardens near Maidenhead (Pike 1965) and Denham in Buckinghamshire (Mellor 1994, 86). Known at numerous sites in south Oxfordshire and Berkshire. Some vessels have distinctive vertical combing on the body. So-called due to it first being noted at sites excavated along the line of the M40 motorway. A substantial minority of the assemblage comprises sherds with vertical combing (14 sherds, 251 g), which is fairly typical of the products of this tradition. The ware is present in the earliest medieval phases, but appears to have gone into decline around the middle of the 13th century.

### *F101: Oxford ware, mid 8th–early 11th century* (Mellor 1994, 37-44). 2 sherds, 182 g, EVE = 0.

This predominantly hand-made shelly ware is found at many sites in the Thames Valley from London to Gloucestershire, and to the north at places such as Worcester and Droitwich, where it is thought to be linked to the salt trade (*ibid.*). It is not possible to date vessels other than to within the life-span of the tradition, but the presence of the material at the Oracle could be indicative of middle Saxon activity. Recent work at Broad Street has yielded evidence of a presence in Reading during the middle Saxon period in the form of a sherd of Ipswich ware (Blinkhorn 2007a). Here, both sherds of F101 were redeposited in later contexts.



**F102: Thetford-type ware, AD 900–1150** (Rogerson and Dallas 1984). 4 sherds, 37 g, EVE = 0.20 (all jars).

This East Anglian import is a rare find on sites in the Thames Valley. A few sherds are known from London (Vince 1985) and Oxford (Blinkhorn 2002b), but the material is generally rare in the region. Most of the sherds from London are from large storage jars with thumbled applied strips, and were probably used as containers for traded goods. The presence of such vessels in Reading shows that it was a place of sufficient importance at the time to attract long-distance trade, although the pottery seems likely to have arrived after a series of exchanges, with London being the most likely final point of departure. All the sherds at this site were redeposited in later medieval contexts.

**F200: Cotswold-type ware, AD 975–1350** (Mellor 1994). 67 sherds, 1281 g, EVE = 0.70 (jars = 0.65, bowls = 0.05).

Oolitic limestone-tempered Cotswolds-type wares are extremely common finds at early medieval sites in Gloucestershire, and also western Oxfordshire, and occur in smaller quantities at sites to the north in Northamptonshire and Worcestershire. It is however, rare at sites in the Kennet Valley in Berkshire, with very little known from Newbury (Mephram 1997), perhaps due to competition from the local flint-tempered industries (*ibid.*, figs 28-9). Its presence at this site suggests that the Thames Valley may have been more or less the southern limit of its distribution, a suggestion made in the past by Mellor (1994, 50). Another factor may be that it was simply uneconomic for the material to be traded beyond the town and up the Kennet.

This group is by far the largest assemblage of the material found in Reading, with reasonably large excavations elsewhere in the town yielding only 2 sherds at 90-93 Broad Street (Blinkhorn 2007a), and none at all from Market Way or the Waterfront sites. It is possible that the presence of this group of material may be evidence of the Oracle area being a point of entry for trade goods in the town in the early medieval period, with the pots arriving as containers for goods rather than moving as items for sale in their own right. Mellor (1994, 40) has suggested that the distribution of the ware was due to the fact that it was used in the transportation of salt, and there were medieval 'salt-ways' from Droitwich to Lechlade and Sodbury in the Cotswolds (Miller and Hatcher 1995, 77).

The material is present in small quantities throughout the medieval period, before declining during the later 14th or early 15th century.

**F202: Newbury coarsewares, late 11th–early 15th century** (Mephram 1997, 51-2). 223 sherds, 5517 g, EVE = 3.82 (jars = 3.53, bowls = 0.08, jugs = 0.21).

Flint, sand and shell tempered ware, probably manufactured in the Savernake Forest (*ibid.*, 65). It has a wide distribution throughout Berkshire, northern Hampshire and Oxfordshire (*ibid.*, fig. 29), and a small number of sherds are known from south Northants (Blinkhorn 2000a, 16). This assemblage is of some significance, as in the past the material was considered to be extremely rare in Reading (Mephram 1997), but both this site and recent excavations at Broad Street and Market Way have

produced good groups. It was also noted at the Waterfront sites, as Underwood's fabric LSF (1997, 145), but only 61 sherds were present (*ibid.*, table 16). It seems likely that Underwood's fabrics FL and FLS are from a similar, if not the same, source. These wares were also somewhat under-represented at the waterfront sites. At the Oracle, Newbury wares are present in quantity throughout the medieval period, but appear to be residual after 1400. The range of vessel types is typical of other finds of the material in the region, although the fragment of the possible fire-cover (Fig. 5.2 No. 8) is somewhat unusual.

**F205: Stamford ware, AD 900–1150** (Kilmurry 1980). 1 sherd, 5 g, EVE = 0.

Fine, wheel-thrown sandy ware, often glazed, particularly from the late 10th century onwards. Stamford ware was widely traded throughout the British Isles, especially the trademark glazed pitchers, with finds of the ware in every county of England, and many in Scotland, Wales and Ireland. It is rare at sites in the Thames Valley and its hinterland, although relatively common in London (Vince 1985). A few sherds are known from Oxford (eg Blinkhorn 2002b), and others are known from Wallingford, Abingdon, Basingstoke and Silchester (Kilmurry 1980, fig. 32). As with the Thetford ware, it seems more likely that London was the final point of departure for the vessel found at this site. The sherd is from an unphased context.

**F300: Medieval Oxford ware, AD 1075–1400** (Mellor 1994). 199 sherds, 4499 g, EVE = 3.02 (jars 0.11, pitchers = 2.91).

Sandy ware, range of vessels comprising mainly plain jars and glazed tripod pitchers, the latter often with incised and/or applied decoration (Fig. 5.2 Nos 11-15), with the former type usually comprising the bulk of assemblages of the ware in Oxford and its hinterland. For example, at Eynsham Abbey, just 21 of the 149 rimsherds in the fabric were from jugs, with 123 from jars (Blinkhorn 2003, 179). However, the pitchers seem to have been imported into Reading in quantity during the earliest medieval phases, with jars very rare, suggesting that the latter were travelling as pots in their own right rather than as containers for trade goods. At the Oracle, the ware is in decline by the end of the 13th century, perhaps due to competition from London ware.

**F352: Brill/Boarstall ware, AD 1200–1600** (Mellor 1994). 4 sherds, 163 g, EVE = 0.

Fine, wheel-thrown sandy ware, with the earlier products of the industry typified by glazed jugs, with production sites at a small number of villages on the Oxfordshire/Buckinghamshire border. The ware has a wide distribution throughout the south midlands, and has been previously noted in small quantities from sites on the Reading Waterfront (Underwood 1997, 144 and table 16) and also at Broad Street. All the sherds from this site are redeposited in early post-medieval contexts. One of the late medieval 'Tudor Green' type mugs from this site is likely to be a product of this industry (see below), but from Ludgershall rather than Brill or Boarstall.

**F358: Ashampstead ware, 12th–14th century** (Mephram and Heaton 1995). 261 sherds, 5485 g, EVE = 1.11 (jars = 0.22, jugs = 0.89).

Sandy ware, the main products of the kiln being jars and highly decorated glazed jugs, the latter often having painted geometric slip designs (Fig. 5.3 Nos 17-21). A bowl with a long tubular spout was also noted at this site (Fig. 5.3 No. 16). It is thought that the kiln, which is located c 15 km to the west of Reading, was supplying the town with the bulk of the sandy wares found here. It is entirely possible that F1 (above) at this site may also be from the same source, as it seems likely that there was more than one kiln at Ashampstead (*ibid.*, 41). Sandy wares such as this are very common throughout central southern England from the early medieval period onwards, and other sources, yet to be discovered, were making such pottery. The pattern at this site, with glazed jugs being more common than jars, is common for finds of such sandy wares, as is the case with Newbury 'C' ware, but at the Ashampstead kiln site, jars were in the majority (*ibid.*). The ware first appears at the Oracle at the end of Site Phase 2, and goes into decline at some point after the middle of the 13th century and before 1400.

**F361: London ware c 1150–1350**

(Pearce *et al.* 1985). 172 sherds, 4668 g, EVE = 2.62 (jars = 0.02, jugs = 2.42).

Sandy ware, common in small quantities throughout the Home Counties, and at more distant locations such as Exeter, King's Lynn, Ipswich, Northampton, Hereford, Gloucester and the east coast of Scotland (*ibid.*, 6-7 and figs 4 and 5). Source unknown, but likely to be close to the City of London, where it occurs in extremely large quantities. The jug was by far the most common form, and these were often highly decorated, sometimes copying imported pottery from Northern France (eg. *ibid.*, pl. 2).

A wide range of the decorated jugs occurred at the Oracle (Fig. 5.3 Nos 23-31), including copies of North French types (Fig. 5.3 Nos 24, 26 and 31). These can be dated to the first half of the 13th century. London ware was also present at Broad St, a site which also produced 'real' North French pottery as well as London copies. At the Oracle, a fragment of a roof-finial (Fig. 5.3 No. 22) was also noted. These objects were decorative additions to the ridges of roofs, this example being very similar to one from Lime Street in London (Pearce *et al.* 1985, Fig. 58 no. 441). It is also similar to large numbers of detachable, 'spinning top' types known from King's Lynn, a style which could have originated in France (Clarke and Carter 1977, fig. 136 nos. 3-5).

Very little London ware was noted at the Waterfront sites, leading Underwood to speculate that there was very little upstream traffic to Reading from the capital (*ibid.* 1997, 145), but this is clearly not the case here, where the material is plentiful. It forms a significant proportion of the pottery at the site during phases 3 and 4, but is residual by 1400.

**F366: Hertfordshire glazed ware, 14th–15th century**

(Jenner and Vince 1983). 3 sherds, 98 g, EVE = 0.

Sandy ware, the most distinctive vessel being glazed jugs, often with stamped decoration. Most finds are from

London or the county of production. Previously unknown in Reading (*ibid.*, fig. 9). All the sherds are from jugs, and occurred in unphased contexts.

**F403: 'Tudor Green' ware, late 14th century–c 1550**

(Pearce and Vince 1988, 79-81 and figs 126-7). 815 sherds, 4437 g, EVE = 8.17 (bowls = 2.18, jugs = 3.21, cups = 1.99, costrels = 0.68, chafing dish = 0.11).

Green-glazed, fine sandy whitewares produced in Surrey and northern Hampshire. Other sources are known, such as Ludgershall in Buckinghamshire (Blinkhorn 2002-3), where potters of the Brill/Boarstall tradition were making some 'Tudor Green' type vessels, particularly mugs, in the late 15th to early 16th century. At least one vessel of this type (Fig. 5.4 No. 33) at this site is a Ludgershall type. There is a wide range of late medieval vessel forms (Pearce and Vince 1988), often delicate and thin-walled, including jugs, costrels (portable flasks) and lobed cups (Fig. 5.4 Nos 32-5). Common throughout central southern England, and present at this site before 1400, carrying on into the post-medieval period.

**F404: Cistercian ware, 1475–1700** (Brears 1971, 18-23).

123 sherds, 1494 g, EVE = 2.44 (all cups/tygs).

Hard, smooth, semi-stoneware fabric, usually brick-red, but can be paler or browner. Few visible inclusions, except for occasional quartz grains. A number of production sites known, mainly in the north and midlands (*ibid.*). Range of vessel forms somewhat specialised, and usually very thin-walled (c 2 mm), cups/tygs a speciality (Fig. 5.4 Nos 37-40). Rare white slip decoration, such as Figure 5.4 No. 37. The ware is present at the site before 1500, and plentiful in late medieval and early post-medieval contexts.

**F420: Martincamp white ware, AD 1475–1550** (Ickowicz 1993). 4 sherds, 290 g, EVE = 0.

Very hard, beige, slightly sandy fabric. All the sherds are from the distinctive mammiform flasks (Fig. 5.4 No. 41) with most from a single vessel in an unphased context which also produced two costrels. The form is of Hurst's (1966) type I. The vessels were likely originally to have been contained in a wicker cover (Ickowicz 1993, 57), presumably to facilitate carrying and suspension. First occurs in the first half of the 16th century at the Oracle.

**F456: Surrey Whiteware, mid 13th–mid 15th century**

(Pearce and Vince 1988). 1207 sherds, 21,431 g, EVE = 17.42 (jars = 9.02, bowls = 1.77, jugs = 5.07, costrels = 1.54).

A range of whitewares from several sources in Surrey, including Kingston and Cheam (Fig. 5.5 Nos 42-9). The range of vessel forms changes over time, but the earlier assemblages are dominated by glazed jugs, some with slipped, incised and plastic decoration (Fig. 5.5 Nos 42, 47 and 49). The ware is invariably found on sites of the period in Reading, and occurs on a large number of sites all over southern England (*ibid.*, figs 2-4).

Fragments of two costrels (Fig. 5.6 No. 50) are particularly worthy of comment. These personal liquid containers, usually with suspension loops to allow the attachment of straps or cords to facilitate carriage, are a

well-attested medieval vessel, but are nevertheless relatively rare finds. These vessels may be unique examples of Surrey Whiteware types. Pearce and Vince (1988) did not record any finds of such vessels in their extensive review of Surrey Whitewares, other than later, 'Tudor Green' types. The ware arrived at the Oracle site before 1267, probably from the earliest years of the industry, and remained a major ware even at the end of the medieval period.

#### *Other fabrics*

The following numeric codes are used in tables for other wares:

F401: LMS. Late Medieval Sandy

F402: LMWFS. Late medieval well-fired sandy.

F405: RARN. Raeren Stoneware

F421: MCPST. Martincomp stoneware

#### *Discussion*

##### *Project Phase 2, mid 11th to mid 12th century*

The majority of contexts of this date contain wares such as local fine sandy ware (F1), local coarse sandy ware (F2), Cotswold-type ware (F200), Newbury coarsewares (F202) and Medieval Oxford ware (F300), with the only other fabric which may date to this period, Ashampstead ware (F358), being relatively rare, and only comprising 0.5% of the phase assemblage. The chronology and sources of the sandy fabrics F1 and F2 are not at this time fully understood, but they are typical of the earliest products of medieval pottery industries. In the south midlands, such wares generally came into production during the mid to late 11th century, and a similar chronology seems likely in these cases. Most of this pottery is likely to be relatively local. Fine sandy wares are found along a considerable length of the middle Thames Valley and its hinterland, and this fabric category should be regarded as a group of several similar traditions rather than pottery from a single source. Maureen Mellor (1994, 84) has identified at least four different quartz-tempered fabrics in southern Oxfordshire and its environs, with centres such as Henley-on Thames and Maidenhead producing very similar wares. Historical sources indicate that there were potters in Henley during the 13th and 14th centuries, and perhaps even Reading itself (*ibid.*, 208, 210). It is likely that other sources in the hinterland of Reading await discovery, and the medieval kiln at Ashampstead is another possible source. The coarse sandy wares probably also originate from a number of different relatively local suppliers.

Wares from perhaps more distant sources, such as Cotswold-type ware (F200), Newbury coarsewares (F202) and Medieval Oxford ware (F300) make up 33.1% of the assemblage (by weight), a significant proportion (Table 5.3). Oolitic limestone-tempered Cotswolds-type wares are extremely common finds at early medieval sites in Gloucestershire, and also western Oxfordshire, and

occur in smaller quantities at sites to the north in Northamptonshire and Worcestershire. It is however, rare at sites in the Kennet Valley in Berkshire, with very little known from Newbury (Mephram 1997), perhaps due to competition from the local flint-tempered industries (*ibid.*, figs 28-9). Its presence at this site suggests that the Thames Valley may have been more or less the southern limit of its distribution, a suggestion made in the past by Mellor (1994, 50). Another factor may be that it was simply uneconomic for the material to be traded beyond the town and up the Kennet. This group is by far the largest assemblage of the material found in Reading, with reasonably large excavations in the town such as those at Market Way and Broad Street not yielding any finds of the ware, and it also appears to be absent at all of the Waterfront sites. It is possible that the presence of this group of material may be evidence of the Oracle area being a point of entry for trade goods in the town in the early medieval period, with the pots arriving as containers for goods rather than moving as items for sale in their own right. Mellor (1994, 40) has suggested that the distribution of the ware was due to the fact that it was used in the transportation of salt, and there were medieval 'salt-ways' from Droitwich to Lechlade and Sodbury in the Cotswolds (Miller and Hatcher 1995, 77).

Newbury coarsewares are a flint, sand and shell tempered tradition, probably manufactured in the Savernake Forest (Mephram 1997, 65). Newbury coarseware has a wide distribution throughout Berkshire, northern Hampshire and Oxfordshire (*ibid.*, fig. 29), and a small number of sherds are known from south Northamptonshire (Blinkhorn 2000a, 16). This assemblage is of some significance, as in the past the material was considered to be extremely rare in Reading (Mephram 1997), but both this site and recent excavations at Broad Street and Market Way have produced good groups. It was also noted at the Waterfront sites, as Underwood's fabric LSF (1997, 145), but only 61 sherds were present (*ibid.*, table 16). It seems likely that Underwood's fabrics FL and FLS are from a similar, if not the same, source. These wares were also somewhat under-represented at the waterfront sites. At the Oracle, Newbury wares are present in quantity throughout the medieval period, but appear to be residual after 1400. The range of vessel types is typical of other finds of the material in the region, although the fragment of the possible fire-cover (Fig. 5.2 No. 8) is somewhat unusual.

Medieval Oxford ware is another sandy ware, with a range of vessels comprising mainly plain jars and glazed tripod pitchers. The tripod pitchers often have incised and/or applied decoration (Fig. 5.2 Nos 11-15). The plain jars usually form the bulk of assemblages of the ware in Oxford and its hinterland. For example, at Eynsham Abbey, just 21 of the 149 rimsherds in the fabric were from jugs, with 123 from jars (Blinkhorn 2003, 179). However, the pitchers seem to have been imported into Reading

in quantity during the earliest medieval phases, with jars very rare, suggesting that the latter were travelling as pots in their own right rather than as containers for trade goods. At the Oracle, the ware is in decline by the end of the 13th century, perhaps due to competition from London ware.

The presence of the Ashampstead ware in this phase is worthy of comment. The excavation of the kiln site suggested that the material in Reading dated from 'at least' the late 12th to early 13th century (Mephram and Heaton 1995, 40), on the evidence from the Waterfront sites. Since then, Mellor (pers. comm.) has provenanced her Oxford fabric OXAG, Abingdon ware (1994, 71) to the Ashampstead kilns. She noted that the material became common during the early to mid 12th century in Oxford (*ibid.*, 79), and the evidence from the Oracle appears to corroborate that dating.

Small quantities of 'M40' ware are also present in deposits of this date. This is a hard, flint and limestone unglazed ware, with possible kiln sources at Camley Gardens near Maidenhead (Pike 1965) and Denham in Buckinghamshire (Mellor 1994, 86). It is known at numerous sites in south Oxfordshire and Berkshire and some vessels have distinctive vertical combing on the body. The name arises from the fact that the ware was first noted at sites excavated along the line of the M40 motorway. The ware is present in the earliest medieval phases at the Oracle, but appears to have gone into decline around the middle of the 13th century.

Jugs are relatively rare in the Project Phase 2 assemblage, and are represented only by sherds from parts of vessels other than rims, with a number of fragments of highly-decorated Medieval Oxford ware F300 Oxford tripod pitchers noted. This pattern is generally typical of pottery assemblages of the earlier medieval period in the region.

Table 5.3: Medieval pottery occurrence per phase by fabric type, main fabrics only, expressed as a percentage of the phase total by weight (in g)

Phase	2	3	4	5	6a
F1	54.8%	27.8%	25.4%	4.3%	0.4%
F2	7.5%	5.0%	7.3%	1.6%	0.1%
F200	2.6%	2.6%	4.2%	1.4%	0
F202	15.6%	10.0%	12.6%	2.2%	0.2%
F300	14.9%	13.6%	5.2%	0.9%	0
F358	0.5%	19.6%	9.2%	4.8%	0.9%
F361	-	12.1%	15.5%	3.9%	0
F456	-	5.4%	14.7%	40.8%	29.7%
F403	-	-	1.0%	7.6%	5.1%
F405	-	-	-	10.7%	20.6%
F404	-	-	-	1.0%	5.8%
F401	-	-	-	6.8%	3.5%
F402	-	-	-	7.4%	28.3%
Total	7951g	11995g	5226g	15862g	9303

#### Project Phase 3, mid 12th to mid 13th century

Sandy wares (F1 and F2) still form a large proportion of the pottery consumed at the site, but now represent only 32.8% of the assemblage, with other wares from a variety of sources becoming more common (Table 5.3). The phase sees the arrival at the site of relatively large quantities of London-type Ware (F361), a sandy ware common in small quantities throughout the Home Counties, and at more distant locations such as Exeter, King's Lynn, Ipswich, Northampton, Hereford, Gloucester and the east coast of Scotland (Pearce *et al.* 1985., 6-7 and figs 4 and 5). Certain styles of this pottery, such as imitation North French ware and Rouen ware, are both distinctive and well-dated to the first half of the 13th century. London ware comprises 12.1% of the pottery from phase 3 contexts, which is very high when compared with other sites in Reading. The source is unconfirmed, but likely to be close to the City of London, where it occurs in extremely large quantities. The jug was by far the most common form, and these were often highly decorated, sometimes copying imported pottery from Northern France (eg. *ibid.*, pl. 2). A wide range of the decorated jugs occurred at the Oracle (Fig. 5.3 Nos 23-31), including copies of North French types (Fig. 5.3 Nos 24, 26 and 31). London ware was also present at Broad St, a site which also produced 'real' North French pottery as well as London copies. At the Oracle, a fragment of a roof-finial (Fig. 5.3 No. 22) was also noted. These objects were decorative additions to the ridges of roofs, this example being very similar to one from Lime Street in London (Pearce *et al.* 1985, fig. 78 no. 441). It is also similar to large numbers of detachable, 'spinning top' types known from King's Lynn, a style which could have originated in France (Clarke and Carter 1977, fig. 136 nos. 3-5).

Pottery from the sources to the west (Cotswold and Newbury wares F200 and F202) was still being brought to the town. There is a small decline in the proportion of Newbury ware in Project Phase 3, but trade with these areas is not greatly diminished, as these two wares make up 12.6% of the assemblage. Oxford wares are also still common, comprising 13.6% of the pottery from this site phase and 'M40' ware is present, but in much smaller quantities. Surrey Whitewares (see below) were also noted in small quantities (5.4% of the phase assemblage) in this phase. Pearce and Vince (1988, 16) noted that the earliest ware groups in the City of London date to approximately 1230-50 and that the industry grew rapidly after 1260.

Ashampstead wares comprise a fairly large (19.6%) proportion of the pottery used during this phase. This is a sandy ware, the main products of the kiln being jars and highly decorated glazed jugs, the latter often having painted geometric slip designs (Fig. 5.3 Nos 17-21). Such vessels appear to have been at their most popular during the first half of the 13th century according to the evidence from

Netherton in Hampshire (Mellor 1994, 80). A bowl with a long tubular spout was also noted at the Oracle (Fig. 5.3 No. 16). It is thought that the kiln, which is located *c* 15 km to the west of Reading, was supplying the town with the bulk of the sandy wares found here. It is entirely possible that F1 (above) at this site may also be from the same source, as it seems likely that there was more than one kiln at Ashampstead (Mephram and Heaton 1995, 41). Sandy wares such as this are very common throughout central southern England from the early medieval period onwards, and other sources, yet to be discovered, were making such pottery. The pattern at this site, with glazed jugs being more common than jars, is common for finds of such sandy wares, as is the case with Newbury 'C' ware, but at the Ashampstead kiln site, jars were in the majority (*ibid.*). The ware first appears at the Oracle at the end of Project Phase 2, and goes into decline at some point after the middle of the 13th century and before 1400.

Jugs were used in considerably larger quantities during this phase (Table 5.4), and represent over a third of all the vessel types, with the rest of the assemblage comprising mainly jars, but bowls also increase their share. No other vessel types were noted, again a pattern which is typical of contemporary assemblages in the region.

#### *Project Phase 4, mid 13th to late 14th century*

The amount of pottery from this phase is somewhat smaller than the preceding phases, although this is a pattern that has been noted elsewhere in the region, in towns such as Abingdon. There may be several reasons for this. The 14th century was a time of economic decline coupled with epidemics such as the Black Death and adverse weather conditions resulting in poor harvests and famines.

Surrey Whitewares increase in popularity to form 14.7% of the assemblage. This tradition comprises a range of whitewares from several sources in Surrey, including Kingston and Cheam (Fig. 5.5 Nos 42-9). The range of vessel forms changes over time, but the earlier assemblages are dominated by glazed jugs, some with slipped, incised and plastic decoration (Fig. 5.5 Nos 42, 47 and 49). The ware is invariably found on sites of the period in Reading, and occurs on a large number of sites all over southern England (*ibid.*, figs 2-4). Fragments of two costrels (Fig. 5.6 No. 50) are

particularly worthy of comment. These personal liquid containers, usually with suspension loops to allow the attachment of straps or cords to facilitate carriage, are a well-attested medieval vessel, but are nevertheless relatively rare finds. These vessels may be unique examples of Surrey Whiteware types. The ware arrived at the Oracle site before 1267, probably from the earliest years of the industry, and remained a major ware even at the end of the medieval period.

London ware also increases, to 15.5%, although the latter industry all but ceases production by the end of the 14th century (Pearce *et al.* 1985, 20-1). The proportion of sandy coarsewares remains largely unchanged (32.7%), and the proportion of the Newbury and Cotswolds wares actually shows a slight increase (16.8%), at the expense of the Oxford and Ashampstead wares (5.2% and 9.2%), which decline fairly sharply during this time. In the case of F300 (Medieval Oxford ware), this corresponds with Mellor's (1994, 71) dating scheme for the industry, which goes into sharp decline after the mid 13th century, and appears to have ceased before 1300. Ashampstead wares appear to have lasted well into the 14th century (*ibid.*, 80) from Mellor's consideration of the chronology of Abingdon ware. 'M40' ware is very rare, but still present in extremely small quantities. The so-called 'Tudor Green' wares from the Surrey-Hampshire border region appear in small quantities during this phase (1.0% of the assemblage). This ware appears in London during the late 14th century, in groups at Trig Lane dated to around 1380. Reliably dated finds of this period are rare otherwise, and so the finds of this material here at the Oracle are of some significance, and show that the material was being imported to Reading from very early in the life of the tradition. Vessel types are still limited entirely to jugs, jars and bowls, although the small quantities of Tudor Green wares are likely to be non-rim fragments of lobed cups.

#### *Project Phase 5, 1400-1500*

This phase sees the representation of the earlier medieval coarsewares (F1 and F2 = 5.9%; F200 = 1.4%; F202 2.2%) decline very sharply, along with the earlier glazed wares (F300 = 0.9%, F358 = 4.8% and F361 = 3.9%). All these industries were for all intents and purposes defunct by this time. The most common pottery type used at the site is Surrey

*Table 5.4: Medieval pottery vessel occurrence per phase, expressed as a percentage per type of the phase assemblage (in EVE), all fabrics*

Phase	Jars	Bowls	Jugs	Mugs/Cups	Costrels	Dish	Vase	Lids	Unid.	Total EVE
2	97.5%	2.5%	0	0	0	0	0	0	0	3.60
3	56.0%	6.3%	37.7%	0	0	0	0	0	0	8.36
4	45.0%	16.4%	38.6%	0	0	0	0	0	0	3.78
5	32.2%	14.5%	26.9%	22.1%	0	0.9%	2.8%	0	0.5%	14.14
6a	42.8%	7.1%	16.0%	22.1%	8.7%	0	0	0.5%	2.8%	1

Whiteware, comprising 40.8% of the assemblage. Other, new wares also become significant. Later medieval Redwares (from unknown, but probably London and local sources) form a significant proportion of the phase assemblage (14.2%). 'Tudor green' wares represent 7.6% of the assemblage. These green-glazed, fine sandy whitewares were produced in Surrey and northern Hampshire. Other sources are known, such as Ludgershall in Buckinghamshire (Blinkhorn in press c), where potters of the Brill/Boarstall tradition were making some 'Tudor Green' type vessels, particularly mugs, in the late 15th to early 16th century. At least one vessel at the Oracle is a Ludgershall type (Fig. 5.4 No. 33). There is a wide range of late medieval vessel forms (Pearce and Vince 1988), often delicate and thin-walled, including jugs, costrels and lobed cups (Fig. 5.4 Nos 32-5). 'Tudor Green' pottery is common throughout central southern England and was present at the Oracle before c 1400, carrying on into the post-medieval period. Cistercian ware, despite not generally coming into use before c 1475, comprises 1.0% of the assemblage. German Stonewares represent 10.7% of the assemblage. Other imports include small amounts of Martincamp-type flasks, sherds of south Netherlandish Maiolica, North French sandy wares, late medieval Saintonge ware, Low Countries Redwares and Iberian Micaceous Redwares. The number of sherds of imported material other than the late sandy wares is unusual for Reading at this time, and not a pattern noted at other contemporary sites such as Broad St. Some of these wares, such as the Rhenish Stonewares and Iberian Micaceous wares, were noted at the Reading Waterfront excavations, but others have never previously been noted in the town.

A much wider range of vessel types was noted, with mugs/cups forming nearly a quarter of the assemblage (Table 5.4), but rim sherds from a single dish and a Netherlandish vase were also noted. Body sherds were noted from at least six flasks, a large number of mugs and cups and also two pipkins. This is fairly typical of late medieval pottery assemblages in the region, but strongly tends towards vessels associated with the storage, transportation, serving and consumption of drink, with very little pottery related to the preparation, serving and consumption of food.

*Project Phase 6(a), c 1500-1540*

The range of pottery types in this phase is largely similar to that in phase 5, with imported wares, both continental and regional, comprising a large quantity of the assemblage. Residual medieval wares are present, but in small quantities (total = 1.6%). Late medieval sandy ware, F401, is in decline (3.5%), but late medieval well-fired sandy ware (F402) becomes very common, forming over 28% (by weight) of the pottery from this phase. Surrey Whiteware appears in decline (20.9%), as would be expected, but German Stonewares form nearly a fifth of the pottery, and Tudor Green and Cistercian

wares each comprise over 5% of the assemblage, and nearly 11% in total. Small quantities of continental imports from a wide range of sources were also noted, including Beauvais Whiteware, Iberian Micaceous and Tin-glazed wares, Low Countries Redwares, Martincamp Stonewares, late medieval North French sandy wares and South Netherlands Maiolica.

Mugs/cups again form a very significant proportion of the assemblage (22.1%), and costrels are well represented (8.7%), along with a fragment of at least three lids. Jars actually increase as a proportion of the assemblage, although most are late medieval sandy wares rather than residual earlier medieval types. Bodysherds from two flasks and a pipkin were also noted.

**Illustrations**

*Figure 5.1*

- 1 Early/middle Saxon hand-built ware: **Rimsherd from jar**, uniform dark grey-brown fabric. Ctx 7292, Ph 3
- 2 Local fine sandy ware: **Rim and upper body of jar with vertical combing**. Grey fabric with darker surfaces. Outer surface heavily sooted. Ctx 6806, Ph. 2.
- 3 Local fine sandy ware : **Rimsherd from large jar**. Grey fabric with browner surfaces. Ctx 7292, Ph. 3.
- 4 Local fine sandy ware: **Base and lower body of combed jar**. Grey fabric with darker inner surface, outer surface has lighter grey and reddish-brown patches and is sooted. Ctx 6806, Ph. 2.
- 5 Local fine sandy ware: **Full profile of spouted bowl**. Light grey fabric with darker surfaces, patchy internal green glaze, stabbed decoration on rim. Inner surface thickly limescaled, outer sooted. Ctx 11048, unphased.
- 6 Local fine sandy ware: **Rim from lipped bowl**. Uniform dark grey fabric, sooting on outer surface. Ctx 5719, unphased.
- 7 Local fine sandy ware: **Rim and spout from bowl**. Light grey fabric with darker surfaces. Ctx 611, Ph. 10

*Figure 5.2*

- 8 Newbury coarseware: **Base from open vessel with applied strips**. Dark grey fabric with browner surfaces. Vessels such as this, with applied decoration on what would normally be the base, are usually thought to be curfews, or fire-covers. However, this vessel has internal limescaling and external sooting, suggesting that it was used for heating liquids, whereas curfews are usually burnt and sooted on the interior. Ctx 12491, unphased.
- 9 Newbury coarseware: **Rim and neck from jug rim with incised decoration**. Light grey fabric with orange outer surface. Ctx 2815, unphased.
- 10 Newbury coarseware: **Rim from very large jar**. Grey fabric with pale orange surfaces. Abraded. Ctx 11362, Ph. 2.
- 11 Medieval Oxford ware: **Complete rim and upper handle from highly decorated jug**. Grey fabric with

orange-brown surfaces, Patchy, dull green glaze over white slip decoration which appears yellow under the glaze. Ctx 7113, Ph. 3.

- 12 Medieval Oxford ware: **Base and lower body from slip-decorated tripod pitcher.** Orange fabric with grey core, outer surface has geometric painted design in white slip, appearing yellow under the patchy green glaze. Ctx 6115, Ph. 3.
- 13 Medieval Oxford ware: **Neck, rim and long tubular spout from ?tripod pitcher.** Grey fabric with light orange surfaces. Horizontal painted slip stripes

appearing yellow under the dull orange-green glaze. Context 6102, Ph. 4.

- 14 Medieval Oxford ware: **Tripod pitcher base.** Pale grey fabric with dark surfaces. Whole of outer surface has even covering of pale green glaze. Each foot has a single stab-mark in the centre of the base. Ctx 11388, Ph. 3.
- 15 Medieval Oxford ware: **Body from decorated ?tripod pitcher.** Grey fabric with buff surfaces, uniform dull green glaze over the whole of the outer surface. Ctxs 6494 and 6497, both Ph. 3.

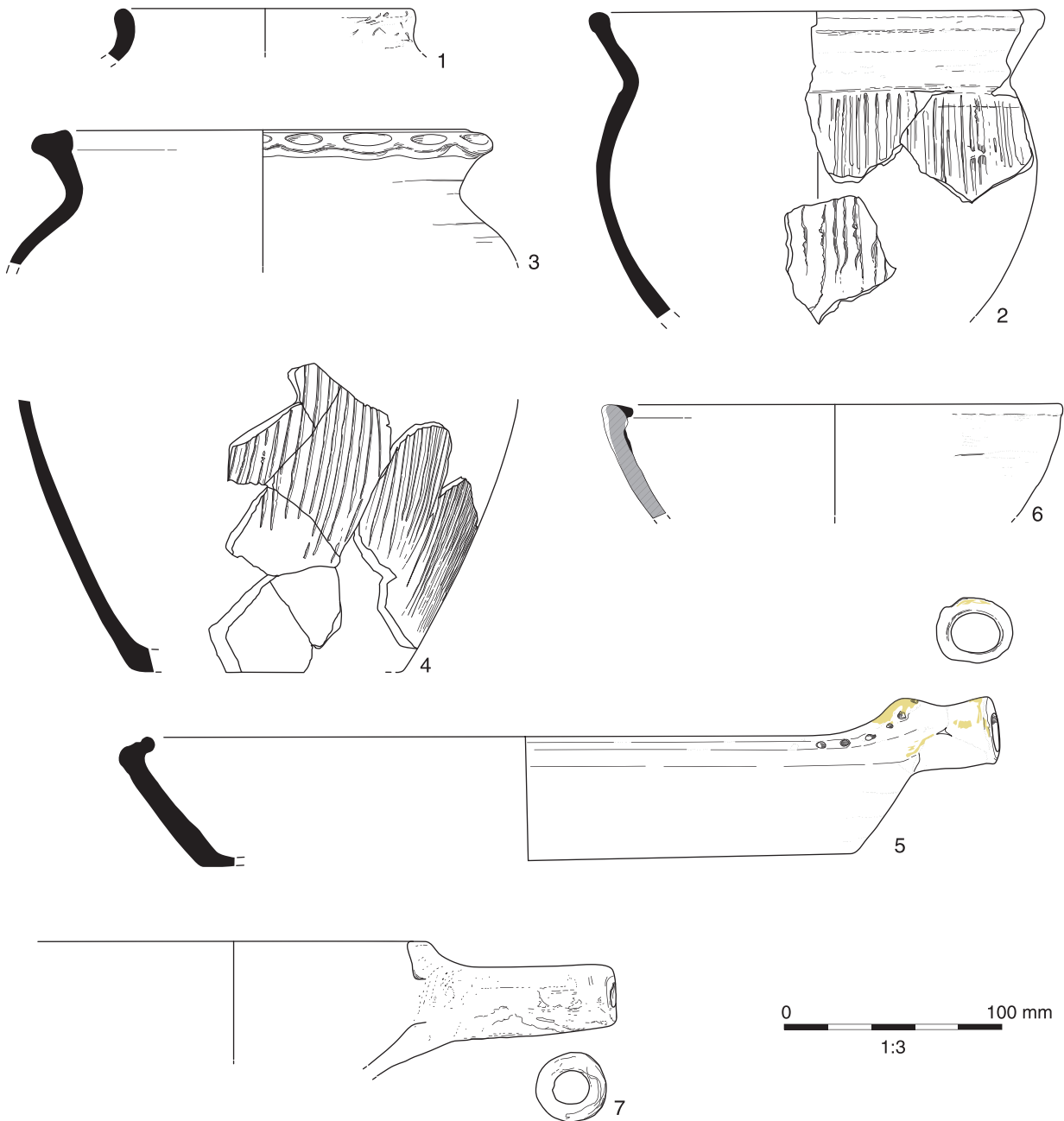


Fig. 5.1 Medieval pottery: early/mid Saxon (No.1) and local fine sandy wares (Nos 2-7)

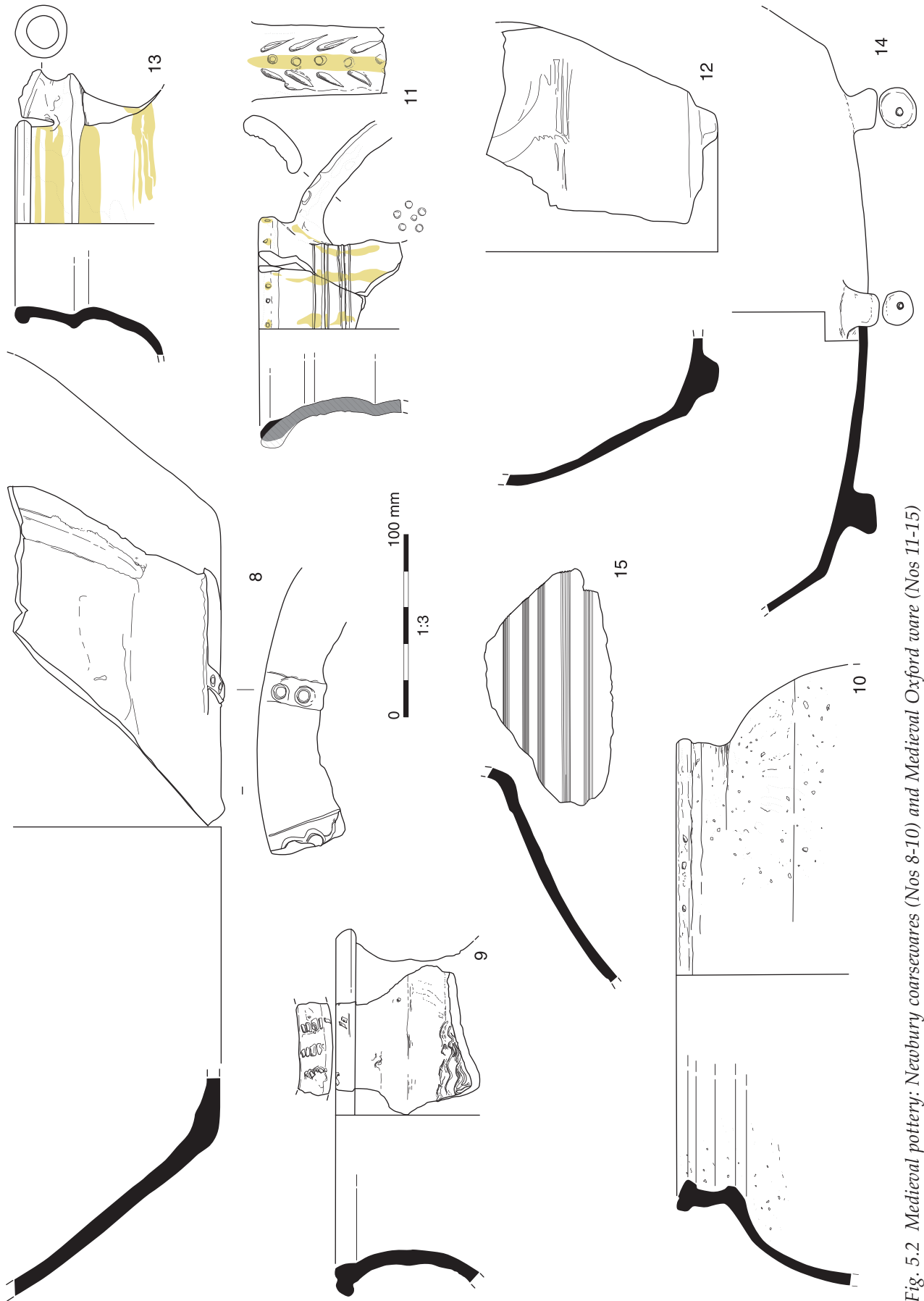


Fig. 5.2 Medieval pottery: Newbury coarsewares (Nos 8-10) and Medieval Oxford ware (Nos 11-15)



Figure 5.3

- 16 Ashampstead ware: **Bowl rim with long tubular spout**. Pale grey fabric with orange surfaces. Outer surface sooted under spout, traces of a thin green glaze on the inner surfaces. Spout shows no sign of internal wear, suggesting it was not used as a skillet. Ctx 5743, Ph. 4.
- 17 Ashampstead ware: **Upper body and neck from highly decorated jug**. Brick red fabric, outer surface painted with horizontal slip lines alternating red and yellow, yellow slip dots, glossy clear glaze appearing orange-green over the body clay. Handle fragment has yellow slip stripes only. Ctxs 5134 (Ph. 6) and 6054 (unphased).
- 18 Ashampstead ware: **Bodysherd from jug**. Grey fabric with orange-red surfaces. Arches and cordons in a white slip, appearing yellow under the thin green glaze. Ctx 6425, unphased.
- 19 Ashampstead ware: **Bodysherd from jug**. Grey fabric with orange-red surfaces. Geometric painted slip design, the uppermost line in a red clay, the rest white. Thin green glaze over all. Ctx 6425, unphased.
- 20 Ashampstead ware: **Rim and handle from jug**. Pale orange fabric with browner surfaces. Horizontal stripes of cream-coloured slip. Poor-quality, partly unvitriified green glaze on body around handle. Ctx 11293, Ph. 3.
- 21 Ashampstead ware: **Base from jug**. Orange-red fabric with brown outer surface. Vertical stripes of cream-coloured slip, thin and patchy green glaze on upper part of outer surface of sherd. Ctx 11293, Ph. 3.
- 22 London ware: **Fragment of spherical roof finial**. Grey fabric with orange surfaces, glossy copper-speckled green glaze on outer surface. Ctx 9622, Ph. 5.
- 23 London ware): **Base and body of early jug**. Brick-red fabric with thin white slip over the upper body, covered in a dull green copper-spotted glaze. Slip appears yellow under the glaze. Ctx 2046, unphased.
- 24 London ware: **Body sherd from imitation North French-style jug**. Grey fabric with brick red surfaces. Outer surface is covered in a white slip, with thin applied strips in the same clay, the whole covered with a pale yellowish-green, copper-spotted glaze. Ctx 6102, Ph. 5.
- 25 London ware: **Bodysherd from highly decorated jug**. Grey fabric with orange surfaces, applied scales and strip in a white firing clay. Outer surface covered in a thick, glossy glaze which appears dark green over the body clay and pale green over the decoration. Ctx 6005, Ph. 3.
- 26 London ware: **Bodysherd from imitation Rouen style jug**. Dark grey fabric with browner surfaces, rouletted applied strip in a white-firing clay, appearing yellow under the glaze. Area inside the strip has a reddish-brown slip. Glaze appears dark green over the body clay. Ctx 5933, Ph. 4.
- 27 London ware: **Bodysherd from highly decorated jug**. Orange-red fabric, outer surface covered in a

thin white slip which has been cut and stamped, giving a partial sgraffito effect. Patchy, thin clear glaze with sparse copper-spotting. Ctx 5721, unphased.

- 28 London ware: **Two non-joining bodysherds from the same highly decorated jug**. Orange fabric with a grey core. Outer surface is covered with white slip with wheel stamps, and the whole covered with a bright green, copper-streaked glaze. Ctxs 5068 (unphased) and 6165 (Ph. 4).
- 29 London ware: Jug rim. **Brick red fabric with greyer core**. Two horizontal yellow slip cordons, copper speckled glaze appearing orange over the body clay over all. Ctx 5792, Ph. 3.
- 30 London ware: **Body sherd from jug**. Brick red fabric with a grey core, white slip over outer surface, with red slip stripes over. Spots of clear glaze over all. Ctx 6006, Ph. 3.
- 31 London ware: **Body sherd from imitation North French jug**. Brick red fabric with greyer core, white slip over outer surface, applied strips in the same clay. Bright green, copper-streaked glaze over all. Ctx 5134, Ph. 6.

Figure 5.4

- 32 'Tudor Green' ware: **Straight-sided handled bowl**. White fabric with glossy, copper-streaked glaze on inner surfaces and top of handle and outer body. Lower body and base-pad burnt and sooted, but may have been post-depositional. Ctxs 9507 and 9511, both unphased.
- 33 'Tudor Green' ware: **Mug, Ludgershall type**. Buff-pink fabric with browner surfaces. Pale green, copper-spotted glaze over the whole of the inner surface and the outer upper body and handle. Ctx 8772, unphased.
- 34 'Tudor Green' ware: **Fragment of double dish**. White fabric with patches of bright green glaze on all surfaces. Ctx 8306, Ph. 7.
- 35 'Tudor Green' ware: **Near-complete costrel**. Pale grey fabric with buff surfaces, large patch of glossy, yellow-green glaze on upper side of body. Ctx 8682, unphased.
- 36 Cistercian ware: **Large cup**. Slightly underfired brick-red fabric with dark grey-brown surfaces, glossy dark brown glaze on inner surface and outer rim. Ctx 9507, unphased.
- 37 Cistercian ware: **Cup with applied slip decoration**. Hard, brick-red fabric with glossy dark brown glaze on both surfaces. Applied dots of white slip on outer surface, appearing yellow through the glaze. Ctx 8802, Ph. 5.
- 38 Cistercian ware: **Two-handled cup**. Brick-red fabric with a thin grey core, chestnut-brown glaze over all except the outer base-pad. Ctx 8682, unphased.
- 39 Cistercian ware: **Cup**. Orange fabric with dark, mottled green and brown glaze over all except the outer base pad. Ctx 8750, Ph. 6.
- 40 Cistercian ware: **Rim from cup**. Purple fabric, applied white slip pad on outer surface, appearing yellow under the glossy brown glaze. Ctx 8738, Ph. 5.

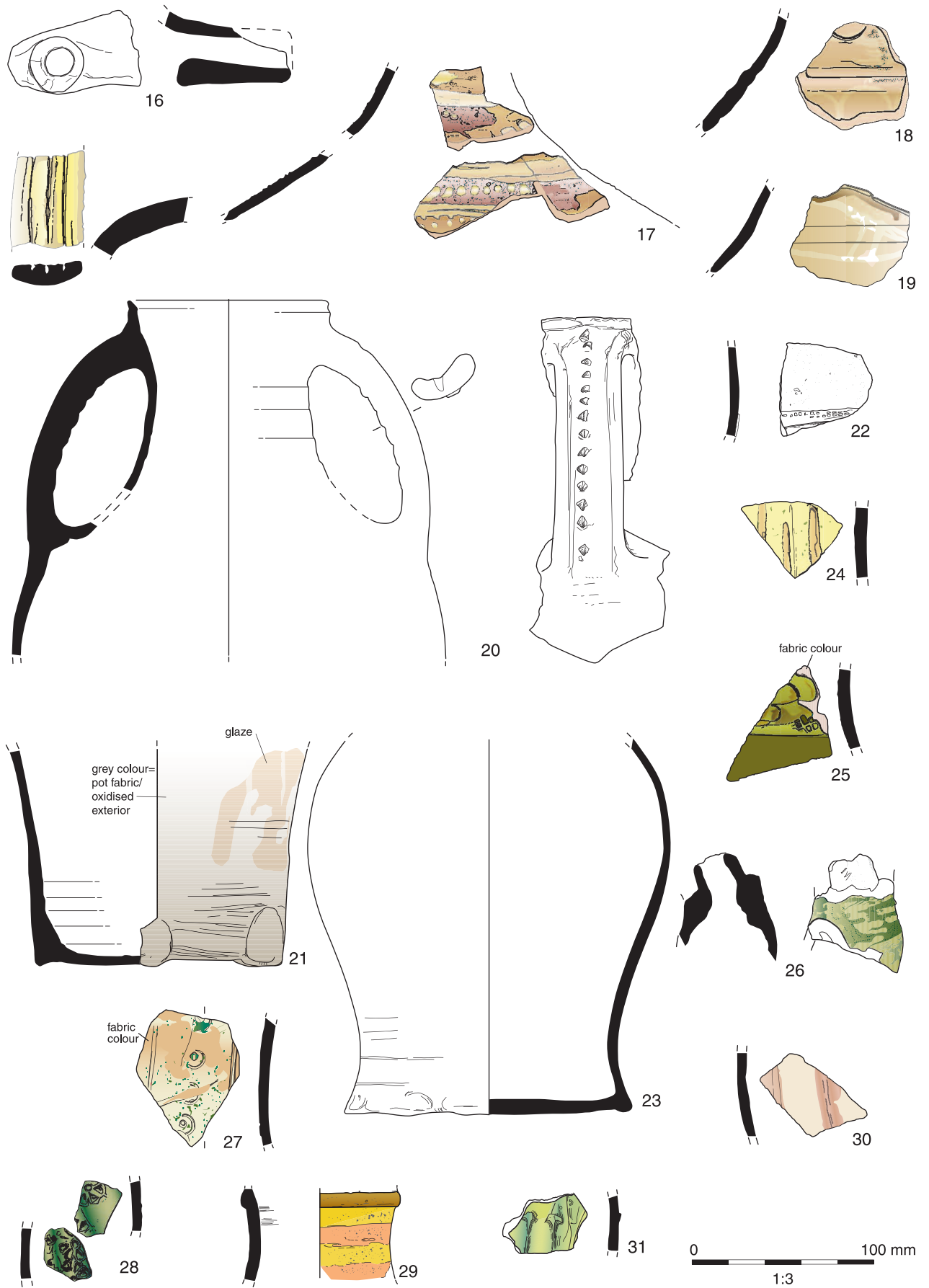


Fig. 5.3 Medieval pottery: Ashampstead ware (Nos 16-21) and London ware (Nos 22-31)

- 41 Martincamp white ware: **Fragments of a mammi-form flask.** Buff fabric, with beige outer surface, single small patch of orange-brown glaze on one of the outer faces. Ctx 8682, unphased.

Figure 5.5

- 42 Surrey Whiteware: **Fragment of highly decorated jug.** Pale grey fabric with darker surfaces. Outer surface has applied strips and dots in the body clay, with a single splash of brown slip. Outer surface covered in a glossy green, copper-speckled glaze. Ctx 9769, Ph. 4.

- 43 Surrey Whiteware: **Base and bunghole from cistern.** White fabric with grey-buff surfaces, small splashes of glossy green glaze on outer surface. Ctx 9692, unphased.
- 44 Surrey Whiteware: **Rim, handle and upper body of jug.** Uniform grey fabric, glossy variegated green and orange glaze on outer body above lower handle terminal, no glaze behind handle. Ctx 9090, Ph. 5.
- 45 Surrey Whiteware: **Skillet handle.** Uniform pale grey fabric. Ctx 9183, Ph. 5.
- 46 Surrey Whiteware: **Rim and handle of jar/cistern.** Pale grey fabric with pale buff surfaces. Ctx 9416, Ph. 6.



Fig. 5.4 Medieval pottery: 'Tudor Green' ware (Nos 32-35), Cistercian ware (Nos 36-40) and Martincamp white ware (No.41)

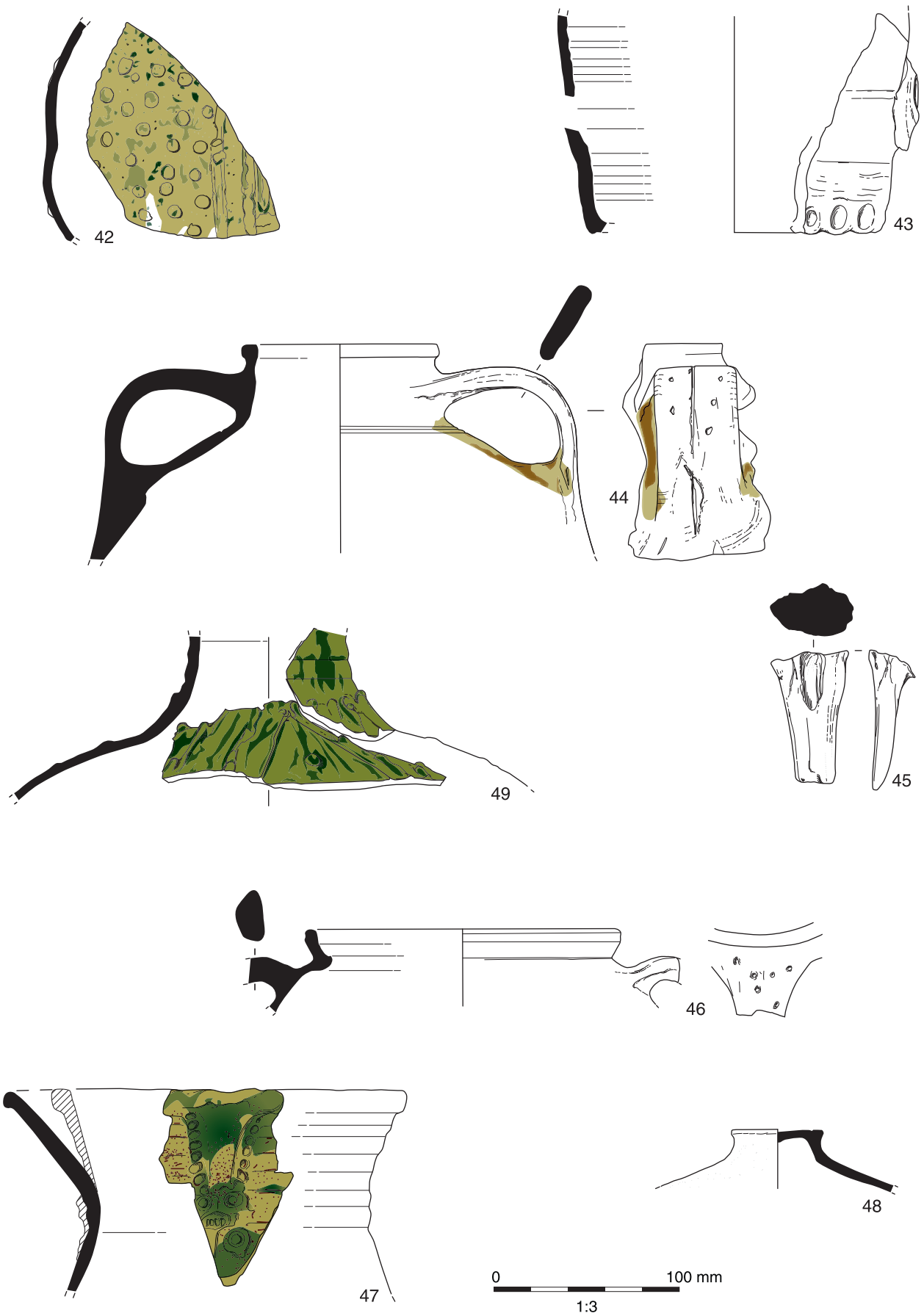


Fig. 5.5 Medieval pottery: Surrey whiteware (Nos 42-49)

- 47 Surrey Whiteware: **Rim and spout of highly-decorated jug.** Stabbed decoration with small modelled face at base of spout. Pale grey fabric with darker surfaces, bright green, copper-streaked glaze on outer surface. Ctx 5179, unphased.
- 48 Surrey Whiteware: **Lid.** Pale orange fabric with light grey surfaces. Ctx 8396, unphased.
- 49 Surrey Whiteware: **Neck and shoulders from highly decorated jug.** White fabric with glossy green copper-streaked glaze, large pool of glaze on inner surface. Ctx 6115, Ph. 3.
- 50 Surrey Whiteware: **Fragment of costrel.** Pale grey fabric with buff surfaces, glossy, yellow-green glaze with copper-spotting in upper body and neck and rim. Ctx 8682, unphased.
- 51 Surrey Whiteware: **Fragment of small rounded jug.** Pale grey fabric with browner surfaces, glossy, copper-spotter glaze on both surfaces. Applied dots of body clay. Ctx 8749, Ph. 3.
- 52 Surrey Whiteware: **Rim and upper body of large jar/cistern.** Pale orange fabric with buff surfaces, patch of thin green glaze on the shoulder. Ctx 8682, unphased.
- 53 Surrey Whiteware: **Rim and shoulder of jar.** Grey fabric with buff surfaces, pool of glossy, apple green glaze on outer surface, partially covering vertical stripes of red slip. Ctx 8881 (Ph. 6) and 8895 (Ph. 5).

Figure 5.6

50 Surrey Whiteware: **Fragment of costrel.** Pale grey fabric with buff surfaces, glossy, yellow-green glaze

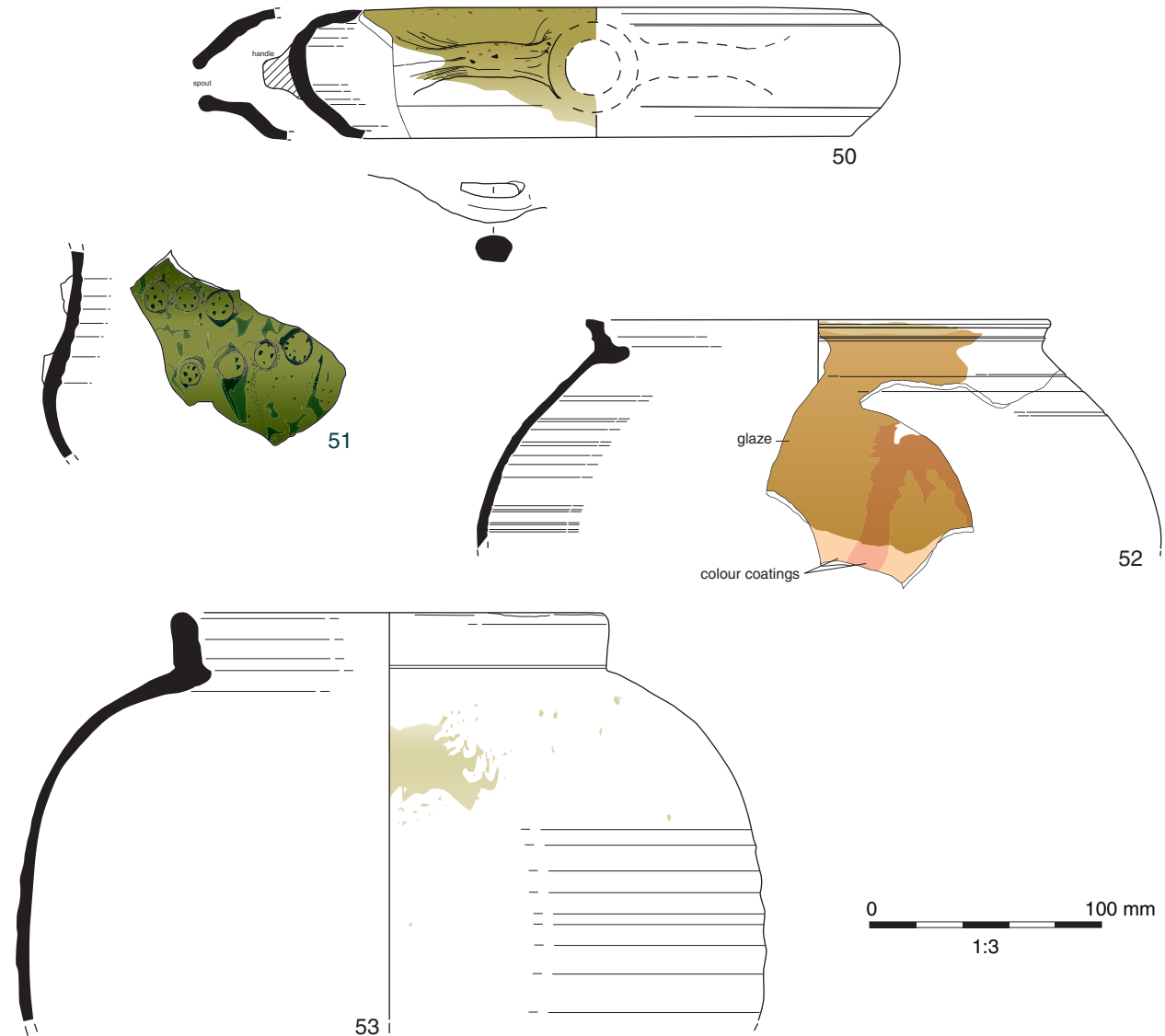


Fig. 5.6 Medieval pottery: Surrey whiteware (Nos 50-53)

**Post-medieval pottery** (Figures 5.7-5.10; Table 5.5)

by Duncan H Brown and Robert Thomson

The beginning of the post-medieval period is open to discussion, but in pottery terms, and in the context of the Oracle, it is marked by the appearance of post-medieval redware in the second quarter of the 16th century. The assemblage considered here therefore comprises all material made after c 1540 and derived from contexts phased as mid-16th century or later. It numbers 3,966 sherds, with a total weight of 100,782 grams and a rim percent of 8,708. A few imported types are present, mainly Frechen stoneware and Chinese porcelain, but the assemblage is dominated by English types, and much of that derives from local sources. Table 5.5 lists the main ware types present, and shows the quantities in each site phase.

Post-medieval redware is the most common ware type, accounting for 34% of the total weight. The ware was ubiquitous in the south of England from the mid-16th century onwards, and seems to have been produced at many different centres. The main suppliers to London were apparently in Essex, although there were also many pottery-makers in Sussex, Surrey and Hampshire. It is likely that most of the post-medieval redware at the Oracle was supplied to Reading from local Berkshire sources, and there is evidence for production at Inkpen four miles to the west of Newbury, and at Ashton Keynes on the Berkshire Downs (Vince *et al* 1997). The Kennet valley is a likely area for potteries to have been established, and the river Kennet would have facilitated the transport of their products to Reading. Vessel types include jars, jugs and bowls (Fig. 5.9 No. 12), paint pots, pipkins and mugs (Fig. 5.9 No 13) and tankards, porringers, dripping pans, costrels, chafing dishes, a drug jar, a candlestick, a fuming pot and an alembic. Jugs do not seem to be as common as jars and are generally undecorated. There is a greater variety of bowls, including handled bowls, bushel pans and pancheons, and there are also modified bowls in the form of colanders. Late post-medieval redware is distinguished by its hard fired fabric and shiny glaze. A complete jar with holes in the base (Fig. 5.9 No 14) was found set into a brick floor on Site 12, and may have been used for drainage. Four similar pots were also found in the fill of a well (Fig. 5.9 No 15).

Surrey/Hampshire Border ware is the next most common type. Among the vessel types are jars, pipkins, tripod pipkins, jugs, bowls, handled bowls, colanders, chamber pots, chafing dishes, a porringer, dishes, plates, mugs (Fig. 5.10 No 17), a cup, a candlestick, a fuming pot and a lid. This was produced at potteries around Farnham, close enough for Reading to have been a natural market.

The remaining ware types are present in comparatively small quantities. Most are well known post-medieval types. The brown, manganese, and black-glazed earthenware mainly takes the form of mugs, while the slipware occurs as dishes or bowls.

Midlands and Staffordshire slipped and plain earthenware also occurs, together with a variety of post-medieval earthenware fabrics of uncertain, but probably local, origin (Fig. 5.10 No 18). Among the less well-represented post-medieval wares are a few sherds from the Verwood potteries in Dorset and slipped redwares (Fig. 5.9 No 16).

Most of the tinglazed ware is English, although the earlier types may be Dutch. It is mostly plain white or pale blue, although there are a few polychrome pieces (Fig. 5.10 Nos 19-20). Bowls, dishes and plates are the most common forms, and there are also chamber pots, ointment jars and drug jars. English stoneware is common in the latest phases, especially in the form of bottles (Fig. 5.10 No. 21), jars and tankards. Two jar fragments bear the names of Reading tradesmen (Fig. 5.10 Nos 22-23). The 19th-century phases produced increasing quantities of refined earthenware, including plain and transfer-printed types.

Among the imported wares Frechen stoneware is the most common, and there are a few pieces of Chinese porcelain and Westerwald stoneware. More unusual are fragments of French, possibly Beauvais, whiteware and Ligurian tinglazed ware (Fig. 5.10 No. 24).

A site by site discussion may be found on the accompanying CD, but it may be worth considering Site 29 here as it produced 76% of the post-medieval assemblage. Phase 2909a is associated with backfill prior to the construction of the Oracle Workhouse. Post-medieval redware and Surrey border ware are the most common types, together with some Frechen stoneware. The range of vessel types includes jars, pipkins, bowls, dishes, jugs and mugs, and there are also fragments of a colander, a candlestick and a fuming pot. There is very little tinglazed ware, evidence perhaps of relatively low economic status. It is possible that the pottery dumped here was not derived directly from on-site domestic activity, but rather comprises material brought in from elsewhere.

Phase 2909b, which relates to the infilling of cellars in the primary phase of the workhouse, is the most productive of the whole site. There are a few pieces of refined earthenware that suggest a date later than 1710 but these may be intrusive and the bulk of the material conforms to the suggested phase dates. The quantity of it reflects the fact that many of these deposits are dumps and fills, although these were made during occupation of the workhouse, and may therefore be representative of the range of pottery used therein. There is relatively little tinglazed ware or porcelain and the small quantities of those more refined types are perhaps indicative of the economic condition of the workhouse. There is a heavy reliance on the cheaper kinds of pottery, and this is what one might expect of such an establishment.

Table 5.5 shows the quantities of the most common ware types in each project phase, while Table 7.19 (see CD) shows the range of vessel types.

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Table 5.5: Post-medieval pottery, quantities of major wares by project phase, by weight (g), sherd count and rim percentages

Ware code	Project phase date range	6 1500-1600	7 1600-1680	8 1680-1750	9 1750-1850	10a 1850-1900	10b 1900+	Totals
Post-medieval redware	RP	198	411	1290	178	509	10	2596
	Weight	3703	4846	17541	2462	5165	330	34047
	Count	108	232	722	96	223	9	1390
Late Post-medieval redware	RP			170	129	310	31	640
	Weight			7050	2392	12886	290	22618
	Count			68	42	136	8	254
Surrey/Hants Border ware	RP	85	410	952	69	259	53	1828
	Weight	602	4075	8295	646	1638	211	15467
	Count	25	151	473	37	111	14	811
Post-medieval brown-glazed	RP	0	20	11	10	23	7	71
	Weight	122	157	367	150	246	13	1055
	Count	7	7	21	6	14	1	56
Post-medieval manganese- glazed	RP	0	0	58	11	0	4	73
	Weight	18	64	727	36	33	12	890
	Count	2	3	46	3	4	2	60
Post-medieval black-glazed	RP		29	15	15	0		59
	Weight		85	113	71	19		288
	Count		6	9	1	1		17
Slipware	RP	0	11	81	73	71		236
	Weight	54	134	1581	795	541		3105
	Count	2	5	44	16	11		78
Tinglazed	RP	18	28	143	128	21	0	338
	Weight	37	147	738	911	442	32	2307
	Count	10	14	80	75	48	3	230
English stoneware	RP	0	20	41	46	591	55	753
	Weight	21	118	413	974	2254	934	4714
	Count	2	9	36	55	73	3	178
Refined earthenware	RP	6	19	3	121	874	28	1051
	Weight	10	62	28	1318	4505	523	6446
	Count	3	10	6	123	274	19	435
Frechen stoneware	RP	67	137	80	4	100		388
	Weight	793	1498	591	41	495		3418
	Count	34	75	35	4	11		159
Westerwald stoneware	RP	0		66	15	42		123
	Weight	7		203	77	138		425
	Count	1		9	3	4		17
Chinese porcelain	RP		3	0	6	3	0	12
	Weight		8	4	19	196	60	287
	Count		1	2	6	9	1	19
Totals	RP	568	1088	2716	805	2803	188	8168
	Weight	12618	11194	30400	9892	28558	2405	95067
	Count	271	513	1474	467	919	60	3704

The most diagnostic and plentiful ware types are included, while rare types, such as most of the imported wares, are not. This allows a clearer understanding of the overall pattern and identifies the wares that best inform our understanding of the whole assemblage. Post-medieval redware is a consistent presence throughout, and is also the most common product of all. The later variant is, as it should be, confined to the later phases. There are indications that the production of post-medieval redware declined rapidly c.1900, as it is a much-reduced presence in Project Phase 10b. Surrey/Hampshire border ware is the next most common product, and occurs mainly in Project Phases 7 and 8. Most of the ware types are distributed according to their established date ranges.

A pattern can thus be discerned that shows how post-medieval Reading, or at least this part of it, drew primarily on local sources for pottery supplies. Frechen stoneware is well represented in Project Phases 6, 7 and 8, but once glass was in ready supply, at the end of the 17th century, the use of imported stoneware jugs tailed off. This is the time when Westerwald stoneware was imported, but this type is rare here. So too is Chinese porcelain, the only other imported product that occurs in any meaningful quantity. The quantities of Chinese porcelain increase through each phase, which is possibly related to a gradual decline in its value as it became more accessible to a wider variety of people.

English imports, primarily tinglazed wares and those from Staffordshire and elsewhere in the Midlands, are also rare prior to the industrial period, although this changes with the advent of mass-produced stoneware and refined earthenware, in Project Phases 9 and 10. Post-medieval redware and Surrey/Hampshire Border ware are the most common types in Phases 6, 7, and 8 and this demonstrates a need for pottery, albeit of a humble kind. Indeed, Table 7.19 (see CD) shows how food preparation, storage, eating and drinking are all represented among the vessel forms. The relatively low quantities of tinglazed ware and an overall lack of slip-decorated earthenware may reflect a low economic status, where function was more important than presentation. It is clear that there was little, if any, requirement for the most highly decorated or expensive types available. With the industrialisation of pottery production, and the improvement of means of distribution, firstly by canal, then railway, non-local English products appear more frequently, and English stoneware and refined earthenware both comprise a significant proportion of the later assemblage. By this time such products were relatively cheap as well as easily available. Table 7.19 (see CD) shows that there is still an emphasis on jars, jugs and bowls in Project Phases 9 and 10, but there are also tea-wares and increased quantities of plates, both of which were most commonly made in refined earthenware.

An important question is just how representative this assemblage may be of on-site ceramic consumption. Many of the deposits are dumps or back-fills, and may be derived from a source some way away from the main areas of activity. Closed groups of material directly derived from domestic activity are rare. Pits, wells and cellars are usually the most productive types of feature in this respect, and as the area developed throughout the post-medieval period, these became increasingly rare. Few other post-medieval assemblages from Reading have been analysed so fully, however, and it is therefore difficult to know what it truly represents as an indicator of levels of demand and sources of supply. The assemblages from Reading waterfront seem to have slightly greater quantities of non-local earthenware, slipware, tinglazed ware and porcelain (Underwood, 1997, Table 16), but it is also debatable how much of this material is derived from on-site domestic activity. The overall picture from the Oracle site, however, is of an area of the town where the cheapest and most freely available forms of pottery were commonly consumed. In terms of pottery use, a fairly prosaic range of functions is indicated, and there is little evidence to show that pottery was required for show or for special occasions.

#### Illustrations

Figure 5.7

- 1 Surrey Whiteware: **Rim of bowl**. Grey fabric with internal greenish-clear glaze. Knife-trimmed external surface. Sooty residues may have accrued post-breakage. Contest 4772, Ph. 7
- 2 Late medieval sandy ware: **Complete profile of a bowl**. Unglazed, sandy, well-fired, red throughout with dark red surfaces. Internal sooting. Ctx 8855, Ph. 5
- 3 Late medieval sandy ware: **Top part of a jar**. Unglazed, red sandy fabric, with splashes of blue paint inside and out. Ctx 8855, Ph. 5
- 4 Late medieval well-fired sandy ware: **Complete profile of a bowl**. unglazed, sandy, red-brown fabric with some large clay pellet inclusions. External knife-trimming. Ctx 8677, Ph. 5
- 5 North French Whiteware: **Top part of a jar**. Unglazed, well-fired, white smooth fabric, possibly Beauvais, Ctx 9053, Ph. 6

Figure 5.8

- 6 Low Countries Redware: **Complete profile of a skillet or bowl**. Internal clear glaze, appearing greenish in parts, concentrated in the base with splashes further up the wall. No evidence for a handle, although this is likely given the presence of alip. Ctx 9507, not phased
- 7 Low Countries Redware: **Top part of a mug**. Internal and external clear glaze, heavily ribbed. Ctx 9047, Ph. 5
- 8 Raeren stoneware: **Complete profile of a mug**. Grey-brown salt glaze. Ctx 8616, Ph. 5
- 9 Raeren stoneware: **Complete profile of a mug**. Grey-brown salt glaze. Ctx 8682, not phased.



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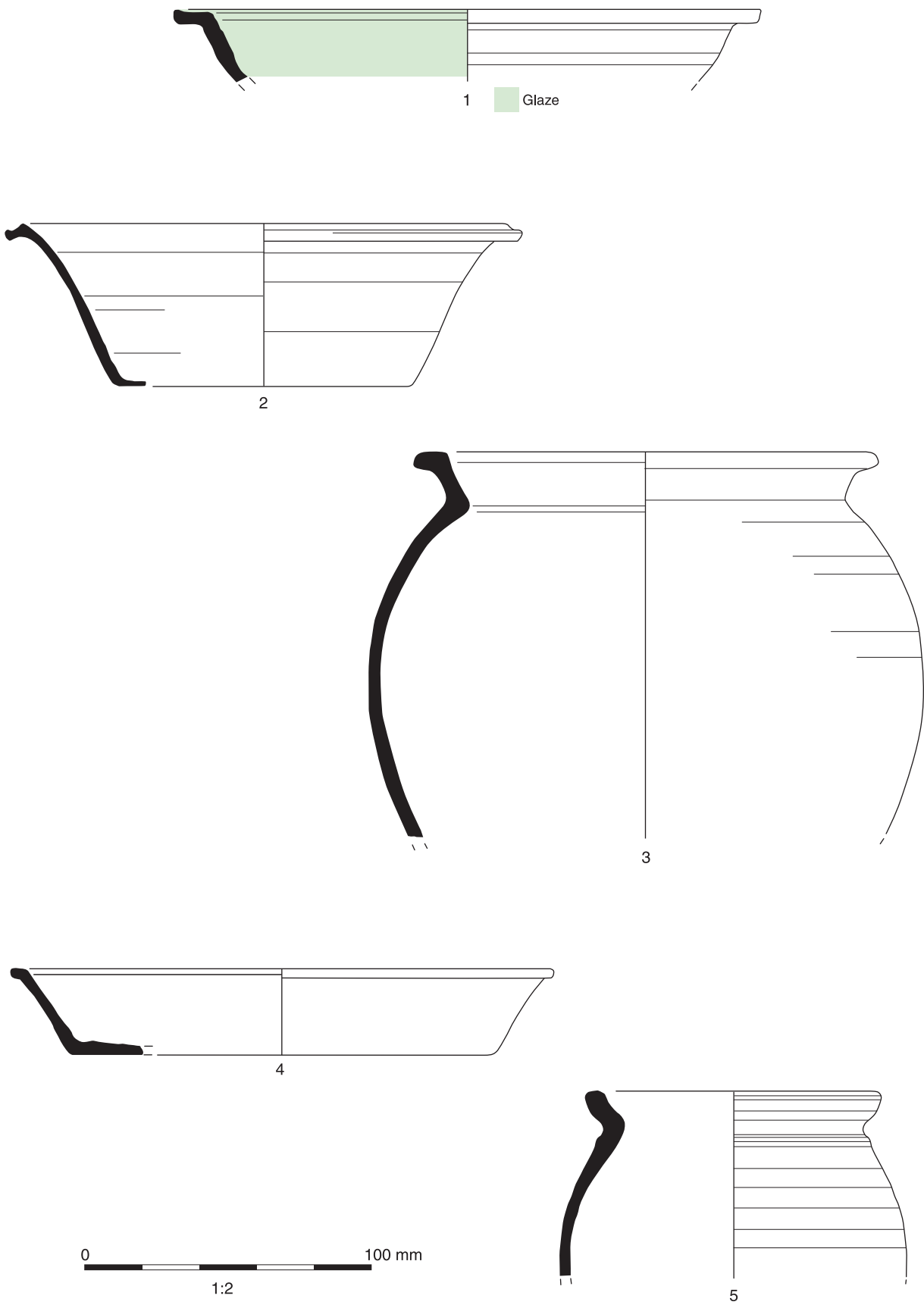


Fig. 5.7 Post-medieval pottery (Nos 1-5)

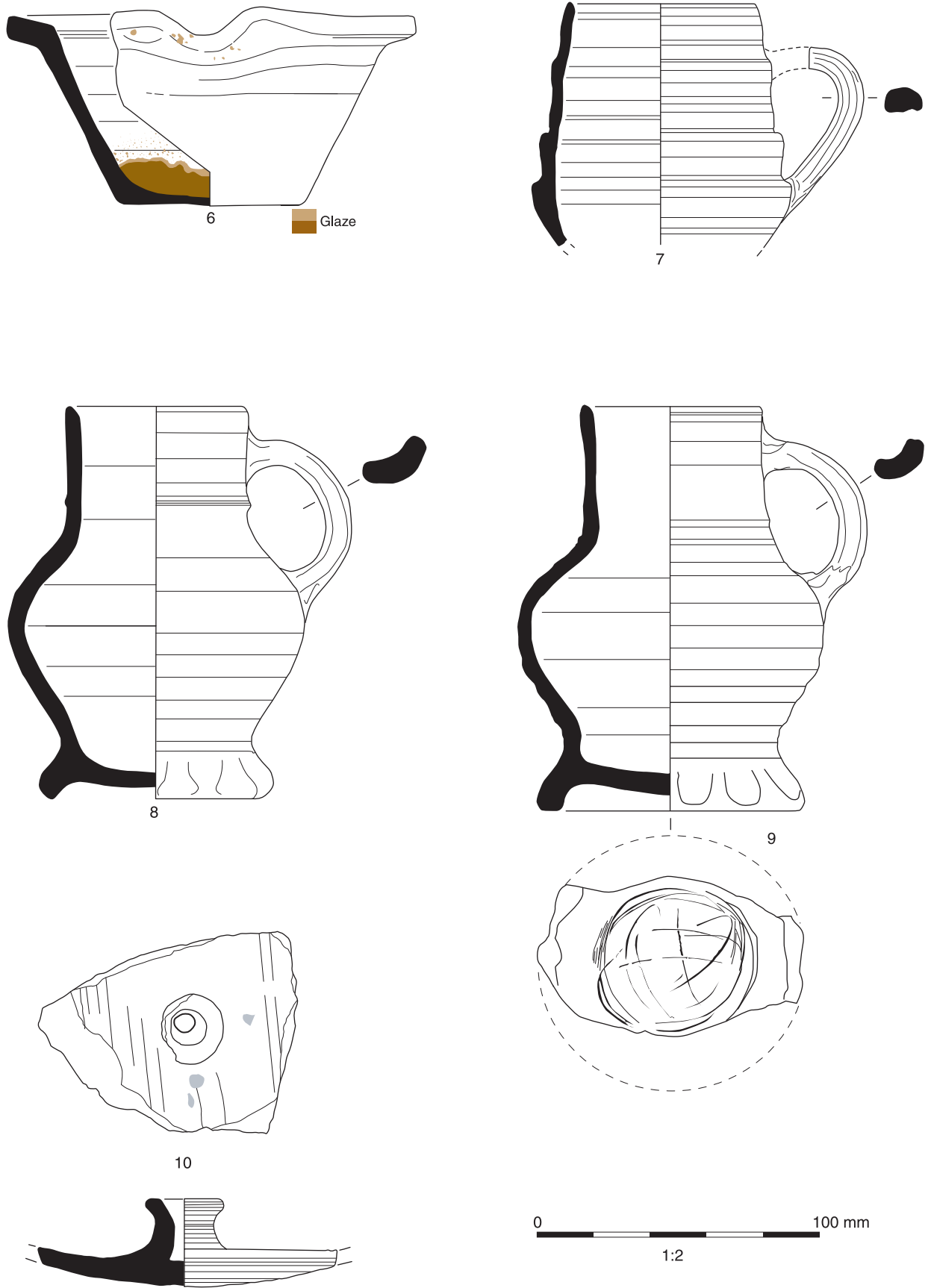


Fig. 5.8 Post-medieval pottery (Nos 6-10)

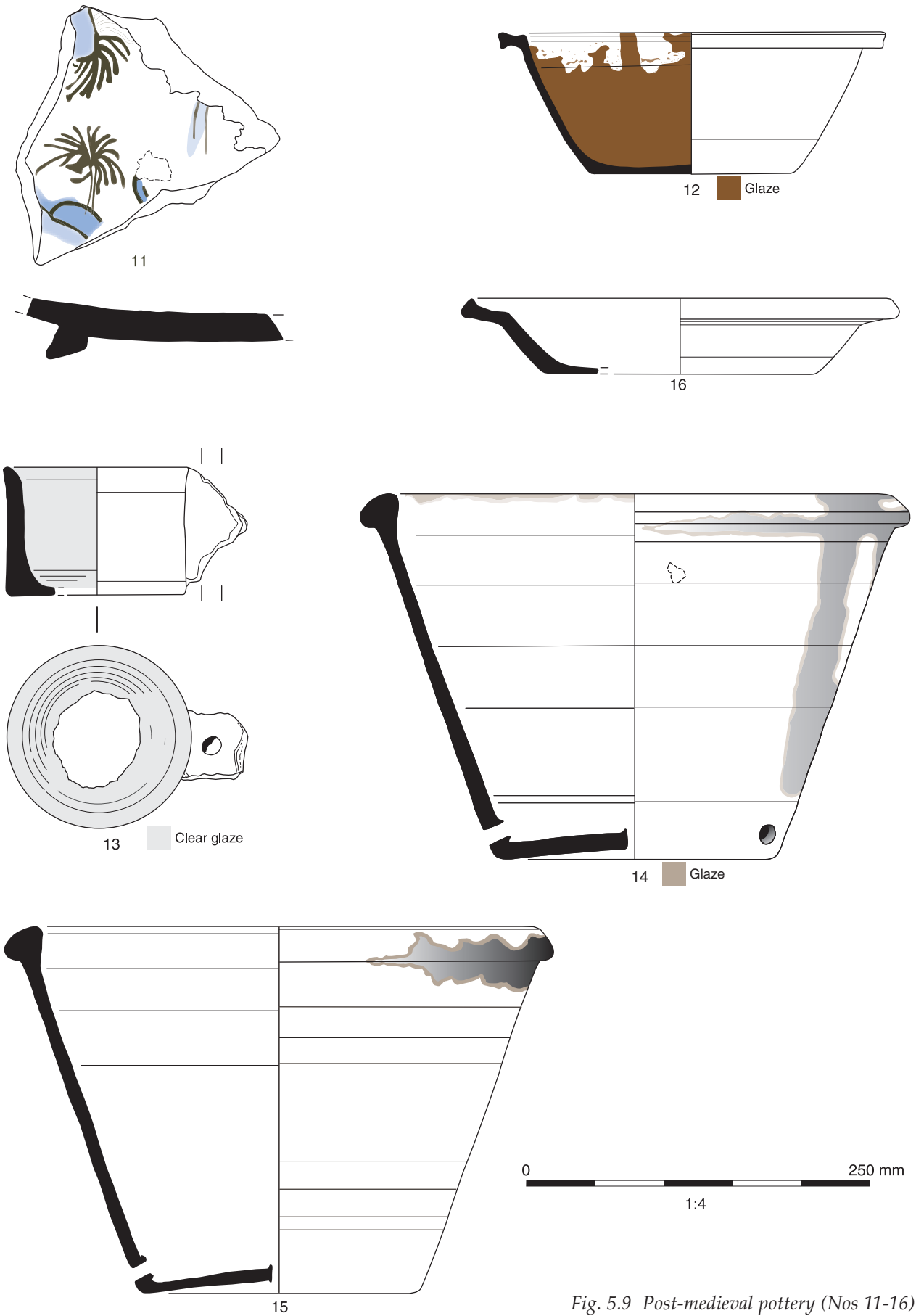
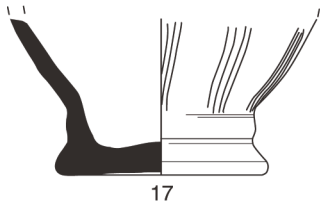
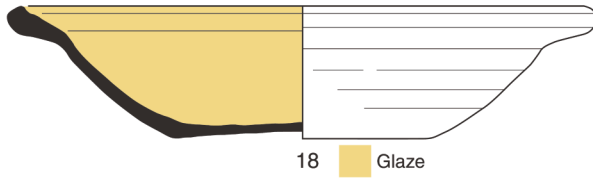


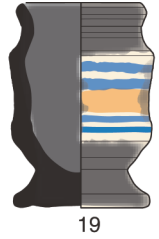
Fig. 5.9 Post-medieval pottery (Nos 11-16)



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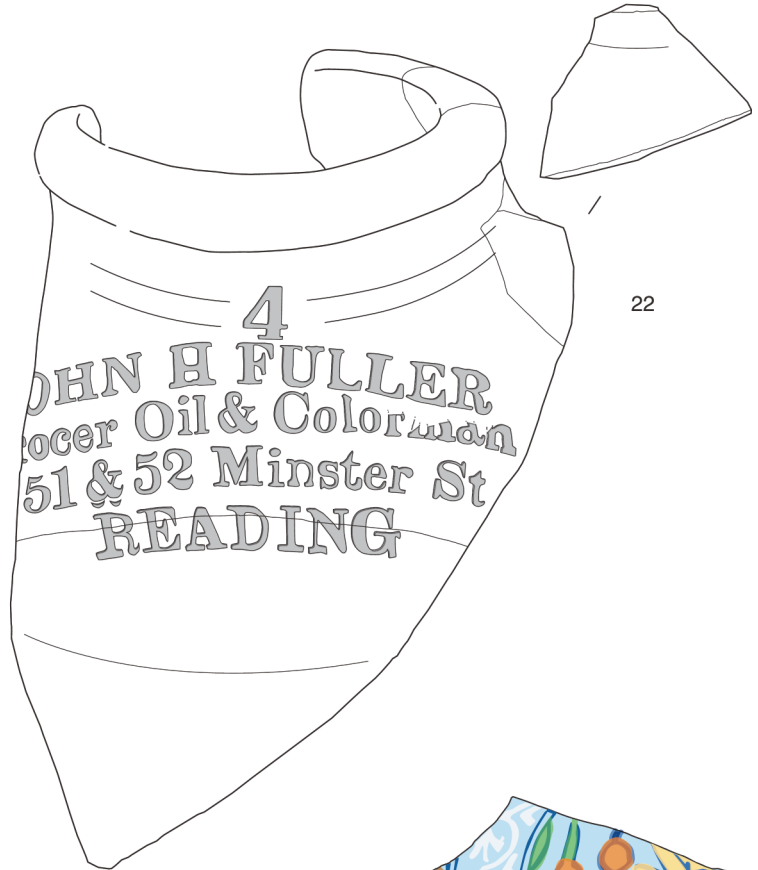
18 Glaze



19



20



22



21



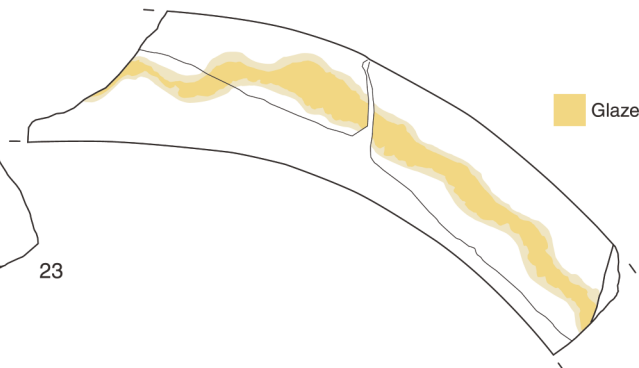
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24



23



Glaze

- 10 Iberian Whiteware: **Lid fragment**. Unglazed. Ctx 5646, Ph. 7

Figure 5.9

- 11 Iberian tinglazed ware: **Dish base fragment**. Decorated with blue and manganese paint, possibly with a tree motif. The sherd is badly abraded. Ctx 5169, Ph. 8
- 12 Post-medieval redware: **Complete profile of bowl**. Internal clear glaze that appears brown over deep red surfaces, glaze mainly confined to the base with runs towards the rim indicating that the vessel was fired upside-down. Ctx 4486, Ph. 8
- 13 Post-medieval redware: **Double-handled cup**. Internal clear glaze. One of a pair of joined pierced flat handles survives and there is a scar where the other handle was attached. The base has been knocked out. Ctx 7114, not phased.
- 14 Late Post-medieval redware: **Complete profile of draining vessel**. Pierced in the centre of the base and in three places above the base. Patches of external black/dark brown glaze. Found set into brick floor. Ctx 647, Ph. 10
- 15 Late Post-medieval redware: **Complete profile of garden pot or draining vessel**. Pierced in the centre of the base and in three places above the base. Patches of external black/dark brown glaze. Ctx 8675, Ph. 6
- 16 Slipped post-medieval redware: **Complete profile of a dish**. Internal clear glaze with white slip decoration. Ctx 4171, Ph. 8

Figure 5.10

- 17 Surrey Border ware: **Base of a mug**. Decorated with vertical lines from a five-toothed comb. Slightly mottled brown glaze inside and out. Ctx 4572, Ph. 7
- 18 Post-medieval earthenware: **Complete profile of a bowl**. Fine, sandy pink fabric with a grey core. Internal yellow-orange glaze. Sooting or scorchmarks on the external surface. Ctx 5201, not phased
- 19 English tinglazed ware: **Complete profile of a small drug jar**. English tinglazed ware. Pedestal base with blue and orange painted decoration. Ctx 8051, Ph. 8
- 20 English tinglazed ware: **Complete profile of a drug jar**. Blue, orange and purple decoration. Ctx 4647, not phased.
- 21 English stoneware: **Complete blacking bottle**. Stamped 'BLACKING BOTTLE/15/J.B.D.' Ctx 11391, Ph. 10
- 22 English stoneware: **Rim and shoulder fragment of a jar**. Stamped '4/...OHN H FULLER/...ocer Oil and Colorman/51 & 52 Minster St/READING/.' Ctx 8301, Ph. 11
- 23 English stoneware: **Rim and shoulder fragment of a jar**. Stamped 'J OLIVER/...e & Spirit Merch t...EADING.' Ctx 3824, Ph. 10
- 24 Ligurian maiolica: **Base of a dish**. Painted with a floral motif in white, dark blue, orange and yellow on a pale blue background. Ctx 4991, Ph. 6

Fig. 5.10 (opposite) Post-medieval pottery (Nos 17-24)

## Glass vessels (Figures 5.11-5.13)

by Hugh Willmott

### Introduction

Glass can be a good indicator of patterns of trade and exchange. It is more chronologically sensitive than many ceramic types and most vessels (with the exception of bottles) can be assumed to have had very short life spans. Stylistically too, glass can easily be identified and it is known to have been made in far fewer locations, facilitating any discussion on provenance and trade. There are, however, certain caveats concerning any conclusions drawn from the glass assemblage. Although, when compared with other similar glass assemblages, this might be considered a large one, the number of vessels is still low when contrasted with other find groups, such as ceramics and clay pipes. Consequently statistically the data must be treated with caution. Likewise glass is prone to a high degree of fragmentation and decay in archaeological environments, resulting in the amount recovered even in meticulous excavation being rather less than that originally deposited. Furthermore certain glasses, such as those made with a potash alkali, are more likely to suffer severe weathering and total decomposition, compared with those made with a soda flux, leading to an over representation of the more durable glasses in the archaeological record.

### Glass as an indicator of trade and exchange

Three broad categories of glass can be identified that help in this discussion: glass produced relatively locally to Reading, glass produced in national urban centres, and glass imported from continental Europe. Each of these categories has different implications for the level and complexity of trade and exchange networks in operation around Reading.

Perhaps the hardest group to identify positively are those glasses produced locally. In the absence of specific archaeological research into the glass industry in the Reading region, it is not known where the nearest source might have been. However, it is increasingly apparent that utilitarian potash glasses were produced in a variety of locations in southern England, usually in woodland areas. Such glasses, which include simple pedestal beakers and flasks, are present in the assemblages from site 12 and site 29. Utilitarian potash glass vessels found at site 12 comprise three urinals (Fig. 5.11 Nos GL2-4) used to inspect urine for medical divination, and three flasks (Fig. 5.11 No. GL6 is the push-in from a flask base). These types of vessel are amongst the commonest survivals from the medieval period, and these examples are most likely to be of 14th- and 15th-century date. Rather later are the fragments of six pedestal beakers found at site 29 (Fig. 5.12 Nos GL51 and 52), all but one decorated with optic-blown wrythen ribbing.

Pedestal beakers are common finds on domestic sites during the later 16th and early 17th centuries (Willmott 2002, 45-6). They are a typical English product, frequently occurring on contemporary furnace sites such as Hutton and Rosedale, N Yorks (Charleston 1972, 146-8) and Kimmeridge, Dorset (Crossley 1987, 359). A more unusual potash glass find from site 29 is the spout from a small spouted jug (Fig. 5.13 No. GL76), which probably dates from the early 17th century. Four flasks from site 29 (Nos GL 56-9) are made in a green glass and are probably of 16th-century date. Figure 5.12 No. GL 56 is an oval flask decorated with heavy optic-blown wrythen ribs. Flasks of this kind were found in the barber-surgeon's chest on the *Mary Rose*, which sank in 1545.

English glass produced in specific specialised urban centres is easier to identify. By the later 17th century the nature of production had changed, with most glass production occurring in large-scale glasshouses based within towns. Centres such as London, Bristol and Newcastle became established at this time, supplying not only their wider hinterlands but also providing for export. Whilst there is no documented industry in 17th- or early 18th-century Reading, vessels such as wine bottles, phials and some of the stemmed drinking vessels are English products, and were probably made in London. Considerable numbers of late 17th- to early 18th-century onion and mallet wine bottles were found on site 12, many from a cellar at the Yield Hall that was backfilled in the late 18th century (Fig. 5.11 Nos GL20-22; Plate 3.27). These were used at a time when wine was not stored for long periods in the bottle. The practice of ageing wine had become popular by the mid 18th century, and straight-sided vessels that could be laid on their side were developed. A number of the later 18th-century squat cylindrical wine bottles were recovered from later contexts, and a range of wine bottles were recovered at site 29 (see Willmott, Chapter 9 on the CD-ROM). Phials were popular household items used for medicines, unguents and lotions, and a minimum of 12 were recovered from contexts associated with the occupation of the Oracle workhouse. Several fragments of a wine glass with a moulded pedestal or 'Silesian' stem (Fig. 5.11 No. GL10) were found at site 12, and date from the early 18th century.

Perhaps the most significant categories are the imported vessels. The most exceptional finds were six fragments from a clear glass goblet with mould-blown fins around its bowl (Fig. 5.11 No. GL1). Finned goblets are found on the continent in late 13th- and early 14th-century contexts, but are considerably rarer in England, where this is the first known example in colourless glass. It was probably made in southern France and is similar to an example from Avignon (see Willmott, Chapter 9 CD-ROM for further discussion). It was found with rubbish and refuse used to raise the ground level of site 12 following major channel realignment in the

early 16th century, and may have been brought from the abbey following its dissolution. Otherwise, imported glass vessels only occur in any significant number at site 29 and almost all belong to the *façon de Venise* tradition of the 16th and early 17th centuries. *Façon de Venise* glass is a generic term to describe an almost pan-European style of vessels and decorative techniques. Many of these styles probably originated in Venice, but were rapidly copied by other production centres. One fragment from site 29 (Fig. 5.12 No. GL60) is quite plain, and is a very fine rim from a goblet of 16th-century date. There are at least three tankards, two cylindrical beakers and two goblets from site 29 that are made in a highly decorative and colourful *filigrana* glass, forms and decoration typical of the Antwerp and Amsterdam industries of this period. The most complete and diagnostic fragments come from the body and rim of a bellied tankard decorated with vertical bands of alternating blue and white glass (Fig. 5.12 No. GL61-63) in the style known as *vetro a fili* (see Willmott, Chapter 9 CD-ROM for a discussion of *façon de Venise* decorative techniques). Bellied tankards are quite a rare form dating to the first half of the 16th century and another fragment (Fig. 5.13 No. GL68) is from a different tankard decorated with alternating opaque white *vetro a fili* glass and canes of coloured glass twisted into a tight spiral in the technique known as *vetro a retorti*. Two fragments (see Fig. 5.13 No. GL64) come from late 16th- or early 17th-century cylindrical beakers decorated with opaque white *vetro a fili*, and two further fragments (not illustrated) come from goblets with white *vetro a retorti* decoration, typical of the first half of the 17th century. Similar vessels have been found on a number of domestic sites, particularly in London. Two rim fragments from cylindrical tankards made in brown glass with white thread decoration (see Fig. 5.13 No. GL70) date to the late 17th century and may have been produced in England.

Whilst it is hard to draw firm conclusions from a single category of material culture, the glass does give an indication of the standing of Reading in its regional and national context. In many ways the assemblages are typical for a midlands or southern English town. Typically such urban assemblages are predominantly post-medieval in date, with glass first occurring in any quantity during the late 16th and early 17th centuries. *Façon de Venise* glass is not particularly rare, but it is nevertheless an indicator of the presence of people with the means to acquire fashionable imported luxury goods. Glass, such as here at Reading, typically continues to be found in 18th-century contexts, before becoming scarcer in the 19th century, probably as a result of changes of practice in rubbish disposal and site excavation biases. As such, the Reading assemblages, with their mix of local and imported Low Country vessels, are directly comparable to others from towns such as Northampton, Coventry, Winchester and Oxford.

Chapter 5

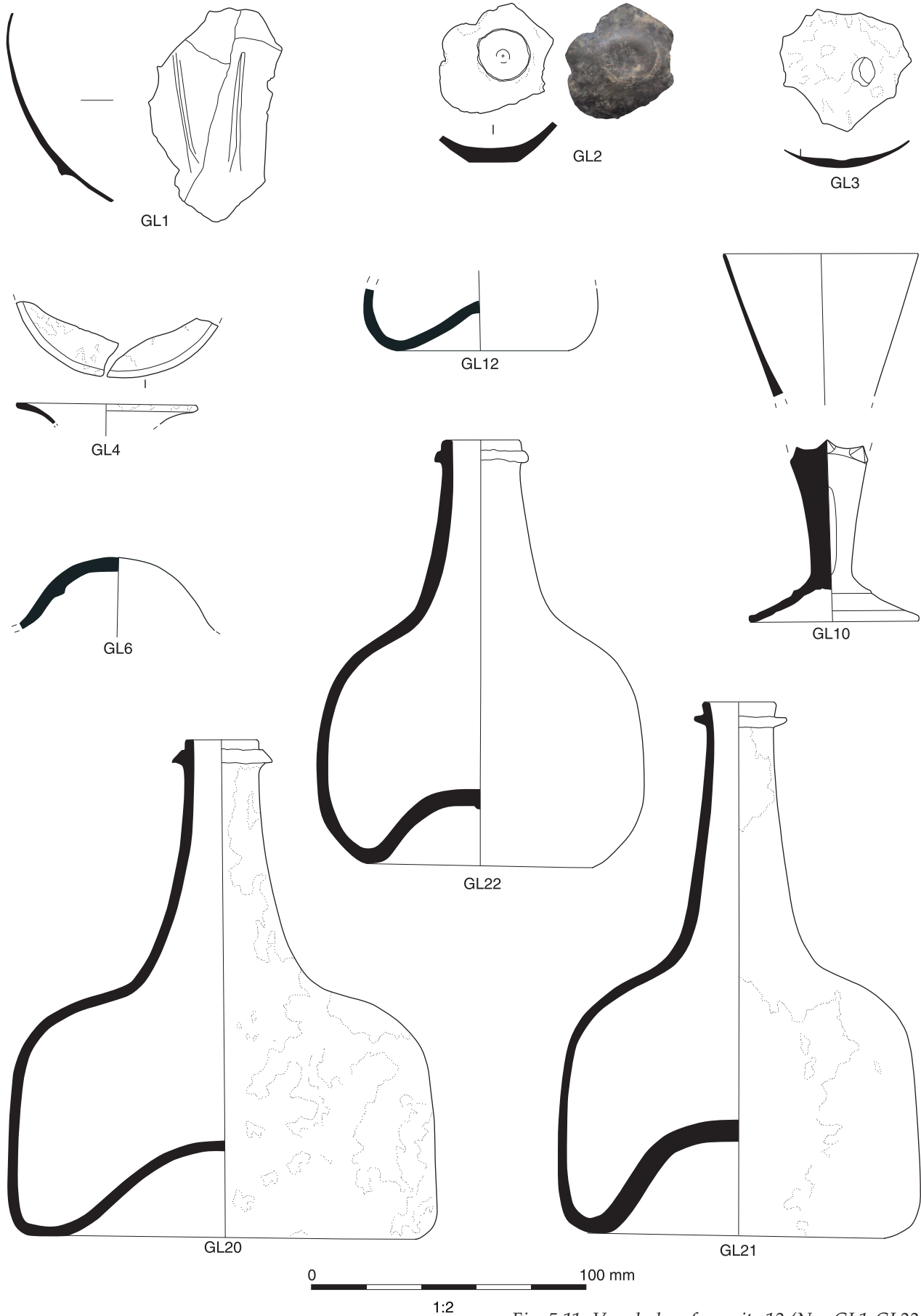


Fig. 5.11 Vessel glass from site 12 (Nos GL1-GL22)

What are absent are any imports from further afield. There are no identifiable Italian glass imports, nor any from Northern Germany or Bohemia, although German pottery and jettons (counters) were clearly reaching the town. This is consistent with the pattern of glass imports found in other regional towns, with such imports usually being restricted to London, or coastal mercantile centres like Southampton. The small but significant amount of residual medieval glass from site 12 is of note. Medieval glass is relatively rare in provincial urban contexts, and usually only found in association with high status secular and ecclesiastical establishments. Furthermore, given the extent that medieval glass is prone to decay and devitrification, it would seem to suggest that it derived from a site in the near vicinity. Had it been brought in from further away as part of material for levelling and land reclamation in this area it is unlikely to have survived.

### Catalogue of illustrated glass vessels

#### Site 12

##### Figure 5.11

- GL1 **Bowl from stemmed goblet.** 6 fragments. Decorated with two remaining vertical pinched 'fins'. Clear glass with heavy weathering. Late 13th-early 14th century. Ctx 8655, final phase 1207a (1500-1530).
- GL2 **Urinal.** 2 fragments of convex base from a urinal. Green potash glass with very heavy weathering. 13th-15th century. Ctx 613, final phase 1209d (1660-1700).
- GL3 **Urinal.** 1 fragment of convex base from a urinal. Green potash glass with quite heavy weathering. 13th-15th century. Ctx 564, final phase 1210a (1700-1750).
- GL4 **Urinal.** 2 fragments of everted rim with an up-turned edge from a urinal. Green potash glass with heavy weathering. Rim diameter 75mm. 13th-15th century. Ctx 564, final phase 1210a (1700-1750)
- GL6 **Flask.** 3 fragments of basal push-in from a large spherical flask. Green potash glass with very heavy weathering. 15th-early 16th century. Ctx 894, final phase 1207a (1500-1530).
- GL10 **Wine glass.** 9 fragments of flaring base with under-folded edge, moulded stem and trumpet-shaped bowl from a wine glass. The stem is square-moulded in section with decorative diamonds on the shoulder. Clear lead glass with no weathering. Base diameter 65mm, rim diameter 70mm. Early 18th century. Ctx 8565, final phase 1209c (1600-1650).
- GL12 **Decanter/bottle.** 3 fragments of pushed-in base from an oval decanter/bottle. Clear tinted glass with light weathering. Base diameter uncertain. 18th century. Ctx 502, final phase 1210a (1700-1750).
- GL20 **Wine bottle.** 2 fragments of complete profile from an onion/mallet wine bottle. Green glass with quite heavy weathering. Base diameter 112mm, rim diameter 25mm, height 185mm. Late 17th-

early 18th century. Ctx 952, final phase 1211 (1750-1800).

- GL21 **Wine bottle.** 15 fragments of complete profile from a mallet wine bottle. Green glass with heavy weathering. Base diameter 102mm, rim diameter 23mm, height 203mm. Late 17th-early 18th century. Ctx 952, final phase 1211 (1750-1800).
- GL22 **Wine bottle.** 14 fragments of complete profile from a small onion/mallet wine bottle. Green glass with quite heavy weathering. Base diameter 78mm, rim diameter 25mm, height 140mm. Late 17th-early 18th century. Ctx 952, final phase 1211 (1750-1800).

#### Site 29

##### Figure 5.12

- GL49 **Pasglas.** 1 fragment possibly of a convex zoomorphic head-shaped knob from an octagonal pasglas. Blue potash glass with heavy weathering. Late 15th century? Ctx 5463, final phase 2908c (1558-1628)
- GL51 **Pedestal beaker.** 1 fragment of rim from a pedestal beaker decorated with optic-blown wrythen ribbing. Blue/green glass with very little weathering. Rim diameter 80mm. Late 16th-early 17th century. Ctx 4488, final phase 2909a (1627-1680).
- GL52 **Pedestal beaker.** 1 fragment of rim, from a pedestal beaker decorated with optic-blown wrythen ribbing. Green glass with heavy weathering. Rim diameter 80mm. 16th century. Ctx 4484, final phase 2908c (c 1566).
- GL56 **Flask.** 1 fragment of rim, neck and shoulder from a small oval flask. Decorated with heavy optic-blown wrythen ribbing. Green clear glass with virtually no weathering. Early-mid 16th century. Ctx 4484, final phase 2908c (c 1566).
- GL60 **Goblet.** 1 fragment of slightly everted rim from a goblet. Clear glass with medium weathering. Rim diameter 90mm. 16th-early 17th century. Ctx 4654, final phase 2908e (1628).
- GL61 **Bellied tankard.** 10 fragments of body from a bellied tankard. Decorated with vertical bands of alternating opaque white and blue vetro a fili. Early to mid 16th century. Ctx 5519, final phase 2908a (1520-1628).
- GL 62 **Bellied tankard.** 2 fragments of vertical rim and body from a bellied tankard. Decorated with vertical bands of alternating opaque white and blue vetro a fili. Rim diameter uncertain. Early to mid 16th century. Ctx 4617, final phase 2908e (1628).
- GL63 **Bellied tankard.** 1 fragment of body from a bellied tankard. Decorated with vertical bands of alternating opaque white and blue vetro a fili. Early to mid 16th century. Ctx 4673, final phase 2908e (1628).

##### Figure 5.13

- GL64 **Cylindrical beaker.** 1 fragment of vertical body possibly from a cylindrical beaker. Decorated with vertical bands of opaque white vetro a fili.





Fig. 5.12 Vessel glass from site 29 (Nos GL49-GL63)



Fig. 5.13 Vessel glass from site 29 (Nos GL64-GL76)

Late 16th-early 17th century. Ctx 4965, final phase 2908c (1558-1628).

- GL68 **Bellied tankard.** 1 fragment of pedestal base probably from a bellied tankard. Decorated with alternating bands of opaque white vetro a fili and retorti. Base diameter 70mm. Early to mid 16th century. Ctx 4564, final phase 2909a (1627-1680).
- GL70 **Goblet.** 1 fragment of vertical rim from a goblet. Decorated with one remaining opaque white vertical prominent trail. Rim diameter 90mm. Mid 17th century. Ctx 3896, final phase 2910a (1850-1998).
- GL71 **Possible tankard.** 2 fragments of vertical rim from a possible tankard. Brown glass decorated with horizontal prominent opaque white trails. Rim diameter 75mm. Late 17th-early 18th century. Ctx 3945, final phase 2910a (1850-1998).
- GL73 **Small flask, or possibly a sand glass.** 2 fragments of low pushed-in base from a small flask or possibly a sand glass. Clear green tinted glass with medium weathering. Base diameter 32mm. Late 17th century? Ctx 4370, final phase 2909a (1627-1680).
- GL76 **Spouted jug.** 2 fragments of spout from a spouted jug. Green glass with extreme weathering. Early 17th century. Ctx 4502, final phase 2909b, (1680-1750).

## Timber

by Dan Miles

A major dendrochronological study was carried out on timbers recovered during the excavations, which can be found in full in Chapter 11 on the CD-ROM.

## Historic Woodland Management in Berkshire and Oxfordshire

In the early medieval period, much of the country was covered by forests which, despite the nomenclature, was more of a varied landscape of open glades and rides interspersed with pockets of dense woodlands, preserved principally for the purposes of keeping deer. Royal forests local to Reading were of course Windsor Forest, the northern parts of which were disafforested in 1227, and Pamber Forest, which was not disafforested until 1614, by which time the woods had been sold (Grant 1991).

During the medieval period, the most common form of woodland management was coppice with standards. The underwood was composed of small young growth of fast-growing species including beech, maple, elm, ash, alder, and hazel which were regularly coppiced about every ten years for such things as wattle and billets (Rackham 1976). Interspersed throughout the woodland were standards, tall timber trees left to mature for eventual building timber. This type of woodland was protected from the time of Henry VIII when in 1543 an Act was passed requiring 12 standards or

store oaks should be left on each acre of copse or underwood felled at 24 years' growth (Forbes 1904).

During the late 16th and early 17th centuries timber began to become scarce, and in 1662 John Evelyn promoted the plantation system of woodlands. He advocated the growing of oaks in nurseries and the planting of saplings in plantations which might be managed both as traditional coppices as well as for building timber on the selection system. In the Chilterns, coppices were almost entirely superseded by the growing of plantations of beech together with oak on the selection system. During the post-medieval period up to the early 19th century, local woodlands in Mapledurham were beech coppice with oak and beech standards. By the first quarter of the 20th century the selection system was considered inferior to the compartment system of plantations following a major study of over 1500 trees on the Mapledurham Estate which even as late as 1920 comprised about 430 acres of mixed woodlands, half of which were pure beech (Wood 1920).

## Interpretation of dendrochronological results

What is significant about the change of woodland management over the past millennium is that it can sometimes be reflected in the dendrochronological record. Trees grown in woodlands or forests which were not greatly interfered with by man, such as might be found in a Royal forest or woodland controlled by the Abbey, are more likely to match better both between the trees in the same woodland as well as with the reference chronologies. The other extreme is represented by the medieval practice of woodland management where individual trees are selectively felled periodically, often affecting the remaining neighbouring trees. Here, intensive woodland management generally results in poor cross-matching of samples. It is not until the 17th and 18th centuries, presumably resulting from the increased use of the plantation system with less periodic intervention, that trees again match each other exceptionally well.

A major question hoped to be answered from the dendrochronology is where did the timber originate. Until the Dissolution, it is quite likely that timber would have been provided by the extensive estates belonging to Reading Abbey, given that the buildings within the Oracle site were their property. Interests along the Kennet valley included Calcot, Burghfield, Bucklebury, Thatcham, and Greenham. Further north, on the south side of the Thames, were Tilehurst, Purley, Pangbourne, Basildon, Blewbury, and Cholsey. The abbot of Reading also had a country residence at Bere Court, near Pangbourne, and possibly another seat at Bucklebury (Man 1816). Certainly, timber must have been transported from somewhere, as there would be very few, if any, trees within an urban area suitable for building. Until the 18th and 19th centuries, when roads

became more passable, the best method of transporting heavy loads such as timber was by water. Mapledurham being so close to Reading meant that timber could easily have been barged downstream a couple of miles, or could equally easily have been carted into the town across Caversham bridge. This meant that the hundreds of acres of woodlands on the Thames escarpment at Mapledurham had a ready and accessible market throughout the whole period of the Oracle period of development. Other woodlands further upstream of Reading along the Thames valley which might have provided timber include Hardwick, Woodcote, Whitchurch, Goring, and South Stoke.

Reading is also especially well placed by being situated where the River Kennet merges into the Thames. Thus not only was the Upper Thames a likely source for timber, but so too was the whole of the Kennet valley from Reading to Newbury. There was a major wharf at Aldermaston where timber and billets were transported from quite early on, as well as Bucklebury. Other sources of timber along the Kennet included the Royal Forest of Pamber on the south side, as well as Englefield, Bradfield, and Lower Padworth on the north (Preece pers comm).

Geologically, Reading is situated on the border between two different types of soils. The land on the north side of the River Thames in south Oxfordshire is the southern-most extent of the Chiltern Hills, from Reading to the Goring Gap. Here the underlying rock is almost invariably chalk, but the surface soils range from sand to clay. On the south side of the Thames lies the Kennet valley and here the soil is quite different – more river gravels, silts, and loams.

Looking at the dendrochronological evidence resulting from this study, the 22 samples spanning most of the 12th and 13th centuries matched each other exceptionally well, despite having felling periods spanning some 30 years. This strongly suggests that these timbers originated from one or more areas of woodland which was not overly managed, but were instead allowed to grow naturally, thus better reflecting the common climatic signal. Interestingly, the best individual sites with which these timbers matched were from Aston Tirrold and York Farm, West Hagbourne, both near to Cholsey. It also matched very well with the site master from the Reading Waterfront excavations (Groves *et al* 1999) which suggests that both sites probably obtained timber from the same sources, or at least Abbey-owned sources.

In contrast, the later medieval/early post-medieval material all exhibited poor inter-site cross-matching, with most of the samples initially dating individually. This suggests that the timbers used in these construction phases were from diverse, typically managed woodlands. The late medieval material matched best with chronologies up the Thames valley towards Oxford, with Mapledurham chronologies the best represented.

Conversely, the early post-medieval material up to about 1611 produced excellent matches with a number of chronologies along, or south of, the Kennet towards Newbury. Here the two best matches with regional chronologies were with Shaw House and Greenham Mill, both near Newbury and both with *t*-values over 10.

The 18th-century material included several beeches, which proved reasonably successful in dating, there being a good degree of cross-matching with the oak. Although the beech sequences clearly matched the oak, this does not necessarily mean that they have come from the same woodlands, as indeed beech often matches oak quite well (Tyers pers comm). However, in the Mapledurham and neighbouring Hardwick woodlands, the oak and beech are mixed, resulting in tall straight oaks. The best six matches were from reference material from Mapledurham, suggesting strongly that most of the oak as well as beech timbers may well have originated from this local wooded estate.

This is supported by a documentary reference showing that the beech coppice was an important woodland product, as well as building timber, often exported as far as London. A reference dated 1573 from the accounts of riverman Thomas West of Wallingford states: "I find Master Browne and Master Shergent did cawes me to carry 20 loads of talle woode and 10 loades of billetes frome John Melsaides of Mapledorme (Mapledurham) unto the 3 Cranes [Wharf] in London..." (Prior 1981, 87). Given the trade in timber from Mapledurham to London, there is no reason to doubt that Mapledurham was a logical and convenient source of timber for the growing town of Reading.

All this strongly indicates that the timber used in the various phases of the Oracle site has originated from local sources, as would be expected. The earliest material growing in the 12th and 13th century probably originated on the chalk uplands. Given the excellent matches with chronologies from Mapledurham, only three miles to the north-west of Reading, it is suggested that the middle Thames valley around Reading was the most likely source of the timber during the mid-to-late medieval as well as 18th-century periods. Conversely, the material felled about 1611 produced equally strong matches with chronologies from the Newbury area, and as these were significantly better than with contemporary Mapledurham chronologies, this suggests that the Kennet river valley might be the more likely source of the early 17th-century felled timber.

However, this sort of dendro-provenancing is fraught with difficulties over such a small geographical area (Bridge 2000; 2012). Indeed, it is simply the availability, or absence, of local reference chronologies during the various chronological periods which have led to the above conclusions. For instance, over a dozen 18th-century chronologies have been developed from the long-running research project into the parish of

Mapledurham, only a few miles distant from Reading, which might account for the exceptional matches with the 18th century. Other intensive dendrochronological research in south Oxfordshire and Oxford City over the past fifteen years has provided an excellent collection of regional chronologies for the southern end of the Chilterns, contrasting with the dendrochronological black hole of Berkshire where very few buildings dated, unlike its neighbours Hampshire and Oxfordshire. Another aspect to consider is that one would expect better matches with the more replicated, longer, chronologies, even if they are further afield, making additional difficulties when dendro-provenancing by *t*-values alone.

### Animal, bird, fish and plant resources

*Animal, bird and fish bone by Naomi Sykes, plants by Ruth Pelling*

A large animal bone assemblage was collected during the excavations, but its interpretation, as with many such urban assemblages, is not straightforward. Detailed analysis was carried out on the assemblages from sites 29 and 12, and it was clear that the bones resulted from a variety of different activities in the area. Much of the material is industrial in character, and reflects the selection of animals and body parts for craft working (see below), rather than the diet of the inhabitants of the area. On site 29, this kind of evidence is present from as early as Project Phase 2 and 3, with goat horncores and a skinned horse bone present in the Phase 2 latrine pits, and worked antler and a skinned cat skull present in deposits of Project Phase 3.

As an urban centre, Reading would have relied largely upon animals and animal-based raw material supplied from outside the town. Presence of foetal and neonatal pig remains indicate that some pigs were bred within the town, and a piggery in the area is mentioned in lease of 1515 (see Chapter 4, above). There is no evidence to suggest that cattle, sheep or goats were raised on-site and these must, therefore have been imported from the rural hinterland. In all probability livestock were moved on-the-hoof, although the presence of large numbers of cattle scapulae, humeri and radii in the seemingly more 'domestic' deposits (Project Phases 7 and 8, site 29) may be evidence for the importation of pre-butchered forelimbs. Certainly shoulders of venison appear to have been brought into the town: anatomical data for fallow deer show an over-representation of forelimb bones compared to those of the hind limbs. These data are interesting as they contrast with the patterns noted on most medieval and post-medieval sites, where scapulae and humeri tend to be absent whilst hind limb elements, especially foot bones, are particularly well represented (for instance Albarella and Davis 1996,

Griffith *et al.* 1983). These patterns have been linked to the hunting rituals introduced after the Norman Conquest (Sykes 2001), whereby cervid carcasses were processed in a formulaic manner, with certain body parts being given to particular people: according to documentary evidence, haunches were reserved for the lord with the shoulders being awarded to the huntsmen and forester (Cummins 1988). From the zooarchaeological record it is clear that hind limbs were, indeed, sent preferentially to high-status sites but the fate of the shoulders has been less easy to determine. It seems possible that whilst the haunches were retained for aristocratic consumption, shoulders of venison were sold on at market. The idea that game from rural estates was taken to market may also explain the presence of the rabbit and hare within the Oracle assemblage. Other resources supplied to Reading must include marine fish. The cod, ling and haddock bones probably represented stored fish, since few cranial bones were recovered: it has been demonstrated repeatedly that bones of the head are removed during processing and that stored fish is signified by the over-representation of appendicular bones and caudal vertebrae (Barrett 1997; Locker 2000). By contrast, body part evidence for the Pleuronectids shows all parts of the skeleton to be represented, suggesting that flatfish were eaten fresh, and were probably brought into the town by boat.

In addition to local or even regional exchange, the presence of goat horncores and the absence of any associated post-cranial bones, may even hint at international trade (Tables 5.6-5.7). Unequal representation of goat skeletal elements is often noted in English medieval assemblages and recent research (Albarella 2003) has suggested that goat skins, with their horns attached, were being imported to this country from mainland Europe.

The greater bulk of the plant remains from sites 29, 12 and 28 consist of dumped material interpreted as stable waste. Several indicator groups of stable waste as suggested by Kenward and Hall (1997) were present, notably compressed straw, bracken and twigs, legume waste, cereals, hay-meadow and grassland plants and house fly pupae. Such material would include animal feed as well as bedding and may be composed of the waste from cereal or pulse processing prior to consumption by humans, as well as fodder crops grown specifically for the animals. Animal dung potentially introduces further habitat groups, particularly of grazed grassland floras. The stable waste was probably cleared out periodically and allowed to rot in the damp or wet ditches and pits, sufficiently so that it may even have been colonised by some of the numerous ruderal weeds represented in the samples. The nest of grass snake eggs in test pit 149 would suggest that stable waste or similar had been allowed to sit and rot for some time creating a warm, damp composting environment in the ditch.

Table 5.6: Skeletal representation data, by phase, for caprines from Site 29

Site 29	Phase 2		Phase 3		Phase 4		Phase 5		Phase 6		Phase 7		Phase 8		Phase 9		Phase 10a	
	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI
Horn Core																		
Mandible	14	6	1	1	2	1	2	2	58	22	28	12	2	1				
Atlas									138	36	25	10	36	9			2	2
Axis									2		2	2	2	1	1			
Scapula	6	4	1		2	1	1	34	3	13	17	9	3	3				
Humerus					2	1	3	31	13	15	8	8	13	7				
Radius	5	3	3	2	1	1	8	40	20	29	15	15	22	13	1	1	1	1
Ulna	2	1						9	7	7	3	3	6	4				
Metacarpal	4	3	2	2	2	1	9	61	31	38	13	13	12	5			2	1
Pelvis	7	3	1				2	42	15	12	4	4	16	5				
Femur	3	3	1		2	2	5	24	12	15	6	6	21	10			1	1
Tibia	7	4	5	2	2	1	6	54	17	20	8	8	24	8			1	1
Astragalus								2	2	3	2	2						
Calcaneum								5	3	2	1	1	4	3	1	1		
Metatarsal	3	3			1	1	10	51	27	34	14	14	22	12	1	1		
Phalanx 1	1	1	1	1	1	1	1	5	1	15	2	2	1	1			1	1
Phalanx 2										2	1	1						
Phalanx 3										2	2	2						

Table 5.7: Skeletal representation data (NISP and MNI) for a) cattle and b) caprines from selected features on site 29. \* = goat.

a) Cattle	Phase 2 Occupation		pit 11060		Phase 2-3 pit 11047		Construction		Phase 6 Dump		Pit		Tanning Vat	
	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI
Horn Core	1	1	1	1			4	2	15	5	7	1	44	8
Mandible	1	1	6	3	4	2			15	4	6	2	47	10
Atlas									3	1	1	1	3	1
Axis					1	1			1	1				
Scapula	3	2	1	1			1	1	12	5	12	3	18	8
Humerus			1	1			3	2	10	3	8	3	10	4
Radius	4	2	1	1			1	1	8	4	6	2	8	3
Ulna	3	2			1	1			4	4	2	1	2	2
Metacarpal	4	4	1	1			2	1	6	4	10	2	10	4
Pelvis	1	1	3	1			1	1	13	7	10	4	13	4
Femur	2	1	1	1			2	1	17	4	9	3	16	4
Tibia	1	1			1	1	1	1	15	5	10	5	20	6
Astragalus									2	2	1	1	2	1
Calcaneum									3	2	2	2	5	3
Metatarsal	4	4	3	2			2	2	8	4	2	2	11	4
Phalanx 1	1	1							7	1	3	1	6	1
Phalanx 2													4	1
Phalanx 3									4	1	2	1	2	1

b) Caprine	Phase 2 Occupation		pit 11060		Phase 2-3 pit 11047		Phase 2-4 pit 11332		Phase 6 Construction		Dump		Pit		Tanning Vat	
	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI
Horn Core			2*	2	2*	2			1	1	10	7	7	3	39	17
Mandible	2	1	10	4	2	1	12	4	17	7	82	20	4	2	9	3
Atlas																
Axis											1	1				
Scapula	2	1	3	2	2	2			1	1	7	5	2	1	19	10
Humerus									2	2	8	5	4	2	10	5
Radius	1	1	3	2	1	1	1	1	4	3	12	9	7	3	12	7
Ulna			2	1					2	2	3	2			3	2
Metacarpal	2	2			1	1	1	1	1	1	14	11	17	9	18	10
Pelvis	1	1	2	1					1	1	9	4	8	2	20	7
Femur	1	1			1	1			1	1	9	5	6	4	4	2
Tibia	2	1	1	1	1	1			3	2	16	5	9	2	19	7
Astragalus															2	2
Calcaneum													1	1	4	2
Metatarsal	2	2			2	1			1	1	11	6	9	6	18	8
Phalanx 1							1	1			1	1	2	1	1	1
Phalanx 2																
Phalanx 3																

A range of economic plants are present, which provide a useful guide to the crops and wild plant resources used by the townspeople as well as providing clues as to the soils and habitat types exploited. Crop plants include rivet wheat and bread type wheat, barley, oats and rye, pulses and brassicas (cabbage, turnip, mustard and so on). The two wheats probably had slightly different although complementary uses. Bread wheat has a higher gluten content and makes better bread. Rivet wheat, however, has a longer straw and was therefore traditionally commonly used for thatching, as

well as for other activities such as malting mats. Oats and barley may have been used for malting, as well as for fodder and human food. Rye, like rivet wheat, also produces a useful long straw, and is used for flour. A range of cultivated and wild fruits and nuts are represented including blackberry, wild/alpine strawberry, fig, grape, sloe, bullace, cherry, hazel and walnut. With the exception of fig all are likely to have been locally produced, and all have been recorded from contemporary deposits at Reading Abbey (Carruthers 1997) where they may have been cultivated in the abbey gardens. Fig can

be cultivated in England, although it will not produce fertile seeds, and it is usually considered to be imported. Reading Abbey produced both grape pollen and wood from 14th- to 16th-century deposits (Carruthers 1997), and a vineyard on the islands between the Kennet channels is mentioned in 14th-century documents (see Chapter 4, above). Walnut was a late introduction into Britain, but is known from at least the 11th century, for example in Norwich (Murphy 1988). The occurrence of hops may suggest brewing activity, which is also supported by charred malted grain, although hops do grow freely as a weed of ruderal habitats or scrubland. Flax and hemp may have been cultivated for fibre. Some of the more robust fruit pips are likely to have derived from sewage, although the absence of bran in the deposits suggests sewage is not a major component.

The arable weeds in the deposits are generally limited to large-seeded varieties or those that form seed heads, such as *Anthemis cotula* and the poppies. These species are hard to separate from the cereal grain by sieving or winnowing, so are most likely to enter an urban environment where the cereals might be expected to be fully processed. The few weeds do suggest that cereals were cultivated on a range of soils. *Chrysanthemum segetum* (corn marigold) is characteristic of acid soils, *Anthemis cotula* tends to favour heavy soils, while occasional weeds of lighter well-drained soils are present, including *Papaver rhoeas/dubium* (field/long-headed poppy) and *Raphanus raphanistrum* (wild radish). It is likely therefore that the arable crops represented in the samples have come from a wide range of soils and geographical locations. Several of the ruderals may have derived from arable habitats, although such species are common colonisers of nitrogen-rich urban environments.

## THE CRAFTS OF READING

### Clothmaking

by Ruth Shaffrey

(with contributions by Leigh Allen, Joan Dils, Penelope Walton-Rogers)

#### Introduction

Clothmaking was the principal industry in Reading in the medieval period, and employed the largest number of craftsmen (Dils 1980, 14). The traditional product of Reading was the broadcloth (ibid.). The Oracle excavations included within their study area the Oracle workhouse, the dyehouse near Bridge Street and both the fulling mills of St Giles and Minster Mill. In the event, the limited evidence from the excavations is perhaps disappointing for a trade known to have been so abundant in the area. Nevertheless, some structural, artefactual and environmental evidence was recovered, and is reviewed below.

### Archaeological and documentary background

Documentary references to the cloth industry are frequent because of the significance of the industry to the town (see Chapter 4). Both St Giles Mill and Minster Mill (both owned by the abbey) were used, amongst other things, for the fulling of cloth. This is referred to in a charter of c 1260-1290 for St Giles Mill, and by the Dissolution, when both mills were granted to William Grey, Minster Mill also included a fulling mill. A land grant of 1204-1220 mentions a tenter yard (for stretching cloth after fulling), located on an island on the floodplain near the gildhall, and there seems also to have been a dyehouse in the area. By the 17th century, the Minster Mill was also associated with a dyehouse (as described in a taxation roll of c 1604-1610). Cloth was produced in Minster Street, and the documentary evidence suggests that the site of the Oracle may have been a clothier's works in the 16th century. The records do not name this site precisely but it was owned by William Bye, who we know also owned a dyehouse and was a wealthy clothier. From the survey it seems that Bye's house was the one sold by William Kendrick to the Corporation for the foundation of the Oracle workhouse in 1628. The workhouse itself was originally intended to provide work for the poor in the manufacture of cloth, but in the event this proved unprofitable as the clothmaking industry went into decline.

### The Oracle excavations

Evidence for the different aspects of the cloth industry was identified in the excavations of the Oracle floodplain zone. It includes (in addition to the fulling mills themselves), the excavated remains of a small early 17th-century dyehouse in the west of the area (site 78), the 17th-century Oracle workhouse, and a possible dyehouse on site 12. Alongside the structural evidence are a number of finds that add to our understanding of the cloth industry in Reading.

#### Structural remains

During the later 16th century, very clear and well-preserved features of an industrial nature were constructed on site 12 (Building 7410 Project Phase 6), comprising a timber frame or platform, with associated hearths and a working platform (see Chapter 2, above, site 12, Project Phase 6). As is so often the case, the interpretation of these structures remains uncertain because of a complete lack of associated artefactual evidence. However, the possibility remains that this could also have been a dyehouse, and a dyehouse is attested in this general area by 16th-century and earlier documentary records (see Chapter 4, above).

The principal structural evidence for the cloth industry is of 17th-century date, in the form of a small dyehouse located at the western limits of the investigated area and south-west of the Oracle workhouse. Here, Test Pit 78 exposed the remains of



a post-medieval dyehouse constructed in the early 17th century (Fig. 3.2; Plate 3.18), which probably continued in operation until the start of the 18th century. It consisted of two roughly square pits positioned 4.5 m apart and linked by a linear E-W channel (8048) formed by a hollowed-out oak timber. Each would have contained a vat, which in turn held the liquids needed for the dyeing process. One pit fed into the other and the second pit had a drain back towards the Minster Mill stream. A lead strainer was found *in situ* in the channel (Fig. 5.32 No. 5). The timber channel was dendrochronologically dated to 1611-1612 and found to have been felled from the same tree as four timbers from structures at St Giles' Mill, suggesting a possible link in ownership. The structures of the dyehouse are described in detail in Chapter 3, and it was ideally located on the floodplain with easy access to the water required from the Minster Mill stream just to the north.

#### *The artefactual and environmental evidence*

Unfortunately, despite the structural remains excavated for the cloth industry, very few artefacts were found that can be directly associated. Amongst these are a heckle tooth (wool comb) from a Phase 8 context at site 29, which is very likely to be residual, six thimbles (mostly on or near the Yield Hall, 8856, 9090, 8555, 564, 501) and several pairs of shears and scissors. Very large quantities of copper alloy pins were found, which are likely to have been used in tailoring, sewing and upholstery. Most of these are, however, from post-medieval contexts and are more likely to reflect contemporary small-scale manufacturing than the remnants of the town's medieval cloth industry.

Two possible fibre crops were represented amongst the waterlogged plant remains: flax (*Linum usitatissimum*) and hemp (*Cannabis sativum*). Seeds of flax were identified in seven samples and were particularly numerous in contexts 8852 and slightly less so in context 9003, both from site 12 (Project Phases 4 and 5). While these samples contained large quantities of cereal processing waste and probably stable litter, it is possible that the seeds were included in fibre processing waste that was fed to animals. A single seed of hemp was identified from sample 1544 from St Giles Mill. *Cannabis* seeds have been recovered in small numbers from a number of medieval sites, including York (Kenward & Hall 1995), and from Reading Abbey (Carruthers 1997) although the fibre is rarely found and the seeds could have been present as a source of oil or chicken feed. Documentary evidence suggests that both flax and hemp were cultivated as a garden crop in the medieval period (Steane 1985, 214, 264; Tusser 1580) and this small scale production is perhaps reflected in the fact that both are frequently found in small quantities in medieval urban deposits.

No definite dye plants were recovered from the samples, although the ruderal weed *Reseda luteola* (weld or dyers rocket), a seed of which was recov-

ered from site 12, does produce a yellow dye used in textile manufacture as its common name suggests. The value of wool was reflected in the age of the sheep in the animal bone assemblage. When sheep are valued more for wool than for meat, farmers tend to maintain animals for several years in order to gain the greatest number of wool clips before selling them on for mutton. A focus on wool production may explain the apparently high frequency of castrate males within the assemblage, since wethers yield a higher quality fleece than either ewes or rams (Trow-Smith 1957, 149).

#### *Textiles*

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Textiles were recovered in small numbers from Project Phases 4 and 6 at site 12, Project Phase 7 at site 101 and Project Phase 8 at site 150. They mostly represent the middle range of clothing fabric, but there is also a knitted item and a large and unusually well-preserved piece of sacking.

The earliest textiles are offcuts left over from cutting out garment pieces, SF1727-8, Project Phase 4. These were recovered from an early fill of an industrial-type pit at site 12, possibly a tanners' layaway pit (fill 8852 of pit 8742). There are snippets from four different wool fabrics, each with rows of stitch holes which indicate that the tailor was reworking old garments. Two of the pieces, SF1727a and b, lie in a double layer with matching rows of stitch-holes, which suggests that one textile has been the lining, cuff or collar for the other. Although all four are similar weights of fabric, with Z-spun yarn in warp and weft, they have been made in two different weaves, from different types of wool, with different degrees of soft-finishing (Table 9.15). The archaeological context, Project Phase 4, places them in the period from the mid 13th to the late 14th century, but the presence of tabby weave puts them in the latter half of this time-span. A well-dated sequence of textiles from London has demonstrated that tabby took over from 2/1 twill during the course of the 14th century, while 2/2 twill remained steadily in the background (Crowfoot *et al.* 1992, 27, 44-9), and a similar development can be seen in collections from other towns (author's unpublished data for Winchester, Coventry, York and Beverley). The Project Phase 4 tailoring offcuts are therefore most likely to belong in the mid to late 14th century.

Textiles of this sort would be well within the capacity of Reading cloth-workers. The town had its own wool textile industry by the beginning of the 13th century (Miller and Hatcher 1995, 118) and a fulling mill, where clothes could be soft-finished is mentioned in 13th- and 16th-century documents concerning the parish of St Giles. Clothiers were numerous in Reading municipal records, beginning in 1432 (Lipson 1921, 247) and they may have formed part of a 'gild merchant' of earlier centuries (Cunningham 1922, 225). Dyes imported through

Southampton were brought to Reading by the London grocers (Thrupp 1933, 276) and these are likely to have included madder, the common medieval red dye imported from the Low Countries and obtained from the roots of the plant *Rubia tinctorum* L. This is the dye identified in three of the offcuts, in one instance combined with a tannin-based brown dye (Table 9.15).

If the Project Phase 4 textiles are indeed locally made, then analysis of the wool suggests that the town was drawing on raw materials from outside Berkshire. In the four different fabrics there are five of the seven possible fleece-types, namely Fine, Fine/Generalised Medium, Generalised Medium, Medium and Semi-Fine (Table 9.16). Medieval flocks were more variable than they are today, but even so it is unlikely that there was such a wide range of wool types together in one area. The only fleece-types absent from the collection are the Hairy and Hairy Medium wools which represent the hill and mountain sheep of upland Britain. Records of the 16th century show fleeces from as far away as Dorset being brought into Berkshire to supplement local supplies (Bowden 1962, 50-1, 60-3) and the Project Phase 4 textiles would suggest that this trade had already begun in the 14th century, assuming that the cloth itself was not brought in ready-made. A bale pin, unfortunately unstratified, was found on site 12. Pins of this type were used to secure wool sacks and are common finds on medieval sites associated with the transshipment of wool (Walton Rogers 1997, 1716-8).

The fragments of coarse knitting from Project Phase 6 (c 1500-1600) at site 12 have been stretched very hard widthways, a feature which has been seen in later knitted stockings (Walton Rogers 2006, 172). The yarn is plied and made from a Hairy Medium fleece type, comparable with wool from hill breeds such as the Radnor and the Cheviot. The craft of knitting became established in England in the 15th century and was widespread, especially in poor rural districts, by the 16th century, when it was used to make hats, petticoats, gloves and sleeves as well as stockings (Walton Rogers 2002, 2745-7; Rutt 1987, 58-66; Hartley and Ingilby 1978, 6-10).

The large pieces of coarse open-weave textile from Project Phase 7 (c 1600-1680) of site 101, SF 1327, represent a rare survival of sackcloth made from a plant fibre. The textile has been woven in narrow pieces, with 260 mm between selvages, and two fragments have been stitched together edge-to-edge with a plied sewing thread. The fibre does not seem to be one of the standard British fibres, such as flax or hemp, and it has features sometimes seen in Indian and south-east Asian fibres (see technical report in archive). Unfortunately, despite an extensive search, it has not been possible to find an exact match. Surviving examples of medieval and post-medieval sackcloth are mostly made from animal hair or coarse wool (Walton 1988), although they too are made in widths of less than a metre. There is a goat-hair piece from early 17th-century Southwark,

for example, which has a loom width of 830 mm (Crowfoot *et al.* 1992, 78). It is likely that there was a greater use of plant fibres for sackcloth than the archaeological record shows. Two poorly preserved plant-fibre examples were found on the site of a 14th-century foundry at York (Walton Rogers 2002, 2881, 2884) and there was another in the late medieval barbican ditch at Oxford Castle (Crowfoot 1976, 274). These, like the Reading example, make use of paired single yarns, where the hair/wool sackcloth has plied yarn. Plant fibres are particularly susceptible to fungal attack when left in damp aerated conditions, but the sacking from site 101 came from a tank with continuously flowing water, Ctx 7182, and it would appear that being kept consistently wet has allowed the fibre to survive in good condition. Such a large piece of sacking may have been connected with the transport of goods to and from the site when the area was being re-developed.

The worn fragments of a fulled wool cloth woven in tabby from S-spun yarn, SF 2000a, from the foundations of the rebuilt Minster Mill (site 150, Project Phase 8, c 1680-1750) represent another standard clothing fabric. Textiles of this sort were common from the 16th century onwards and this medium-fine example probably comes from a light-weight coat or heavy dress (Walton 1981, 1983). Alongside it was a small piece of a flat blue-dyed wool braid, 15 mm wide, worked in simple diagonal plaiting, probably by the 'fingerloop' technique, SF2000b. Narrow braids of this construction were used in the medieval period for garment laces and purse strings (Crowfoot *et al.* 1992, 138-140), but this wider, later example is more likely to have been a decorative border on a garment, or a ribbon trim (Brooke 1937, 136, 150).

### Tanning and leather working

by Ruth Shaffrey and Quita Mould

(with contributions by Leigh Allen, Joan Dils, Ruth Pelling, Ian Scott, Naomi Sykes and Penelope Walton Rogers)

### Introduction

Leather was a very significant material in medieval and post medieval town life, being used for all manner of objects from clothing, particularly shoes, to horse harness and luxury items such as purses. The leather industry naturally subdivided into two very distinct groups of activity, those who prepared the animal hides and turned them into leather (the tanners, curriers and tawyers) and those who used the prepared leather to make objects (the shoemakers, saddlers etc). The tanners took the raw animal hides (usually cattle) from the butcher and subjected them to a lengthy set of procedures that transformed them into workable leather. The animal hides were first cleaned, usually by soaking in

running water and were then allowed to rot slightly so the hair could be easily removed, either by piling somewhere warm and sprinkling with urine or soaking in pits containing wood ash or lime (Cherry 1991, 295). During these pre-tanning processes, the hides were scraped, soaked and washed in order to get them thoroughly cleaned and prepared for the tanning itself; this involved the use of foul substances such as dung, fermenting barley or rye and urine (Cherry 1991, 296).

The hides were then soaked in tanning solutions of oak bark and water of increasing strength before being placed between layers of oak bark in layaway pits and left to steep in tanning liquor, usually for about 12 months depending on the thickness of the hides (*ibid.*). Finally, when the hides were fully tanned, they were rinsed, smoothed and dried out. The currier was then responsible for working the raw processed leather into a more usable material of the appropriate thickness, softness and flexibility depending on the end product the leather was intended for (Thomson 1981, 167).

The tawyer processed the skins of other, smaller, animals such as goat using the alum tawing process. After cleaning the skins were placed in large tubs and treated with a mixture of alum, salt, fatty materials and flour (Thomson 1981, 171). Once the hides and skins had been prepared by the tanners and curriers or the tawyers it was sold to the leather workers who made it in to the everyday objects required.

Evidence for the initial processing was excavated in the form of probable tanneries. Evidence for the manufacture of leather goods (from the raw material) was also produced in abundance because of the waterlogged, and therefore anaerobic conditions of the floodplain, which allowed excellent preservation of the leather. Leather objects and off cuts were found dating to both the medieval and post-medieval periods and provide evidence of several different trades including shoemaking and horse harness manufacture. All the leather recovered was vegetable tanned by the heavy leather trades of tanning and currying as mineral and oil tanned leather produced by the light leather trades does not survive damp burial conditions.

#### *Documentary and archaeological background*

Documentary evidence indicates that the tanners worked in the parishes of either St Giles's or St Mary's (Dils 1980, 16), the boundary of which ran along the Minster Mill stream, and it was therefore likely that evidence for them would be found in the Oracle excavation area. The few historic references to the tanning industry include a deed dated c AD1240 (BRO R/AT/12) which refers to a tannery in Minster Street on the northern boundary of the excavated area, while documents of the 16th century include three inventories for tanners from St Mary's Parish. In addition, Peyton's map of 1919 reveals a Tanne Lock near the southern end of Seven

Bridges, just to the west of the excavation area, and although it was described as a fishery in 1545 (Hawkes and Fasham 1997, 184), its name suggests the presence of the tanning industry there. This indication of tanning to the west of the Oracle was supported by discoveries of hide processing pits and samples of animal hair of mid 18th- to early 19th-century date (Hawkes and Fasham 1997, 52) during the excavations carried out by Wessex Archaeology at Bridge Street East.

With the exception of the Bridge Street East evidence, previous archaeological evidence that might relate to tanning in Reading has largely been in the form of dumps of horn cores and deposits of waste leather and has not been directly connected to any manufacturing or processing sites (Hawkes and Fasham 1997, 193). Dumps such as these were found at the Abbey Wharf site to the east of the Oracle excavations. The evidence indicates the widespread existence of either tanning or the disposal of tanning refuse or that of related trades along the route of the Kennet right through Reading from Seven Bridges in the west to the abbey in the east.

While the evidence indicates that tanning was carried out in the parishes of St Giles's and St Mary's, most of the leather goods manufacture was carried out in St Lawrence's parish, in particular the shoemaking which occurred in 'Shoemakers Row' situated on the eastern side of what is currently known as Market Place. The first documentary reference for this dates to 1134 (Kerrane 1997, 142 and Coates 1802, 450) and during the 16th century, the 'book of regulations of the tanners and leather seller company' (1550 and 1570) dictated that shoes and boots must be made in Shoemakers Row (Kerrane 1997 142). It is therefore unlikely during the medieval and early post medieval periods at least, that much, if any, actual manufacture of shoes occurred on the floodplain. Previous archaeological evidence for leather working in Reading has mostly been for shoemaking and cobbling, a substantial assemblage of which was produced from Abbey Wharf with a further small assemblage from Fobney Street of probable domestic rubbish. These excavations produced shoes varying in date from the early 14th to the 19th century (Mould 1997). In addition to shoes, straps from harness, a knife sheath and a carding comb were also found at Abbey Wharf (Mould 1997, 118) but these only provide evidence of their use, not of their manufacture.

Other leather trades are more likely to have been located near to or on the edges of the floodplain, for example the glovers, who are known to have worked in St Mary's parish (Dils 1980, 16); they used the softer tawed leathers which would not have survived. Later, restrictions to where shoemakers could operate either did not apply or were not rigidly enforced as there is at least one reference to a 'messuage and tenement' on the south side of Minster St occupied by Ravenscroft, a shoemaker (in a deed for 1801).

### *Tanning and leather processing*

The structural remains of two tanneries were identified during the Oracle excavations (Chapter 2, above), the earlier under the Yield Hall on site 12 dating to the 13th to 15th centuries and the later and more formalised under the Oracle workhouse on site 29 of the 16th century and early 17th century. Evidence of leather processing (tanning and currying) was also provided by artefactual evidence.

A series of large pits were found on site 12 under the Yield Hall. These were probably constructed during the mid 13th century (although the precise construction date is unknown) and are best interpreted as layaway pits for the soaking of hides, a process which could take anywhere between one and three years (Thomson 1981, 166). Both goat and calf hair were found within the fills of these pits (Walton Rogers, Chapter 9, below). Since hair would have been removed from hides before they were 'laidaway', this may simply be debris dumped from elsewhere. The long 'layaway' process was not used by whitewyers and the presence of this hair may suggest that goat and calf skins were being vegetable tanned here. This would have contravened the strict distinction in craft and process between vegetable tanning of cattle hide and tawing of soft leather (see above) but evidence from elsewhere suggests that this was not uncommon (see below). The pits were located approximately midway between the Minster Mill channel to the north and the Back Brook to the south. A channel linking the Minster Mill channel to the Back Brook lay just to the east of the pits and would have been very useful for the washing of the hides which took place during the pre-tanning preparation process (Thomson 1981, 162). At the time the layaway pits were initially constructed there is no indication that this land was specifically reclaimed and the land would probably still have been very marginal. Regular flooding in the area would have made the pits very difficult to use, however, and it is possible that the channel management occurring at the same time was sufficient to prevent frequent flooding episodes. The evidence indicates a fairly intensive use of the land which would have been difficult if flooding were occurring annually. All the pits were substantial in size, up to 12 x 4 m, and underwent recutting as part of their ongoing management. At least one of the pits (they were not all fully excavated) was carefully revetted around the edges with a mixture of wattle and wooden fencing and chalk packing (see Chapter 2 for detailed description) and all were found to have contained standing water which could easily have been taken off the channel which ran alongside them. The numerous concentrations of caprine metapodia (sheep and goat feet) may also suggest hide processing, but could just represent butchery waste.

The pits continued to be used throughout the 14th century and into the early 15th century, but it is

not clear whether they were used continuously during this time. At least one pit continued to be used while the remainder were being infilled; this was not filled until the last quarter of the 15th century. It is possible that there was a gradual decrease in the scale of the industry or a phased movement to another location. The use of these pits occurred at a time when the abbey had control over the water channels. The positioning of the tanning pits to the south of the Minster Mill stream, and downstream of the mill itself, would have ensured that the industry did not interfere with the operation of the mill, and offensive liquids from the tanning process would have been discharged into the Back Brook and not affected the Minster or Abbey Mills or the abbey itself.

During the early post medieval period (Project Phase 6), a complex of pits was created on site 29, just to the south of Minster Street (Fig. 2.10, Plates 2.17, 2.20). The complex, which is described in Chapter 2, above, was in use from the 16th to early 17th century with the main phase of expansion after 1558 and it was out of use by 1628 when the Oracle workhouse was constructed. Although the documentary evidence indicates that this may have been a clothier's works, the archaeological parallels between this and tanneries excavated elsewhere, particularly at The Green, Northampton (Shaw 1996), are compelling. Excavations at The Green uncovered the remains of tanneries dating to the periods *c* 1470-1550 and *c* 1550-1700. The earlier phase, located within the western area of the trench, comprised two groups of circular and rectangular pits set in rows within an open-sided building and its yard to the east. A group of large rectangular pits in the eastern half of the trench was in use during the later phase. The circular pits were lined with clay, and some also contained surviving remains of wood and groove marks within the clay linings suggesting that wooden tubs or possibly the bottom half of barrels had been set into them. Evidence suggested that the rectangular pits had been lined with wooden planks. In considering the interpretation of this site, which remains the most extensive example yet published in this country, Shaw reviewed evidence for possible tannery sites elsewhere, including two very extensive examples of tanneries from Bruges (*ibid.* 114). At Bruges, two neighbouring tanneries that came into use in the later medieval period comprised 80 circular pits lined with wooden tubs, associated with thousands of horn cores, leather off-cuts, bark and tanners' tools. Shaw concluded (*ibid.*) that the combination of rectangular and circular watertight pits of a fairly standard size in association with organic matter, oak bark, wood fragments or chips and leather off-cuts would appear to be a reasonably good indication of tanning especially on sites where horn cores or sheep foot bones were associated. Since his review, in addition to the sites that form part of the Oracle excavations, further evidence for tanning pits of this kind has been recovered locally at

Abingdon (Pine and Taylor 2006, 57-60) and King Stable St, Eton (Blinkhorn and Pugh 2000, 13-15). Analysis of chemical residues within the pit fills at The Green, and the distribution of animal bone residues, led Shaw to the conclusion that pits within these small tanneries could be used for multiple stages of the tanning process, and there was no correspondence between the stage of the process and pit shape. The final tanning of the prepared hides was probably carried out in only one pit, or in a small number of pits, with the strength of the tanning liquor being gradually increased, rather than the hides being moved from one pit to another. It was also clear that a variety of skins were being vegetable tanned at The Green, and that the distinction between the tanning process for cattle hides and the tawing process for other skins was not being adhered to. Shaw suggests it is unlikely that high quality leather was being produced in this way, and it may not have been until later that the better processes described in 18th-century manuals and encyclopaedias were widely adopted (*ibid.*, 119-20).

The industrial complex at Oracle site 29 may have seen mixed use over its hundred years of operation, possibly leading to its identification as a clothier's in its final years. Although no direct evidence links the probable medieval tanning pits at site 12 with the tannery under the Oracle, it is of interest that the formalised tannery came into being shortly after the earlier pits went out of use. Environmental analysis of samples from these pits identified mineralised seeds of edible fruits usually associated with cess pits, or with the urine used in the tanning process.

Studies of the zooarchaeological material from tanneries (see Shaw 1996) have demonstrated that tanning waste tends to be highly characteristic, with assemblages consisting predominantly of cattle and caprine horn-cores and/or foot bones (metapodia and phalanges), with fewer meat-bearing elements being present (Serjeantson 1989, Harman 1993, Sykes n.d). The reason for this skeletal patterning is that animal hides were sent to the tanner with the feet and head, or at least the frontal part of the skull, attached to the skin. Why horns and feet should have been left attached has been the subject of some debate but the most probable explanation is that these elements were valued commodities in their own right. Foot bones would have been attractive to the tanner because they are the source of neatsfoot oil, the finest of animal fats, often used for dressing leather (Serjeantson 1989, 141). Horns would not have been used by the tanners but would have been sold to the horners, who often worked in association with tanners (see below).

The Phase 6 material from site 29 does, to a large extent, conform to the pattern expected of a tanning assemblage: Table 5.6 shows that the caprines are represented by an abundance of metapodia, mandibles and horn cores. Anatomical frequency data for cattle, however, show large numbers of

prime meat bones, an under-representation of metapodia and a virtual absence of phalanges, skeletal patterning more suggestive of domestic rubbish than industrial waste (see Sykes, Chapter 10, Table 10.11b). Composition of the tanning vat material (Table 5.7) is a little more typical, with horn cores being well represented, but there is still an unexpectedly large number of scapulae in both the cattle and caprine assemblages. It may be that the area witnessed dumping from both industrial and domestic sources but, if the material derived exclusively from the tannery, an explanation for the over-representation of upper limb bones may lie with the butchery evidence (Chapter 10). It was noted that most of the cattle bone from this phase had been butchered in a standardised way, the majority having been cleaved to expose the marrow cavity. Since few metapodia were present in the assemblage, the tanners would not have had access to a ready source of neatsfoot oil and may, instead, have extracted marrow fat and bone grease as a substitute. The chopped bones could have been boiled to release these oils and it seems possible that the industrial hearths identified on the site were employed in this process. The vegetable tanning process does not use marrow, but it would be used in oil tanning.

By the 16th century it was a legal requirement that leather dressing was undertaken by specialist curriers (Thomson 1981, 166). Rare evidence of the work of the currier was recovered from the south bank of the Kennet where a group of flesh shavings was found amongst other primary waste in a deposit (12554) likely to be of post-medieval date. Currying waste has also been recognised at York where a group of mid 10th-century date and another of late 14th/early 15th-century date were found at 16-22 Coppergate (Mould, Carlisle and Cameron 2003, 3254 and fig 1588).

Another discrepancy between the zooarchaeological and historical evidence is demonstrated by taxa represented within the assemblage. Both cattle and sheep are well represented in the Oracle assemblages but, according to the legislation of the time, the hides were required to be sent to different craftsmen, the tanner and tawyer respectively (Serjeantson 1989, Albarella 2003). It is probable that the waste from a number of related industries was simply being dumped together.

In addition to structural evidence for tanning and the evidence provided by animal hair (above), leather preparation on the floodplain was also suggested by the recovery of dumps of horn core (removed from the hides by the tanners along with other unusable parts until the 15th century). Tanners were required to remove the horn cores themselves, a process which may have led to a build up of waste on site (Thomson 1981, 162) and possibly to legislation regarding their disposal. In Northampton for example, the tanners were required to clear these deposits out once a year (*ibid.*) and a similar pattern of disposal is indicated

by the large deposits of horn cores recovered in Reading. From the 15th century, as the tanner sold leather to the currier by weight, it became more common for waste parts to be removed later when the currier sold the finished leather to the shoemaker or other leather worker (Roy Thomson pers. comm.). The discovery of large dumps of horn cores is nevertheless indicative of leather processing and of the work of horners. During the Oracle excavations, dumps of horn cores were found in late 16th- to early 17th-century pits on site 12 under the Yield Hall and in a late 16th-century dump in the edge of the Minster Mill channel just to the south of the post-medieval site 29 tannery.

Deposits of primary waste leather, also characteristic of leather processing, were found in 30 contexts during the excavations, principally concentrated into five leather dumps dating to the mid 14th century (St Giles Mill) through to the 15th and early 16th century (under the Yield Hall on site 12). This material comprises unusable parts of the skin or hide such as bellyskin, udders and areas around the head, legs and hide edges that were trimmed off during leather processing. Occasional pieces of primary waste leather still retaining hair were also found in the same late 15th/early 16th-century deposits on site 12 and are certainly waste from the initial tanning process. This waste may have been thrown away by the tanners or the leather sellers.

### *Leatherworking* (Figs 5.14-5.25) by *Quita Mould*

Most of the evidence for leatherworking at the Oracle comes from dumps of secondary waste leather – the discarded pieces left over from the cutting and trimming of pattern pieces during the manufacture of various types of leather goods. During the Oracle excavations, secondary waste was recovered from 35 contexts, a single piece dating to before the mid 12th century, but the majority dating from the mid 13th through to the early 16th century (Project Phases 4, 5 and 6).

Intersectional cutting pieces of waste leather characteristic of shoemaking were found in five contexts dating from the mid 13th-14th century through to the early 18th century. Though only found in small quantities within each context much of the other secondary waste with which they were found is also likely to be waste from shoemaking. The largest group was found in a large 15th- to early 16th-century dump on site 12 (8510). Several pieces of secondary waste leather with a length of hide edge present were recovered from 15th-, 16th- and 18th-century contexts suggesting that the shoemakers were sufficiently wealthy to buy entire hides rather than smaller cut pieces from the leather seller.

While a proportion of the shoes probably represent smallscale everyday disposal of domestic rubbish it is clear that the majority of the shoe leather recovered from 15th- and 16th-century deposits was cobbling waste: 65% of the shoe soles from this

period had been repaired, and some had been repaired on more than one occasion. Small dumps of cobbling waste were found in 13th- to 14th-century deposits at St Giles Mill as part of the ground reclamation near London Street and 15th- and 16th-century channel deposits on site 12. These dumps of cobbling waste, apparently the clearance of waste accumulated in workshops over a number of years, included old shoes cut up to salvage reusable leather, discarded soles and repairs, and trimmings and off-cuts produced when cutting out new repair pieces and other shoe parts. The cobbler refurbished old shoes by replacing worn soles and repairs and remodelling and repairing the uppers. At least 36 separate soles and 101 clump repairs were found that had been discarded during this process of refurbishment. At least 41 shoe components had been deliberately cut up to salvage reusable leather before being thrown away. A large early 16th-century forepart clump repair (SF78) found in 16th-century ditch fill 1139 (10104c) had a series of parallel slashes suggesting it had been used as a cutting platform on a work bench by a leatherworker, probably a cobbler.

Many shoes, particularly those of turnshoe construction (see below), wore through quickly and clump repairs were often added at the tread (forepart) and seat (heel area). At least five soles of medieval or Tudor date had been repaired twice in the same area before being finally thrown away and two had been repaired three times. On one occasion the entire sole of an early 16th-century welted shoe (SF3056) had been covered with a single, large repair. Repairs to shoe uppers were also noted. An ankle boot (SF3018) had stitching from a semi-circular patch positioned over the side seam just above the lasting margin.

In addition to repairing heavily worn shoes it was the practice for cobblers to buy old shoes, remove the worn out soles and re-last the uppers onto a new sole for resale. By the 16th century the cobblers were kept so busy repairing shoes that a separate branch of the trade developed to undertake this particular activity known as ‘translating’. The remodelling or ‘translating’ of old shoes can be seen in the cobbling debris from Reading where at least three shoes had their uppers cut away from their soles, two of turnshoe construction (SF63, 3040) the other of turnwelted construction (Fig. 5.21 No. 11).

All the later, Victorian shoes were very heavily worn. Eight of the twelve shoes with well preserved bottom units had repairs to the sole attached with iron hobnails. The degree of wear is perhaps best exemplified by a Balmoral boot (SF3123) that had three repairs to the forepart (tread) of the sole nailed one above the other and an iron boot iron nailed to the heel. Repairs to upper seams were also noted (SF3113). At least one shoe, a front-lacing Derby boot (SF3118) had the upper part of the boot leg cut off, presumably to salvage re-usable leather, before it had been thrown away.

The quantity of straps and strap strengtheners found provides evidence of the harness maker on

site 12 in pre Yield Hall contexts. The number of strap pieces in the 15th- (8395) and early 16th-century (8502/8510) leather dumps suggests clearance of an accumulation of old, broken harness from workshops engaged in refurbishing worn harness and making new. The recovery of an unused strap strengthener (Fig. 5.23 No. 20) indicates that straps were certainly being made or repaired locally. Similarly, the recovery of various cut-down panels of stitched leather and lengths of seam may suggest the refurbishment of saddles or leather upholstery was being undertaken.

This evidence for a tradition of some forms of leatherworking in the area of the Yield Hall is added to by the finds of four leatherworking awls in 15th-, 16th- and 18th- to 19th-century deposits along with a pair of shears in a 15th-century deposit. At least one of the 16th-century finds was directly related to the Yield Hall as was a single coarse thimble, probably used for sewing leather (L Allen, Chapter 9) and most likely to have been associated with activity in the mid 17th-century phase of the building. These finds suggest that leatherworking, either horse harness as in previous phases or one of the soft leather trades such as purse or glove-making, was occurring here.

In addition, there is some indication of the presence of leatherworkers on the south side of the floodplain where two needles used by upholsterers or saddlers were found (unphased) and three pairs of shears which may have been associated with leather working (phases 4, 10a and unphased).

Shoe construction methods are shown in simplified form in Figure 5.14. Figures 5.15-5.18 illustrate the types of shoes recovered during the excavations, and Figures 5.19-5.25 illustrate the best examples of the excavated shoes and other items of leatherwork. A fuller explanation of technical vocabulary can be found in the complete leather report in Chapter 9 on the CD-ROM.

The majority of the footwear dates to the 15th century (probably the second half of the period) and the earlier 16th century, and the styles of at least 34 individual shoes of this date could be recognised. Small groups of footwear were also found in later post-medieval deposits in which at least seven different shoe styles were represented.

During the medieval period shoes were made by the turnshoe method, so called because the shoe sole and upper were sewn together and then turned inside out so that the seam lay on the inside of the shoe and was protected from wear. A strip of leather called a rand was often inserted into the seam (Fig. 5.14 No. 1). The thin soles wore through quickly and were frequently repaired with patches known as clumps. During the later 15th century the turnshoe construction was sometimes modified by the addition of a second sole sewn to a wide rand to make the shoe more hard-wearing, an adaptation known as the turn-welt construction (Fig. 5.14 No. 2). This developed into the welted construction whereby the shoe upper and a bottom unit, comprising a sole (insole) and an

outer sole (tread shoe), were joined together with two separate seams to a wide strip known as a welt (Fig. 5.14 No. 3). Thicker leathers could now be used for both the upper and the sole. Shoes made in each of these three constructions have been found at Reading in the same dump deposits, although, as elsewhere, the turn-welted shoes are very much in the minority. A method of joining the shoe components together with metal rivets was devised at the beginning of the 19th century but did not come into wider use until the middle of the century. Two shoes

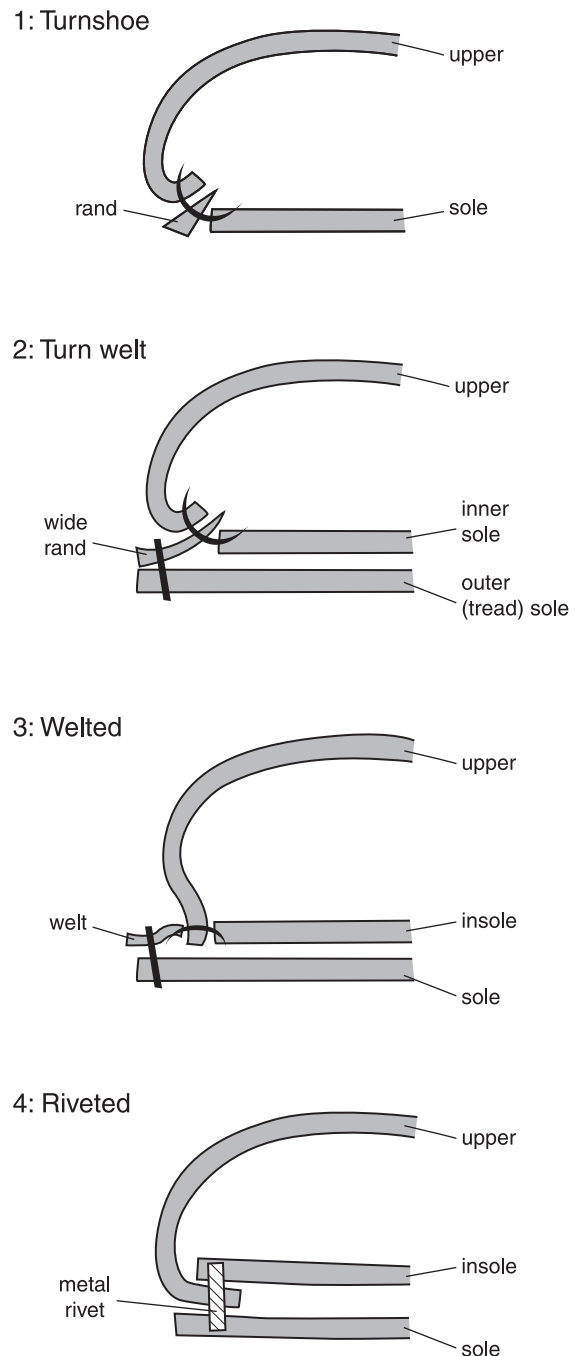
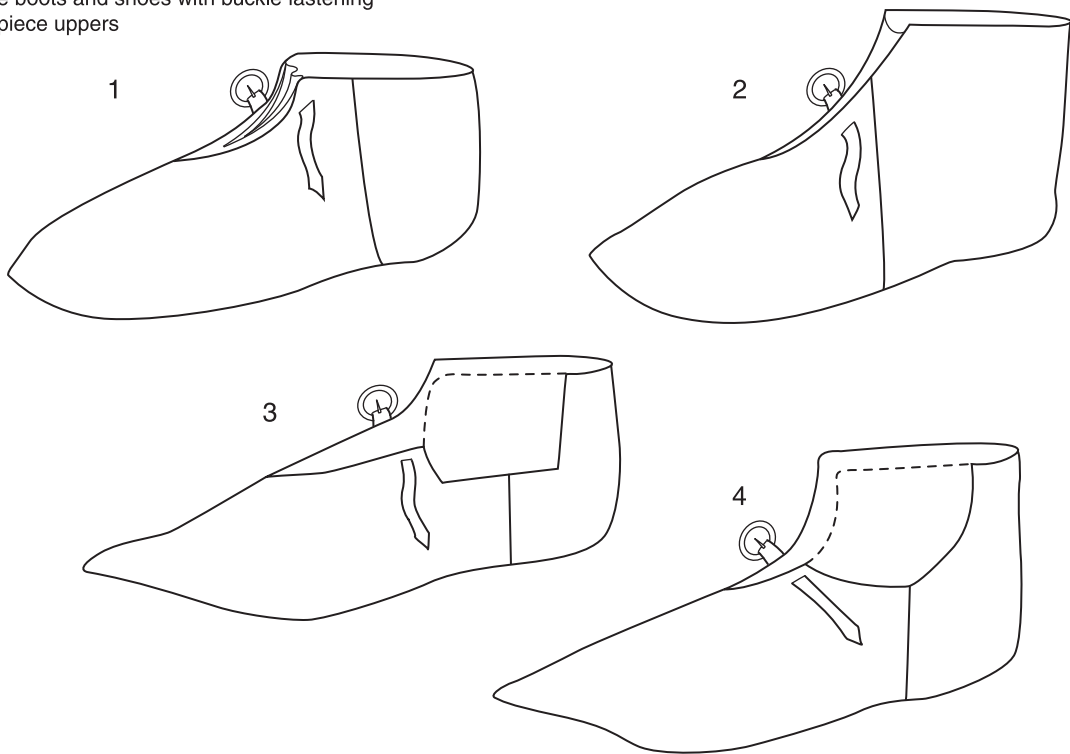
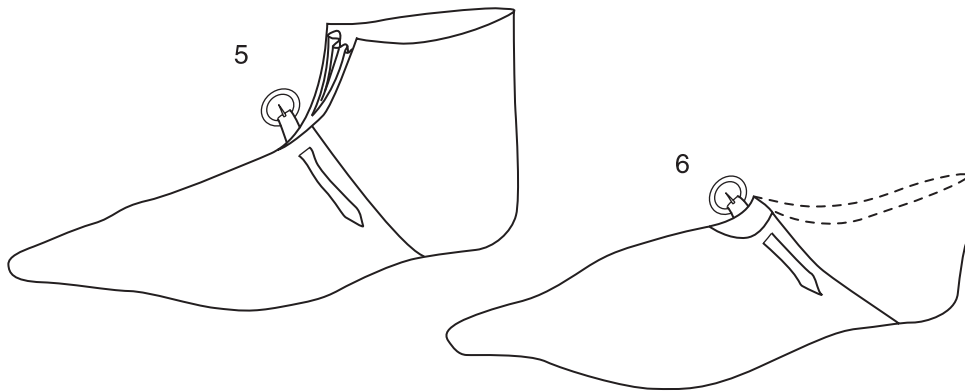


Fig. 5.14 Leather: Shoe construction methods

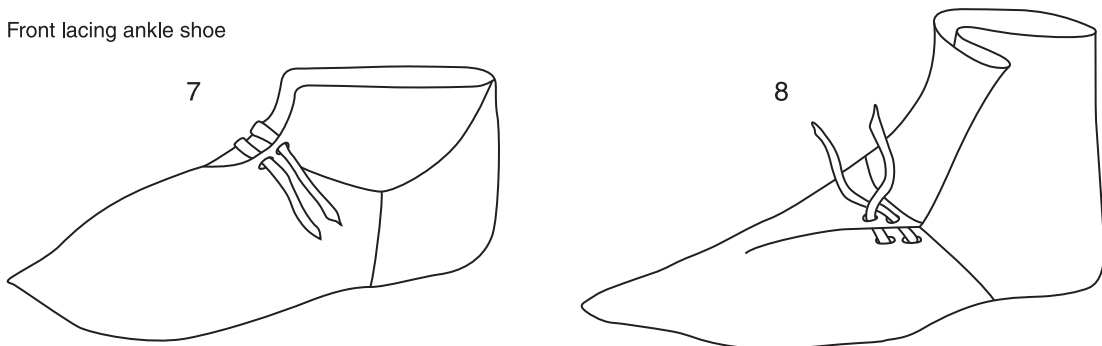
Ankle boots and shoes with buckle fastening  
one piece uppers



Ankle boots and shoes with buckle fastening  
separate vamp and quarters



Front lacing ankle shoe

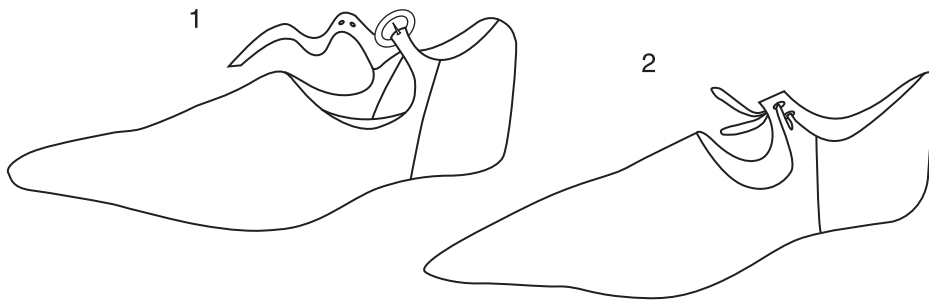


Ankle boot with folded and tied fastening

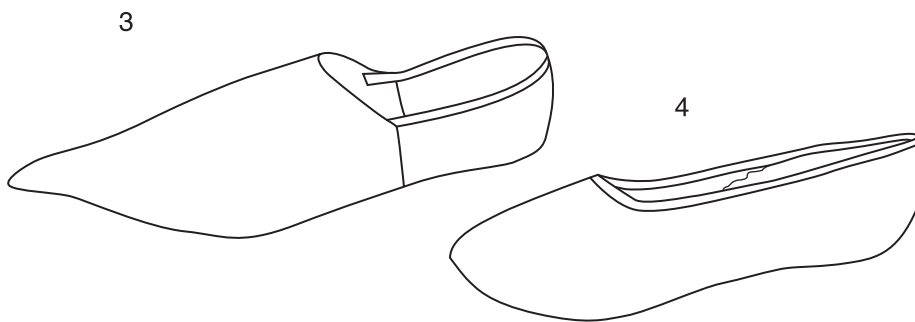
Fig. 5.15 Leather: Later medieval shoe types



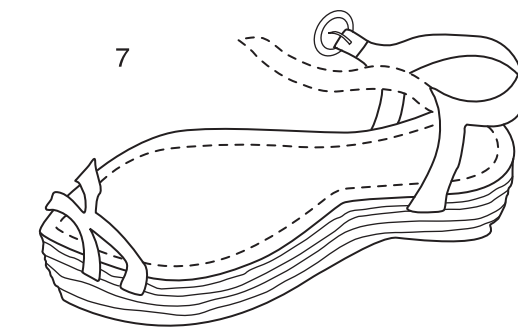
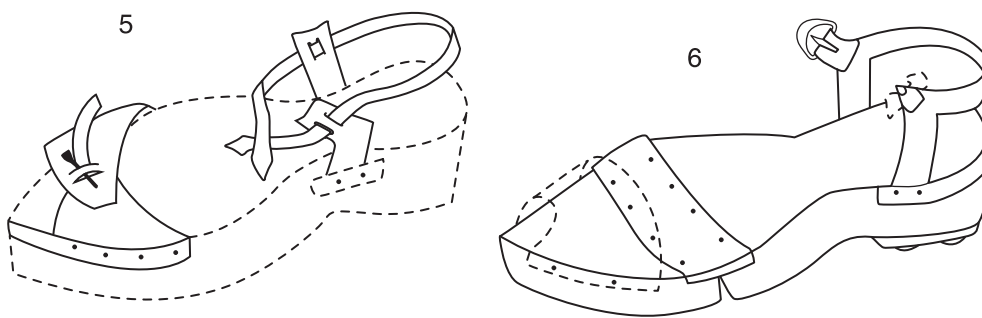
shoes fastening with buckle and strap across the instep



Slip on shoes



Pattens



Sandal

Fig. 5.16 Leather: Later medieval shoe types continued

of riveted construction using a single row of small copper alloy nails, likely to be of brass, were found during the excavations (Fig. 5.14 No. 4).

*Later medieval footwear* (Figs 5.15-5.16)

The later medieval footwear was of turnshoe construction, with the exception of a single shoe (Fig. 5.21 No. 11) of turn-welted construction. The shoe soles had pointed toes and narrow waists; those in small children's sizes had oval toes. Some of the shoes had fashionable extended toes curving slightly outwards, the longest measuring 45 mm in length. Four examples had their toes stuffed with moss. No examples of the extremes of high fashion as exemplified by the exaggerated long 'poulaine' toes were found, however, suggesting that the footwear was for the most part practical working wear. Six shoe soles with extended pointed toes had not been repaired before being discarded, which may suggest that a small proportion of the shoes came from a more well-to-do sector of the community. At least 18 buckled ankle boots were found with uppers made from a single piece of leather joined with a single seam (style as in Fig. 5.15 Nos 1-4). They fastened at the instep with a strap and a small circular iron buckle, and some were finished with a topband. The majority were made of bovine leather, but of the 14 that could be identified, 2 examples of sheep/goatskin were noted, and three had a heel stiffener or a tongue made of sheep/goat skin or calfskin. The ankle boots were found in children's and adult sizes (see catalogue). Most were found in 15th-century and later 15th- to earlier 16th-century deposits.

A number of shoes with the same fastening made with a different cutting pattern with separate vamp and quarters were found in similarly dated contexts (style as in Fig. 5.15 Nos 5 and 6). A front-lacing ankle shoe with a one piece upper of cattle hide (style as Fig. 5.15 No. 7) represents a common shoe style found throughout the country in later 14th- and 15th-century contexts. An uncommon 15th-century style of ankle boot with a folded and tied fastening (style as Fig. 5.15 No. 8), of bovine leather with a moss-stuffed toe, had hardly been worn prior to discard.

Two calfskin shoes found in later 15th-century deposits (style as Fig. 5.16 Nos 1 and 2) are of a similar general style to the fashionable buckle and strap fastening shoes described above. They have vamps with long pointed toes and one-piece quarters around the heel that peak at centre back and dip to lie below the ankle. Both are of a size worn by men. High throated slip-on shoes (style as Fig. 5.16 Nos 3 and 4) were found in later 15th-century deposits; the low slip-on shoe (Fig. 5.21 No. 10) has an oval toe with an upper of calfskin, and is probably an indoor shoe or slipper. The remains of at least two wooden pattens were found at site 12 (style as Fig. 5.16 Nos 5 and 6). Two sandals (Fig. 5.16 No. 7) were also recovered. These had multi-layered soles; the small, divided toe-strap suggests an early 15th-century date. It has been suggested that sandals were worn by monks and nuns but there is no particular evidence in Britain that this type of footwear can be associated with monastic contexts; sandals have occurred in non-monastic contexts in London (Geoff Egan pers. comm.), and conversely none have been recognised amongst

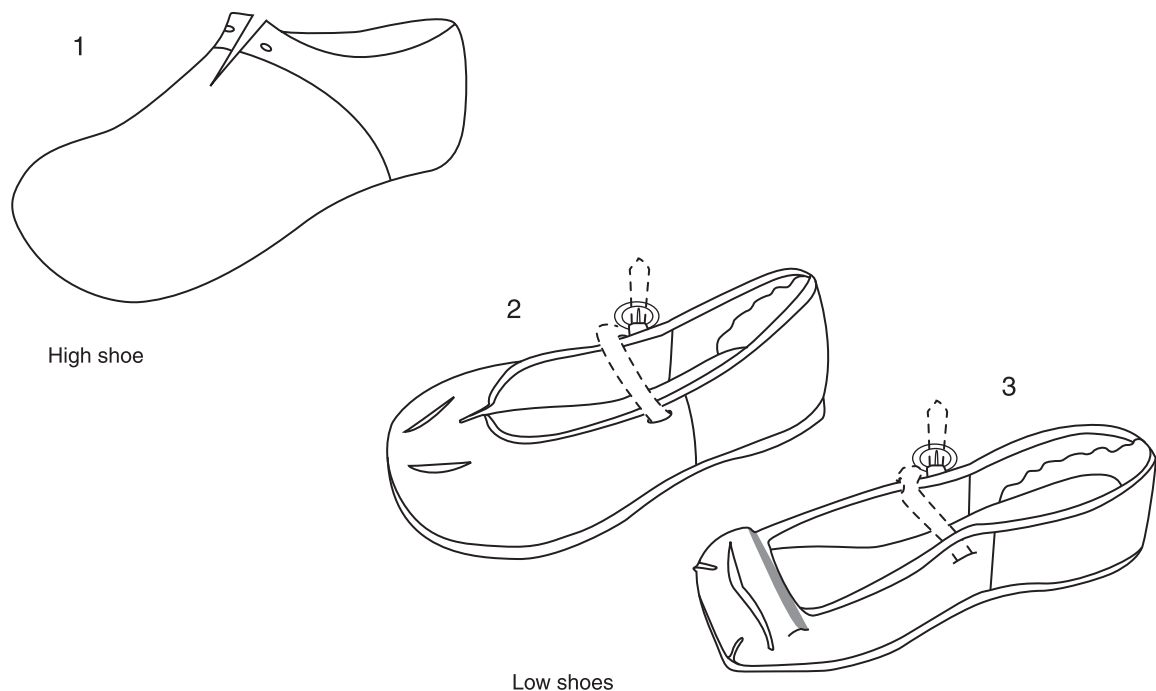


Fig. 5.17 Leather: 16th-century shoe types

shoe assemblages from Shrewsbury Abbey (Mould 2002) and the Austin Friars, Leicester (Allin 1981b).

*16th-century shoe styles (Fig. 5.17)*

A distinct group of shoes with wide soles and broad, round or occasionally square toes date from the very end of the 15th century and the earlier 16th century. High-throated shoes (style as Fig. 5.17 No. 1) were practical everyday working footwear. There is a very small hole for a tie lace in each of the quarters, though the holes may be secondary in what was originally a slip-on style. The low-cut shoes (style as Fig. 5.17 Nos 2 and 3) were dress shoes or summer

wear. The better-preserved examples fastened with a strap and buckle across the instep. A square-toed shoe (Fig. 5.23 No. 17) of sheepskin was highly fashionable, with a short vamp that barely covered the toes and very low sides. The square throat has a line of decoration piping. A single shoe of this kind was found on the *Mary Rose*.

*Later post-medieval styles, 18th- and 19th-century footwear (Fig. 5.18)*

The later footwear was chiefly welted with two shoes being of riveted construction. The styles, heavy wear and extent of repair on the later shoes

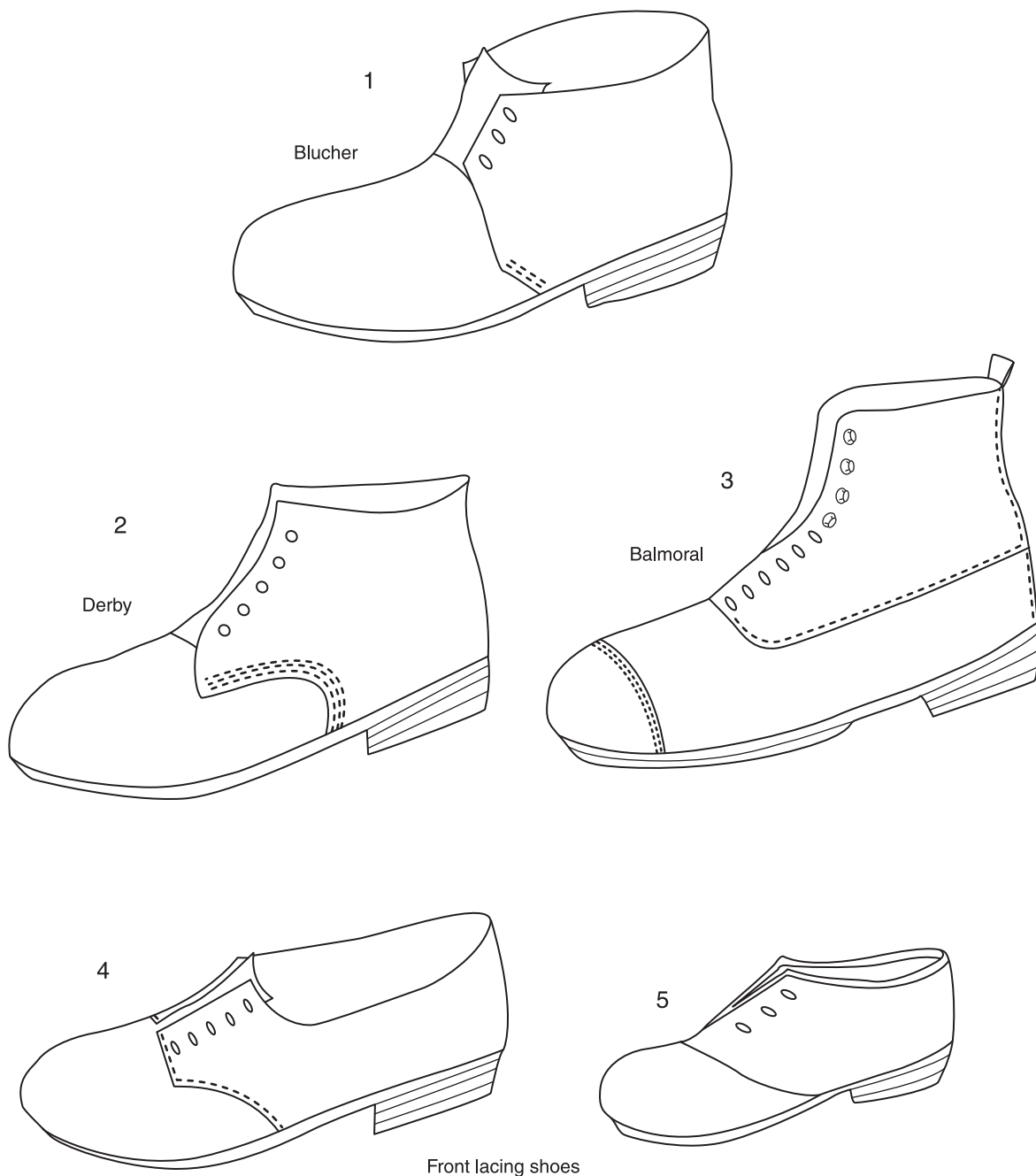


Fig. 5.18 Leather: 18th- and 19th-century footwear types

show them to be practical working footwear. The uppers were made of thick leather, cattle hide where identifiable, often grain side outward (suede). The majority had hobnailed sole repairs and two had a boot iron nailed to the low stacked heel. The shoes were principally for men, but a shoe for an adolescent or a woman and another for a small child were also present. The recognised shoe styles are shown in Figure 5.18.

### *Straps*

A large number of straps were recovered, principally from the Yield Hall excavations in late 15th- and early 16th-century dumping within the channels (1206b pp5, 1207a pp6). At least 55 straps and strap fragments were found along with nine reinforcing pieces that were used to strengthen the area of strap where it was attached to a buckle. All were of cattle hide. Table 9.17 (CD-ROM) provides details of the straps found. All the straps were flat. The majority (47) were plain (eg Fig. 5.23 No. 18); six had a line of grain/flesh stitching sewn with thread (not preserved) running along each edge (eg Fig. 5.23 No. 19).

Although the straps varied in width (11–45 mm), over half measured 13–25 mm ( $\frac{1}{2}$ –1 in) and 82% measured 13–32 mm ( $\frac{1}{2}$ – $1\frac{1}{4}$  in). It may be that the straps were being cut to widths in standard imperial measurements; indeed, the two widest straps found conformed exactly to imperial measurements of  $1\frac{1}{2}$  in and  $1\frac{3}{4}$  in. It is difficult to be certain of this, as the spread of measurements, taken following conservation, no doubt reflects a certain amount of shrinkage during burial and treatment. Nearly half of the straps had one of their two terminals preserved. Ten pointed and four rounded terminals were found. Other straps had folded or looped ends present that had wrapped around the buckle frame or pin bar and were sewn with leather thong or occasionally with thread. Two straps had iron buckles still in place. Several straps had a series of buckle pin holes present; again their spacing appears to conform to imperial measurements from  $\frac{3}{4}$  in–2 in, in increments of  $\frac{1}{4}$  in; 1 in (25 mm) and  $1\frac{1}{4}$  in being the most common. The highest number of buckle pin-holes found was 17, spaced 20 mm ( $\frac{3}{4}$  in) apart on a strap (SF3103) from the clay foundation bed (10036) for the Minster Mill frame dated to c AD 1680. One strap had fragmentary remains of an iron strap end preserved, while two straps had rivet/shank holes from the attachment of decorative metal mounts; these mounts had been removed before the straps were discarded. Six straps had creased edges, that is an impressed line made with a blunt-ended tool called a crease iron running parallel to each edge (eg Fig. 5.23 No. 18). The creased line helped to prevent the edge from stretching and added a decorative finish. A single strap had a scored line along each edge. Two pieces of post-medieval harness strap (SF3119, 3120), found in a dump of material seen in TP333 located south of the river Kennet, were distinct from the rest

of the straps recovered. One (SF 3120) had three parallel rows of oblique grain/flesh stitching each within a stitching channel and had originally been lined or of double thickness. The other (SF3119) had a line of faint, rouletted dots running either side of the creased line along each edge to imitate stitching.

### *Strap strengtheners*

Eight strap terminal strengtheners were found. These were placed at the looped terminal of the strap to reinforce the area where the metal buckle pin passes through a hole in the strap to articulate with the buckle loop. The strengtheners take the form of a rectangular piece of cowhide, often with cropped corners, with a large central hole (eg Fig. 5.23 No. 22) or slit (Fig. 5.23 No. 21) to take the buckle pin. They were folded and inserted between the folded strap terminal and stitched in place with leather thong between the fold of the main strap. They varied in width between 28 and 46 mm apparently coming from straps 1 in,  $1\frac{1}{4}$  in and  $1\frac{1}{2}$  in wide. While the majority had clearly been used, a single example (Fig. 5.23 No. 20), from a 1450–1500 pit fill (8902), had no stitching, was unfolded and, therefore, unused. One terminal strengthener (Fig. 5.23 No. 22) had been reinforced with a second piece of leather stitched to it. Another reinforcing piece to strengthen a strap at least 2 in wide was found separately (context 8895 pit/ditch fill 1450–1500 Project Phase 5). The majority of the strap strengtheners were recovered from late 15th- and early 16th-century dumping at the Yield Hall excavations (1207a) with a single example (SF3108) being found downstream of St Giles Mill adjacent to London Road (TP 315) in a dump (12523) dating to 1350–1450.

The strap strengtheners and the use of stitching with leather thong to attach the strengtheners and hold the buckle frame or ring in place suggests the straps were to be put under some strain and intended for heavy use such as harness rather than as dress accessories. Of the 53 straps, 30 had a cut end or ends, probably because reusable leather had been removed before disposal, and the majority of metal fittings had been removed. This and the recovery of an unused strap terminal strengthener (Fig. 5.23 No. 20) suggest that the straps and strengtheners are discarded waste from the refurbishing and refitting of horse harness.

### *Other straps*

#### *Fastening straps*

A short, tapering fastening-strap with two buckle pin holes, probably from a bag, and a possible second example, were found in the fill (9003) of a pit (8990) dated 1450–1500.

#### *Handles*

A thick handle of folded cattle hide (SF3061) that had been nailed in place at each end was found in late 15th- to early 16th-century dumping (8510) in the western channel (8634).

A long, narrow strap of calfskin (SF3043) with a long central slit close to the straight cut terminal, found in a dump of material (8505) of 16th-century date, might be a broken handle. Such a simple strip handle can be found on a deerskin drawstring pouch of late 14th-century date from London (Egan and Pritchard 1991, 344-7 no. 1695 and fig. 228). The drawstring passes through the slotted end and the opposite end is stitched to the pouch.

#### *Other leather objects*

##### *Knife sheath*

A highly fragmentary and heavily worn knife sheath (SF3064), internally lined and with a central back seam, was found amongst a large dump of leather (8510) thought to have been deposited between 1500 and 1530 in the western channel (8634) as part of land reclamation.

##### *Fringed border*

A fringed border (Fig. 5.23 No. 23) of calfskin was found in the primary fill (8399) of a ditch or pit (8407) seen in TP 146 to the south-east of site 101. It may have been rolled to form a tassel; however, as it is folded at present, it may possibly be a heavily slashed mouth of a sword scabbard. It is comparable with the mouth of a sword scabbard found in a 12th-century context at Coppergate, York (cf. Cameron in Mould, Carlisle and Cameron 2003, no. 15601, 3366 and fig. 1690), that also had four vertical slashes just below the mouth on the front face. A fringe of goatskin closely dated to 1270-1300 was found at a domestic site at Svenborg, Denmark (Groenman-van Waateringe 1988, fig. 11.5 no. 6) but lacks the plain border and stitching seen on the Reading example.

##### *Purses and cases*

A finely sewn rectangular panel of calfskin (Fig. 5.23 No. 24), possibly the mouth torn from an implement case of some sort, was found in medieval silting (7324 phase 10101b) between the Kennet and the Back Brook (overlying 7830) dating to the later 12th century. A piece of sheep/goatskin (SF3088) with a very finely sewn lapped seam cut and torn from a larger panel was found in the fill (9003) of a pit (8990) at the Yield Hall dated to the second half of the 15th century (phase 1206b). The quality of the workmanship suggests it came from a luxury item, possibly a fine purse or case.

A fragment (SF3124), possibly of sheep/goatskin, cut from the worn front panel of a belt purse was found unstratified at the Yield Hall. A fragment of cattle hide panel (SF3072) that may come from a second example was found in a 15th- to early 16th-century dump (8510, 1207a) of material in the western channel (8634) at the same site. These flap-closing purses, often incorporating separate drawstring pouches to hold coins, were worn hung on a belt around the waist. Parts of purses of this type have been found in several leather assemblages in Britain (for example London, Hull,

Shrewsbury Abbey, York) dating to the late 14th and 15th century and they are depicted in contemporary illustrations. The construction of belt purses is now better understood following the recovery of complete examples from the Netherlands and the reconstruction of others found in late 15th-century and 16th-century contexts at Criblet in Fribourg, Switzerland by Marquita Volken (Volken, Volken and Bourgarel 2001, 46-7, fig. 13-4).

##### *Possible garment pieces*

A folded panel (SF3081) of bovine leather with remains of a decorative, scalloped edge and a seam of paired grain/flesh stitching was found in fill (8885) of a N-S channel (8976) dated to the second half of the 15th century. The fold, seam and decorative edge suggest it may be a cuff, from a garment or a thick glove.

Two decorative semi-circular panels (Fig. 5.23 No. 25) of bovine leather lined with sheep/goatskin with scalloped borders and decorative stitching and tooling may be cap sleeves from a jerkin. The panels have grain/flesh stitching along the curved edge by which they may have been attached to the armholes of the jerkin. They were found in a dump of material (8510) in the western channel (8634) with shoes of late 15th and early 16th-century styles. Few leather garments or parts of garments of this date have been recognised previously. Perhaps the best collection comes from the wreck of the *Mary Rose*, which sank in 1545. All the styles of leather jerkin recovered from the *Mary Rose* have 'integral' cap sleeves that are simple extensions of the upper arm holes lined on the inside, not separate pieces sewn around the arm holes. Separate cap sleeves appear to have become popular later in the 16th century (Forster 2005, 40). One of the jenkins (MR81A1650) did have scalloped edges on the skirt flaps. The jenkins from the *Mary Rose* were made in a variety of designs, and whilst nearly half were of calfskin, sheepskin, goatskin and cattle hide were also used, sometimes on the same garment. Some of the individual pattern pieces were made up from a number of varied pieces apparently in order to use whatever leather was available at the time. Once separated from the other components individual pieces of these garments would be very difficult to recognise. It may be that some of the larger stitched leather items found at Reading and discussed below may come from garments.

##### *Sheet leather*

Amongst the dumped leather recovered from the Yield Hall excavations were discarded seams and stitched fragments cut and torn from larger items when reusable leather was being salvaged. They varied from lengths of cut-down seam to the remains of large panels. Table 9.18 (CD-ROM) provides details of this sheet leather. It is not now possible to know from what items these fragmentary remains came but a number of different leather

goods including saddlery, upholstery and clothing may be represented. Those with particular features including nailing, curved seams and tooling are discussed under the broad heading of possible saddle fragments; other pieces are considered under discarded seams below.

#### Possible saddle fragments

A number of sheet leather items from 15th- and early 16th-century leather dumping in channels at the Yield Hall may come from saddlery or items of nailed upholstery. What little is known about medieval saddles comes from pictorial evidence and the few surviving examples in museum collections such as the wooden tree of Henry V's saddle in Westminster Abbey and a late 15th-century armoured saddle in the Wallace Collection (Waterer 1981, figs 109F and 110 respectively). The nature and variety of everyday riding saddles that might be discarded here is uncertain. One may imagine that the saddle comprised a wooden frame ('tree'), with a stuffed seat of leather with upstanding components front (a pommel or bow) and back (candle) to support the rider, perhaps mounted on to a shabrack (padded horsecloth) or 'skirt'. The leather pieces described here have characteristics that suggest they were nailed to a wooden frame or come from large, shaped panels that might have covered the seat, the upstanding components or formed the shabrack/skirt. None of the pieces recovered have distinctive parallel lines of stitching that might indicate that the panel had been quilted, a feature often present on surviving saddle coverings.

The highly fragmentary remains of a cut down item of calfskin (SF3037), possibly from a saddle, were found in a late 15th-century dump (8395) of leather in the N/S channel (9269). A fragment of a pigskin panel (SF3038) with a curved grain/flesh seam was found in the same context and may come from the same item. The thirty fragments of calfskin (SF3037), the longest 245 mm in length, had remains of a curved seam with whip stitching; two bore the impression of dome-headed studs, two others had nail holes present. Two pieces appear to have been originally sewn together to form a 'cone-shape' (190 x 117 mm), perhaps the leather covering from a pommel or candle terminal.

A large dump (8510) of leather in the channel 8634 contained a length of lined hem of worn bovine leather with decorative tooling (Fig. 5.24 No. 26), stitched panels of sheep/goatskin (SF3070 and Fig. 5.24 No. 27) and two pieces of thick leather (SF3066) nailed together. Part of a large panel of sheep/goatskin (Fig. 5.24 No. 27) had rounded corners and a bound seam running around the edge. Two other fragments (SF3070) are likely to come from the same object, possibly from a saddle seat or shabrack.

Amongst another large group of later 15th-century leather dumped in the latest deposit (8502/8505) in the western channel (8634) were other items possibly from saddlery. One (Fig. 5.24

No. 28) was a slotted, rectangular calfskin panel lined with pigskin with bound edges and tooled decoration. The panel retains a distinctive curvature that appears original, and the two iron nails present suggest it may come from a saddle. A rectangular piece of thick pigskin (SF3041), now folded, and formerly nailed along one side was found in the same context (8502). A curved panel of calfskin (Fig. 5.25 No. 29) crossed by a line of nail holes was also found (8505). Another curved panel (Fig. 5.25 No. 30) of calfskin along with a rectangular lined and bound panel of sheep/goatskin (SF3079) were found in the deposit (8713) lying directly above (8502) and may well be associated. These curved panels are comparable with others found previously at Reading at the Abbey Wharf (Mould 1997, 132 and fig. 76, no. 78) in a context dated from the dissolution of the abbey in 1539 to the early 18th century.

#### Discarded seams

In addition to the possible saddle fragments discussed above, a number of other seamed fragments lacking other distinguishing features were found. They range from the remains of sizeable panels of sheep/goatskin (SF 3099, 3100) and calfskin (SF3042 and context 8696, 9110) to small lengths of cut down seam (SF 3069). While most came from unphased contexts, four small lengths of cut down seam (SF 3069) were found in early 16th-century dumping (8510) in channel 8634, with a calfskin panel (SF3042) in the layer above (8502). A large calfskin panel was found in an 18th-century pit fill (8696) in the Yield Hall. A seam cut from a panel of sheep/goatskin was also found in fill (10253) of a possible channel of the Minster Mill stream seen in TP 156.

#### *Leather associated with machinery*

Steam engines were installed in the northern end of the 1750s mill at some time after 1850. The 1895 Goad insurance map shows the mill being run by Hurley and Son as a steam-powered flourmill. Power from a steam engine was transferred to machinery by a belt drive and the junction of a leather driving-belt (Fig. 5.24 No. 31) was found in Test Pit 318 in a metal dump layer (context 12531) associated with the mill. The area where two overlapping ends of wide strap had been stuck together and then reinforced by brass rivets and washers had been cut from a driving-belt. The leather belt was usually bought as a coiled length and joined 'on site'; later adjustment was undertaken as it stretched during use (Salaman 1986, 203-4). This join (Fig. 5.24 No. 31) would appear to have been discarded following adjustment of the belt.

A fragment possibly broken from a large leather washer was recovered from the fill of a construction or levelling cut (context 12085 Test Pit 301) of Victorian date inside the remains of the engine room.

*The waste leather*

Waste leather was recovered from 45 contexts across the areas of investigation but principally concentrated in four dumps. Waste leather was dumped at St Giles Mill in the mid 14th century and at the Yield Hall in the 15th and earlier 16th centuries. Four types of waste leather were identified relating to both leather processing and the manufacture of leather goods.

## Leather processing waste

*Primary waste:* 210 pieces of primary waste were found, that is unusable parts of the skin or hide such as bellyskin, udders, areas around the head and legs and hide edges, trimmed off the hide during leather processing. Holes created when handling the hides and skins during processing are often present in the hide edges.

*Currying waste:* Currying was undertaken following tanning in order to make the tanned hides sufficiently thin and flexible to be made into a range of leather goods. As part of this process the currier pared down the thickness of the hides on the flesh side. A group of shavings resulting from this procedure with a dry weight of *c* 80g were found with 53 other pieces of primary waste in an alluvial clay (12554) seen in TP 333 on the south bank of the river Kennet. The context (12554) has not been phased but the seat area of a welted shoe sole found in the same deposit suggests a post-medieval date.

## Manufacturing waste

*Secondary waste:* 304 secondary waste off-cuts produced when cutting out pattern pieces were recovered. Certain shapes of off-cut are characteristic of the cutting out of particular pattern pieces such as the triangular intersectional cutting pieces produced when cutting out shoe soles. A small number of other distinctive shapes were found that suggest the production of other categories of leather goods.

*Tertiary waste:* Secondary waste that takes the form of thin trimmings produced when paring down pattern pieces to fit during their assembly into finished items are recognisable and have been termed tertiary waste (Mould, Carlisle and Cameron 2003). 494 of these trimmings were found during these excavations.

## The waste dumps

*Project Phase 4 mid 13th to mid 14th century:* The earliest significant dump of waste leather was recovered in TP 312 from a dump layer (12506) dated to the mid 14th century (3002b) associated with the reclamation of ground downstream of St Giles Mill adjacent to London Street. The waste leather comprised 119 pieces of primary waste, 57 of secondary waste and 129 of tertiary waste. The primary waste included over 100 fragments of unusable areas from a variety of hides, principally

bovine leathers, and 19 hide edges, two handling holes present. The secondary waste included an intersectional cutting piece characteristic of shoemaking debris as well as a small number of waste pieces of a distinctive shape along with particularly narrow slivers of waste trimmings. These more unusual waste pieces are indicative of the manufacture of another class of leather goods, possibly harness.

*Project Phase 5 c 1400-c 1500:* A large dump of organic material (8395, 8396, 9183) in a N/S channel (9269) at the Yield Hall included a dump of waste leather (8395). The 182 pieces of primary waste included three fragments of udder and 57 hide edges, 16 with handling holes present. 38 pieces of secondary waste and 60 trimmings were found; the secondary waste came from a variety of hides and skins including cattle hides, calfskins and sheep/goatskins. A further dump of waste leather comprising primary, secondary and tertiary waste along with a notable amount of small fragments of scrap was found in a later 15th-century context (8894). The waste included 62 hide edges, a piece of udder, 57 secondary waste off-cuts and 85 trimmings. A variety of hides were present in both the primary and secondary waste material, including bovine leathers, sheep/goatskin and pigskin. Goat hair from the processing of goatskin was also present in the dump (see Walton Rogers, above).

*Project Phase 6 c 1500-c 1600:* Waste leather was found with a large amount of cobbling waste dating to the 15th and earlier 16th century dumped (8510) into channel 8634. The primary waste included 63 hide edges, 14 with handling holes present, 4 pieces of udder and 3 pieces with the hair still remaining. The 98 pieces of secondary waste included 7 intersectional cutting pieces from shoemaking, one with two 'C' shaped marks made by a leather punch. 152 trimmings were also found. The secondary and tertiary waste was cut from a variety of bovine hides, sheep/goatskins and pigskin.

## Catalogue of illustrated leather

Full explanations of technical terminology can be found in the complete leather report in Chapter 9, on the CD ROM.

Figure 5.19

## Shoes

- 1 **Turnshoe ankle boot with buckle fastening**, right foot. Leather. Sole with oval toe, edge/flesh seam and rand. One-piece upper with straight, butted edge/flesh side seam. Straight cut top edge, concave throat with lapped seam with whip stitch to attach the lozenge-shaped tongue. Strap with tab end and buckle strap with circular iron buckle D 15mm. Heel stiffener at centre back. Leather: upper calfskin. Size child 4 (20), child 5 (22) with 10% allowance for

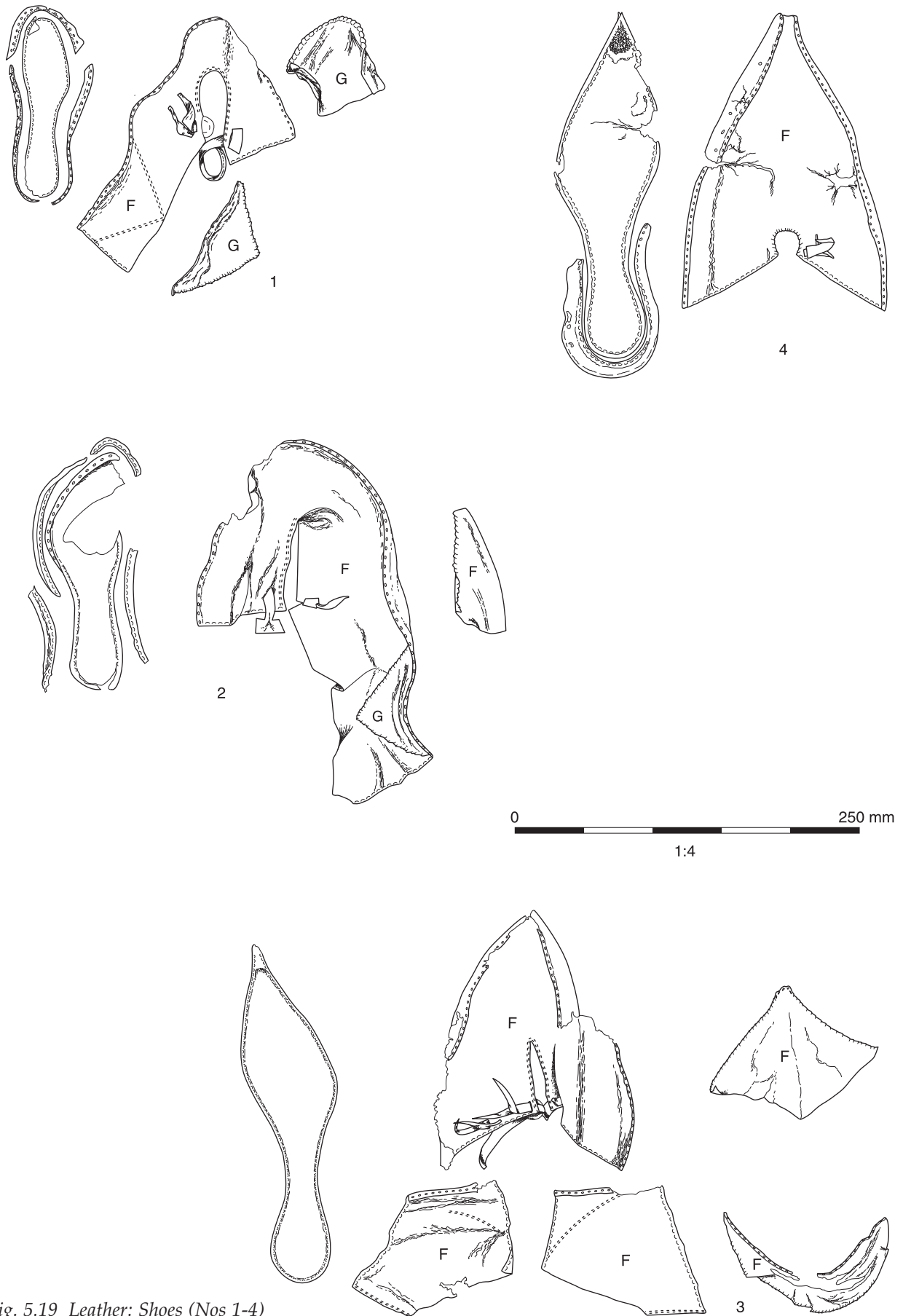


Fig. 5.19 Leather: Shoes (Nos 1-4)



- shrinkage. Sole L: 130 mm. Upper ht centre back: 54 mm. Ctx 8505. Unphased. SF3044.
- 2 **Turnshoe ankle boot with buckle fastening**, left foot. Leather. Sole and one-piece upper as SF3044 above. Whip stitch on right side of central opening slit to attach the flat tapering rectangular tongue. Heel stiffener at centre back. Leather: upper calfskin. Size child 9 (27), child 11 (29) with 10% allowance for shrinkage. Sole L: 173 mm. Upper ht at centre back 78 mm. Ctx 1322. TP17. Unphased. SF73
  - 3 **Turnshoe ankle boot with buckle fastening**, right foot. Leather. Sole with pointed toe with 35mm extension, narrow waist, edge/flesh seam. Vamp with butted edge/flesh side seams and central opening with stitching for lozenge-shaped bellows tongue. Strap with circular iron buckle and keeper loop on one side of central opening and fastening strap on the other. Quarters with central butted edge/flesh back seam and low triangular heel stiffener. Top edge cut to dip at centre back, appears secondary. Leather: upper sheep/goatskin. Size child 13 (31), adult 3 (35) with 10% allowance for shrinkage. Sole L: 249 mm. Quarters ht at centre back 98 mm. Ctx 8817. Ph.1207a. SF1715
  - 4 **Turnshoe with buckle fastening**, left foot. Leather. Sole with pointed toe with 35mm extension, medium waist, edge/flesh seam and stitching for repair to forepart and seat. Rand with stitching to attach clump repair. Vamp with toe stuffed with moss, butted edge/flesh side seams, small concave throat with small central slit. Strap with circular iron buckle D 15mm and keeper loop. Leather: upper bovine. Size adult 5 (38), 8 (42) with a 10% allowance for shrinkage. Sole L: 250 mm. Ctx 8505. Unphased. SF3045
- Figure 5.20*
- 5 **Turnshoe with buckle and strap fastening**, left foot. Leather. Sole with pointed toe with 25 mm toe extension, medium waist, edge/flesh seam. Rand and forepart clump repair. Vamp with pointed toe stuffed with moss and straight throat. Edge/flesh butted side seams, left extending onto a buckle strap with small circular iron buckle D 14mm, right has whipped seam to attach fastening strap. Leather: upper bovine. Size adult 2+ (34), 5 (38) with a 10% allowance for shrinkage. Sole L: 232+ mm. Ctx 1324. Ph.10103a. SF79
  - 6 **Turnshoe with split strap tie fastening**, left foot. Leather. 2 part sole seamed across the waist, long toe with 30mm toe extension, medium waist, edge/flesh seam. Rand and forepart clump repair. Vamp with concave throat with central slit, butted edge/flesh side seams extending into instep tie straps the right with pair of large fastening holes. One-piece quarters with peak at left front seam and plain top edge raised at centre back. Stitching to attach a strengthening cord on interior at top of quarters front seams and junction of vamp throat and fastening straps. Lasting margin of heel stiffener present. Leather: upper calfskin. Sole L: 255 mm. Ht centre back 63 mm. Size adult 5(38), 8(42) with a 10% allowance for shrinkage. Ctx 1324. Ph.10103a. SF80
  - 7 **Turnshoe ankle shoe or boot with front laced fastening**. Leather. Incomplete one-piece upper with stitching for large heel stiffener at centre back, butted edge/flesh side seam and plain cut top edge. Trapezoidal insert with butted edge/flesh and whip stitched seams. Divided lace passing through a pair of lace holes. Fragment of rand. Leather: upper bovine. Surviving ht centre back 115+ mm. Size unknown. Ctx 1319. Unphased corresponds to 10103a. SF67
  - 8 **Turnshoe ankle boot with folded side tie fastening**, left foot. Leather. Sole with pointed toe with 25mm extension, narrow waist, edge/flesh seam and rand. Vamp with toe stuffed with moss, butted edge/flesh seam across throat, left side seam and seam running from side seam to centre of vamp. Pair of fastening holes at junction of side seam and throat. Leather: upper bovine. Size adult 2(34), 4(37) with a 10% allowance for shrinkage. Sole L: 226 mm. Ctx 8510. Ph.1207a. SF3050
- Figure 5.21*
- 9 **Turnshoe high slip-on shoe**, left foot. Leather. Sole with pointed toe with 45mm extension, torn away, edge/flesh seam. Forepart clump repair. Vamp with straight throat and butted edge/flesh side seams with stitching to attach ends of topband on the interior. Leather: upper calfskin. Size adult. Ctx 8510. Ph.1204a. SF3049
  - 10 **Turnshoe low slip-on shoe**, right foot. Leather. Sole with oval toe, edge/flesh seam, stitching for repair to forepart and seat. One-piece upper with butted edge/flesh seam at centre back, top edge with whip stitched to attach the flat top band. Long, low heel stiffener. Impression of a wide rand. Leather: upper bovine. Size child 11(29), 13(31) with 10% allowance for shrinkage. Sole L: c.190 mm Ht centre back 40 mm. Ctx 101/5 Unphased. SF1
  - 11 **Turn-welted shoe**, upper cut away, right foot. Leather. Sole with pointed toe with 25mm extension, edge/flesh seam and welt with edge/flesh and grain/flesh seams. Forepart of matching sole, grain/flesh seam, cut across tread, and other sole fragments. Vamp with stuffed toe, cut. One-piece quarters and heel stiffener cut away above lasting margin. Leather: upper calfskin. Size adult 5(38), 8 (42) with 10% allowance for shrinkage. Sole L: 248 mm. Ctx 8502. Unphased. SF3039
  - 12 **Patten straps**, left foot. Leather. Plain, triangular foot straps for wooden patten, end of one passing through a semi-circular hole in the other and held in place by an iron pin. Nailing strip with an iron nail present on right strap (nailing strip with 3 nails fitting on to the left strap found in context 8942 Ph 1204a). Curved arm from back strap with paired slits in the terminal. Leather: cattle hide. Tapering fastening strap with horizontal slit at each end. Leather sheep/goatskin. Individual foot strap L: 140 mm, W: 45 mm. Ctx 8941. Ph.1206b. SF 3084

Under the Oracle

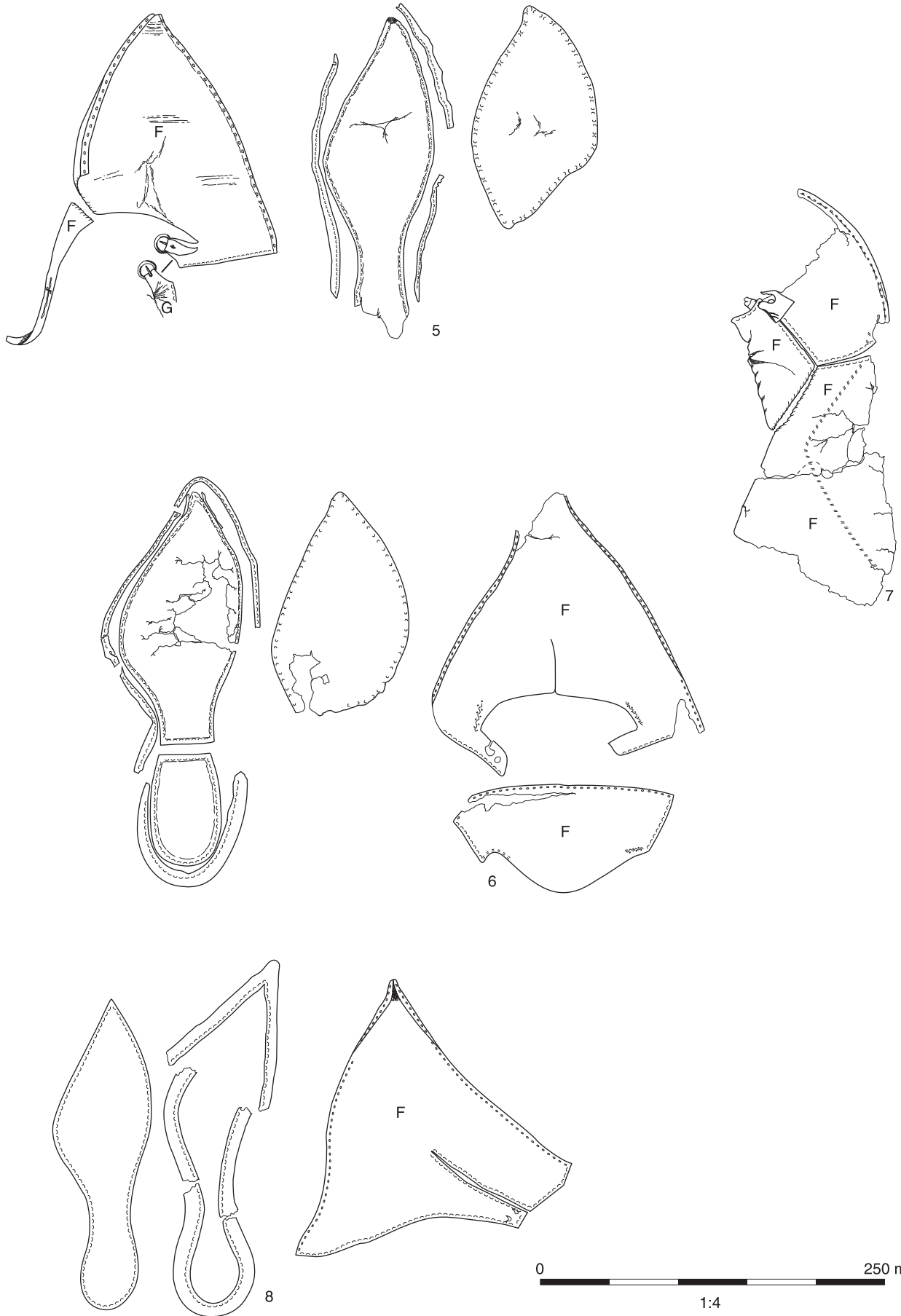


Fig. 5.20 Leather: Shoes (Nos 5-8)

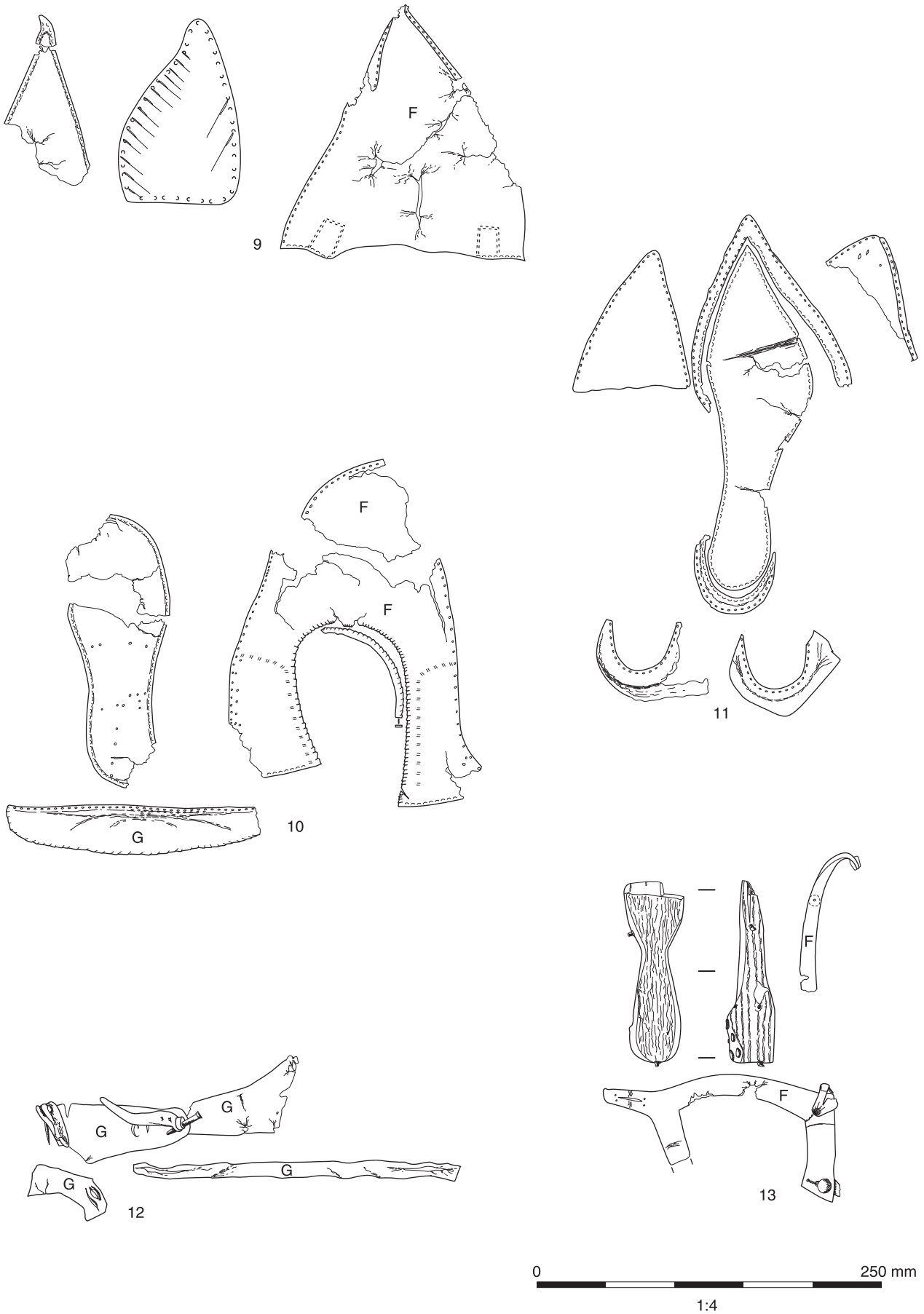


Fig. 5.21 Leather: Shoes and patters (Nos 9-13)

- 13 **Hinged patten**, right foot. Wood and leather. Wooden sole with narrow waist and long seat, rebated for a leather hinge across the lower tread, toe missing. Leather top piece nailed to seat. Leather back strap with small integral strap on right side for a buckle (now missing) and the stub of a divided strap on the left. Base of the back strap strengthened by an additional strip through which it was nailed, nailing strip from one side of the forepart also present. Leather: worn bovine. Sole L: 127+ mm, Ht at seat: 29 mm. Ctx 8505. Unphased. SF3048

Figure 5.22

- 14 **Sandal**, right foot. Leather. Sole with multiple layers, five present, all with pointed toe, narrow waist, wide round seat, and with grain/flesh seam. One layer is pieced. Back strap with narrow ankle strap and small annular iron buckle, butted edge/flesh seam for a separate fastening strap, now missing. Remains of divided toe strap, part of which passes through a pair of vertical slits at the toe. Leather: cattle hide. L: 210 mm. Child's size 13 (Adult 2/3 with a 10% allowance for shrinkage). Ctx 41. Test Pit 6/7. Unphased. SF3003
- 15 **Turn-welted high shoe**, left foot. Leather. Two fragments of outer sole with grain/flesh stitching within a stitching channel. Inner sole with broad, round toe tapering from tread to seat, edge/flesh seam, stitching from repair to forepart and seat. Welt and fragment of clump repair. Right quarter with lasting margin cut off, butted edge/flesh back and front seam. Plain top edge with fastening hole at junction with front seam. Stitching for heel stiffener. Fragment of left quarter also cut away and other upper fragments. Leather: upper bovine. Size adult 3(35), 6(39) with a 10% allowance for shrinkage. Sole L: 235mm. Ctx 8512. Unphased. SF3074
- 16 **Welted low shoe with strap and buckle fastening**, left foot. Leather. Sole and mid sole edging with grain/flesh stitching, insole with edge/flesh stitching. Sole and insole with broad forepart, toe torn away. Broad, round-toed vamp with curving throat with small central slit with fastening hole to either side, pair of parallel slashes running from throat to toe. Straight butted edge/flesh side seam with remains of buckle strap, vamp wing torn away on other side. Left quarters with butted edge/flesh back seam with stitching for heel stiffener, front seam missing. Top edge with whip stitching for top band. Leather: upper cattle hide. Size adult. Ht at centre back 58 mm. Ctx 8510. Ph.1207a. SF3055

Figure 5.23

- 17 **Welted low shoe with strap and buckle fastening**, left foot. Leather. Insole with a broad, square toe, edge/flesh seam and welt. Second insole possibly placed on top of the first as an insock or from a second shoe. Low cut vamp with square throat with line of decorative piping and internal toe puff, both slashed across the toe. Low vamp wing present on one side with short butted edge/flesh side seam with tab-ended strap. Line of stitching to attach

lining. Fragments of quarters, heel stiffener and linings. Leather: vamp sheepskin, lining calfskin. Size child 13(31), adult 3(35) with 10% allowance for shrinkage. Insole 180+ mm, ht vamp wing 21 mm. Ctx 1125. Ph.10103d. SF45

#### Straps

- 18 **Strap**. Leather. Plain strap with pointed terminal, other end broken, seven buckle pin holes spaced 20-25 mm apart. Crease line along each edge. L: 153 mm, W: 16mm Also rectangular piece cut from a strap across a large buckle pin hole and buckle pin slot. Leather cattle hide. L: 23 mm, W: 19 mm. Ctx.9293. Ph.1206b. SF3098
- 19 **Strap**. Leather. Stitched strap with line of grain/flesh stitch holes, with thread impression on grain side only, along each edge, ends torn. Two large buckle pin holes spaced 52mm apart. Leather cattle hide (5mm thick). L: 165mm, W: 25mm. Ctx.1324. Unphased equivalent Ph.10103a. SF81
- 20 **Strap terminal strengthener**, unused. Leather. Rectangular strap with central lozenge-shaped hole cut in the centre. Leather cattle hide. L: 104 mm, W: 46 mm. Ctx 8902. Ph.1206b. SF3083
- 21 **Strap terminal strengthener**. Leather. Rectangular strap with central horizontal slit, the strap was folded and stitched with leather thong. Leather cattle hide. L: 79 mm, W: 32mm. Ctx. 8510. Ph.1207a. SF3063
- 22 **Strap terminal strengthener**. Leather. Rectangular strap folded in half with a hole for buckle pin at the fold. Stitched to a smaller reinforcing piece with leather thong. Leather cattle hide. L: 50mm, W: 35mm. Ctx. 9110. Unphased. SF3096.
- 23 **Fringed border**. Leather. A plain border, c 12-13mm deep, with grain/flesh whipped stitching along the edge sewn with thong, and cut into a series of fine, vertical slits forming a fringe with torn edges below. Leather calfskin. L: max 39 mm, total W: c 80 mm, folded 46 mm. Ctx 8399. Unphased. SF3033.

#### Purses and cases

- 24 **Rectangular panel**. Leather. A lapped seam with two lines of grain/flesh stitching with thread impressions on the grain side only runs down each side. The upper edge is skived with a whip stitched seam, stitch length 2mm, this stitching continues and marks the former position of an appliqué piece that extended 25mm below the edge. A double, tooled line producing a shallow, vertical raised rib marks the central line of the panel. Leather: calfskin. L: 67+ mm, W: 94 mm, Th: 2 mm. Ctx 7324. Ph.10101b. SF3017

#### Possible garment pieces

- 25 **Semi-circular panels** with a scalloped edge. Leather. Two panels of heavily worn bovine leather with separate linings of sheep/goatskin, placed flesh to flesh. Each panel has a curved edge with grain/flesh stitching, the corresponding linings with whip stitching, and a straight edge with a multiple-lobed border. A line of oblique grain/flesh stitching with thread impression on the grain side runs parallel to

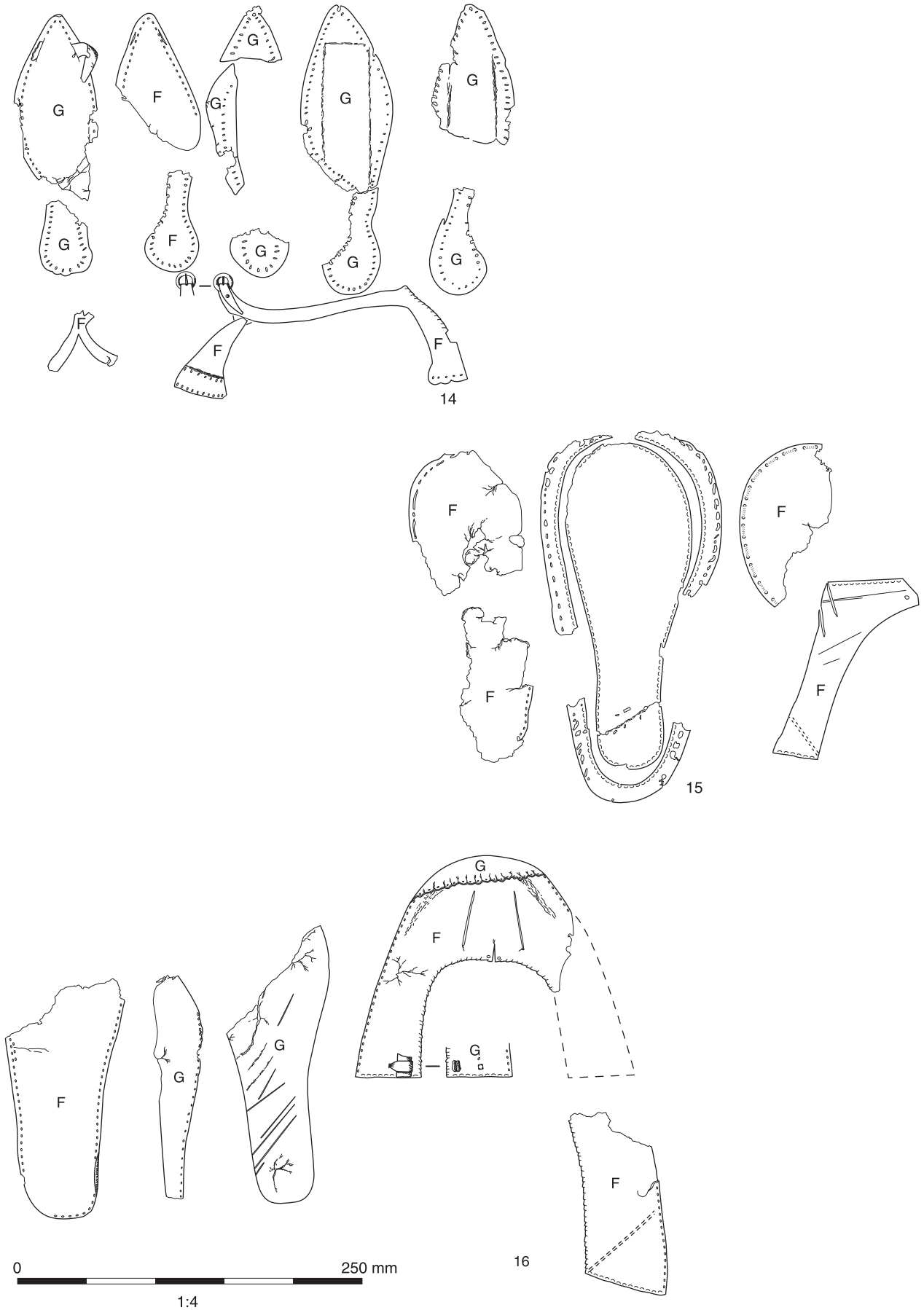


Fig. 5.22 Leather: Sandal and shoes (Nos 14-16)

Under the Oracle

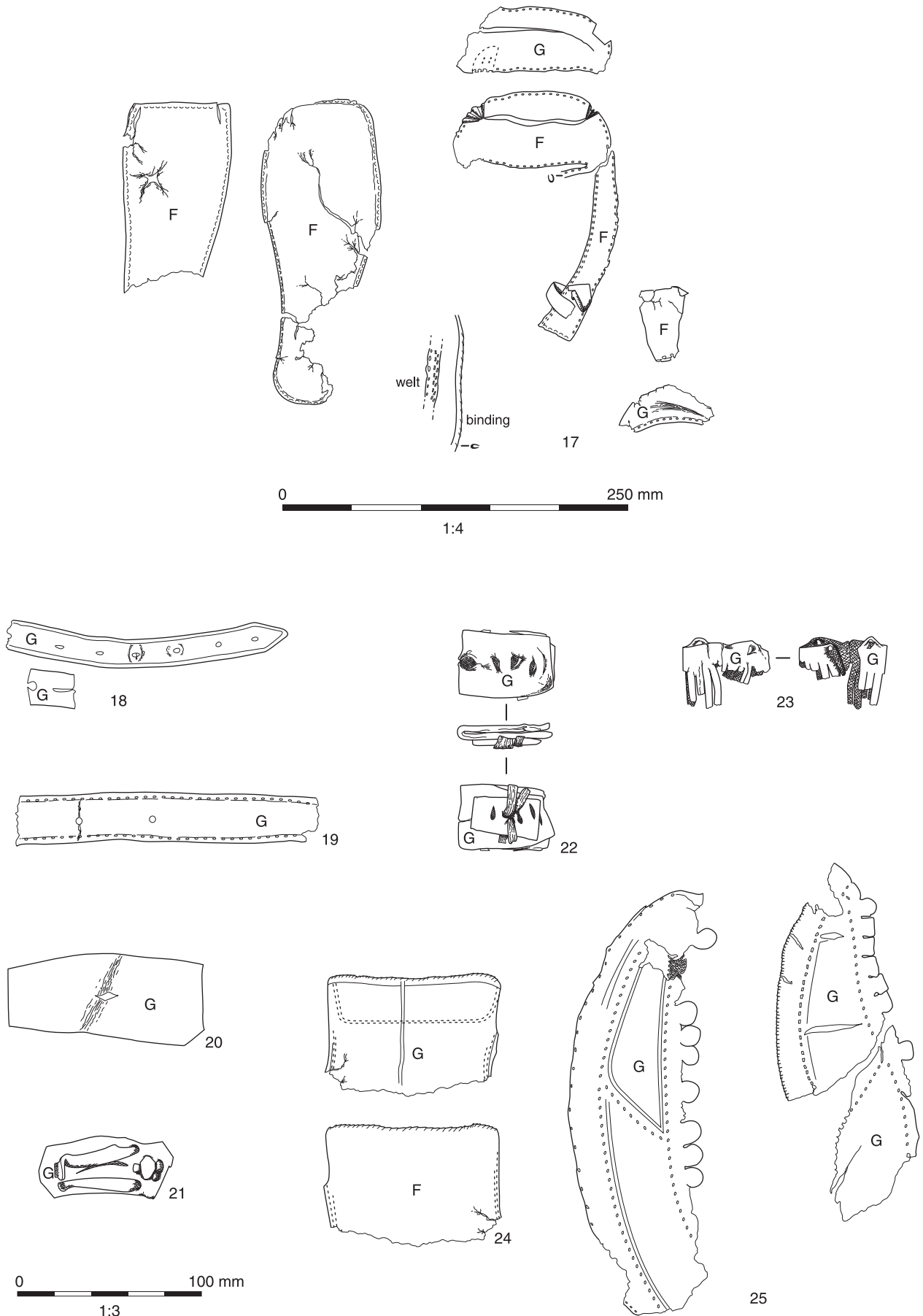


Fig. 5.23 Leather: Shoe, straps, border and panels (Nos 17-25)

Chapter 5

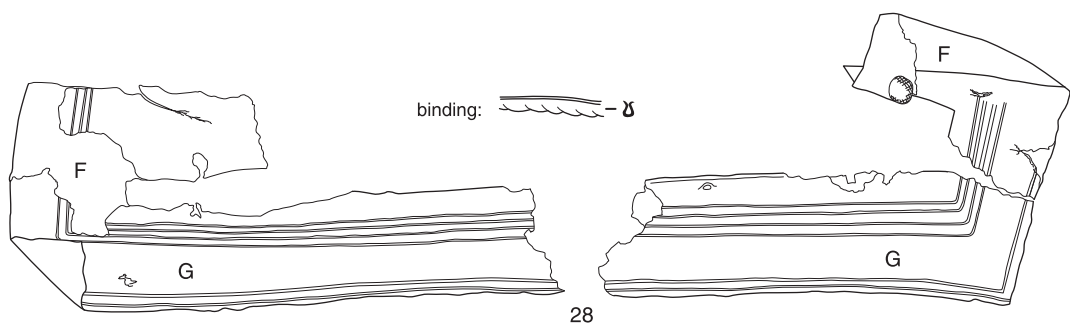
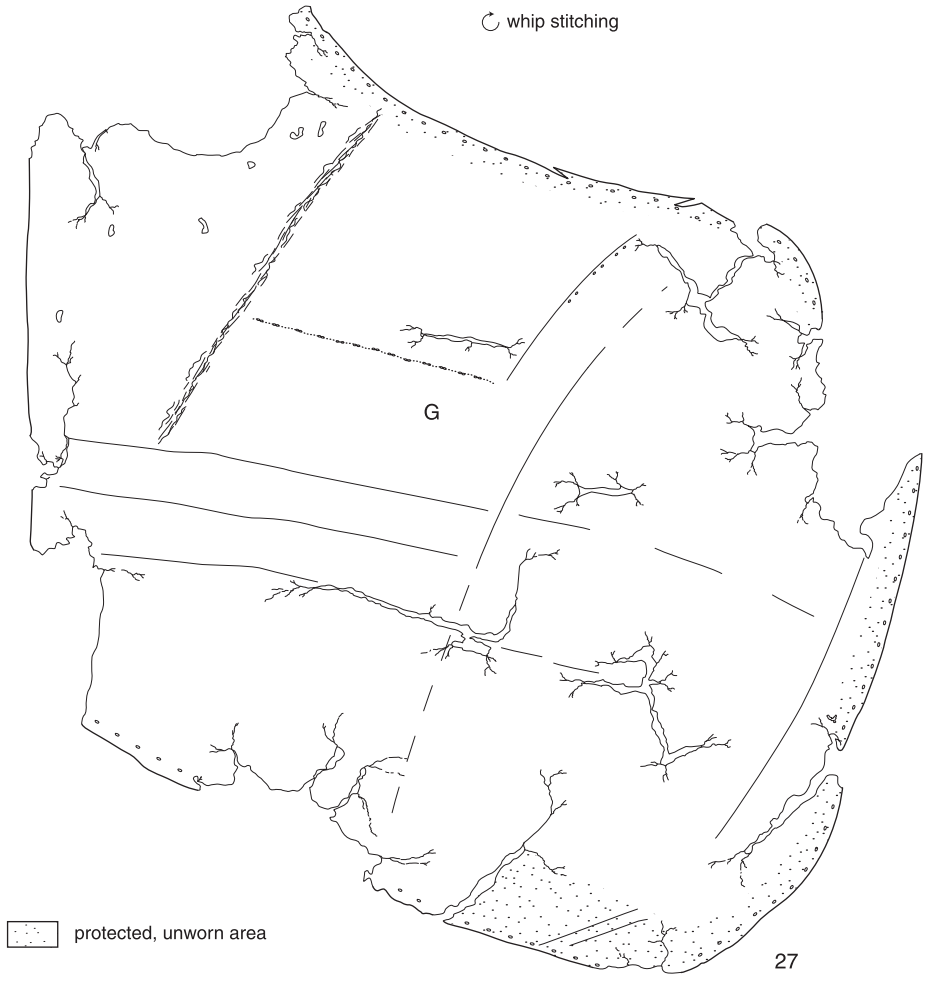
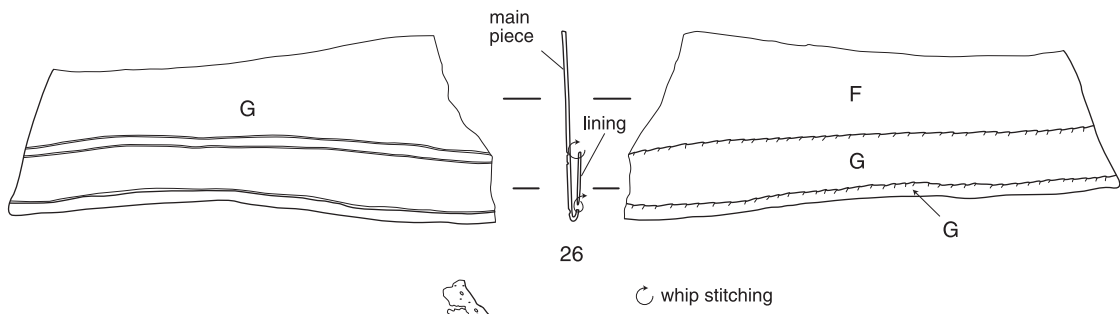


Fig. 5.24 Leather: Sheet leather (Nos 26-28)

the curved edge and the lobed border with an oblique line joining the two at the centre. The better preserved panel has a double tooled line that runs along the inner side of the stitching and may also have run along the outer edge on the left side. The grain surface of the leather is cracked and it is uncertain whether the tooling was incised or impressed. The linings each have a vertical cut present. Better preserved panel L: 245 mm, max W: 70 mm. Ctx 8510. Ph.1207a. SF3065

Figure 5.24

Sheet leather

26 **Lined hem**, cut down from larger item. Leather. Cut down hem, edge turned under and sewn with whip stitching to a separate lining 20mm wide that is sewn to the underside with whip stitching. The edge is decorated on the upper face (grain) with a tooled line with a fine double line 19mm above. Leather: worn bovine. L: 198 mm, W 77 mm. Ctx 8510. Ph.1207a. SF3068

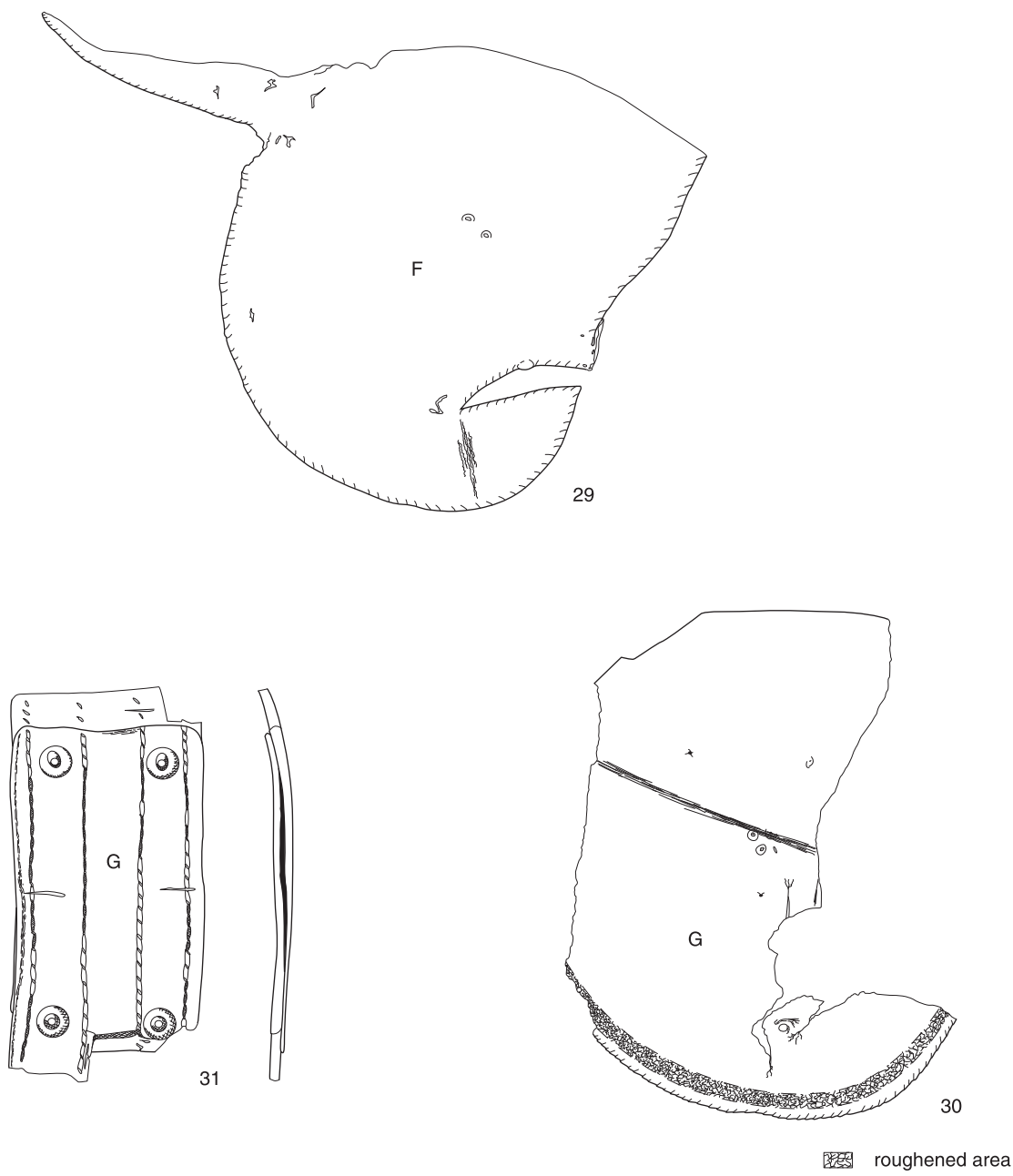


Fig. 5.25 Leather: Sheet leather and driving-belt junction (Nos 29-31)



- 27 **Rectangular panel** with rounded corners. Leather. Three sides of the panel have a grain/flesh seam originally protected by a binding the fourth side has been torn away. Paired stitching with thread impression visible on the grain side that is more polished and stained in that area indicates the former position of a rectangular piece underlying the panel. Three widely-spaced, tooled lines run down the centre at an oblique angle, they are followed by crease lines that suggest that the panel was folded along this axis but this may be a secondary feature. Another tooled line runs at right angles close to one edge. Leather sheep/goatskin. L: 370 mm, W 320 mm. Ctx 8510. Ph.1207a. SF3073
- 28 **Slotted panel**, lined and bound. Leather. Two lengths of rectangular calfskin panel with a central slot, torn but probably joining originally. The panel appears to have been symmetrical and has been cut across two areas in each case close to an iron nail. The panel is lined with pigskin, placed flesh to flesh, and secured along the edges with whip stitching. A folded calfskin binding 5-6 mm wide bound three of the four sides. Decorated with parallel, tooled lines. Leather: panel calfskin, lining pigskin. L: 220+ mm, max W 90 mm; L 165+ mm, max W 97 mm. Ctx 8502. Unphased. SF1606

Figure 5.25

- 29 **Curved panel**. Leather. Near circular panel with shallow semi-circular notch in one side. The majority including the notch has whip stitching along the edge the remainder is cut and torn. Panel extends into a second curved edge but the majority of this area has been torn away. A line of small holes from mounts or nails runs across the panel, two with the impression of circular domed heads present. Leather calfskin. L: 285 mm, W 204 mm. Ctx 8505. Unphased. SF3047
- 30 **Curved panel**. Leather. Panel with a curved edge with whip stitching, other edges cut and torn away. A group of three nail holes with impression of domed heads are present in the centre of the panel and possible holes from three others. Leather calfskin. L: 218 mm, W 165+ mm. Ctx 8713. Unphased. SF3078

#### *Leather associated with machinery*

- 31 **Driving-belt junction**. Leather. Two straps lying one on top of the other, each grain side upward with skived and cut ends, the upper strap is broken at the left end. Each strap has four parallel rows of oblique grain/flesh stitching, stitch length 5mm, the stitch holes were pricked out and the thread passes through alternate holes. The straps are secured by four rivets and washers of copper alloy (probably brass). Two small vertical cuts present in one strap, three in the other. Thread present. Leather likely to be cattle hide (oxhide). L: 165 mm, W: 80 mm, combined thickness 9 mm. Ctx 12531. Unphased. SF3111

### **The clay tobacco pipe industry in Reading** (Figs 5.26-5.31)

*by David A Higgins*

The Reading Oracle excavations produced an extensive assemblage of 3904 fragments of clay pipes dating from the early 17th century onwards. This is by far the largest assemblage of pipes ever recovered from Reading and it ranks amongst some of the largest groups from anywhere in the country. It is not clear precisely where in the town the clay pipe manufacturers operated and it may well not have been within the excavated areas, but the material still has the potential to be extremely informative about industry in the town. The full report on the clay pipes can be found in Chapter 9 on the CD-ROM. The present section provides an overview of the assemblage and the pipe-making industry in Reading, together with the bowl form typology for Reading that has been developed as a result of this study, and the full catalogue of illustrated pipes.

Although the social elite are likely to have been smoking in Reading from the late 16th century onwards it is only from around 1610 that tobacco became sufficiently affordable and readily available to allow smoking at all levels of society. It is clear, however, that the habit was rapidly adopted at Reading and that pipemakers soon set up in the town to meet the demand. As early as 1623 there were clearly pipemakers in the town, since the chartered company of tobacco pipe makers of Westminster tried to assert their rights over the Reading makers in this year (Oswald 1975, 9) and by the 1630s there were at least four pipemakers working in the town: Caleb Dearing, Ferdinando Hulyns, John Perry and Richard Wheeler (Oswald 1975, 160-161). Records of early pipemakers do not often survive and this is a large number compared with most other English towns of the period. These records suggest that Reading developed an early pipemaking industry and that it was of sufficient importance to attract the attention of the Westminster Company. It is also of interest to note that at least two of these early pipemakers had probably moved to Reading to set up in business. Ferdinando Hulyns is clearly not a local name while both the bowl form and style of mark used by John Perry suggest that he had learnt his trade somewhere in the West Country. This suggests that early 17th-century Reading was a dynamic centre, not only receptive to new ideas and fashions, such as smoking, but also a place that outsiders could move to and set up new businesses.

The significance of Reading as a pipe-making centre is demonstrated by the export of pipes from the town. A pipe of one 17th-century manufacturer, John Perry, was found in London at Queenhithe, one of the principal docks in the heart of the city. This almost certainly reflects 17th-century shipping from Reading that was trading right into the centre of London. During the 18th century, when the Thames was still one of the most important arterial

routes for the movement of goods in and out of London, Reading was ideally placed to take advantage of this trade. Reading continued to export pipes along the Thames into London including examples produced by John Greatham (Fig. 5.29 No.17) and the symbol marked pipes from Reading (Fig. 5.31 Nos 59-65).

For at least the next 200 years the town would almost certainly have been supplying the majority of the pipes consumed within a 10-15 mile radius. Studies from elsewhere have shown that pipes provide an excellent means of determining the market areas of towns (Walker and Wells 1979). Unfortunately, there are no good studies of pipes from the rest of the county with which to compare the Oracle finds and this is clearly a priority for future work. It is only once all the marked pipes from across a wide area have been systematically recorded that the true market areas and influences of Reading will become apparent.

Although Reading never became a major exporter of pipes or a regional trend-setter it is clear that the pipe making industry established itself in the town very early in the 17th century and that it continued to supply the local market until at least the later 19th century. The town sat at the crossroads of trade flowing along the Thames and out to the West Country. The local makers came into contact with pipes from these areas and absorbed elements of them into their own designs but did not establish their own distinctive identity. The impression is of a sound and well-established industry supplying the town and its hinterland, but not one that grew to supply a larger area or to set its own fashions. The majority of the pipes that they produced were very plain and ordinary but they were still able to produce a range of wares to cater for the top end of the market as well. During the 19th century improved transport systems brought increasing competition from more distant markets, which, together with changes in smoking fashions towards other forms of pipe or cigarettes, eventually led to the demise of the industry. In national terms, Reading supported a steady community of pipemakers for some three centuries who made an interesting range of products to meet the local market needs. These excavations have not only started to reveal their products but also to set them into a broader context.

### *Bowl form typology*

One of the most important advances made as a result of this study has been the establishment of a bowl form typology for the town. The excavated material reliably charts the evolution of bowl forms for the two centuries from c 1610. Pipe styles changed rapidly during this period and many of the forms were produced for no longer than 30 or 40 years. Since pipes had a very short life expectancy, these bowl forms can be used to accurately date the archaeological deposits in which they occur.

The pipe bowls have been divided into two broad groups, spur forms and heel forms, prefixed 'S' and 'H' respectively, and a separate typological sequence has been provided for each. The typology has been established on the basis of the bowl profile, and it is the size and profile of the bowl that should be matched with the following forms; marks, decoration or finishing occurring on the examples selected are not significant.

### *The Spur Forms (S1-S18)*

A total of 18 different spur types were represented amongst the excavated material. The earliest forms (S1-S5) are very similar to the styles produced in London and would be indistinguishable from them. After the middle of the 17th century there is a slight tendency for the Reading pipes to be rather more forward leaning than their London counterparts (S6-8) but the majority of the pipes remain very similar. The real break with London fashions is heralded from the 1660s onwards by the appearance of a few forms more typical of central southern England (S9-S10). These pipes tend to have more curved forms, their rims are more nearly parallel with the stem and they often have burnished (polished) surfaces. Some of these bowls are certainly imports to the town, but others may well have been produced in Reading, copying popular styles from further west.

During the late 17th and early 18th centuries the spur forms become rather taller and more slender but with well-developed curves to their profiles (S11-S17). These curved forms are typical of central southern England and some examples may actually be from there, for example, S14. The majority, however, were almost certainly produced in the town, where they become relatively common during this period. The end-date for these forms has generally been put at around 1730 but it is worth noting that well dated groups from this period are scarce and the terminal date for these forms is not very secure. Late 18th-century groups were not well represented from the excavations but there is no evidence for spur pipes from this period and they may well have gone out of fashion for a while. Spur forms reappear during the 19th century (S18), when they form a small element of the pipes in use.

### *The Heel Forms (H1-H35)*

Heel forms were always more popular than spur forms in Reading and represent the majority of the pipes found at all periods. As with the spur forms, the heel forms dating from before around 1680 almost all mirror London styles (H1-H17). The only exception is H15, which is of a style used in central southern England and the West Country. Although this piece could be an import, there is a similar example stamped with the mark of John Perry, who is known to have worked in Reading. The Perry example clearly shows that this style was also produced in the town, even if only in small numbers. The profiles of the early bowls are very

variable, making it hard to divide them into clear-cut types. Most have round or oval heels although some are heart-shaped, for example, H6-H7.

Towards the end of the 17th century the heel bowls become rather more elongated and with markedly curved profiles (H18-H24), mirroring the changes seen in the spur types. One characteristic that does stand out is the occasional use of a particularly flared round heel (H22 and H24). Alongside these curved types are some interesting transitional forms that include relatively straight-sided types (H25-H27) and some very forward-leaning types (H28-H30). The latter seem to have been relatively common in Reading, where they may well represent a distinctive local development. At the very end of the 17th century a much more tubular, upright bowl form appears (H31-H32), which goes on to become the dominant form for much of the 18th century, when it occurs in large numbers, replacing almost all other forms. Examples of this type are very hard to date within the broad period of their currency, since the form changes little, although later examples tend to have thinner stems and bowl walls and smaller stem bores and makers' initials. This form was also dominant in London and many other areas of the south-east. Towards the end of the 18th-century type H33 evolved into a rather fuller form with a smaller heel (H34) before becoming rather more squat and with a deeper heel by the early 19th century (H35). Types H32-H35 usually have the maker's initials moulded onto the heel, the base of which was almost always trimmed before about 1800 but very rarely thereafter. Some of the examples dating from after *c* 1760 also have moulded decoration on the bowl, for example H34.

Not enough later material was present to establish a reliable 19th-century typology for either the spur or heel pipes although both forms would have continued to develop during this period. The main change later in the 19th century was the introduction of spurless pipes, such as Figure 5.31 No. 68, from about 1850 onwards.

Overall, the Oracle assemblage shows that London styles were followed until the middle of the 17th century but that, around the middle of the century, small numbers of pipes of central southern or West Country form appear. Initially these occur in very small numbers, both as actual imports and as local copies in that style. From about 1680-1750 these styles had a great influence on local production and local variants emerge, which form a significant element of the excavated assemblage during most of this period. Alongside the West Country styles other more London-orientated forms were produced, some of which also evolved into distinctive local types. Around 1700 a new upright, tubular London style appears, which gradually replaced the other more local forms to become the dominant type. Spur forms become much less common after about 1730 and may have totally disappeared for a while during the later 18th century. Styles start to change again from around the 1760s, once again

following London trends. Later forms were not recovered in any quantity but it is almost certain that London styles would have been copied from the later 18th century onwards.

#### *Decorated and modified pipes*

Almost all of the pipes recovered from the excavations are plain. Four stems had been ground at one end after breaking (Fig. 5.28 Nos 1-4) and had probably been used like sticks of chalk for writing or drawing. A few examples of decorated stems include milling used to disguise sections that had been damaged and repaired during the manufacturing process (Fig. 5.28 Nos 9 and 10). Moulded decoration did not become common on British pipes until towards the end of the 18th century, a period poorly represented in this assemblage. A good early example of a fluted design can be seen on Figure 5.28 H34, and Figure 5.31 No. 66 is a relatively early and unusual example of swag decoration. It is a northern European import, most probably from France, where similar designs are illustrated in the Fiolet trade catalogue of 1846. This is the only known example of its type from the country.

#### *Manufacturing and finishing techniques*

Only a very small proportion of the fragments had been burnished, that is, finished with a polished surface during the manufacturing process, and it appears primarily on the West Country style bowls, suggesting that these pieces were either imported, or else that the technique was adopted along with the new bowl styles. Burnishing seems to have gone out of use in this area around 1730. Internal bowl marks are also rare. This technique, usually associated with the flat bowl interior bases of the late 17th and 18th century, was noted on only 12 of 385 examples. Ten of these had an upright cross aligned with the stem of the pipe (eg. Figs 5.28 H34; 5.29 No. 29; and 5.31 No. 63). One had an eight-arm star (Fig. 5.30 No. 46), and another an eight-arm star with spikes between the arms (Fig. 5.30 No. 45). The final point to note with regard to production techniques is that some of the late 17th- to early 18th-century pipes have unusually small stem bores. This feature was noted on 37 examples with stem bores of 4/64", some of which occur in what appear to be early 18th-century groups. Such small stem bores are usually associated with late 18th-century or 19th-century pipes, although the author has noted that similar small stem bores appear to be characteristic of the Oxford industry during the early 18th century.

#### *Marked pipes*

Some 30 different manufacturers are represented by 187 different marks, the majority of whom are known, or presumed, to have worked in the town.

No examples of marked pipes appear to have been published from Reading before, making the examples illustrated here particularly valuable. The 17th-century pipes from Reading are very rarely marked. The only stamped heel from the excavations was marked John Perry, who is recorded as a pipemaker in the town during the 17th century. This is the first known example of a Perry pipe, which shows how inadequate the sample of pipes from the town still is. A few marked pipes of late 17th- to early 18th-century date confirm the arrival of pipes from the west and south-west of the country, for example from the regionally important pipe production centre of East Woodhay in Hampshire. These imported pipes tend to have incuse stamped marks and burnished surfaces, features not normally found in London and the Home Counties. By far the largest and most interesting groups of stamped pipes are those with the mark of John Greetham on the stem, 11 examples of which were found (Fig. 5.29 No. 17). A search of the internet IGI site has shown that a John Greetham, age 28, married Francis Pinnock at East Woodhay in 1704, and a John Greetham is listed as marrying at Reading on 21 December 1721. Was this a pipe-maker from the East Woodhay production centre who moved to Reading, or perhaps his son? It seems almost certain that one of these is the maker who produced the pipes found in the excavations. A group of 30 distinctive West Country style bowls have various combinations of hand (or gauntlet), crown and star marks (Fig. 5.31 Nos 59-65). The occurrence of similar marks at London seems likely to be evidence for river trade between Reading and London, rather than the production of West Country styles in the capital itself.

From the later 17th century onwards, moulded marks came into such common use that the majority of the later pipes have them on the side of the heel. These are usually just the maker's initials, although occasionally symbol marks occur. Many of the initial marks can be linked with documented makers from Reading or the surrounding area. From the middle of the 19th century there was a fashion for incuse moulded stem marks, and this is reflected in the excavated assemblage by a single example produced in the town by the Brunsdon family (Fig. 5.29 No. 22). A full catalogue of stamped and moulded marks can be found in the clay tobacco pipe report in Chapter 9, on the CD-ROM.

### Catalogue of illustrated pipes

All illustrations are at 1:1 with the exception of the details of the stamped marks, which are at 2:1.

Figure 5.26

- S1 **Bowl fragment** of c 1610-1640 with fully milled and bottered rim and a stem bore of 7/64". Quite a good little form, but roughly finished. Area 22 Ctx 2135, Ref. No. 113.
- S2 **Bowl fragment** of c 1630-1660 with unmilled and

- bottered rim and a stem bore of 7/64". Area 29 Ctx 3833, Ref. No. 173.
- S3 **Bowl fragment** of c 1650-1670 with half milled and bottered rim and a stem bore of 8/64". Area 29 Ctx 4171, Ref. No. 321.
- S4 **Bowl fragment** of c 1650-1670 with fully milled and bottered rim and a stem bore of 7/64". Area 22 Ctx 1855, Ref. No. 66.
- S5 **Bowl fragment** of c 1660-1680 with half milled and bottered rim and a stem bore of 7/64". Area 12 Ctx 572, Ref. No. 26.
- S6 **Bowl fragment** of c 1660-1690 with unmilled and bottered rim and a stem bore of 7/64". Area 12 Ctx 752, Ref. No. 42.
- S7 **Bowl fragment** of c 1680-1710 with unmilled and bottered rim and a stem bore of 6/64". Made of a fine sandy fabric. Area 29 Ctx 4486, Ref. No. 533.
- S8 **Two joining bowl fragments** (freshly broken) of c 1680-1710 with a bottered rim and a stem bore of 7/64". Rim slightly damaged but probably never milled. Area 29 Ctx 4344, Ref. No. 379.
- S9 **Bowl fragment** of c 1660-1690 with a bottered rim and a stem bore of 7/64". Incuse stamped mark reading R G across the stem – probably Richard Greenland of Norton St Philip, Somerset, recorded 1664-1710 (ob). The pipe has been finished with a good burnish. Area 29 Ctx 5600, Ref. No. 726.
- S10 **Bowl fragment** of c 1680-1720 with unmilled and bottered rim and a stem bore of 7/64". Well finished spur bowl with good curved form and finely burnished surface. Rather a large bore for Reading at this date and almost certainly an import to the town. Area 29 Ctx 3958, Ref. No. 262.
- S11 **Bowl fragment** of c 1680-1710 with a bottered rim and a stem bore of 7/64". Unusual form – uncertain if it has an unusually curved front or whether it has just been distorted when soft. Plain groove for one quarter of rim facing smoker. Area 29 Ctx 5602, Ref. No. 731.
- S12 **Bowl and joining stem fragment** (fresh break) of c 1680-1720 with unmilled and bottered rim and a stem bore of 5/64". A total of 89mm of stem survives without a mark. Area 29 Ctx 5274, Ref. No. 606.
- S13 **Bowl and four joining stem fragments** of c 1690-1730 with unmilled, internally trimmed and bottered rim and a stem bore of 7/64". The joining fragments suggest that this piece was freshly deposited, thus providing a reliable date for the context. Area 29 Ctx 3854, Ref. No. 207.
- S14 **Bowl fragment** of c 1690-1750 with unmilled and cut rim and a stem bore of 6/64". The pipe has been given a good burnish. REORM 98 [U/S].
- S15 **Bowl fragment** of c 1690-1730 with unmilled, cut and wiped rim and a stem bore of 5/64". Unusual form with very pronounced flare at rim and a sharp, forward pointing spur. Area 29 Ctx 5448, Ref. No. 641.
- S16 **Bowl fragment** of c 1690-1730 with unmilled, cut and wiped rim and a stem bore of 6/64". Area 29 Ctx 5575, Ref. No. 702.
- S17 **Two joining bowl fragments** (fresh break) of

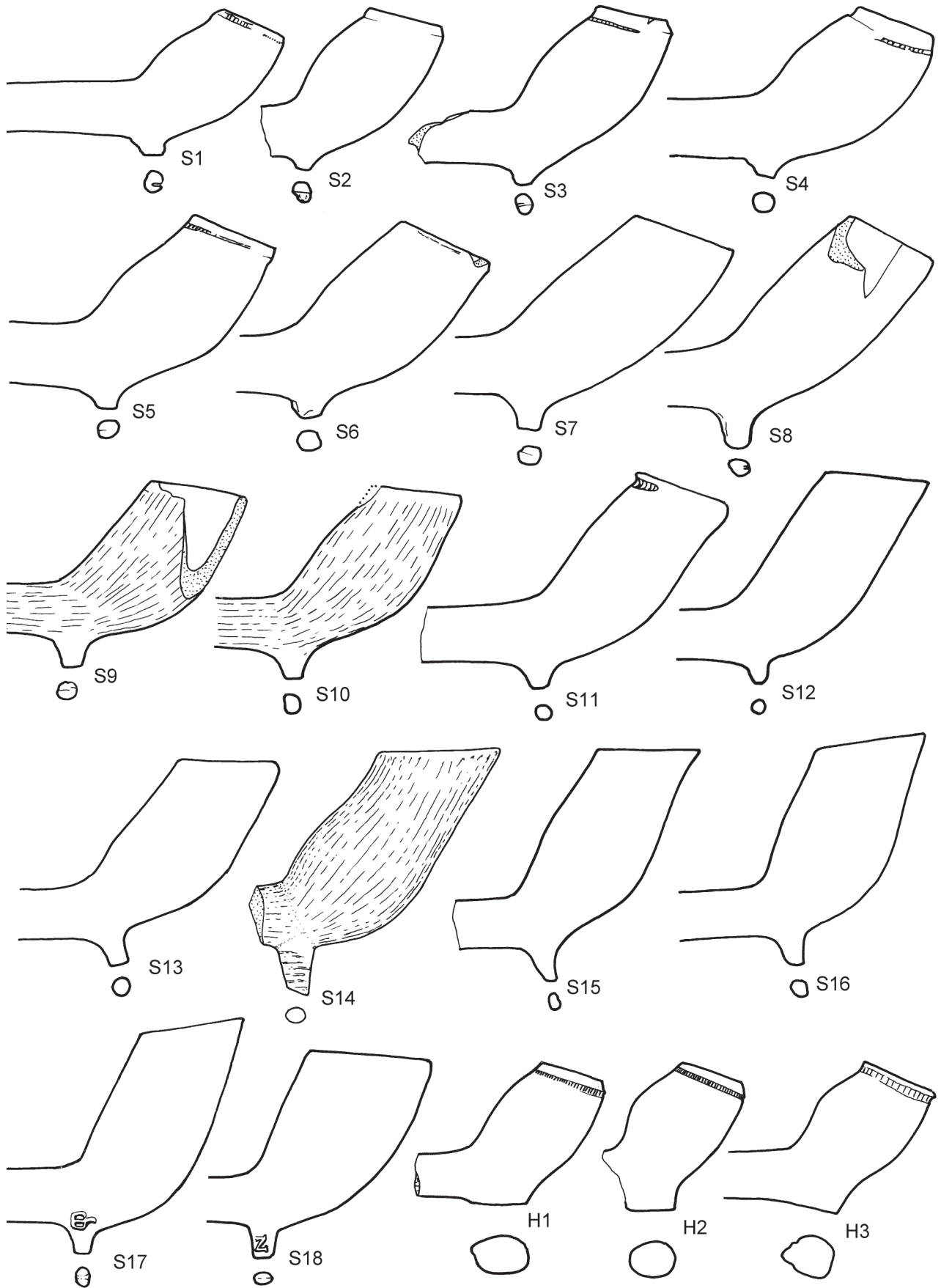


Fig. 5.26 Clay tobacco pipes: Spur forms (Nos S1-S18) and heel forms (Nos H1-H3)

c1690-1730 with unmilled and cut rim and a stem bore of 6/64". Relief moulded mark comprising a hand and crown on the sides of the spur. The bowl has an internal bowl cross – the 'upright' axis of which leans slightly to the left of the long axis of the pipe. Area 29 Ctx 5199, Ref. No. 590.

- S18 **Bowl fragment** of c 1820-1880 with unmilled and cut rim and a stem bore of 4/64". Relief moulded mark reading I N on the heel sides. Same mould as an example in Context 282 (No 749). Made by John Norris of Reading. Area 304 Ctx 12560.
- H1 **Bowl fragment** of c 1610-1640 with fully milled and bottered rim and a stem bore of 6/64". Area 22 Ctx 2002, Ref. No. 79.
- H2 **Bowl fragment** of c 1610-1640 with fully milled and bottered rim and a stem bore of 7/64". Area 29 Ctx 4362, Ref. No. 403.
- H3 **Bowl fragment** of c 1610-1640 with fully milled and bottered rim and a stem bore of 8/64". Area 22 Ctx 2000, Ref. No. 68.

Figure 5.27

- H4 **Bowl fragment** of c 1620-1640 with fully milled and bottered rim and a stem bore of 8/64". Area 29 Ctx 5502, Ref. No. 684.
- H5 **Bowl fragment** of c 1630-1660 with fully milled and bottered rim and a stem bore of 7/64". Area 22 Ctx 2053, Ref. No. 104.
- H6 **Bowl fragment** of c 1630-1660 with half milled and bottered rim and a stem bore of 7/64". Area 29 Ctx 5250, Ref. No. 597.
- H7 **Bowl fragment** of c 1640-1660 with half milled and bottered rim and a stem bore of 7/64". Lop-sided and rather oval heel. Area 22 Ctx 2000, Ref. No. 77.
- H8 **Bowl fragment** of c 1650-1670 with half milled and bottered rim and a stem bore of 6/64". Area 28 Ctx 10266, Ref. No. 761.
- H9 **Bowl fragment** of c 1650-1670 with half milled and bottered rim and a stem bore of 7/64". Area 29 Ctx 5475, Ref. No. 658.
- H10 **Bowl fragment** of c 1650-1670 with half milled and bottered rim and a stem bore of 7/64". Area 22 Ctx 2199, Ref. No. 114.
- H11 **Bowl fragment** of c 1650-1670 with half milled and bottered rim and a stem bore of 7/64". Very poor and lop-sided little bowl. Area 12 Ctx 9317, Ref. No. 55.
- H12 **Bowl fragment** of c 1650-1670 with half milled and bottered rim and a stem bore of 7/64". Area 29 Ctx 3704, Ref. No. 131.
- H13 **Bowl fragment** of c 1660-1680 with three quarters milled and bottered rim. Area 29 Ctx 3705, Ref. No. 132.
- H14 **Bowl fragment** of c 1650-1670 with three quarters milled and bottered rim and a stem bore of 8/64". Area 29 Ctx 4376, Ref. No. 424.
- H15 **Bowl fragment** of c 1650-1680 with unmilled and bottered rim and a stem bore of 6/64". Unusual bowl type for Reading – more typical of Central/Southern or West Country styles. Area 29 Ctx 5596, Ref. No. 724.
- H16 **Bowl fragment** of c 1660-1680 with one quarter

milled and bottered rim and a stem bore of 7/64". Area 12 Ctx 586, Ref. No. 29.

- H17 **Bowl fragment** of c 1660-1680 with one quarter milled and bottered rim and a stem bore of 7/64". Area 29 Ctx 5790, Ref. No. 733.
- H18 **Bowl fragment** of c 1660-1690 with half milled and bottered rim and a stem bore of 6/64". Area 29 Ctx 4439, Ref. No. 470.
- H19 **Bowl fragment** of c 1670-1700 with unmilled and bottered rim and a stem bore of 7/64". Area 29 Ctx 5475, Ref. No. 663.
- H20 **Bowl fragment** of c 1670-1700, unmilled and internally trimmed and bottered rim and a stem bore of 7/64". Area 29 Ctx 4209, Ref. No. 333.
- H21 **Bowl fragment** of c 1670-1700 with unmilled and bottered rim and a stem bore of 6/64". Area 29 Ctx 5582, Ref. No. 715.
- H22 **Bowl fragment** of c 1680-1710 with one quarter milled and bottered rim and a stem bore of 7/64". Transitional type with large flared heel. Area 29 Ctx 5544, Ref. No. 686.
- H23 **Bowl fragment** of c 1680-1710 with unmilled and bottered rim and a stem bore of 6/64". Area 29 Ctx 3839, Ref. No. 179.

Figure 5.28

- H24 **Bowl fragment** of c 1680-1720 with a milled and bottered rim. Stem bore unmeasurable. Transitional form with a flared heel and very curved body shape – not a London form. Bowl damaged. Area 29 Ctx 3787, Ref. No. 152.
- H25 **Bowl fragment** of c 1670-1700 with a milled and internally trimmed and bottered rim and a stem bore of 7/64". Area 29 Ctx 5567, Ref. No. 696.
- H26 **Bowl fragment** of c 1680-1710 with unmilled and bottered rim and a stem bore of 6/64". Area 29 Ctx 4463, Ref. No. 522.
- H27 **Bowl fragment** of c 1680-1710 with one quarter milled and internally trimmed and bottered rim and a stem bore of 6/64". Relief moulded mark reading P I on the sides of the heel. Early use of a moulded initial mark – possibly arranged incorrectly and intended to read IP rather than PI. Area 29 Ctx 4463, Ref. No. 523.
- H28 **Bowl and joining stem fragment** (fresh break) of c 1680-1710 with unmilled and internally trimmed and bottered rim and a stem bore of 7/64". Area 29 Ctx 4486, Ref. No. 540.
- H29 **Bowl fragment** of c 1680-1710 with half milled and bottered rim and a stem bore of 6/64". Area 22 Ctx 2046, Ref. No. 93.
- H30 **Bowl fragment** of c 1680-1710 with unmilled and internally trimmed and bottered rim and a stem bore of 7/64". Area 29 Ctx 4394, Ref. No. 460.
- H31 **Bowl fragment** of c 1690-1740 with unmilled and cut and internally trimmed rim and a stem bore of 6/64". Area 300 Ctx 13273.
- H32 **Bowl fragment** of c 1690-1720 with unmilled and cut and wiped rim and a stem bore of 6/64". Area 29 Ctx 5575, Ref. No. 707.
- H33 **Bowl fragment** of c 1700-1770 with unmilled and cut and wiped rim. Area 29 Ctx 3789, Ref. No. 155.

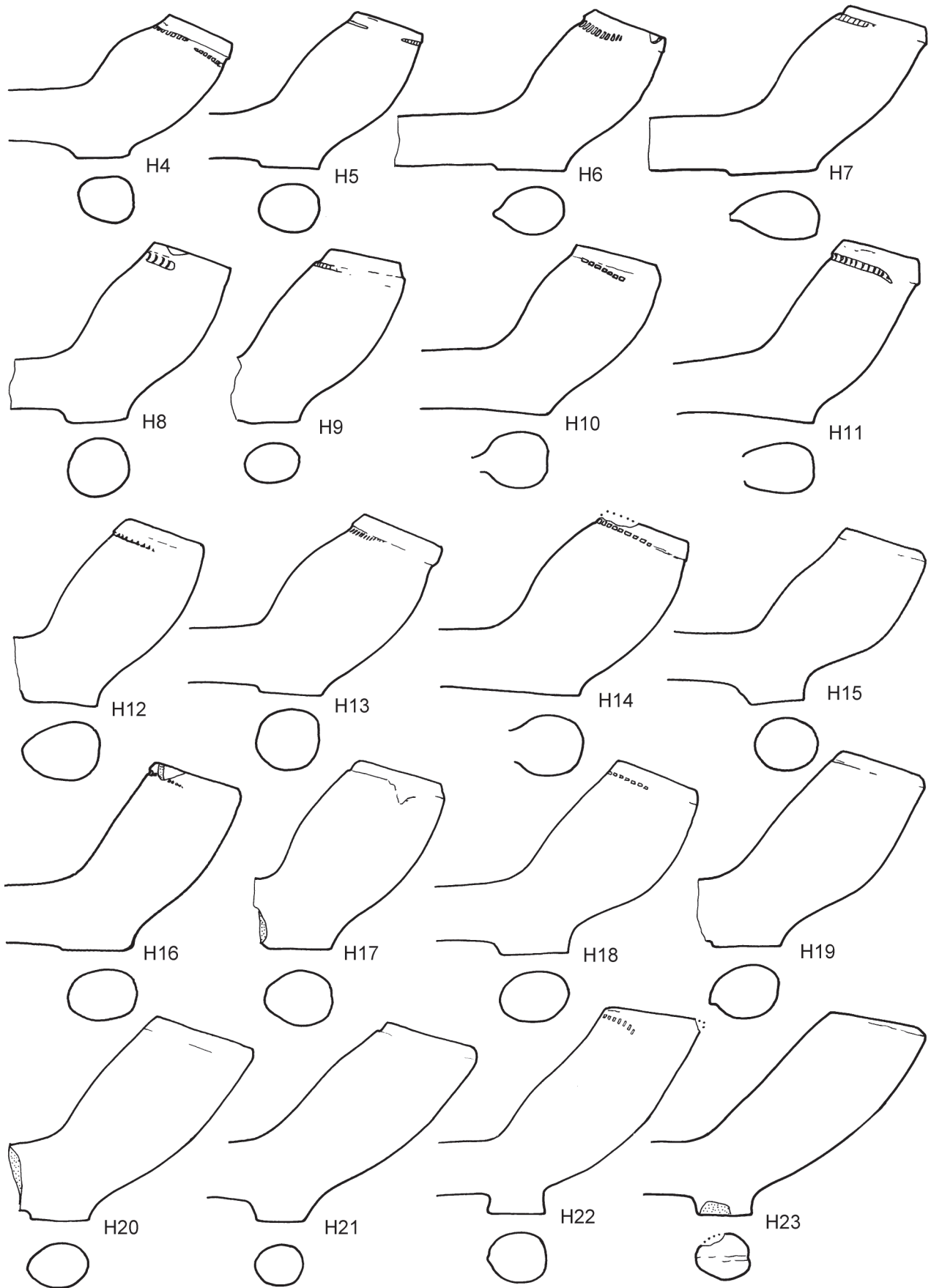


Fig. 5.27 Clay tobacco pipes: Heel forms (Nos H4-H23)

- H34 **Bowl fragment** of c 1760-1820 with unmilled and cut rim and a stem bore of 4/64". Flutes and dots on bowl with foliage above. Traces of moulded initials on heel that appear to have been erased in mould. Heel base trimmed. Upright internal bowl cross. Area 29 Ctx 5475, Ref. No. 682.
- H35 **Bowl fragment** of c 1780-1820 with unmilled and cut and possibly wiped rim. Relief moulded mark reading I N on the sides of the heel. Complete bowl with cut and possibly wiped rim. Base of heel not trimmed so most likely early nineteenth century in date. Area 29 Ctx 3704, Ref. No. 129.
- 1 **Mouthpiece fragment** of c 1700-1800 with a stem bore of 4/64". Unusual fragment comprising a mouthpiece with the broken end ground smooth to give a total length of 34mm for the re-worked fragment. Area 12 Ctx 627, Ref. No. 766.
  - 2 **Stem fragment** of c 1670-1730 with a stem bore of 7/64". A 67mm section of stem with part of one end ground smooth (just one edge of the narrow end break). Area 29 Ctx 3715.
  - 3 **Stem fragment** of c 1610-1700 with a stem bore of 7/64". Stem with one end ground smooth after having been broken. Area 12 Ctx 505, Ref. No. 765.
  - 4 **Stem fragment** of c 1640-1700 with a stem bore of 7/64". Stem fragment with a single facet ground across one end after having been broken. Area 29 Ctx 5475, Ref. No. 664.
  - 5 **Two joining stem fragments** (freshly broken) of c 1610-1700, pinched to give barley-sugar decoration and with a stem bore of 7/64". The stem is very highly fired to near stoneware and has slaggy encrustation. An associated bowl from the same context dates from c1650-1670. Area 22 Ctx 2060, Ref. No. 770.
  - 6 **Stem fragment** of c 1680-1710 with a stem bore of 6/64". Unusual stem with faint lines along its length, as if burnished but too wet, and faint spiral decoration impressed. This is not a very clean line or milled, just a lightly impressed marks comprising two complete loops with flanking spirals. Area 29 Ctx 5544, Ref. No. 688.
  - 7 **Stem fragment** of c 1610-1700 with a stem bore of 7/64". Stem fragment from near the mouthpiece that has clearly broken during manufacturing and been pushed together again, leaving a 'step' in the stem. This has been wiped smooth but not finished with a band of milling, as is usually the case. Area 29 Ctx 5370, Ref. No. 619.
  - 8 **Stem fragment** of c 1610-1700 with a stem bore of 7/64" and a double spiral groove all along the stem. One groove is more steeply angled and has been applied over the other. Uncommon form of decoration. Area 29 Ctx 4468, Ref. No. 531.
  - 9 **Stem fragment** of c 1650-1670 with a stem bore of 7/64". Stem fragment from mid-section of the pipe with a lumpy area decorated with a milled band, presumably from a stem repair. Area 29 Ctx 4376, Ref. No. 458.
  - 10 **Bowl fragment** of c 1640-1660 with half milled and bottered rim and a stem bore of 8/64". Neat pattern of milled decoration on an expanded stem section with a smooth rather than ragged fracture. Almost certainly the milling was to disguise a manufacturing mend which has subsequently parted. Area 22 Ctx 2000, Ref. No. 69.
- Figure 5.29
- 11 **Mouthpiece fragment** of c 1610-1700 with a stem bore of 7/64". Interesting mouthpiece with the end slightly expanded, rather like the nineteenth-century nipple type mouthpieces. Area 12 Ctx 752, Ref. No. 768.
  - 12 **Stem fragment** of c 1660-1710 with a stem bore of 6/64". Stem with at least four neat, regular cuts made across the stem after firing. Fine, sandy fabric, most likely contemporary with main group of associated bowls, which date from c1680-1710. Area 29 Ctx 3839, Ref. No. 194.
  - 13 **Stem fragment** of c 1700-1770 with at least three deep cuts made into stem after it has been fired (one is at the left hand break). The cuts are not deep enough to intersect the stem bore. Area 29 Ctx 3803.
  - 14 **Bowl fragment** of c 1650-1680 with one quarter milled and bottered rim and a stem bore of 7/64". Incuse stamped mark reading IOHN PERRY on the heel. West Country style bowl and stamp. Pipemakers named John Perry are recorded at Reading in 1636-37 and 1694. Area 12 Ctx 823, Ref. No. 43.
  - 15 **Bowl fragment** of c 1690-1730 with a stem bore of 6/64". Incuse stamped mark reading RICH/ARD/CVTTS across the stem 14mm behind the bowl. Cutts worked at East Woodhay where he married in 1693 and was buried in 1731. Area 29 Ctx 3864, Ref. No. 214.
  - 16 **Bowl fragment** of c 1660-1690 with bottered rim and a stem bore of 7/64". Incuse stamped mark reading R G across the stem. Probably Richard Greenland of Norton St Philip, Somerset – recorded 1664-1710 (ob). The pipe has been given a good burnish. Area 29 Ctx 5600, Ref. No. 726.
  - 17 **Bowl and joining stem fragment** of c 1690-1730 with bottered rim and a stem bore of 5/64". Incuse stamped mark reading IOHN/GREE/THAM across the stem. Fine spur bowl with joining stamped stem – the stamp starts 15mm from bowl. Illustrated pipe from Area 29 Ctx 5575, Ref. No. 700 with another stamp from Area 29 Ctx 5366, Ref. No. 614 used to complete the die detail. The second example has a stem bore of 6/64" and the stem stamp starts about 10mm from the bowl junction.
  - 18 **Bowl fragment** of c 1690-1720 with cut rim and a stem bore of 6/64". Incuse stamped mark reading RICH/ARD.S/AYER across the stem. Richard Sayer is recorded at East Woodhay in Hampshire from at least 1685 until his death in 1716 (Cannon 1991, 25). Area 300 Ctx 13361.
  - 19a **Bowl and joining stem fragment** of c 1690-1730 with unmilled, cut and wiped rim and a stem bore of 6/64". Relief moulded mark comprising a hand and crown on the sides of the spur and an octagonal bird stamp (probably an eagle) across the stem. The



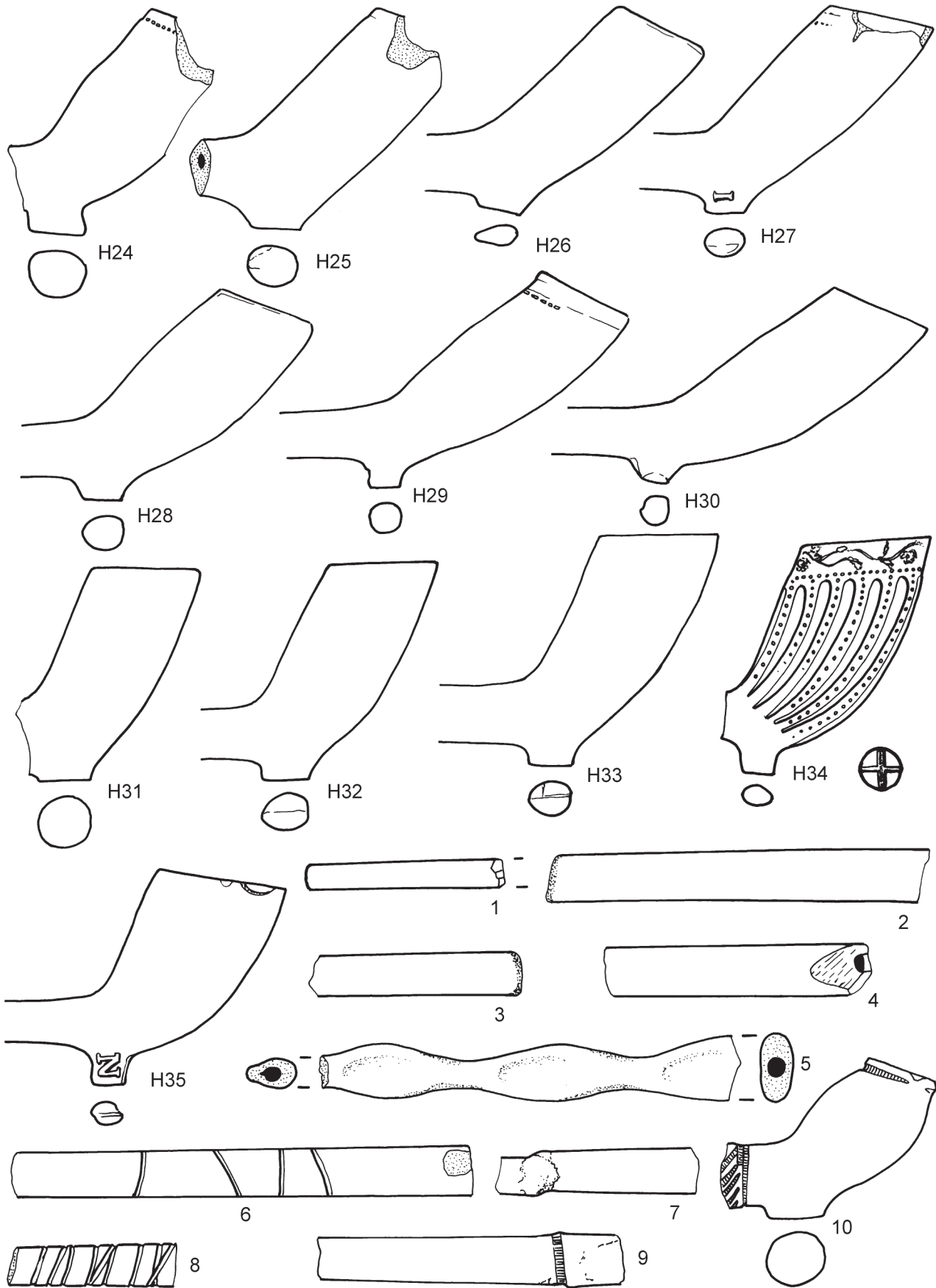


Fig. 5.28 Clay tobacco pipes: Heel forms (Nos H24-H35), other pipes (Nos 1-10)

- joining fragment (old break) gives 15cm of stem surviving in all. The stem stamp starts 17mm from bowl and was clearly not associated with any other borders, etc. The pipe has been given a good burnish. Area 12 Ctx 8565, Ref. No. 49.
- 19b **Detail of a different bird oval stamped** across the stem of a bowl from the same mould as 19a above. This example has a cut rim, a stem bore of 6/64" and has been given a finely burnished surface. This stamp also occurs in isolation and starts 20mm from the bowl. Area 29 Ctx 4171, Ref. No. 323.
- 20 **Stem fragment** of c 1850-1920 with a stem bore of 3/64". Incuse stamped mark reading 'L. Fiolet/a St Omer' across the stem. Thin stem with moulded vine scroll design, picked out with enamel decoration. The firm operated from 1765-1921 but this mark was only appears to have been used after 1833 and the style of the pipe is mid-nineteenth century or later. Area 12 Ctx 646, Ref. No. 767.
- 21 **Stem fragment** of c 1880-1920 with a stem bore of 4/64". Incuse stamped mark reading 'Gambier/à Paris/M \* H/Deposé' across the stem. This particular mark was only introduced in about 1879 by the firm. The stem has been given a good burnish. Area 29 Ctx 3831, Ref. No. 172.
- 22 **Stem fragment** of c 1850-1880 with a stem bore of 4/64". Incuse moulded mark reading BRUNSDON/READING along the sides of the stem. The Brunsdon family is recorded working at Reading from at least 1840-81. Area 12 Ctx 8788, Ref. No. 764.
- 23 **Bowl fragment** of c 1840-1880 with a stem bore of 3/64". Relief moulded mark reading I B on the sides of the spur. Not enough of the bowl survives to see whether it was decorated or not. Area 29 Ctx 4541, Ref. No. 556.
- 24 **Three joining bowl fragments** of c 1780-1820 with unmilled and cut rim and a stem bore of 4/64". Relief moulded mark reading W H on the sides of the heel. Unidentified maker. Area 356 Ctx 12691.
- 25 **Bowl fragment** of c 1680-1710 with one quarter milled, internally trimmed and bottered rim and a stem bore of 6/64". Relief moulded mark reading P I on the sides of the heel. Early use of a moulded initial mark – possibly arranged incorrectly and intended to read IP rather than PI. Area 29 Ctx 4463, Ref. No. 523.
- 26 **Bowl fragment** of c 1700-1770 with a stem bore of 5/64". Relief moulded mark reading P I on the sides of the heel. Lettering matches IP pipes, perhaps reversed in error. Area 300 Ctx 13271.
- 27 **Bowl fragment** of c 1760-1810. Relief moulded mark reading W I on the sides of the heel. Heel has been trimmed so probably dates from before c1800-1810. A similar example, but probably from a different mould, was recovered from Ctx 3923, Ref. No. 253. This piece is from Area 29 Ctx 3704, Ref. No. 127.
- 28 **Bowl fragment** of c 1810-1850 with unmilled and cut rim and a stem bore of 4/64". Relief moulded mark reading D M on the sides of the heel. Large serif initials on heel; thin flutes and alternating spikes and leaves on the bowl. Quite a short bowl form. Area 29 Ctx 3833, Ref. No. 176.
- 29 **Bowl fragment** of c 1760-1800 with cut rim and a stem bore of 4/64". Relief moulded mark reading I? M? on the sides of the heel. Thin-walled bowl with a faint upright internal bowl cross – leaning slightly to right. Damaged initials, possibly reading IM but not certain. Heel trimmed. Area 29 Ctx 5475, Ref. No. 678.
- 30 **Bowl fragment** of c 1780-1820 with a stem bore of 4/64". Relief moulded mark reading E N on the sides of the heel. Area 29 Ctx 3839, Ref. No. 193.

Figure 5.30

- 31 **Bowl fragment** of c 1780-1820 with unmilled, cut and possibly wiped rim. Relief moulded mark reading I N on the sides of the heel. Base of heel not trimmed so most likely early nineteenth century in date. Area 29 Ctx 3704, Ref. No. 129.
- 32 **Three joining fragments** from a large, thin-walled bowl of c 1780-1820 with cut rim and a stem bore of 4/64". Relief moulded mark reading I N on the sides of the heel, which is not trimmed so most likely to be early nineteenth century in date. Area 29 Ctx 5475, Ref. No. 679.
- 33 **Bowl fragment** of c 1820-1880 with unmilled and cut rim and a stem bore of 4/64". Relief moulded mark reading I N on the sides of the heel. Same mould as an example in Ctx 282] Ref. No. 749. Made by John Norris of Reading. Area 304 Ctx 12560.
- 34 **Bowl fragment** of c 1780-1820 with a stem bore of 4/64". Relief moulded mark reading W N on the sides of the heel. Heel fragment only. Area 29 Ctx 3963, Ref. No. 275.
- 35 **Bowl fragment** of c 1820-1860 with unmilled and cut rim and a stem bore of 5/64". Relief moulded mark reading W N on the sides of the heel. Area 304 Ctx 12560.
- 36 **Bowl fragment** of c 1690-1730 with unmilled and cut rim and a stem bore of 5/64". Relief moulded mark reading I P on the sides of the spur. I has curled serifs; spur base is trimmed. Area 29 Ctx 4050, Ref. No. 306.
- 37 **Bowl fragment** of c 1690-1730 with unmilled and bottered rim and a stem bore of 5/64". Relief moulded mark reading I P on the sides of the spur. Area 29 Ctx 3887, Ref. No. 243.
- 38 **Bowl fragment** of c 1700-1750 with unmilled, internally trimmed and wiped rim and a stem bore of 6/64". Relief moulded crowned mark reading I P on the sides of the heel. Chunky bowl form – could well be early eighteenth century (c1700-20) and contemporary with other bowls in this context. Area 29 Ctx 3864, Ref. No. 218.
- 39 **Bowl fragment** of c 1700-1770 with unmilled, cut and wiped rim and a stem bore of 5/64". Relief moulded mark reading I P on the sides of the heel, with a dot moulded before the initial I. Area 12 Ctx 8565, Ref. No. 50.
- 40 **Bowl fragment** of c 1700-1770 with unmilled and cut rim and a stem bore of 5/64". Relief moulded



Fig. 5.29 Clay tobacco pipes: Pipes (Nos 11-30)

- mark reading I P on the sides of the heel. Area 300 Ctx 13273.
- 41 **Bowl fragment** of c 1700-1770 with unmilled and cut rim and a stem bore of 4/64". Relief moulded mark reading I P on the sides of the heel. Curled serifs to the I. Area 29 Ctx 4039, Ref. No. 297.
- 42 **Bowl fragment** of c 1700-1770 with unmilled and bottered rim and a stem bore of 4/64". Relief moulded mark reading I P on the sides of the heel. I with curled serifs. Area 29 Ctx 4173, Ref. No. 330.
- 43 **Bowl fragment** of c 1700-1770 with unmilled and cut rim and a stem bore of 5/64". Relief moulded mark reading I P on the sides of the heel. Small bowl, very similar to 40 but from a different mould. Area 300 Ctx 13271.
- 44 **Bowl fragment** of c 1700-1770 with unmilled and cut rim and a stem bore of 5/64". Relief moulded mark reading I P on the sides of the heel. Area 29 Ctx 3868, Ref. No. 224.
- 45 **Bowl fragment** of c 1700-1770 with unmilled, cut and wiped rim and a stem bore of 5/64". Relief moulded mark reading I P on the sides of the heel and an unusual internal bowl mark comprising an eight-arm star with spikes between the spokes. Plain serifs on the I. Area 29 Ctx 3824, Ref. No. 160.
- 46 **Bowl fragment** of c 1700-1770 with unmilled and cut and wiped rim and a stem bore of 4/64". Relief moulded mark reading I P on the sides of the heel. Interior bowl mark comprising a fairly bold upright cross (+) and a slighter angled cross (x) making up an eight arm star. Area 29 Ctx 4046, Ref. No. 300.
- 47 **Bowl fragment** of c 1740-1780 with unmilled and cut and wiped rim and a stem bore of 4/64". Relief moulded mark reading I P on the sides of the heel. Area 29 Ctx 3870, Ref. No. 224.
- 48 **Bowl fragment** of c 1740-1780 with a stem bore of 4/64". Relief moulded mark reading I P on the sides of the heel. Area 29 Ctx 3870, Ref. No. 227.
- 49 **Bowl fragment** of c 1770-1820 with a stem bore of 4/64". Relief moulded mark reading M P on the sides of the heel. This fragment has traces of enclosed flutes on bowl. Base of heel not trimmed. Area 29 Ctx 5475, Ref. No. 683.
- 50 **Bowl fragment** of c 1700-1770. Relief moulded mark reading R P on the sides of the heel. Area 29 Ctx 3704, Ref. No. 119.
- 51 **Bowl and joining stem fragment** of c 1700-1770 with unmilled and cut rim and a stem bore of 5/64". Relief moulded mark reading R P on the sides of the heel. Bowl and joining stem (old break) to give 123mm of straight stem surviving. The R is rather small and poorly executed in comparison with the P. Area 29 Ctx 5582, Ref. No. 721.
- 52 **Bowl fragment** of c 1700-1770 with cut rim and a stem bore of 6/64". Relief moulded mark reading R P on the sides of the heel. Area 29 Ctx 4848, Ref. No. 562.
- 53 **Bowl fragment** of c 1700-1770 with a stem bore of 5/64". Relief moulded mark reading S P on the sides of the heel. Heel only, probably early C18, unidentified maker Area 302 Ctx 12201, Ref. No. .
- 54 **Bowl fragment** of c 1760-1810 with a stem bore of 4/64". Relief moulded mark reading T P on the sides of the heel. Heel fragment with trimmed base. Area 29 Ctx 5475, Ref. No. 680.
- 55 **Bowl fragment** of c 1690-1730 with a stem bore of 5/64". Relief moulded mark reading I S? on the sides of the spur – poorly moulded and with the surname initial unclear. Area 29 Ctx 5383, Ref. No. 629.
- 56 **Bowl fragment** of c 1700-1770 with unmilled and cut rim and a stem bore of 5/64". Relief moulded mark reading P or R S on the sides of the heel. Area 300 Ctx 13273.
- 57 **Two joining bowl fragments** (fresh break) of c 1700-1770 with unmilled and internally trimmed and cut rim and a stem bore of 5/64". Relief moulded mark reading T S on the sides of the heel. Area 29 Ctx 3833, Ref. No. 174.
- 58 **Two joining bowl fragments** (fresh break) of c 1700-1750 with unmilled and cut and wiped rim and a stem bore of 6/64". Relief moulded mark reading T? S on the sides of the heel. Area 12 Ctx 8676, Ref. No. 52.
- 59 **Bowl fragment** of c 1690-1730 with unmilled and cut and wiped rim and a stem bore of 5/64". Relief moulded mark comprising a star with a central dot on each side of the spur. This fragment has 62mm of surviving stem without any stamped mark on it. Area 29 Ctx 5384, Ref. No. 631.
- 60 **Bowl fragment** of c 1700-1740 with unmilled, cut and possibly bottered rim and a stem bore of 5/64". Relief moulded mark comprising a star with a central dot on each side of the heel. Area 302 Ctx 12201.
- 61 **Bowl fragment** of c 1690-1730 with unmilled and cut and wiped rim and a stem bore of 5/64". Relief moulded mark comprising a hand on each side of the spur. Area 29 Ctx 5383, Ref. No. 627.
- 62 **Bowl and joining stem fragment** of c 1690-1730 with unmilled, cut and wiped rim and a stem bore of 6/64". Relief moulded mark consisting of a hand and crown on the sides of the spur. Two examples from this particular mould type were found, each of which had a different bird stamp applied to the stem (see s 19a and 19b). Area 12 Ctx 8565, Ref. No. 49.
- 63 **Two joining bowl fragments** (fresh break) of c 1690-1730 with unmilled and cut rim and a stem bore of 6/64". Relief moulded mark comprising a hand and crown on the sides of the spur. The bowl has an internal bowl cross – the ‘upright’ axis of which leans slightly to the left. Area 29 Ctx 5199, Ref. No. 590.
- 64 **Bowl fragment** of c 1700-1740 with unmilled and cut and wiped rim and a stem bore of 6/64". Relief moulded mark comprising a hand and crown on the sides of the heel. Area 29 Ctx 5383, Ref. No. 628.
- 65 **Bowl fragment** of c 1760-1790 with a stem bore of 5/64". Relief moulded mark comprising a crown

Figure 5.31

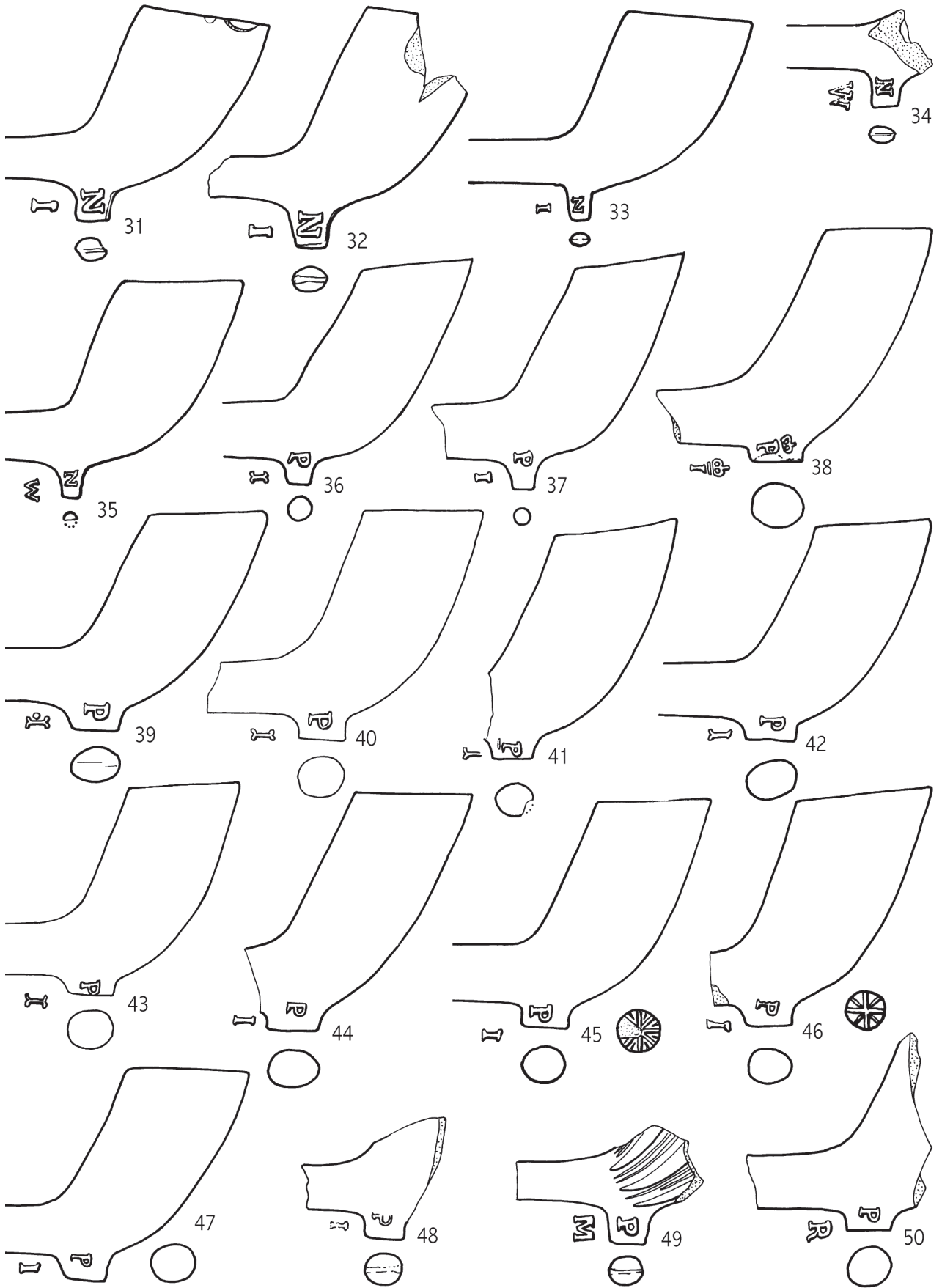


Fig. 5.30 Clay tobacco pipes: Pipes (Nos 31-50)

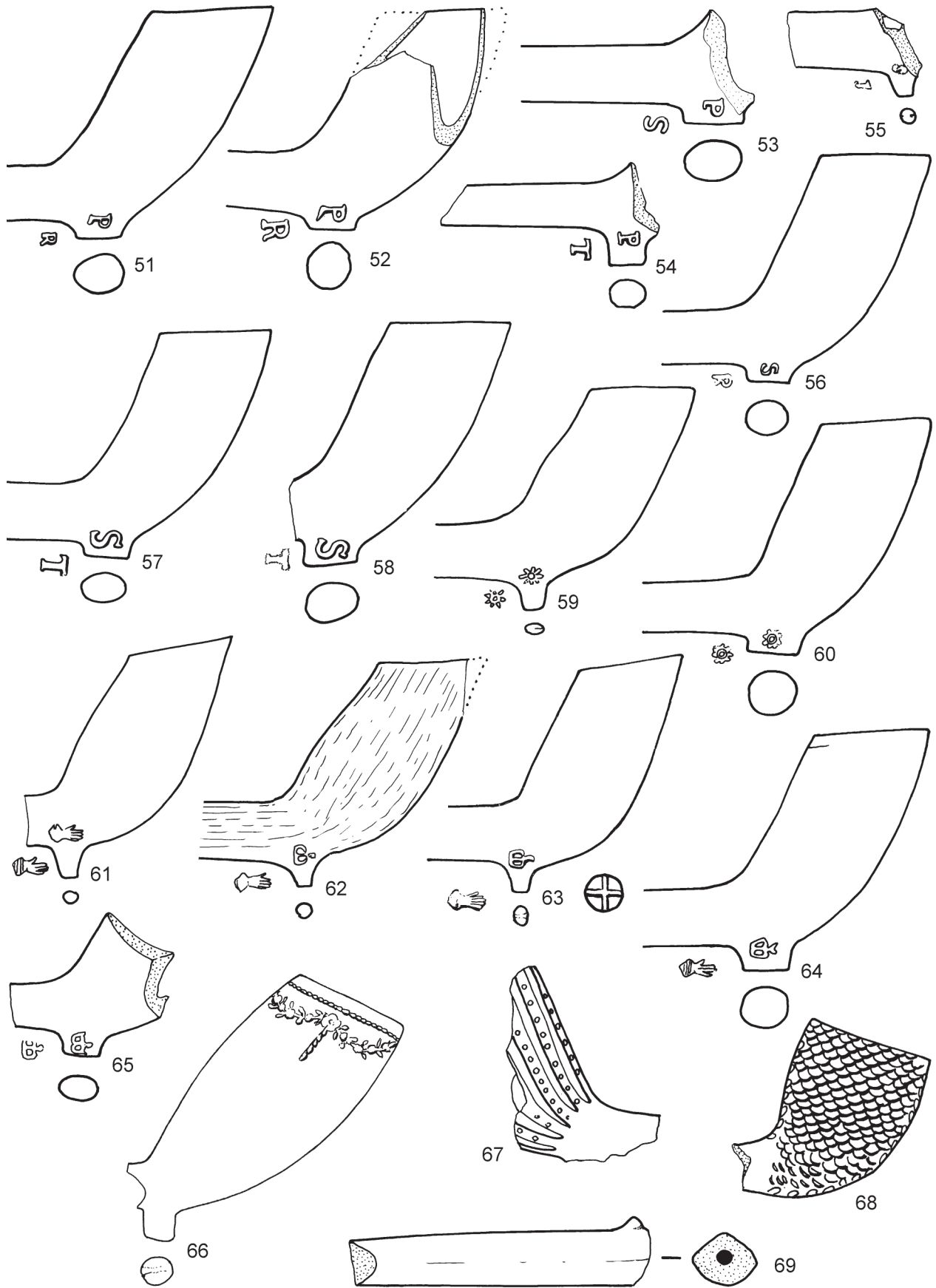


Fig. 5.31 Clay tobacco pipes: Pipes (Nos 51-69)

- on each side of the heel. Area 29 Ctx 5378, Ref. No. 625.
- 66 **Bowl fragment** of c 1780-1850 with unmilled, cut and wiped rim and a stem bore of 5/64". Bowl decorated with moulded beading and floral swags; probably French. Area 301 Ctx 12043.
- 67 **Bowl fragment** of c 1780-1820 with moulded decoration consisting of bold, deeply moulded flutes with dots between. Another fragment probably from the same mould recovered from Ctx 5475] Ref. No. 681. Area 29 Ctx 3704, Ref. No. 126.
- 68 **Bowl fragment** of c 1850-1910 with unmilled and cut rim and a stem bore of 4/64". Spurless bowl with open leaves on seams and tile or scale decoration on the bowl sides. Area 12 Ctx 8899, Ref. No. 54.
- 69 **Stem fragment** of c 1850-1920 from a short stemmed or 'cutty' pipe with thorn decoration. The stem has a lozenge-shaped section. Area 300 Ctx 13011.

#### **Other crafts, industries and activities on the floodplain** (Figs 5.32-5.50; Plate 5.2)

*(Copper alloy and worked bone by Leigh Allen, wooden objects by Steve Allen, lead objects by Cecily Cropper, metalworking by Roger Doonan, worked stone by Ruth Shaffrey, iron by Ian Scott)*

#### **Trades at the Oracle and the Yield Hall: the evidence from small finds**

The small finds assemblages recovered from the excavations are dominated by utilitarian objects such as nails. There were very few objects from Project Phases 2-4, which is perhaps surprising given the evidence for medieval activity at sites 29 and 12. A very large proportion of the finds are associated with the late medieval and 16th-century leather and textile trades, and subsequently the products and waste of the small-scale craft workshops that were set up at the Oracle workhouse and the Yield Hall. There is also a notable presence of material associated with horses and stabling.

The first sizeable group is from site 12 in Project Phase 5 (15th century). Two thirds of this group comprised nails and miscellaneous fragments, and many of the identifiable objects came from dumps and channel fills and so may have been brought from elsewhere. However, there are some striking consistencies in the character of the different finds and environmental assemblages in this area, which suggests that a considerable proportion could result from fairly localised activities. Some items, particularly two awls and a pair of shears, are associated with leather working. Two fragments of frame from a purse or game bag and a buckle may also have been leather workers' debris. Site 12 also shows an interesting early concentration of knives, with all 9 knives from Project Phase 5 contexts occurring there, and 8 out of 13 of the knives from Phase 6 contexts. More awls and buckles occurred at the site

in Project Phase 6. There were also two fragments of sickle blade and two possible fragments of rake tine, which might have been used in the gardens and meadows mentioned in numerous documentary references. Horse gear is also well represented at late medieval and Tudor site 12, with 5 horseshoes and a spur in Project Phase 5, and 3 curry combs, 2 horseshoes and a spur in Project Phase 6. A further spur of medieval form was found redeposited in a Project Phase 8 context. Straps from horse harness and leather panels that may have come from saddles were also found, and waterlogged plant remains from pit and channel fills show that stable waste was being dumped in the area, including compressed straw, bracken and twigs, animal feed and bedding, and the seeds of grassland plants from animal dung. Copper alloy finds from Project Phases 5 and 6 include 'sewing' pins, present from the 15th century onwards, lengths of copper alloy wire that would have been used to make them, thimbles, loop fasteners, strap fittings and buckles. It seems very likely that sewing pins and perhaps associated copper alloy items such as lace tags were being manufactured in the vicinity of the Yield Hall throughout the post-medieval period, starting in the late 15th century. Thimbles occur in small numbers in various phases at site 12 and seem to be particularly associated with it. These are generally coarse thimbles such as might have been used in leather working. A further interesting group of finds from site 12 comprises bone points (not illustrated; see Chapter 9 for catalogue). Some were fashioned from goose radii; the ends were cut obliquely and these objects could have functioned as a rudimentary form of pen, although this interpretation remains uncertain. Other points were fashioned from animal bone, with flat cut heads and tapering shanks, and could have functioned as hair or clothing pins. Potential refuse from specialised craft activities involving goose bones was also noted in the animal bone assemblage (Sykes, Chapter 10). The over-representation of butchered goose metacarpi at site 12 suggests feather exploitation. Many of these elements showed cut marks on the pollical facet or the nose where the ligament attaches (Fig. 10.8). A fragment from a large broken whetstone that would have been used in a workshop (Fig. 5.49 No. 1), and a weight that may have been used for weighing down skins during processing (Fig. 5.49 No. 3) were found in the fills of late medieval pits. A number of turned wooden vessels were found on the floodplain sites (Fig. 5.50 Nos 1, 3, 4 and 5), one of them, together with a crude wooden lid (Fig. 5.50 No. 2), from contexts of Project Phases 5-6 on site 12. A number of staves from coopered vessels (not illustrated; see S Allen, Chapter 9) were also found in deposits of Project Phase 6 at site 12. Iron finds from Project Phases 7 and 8 at site 12 are dominated by structural ironwork, especially nails, with a small quantity of horse gear in Phase 8, perhaps no more than might be expected from a single household. The assem-

blages from Project Phases 9 and 10, dating from the period 1750-1900, are dominated by industrial machinery and tools. The Yield Hall and the surrounding area were, by this time, leased out by the Corporation to a variety of tradesmen (see Chapter 4, above). These included a floorcloth manufacturer, a cabinet maker and upholsterer, a brewer, and by 1821 James Wilder's iron foundry, with which the ironworking debris found in a very late phase from Room 2 of the Yield Hall is certainly to be associated.

There are very few metal finds from site 29 prior to Project Phase 6, the 16th-century development of the area as a tannery and possibly also a cloth works. The copper alloy assemblage from this site and phase is of some interest, however, although there is little to reflect the presence of the tannery in the contemporary ironwork, which is dominated by structural items and tools such as a chisel and fragments of a saw blade, which may have been used in construction. Horse gear included a curb bit and six horseshoes. Contexts associated with the establishment of the sandstone house and its yard on site 29 in the earlier part of the 16th century have produced almost the only notable personal items from the whole site. These include a decorated pin (Fig. 5.34 No. 13), a highly ornate belt chape (Fig. 5.33 No. 12) and a sickle-shaped toothpick or earscoop (Fig. 5.35 No. 21). A number of copper alloy purse mounts are also represented (Fig. 5.34 Nos 17-20). These metal-framed purses appear to have been fashionable for a very restricted period, from the late 15th century until the late 16th century. These, and a number of the plainer buckles, may have been debris from the reworking of cloth or leather, or they may have formed part of a soft-leather worker's stock. Alternatively they may have

belonged to fashionable citizens, perhaps living nearby; there are a number of other indicators (including imported glassware) of high-status lifestyles from site 29 at this period.

The Oracle was founded on the site in 1628 as the Kendrick Cloth Workhouse and was intended by its founder, John Kendrick, to provide work for the poor in the manufacture of cloth. Rooms with equipment were leased to various clothiers, but a general downturn in the cloth trade meant that new uses soon had to be found for the facilities (see Chapter 4, above). Pinmaking may have been established there fairly early, and by the 1720s the rooms were occupied by a variety of poor craftsmen making pins, silk and sailcloth. By the 19th century the Oracle housed manufacturers of sacking, rope and sailcloth, pins and light fabrics such as silk and satin. A Directory of 1830 records a ribbon manufacturer, a haberdasher and a rope maker at the Oracle. Out of the total of 806 copper alloy objects found at site 29, 564 were 'sewing' pins, made from drawn wire with a spiral wire head; in all, 1677 of these pins were recovered from all areas of Oracle excavations. There can be little doubt that these are the pins that were being made at the workhouse (Plate 5.2). A furnace and its fills were excavated (Project Phase 8) and produced evidence for cinder, coke and clinker, suggesting that smithing was taking place and using coke as a fuel, and this was confirmed by the identification of hammerscale on the site. The overwhelming predominance of short pins with two twists of wire tightly crimped into a spherical head suggests that the main period of manufacture was after 1630, probably after *c* 1700. Also present were over 100 lengths of copper alloy wire from which the pins were made. Pins of this type were used for dress-



*Plate 5.2 Drawn wire 'sewing' pins*



making and tailoring as well as for securing headdress. They were also used in the upholstering of furniture, and it is interesting to note that other furniture fittings such as tacks and drape rings were also in evidence among the Oracle copper alloy assemblages. While these could have been used within the work house, it is possible that furniture was being made there, or that upholstery supplies were manufactured. Lace tags frequently occurred in the same contexts as the pins, and may also have been manufactured on the site, as may the small number of buttons found. There is little evidence in the iron assemblage for these activities, however. Most iron finds are of structural metalwork (including nails) from demolition deposits; there are also horseshoes and bridle fragments, spurs and a number of tools such as a hammer and a possible craft knife. The final phase, Project Phase 10, relates to the period 1850-1900, following the demolition of the Oracle workhouse. The ironwork from this phase is still predominantly structural, but includes a wood chisel and two furniture fittings, a drop handle and a drawer handle. The 'stable and cabinet fac' shown immediately east of the site on the Goad Insurance map of 1895 (Plate 1.8) may have been the source of these.

## Illustrations

### Lead

#### Figure 5.32

- 1 **Lead plug or pot rivet.** Site 29, SF 841
- 2 **Near complete spoon** with the tip of the handle missing. Site 12, SF 1703
- 3 **Fragment of spoon handle** with a diamond-shaped section and conical tip. Site 12 SF 1788
- 4 **Complete spoon** with a pear-shaped bowl and a hexagonal-sectioned shank with a conical terminal. Site 101, SF 1331A
- 5 **Fragment of perforated lead sheet filter.** Site 28. Found in a timber channel linking two probable vats. It is likely to have been used as a filter in the dyeing process

### Copper alloy

#### Figure 5.33

- 1 **Buckle frame.** A plain circular buckle frame with a D-shaped section and a thin central bar, probable shoe buckle. L: 30mm, 29 (4202), SF -, Phase 2909a
- 2 **Buckle frame.** Double oval buckle frame with expanded pin rests. L: 42mm, 29(3864), SF 847, Phase 2909c
- 3 **Buckle frame.** Oval hinged frame from a shoe buckle with 2 prongs on the inside of the frame to secure the shoe strap. L: 41mm, 29 (3704), SF 803, Phase 2910a
- 4 **Buckle frame.** Elongated D-shaped buckle frame with an inward facing pin rest, the frame has a D-shaped cross section and has moulded decoration all the way round. L: 38mm, 29(3829), SF -, Phase 2910a
- 5 **Buckle frame.** Double oval buckle frame with

slightly protruding knobs at the end of the central bar, the pin is still *in situ*. L: 28mm, 12 (668), SF 33, unphased

- 6 **Buckle frame.** Double oval buckle frame, the ends of the frame overlap and are secured by the central bar. L: 24mm, 12 (2742), SF 163, unphased
- 7 **Buckle frame.** A D-shaped buckle frame with a grooved rest for the pin and lobes at the end of the bar. L: 36mm, 101 (7132), SF 1326, unphased
- 8 **Buckle frame and plate.** Double oval buckle with a folded plate attached to the central bar. The frame is decorated with a stylised floral design. The folded plate has a scalloped attachment end and a single rivet to attach it to the strap. (see Southampton and LMMC). L: 35mm, 300 (13955), SF 2619, unphased
- 9 **Mount.** Octofoil sheet metal mount with domed lobes, there is a circular perforation through the centre for a rivet. L: 17mm, 29 (5604), SF1146, Phase 2905c
- 10 **Mount.** Fragment from a rectangular sheet metal mount. There are small circular perforations in the two surviving corners; the upper face is decorated with fine crosshatched lines. L: 37mm, 300 (12621), SF 2538, phase 3000
- 11 **Strap-end.** Tongue shaped sheet metal plate broken across 2 perforations at the attachment end. There is a third rivet through the point and a fine incised groove runs all around the edge. L: 33, 29 (6079), SF 1164, unphased
- 12 **Belt chape.** A cast belt chape with a slot at one end for attachment to the strap, the chape is highly decorated with knot designs and open-work. It has a recessed bar and a rectangular slot at the butt end for attachment of the chape to the strap; the slot is reminiscent of the design of 16th-century hooked tags. The body of the chape is roughly tongue shaped, highly decorated with openwork and a grooved design that looks like woven textile. L: 45mm, 29 (5521), SF 1154, phase 2908a

#### Figure 5.34

- 13 **Pin.** Pin with a hollow domed head that is formed from 2 flattened hemispheres joined together; the upper face is decorated with repousse bobbles. L: 62mm, 29 (4420), SF 933, Phase 2907a
- 14 **Pin.** Pin with a hollow domed head that is formed from 2 flattened hemispheres joined together; the upper face is decorated with repousse bobbles. L: 47mm, 101 (7132), SF -, unphased
- 15 **Pin.** Pin with a solid, cast head in the form of a knot made of interlacing strands of twisted wire. L: 45mm, 300 (13463), SF -, Phase 3002a
- 16 **Decorated lace tag.** A lace tag with edges that meet and then turn in on themselves (type 2). The lace tag is decorated all over with punched diamonds. L: 27mm, (7019), SF 1322, unphased
- 17 **Purseframe.** Fragment from the pendent frame of a purse with an L-shaped section. One face has a fine incised lattice pattern on it that may originally have been inlaid with niello. The other face has 6 small circular perforations along it to which the material of the purse would have been attached. (LMMC type A). L: 168mm, 29 (5071), SF 1041, Phase 2907a

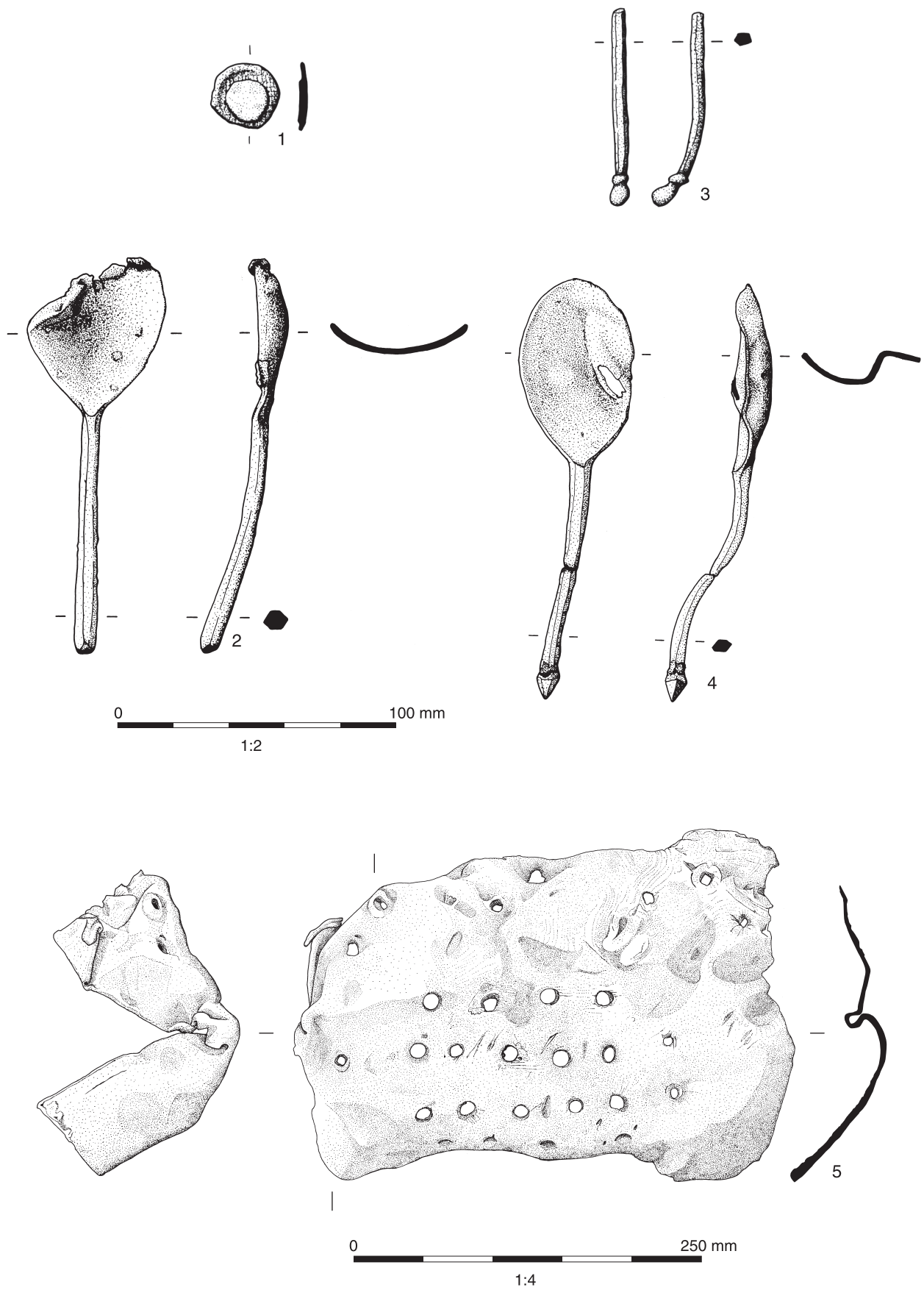


Fig. 5.32 Lead objects (Nos 1-5)

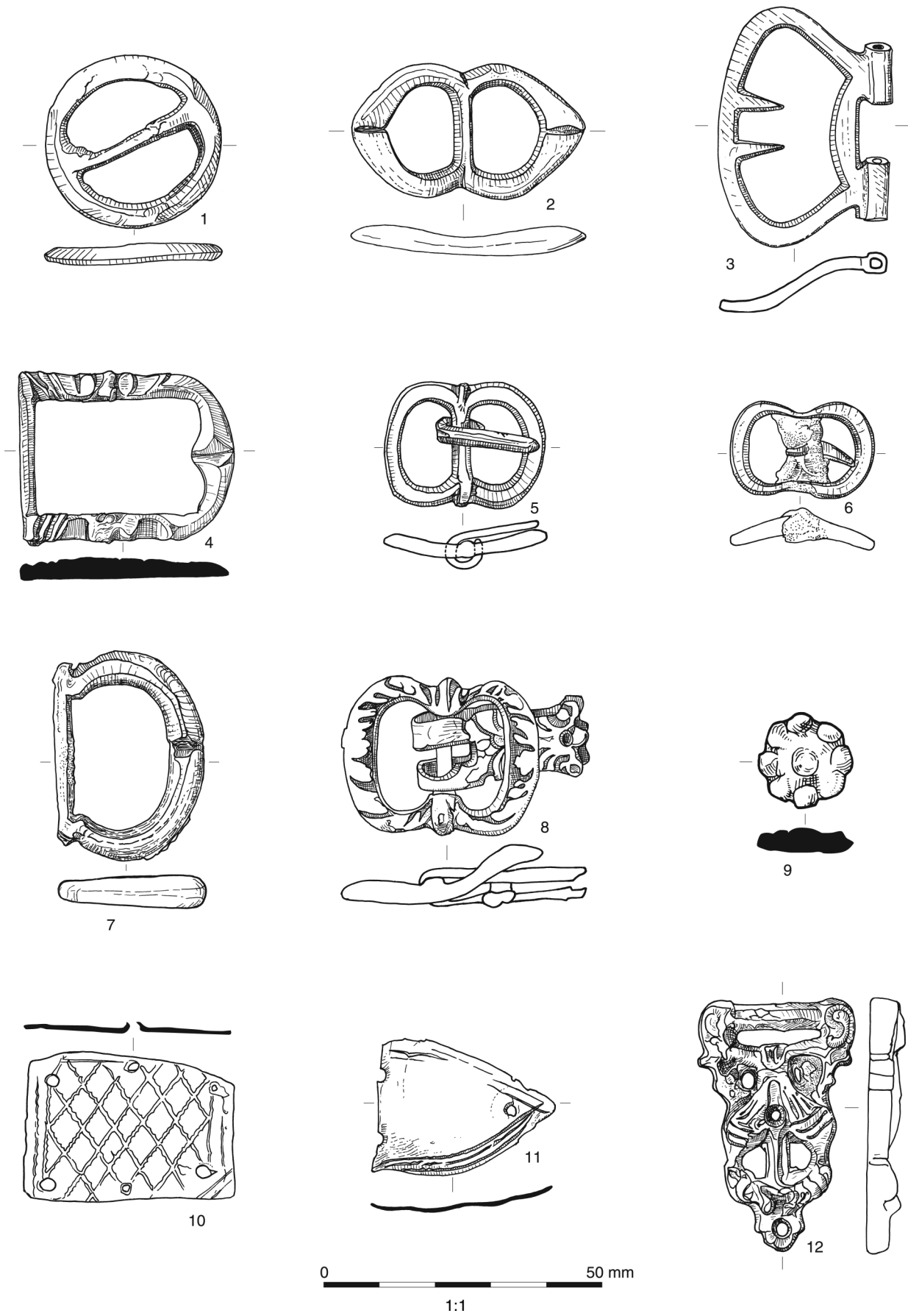


Fig. 5.33 Copper alloy: buckles and belt/strap fittings (Nos 1-12)

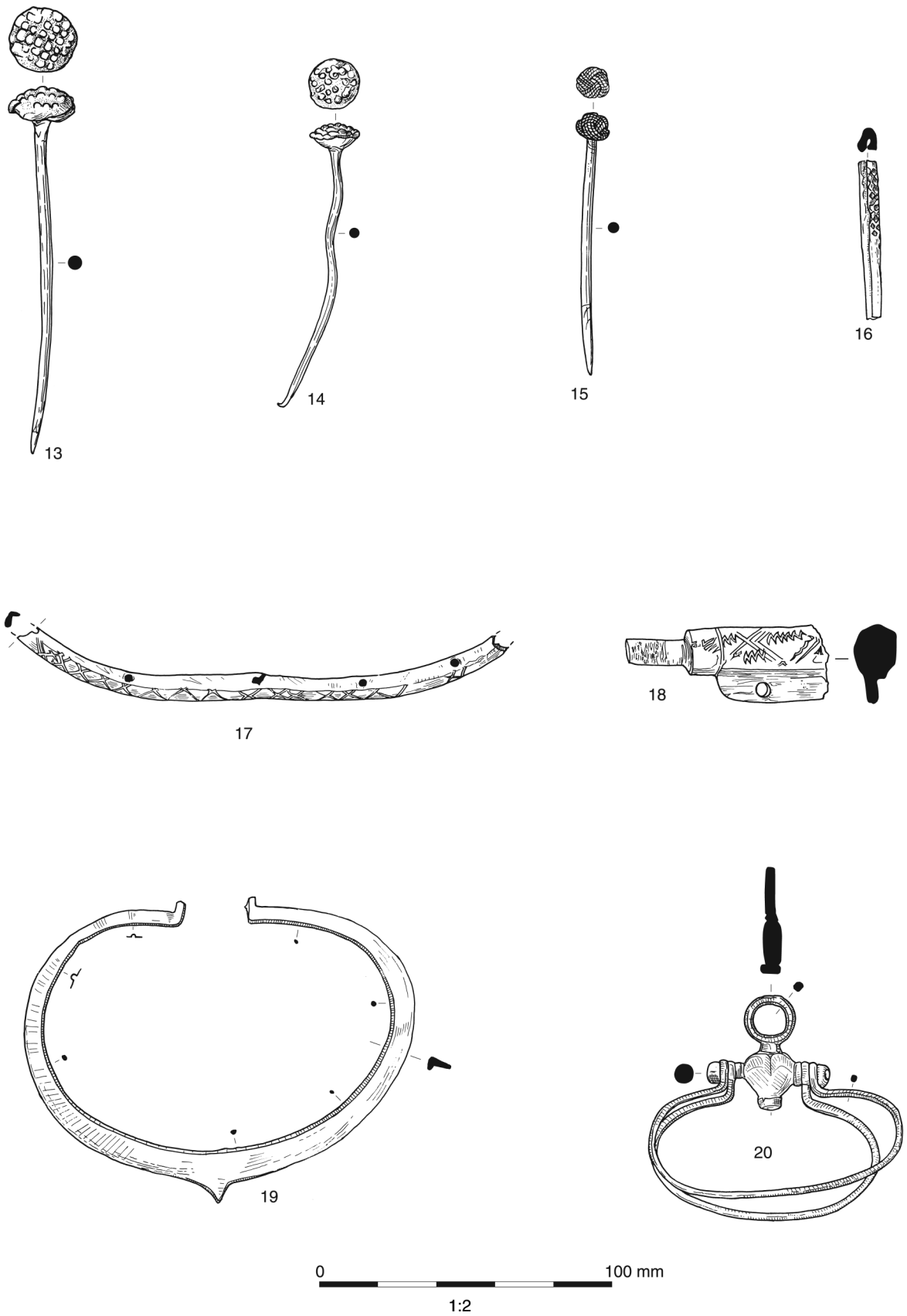


Fig. 5.34 Copper alloy: pins, lace tag and purse frames (Nos 13-20)

- 18 **Purseframe.** Fragment from the side bar of a purse, the fragment has a circular section and a flange below with a single circular perforation through it for attaching the material of the bag to. The fragment is decorated with a fine incised lattice pattern that may originally have been inlaid with niello. (LMMC type A1). L: 35mm, 29 (4524), SF 1130
- 19 **Purseframe.** A complete pendent frame from a purse with an L-shaped section with circular perforations running along one face to which the material of the purse would have been attached. The loops that would have attached the frame to the bar are broken. (LMMC type B). L: 132mm, 29 (4663), SF 1020, Phase 2908d
- 20 **Purseframe.** A complete purse frame with a shield shaped central boss, a short bar of circular section and two pendent loops of circular section (LMMC type B). L: 86mm, 29 (3723), SF 807, Phase 2910a

Figure 5.35

- 21 **Toothpick/Earscoop.** A combined toothpick/ earscoop with a sickle-shaped pick and a fluted
- 22 **Hooked clasp.** Sheet metal clasp, hooked at one end and with a flared terminal at the other. There is a rivet at the flared end, which would have secured the clasp to its sprung back plate. L: 33mm, 29 (4376), SF 931, Phase 2909b
- 23 **Hooked clasp.** Sheet metal book clasp hooked at one end and with a flared terminal at the other. There is an iron rivet at the flared end which secures the clasp to a small surviving fragment of the sprung back plate. The upper face is decorated with a band of rocker arm decoration. L: 26mm, 101 (7109), SF 1305, unphased
- 24 **Fishhook.** A complete fish hook with a flattened terminal and a barbed hook. L: 38mm, 300 (13955), SF 2617, unphased
- 25 **Thimble.** Hemispherical thimble with horizontal spiralling indentations on the shoulders and sides. The very top of the thimble is plain and there is a narrow plain band at the rim. L: 18mm, 12/2 (8555), SF 1625, unphased
- 26 **Thimble.** Cast thimble with an elongated body and tapering sides, the indentations are all over the thimble and in clear horizontal lines. The indentations are large and deep. L: 20mm, 12/1 (564), SF 58, Phase 1210
- 27 **Spoon.** A near complete spoon with a fig leaf shaped bowl and a handle with a hexagonal section. The handle is broken just below the knop. L: 116mm, 12/2 (8655), SF 1669, Phase 1207a
- 28 **Pin,** possible practice piece.

### Iron

Illustrated items from the complete ironwork catalogue; the complete catalogue can be found in Chapter 9 on the CD-ROM.

Figure 5.36

- 1 **Arrowhead.** Socketed arrowhead, with broad leaf-shaped head and flattened socket. L 44mm. 12/2 (0)

unphased. (ID 1015). This arrow is of multi-purpose form as defined by Jessop (1996, 195-7 & fig 1; see also Jessop 1997).

- 4 **Dagger.** The blade is incomplete and has a simple iron guard or hilt with down turned kite-shaped terminals. The upper part of blade has single edge and triangular section; lower down the blade has a double edge. The x-ray plate suggests that the blade widens slightly at this point, and may be evidence that the blade was slightly curved. Just below the hilt the x-ray shows a circular hole or depression in the centre of the blade, which may have been a makers stamp. L 298mm. 28 (8059) Ph 8. (ID 717). This object cannot be readily paralleled. The initial impression is that the form is medieval with a simple cross hilt. However, although superficially medieval in form there must be doubts about the date of this weapon. Firstly the hilt is very loosely fitted, which suggests that the hilt was packed with organic material to fix it, rather than being a tightly fitted to the blade as we might expect. Secondly, the blade form is wrong, because it is parallel-sided, too narrow and the cross-section unusual for a medieval blade.
- 5 **Bullet mould,** of tong, or pincer, type for casting a single ball. L 170mm. 22 (2055) sf 319 unphased. (ID 661). This form of bullet mould for casting a single bullet is common from the 16th century; this example is probably of 19th-century date (Blair 1983, 512 & pls 112-3)
- 6 Possible **wedge.** Flat on one face, curved on the other face, it has chisel edges at each end. L 254mm. W 32mm. 300 (13463) sf 2608 Ph 4. (ID 2029)
- 9 **Adze.** Complete adze head. Rectangular eye for handle. It has a small hammer head. The x-ray plates show that there is a rectangular hole of slot in the centre of the blade. The function of this slot is uncertain. L 180mm; W 54mm. 300 (14023) sf 2626 Ph 1. (ID 2031)
- 15 **Claw hammer.** Hammer head, with oval eye. L 133mm. 12/2 (8614) sf 1630 Ph 5. (ID 924)

Figure 5.37

- 17 **Saw.** Fragment from the tip of a saw blade. The back is curved down towards the point. There appears to be a slight notch near the point. The teeth are spaced at 3+ teeth per inch (c 10 teeth per 3 inches). L 110mm. 12/2 (9334) Ph 4. (ID 1639)
- 19 **Awl,** with tapering circular section blade and tapering square section tang. The junction between the tang and blade is marked by slight encrustation. L mm. 12/2 (8822) Ph 5. (ID 1630)
- 20 **Awl,** with a square section tapering blade and broken tang. L 138mm. 12/2 (8655) sf 1636 Ph 6. (ID 929)
- 21 **Awl,** with a round section tapering point and a square section tapering tang. Marked step between the blade and tang. Probably for leatherworking. L 123mm. 12/2 (8675) sf 1646 Ph 6. (ID 974)
- 26 **Saddlery or upholstery needle** with circular section stem and elongated rectangular eye. The point is of diamond section and slightly curved. L 74mm. 300 (13361) unphased. (ID 1981)

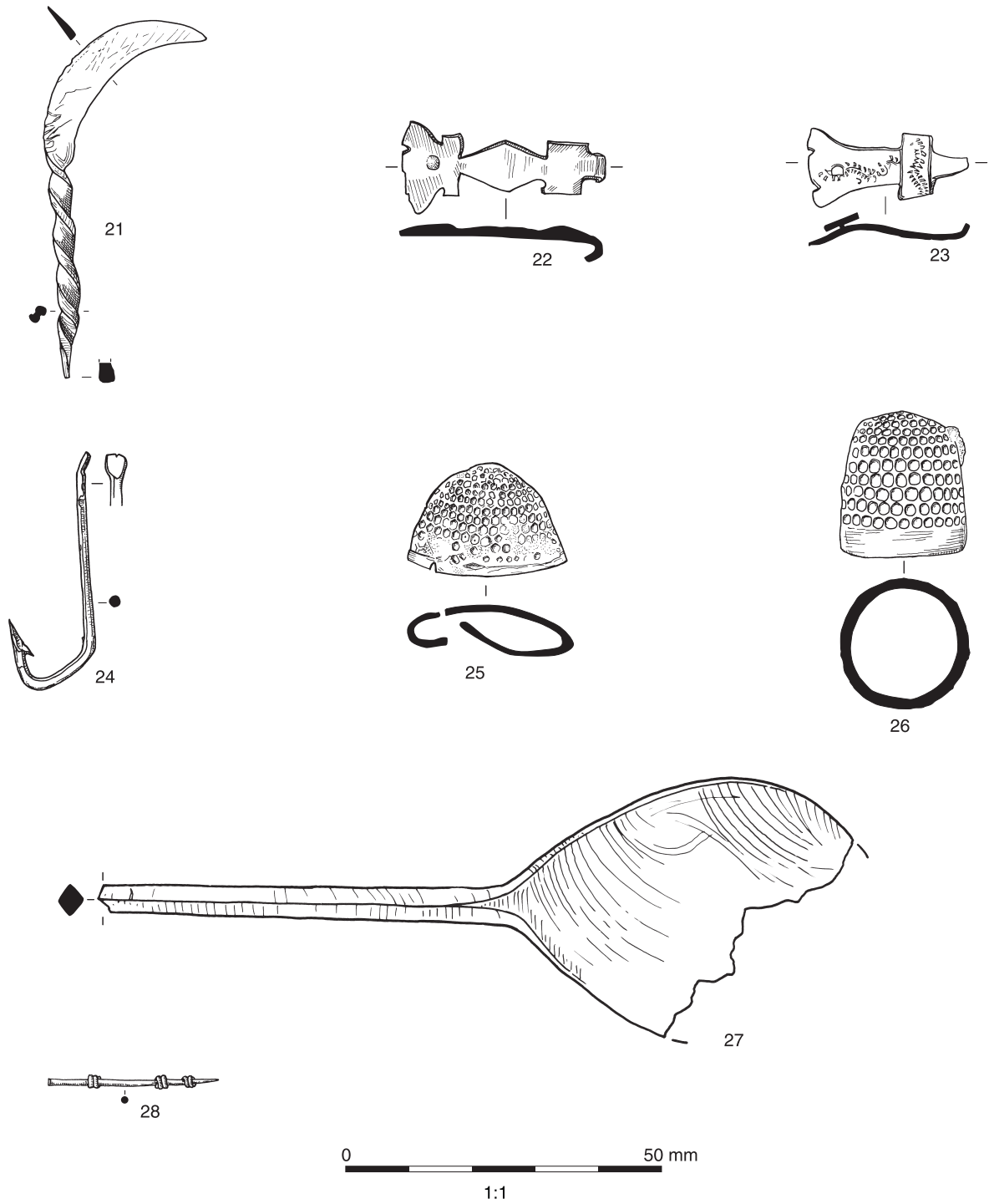
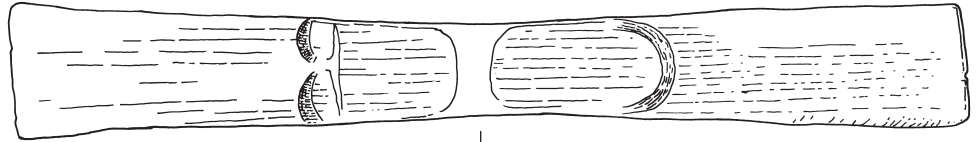


Fig. 5.35 Copper alloy: clasps, thimbles and various objects (Nos 21-28)

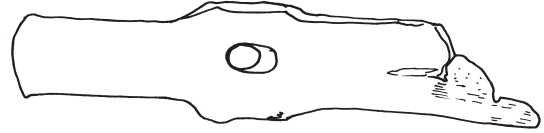
Fig. 5.36 (opposite) Iron: Arms, accessories and tools (Nos 1, 4-6, 9, 15)



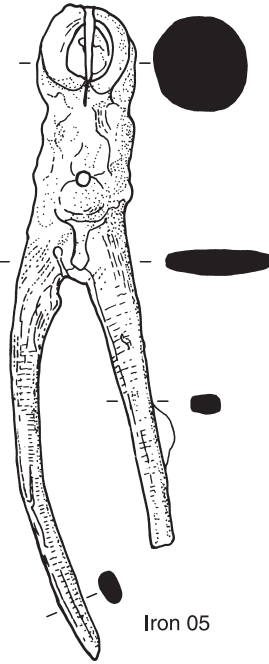
Iron 01



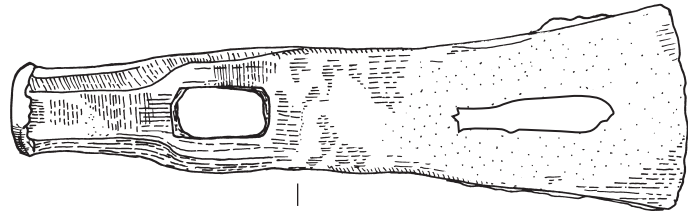
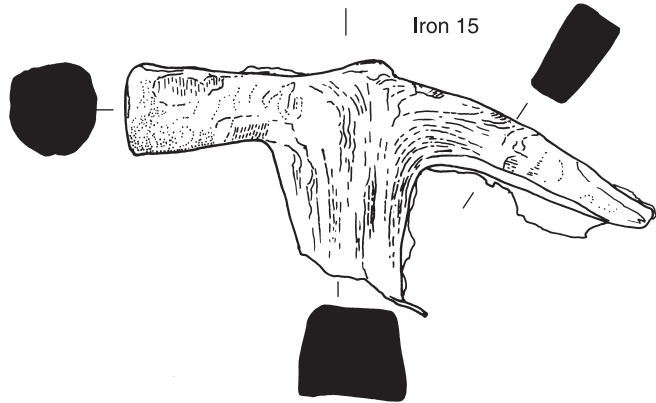
Iron 06



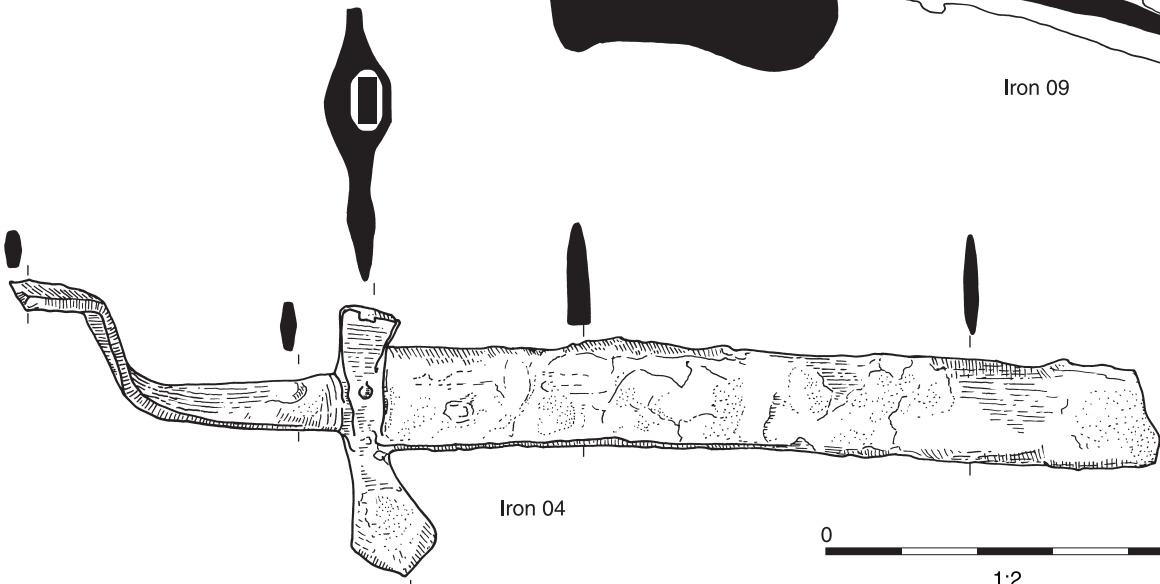
Iron 15



Iron 05



Iron 09



Iron 04



1:2

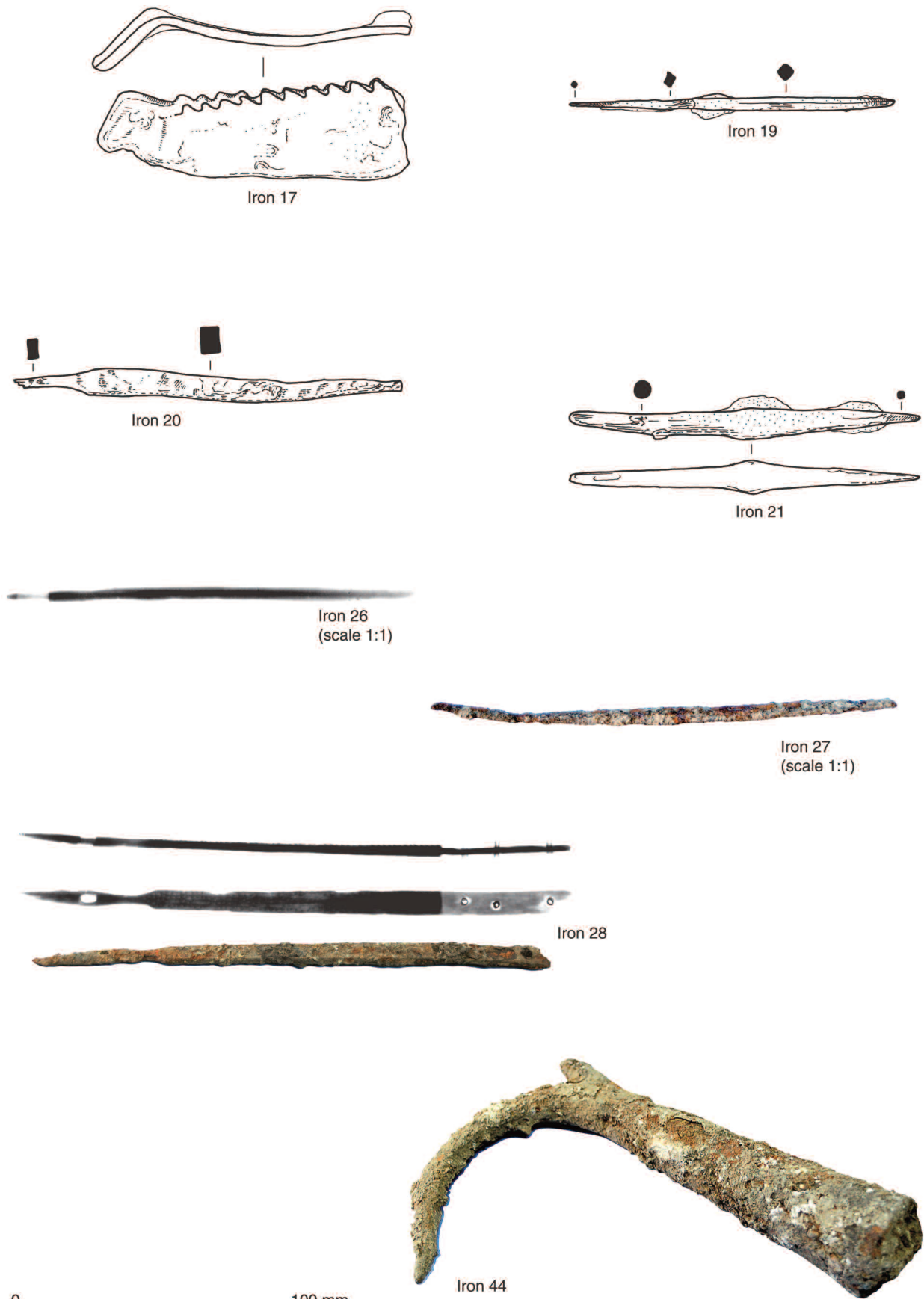


Fig. 5.37 Iron: Tools (Nos 17, 19-21, 26-28, 44)





0 250 mm  
1:5

Fig. 5.38 Iron: Industrial machinery and tools (Nos 45-48, 55, 57)



Iron 62

*Fig. 5.39 Iron: Forked socketed object (No. 62)*

- 27 **Saddlery or upholstery needle** with circular section stem. The eye is broken. The point is an elongated leaf-shape of diamond cross-section and slightly curved. L 112mm. 300 (13462) unphased. (ID 1985)
- 28 Possible **bailing needle**? Object with a scale tang handle, with 3 cu alloy rivets. There is a step to the blade, which tapers slightly and is of rectangular section. This portion has possible 'toothing' along one edge. The narrow end is then waisted before terminating in an elongated point with a perforation through it. Possibly some kind of bailing needle. L 199mm. 12/2 (9507) sf 1836 unphased. (ID 1058)
- 44 Possible **Boat hook**. Circular section socket. The hook is large and its end is has a slight bend. The spike is very small, almost vestigial. L 182mm; W 130mm. 300 (13463) sf 2615 Ph 4. (ID2036)

Figure 5.38

- 45 **Fire shovel**, with a long handle terminating in a small loop. Much of the fore part of the shovel blade is missing. L 950mm. REORM (12473) sf 2524 unphased. (ID 2072)
- 46 **Fire shovel**, with a long handle. Most of the shovel blade is eroded away. The handle is bent and terminates in an oval loop. L 695mm. REORM (12473) sf 2522 unphased. (ID 2074)
- 47 **Ash tray**. Rectangular tray with small upright vertical rim folded up on all four sides and riveted at the corners. The rod handle terminates in a neat loop. L 540mm. REORM (12473) sf 2521 unphased. (ID 2073)
- 55 Possible **mechanised mixing paddle**, comprising central spindle, with machined collar near one end. There is a short bar which turns about the spindle. Attached to each end of the short bar is a single long strip each of which has a series of staples along one face. These staples probably served to attach organic paddles. The strips are twisted. Probably a mechanically driven paddle for bulk mixing. L 720mm. REORM (12531) sf 2527 unphased. (ID 2075)
- 57 **Spanner**. Large spanner with square head at each end, one internally 45mm x 45mm, the smaller 35mm x 35mm. They are linked by a heavy bar which curves down to the ends. Spanner for use with machinery? L 420mm. 300 (13955) unphased. (ID 2027)
- 59 (Illustrated on Fig. 5.41) **Object**, with open socket at the centre; one end is formed of square section rod and ends in a hook; the other end is in the form of a strip and is incomplete. Function unclear. L 190mm. 12/1 (633) Ph 7. (ID 599)

Figure 5.39

- 62 **Large forked socketed object**, with waterlogged timber in socket. Attached by means of nails or bolts to wooden beam. In addition it has an iron band around the socket. Similar to sf 709, but much larger. The object is marked with 'VV [or W] L' followed 'XII on one fork, and on the other with 'VV [or W]

C'. L c 610mm. 28 (8473) sf 708 unphased. (ID 1876). The function of this is uncertain. It may have served as the end of a prop or similar.

Figure 5.40

- 63 **Large forked object**, with open socket with 2 nail or bolt holes. Similar to but smaller than sf 708. The object has several markings: at the base of the fork is a 'P'; one arm has a crudely inscribed 'VV' or 'W', the other possibly 'DW', but the letters are very poorly formed. L c. 400mm. 28 (8473) sf 709 unphased. (ID 1877)

Figure 5.41

- 73 **Bridle bit**. Fragments of side bars from a curb bit identified from x-ray plates. The longer fragment is 175 mm and has part of a curving elongated lower arm. The outer part of the D ring to which the reins were attached is lost, but part of the jointed mouth bar survives. The shorter piece is 135 mm, and comprises the complete upper portion of the side bar, upper ring with attached small link, the D ring to which the reins were attached, part of the mouth bar and part of the lower arm. The small link attached to a ring at the top of the side bar is part of the curb chain. L 175mm & 135mm. 29 (5071) sf 1040 Ph 6. (ID 1074) P
- 74 **Bridle bit**. Comprises two elongated sidebars from a curb bit. One is incomplete but otherwise well preserved. This comprises a D ring to which the reins and mouth bar would have been attached, and an upper ring with an attached figure-of-eight link and hook to which the curb chain was fixed. There is a square lug below the D-ring with a small square hole, to which a decorative roundel could be attached. The second sidebar is bent and encrusted, but the long lower bar is present, with a straight bar looped at each end, attached to it. Probably 18th century in date. L 234mm. 28 (8160) unphased. (ID 702)
- 75 **Bridle bit** fragment of side bar with D ring. L –mm. 29 (4439) Ph 8.
- 80 **Junction plate**. Tapering plate with two nail or rivet holes, and hook or eye at the narrower end, which has decorative cut outs. Probably for horse harness. L 55mm. 12/1 (900) Ph 8. (ID 754)
- 81 **Harness fitting**, comprising an elongated oval link with an attached swivel ring and a T-shaped buckle at each end. Probably from a bridle. L 100mm. 28 (8395) unphased. (ID 714)

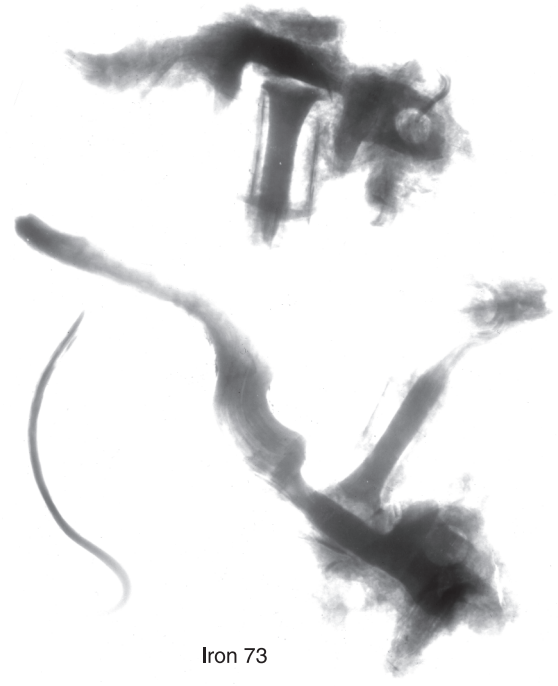
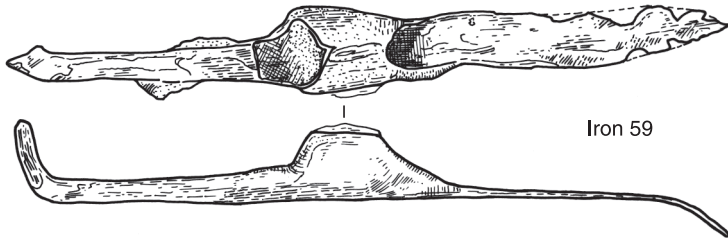
Figure 5.42

- 82 **Rowel spur**, almost complete rowel spur. The rowel is missing, the neck is short and very slightly curved up, the crest is low and the arms are only slightly curved, with single loops at their ends. This is a small example. Probably of 14th-century date. L 115mm. 12/2 (9511) sf 1823 unphased. (ID 1046)
- 83 **Rowel spur**, incomplete. Rowel spur, with deeply curved sides, of flat section. The sides meet at a peak. There is long neck of ?diamond section. The



Iron 63

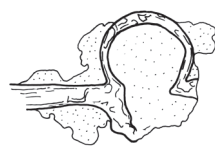
*Fig. 5.40 Iron: Forked socketed object (No. 63)*



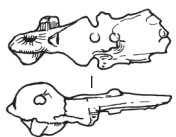
Iron 73



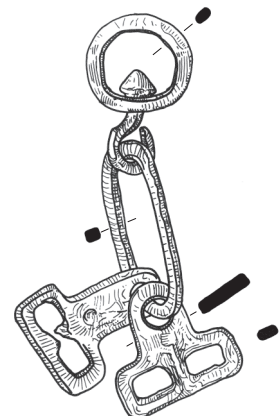
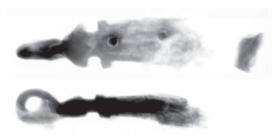
Iron 74



Iron 75



Iron 80



Iron 81

0 100 mm

1:2

Fig. 5.41 Iron: Object of uncertain function (No. 59) and horse and riding gear (Nos 73-75, 80-81)

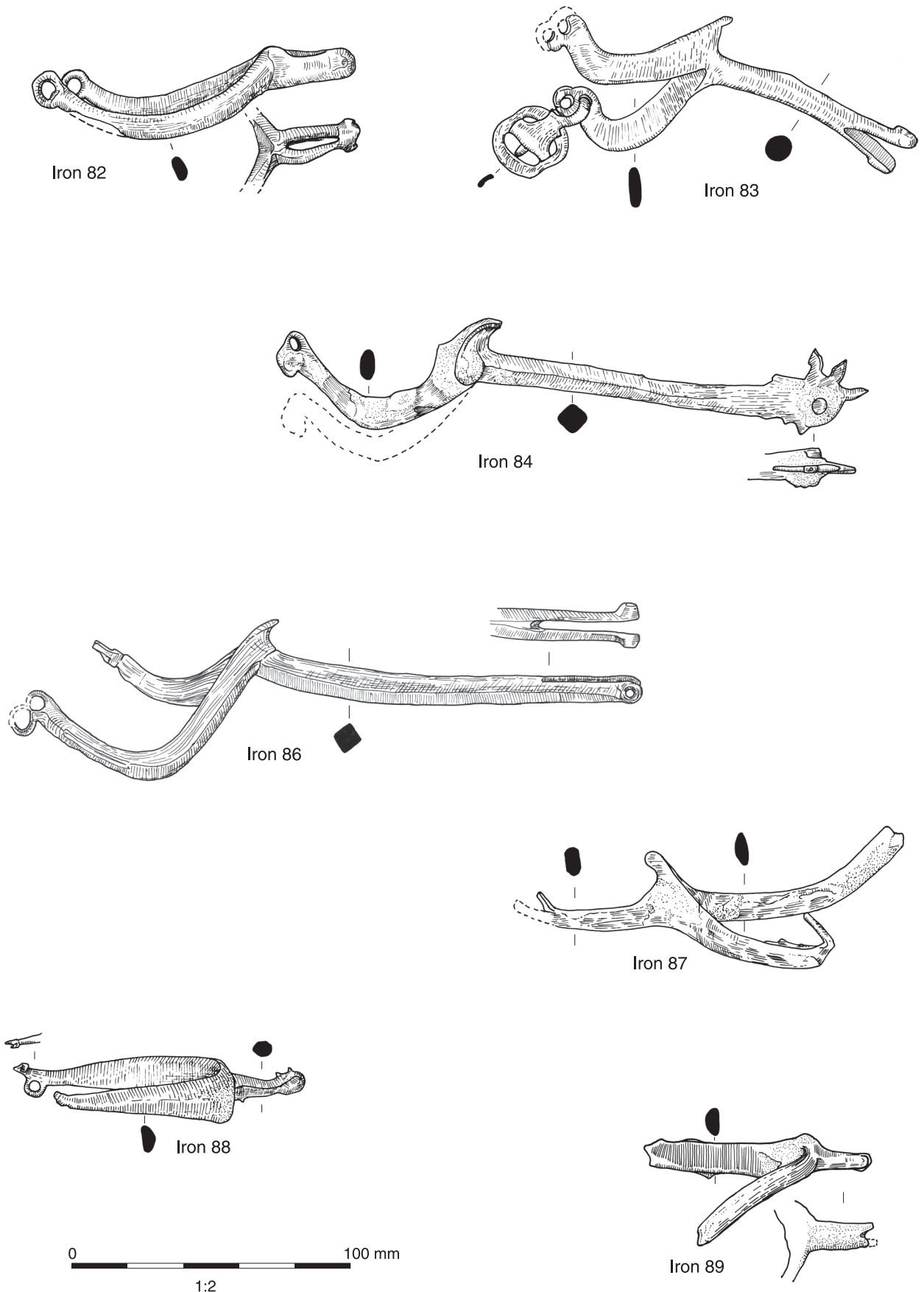


Fig. 5.42 Iron: Spurs (Nos 82-84, 86-89)

neck is slightly curved and slotted at the end to form the rowel box. The sides end in figure-of-eight terminals. A buckle is attached to one loop. 15th century. L 150mm; W 120mm. 300 (13463) sf 2616 Ph 4. (ID 2046). See an example from Trig Lane (Ellis 1995, 144 & fig 103, 348).

- 84 **Rowel spur**, almost complete. The neck is long and of diamond section. The rowel still in the slotted rowel box. The peak has a high crest. Only one arm, with a figure-of-eight terminal remains. The sides are deeply curved and have a flat rectangular section. 15th century. L 192mm. 12/2 (8731) sf 1688 Ph 5. (ID 959). See an example from Baynard Castle (Ellis 1995, 146-7 & fig. 104, 355).
- 86 **Rowel spur**, almost complete. It has deeply curved sides of triangular section, ending in figure-of-eight terminals. The sides meet at a peak at the junction with the neck. The neck is long and of diamond cross-section, and has a slotted rowel box. 15th century. L 217 mm. 101 (7209) sf 1328 Ph 6. (ID 850). Probably of 15th-century date.
- 87 **Rowel spur**, incomplete. It has curved sides of half round section. The sides meet at a distinct peak above the straight rowel neck. The latter is short and of oval cross section, and has a slot for the rowel, now lost. The arms appear to end in figure of eight terminals. 15th century. L 130mm. 12/2 (8504) sf 1603 Ph 8. (ID 902)
- 88 **Rowel spur** with straight tapering sides of triangular section. The sides originally probably ended in small figure-of-eight terminals. Short circular section neck probably with slotted rowel box. Possible decoration but not clear. 17th century. L 102m; W 69m. 300 (13273) sf 2606 Ph 7. (ID 2067)
- 89 **Rowel spur**, with short slotted neck but no rowel. The sides are straight and of half round section, not very deep. 17th or 18th century. L 70mm. 29 (3894) sf 815 Ph 8. (ID 861)

Figure 5.43

- 92 **Stirrup iron**, flattened but complete and otherwise well preserved. The sides are flat with thickened edges and pierced with a pattern of slots and small holes for decoration. The footrest comprises three bars of rectangular section, the central one flat, the outer ones on edge. The slot at the top to hold the stirrup leather is stepped, but undecorated. Possibly Tudor?. L 260mm. 12/2 (8567) unphased. (ID 1911)
- 93 **Stirrup iron**, with swivel attachment at the top to hold the stirrup leather. The footplate is formed from strips and is circular. The sides are formed from rod, flattened towards the foot plate. Later 17th or 18th century. L 159mm; W 128mm. 12/2 (8696) sf 1675 Ph 8. (ID 1005)
- 94 **Curry comb** with a blade of semi-circular cross-section and a handle that divides into two arms that are riveted to the back of the blade by means of two flattened terminals. One of the terminals ends in a rolled-over loop with an attached ring, the other ogee has no loop. There are two loose rings on each of the two arms. There are traces of teeth at the edge

of the blade. The extant end of the blade is strengthened by thickening. Medieval. L 198mm; W 158mm. 12/2 (8655) sf 1734 Ph 6. (ID 989)

- 95 **Curry comb handle**. The handle was tanged and has three arms with loose rings from tanged curry comb handle. Each arm is flattened and pierced for a rivet near its end, and each terminates in a rolled-over loop holding a loose running ring. In addition there is a further single loose rings on each arm of the handle. The blade is missing. Medieval. L 208mm. 12/2 (8661) sf 1736 Ph 6. (ID 1912)

Figure 5.44

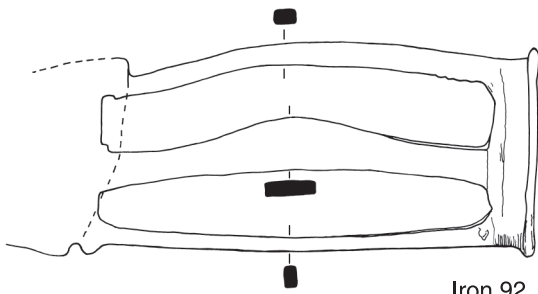
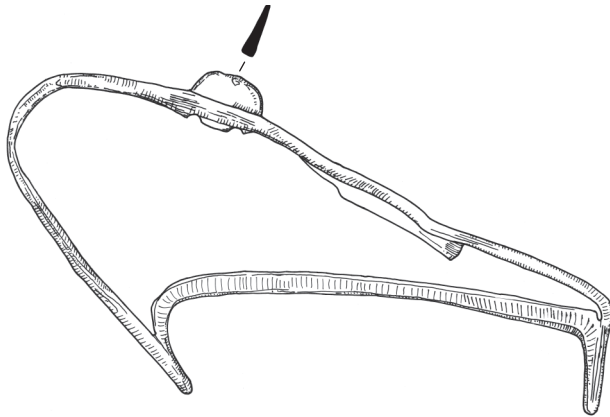
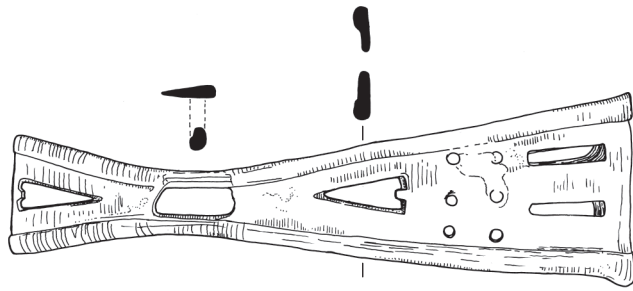
- 132 **Cast iron lion head plaques**. Two decorative fittings. They are shaped in such a way as to suggest that they were attached to a curved object or objects. There is only a single nail or rivet hole visible below the mouth of each lion plaque. They are hollow cast. Ht 100mmW

Figure 5.45

- 154 **Whittle tang knife**. Large whittle tang knife with a triangular blade and centrally placed tang. L 202mm. 12/2 (8616) sf 1631 Ph 5. (ID 906)
- 155 **Whittle tang knife**. Whittle tanged knife with almost triangular blade of triangular section. The tang is centrally placed and the edge has a slight s-curve. The back is straight. L 145mm. 12/2 (8616) sf 1634 Ph 5. (ID 913)
- 156 **Whittle tang knife**, with an almost triangular blade, the tang is central to the blade. The back of the blade is straight but angled down, at the tip it curves down to meet the straight edge. L 151mm. 12/2 (8974) sf 1748 Ph 5. (ID 1041)
- 157 **Whittle tang knife**. The blade, of triangular section has a sinuous back; the point is missing. L 154mm. 29 (5520) sf 1122 Ph 5 to 6. (ID 1272)
- 158 **Whittle tang knife**, poorly preserved, with possible maker's mark 'T' on one face. L -mm. 29 (5412) unphased. (ID 1064)
- 160 **Whittle tang knife**. Small whittle tang knife with broken blade and broken end of tang. Tang appears centrally placed. Rounded choil. Possible remains of a shoulder plate made of non-ferrous metal. L 98mm; W 11mm. 300 (13282) sf 2540 unphased. (ID 2063)
- 162 **Whittle tang knife**, with possible ?bolster. The blade has a possible curved back and straight edge, incomplete; tapering bone handle of sub-rectangular section. Maker's mark on blade. L 145mm. 29 (4465) sf 935 Ph 6. (ID 986)
- 163 **Whittle tang knife**, large, with a simple wooden handle. The blade is parallel sided and ends in a tapered point. The end of the tang has been roughly flattened to secure the handle. L 350mm. 12/2 (8510) sf 1621 Ph 6. (ID 1672)

Figure 5.46

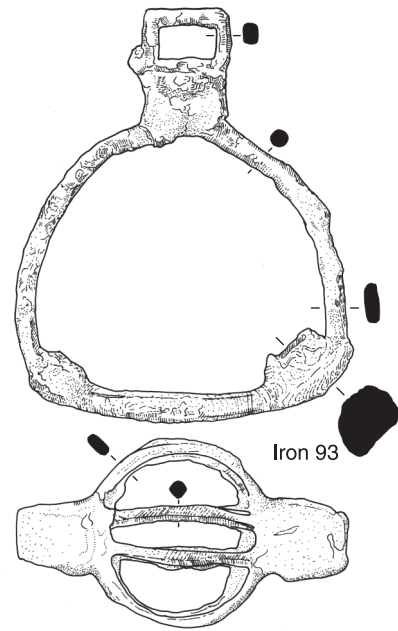
- 164 **Whittle tang knife**. Blade of triangular section. The back of the blade and the blade edge run parallel. L 138mm. 12/2 (8655) sf 1642 Ph 6. (ID 976)
- 166 **Whittle tang knife**. It has a non-ferrous copper alloy hilt band around shoulder of tang and cylindrical



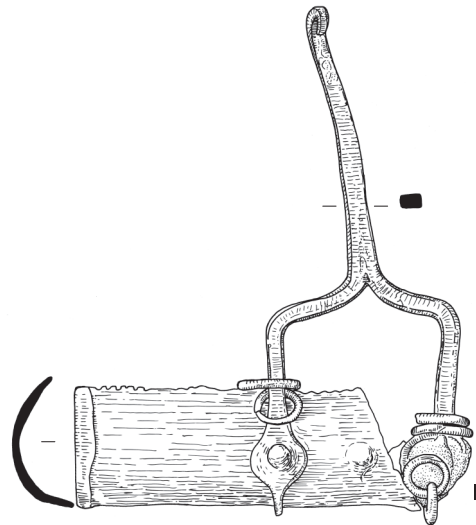
Iron 92



Iron 95



Iron 93



Iron 94

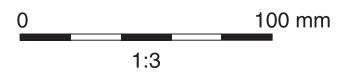


Fig. 5.43 Iron: Riding and horse gear (Nos 92-95)





Fig. 5.44 Iron: Cast iron lion head plaques (No. 132)

Iron 132

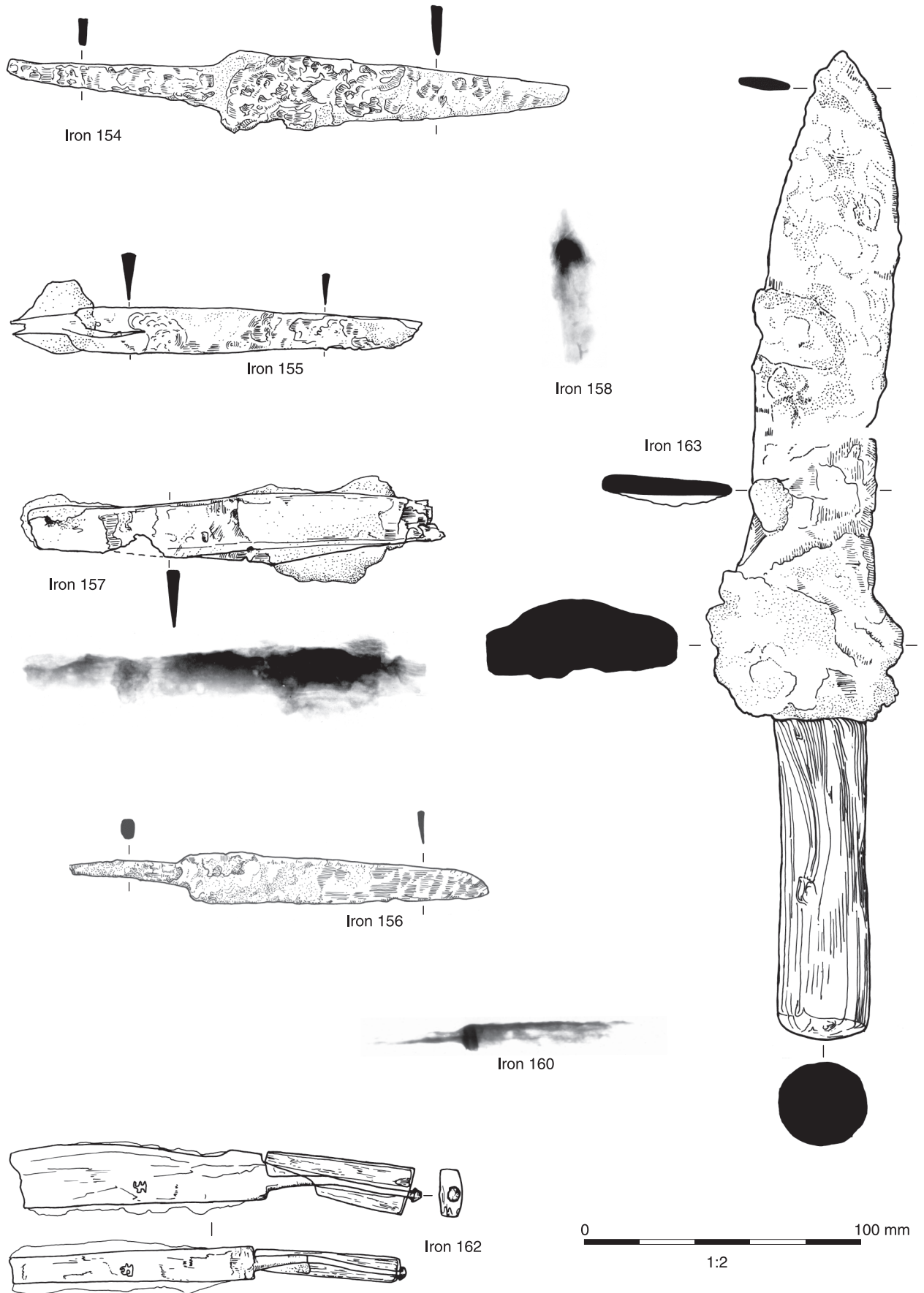


Fig. 5.45 Iron: Knives (Nos 154-58, 162-63)

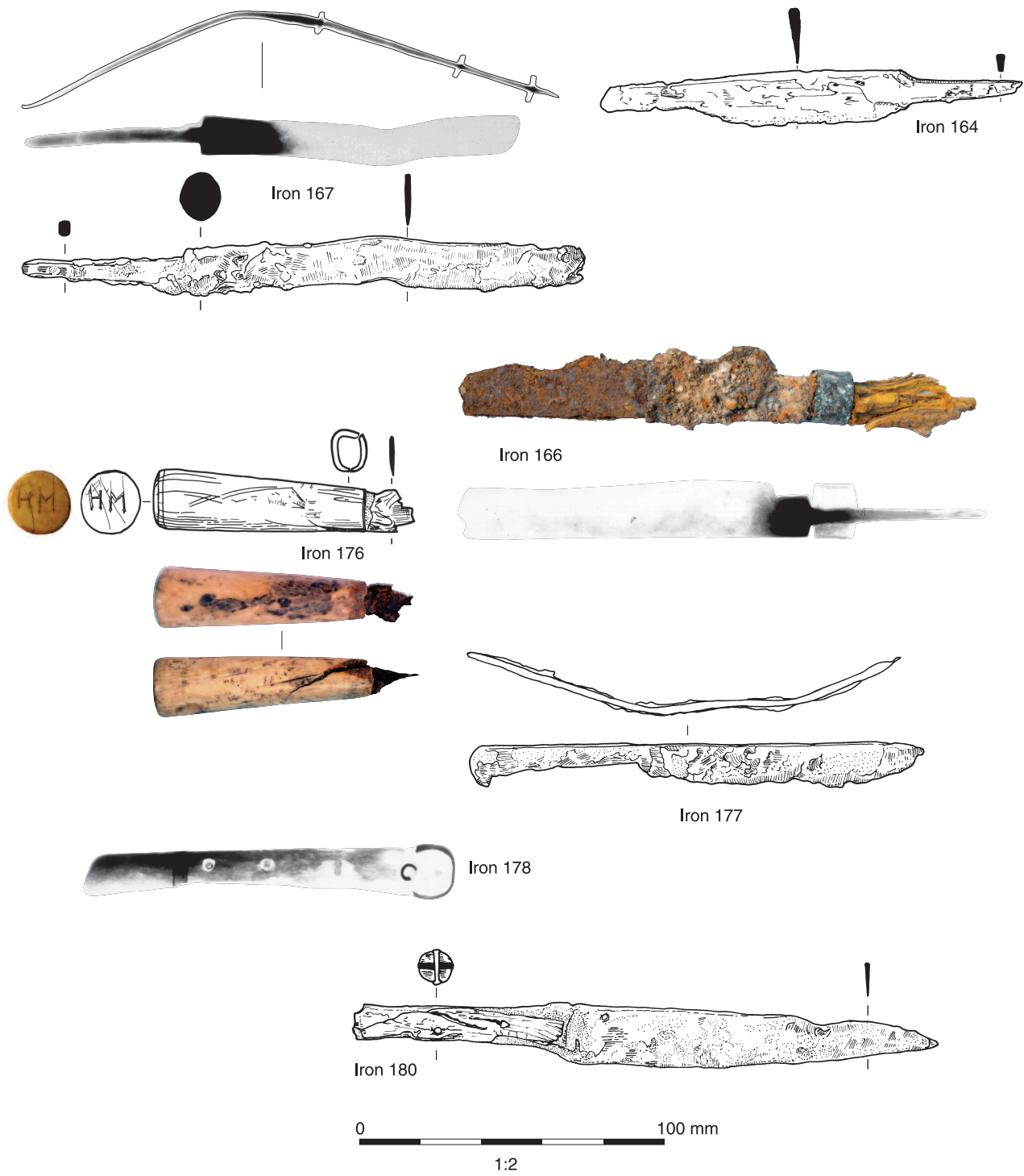


Fig. 5.46 Iron: Knives (Nos 164, 166-67, 176-78, 180)

- wood handle. There is a solid bolster. The end and cutting edge of the blade are broken. The blade has a straight back and angled choil. L 170mm; W 22mm. REORM (12691) sf 2588 unphased. (ID 2070)
- 167 **Whittle tang knife**, with elongated solid bolster and broken blade. The back of the blade has a marked peak. The cutting edge is slightly eroded but appears to have matching shape. L 183mm; W 22mm. 300 (13462) unphased. (ID 1987)
- 168 **Whittle tang fruit knife** (NI), with decorated bone handle and elongated solid bolster. The back of the blade is straight. The choil is rounded, the edge curved. The brown bone handle is highly polished and, towards the end on each face of the handle, there is a circular depression with 8 small circles around it with radiating lines of dots between each small circle. The blade is broken but the back is straight and the edge eroded. L 133mm; W 11mm. 300 (13881) sf 2635 unphased. (ID 2041)
- 176 **Whittle tang knife handle**. Comprises tapering polished ivory handle of circular section with fragment of knife blade attached by a rod tang. The initials HM have been scratched on the flat end of the handle. L 92mm. 29 (3864) sf 850 Ph 9. (ID 877)
- 177 **Scale tang knife**. Complete scale tang knife. Bent. Straight line from handle through top of blade. Edge eroded, slightly curved and curves up to point. Possible square choil. Handle ends in slight hook. Three rivets/ rivet holes. L 145mm; W 12mm. REORM (12523) Ph 4. (ID 1962)
- 178 **Scale tang knife**. Broken scale tang blade with parts of handle (wood?) preserved. There are the remains of four rivets in handle. The blade back is straight. The handle widens at the end and has a non-ferrous cap. The x-ray reveals that the knife has non-ferrous hilt plates L 120mm; W 14mm. 300 (13463) sf 2609 Ph 4. (ID 2069)
- 180 **Scale tang knife**, nearly complete. Only the end of the tang is missing. The tang has two rivets through it to secure the wooden scales (traces of the wood remain). The tang and the back of the blade are almost continuous, and dip slightly at the tip to meet the curved cutting edge. L 191mm. 12/2 (8857) sf 1722 Ph 5. (ID 994)
- Figure 5.47*
- 184 **Scale tang knife**, with antler handle plates. There are five hollow rivets through the handle and a copper alloy band/hilt plate. L 130mm. 12/2 (8655) sf 1751 Ph 6. (ID 1033)
- 185 **Scale tang knife**, with tapering tang pierced by 4 nail holes; the blade has a straight back and curved edge. L 210mm. 29 (4573) sf 954 Ph 7. (ID 1003)
- 187 **Scale tang knife**, with long tapering narrow blade with a rounded point and triangular section. The handle has a round end and there is a U-shaped hilt cap wrapped around the end. The handle has seven perforations, three of which have hollow copper alloy rivets. L 209mm. 12/2 (8502) sf 1607 unphased. (ID 909)
- 188 **Scale tang knife**. The blade is of triangular section, with a slightly curved back and a curved blade tapering to the tip which is missing. There are 2 nail holes through the tang, close to the junction with the blade. L 202mm. 12/2 (9078) unphased. (ID 1633)
- 190 **Scale tang knife**, with much of handle missing. There are the remains of possible hilt plate at junction of handle and blade. The handle and back of the blade are straight. The blade edge is curved, with a round choil and rounded tip to blade. L 165mm; W 20mm. 300 (13360) unphased. (ID 1977)
- Figure 5.48*
- 228 Large hook from **hook and eye fitting** for clothing. Probably 17th-century in date. L -. 29 (4440) Ph 8.
- 237 **Purse mount**, comprising iron rod pierced at the centre for the attachment of a swivel ring; the rod tapers slightly to each end and is pierced by a single small eyelet spaced at c. 45mm either side of the swivel for the attachment of the purse bag. L c. 290mm. TP 15 (1135) unphased. (ID 563)
- 240 **Key** for a mounted lock with an oval, or kidney-shaped, bow. The end of the solid shank protrudes beyond the bit. The bit is symmetrical, there is a stop over the bit in the form of a raised step. The bit has two opposed wards. L 107mm. 12/2 (8503) sf 1601 Ph 6. (ID 914)
- 241 **Key** for lever lock, with hollow stem joined to the plain oval bow by a solid collar; the bit has two vertical slots. L 86mm. 12/1 (766) sf 60 Ph 8. (ID 570)
- 242 **Key** for a mounted lock, with oval bow and a symmetrical bit with opposed wards. The stem is stepped by the first half of the bit and extends beyond the second part of the bit. L 105mm. REORM (12001) Ph 9. (ID 1949)
- 243 **Key** for a mounted lock with a stem that extends beyond the end of the bit. The stem has a step near the back of the bit, which has three wards. The bow is a plain oval, but incomplete. L 129mm. 12/2 (9307) unphased. (ID 1636)
- 244 **Key** with square bit and round bow. Bit is large, but heavily encrusted. In poor condition. Key for a mounted lock, probably medieval. L 108mm. REORM (12678) sf 2545 unphased. (ID 2043)
- 245 **Ward plate**, comprising slightly curved plate with an arched top. The plate narrows to each end and has a cut out or key hole at its centre. The x-ray shows traces of what appear to be cuts in metal on X-ray, but are probably remains of the wards. L 78mm. 29 (3729) Ph 8. (ID 1409)
- 256 **Butterfly hinge**, large with 5 nail holes in each plate. L 101mm. 29 (4338) sf 908 Ph 7. (ID 953)
- 258 **H-hinge**, or possibly **T-hinge** fragment. Comprises hinge cylinder with part of one plate. This tapers slightly and is rounded at the end with a small diamond shaped extension. Four extant nail holes. L 149mm. 29 (3793) Ph 10a. (ID 1414)
- Worked stone*
- Figure 5.49*
- 1 **Slab-shaped primary whetstone**. Fine-grained grey micaceous sandstone. Broken at both ends. One face

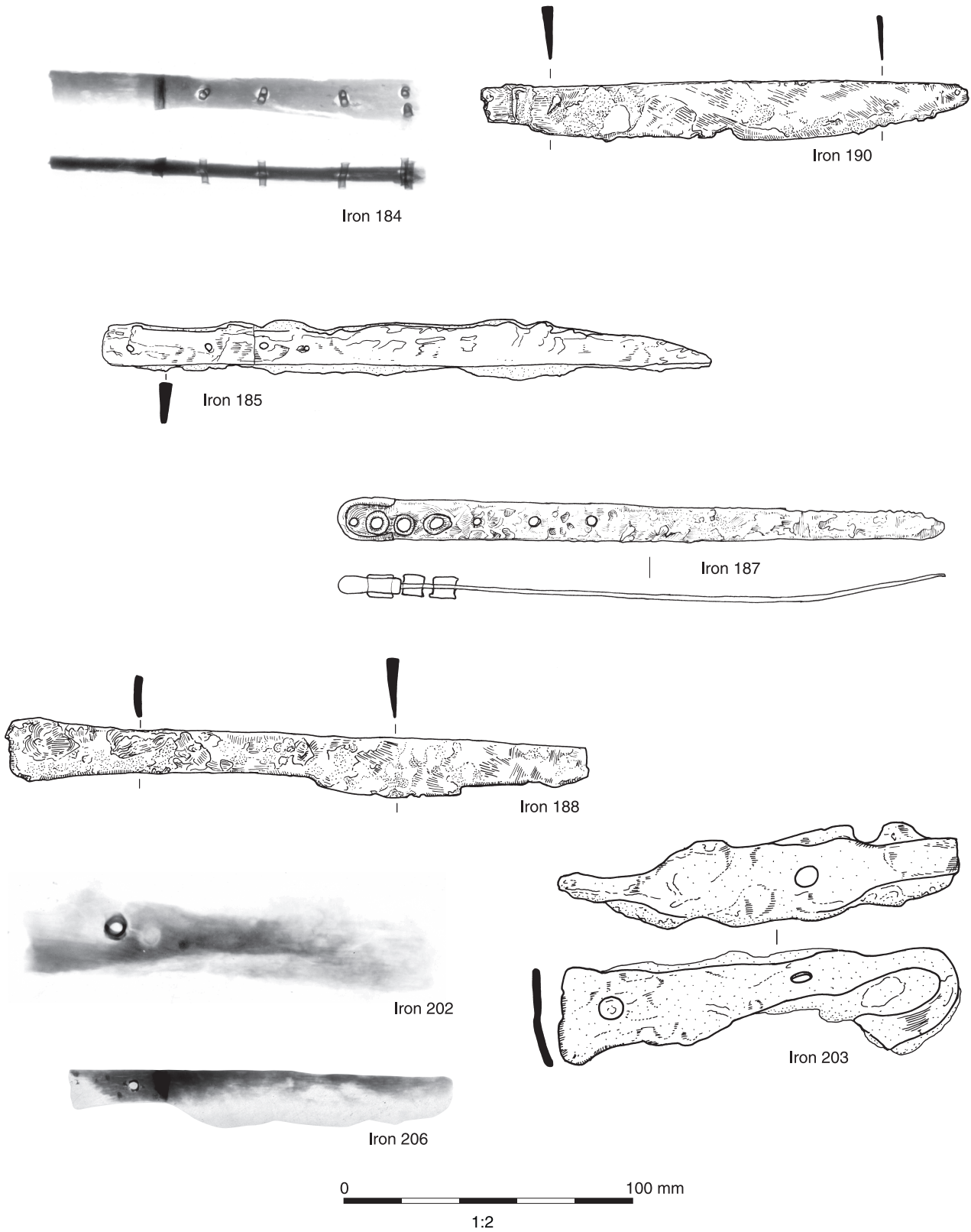


Fig. 5.47 Iron: knives (Nos 184-85, 187-88, 190)

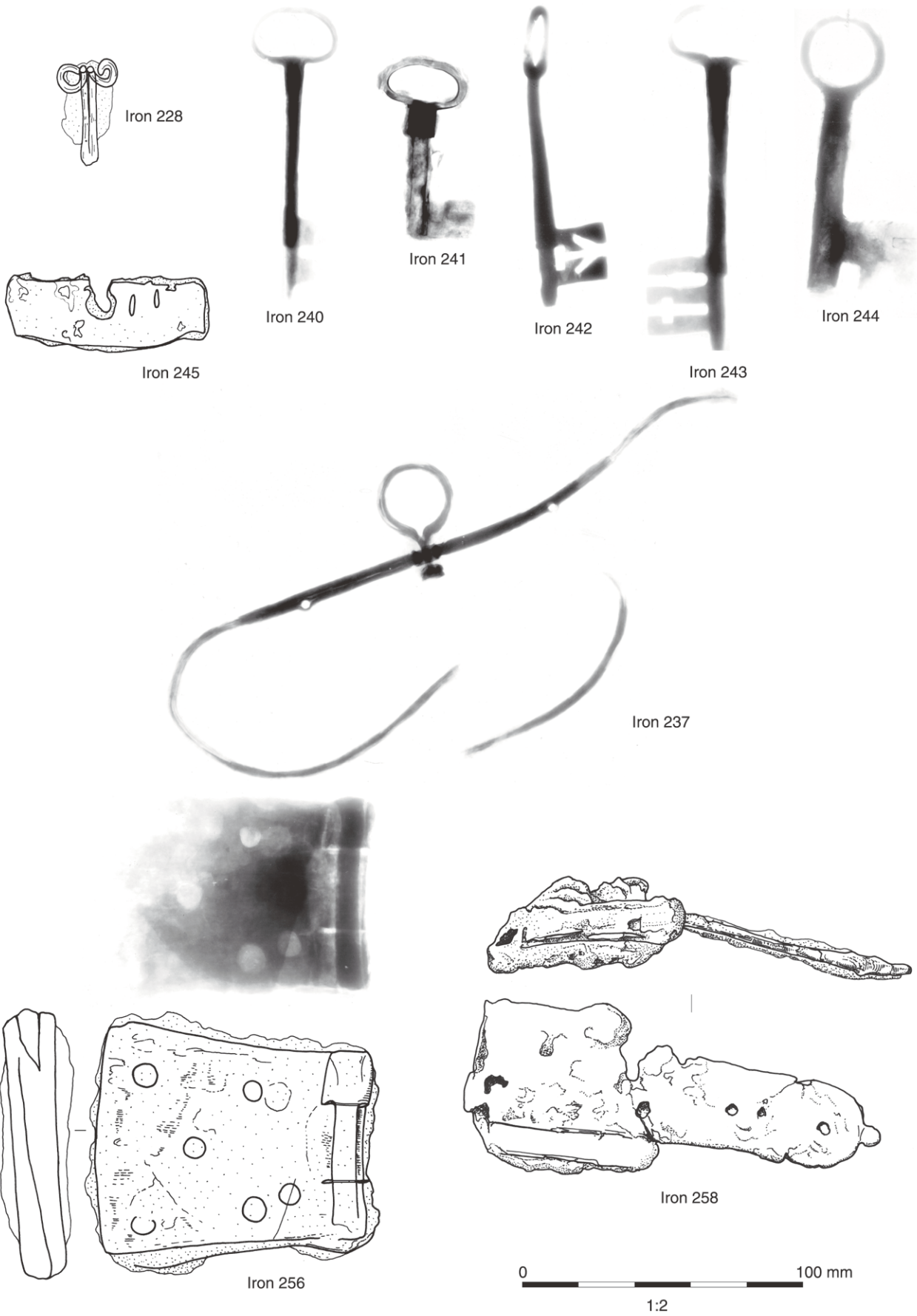


Fig. 5.48 Iron: Personal items keys and hinges (Nos 228, 237, 240-45, 256, 258)

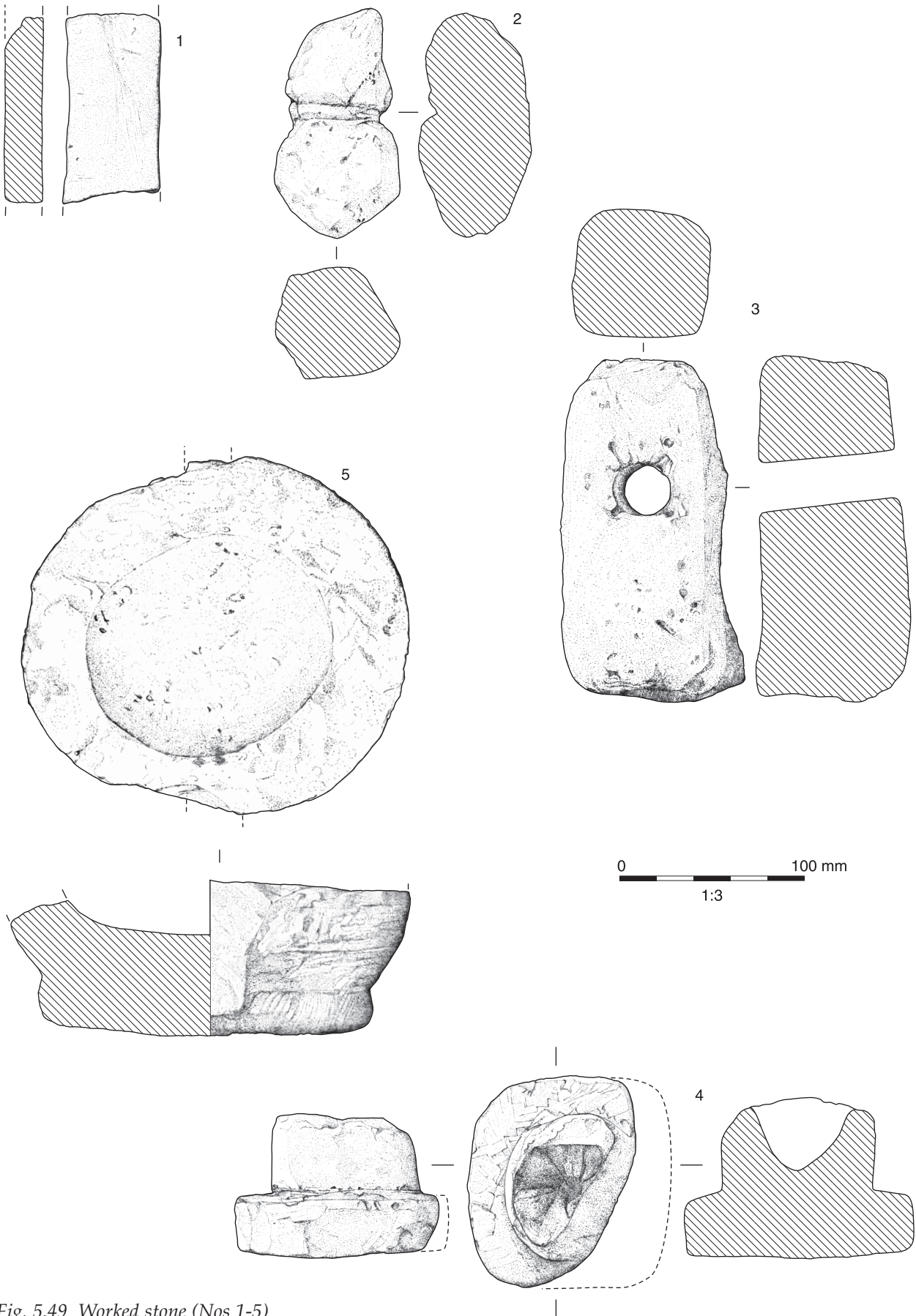


Fig. 5.49 Worked stone (Nos 1-5)

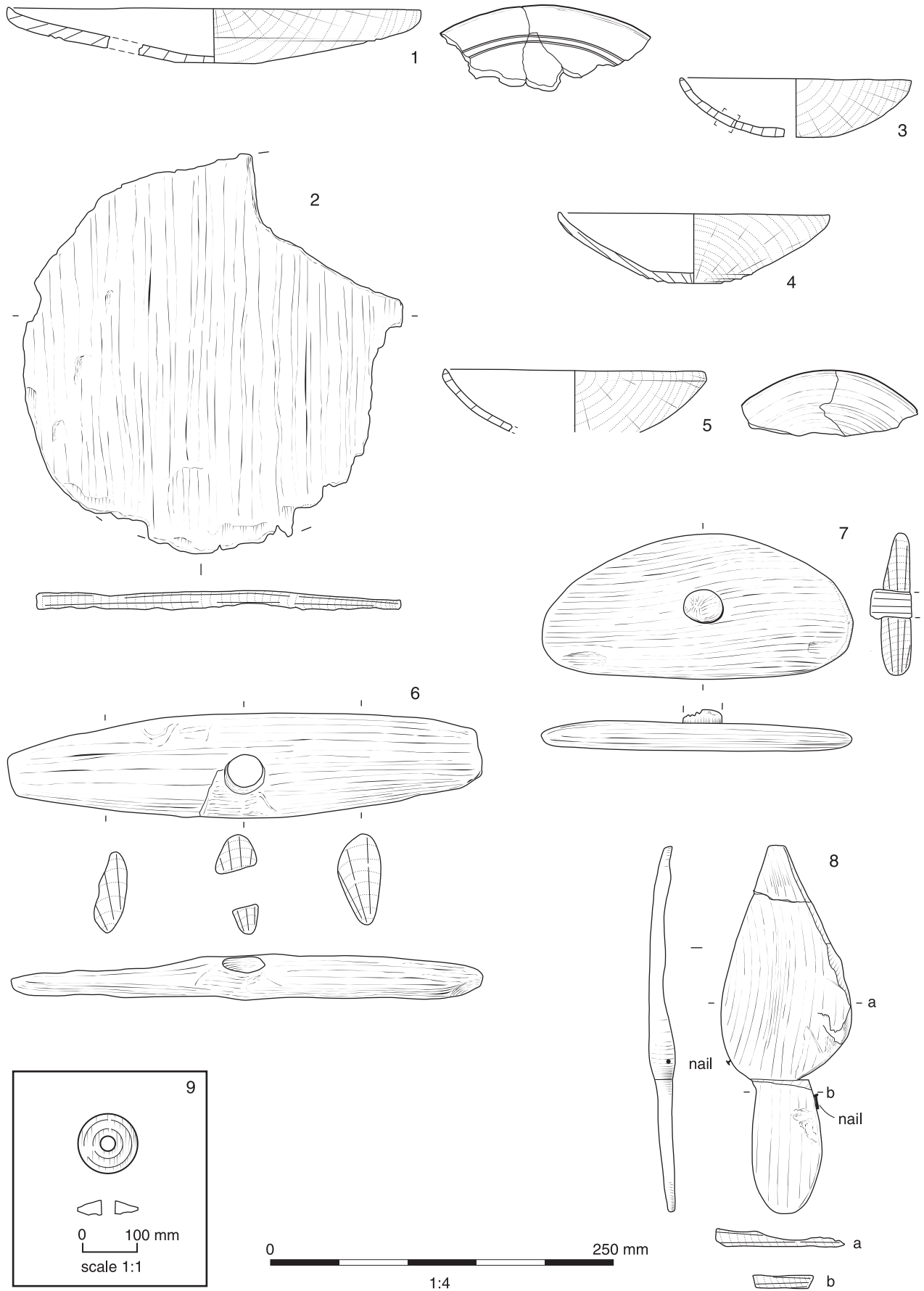


Fig. 5.50 Wooden objects (Nos 1-9)



is particularly smooth and has wear marks an polish longitudinally along the surface. Measures 100 mm remaining length x 51 x 21 mm. Ctx 8895. SF 1739. Ph 1206b

- 2 **Possible fishing weight.** Chalk. Roughly ovoid shaped stone with wear marks around the middle caused by attachment of cord rubbing away at the stone. Probable fishing weight. Ctx 7317. SF 1336
- 3 **Oblong weight.** Oolitic limestone. Large well shaped weight with perfectly circular and cylindrical perforation which is worn inside and with fittings on one face. Slightly damaged at each end. Measures 181 x 87 x 84 mm. Site 12. Ctx 8719. SF 670
- 4 **Crudely worked lamp with base.** Fine grained Jurassic limestone. Inside is burnt around the top half. Measures 115 mm square x 80 mm high. ST 815. Site 29. Ctx 6882. SF 815
- 5 **Base of mortar.** Fine grained shelly jurassic limestone. Mortar with thick base and remains of two diametrically opposed ribs. Nicely worked edges and smooth inside. Base inside is fairly flat and has an internal diameter of 105 mm although it has been worn through use into an oval shape. Site 28 (TP 180, in site 29). Ctx 11396. SF 721 Ph 2-3

### Wooden objects

Figure 5.50

#### Wooden Vessels

- 1 **Turned bowl.** Eight fragments of which three refit, forming part of a wide, shallow, face turned vessel. Two prominent turned grooves around exterior at mid height. Black residue on inner and outer faces. Turned from tangentially faced *Alnus spp.* block. c. 300 mm dia, c. 38 mm high. Wall of vessel 10 mm th. Ctx 9110 SF 1777. Project Phase 5-6, Site 12.
- 2 **Lid.** Cut to roughly circular plan but much damage and erosion, especially to edges. Several small charred patches on one face and part of edge. Radially faced oak (*Quercus sp.*). 267 mm max dia., 10 mm th. Ctx 8655. Project Phase 6, 1207a
- 3 **Turned bowl.** Six fragments of which five refit, forming the rim and partial base of a face turned vessel. Black residue on inner and outer faces. Turned from tangentially faced *Salix spp.* block. c. 170 mm dia, 42 mm high. Wall of vessel 06 mm th. Ctx 7319 SF 1337. Project Phase 6, 10104b.
- 4 **Turned bowl.** Seven fragments of which several refit, forming part of a face turned vessel. Prominent turning marks. Black residue on inner and outer faces. Turned from tangentially faced *Alnus spp.* block. c. 200 mm dia, 49 mm high. Wall of vessel 06 mm th. Ctx 8306. Project Phase 7, 15006a.
- 5 **Turned bowl.** Three fragments refitting to form the rim and much of the wall of a face turned vessel. Sharp angle at rim, base missing. Prominent turning marks. Black residue on inner and outer faces. Turned from tangentially faced *Alnus spp.* block. c. 190 mm dia, more than 44 mm high. Wall of vessel 07 mm th. ctx 1319 SF 62. Not phased.
- 6 **'Raddle'.** Stave, tapered towards each end with

asymmetric twist along length. Rounded edges and a single central drilled hole, passing at angle from face to face, retaining part of a roundwood shaft.

Radially faced oak (*Quercus sp.*). 345 mm l, 78 mm w, 28 mm th. Hole 27 mm dia., roundwood 64 mm l.

Ctx 8696. Project Phase 8, 1210a.

- 7 **Rake head.** Board with one straight edge and one curved edge/ends. Edges and ends rounded. Single central drilled hole retaining the end of a roundwood handle. All surfaces worn. Head radially faced, both pieces oak (*Quercus sp.*). 230 mm l, 102 mm w, 19 mm th. Hole 25 mm dia, roundwood 22 mm l. Ctx 3202. Not phased, TP 11
- 8 **Wooden sole from Patten** for a right foot. Carved to give a rounded heel, broad instep and long tapering toe. Upper face smoothed to the contours of the foot. Lower face work and damaged. One nail in edge at rear of instep, second nail in opposing edge at heel. Broken into three refitting sections. Radially faced *Salix spp.* 267 mm l, 92 mm w, 18 mm th. Ctx 8942. Project Phase 4, 1204a.
- 9 **Button.** Single central through perforation. Bi-convex cross section with concentric groove on one face. Prominent turning marks. Cut from a ring porous hardwood, species not identified. 12 mm dia, 04 mm th. Hole 05 mm dia. Ctx 4781 SF 442. Project Phase 7, 2908e.

#### Metalworking

Other than the material reviewed above, the excavations did not recover evidence for metalworking on the floodplain on any significant scale, and there is no evidence for a tradition of metalworking here prior to the establishment of Wilder's Foundry in the early 19th century. Much of the evidence recovered is likely to relate to small-scale activity undertaken as part of general building and repair works. The exception to this was a relatively sophisticated forge operating on the George Hotel site (site 22), and the evidence for this is available in the project archive.

The most interesting metalworking remains came from the Yield Hall site (site 12), where bell-founding debris was identified (see Chapter 9, below). Since this was almost certainly dumped on the floodplain from elsewhere, we have only limited information about the activity it represents. The debris did, however, include mould fragments and casting dross, and seems to have derived from a single casting of a bell approximately 55 cm in diameter and 50 cm high. The metal used to make the bell was a high tin bronze, which, in combination with the stratigraphic evidence, suggests that the casting took place in the 15th or early 16th century. The Yield Hall site also produced metallurgical evidence for iron smithing during the 16th century and tools such as a smith's punch from a late 17th- to mid 18th-century context.

The excavations of St Giles Mill produced a smith's punch from a 13th- to 14th-century context, which may well have been lost during construction

works at this site. The function of a substantial cast iron crucible found at the site (unphased) remains unclear. Three unphased fireshovels (Fig. 5.38) are probably to be associated with the period when the mill had been converted to steam power.

### **Brewing**

Little physical evidence of brewing was found during the excavations, although it is attested in medieval documentary records, and was one of the most widespread occupations in medieval towns. A pit excavated in TP27 (adjacent to the site of the Minster Mill, see Chapter 2, above) produced a large assemblage of partially germinated oats and barley dating to the 12th century, which is interpreted as malting waste. The process of malting involves steeping the grain in water until it is swollen then turning it out onto the floor in a heap or 'couch' for the germination of the grain, the 'chitting'. Once this is sufficient, the process is terminated by parching or roasting in a kiln or oven ('curing') with hot air (Brown 1983; Corran 1975; Fenton 1978). The final stage involves the malted grain being 'cracked' before it is mashed; a process, as at the Oracle site, likely to be associated with a mill. A similar association of malting and mills was identified at West Cotton (Campbell 1994). At Minster Mill it appears that a fire may have destroyed the malting grain, and grain of wheat and rye possibly awaiting milling.

A hop seed was recovered from site 12. The transition from un-hopped to hopped beers is supposed to have occurred in the late 15th century (Corran 1975), although hopped beer was apparently brewed throughout the medieval period in Europe (Greig, 1996) and a large cargo of hops on the Graveny boat (Wilson & Conolly 1978) suggests hops may have been used from the 10th century. Hops were recorded in small numbers throughout the deposits at Reading Abbey and in large quantities by the 18th century (Carruthers 1997). By this time, malting and brewing had become major industries in Thames-side towns such as Reading and Abingdon, which supplied malt to London. The scale of the brewing industry in Reading at this period is reflected in the foundation of Simonds' large brewery on Bridge St by 1794.

### **Fishing, fowling and poultry-keeping**

The natural resources afforded by the floodplain and river channels were exploited in many different ways. At least three finds testify to fishing in the channels. A chalk fishing weight (or line sinker), was found in the silty deposits at the base of the Back Brook dating to the early 16th century (phase 10104b, Project Phase 6) and a probable barbed fish hook was found in a 17th-century context (phase 10105c). A further fish hook was also found in an unphased channel fill associated with St Giles Mill. Numerous fish trap structures were set up across the channels (see, for example, Plates 2.28 and 2.31).

The bone assemblage contains numerous examples of freshwater fish (chub, pike and perhaps eels and salmon) that could have been caught in the nearby streams and rivers. A holding tank for the storage of live fish was identified on site 101 (Back Brook).

Geese and ducks are present in substantial numbers in 15th- and 16th-century deposits on both site 12 and site 29 (Table 10.2) and may have been reared on the floodplain. As well as being used for food, these birds also provided the valuable resource of feathers. Naomi Sykes (Chapter 10, below) has noted an interestingly high representation of goose *carpometacarpi* in the site 12 assemblage. This is reminiscent of a 14th-century assemblage from Victoria Road, Winchester which Serjeantson (2002) interpreted as evidence for feather exploitation. Wild birds also appear among the bird bone remains (Table 10.2) and were presumably caught for the table: edible species identified include swan, grey heron, snipe, woodcock, golden plover, curlew, pigeons and partridge, although not all of these are likely to have been caught locally.

## **MILLS AND MILLING**

*by Ben Ford*

*(with contributions on wooden mill machinery by Steve Allen and millstones by Ruth Shaffrey and Fiona Roe)*

### **Introduction**

Excavation in the 1960s uncovered the remains of the Abbey Mill, which was the only mill in Reading to have been excavated prior to 1997. The date of this mill's construction is not certainly known; Slade (1971/2, 67) thought that it must have been contemporary with the main construction phase of the abbey itself, and therefore dated to some time between 1121 and 1164 (but see also Hawkes and Fasham 1997, 18). Excavations on the site of the Oracle revealed the remains of three further locations where mills had been positioned within the landscape of an urban if not an industrialised valley floor. Two of the mill sites, St Giles Mill (site 300) and Minster Mill (site 150), were subject to area excavation and have a comprehensive record of the remains of their foundations and water races. The other site, that of the water pumping mill (Test Pits 268 and 293) upstream from St Giles Mill, was subject to recording under watching brief conditions and therefore the details of its foundations were less comprehensive.

Other excavations within the project area revealed details of the watercourses that led to and away from these mills, which enables the mills to be placed within their lowland landscape, and shows how their position affected subsequent developments within that landscape. The results show that there was a long continuity of mill location at the sites of the St Giles and Minster mills. In the case of

Minster Mill this lasted possibly from as early as the 11th century (and almost certainly from the 12th century) until the 20th century, and at St Giles Mill from the 12th century until the 20th century. St Giles Mill was finally demolished in 1900, and Minster Mill in the 1940s. In addition to the substantial timber and brick structural remains from these sites, the excavations recovered an unprecedented number of objects, including elements of the mill gearing mechanisms from the 12th and 13th centuries, and parts of waterwheels and sluicing structures from 14th- to 19th-century mills. In addition, evidence for the milling of four types of grain at Minster Mill was recovered. In combination with the documentary record these discoveries greatly expand our understanding of the changing and evolving form and function of these mills, essentially the engines of the pre-industrial period, and their effect upon the surrounding landscape.

### Medieval mills and milling in Reading

Domesday Book lists Reading as having 6 mills (Astill 1978, 80). Excavation did not reveal any remains that could definitely identify the site of any of these. However postholes (whose fills dated to the late 11th or 12th century) that held timber uprights for an earthfast structure indicate that there was possibly a mill on the site of the later Minster Mill in this period (see Chapter 2, above) and large millstone fragments of Niedermendig lava that may be from Saxon millstones were recovered from later contexts at site 29 and site 12. Although there have been a number of Anglo-Saxon mills excavated in England, none has a proven continuity of location through to the post-Conquest period. Not a single Domesday period mill has been definitely identified from excavation (Watts 2002, 83-4), and these remains from Minster Mill are among only a few cases in the country where this link can be more than tentatively suggested.

In 1125 the foundation charter of Henry I granted the abbey all the mills in Reading, although these were not necessarily all within the town (see Chapters 1 and 4, above). Archaeological evidence suggests that both Minster Mill (see above) and St Giles Mill were in existence by this time; at St Giles Mill a pond associated with a probable bypass channel was silting up in the early 12th century, and the silts contained a discarded pitwheel that is most likely on technological grounds to date to the period 1100-1150 (see Chapter 2 above, and this chapter, below). While Reading Abbey was under construction, the Abbey Mill may also have been built (Slade 1971-2, 67). St Giles Mill may be the mill mentioned in a lease by the abbey of the period 1173-86 (Kemp 1987, 115). Minster Mill is first explicitly mentioned in a grant of 1250, and St Giles Mill is mentioned as being used to full broadcloths in the late 13th century (see Chapter 4, above, and this chapter, below). The mills remained in the ownership of the abbey for a little over four centuries until the

Dissolution, when a Royal Schedule of the late dissolved monastery dated to c 1540 records:

Borough of Reading. Mills. Two grain mills and fulling mill called St. Giles' mills, with the tythes of the same; a fishery called Tanlock; two other mills and a fulling mill in St Mary's parish, called Mynster mills, and a fishery called Grey's lock (Hurry 1901).

### Water supply

Although located within a lowland environment, the fast-flowing channels of the Kennet at Reading are very suitable for milling. A watermill needs a fall of water and a relatively constant flow; both the volume and height (head) of water and the rate at which it was allowed to flow onto the waterwheel needed to be controlled to guarantee efficient working. In lowland areas a fall of water was often created by building a dam or weir across a river and diverting water from its crest to the site of the mill along an artificial channel known as a leat. Weirs were often built at a natural bend in the river so that the height of the water could be raised and the main flow directed into the leat. Surplus water flowed over the weir and returned to the natural level of the main course of the river, but the leat channelled water to the mill at a higher level to create the necessary fall to power the waterwheel.

Evidence from excavation and historic maps suggests how the water supply for the mills in Reading was managed. All three were powered by leats taken off the main channel of the Kennet. The Holy Brook clearly exists as a separate channel for a long distance upstream of Reading. Evidence for the early natural channels of the floodplain in the project area, however, suggests that it may originally have merged with the forerunner of the Minster Mill Stream in a wider natural channel around the northern edge of the floodplain. The straight cut running to the Abbey Mill may well have been a human modification. Cartographic evidence (see Chapter 1, above) suggests that by the 18th century the leats for the Minster Mill and St Giles Mill (Minster Mill stream and Mill Water) were taken off the Kennet at the point where it turns eastwards just outside the area of the medieval town, near the site of the present County Lock. It seems likely that this would also have been the case in the medieval period. Speed's map of 1611 (Fig. 1.3) shows St Giles Mill at around the time of a major rebuild identified by excavation (see Chapter 3). He shows the mill located on the main channel of the Kennet. Although the precise configuration of the water supply may have changed with this rebuild, it is unlikely that either phase of the mill was located directly on the main channel of the Kennet, and the excavations have clearly demonstrated the presence of a medieval revetted leat of late 13th-century date along the line of the later formalised Mill Water. Evidence for the mainte-

nance of the Minster Mill stream by the late 11th or early 12th century was seen on site 150 and in TPs 27 and 119.

Water supply to a mill was further controlled by the use of bypass and spillway channels and sluices. When the mill was not working, or at times of high water or floods, water could be diverted out of the leat through a bypass or spillway channel. A spillway channel close to the site of the mill provided an easily accessible point for final adjustments to the water level and flow, and could run through or around the mill building. Water flow into the leat and into bypass and spillway channels was controlled by sluices, which could be opened (raised) or closed (lowered) as required. The Oracle excavations have shown how numerous bypass channels were strengthened, realigned, redug and backfilled during the medieval period as needs changed. A probable bypass channel leading to a pond was the strongest evidence for the existence of St Giles Mill by the early 12th century (Fig. 2.22b). This appears to have been replaced by a channel to the south in the late 13th century, and then reinstated with the major rebuilding of the early 14th century. The early 14th-century mill frame at the site was clearly designed to accommodate at least one spillway channel (Fig. 2.23). At site 12, a probable early bypass channel of the Minster Mill provided a water source for industrial activities in the area from the later 12th century onwards (Fig. 2.13). A second channel was soon dug in the area, bringing water from downstream of the mill, which suggests either that the bypass channel was not a reliable enough source, or that the demand for water from the newly established industries was interfering with the supply to the mill. The digging of the new channel seems to have been a successful compromise.

The tailrace channel carried the water away from the mill after it had turned the waterwheel. It was essential to get the water away from the wheel at a level low enough to prevent backwatering, in which the operation of the wheel was hindered by the pooling or backflow of dead water. The tailrace channel of the Minster Mill carried water back to rejoin the main course of the Kennet, via the Back Brook, a short distance upstream of High Bridge. St Giles Mill appears to have had two tailrace channels, a very long, narrow channel known historically as Gunter's Brook or Mill Tail, and a shorter, wider and possibly less formalised channel leading almost directly back to the main course of the Kennet. A long, narrow tailrace channel was in existence by the late 12th century, surviving as a strip of dark organic silts associated with post and plank revetments. The channel was observed for a length of 80 m east of the mill site, and numerous timbers from the revetment gave dendrochronological date ranges between the mid 13th and early 14th century. Excavations at the eastern end of the Holy Brook found a revetted channel interpreted as the tailrace channel for the Abbey Mill, which appeared to have been con-

structed between the 12th and early 13th centuries (Hawkes and Fasham, 1997).

The excavations have demonstrated that the positions of these mills remained fixed within the landscape of the valley floor from the 12th century until the 20th century. Where their associated waterways ran through the project area they appear to have had a similar longevity. On maps dating to the post-medieval period (for example Plate 1.4), the organisation of the valley floor becomes apparent and the evidence shows that this has its roots in the medieval period. It is notable that water was taken off at a single point to feed both Minster Mill and St Giles' Mill, and also that the tailrace channels of both St Giles' Mill and the Abbey Mill return to the main Kennet at similar points, while water from Minster Mill was returned upstream of the bridge. This suggests a high level of organisation of the valley floor through the town, with water management and the placement of mills at its heart.

#### *The mill races and waterwheel*

Water was fed from the leat to the waterwheel of a mill via a channel known as the headrace. This was sometimes funnel shaped at its upstream end, with a grille to exclude debris positioned at its downstream end. Upon leaving the head race, the water entered the wheelpit (or wheel trough) where it struck the waterwheel, causing it to turn, and then flowed out of the wheelpit via the tail race and into the tailrace channel, which returned it to the main course of the river. In the medieval period the races and wheelpit were often lined with timber. The rate at which the water passed onto the wheel would be controlled by a sluice, a wooden shutter that could be raised or lowered.

The best evidence for mill design in the project area comes from the early 14th-century rebuild of St Giles Mill (see Chapter 2, above). A large horizontal timber frame with associated vertical posts and piles (Fig. 2.23; Plate 2.40) was found set into a chalk platform that lined the base of a large construction cut. The three large timbers set transversely to the direction of water flow would have supported the end of the timber head race, and the wheelpit and tailrace in their entirety. The westernmost timber, the Head Sill, retained three large equally-spaced trenches (Fig. 2.24; Plate 2.41) in which it is suggested that the 3 timber troughs for the water races would have been seated. From south to north these trenches measured 0.47 m, 0.55 m and 0.55 m wide. The northern trench probably held a bypass channel, perhaps utilised as a fish trap, with the remaining 2 trenches housing the upstream end of the junction between two head races and two wheelpits. The troughs were probably of timber plank construction, perhaps similar to those found at Bordesley Abbey (Astill 1993, figs 33 and 36), and the width of the troughs would have been significantly narrower than the trenched housings in the Head Sill. Recovery of a near complete paddle or

float (Fig. 5.53 No. 16, see Allen, below), still jointed to two starts, indicates the form of the waterwheel in use on this mill (reconstructed on Fig. 5.53). The paddle is the part of the waterwheel that was struck by the water and it was jointed to the ring of the waterwheel by the starts. It appears to retain its full width, 0.33 m, a dimension that would have been compatible with the troughs. The gradient formed by the beams on which the wheelpits would have been seated shows that there was no gradient in the wheelpit (if a flat based trough is assumed), whereas the tail race has a gradient of 1:13. A drop in level in the tail race was important to prevent water flowing back into the wheelpit and impeding the operation of the wheel.

No structural remains of the head race or possible associated sluice gates survived upstream of the Head Sill and therefore it is impossible to ascertain the gradient of the head race. In a lowland environment such as the Kennet floodplain at Reading it is very likely that the mill at this time would have been undershot or stream fed, where simply the flow of water onto the paddles drove the waterwheel, and the head race would have been at the same level as the wheel race. The force of the water onto the wheel could have been increased on an undershot wheel by use of a sluice gate.

The level at which the race floors were constructed tended to rise over time with each rebuild (Fig. 5.56).

### *The operation of the mill*

The machinery of an early vertical watermill is illustrated in Figure 5.51, which shows the components that were recovered in the excavations at St Giles Mill. It should be noted that the illustrated components derive from a mill of probable 12th-century date, while the structural remains are of the early 14th century.

The waterwheel was mounted on the outer end of the waterwheel axle. On the inner end of the axle was the main driving wheel of the mill, the pitwheel (often called the cogwheel in the medieval period). The pitwheel was a timber gear with cogs projecting from its face. In a corn mill the pitwheel meshed with a smaller gear known as a lantern pinion (or trundle). This was made of two timber discs with a number of vertical staves or rungs fixed between them. The lantern pinion drove the upper millstone (the lower millstone was stationary), transforming the vertical motion of the waterwheel and pitwheel into horizontal motion and increasing the speed of rotation. The millstones were supported by a sturdy timber frame known as the hurst frame, which enclosed (and often also supported) the pitwheel and lantern pinion. One of the earliest known illustrations of a waterwheel comes from the *Hortus Deliciarum* of Herrad von Landsberg of c 1200 (illustrated in Watts 2002, fig. 42). It shows a waterwheel driving a pitwheel and lantern pinion, with the grain being fed into the millstones via a hopper. The

gears and millstones are supported by the timber hurst frame.

The most important finds from this early period came from St Giles Mill, and comprise an entire pitwheel (without spokes and cogs; Fig. 5.51 and Plate 2.36), and part of a lantern pinion (Fig. 5.52). The excavated contexts of these objects are described in Chapter 2, above, and the technical details of their construction are considered by Steve Allen in this chapter, below. Both objects had clearly been discarded, the pitwheel thrown into the silting pond that formed part of the mill bypass channel, and the lantern pinion into the chalk and rubble foundations of the early 14th-century mill rebuild. It is interesting to note that the pitch between the position of the cogs and staves was compatible, and it is therefore possible that they were from the same mechanism and operated together (Watts pers. comm.). The pitwheel had 36 holes for cogs and the lantern would have had 6 staves, giving a gearing ratio of 1:6; that is, for each turn of the waterwheel and main axle the vertical shaft would have turned 6 times.

Both gear wheels showed signs of damage, clearly illustrating the problems that these early wooden gearing mechanisms experienced and how the millwright dealt with them. Running across the face of the pitwheel immediately before the vacant holes for the cogs were long indentations. These were only apparent on one of the four wooden rim segments (or felloes). It is thought that the indentations were made by the 'staves' of the lantern pinion colliding with the face of the pitwheel. The fact that the wear from this problem focused on a single felloe indicates that this element of the pitwheel was out of true or buckled. This was possibly as a result of a weakness in the grain of the wood, inferior jointing, or an incorrect selection and use of timber for the task by the millwright. This fault had a 'knock-on' effect on the lantern pinion. Although less than half of one of the lantern pinion 'discs' or 'roundels' survived, there was clear evidence that it had broken into at least two pieces, which had been rejoined with an oak dowel. The depths of the indents suggest this fault had been a problem for some time and was only remedied when the lantern pinion finally broke. Although it was repaired, it is impossible to tell if the pitwheel was replaced at the same time. Perhaps the repairs were a temporary 'make-do' solution, simply to get the mill operating again. Faults such as these may have prompted the longer term solution of rebuilding the mill in the early 14th century, when these objects were finally discarded.

The gearing mechanisms described above would have been supported on a hurst frame, although no contemporary 12th-century evidence of it survived. The remains of the early 14th-century St Giles Mill, however, included groups of posts (14086 and 14060, Fig. 2.23) that are interpreted as components of a hurst frame. Posts 14060 would have supported the outer end of the waterwheel axle, on which the

waterwheel itself turned. Posts 14086, set in a trapezoidal arrangement, formed the base of the hurst frame. The pitwheel would have been located within the frame, meshing with the lantern pinion and turning the millstone above.

*The form and function of the medieval mills at Reading*

The entire superstructure of the medieval St Giles Mill, including the water races, was probably dismantled in a rebuild during the early 17th century. However, sufficient evidence survived from the 14th century to indicate the form of the mill that operated during this period. The waterwheels projected from the north side of the mill building, probably from a gable end, although the mill building itself lay outside the excavated area and there is no direct evidence for its medieval form. The excavated evidence described in Chapter 2 and in the present chapter, above, implies the presence of three channels at the mill, one of which is likely to have been a spillway. The position of the waterwheel on the channel closest to the mill building can be inferred from the location of the

ground beams and the posts that would have formed the foundation to the hurst frame that supported the waterwheel axle. This mechanism would certainly have been used to drive a cornmill.

However, it is clear from documentary sources that St Giles Mill was being used for fulling by the late 13th century. Documentary evidence from the cartularies of Reading Abbey of the period 1260-1290 state that a gift in free alms was made to Reading Abbey by Richard de la Watere of 6d for annual rent from a tenement leading from Old Street to the fulling mill in the parish of St Giles, between the tenement of William Dyer and the mill (Kemp 1987, 135). This is supported by a separate reference from a quit claim dated to the period *c* 1270-1285, made by Richard de la Hyde to the Abbey of Reading, of his right in a tenement once held by James Forester in the parish of St Giles near the fulling mill (*ibid*, 178). It is possible that one wheel drove a combination of grinding stones, and then, via the main axle, which would have extended into the mill building beyond the hurst frame, a set of fulling stocks. The only example of such a multiple mill was identified from a late 14th-century documentary reference in Layham, Suffolk (Holt 1988, 132).



Plate 5.3 *'Two Water Mills and an Open Sluice'*, Jacob van Ruisdael, 1653 (The J Paul Getty Museum, Los Angeles)

However, fulling machinery could also be driven directly from a waterwheel axle by the use of cams. These are stout projecting pegs that catch and lift hammers or stampers as the wheel rotates. Water-powered fulling mills were introduced into England in the 12th century using either vertical stampers or heavy timber hammers called stocks to full cloth. Bolts of newly woven cloth were put in a container with water and a scouring agent, then pounded by the action of the stocks or stampers, which felted together the fibres and shrank the cloth so that it was fit for use (Watts 2006, 43-4). Given the evidence for a second channel at St Giles Mill, it is likely that there was a separate waterwheel, on the central channel, that could have driven a set of fulling stocks directly.

By 1545, when William Grey bought St Giles and Minster mills, they were both described as two corn mills and a fulling mill, that is, two sets of grinding stones and a set of fulling stocks would have been present at each mill. If so, then the three processes appear to have been driven by two waterwheels, suggesting that one of the wheels drove two processes. Current knowledge suggests that it was not until the 16th century and the inception of the spur wheel that two separate processes could be driven by one wheel (Watts 2002, 136-7).

A good impression of how St Giles Mill may have looked by the later medieval period can be gained from Jacob van Ruisdael's painting of a Dutch lowland mill of 1653 (Plate 5.3), although the Dutch mill is of breast-shot type rather than the undershot type suggested for St Giles Mill. Although this painting is from the mid 17th century, the dilapidated state of the building indicates that it was probably of late medieval construction.

There was much less evidence for Minster Mill during the medieval period. A very early deposit (Project Phase 2, see Chapter 2, above) from a small pit on the site of Minster Mill produced an exceptionally large assemblage of charred grains which was dominated by partially germinated oats and barley interpreted as evidence for malting, and a significant proportion of wheat and rye probably awaiting grinding into flour. The initial stages of the malting process, 'chitting' and 'roasting', lead to a final stage which involves the malted grain being broken open or 'cracked' before it is mashed. Therefore malting is a likely activity to be associated with a mill. A similar association of malting and mills, although from the Anglo-Saxon period, was identified at West Cotton (Campbell 1994). No other deposits of grain were recovered from the mill sites or any other location or period during the excavations. The deposit suggests that in the 12th century Minster Mill had two separate functions, perhaps requiring two sets of machinery and therefore two separate waterwheels. Rollers or hammers may have been used for 'cracking' the roasted grain as part of the malting process, and grinding stones for processing wheat and rye into flour. The charred nature of the grain suggests that a fire may have

destroyed the building it was being stored in, which may have been a warehouse or the mill itself. Unfortunately no elements of the mill's machinery were recovered that could be directly linked to this period, although fragments from what were possibly very early millstones were recovered from later contexts in the vicinity (see below).

### Millstones

by Ruth Shaffrey and Fiona Roe

Three large pieces of millstones made from Niedermendig lava, along with a few small weathered fragments, were discovered during the course of the excavations, but all were redeposited in secondary contexts. Among the most interesting was a fragment from site 12 (SF 1760), from a relatively small millstone, with an estimated diameter of 560 mm and a maximum thickness of 100 mm. There were traces of worn grooving on the grinding surface. A millstone with this diameter falls within the size range given for lower stones from the late Saxon Thames Exchange site in London (Wright 1992, 76), and it is a possibility that this millstone could be linked with a late Saxon mill. Small millstones such as this example were usually used in horizontally-wheeled mills (Grenville Astill pers. comm.) which suggests that the Minster Mill might originally have been of this form. Niedermendig lava, which was imported from the Rhineland, was widely used for millstones during the mid and late Saxon period, although lava millstones tended to be in a minority in the medieval period. It is not clear why the only millstone fragments found at the site were of lava, when other types of stone were more commonly used at the time. A second fragment came from an early Project Phase 2 context on site 29, dating it to the late 11th or early 12th century. This fragment is from a larger millstone, of a type more common in the 17th and 18th centuries, although known from as early as the 11th century in London. The third fragment, found in a relatively modern context at St Giles Mill, is of the same material and type.

### Millstones

*Not illustrated*

**Fragment of small millstone.** Niedermendig Lava.

Traces of grooved grinding surface and cement from re-use as building stone. Measures 560 mm diameter x 100 mm maximum thickness at the edge. Ctx 8523. Site 12. SF 1760. Modern

**Fragment of probable lower millstone.** Niedermendig Lava. Roughly shaped underside. Measures approximately 1200 mm diameter x 105 mm thick towards centre. Site 150. SF 61. U/S

**Fragment of probable lower millstone.** Niedermendig Lava. Traces of grooved grinding surface, lower side very uneven. Found with SF 907. Measures approx. 1200

mm diameter x 90 mm maximum thickness at centre. Ctx 13030. Site 300. SF 906. Probably modern?

**Probable rotary quern or millstone fragments.**

Niedermendig Lava. Two small fragments with small sections of worked surface. Ctx 6954. Site 29. Ph 2902b

**Probable rotary quern or millstone fragments.**

Niedermendig Lava. No worked surfaces remain and sample is very weathered but is likely to be from a rotary quern or millstone. Ctx 3353. Site 150 (TP 27). Modern

**Watermill machinery and fittings from the excavations**

by Steve Allen

A number of pitwheels (sometimes known as cogwheels) have been identified in recent years, but the example from Reading Oracle is the most complete. The wheel had clearly been used, as several of the pegs which once fastened the spokes were *in situ* and wear marks were present on the face between the cog holes. The construction of the wheel is relatively straightforward. Four slightly curving pieces of timber were selected, one of which was cut from a branch trunk junction. The curvature of the timber was not sufficient for the tight curve required by the wheel diameter and so each piece was cut to shape working from the middle of the timber towards the ends. The signature marks indicate that this was done with an adze, rather than an axe. Each section (known as a felloe) was shaped individually before the wheel was finally fastened together, as the facets cut by this adze do not continue across from one felloe to the next where they overlap at the scarf joints.

The scarf joints were cut with axes. Though technically a stop-splayed scarf joint, the splay is very shallow. It should be noted that the scarf at one end of each felloe is the mirror image of the scarf at the other end; the splays are cut into the same face at each end. When one face of the wheel is seen with the felloes joined together, this gives the impression that the wheel is made of unequal sized felloes (Watts 2002, 95) whereas the felloes are actually the same size. A stepped lap housing cut completely across the face from the inner to the outer edge to hold the ends of the spokes. The shoulders of these housings were sawn, not hewn. Each housing was located midway between the scarf joints, with the deeper part of the step at the inner edge.

All joints were fastened in place with wooden pegs. These were headed, that is, shaped to have one thicker end. In each case they were driven into pre-cut auger holes and moreover, driven into the same face as that in which the lap housings for the spokes had been cut. The thinner ends of the pegs were cut off more or less flush with the face from which they protruded, and locked firmly in place by a thin wedge driven into the end.

The holes for the cogs were cut after the wheel had been assembled. The holes are each *c* 42 mm in

diameter, spaced between 55 and 61 mm apart (edge to edge). The holes are not cut perpendicular to the face of the wheel, but slope at 7° from the vertical. All these holes slope in the same direction. Shallow wear marks are present on one face of the wheel, between these cog holes, but are not perpendicular to the outer edge of the wheel. This suggests that these marks were made as the cogs or staves on the other wheel rubbed against the face of the surviving wheel as they were disengaged.

Two other medieval pitwheels are currently known, from Chingley (Crossley 1975) and Beckside, Beverley (Allen unpublished), with a related trip wheel from Bordesley Abbey (Allen 1993, 216). The scarf joints on the Reading wheel are very similar to those of the late 12th-century Bordesley example, though in the latter case the scarf is pegged from both faces. The spokes of the Bordesley wheel are housed in through mortices, though not enough of the joint survived to indicate whether this was pegged or not. At Chingley the wheel rim fragment appears to have been shaped, being wider about the lap dovetail housings for the compass arms. No indication of any sloping was noted and none of the joints to neighbouring felloes had survived. The Beckside wheel is the closest parallel to the Reading wheel, though again the joints between the felloes have not survived. Though the spokes are pegged into bare-faced lap dovetail housings, the *c* 48 mm diameter cog holes (spaced 52-58 mm apart) are also sloped, at around 6° from the vertical.

The lap housings for the spokes and the pegs used to fasten the joints are set into or driven from the opposite face of the wheel to that where traces of wear are evident. The intention seems to have been to leave that face of the pitwheel from which the cog heads projected clear of minor obstructions, perhaps to avoid any risk of jamming the wheels or throwing them out of gear.

A similar concern may lie behind the sloping of the cogs relative to the wheel face, making it easier for the cogs to catch and release as the wheels rotated. This feature is illustrated in a number of medieval manuscripts, such as Herrad von Landsberg's *Hortus Deliciarum* of *c* 1200 (reproduced in Watts 2002, fig. 42), but does not appear to have been commented on. All reconstruction drawings of medieval watermill machinery show cogs perpendicular to the face of the pitwheel. Whilst this is certainly true in some cases, the presumption seems to be that the angle of the cogs in medieval illustrations is either an artistic convention or poor draughtsmanship. The Reading and Beckside wheels can now demonstrate that the artist in these cases was accurately reproducing an important feature of contemporary mill gearing.

The disc (or roundel) from a trundle or lantern pinion (Reid 1987, 70) appears to have been made from two halves, though it is not clear whether they were intended to be fastened together around the



axle or to have had the axle passed through them after they had been joined. Ben Ford (above) discusses the possibility that the joining of the two pieces of disc may have resulted from the item suffering damage while in operation. Assuming an even spacing around the wheel, there would have been six such staves. The wood from which these staves were cut cannot be closely identified but is one of the fruit wood species, apple (*Pirus malus* L.), pear (*P. communis* L.) or hawthorn (*Crataegus* sp.). All are very hard and resistant to wear, and are among those recommended for use in watermills for cogs and similar applications (Fuller and Spain 1986, 147; Reid 1987, 69).

The remainder of the identifiable watermill machinery components are from the waterwheels. Four 'Starts', the staves on which the blades or 'Floats' of a waterwheel are mounted, were recovered, one with the float still attached. The starts were generally shaped with one face of the head cambered, the float being attached to the flat face by two or three trenails. The shafts of the start are worked so as to fit into one of several sockets located around the circumference of the wheel rim. None seems to have been pegged or nailed in place, but this is not unusual as these objects appear to have been secured to the waterwheel with wooden wedges (Allen 1993, 214; Salisbury 1993, 74). Similar wedges in the small finds assemblage could have been used for this purpose.

The one medieval float is almost complete and has two auger holes additional to those used to peg it to the start. These are not symmetrical and may be a means of allowing water to drain quickly from the float as it was lifted out of the water.

The form of the waterwheels from which these components derive is uncertain. 12th-century wheels such as those at Bordesley (Allen 1993, 214) and Hemington Fields (Salisbury 1993, 74) have floats mounted on starts set into the wheel rim, with their ends stabilised by struts fitting into rectangular slots towards the ends of the board. 14th-century examples such as Chingley have the floats pegged or nailed to shrouds, boards which enclose the floats on each side, making the rim of the wheel into a series of boxes. The 14th-century wheel at Batsford (Bedwin 1978, 194) has wooden pegs passing through holes in the shrouds across the face of the floats, helping to support them. The Oracle example of Project Phase 4 lacks rectangular slots for struts, yet was clearly not nailed or pegged through its edges to any shrouds. On current evidence, it may be suggested that the wheel was open sided and the starts so firmly wedged in place that there was no need for additional struts.

One of the boards from Project Phase 9 (12096) may be a float from the type of shrouded waterwheel just described. This board shows marked differential wear across its faces, with the ends unworn and the middle of each face very highly abraded. This is a pattern which occurs when the

ends of a piece of wood are retained and protected in a groove or slot whilst the rest of the board is open to erosion. It is possible that this would happen to a float whose ends were retained in grooves or between a pair of battens.

The second board from Project Phase 9 (12537) is another possible float, but if so it is from a much wider wheel. Differential wear on one of the faces indicates that this piece had two starts pegged to it with *Pomoideae* species pegs, one start towards each end.

One final artefact which may be related to the latest phase of watermill is 12535, which may be part of a sluice gate. The presence of a layer of hair between the layers of boards is an arrangement normally associated with caulking or making a joint watertight, desirable qualities if it were to be used in shutting off a water supply to a mill race. However, this identification is not certain and it is possible that the object is simply an insulated shutter or hatch.

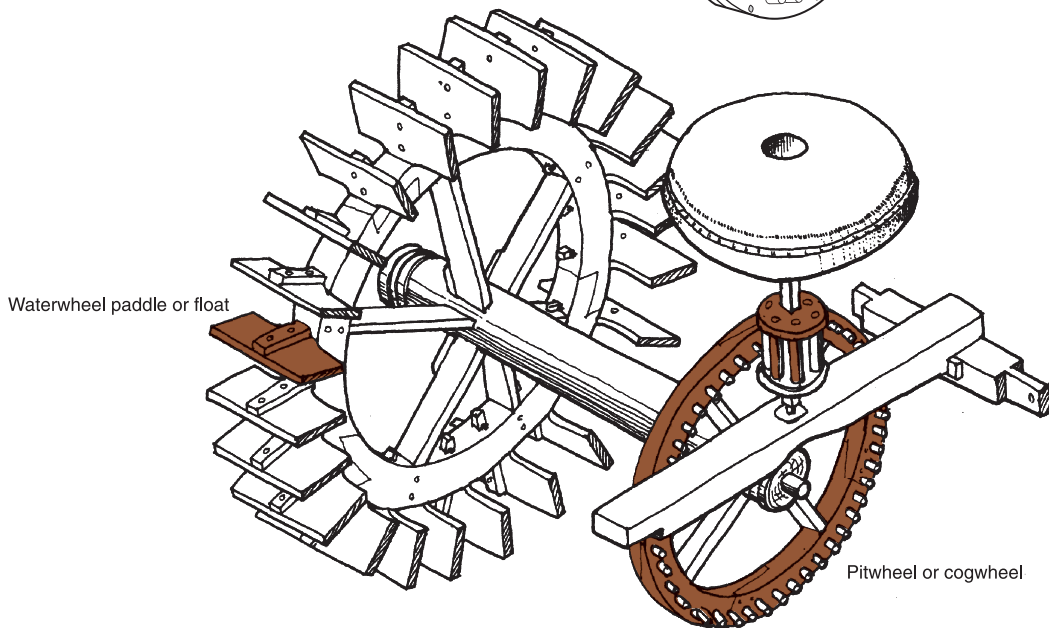
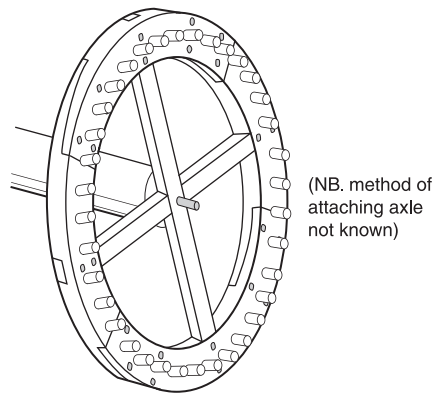
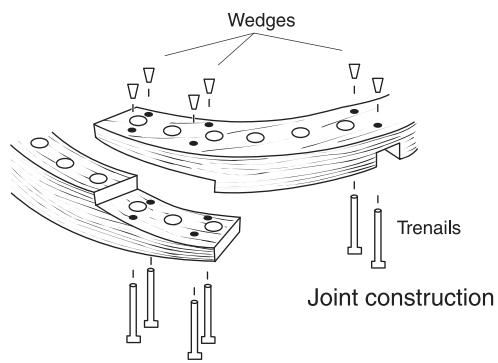
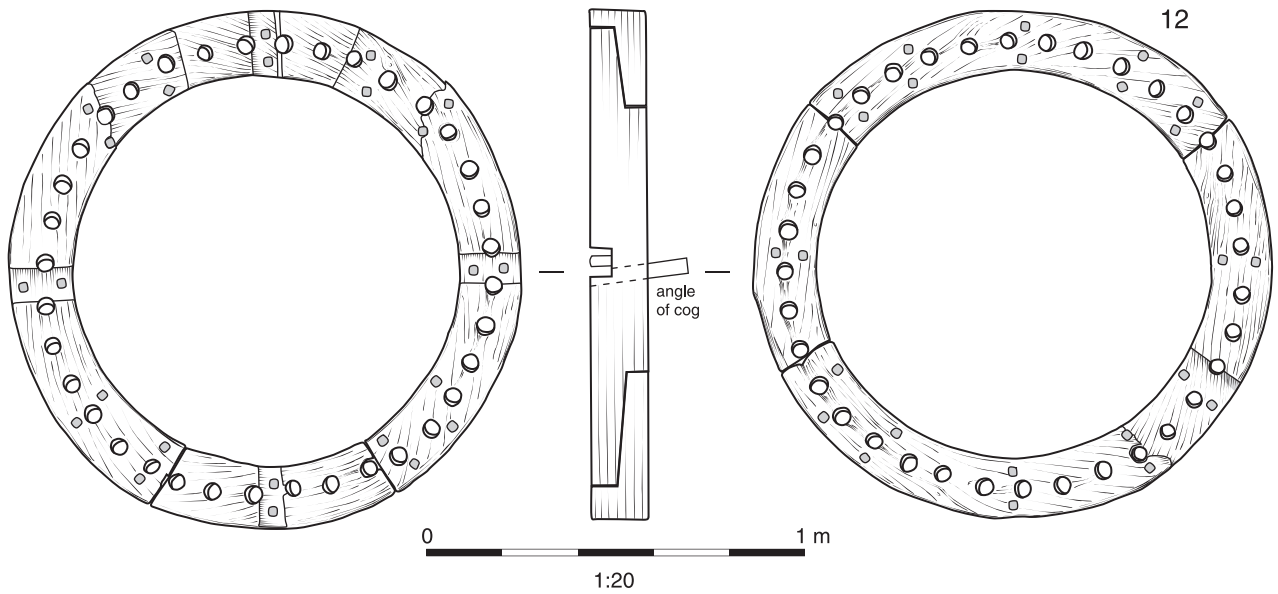
The objects discussed above were all recovered from silted deposits within water channels, either within the mill race or associated with it, having been discarded. Of interest is that one of the starts (No. 14, below) is from a deposit which predates any of the watermills excavated in the current project area. As such it adds to the evidence for a pre-14th-century watermill at or upstream from the site. An unusual aspect of the wood assemblage from these watermills is the absence of any cogs. Cogs in whole or in part were recovered from Bordesley (Allen 1994, 214-216) and Batsford (Bedwin, 1978, 199). Where they are absent from mill sites, this coincides with the almost complete absence of other wooden small finds, as at Hemington Fields (Salisbury 1993) and Blackwater Green (Place and Bedwin 1992). It must be presumed that such cogs may have been swept away down river. A cog and a cog head, not recognised at the time, were in fact recovered downstream from these mill sites, in medieval deposits at the Abbey Wharf (Mills 1997, 175, Nos 9 and 10).

### Catalogue

The catalogue of illustrated mill machinery and fittings is an extract from the full structural timber catalogue, which can be found in Chapter 8 on the CD ROM.

Figure 5.51

- 12 **Ring of a pit- or cogwheel.** Constructed from four felloes joined by stop splayed scarf joints. Stepped lap housings for four compass arm spokes in two pairs. Each scarf fastened by four trenailed pegs and each spoke fastened by two headed trenailed pegs. Face of wheel pierced by 36 through holes, 40-42 mm diameter spaced 55-61 mm apart (edge to edge). All felloes oak (*Quercus* sp.), two box quartered, two box halved. Some of pegs are *Pomoideae* sp. External diameter *c* 1.34 m, internal diameter *c* 1.04 m, width of felloes *c* 157 mm, thickness of felloes *c* 150 mm. Ctx 13385. Project Phase 2, 3001a.



Components found at St Giles Mill

Figure 5.52

13 Part of the Disc or Roundel from a lantern pinion.

Approximately 75 % of one half of the disc present, remainder broken and missing. Single 23 mm diameter through peg hole for attachment to missing half of disc, with peg *in situ*. Three 41 mm diameter through holes in face, spaced 64-65 mm apart (edge to edge), two of which contain the

cylindrical shafts of the 'staves'. Part of rectangular socket to house axle/spindle towards flat edge of object. Disc and attachment peg are oak (*Quercus* sp.), disc box halved from a piece of burr wood, peg radially faced. Shafts are *Pomoideae* sp., both radially faced. Very worn and eroded surfaces. Overall 290 mm l, 140-150 mm w, 120 mm th. Ctx 13628. Project Phase 4, 3002a

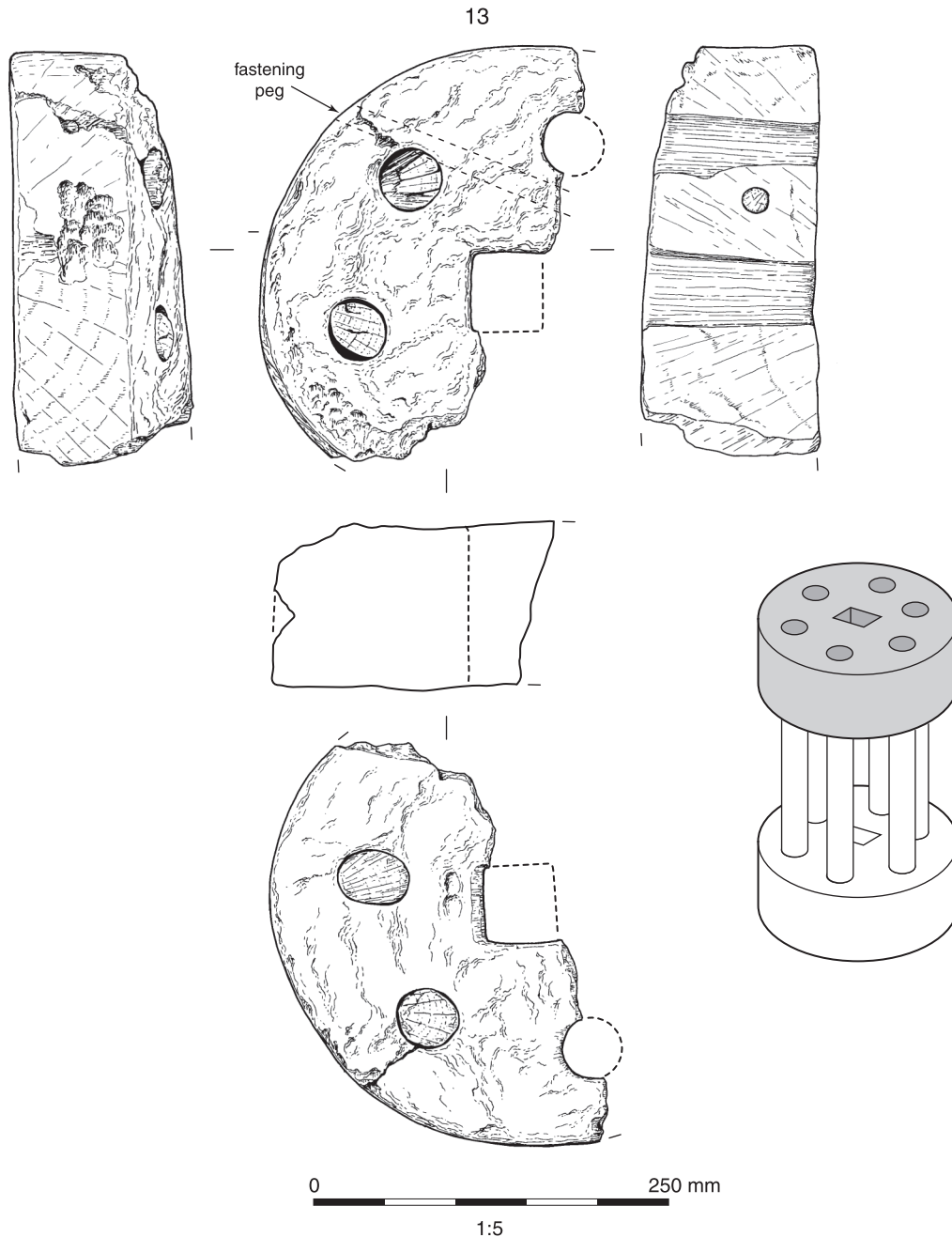


Fig. 5.52 Structural timber, watermill machinery and fittings: Part of the disc or roundel from a lantern pinion (No. 13)

Fig. 5.51 (opposite) Structural timber, watermill machinery and fittings: Ring of a cog- or pitwheel (No. 12); the machinery of an early vertical watermill showing the components recovered in excavations at St Giles Mill (after Watts 2002)

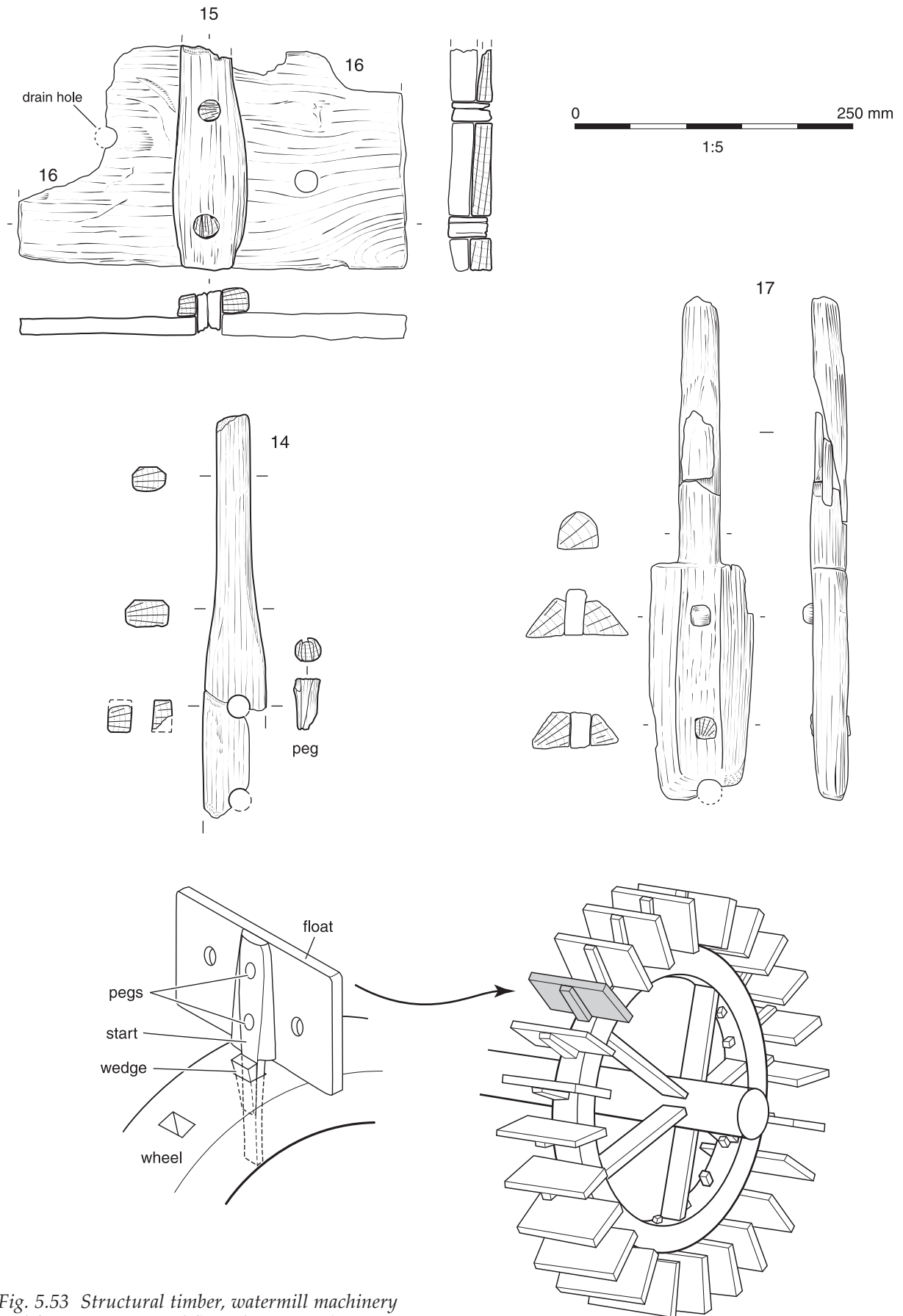


Fig. 5.53 Structural timber, watermill machinery and fittings: Starts and floats (Nos 14-17)

Figure 5.53

- 14 **'Start' from Waterwheel.** Stave with one end cut to form octagonal cross-section shaft, remainder cut to a wider flat blade or head. Top and most of one edge of head missing. Head is flat on each face and pierced by two holes, one at the broken end. The complete hole retains part of a peg. 'Start' and peg are radially faced oak (*Quercus* sp.). Overall 363 mm l, 54 mm w, 20 mm th. Shaft 200 mm l, 30 mm w, 20 mm th. Peg holes 22 mm dia, spaced 64 mm apart. Ctx 13980. Project Phase 1, 3000
- 15 **'Start' from Waterwheel.** Head of 'Start', cut to form a flat blade, shaft broken away and missing. Head is flat on each face and pierced by two holes. The two holes retain parts of two trenailed pegs attaching the piece to the face of No. 16 (ctx 13968). 'Start' and pegs are radially faced oak (*Quercus* sp.). Overall 203 mm l, 68 mm w, 25 mm th. Peg holes 20 mm dia, spaced 120 mm apart. Ctx 13967. Project Phase 4, 3002a.
- 16 **'Float' from Waterwheel.** Board with one corner and most of one end broken and missing. Pierced by two holes along mid point of length, one towards each edge, which retain parts of two trenailed pegs attaching the piece to the face of No. 15 (ctx 13967). Two further holes present set asymmetrically, one towards each end. Radially faced oak (*Quercus* sp.). 350 mm l, 200 mm w, 16 mm th. All holes 20 mm dia. Ctx 13968. Project Phase 4, 3002a.
- 17 **'Start' from Waterwheel.** Stave with one end cut to form cylindrical shaft, remainder cut to a wider flat blade or head. Top of head missing, shaft broken but refitting. Head is flat on each face but edges are chamfered to give a wider and a narrower face. Head is pierced by two holes, with the remains of a third at the broken end. The two complete holes

retain parts of two trenailed pegs. 'Start' is radially faced oak (*Quercus* sp.), both pegs elm (*Ulmus* sp.). Overall 474 mm l, 88 mm w, 37 mm th. Shaft 261 mm l, 27 mm dia. Peg holes 25 mm dia, spaced 34 and 80 mm apart. Ctx 9213; SF 1790. Project Phase 5, 1206b

Figure 5.54

- 18 **Part of float from waterwheel?** One edge broken away and missing. Remains of two cut holes, one towards each end, asymmetrically placed. Both faces highly eroded except at ends. Radially faced oak (*Quercus* sp.). 406 mm l, 165 mm w, 26 mm th. Ctx 12096. Project Phase 9, 3004b.

Figure 5.55

- 19 **Shutter, hatch or part of sluice gate?** Composite artefact built from two tangentially faced oak (*Quercus* sp.) boards joined edge to edge by iron spikes with set of iron spikes in one edge for attachment to a third missing board. A layer of hair is applied to one face of these boards and three thin scots pine (*Pinus sylvestris* L.) boards are nailed on top of this. On the opposite face is nailed a transverse batten of radially faced pine (*Pinus sylvestris* L.). Very eroded, much surface damage. 1.02 m l, 545 mm w, 84 mm th. Ctx 12535. Project Phase 9, 3004b.
- 20 **Part of float from waterwheel?** Board with two adjacent corners and most of the edge between them broken and missing. Remains of three through peg holes in face, two towards one end, one towards the other. Strip of uneroded wood surface between the holes running edge to edge. Tangentially faced oak (*Quercus* sp.). 1.012 m l, 350 mm w, 22 mm th. Holes 20-21 mm dia. Ctx 12537. Project Phase 9, 3004b (not illustrated) **'Start' from Waterwheel.** Stave with

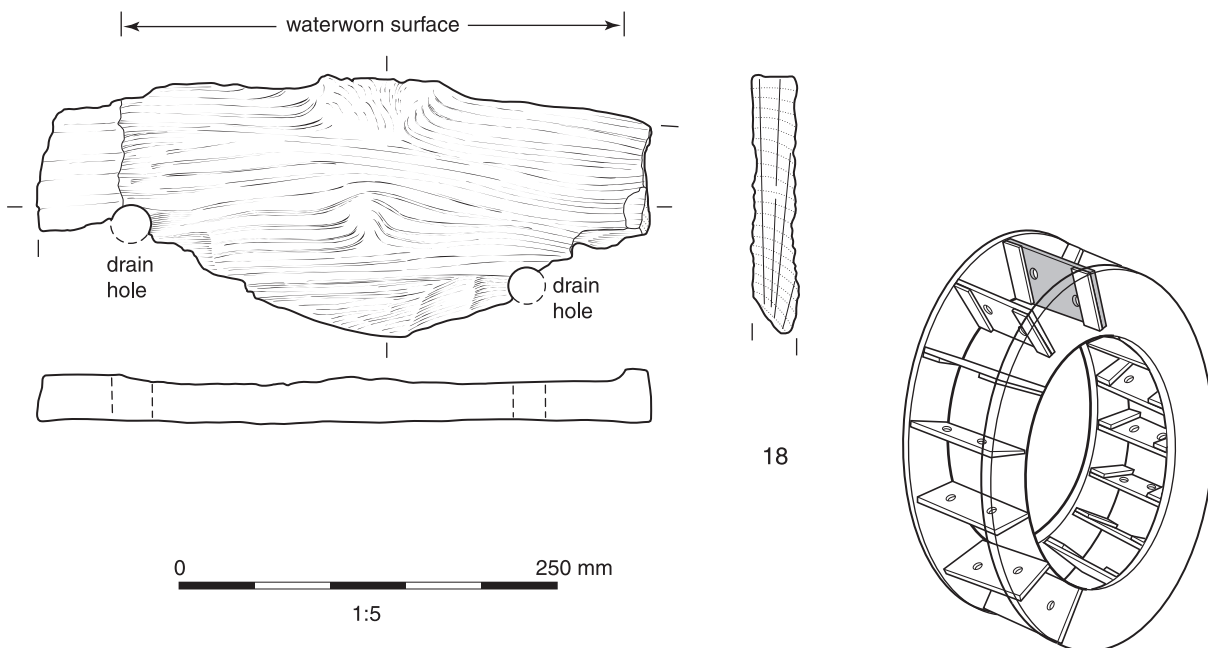


Fig. 5.54 Structural timber, watermill machinery and fittings: Possible float from waterwheel (No. 18)

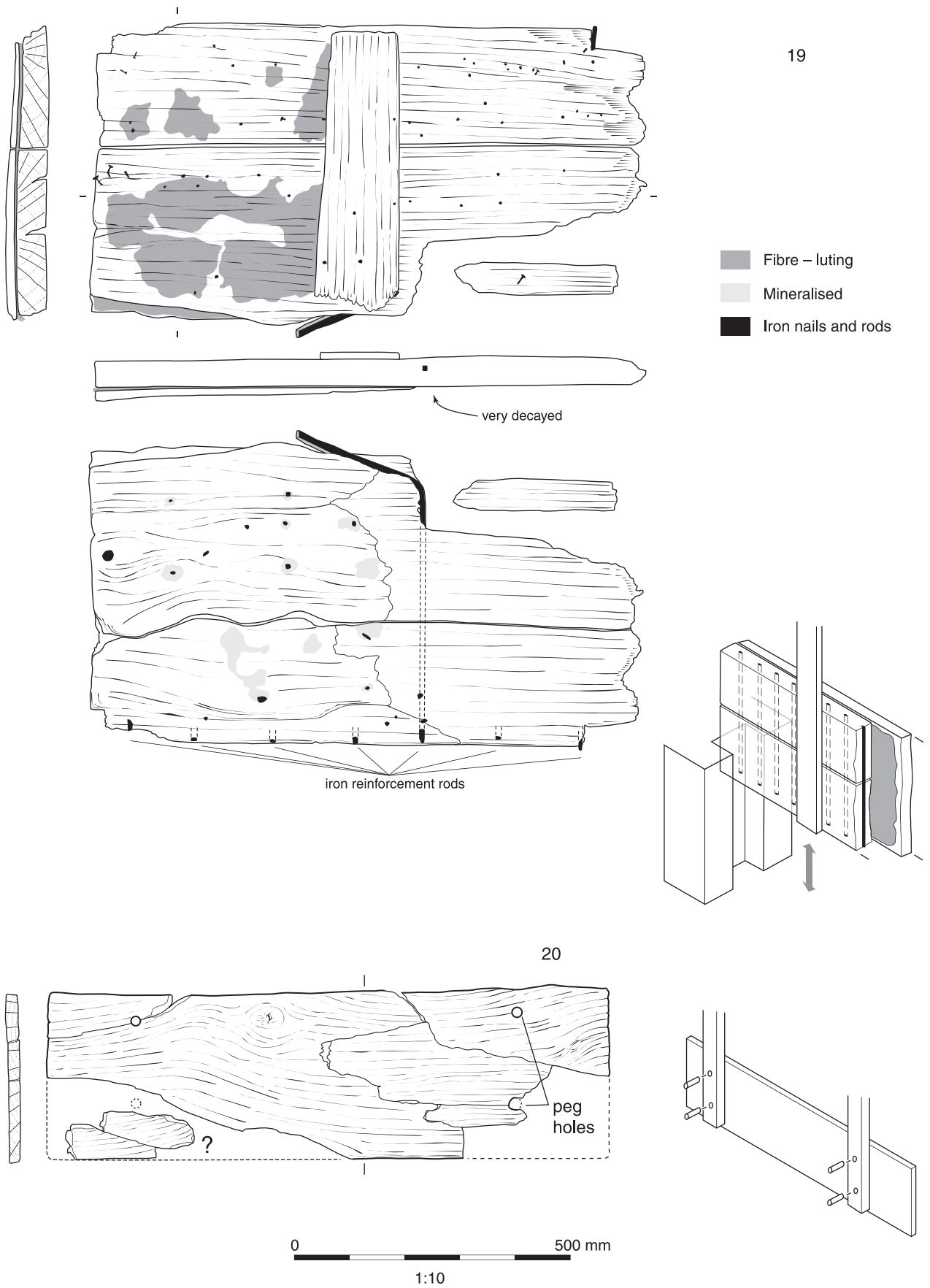


Fig. 5.55 Structural timber, watermill machinery and fittings: Possible shutter, hatch or sluice gate fragment (No. 19) and possible float (No. 20)

one end cut to form cylindrical shaft, remainder cut to a wider flat blade or head, end missing. Head is flat on one face and cambered on the other. Head is pierced by two holes, one of which holds part of an *in situ* trenail. All elements radially faced oak (*Quercus* sp.). Overall 430 mm l, 100 mm w, 35 mm th. Shaft 230 mm l, 33 mm dia. Peg holes 24 mm and 22 mm dia, spaced 73 mm apart. Site 28 Test Pit, Ctx 8395; SF 707. Not phased.

### Millwrights and mill carpentry

Some of the evidence from the excavations gives insights into different aspects of the millwright's trade, not only relating to the machinery within a mill, but to structural elements of the buildings themselves.

### Structures

It is believed that medieval timber-framed buildings were prefabricated at the carpenter's yard, dismantled, and then re-assembled at the construction site (Quiney 1990, 114), thus leaving only minor re-adjustments to be made at this final stage. Limited evidence in the form of a linear deposit of oak chips on the surface of the foundation/construction platform in the early 14th century at St Giles Mill (Fig. 2.23; Plate 2.39) suggests this was also the practice for the construction of mills. This deposit was not very large and would have resulted from carpenters' work at the construction site with the use of a side axe or adze.

Until the 15th century the remains of the mill structures discovered were exclusively made from oak. This timber was sourced from naturally grown and managed woodland from along the Thames Valley upstream from Reading (Miles, Chapter 11, below). This situation changed in the late 15th to early 16th centuries, when a greater variety of wood species were used, including beech and elm as well as oak, which were sourced from the Kennet valley. In the 18th and 19th centuries timber (still from a variety of species) was once again mainly sourced from woodlands bordering the Thames upstream from Reading. During the period when timber sources shifted from the Thames to the Kennet, a characteristic timber joint was introduced in the timber framing for mill channel foundations. The wedged bare-faced dovetail tenon was used to join transverse to longitudinal beams at St Giles Mill in the rebuild of 1611 (see Plate 3.35). Interestingly the first recorded use of this joint for this purpose in a similar structure is from Greenham Mill, near Newbury and dated to c 1570 (Allen in Hawari, 2004-2008). Although the evidence is currently limited, it does suggest the emergence of a construction tradition associated with timber sourced from the Kennet valley, from the late 16th century into the early 17th century. It is interesting to speculate whether this was developed by local millwrights based along the Kennet, using local timber. These

two distinct trends may reflect changes in sources of supply linked to the demise of Reading Abbey, whose woodlands had probably provided much of the excavated timber from the medieval structures.

Locks are closely associated with mills within the landscape. As far as the author is aware no examples of medieval locks have been excavated, although references in documentary records confirm their existence, in other parts of the country as well as in Reading. Early 'flash' locks were relatively simple. The passage of boats up and down stream was made possible by removing timber elements, or paddles, from the weir and the boats travelled through the gap. This was a potentially hazardous operation, which not only lost the head of water from behind the weir but also depleted the water level in the mill leat, and was therefore unpopular with mill owners. The later pound locks were safer and made more efficient use of water. In this type of design water was contained between two sets of gates within a chamber where its level could be controlled. Pound locks were introduced on the Exeter Ship Canal in 1564. Both mills and pound locks share a common structure, that of the timber water channel. Head and tail aprons at either end of the lock pound are equivalent to the head and tail races at either end of the wheel race in the case of mills. Excavations at Monkey Marsh lock on the Kennet navigation at Thatcham (Harding and Newman 1997) demonstrate that the timber floors for the Phase 1 lock head and tail aprons, which dated to the second half of the 18th century, were constructed in an almost identical way to the floors of the mill races at St Giles Mill, Minster Mill and the water pumping mill in the post medieval period. Other parallels between these structures include the mixed use of oak and elm. At Monkey Marsh it is suggested that elm may be more commonly used where the structure would be continually submerged below water. This may also be true for St Giles Mill, although none of the above-water elements survived for comparison.

The similarity between the water-carrying structures for locks and mills suggests that there was a link between those who designed and those who carried out the building works of these structures. It is probable that the skills and knowledge of the millwrights, acquired over many hundreds of years, if not the actual labour itself, would have been used in the design and building of locks. Indeed John Rennie (1761-1821), engineer and architect of the Kennet and Avon Canal, trained as a millwright with Andrew Meikle, who was himself a millwright.

### Rebuilding

The archaeological evidence demonstrated that mill channels were rebuilt in the same position as their predecessors, and the new foundations were often constructed upon the remains of those from the





former channels. Timber posts or piles might have been too difficult to remove, but primary transverse and longitudinal beams were also often retained *in situ* to provide extra stability to the new structures (see Figs 3.14, 5.56; Plates 3.35, 3.45). Evidence was also found that elements of earlier structures were re-used *ex situ* during the rebuilding works, for the purposes of choking and blocking up new beams to the correct height, and to fashion makeshift walkways to facilitate these works. These features of the construction process demonstrate a consistently practical and pragmatic approach by the Reading mill builders to their work over many centuries.

### **Repair**

In terms of repair to the mill structures themselves, the evidence is restricted to elements of the foundations, because much of the superstructure of the mills had been destroyed. Where repair was recognised it was mainly concerned with water erosion of various parts of the structure. The effects of erosion

were identified in two principal locations. Water in the mill tail affected the foundations of the downstream end of the mill structures, and water eroded the timber of the water races and seeped through the race floors to erode the ground and affect the foundations below the races. Tree-ring dating at St Giles Mill demonstrated that the piles retaining the tail sill supporting the tail race from the mill tail needed reinforcement in the mid 15th century.

### **Increasing productivity and changing methods of power generation**

The most notable changes that can be seen from excavated and cartographic evidence within the project area in the post-medieval period are related to the need for increased productivity and the subsequent demands for increasing, and increasingly efficient, use of water power. This process ultimately resulted in the replacement of water engines by steam engines. This is discussed further in Chapter 6, below.



# Chapter 6 Discussion of the Evidence

*by Ben Ford and Anne Dodd*

## THE FLOODPLAIN: FROM MEADOW TO INDUSTRIAL QUARTER, A NEW MODEL FOR WATERSIDE DEVELOPMENT

### Introduction

At the time that the excavations at the Oracle Centre took place, between 1996 and 1998, there had been only two previous archaeological projects of any significant scale within the centre of Reading. The earlier of these had concentrated exclusively on the remains of the abbey (Slade 1969b, 1971-2, 1975-6). The other was a series of archaeological investigations collectively termed the Reading Waterfronts project, which was carried out by Wessex Archaeology between 1979 and 1988 (Hawkes and Fasham 1997). The Waterfronts project, like the Oracle excavations, focused on the urban valley floor of the river Kennet. In their conclusion, Hawkes and Fasham presented a model of changing land use over time (1997, 191, fig.104) and the stimulation for this (*ibid.*, 194, fig. 105). Their model was applied to the entire landscape of the urban valley floor, including the Oracle project area. They identified five main land use categories: improved river flow/flood relief, wharfage, managed meadowland, industry and settlement. In general they concluded:

The utilisation of the waterfront at various periods suggests a general chronological sequence, with earlier phases of activity limited to the control of watercourses, and the subsequent exploitation of the new conditions for water power and wharfage. The secondary benefits of drainage and the consequent utilisation of the adjacent areas was apparently only slowly realised, and then in selected areas only (*ibid.*, 191).

The evidence from the Waterfronts project was mainly limited to water channels and the structures associated with them, principally revetments for improved river flow/flood relief and wharfage provision. There was only limited archaeological evidence for the other three categories, and for their conclusions about industry Hawkes and Fasham relied mainly upon documentary sources. The evidence from the Oracle excavations was much more varied. In addition to a large number of revetments, the Oracle project also investigated the sites of two mills (sites 150 and 300), a complex sequence of reclamation, construction and occupation within

the valley floor itself (site 12), and activity on the edge of this landscape (site 29). This has shown that the sequence of development identified by Hawkes and Fasham is broadly confirmed by the Oracle results, but a significant revision is possible for many of the date ranges attributed to the changes in land use. No true wharfage was recovered by the Oracle excavations, but it is hard to understand why Hawkes and Fasham place this as late as 1300-1400 when documentary evidence (see below) makes it clear that there were wharves in place by at least the late 12th or early 13th century.

However, it is the evidence for industrial and settlement activity from the Oracle excavations that prompts the most significant revisions to the model. The 16th-century date proposed by Hawkes and Fasham (1997) for the appearance of industry on the floodplain can now be seen to be much too late. The construction of mills within the valley landscape is itself an indicator of industrial activity, whether it is for the milling of grain or, later, also for fulling. These buildings were essentially timber engines that effectively replaced the domestic grinding of grain by quern for a large number of households. How early this happened in Reading remains uncertain, but there were six mills by the time of Domesday Book, suggesting that industrial use of the floodplain should probably be seen as having a very early origin, at least in this restricted sense of the term. The Oracle excavations also recovered evidence for the establishment of industrial activity on reclaimed land from the late 12th century onwards.

Likewise, some revision can be proposed to the dating of settlement in the waterfront zone, although this was always on a very limited scale and probably closely linked to the industries in the area. The building known as the Yield Hall, investigated on Oracle site 12, may well have seen mixed trade and domestic use over its 400-year life, but the nature of alterations to it in the late 16th and 17th centuries suggest that it was certainly in use as a domestic dwelling, and even one that aspired to the architectural fashions of the day. If documentary evidence is taken into account, the date for occupation on the floodplain can be taken back even further, to the mid 14th century, when William le Catour held a house and vineyard on the west side of the gildhall from the mayor and burgesses, and a cottage with barns, stables and gardens was leased by the gild throughout the 15th century (Chapter 4, above).

## THE ORACLE EXCAVATIONS AND THE DEVELOPMENT OF READING

In his general survey of the fortunes of British medieval towns between 1300 and 1540, Barrie Dobson (2000, 273) found himself drawn back to the famous comment of the great urban historian F W Maitland, who declared that he was 'far from thinking that any one history should be told of all our boroughs'. Nowhere is the truth of this better illustrated than in the case of Reading. It was, of course, subject to the same political, economic, social and cultural forces as other places and it shared many of the characteristics of other medieval towns, but, nevertheless, the development of Reading followed a distinctive trajectory that does not readily conform to any one model of medieval urbanisation.

In very general terms, the chronology of Reading's development can be followed in the town ranking lists derived from medieval taxation records (A Dyer 2000a and b). Reading was a 'small' town for much of the earlier part of our period. With 59 urban properties recorded in Domesday Book (which we might estimate as perhaps some 250-300 inhabitants), it ranks somewhere around 70th out of a total of 112 contemporary towns. The 'exact' figures are far from reliable, but the relative differences we see in these rankings are more meaningful; figures of around 900 properties are given for the largest recorded towns of the time, and the Domesday figures suggest that Reading was only a little more than one tenth the size of its Thames Valley neighbours Oxford and Wallingford. As such it provides an opportunity for us to recover and consider archaeological data for the obscure origins of early small towns, here perhaps developing at the site of a royal vill or a minster church, or both.

By the late 14th century, Reading's population had increased to something like 1700, and it ranked 44th amongst the country's most populous towns, a position it shared with Bridgnorth and Wells (Dyer 2000b 274, table 12.1). Once again, the 'exact' figures are less useful than the relative changes we see in the taxation records of this time. Reading's population in the late 14th century was perhaps six times what it had been in the 11th century. Although we have no population estimates for the 12th or 13th centuries, it is likely that a major phase of growth had taken place in the late 12th and early 13th centuries, as a result of the abbey's development of new streets and tenements (see below). A Franciscan friary had been established in the town in 1233, and the presence of friaries has often been seen by commentators as a mark of increasing size and status in a town, as the friars sought out populous urban centres for their mission. We have no evidence to assess how Reading had been affected by the population crises of the early and mid 14th century, or how rapidly it may have been recovering in the later 1300s.

Nevertheless, we can perhaps at least suggest that Reading's expansion over this period had been steady rather than spectacular. By comparison, for example, Coventry had also been a very small place in the 11th century but had over 9000 inhabitants by 1377 (*ibid.*).

By 1524/5, however, Reading ranked as the 12th richest town in England in terms of the size and wealth of its business community, and around 20th in the country in terms of its population, more than 500 of whom were rich enough to be included in a national tax levied at this time (Dyer 2000a, 761-7, tables 6 and 7). This might imply a total population of around 3000. Although these estimates can only be approximate, they suggest that by the early 16th century the population of Reading was about half the size of the largest towns in the country excepting London. This was, of course, not the result of a simple linear process of growth at Reading, but a relative change due also to retrenchment and decline in other places. Against a background of substantial reductions in many larger towns, Reading's population roughly doubled between the late 14th century and the early 16th (Dyer 2000b, 278-81, table 12.3). Decline in some towns and growth in others is a characteristic feature of the later medieval period, but its causes are complex. Alan Dyer (2000b) has identified two clear trends in the distribution pattern of expanding and contracting towns in the later medieval period. Firstly, while declining towns form the great majority in eastern England, there are clear clusters of expanding towns in certain favoured regions, including central southern England, which probably reflects the buoyancy of the regional economy (*ibid.*, figs 12.1-2). Secondly, there was a slimming-down of the urban hierarchy, with the larger towns shedding large numbers of inhabitants, while towns in the middling ranks were expanding (*ibid.*, 285). As an expanding middle-ranking town in a prospering region, Reading provides a particularly good opportunity to study this process of change archaeologically.

The excavations at the Oracle development that are reported in this volume were not located within the core of the medieval town. They do not provide us with an opportunity to chart its development by the growth or decline in occupation of tenements along its street frontages, although some evidence for this has been recovered recently in smaller excavations elsewhere in the town. The Oracle excavations, located at the southern edge of the medieval town, largely provide complementary data relating to the town's economic development. In some cases, the excavations recovered evidence for *in situ* activities on the Kennet floodplain, but in other cases the evidence is a reflection of what was (or arguably was not) taking place elsewhere. This final section of our report reviews what light this can shed on some of the important

archaeological questions raised by Reading's origins and development, and what factors may have been influential in promoting its remarkable late medieval growth.

### **Reading: the origins of a medieval small town to c 1150**

#### *The late Saxon town*

Reading was a monastic borough, a town developed and for long controlled by the major Benedictine abbey in its midst. But uncharacteristically, in the case of Reading the borough preceded the monastery by nearly a century (see Chapter 1). At the time of Domesday Book it was shared between the rich royal manor of Reading and the estate of its minster church, with properties in the borough being held in virtually equal numbers by both the king and the church. The date and circumstances of the creation of the borough are unknown, but foundation by Edward the Confessor would be consistent with the existence of a minor mint at the site in the 1040s. Grenville Astill has suggested that the borough may have been founded to act as a secondary marketing centre for the produce of the royal manor (1978, 75), and something very similar may have taken place at much the same time at the royal manor of Old Windsor (*ibid.*, 69). If the equal shares of the king and the minster in the town of Reading pre-date the gift of the church to Battle Abbey, then it may be that the original establishment of the borough was intended to provide a marketing centre for the royal and minster estates jointly, with the profits divided between them.

No structural remains of the early town have yet been found in archaeological excavations in Reading, and little can therefore be added to what is known from documentary sources. A number of excavations in addition to those reported in the present volume have taken place in the centre of Reading in recent years but the only feature that might possibly be of this date was an early ditch observed at the north edge of St Mary's churchyard during the excavations at 90-93 Broad St (Norton and Poore 2007). The accumulation of negative evidence from these sites adds weight to Grenville Astill's suggestion that the early focus of the town is likely to have been around the crossroads to the west of St Mary's Church, along the Old Market and Old Street (now Bridge St) (1978, 77), in an area that has not been archaeologically investigated. As has been noted above, the Domesday figures imply that this settlement need have been no more than roughly one tenth the size of contemporary Oxford or Wallingford. One final independent strand of evidence that may be noted is that the quantities of late Saxon pottery reported from Reading remain very small indeed. In a recent review, Paul Blinkhorn (2005, 173-6) notes the presence of only a handful of sherds of pottery of this date, none of

which need be earlier than the 11th century. The pottery that has been found includes shell-tempered ware similar to pottery found in Oxford and London, and a few sherds of regionally imported pottery from Stamford and Thetford.

The scarcity of archaeological evidence for late Saxon Reading is a feature shared with most other small towns of the Thames Valley region, although it contrasts starkly with the evidence for the known major towns at Oxford and Wallingford (Booth *et al.* 2007, 139-41, 247-63). One feature of these places that would repay further consideration in the future is the evidence from some of them that areas where occupation becomes established in the late 11th or 12th century show no evidence of occupation during the preceding centuries. In other words, the archaeology of small towns may be quite different from that of larger towns, where we are used to finding long sequences of occupation on the main street frontages that can date back to the earliest years of the town's existence. Small towns, which usually have much shorter stratigraphic sequences, may be showing us more clearly than their larger and more complex contemporaries, how urban expansion proceeded as a result of discrete additions to a small pre-existing core. The process may have been no different in some of the larger towns (Coventry might be a good example – Lilley 1994), just harder to detect archaeologically. To a certain extent this is stating the obvious, but perhaps archaeologists need to resist the tendency to think of small towns simply as smaller versions of large towns. Their archaeology may, in fact, be quite distinct.

#### *The late 11th and early 12th centuries*

The minster church at Reading was granted by William the Conqueror to his new foundation of Battle Abbey in 1071, and the pottery dating implies that the earliest signs of settlement from the Oracle excavations probably belong to the Abbot of Battle's 50-year period of tenure. Quarry pits for the extraction of gravel and chalk had been dug across a wide area, exploiting a naturally occurring band of thick gravel on the rising ground to the north of the Kennet valley floor (Fig. 2.3). With the exception of single redeposited Roman and early/mid Saxon sherds, the pottery from these pits dates from the mid to late 11th century onwards. In addition to the quarrying, three very large pits were found at the north edge of the site. From the nature of their fills, their size, spacing and regularity of alignment, these seem likely to have been a row of latrine pits, arguably located within a single large building of which no other evidence was seen. Pottery from the pits was of late 11th- to 12th-century date, and they also contained animal bone indicative of skinning or hide craft working activity. The latrine pits were located some 80 m to the south-east of the present church of St Mary's, which is a considerable, but still plausible, distance for an element of a minster

complex. The latrine pits remained in use although the quarried area to the south was soon redeveloped for the construction of a sequence of buildings. The first of these was represented by only slight remains (not illustrated), but the second was partitioned and floored with gravel and chalk and included a rare domestic detail, a hearth with a clear circular indentation such as would have been formed by the base of a pot (Fig. 2.4; Plate 2.2). Numerous sherds of pottery in the local fine sandy ware (F1) were recovered from the area around the hearth, refitting to form parts of two jars, either of which could have been the vessel that sat on the hearth. Part of a stone lamp was recovered from occupation layers within this building. Ruth Shaffrey (Chapter 9) comments that the lamp is similar to examples found at Winchester; early stone pedestal lamps such as this are quite rare, and mostly found in 12th-century contexts, although an earlier date cannot be ruled out.

In the absence of dendrochronological or other absolute dates, the pottery provides the only dating framework for this activity. However, the assemblages are dominated by fine sandy wares of probably fairly local origin, which were in use from the mid 11th century throughout the 12th century and offer little chronological precision. The very limited presence of Ashampstead ware and the absence of London ware from Project Phase 2 assemblages suggests an end date for the whole phase by the middle of the 12th century. An intermediate dating horizon is provided by pottery from the soil that built up over the abandoned remains of the second building, which dates from the end of the 11th century onwards. This would suggest that the quarrying, the construction and first use of the latrine pits, and the first two timber buildings date from the mid to late 11th century into the early 12th century, with the later activity of this phase taking place between the early and mid 12th century (see below).

The most convincing explanation for the archaeology of site 29 at this time would be a programme of rebuilding at the minster, which would have required the quarrying of gravel and chalk for construction, and it is arguable, although highly speculative, that a demolished Saxon church might have been the source of the stone lamp and the fragments of Roman tile found both at site 29 and in excavations nearby at the north-east edge of St Mary's Churchyard (90-93 Broad St; Norton and Poore 2007). It is worth noting that the Broad St excavation also recovered a sherd of Ipswich ware pottery, datable to 725-850. This type of pottery in this region tends to be associated with high status sites and places that were integrated into exchange networks linked with London in the mid Saxon period (Blinkhorn 2007a, 14). While this remains the simplest explanation for these events, it is also true that the nature and location of the royal manorial centre and its relationship to the minster remain unknown, and construction work at this time might

conceivably have been associated with either of these centres, or both.

If we are right in suggesting that the latrine pits formed part of a minster complex, this would imply that it extended as far south as the river channels at the north edge of the valley floor at this time. This is a very plausible location for a Saxon minster, and is reminiscent of the position of St Frideswide's minster at Oxford, which was similarly located on higher ground overlooking not only river channels but also the route across them (Dodd 2003, 17-19). The first two timber buildings constructed on site 29 could well have been houses or workshops of minster servants or tenants, located towards the periphery of the complex. The occupants might conceivably have been engaged in the skinning or hide-processing activities for which there was some evidence in the contemporary animal bone assemblage. The excavations at 90-93 Broad St found some additional evidence for early occupation in the area. A butchered roe deer bone was found amongst a small animal bone assemblage from the earliest excavated layers at this site, which are dated to before *c* 1100, and other food remains included charred grains of processed wheat, barley and oats, with a single rye grain, together with abundant charred hazelnut fragments (Norton and Poore 2007, 24, 28).

Elsewhere, the earliest evidence for management of the Minster Mill stream may be datable to this period, and it is possible that St Giles Mill was also operating at this time (this volume, Chapter 2 above). Domesday Book records that the Abbot of Battle held two mills as part of the minster church estate and the king held another four in the royal manor. Slight evidence for an insubstantial revetment of a river channel meander, possibly from the Holy Brook, was recovered in the excavations at the Abbey Wharf (Hawkes and Fasham 1997, 16-18, fig. 13 Phase 1c). The remains consisted of a small number of beech posts possibly of 11th- or early 12th-century date. In excavations on the floodplain immediately to the east of Bridge St two beech or birch stakes were recovered that appeared to be part of a reinforcement of a channel junction. One of the stakes gave a radiocarbon date of cal AD 980-1120 (*ibid.*, 50-51, fig. 36).

### *The early to mid 12th century*

On midsummer's day in 1121 Henry I laid the foundation stone for his most favoured monastery, where he was himself to be buried, on the promontory overlooking the confluence of the Kennet and the Thames at Reading. Henry's new foundation was a Cluniac house, a Benedictine monastery following the practice of the mother house at Cluny in Burgundy, which was distinguished by the magnificence of its liturgy and ritual. The gift of the hand of St James ensured that it soon became a major centre of pilgrimage. Why Henry I made this decision will probably never be known. It could have been a symbolic decision, as the promontory

on which the abbey was built had been a Danish headquarters for the thwarted invasion of Wessex in 871. However, Reading also occupied a key strategic site within the Thames Valley, which was a prime route used by medieval kings and their courts on journeys west of London. It is almost certainly no coincidence that Henry had a palace built at Oxford by 1132, and both establishments were probably intended to provide a night's staging post on journeys to the favoured royal hunting lodge at Woodstock. The abbey was given all the lands and property of the royal manor at Reading, and of the minster, which Henry obtained from the Abbot of Battle in exchange for property in Sussex.

The problems of dating the archaeology of this phase have been discussed above. However it would seem reasonable to associate the next developments at site 29 with the second quarter of the 12th century, when the minster had passed from the control of Battle Abbey to that of the newly founded Reading Abbey, and during which the new abbey was itself under construction.

Until the late 12th century Old St and its bridge was probably the only route into the town from the south. Access to the abbey building site would then presumably have been along the edge of the old minster precinct itself, suggesting a plausible context in which Minster St might have become firmly established as a public thoroughfare. Arguably, it is at around this time that we see the first evidence for the laying out of the lane to the west of site 29, at right-angles to Minster St, and the construction up against it of a very large timber building of good quality. Building 5830 (Fig. 2.5) measured 12.5 x 9 m in plan, with partitioned spaces along its east side, a large open area on its west side, and a gravelled yard bounded by a small ditch or gully. The only evidence for its function is the presence of two hearths, one of which, at the south end of the building, was contained within the remains of a small chalk and flint wall and was possibly a small-scale furnace. Deposits within this hearth had a rusty colour, suggesting possible iron working. Large quantities of charcoal and a significant number of iron nails were found overlying the floor of this building. Although the nails might have been used in its construction, the combination of this evidence suggests the possibility that they were being made on the site, and it is possible that this short-lived building was in some way associated with the construction works at the abbey.

The final development of the first half of the 12th century at site 29 saw the construction of two new buildings, following the destruction by fire of Building 5830. Building 5820 (Fig. 2.6) was the first to use a mixture of stone and timber, with its south wall built of chalk with a dressed flint external face, but a timber-framed east wall at the back. It was a well-kept building with an extensive metalled yard and two successive internal floor surfaces, the first of rammed gravel, and the second of rammed chalk. The second floor was overlain by charcoal-rich

occupation deposits, especially above a heavily fire-scorched area in the north part of the building that indicated the position of an internal hearth (Plate 2.4). Bone from one of these occupation deposits contained a rich variety of animal and bird bone, including pig, cattle, sheep/goat, hare, partridge, duck, domestic fowl and other birds. Both the variety of this bone and the subsequent history of this building suggest that it represents the probable establishment in its first form of the public cookshop later known as *La Kychene*, the evidence for which is discussed below. At first sight, the location might seem a rather odd choice, tucked away down a lane at the very edge of the valley floor. However, if we are right in suggesting that at this time Minster St would have formed the main thoroughfare between the Kennet crossing on Old St and the new abbey, then the choice of site becomes much easier to understand. Documentary sources of the later medieval period show that the site was owned by the abbey almoner, whose duties would certainly have included providing for the support of pilgrims and visitors. A smaller building, Building 5825, with chalk-built walls, was subsequently added to the south. Very little evidence survived for the function of this building, but it seems likely that it was a short-lived annexe to Building 5820.

Elsewhere on the floodplain there is evidence for the existence of St Giles Mill at this time, including the important discovery of a discarded pitwheel (an element of mill gearing) whose form suggests a date in the first half of the 12th century (see above, and Chapter 2). Associated features included a number of timber stake and post alignments from channel revetments, and a bank consolidated with deliberately laid plant matting (Plate 2.37). A single timber pile from within the area of the later mill building was dated by dendrochronology to the year 1131. Deposits of grain from a pit at the Minster Mill site are probably datable to this period rather than later, and suggest that the Minster Mill was being used for the cracking of germinated barley and oats for malting, and the grinding of wheat and rye into flour.

Pottery becomes abundant on the site in this period, and is dominated by simple sand-tempered wares from relatively local sources (Blinkhorn this volume, Chapters 5 and 7; Blinkhorn 2005). Pottery from further afield suggests that Reading's principal contacts at this time were to the west, with the Oxford area on the Thames, with the Newbury area on the Downs, and with the Cotswolds. Paul Blinkhorn (Chapter 5, above) draws attention in particular to the significance of the presence of the Cotswold wares, which may be associated with trade in Droitwich salt. He also notes contrasts between the pottery evidence from early Reading and that from Windsor, where shell-tempered wares that may have come from London were common, but conversely pottery from the Cotswolds and Newbury area was rare (2005, 175).

## **The developing town: c 1150-1400**

### *Streets and tenements*

The period from c 1150 to 1250 sees the first substantial evidence for the development of the town. Documentary sources suggest that it was during the mid to late 12th century that Reading Abbey embarked on a programme of development of its borough with the construction of a new market place outside its gates, a new bridge over the Kennet, and the laying out of new streets with tenements for rent (Astill 1978, 77-8). Grenville Astill suggests that Broad St and Friar St may have been laid out as a small grid, with interconnecting lanes between them, and London St was created to bring traffic to the abbey's new market place, and was set out with tenements for rent to either side. By the late 12th century, suburban settlement is also attested in the St Giles area, south of the Kennet, where a parish church is first mentioned in documentary records at this time.

This is supported by a marked increase in archaeological evidence. The laying out of Broad St for occupation in the late 12th century would have required the definition of a new boundary to St Mary's Churchyard, and this may be represented by a west-east aligned ditch seen at the south edge of the excavations at 90-93 Broad St (Norton and Poore 2007, 2-3, figs 3, 4). The fills of this ditch contained 12th-century pottery; later chalk foundations on the same alignment were probably the churchyard wall, and a wall is shown in this position on Speed's map (Plate 1.3). The suggestion that the abbey laid out a grid of streets and interconnecting lanes is supported by evidence for the early existence of two properties aligned east-west in the south-eastern part of the same site, which would have fronted a lane (now Chain St) connecting Broad St and Minster St (*ibid.*, 29-30). This lane appears as a substantial thoroughfare on Speed's map of 1611 (Plate 1.3) where it can be seen to form the eastern boundary of St Mary's Churchyard. This might suggest that the lane was originally laid out to mark the churchyard's edge, and that its frontage north of the churchyard was used to create additional tenements from an early date. The Oracle excavations identified a 12th-century surfaced lane leading from Minster St to Minster Mill and a third lane, leading down onto the floodplain from the east end of Minster St, was inferred from excavated evidence for the reclamation of land and construction to either side of it during the late 12th or 13th century (Chapter 2).

Excavations at both the west and east ends of Broad St and Friar St have shown that occupation was established on the main street frontages during the 12th or early 13th century, although in most cases the surviving evidence was fragmentary and had suffered much later truncation (Norton and Poore 2007; Scott and Hardy 2007; Ford and Ford 2005; Atherton 1999). The best results come from the west ends of both streets, with those at the east

ends having suffered most subsequent damage. Occupation was also spreading along Castle St at this time, and excavations at Nos 31-37 found pits of mid 12th- to 13th-century date (Pine 2005a). A poorly preserved building identified on the site could only be broadly dated to the 13th or 14th century. The excavator comments that this seemed to have been a domestic rather than an industrial building, and as such its position on reclaimed land at the rear of the plot, and on a constricted site, might be evidence for pressure on land within the town at this time (*ibid.*, 77).

### *La Kychene*

On site 29 of the Oracle excavations, the suggested cookshop was reconstructed as a large and elaborate stone building, probably during the second half of the 12th century, at a time when the abbey was receiving frequent royal visits and had become established as a centre of pilgrimage. Building 5825 was demolished and replaced by the much larger and more substantial Building 5840, but Building 5820 continued in use to the north (Fig. 2.7; Plate 2.5; Fig. 6.1).

The evidence suggests that this was a prestigious building, probably of one storey, with walls entirely constructed of chalk rubble with a dressed flint exterior up to eaves height. A chalk rubble internal wall created a small western room and a much larger eastern space containing a large centrally placed hearth, and stakeholes that were probably for benches in the eastern corners. A further hearth and charcoal-rich occupation deposits were found in the western room but there were very few finds, suggesting that the building was kept clean. Some time after the initial construction and occupation of Building 5840 a large new hearth of flat roof pegtiles set on edge was installed within the eastern area (Plate 2.8). Well-constructed keyhole shaped ovens, probably for cooking, were later inserted into both Building 5820 and Building 5840 (Plate 2.9). In addition, a semi-sunken cellar, probably originally timber-lined, was constructed on the east side of Building 5820.

Two large stone-lined cess pits (Groups 11294 and 11396) were constructed to the north of Building 5840. These were located on the north edge of the previously quarried thick band of gravel, and were set some 10 m apart. It is possible that they were associated with Building 5840, although they might equally have been constructed at the end of new tenement plots along the south side of Minster St. In the light of our suggested interpretation of the function of Buildings 5820 and 5840 it is interesting to note that a large fragment of a stone mortar (Fig. 5.49 No. 5) had been built into the wall of one of the pits.

Pottery associated with the construction and use of Building 5840 and the continuing use of Building 5820 includes relatively large quantities of London-type ware, likely to have been manufactured close



to the City of London from the middle of the 12th century, and Ashampstead ware from a kiln located c 15 km to the west of Reading. Highly decorated imitation North French and Rouen jugs in London ware, and highly decorated glazed jugs with painted geometric slip design in Ashampstead ware were found at the site, and are very characteristic of the first half of the 13th century, when we can assume that the cookshop was in use. Sherds from two of these Ashampstead ware jugs were found in context 11293.

In addition, Jamie Preston (Architectural stone, Chapter 8) comments that the earliest example of the re-use of architectural worked stone was recorded in the additions to Building 5840 creating Building 5860 (see below). This piece, Stone Type No. 10 (Fig. 8.2), is a hoodmould carved from chalk, dates to the 12th century and with its quirk and hollow mouldings is typical of the period. Hoodmoulds were employed on the extrados of window and doorway arches both externally and internally. While it is possible that this piece derives from remodelling works at the abbey itself, it is also possible it was re-used from demolished sections of Building 5840. The walls of the structure were built using roughly dressed chalk blocks, which corresponds with the material used for the hoodmould.

Eventually the location of Building 5840 proved to be problematic. At some point the southern wall must have started to fail, probably due to the effects of the Holy Brook flowing against its southern face, in combination with the soft nature of the underlying ground into which the foundations were placed. The response to this took the form not only of efforts to counteract the instability of the ground, but also of an ambitious expansion of the building, which was doubled in size to form Building 5860 (Fig. 2.8; Plate 2.10, Fig. 6.1). Building 5820 was demolished, probably as part of this operation, and its functions seem to have been transferred to a large new extension built onto the east end of Building 5840. A new northern wall created a cross passage along the entire length of Building 5840. The newly created extension had four centrally placed chalk and flint rubble column bases to support the roof, a small projection at its east end for a chimney and fireplace, and a large gap in the southern wall that opened onto the Holy Brook. The southern wall was underpinned with oak piles to prevent the subsidence experienced in Building 5840, and these have provided the dendrochronological evidence dating the creation of Building 5860 to around 1270. On the southern bank of the Holy Brook, opposite the gap in the southern wall of 5860, two short lengths of similar foundations were revealed suggesting the presence of an associated structure. Running along the southern face of Building 5860 was a well-built timber revetment that probably supported a walkway; this would have served to give access to the stream for water and waste disposal, but may also have functioned as a small wharf for loading and unloading goods.

The new extension housed a significant number of purpose-built hearths and working platforms (see Chapter 2, above). The specific function of hearths such as these is notoriously difficult to interpret in the absence of debris associated with their use. Similar structures at Swan Lane in London (Egan 1991, 12–15; Schofield and Vince 2005, 140–2, figs. 4.5–6) and Brooke Street in Winchester (Biddle 1968, 267 pl. 1xb) were interpreted as the remains of structures associated with cloth working; similar structures at Newbury (Vince *et al*, 1997) have had a broad industrial interpretation offered, as well as a kitchen hearth. However, at the Oracle the combination of structural, environmental and documentary evidence suggests that a very specific function can be proposed. Occupation deposits associated with Building 5820 and with the use of hearths 6134 and 6097 within building 5860 contained a varied range of food remains, including bones from pig, cattle, sheep/goat, hare, partridge, woodcock, duck, domestic fowl and other birds, as well as fish including plaice and flounder. Environmental samples from the same sequences of occupation layers (contexts 6096, 6125 and 6150) included grain from free threshing wheat, hulled barley and oats, along with rye chaff, broad bean, bean/pea/vetch, hazelnuts and fig seed, together with charcoal from oak and *Prunus* (plum-type) wood. Large proportions of seeds from cornfield weeds were also present, and taken together this evidence is highly suggestive of kitchens in which baking and the preparation and cooking of meat, fish, fruit and vegetables was taking place. This implies that the new extended area of Building 5860 had taken over and intensified the earlier function of Building 5820, as a kitchen serving Building 5840. However a kitchen on this scale would be much too large to provide for simply a domestic occupation.

There is little doubt that a prestigious building of this type built on a large scale and of good quality would have cost a significant amount of money to construct. There were only a few groups or individuals within medieval society at this time for whom this would have been possible and it is suggested that this building was probably developed by the abbey itself. Documentary sources offer only a generalised view of activities on Minster Street in the medieval period, and none can be identified specifically with site 29 (see Chapter 4, above). However, Amyce's survey of 1552 lists a number of properties on Minster Street that had belonged to the abbey but were purchased after the Dissolution by William Grey. Two of these may have belonged to the abbey almoner, and one of them may have been the property that formed the subject of a lease dated December 1370, called *La Kychene* (Kemp, Almoner f48a). On Peyton's cartographic representation of the Amyce Survey (Plate 1.2) a property owned by Grey is situated in a position that would have been covered by site 29. The coincidence of this with the archaeological evidence for a kitchen operating on a



*Fig. 6.1 Reconstruction of Building 5860*

very large scale on site 29 is compelling, and it is suggested that Buildings 5820, 5840 and 5860 represent the remains of *La Kychene*, and that it was a public cookshop. William FitzStephen, clerk, friend and biographer to Thomas Becket, describes a public cookshop in London in his celebrated account of the city in 1173:

Every morning you can find those carrying on their various trades, those selling specific types of goods, and those who hire themselves out as labourers, each in their particular locations engaged in their tasks. Nor should I forget to mention that there is in London, on the river bank amidst the ships, the wine for sale, and the store-rooms for wine, a public cookshop. On a daily basis there, depending on the season, can be found fried or boiled foods and dishes, fish large and small, meat – lower quality for the poor, finer cuts for the wealthy – game and fowl (large and small). If friends arrive unexpectedly at the home of some citizen and they, tired and hungry after their journey, prefer not to wait until food may be got in and cooked, or ‘till servants bring water for hands and bread’, they can in the meantime pay a quick visit to the riverside, where anything they might desire is immediately available. No matter how great the number of soldiers or travellers coming in or going out of the city, at whatever hour of day or night, so that those arriving do not have to go without a meal for too long or those departing leave on empty stomachs, they can choose to detour there and take whatever refreshment each needs. Those with a fancy for delicacies can obtain for themselves the meat of goose, guinea-hen or woodcock – finding what they’re after is no great chore, since all the delicacies are set out in front of them. This is an exemplar of a public cookshop that provides a service to a city and is an asset to city life. Hence, as we read in Plato’s *Gorgias*, cookery is a flattery and imitation of medicine, the fourth of the arts of civic life (Corporation of London Records Office, *Liber Custumarum*, ff.3-5 ca.1174/1183: translation in Transcription in: Henry Thomas Riley, ed. *Liber Custumarum*. Rolls Series, no.12, vol.2 (1860), 2-15).

The development of a cookshop on this site probably dates back at least as far as the construction of Buildings 5820 and 5825 towards the middle of the 12th century. Building 5840 seems likely to represent the addition of a larger eating hall, containing benches and a large fireplace for heating and light. The addition of the two keyhole hearths in these buildings charts the need to increase production and attests to the success of this enterprise. The eventual demolition of Building 5820 and the apparent transfer of its role to the new extension at the east end of Building 5860 sees activity increase to a scale that must have served scores of people each day. The changing access arrangements to the buildings provide some insight into how they

were used, with the new cross passage giving access from the lane into the kitchen area of Building 5860. An entrance in this position would be consistent with continuing use of the former western area of Building 5840 containing oven 6004 for food preparation. Further east the large opening in the south wall of the extended area, which communicated directly with the Holy Brook and the structure on the opposite bank, was probably for the unloading and delivery of supplies, for access to water, and perhaps for the throwing and sweeping-out of rubbish into the river channel.

### *The Kennet valley floor*

The extending of lanes across the floodplain, sometimes towards existing islands, and the land reclamation through dumping material beside these lanes (with subsequent construction of buildings) forms a general process by which the town was extended towards the main river channel or channels. At Reading this process was additional to, and probably more important than, the better-documented construction (at other towns) of successive revetments parallel to the river.

By the late 12th century there were three mills operating on the Kennet floodplain. The abbey’s mill was built at the south edge of its precinct and powered by the Holy Brook. Excavations at Castle St and at the Abbey Wharf identified works associated with the realignment of the Holy Brook at this time (Pine 2005b, 63, 77, figs 4.3-4.4) and the revetment of a bypass channel and tailrace channel for the Abbey Mill (Hawkes and Fasham 1997, 18-19, fig. 14). New oak post and plank revetments were installed in the mid to late 13th century, probably in the period 1253-7 and it may be at this time that the old bypass channel was closed off and diverted to a more northerly alignment (ibid., 22-3; Groves *et al.* 1997, 69).

Although the Abbey Wharf excavations did not locate clear evidence of wharfage in the area at this time, it clearly existed. John Chandler (1997, 178-9) suggests that the late 12th- and early 13th-century revetment works in the area may have been associated with the construction of wharfage. A lease by the abbey to Osbert of Waltham of 1186x1213 refers to the grant of a quay (*kaio*) on land east of High Bridge, on condition that Osbert ensured that boats were not prevented from berthing there by flood or drought, and that he maintained a way through his property to the quay so that there was no hindrance to boats or waggons coming there for loading and unloading. In return, the profits of the quay would be shared equally between Osbert and the abbey (ibid.; Kemp 1987, 123 no. 846).

A lane giving access to the large island ‘nearest the Gildhall’ is mentioned in a deed of 1204x1220, and was probably the forerunner of the lane later known as George Lane/Yield Hall Lane.

This lane was not directly observed in the excavations, but its presence can be inferred from the

development and alignment of structures excavated to either side.

Reclamation of the valley floor was made possible by the dumping of chalk and gravel, retained by characteristic chalk and flint walls, to raise the ground above the level of flooding. In this way suitable building plots could be created that fronted onto the lane, with ready access to flowing water at the rear. Only the western plot, Site 12, the future site of the Yield Hall, was investigated in detail. Here, a man-made channel (9549/9149) a metre wide and lined with a post and plank revetment was dug to bring water to the area from downstream of the Minster Mill (Figs 2.13, 2.14).

Building 7410 stood next to this channel, on a raised platform of chalk and gravel, between the channel and the inferred lane. It had narrow chalk and flint walls that probably supported timber framing, thus elevating the elements that would be susceptible to decay in this damp location. Adjacent to the channel was a chalk-surfaced corridor or walkway, and within the building itself immediately to the east of the walkway were the remains of two opposing hearths with extensive rake-out deposits (Fig. 2.14). These hearths were probably used for heating vats, although what they had contained was unclear. They might have been part of a cloth finishing workshop or they may have been associated with the tanning trades active a short way to the south-west. Similar reclamation dumps associated with similar chalk rubble and flint walls were seen in test pits to the east of the inferred lane, suggesting that development of the valley floor was quite widespread.

Some 20 m to the south-west, a complex of large, sub-rectangular tanners' pits was excavated (Fig. 2.16), and in some cases evidence for timber and wattle linings survived. A very similar pit was identified in Test Pit 149 to the east, and it is likely that the excavations located only a small part of a more extensive industry. The pits were not closely datable, but pottery from the fills suggested that they came into use during the 13th century, and remained in use until the late 15th century. A detailed discussion of the excavated evidence for the medieval and early post-medieval leather trades at the Oracle sites can be found in Chapter 5, above. Dumps of unusable parts of the hides provide direct evidence for the operation of the industry in the vicinity. The earliest significant dump of waste leather was from late Phase 4 (late 14th century) adjacent to London St, and included hides with holes at the edges where they had been pegged out to dry. A large dump of 15th-century waste from the Minster Mill bypass channel at site 12 included udder fragments and more hide edges with pegging-out holes. A variety of hides were present in both primary and secondary waste at site 12, including bovine leather, but also evidence for the preparation and use of the softer leathers made from the skins of calves, pigs, goats and sheep. This suggests that the area was being used by both the

tanning and tawying trades. A strict distinction was maintained by medieval gild regulations, between the trades of the tanners (who tanned cattle hides with oak bark) and the tawyers (who prepared the skins of other animals, including calf and kid, for the manufacture of softer, paler leathers for gloves and purses).

At some point before the 15th century the industrial structures in Building 7410 were demolished. A new revetment was constructed along the channel edge, chalk and flint were dumped to raise the ground level, and the building itself was reconstructed (Fig. 2.17). The new walls were built in several stages, of a mixture of materials including flint, chalk and tile in varying combinations. This suggests a more makeshift approach to building, with construction proceeding on the basis of what became available.

Active management of the Back Brook, which lay between the Minster Mill Stream and the main channel of the Kennet, seems to have begun rather later than that of channels closer to higher ground. Over time, the course of the Back Brook moved consistently southwards, with evidence for a sequence of revetments along its northern bank, while the southern bank was allowed to flood. The earliest evidence for a substantial revetment was seen on site 101 but can be only broadly dated to some time between the mid 13th and mid to late 15th centuries (Fig. 2.13).

Investment in Reading's infrastructure continued in the 14th century. The Oracle excavations found evidence for a complete rebuild of St Giles Mill at this time, which is discussed in more detail in Chapter 5, above. Dendrochronological dates on timbers from the mill frame suggested that the rebuilding took place during the early 14th century. At much the same time a phase of substantial river channel engineering took place downstream in association with the Abbey Mill. Here, the main channel of the Kennet was reorientated towards a more direct south-north alignment, an extensive new revetment was installed, and wharfage was developed (Hawkes and Fasham 1997, 23-5, fig. 17). Dendrochronological dates suggest that the new revetment was installed during the period 1296-1323 and repaired or rebuilt in 1343/4 (Groves *et al.* 1997, 69). Although this was the first physical evidence for the abbey's wharves (Hawkes and Fasham 1997, 192), it is likely that this represents a phase of remodelling and new investment, since it is clear that the abbey had wharfage in this area from a much earlier date (see above).

### *The economy of the medieval town*

The excavators of recent sites in Reading have not been able to identify clear archaeological horizons distinguishing later 12th-, 13th- and 14th-century activity, except in the few cases on the floodplain where dendrochronology has been used to date preserved timber. Evidence for crafts and trade in

the town can therefore be only broadly dated to this general period, but some useful observations can be made. Reading had a Merchant Guild composed of the leading craftsmen and merchants by the 13th century (Chapter 4, above). Its most important industry, at least by the early 16th century, was the manufacture of high quality broadcloth. No structures that could definitely be associated with the medieval cloth trade were identified in the Oracle excavations, although it is possible that Building 7410 built on reclaimed land on the floodplain on site 12 in the late 12th or early 13th century could have been used for dyeing. A parasite of sheep known as a ked was found in silts at the bottom of the early Holy Brook channel at 31-37 Castle St (Pine 2005b, 76). This parasite cannot live long after separation from its host, and its presence suggests processing of sheep skins nearby. The channel was infilled during the mid to late 12th century, and this may be the earliest sign to date of the wool or cloth trade in the town. Four fragments of 14th-century woollen cloth from site 12 may well have been made in Reading, and wool from five of the seven different fleece types had been used in their manufacture (see Walton-Rogers, Chapter 5 above, and Chapter 9). This suggests that the town was drawing on wool from a relatively wide area. Three of the four fragments had been dyed with madder, in one case combined with a tannin-based brown dye. Dyes imported through Southampton were brought to Reading by London grocers, and madder, which was obtained from the Low Countries, is likely to have reached the town in this way. Two used fired clay spindle-whorls were found in medieval pits at the west end of Friar St (Ford and Ford 2005, 27). These provide the only direct evidence to date for spinning in the town; one of them is likely to be of 13th-century date, and the other occurred in a pit dated to the 14th century, but might have been redeposited. Documentary sources tell us that there had been a tenter-yard for the stretching of cloth on an island in the floodplain near to the land in John son of John's grant of 1204x1220 (this section, above), and also that there was a fulling mill at St Giles by the late 13th century (Kemp 1987, 135, 178). The evidence for the rebuilding of the mill in the early 14th century can be interpreted as a sign of substantial investment in cloth manufacturing at this time, although no direct evidence of the fulling process was found; both St Giles Mill and the Minster Mill were used for fulling as well as the milling of corn when sold to William Grey in the 16th century (see Chapter 4, above). There is also some evidence for flax cultivation and processing for linen. A single fragment of flax was found at 99-105 Friar St, but seed and capsule fragments were much more abundant in early levels at the Abbey Wharf excavations. Here, it was suggested that flax retting was being undertaken in the area, where the water resources for this process of soaking flax bundles to loosen the

fibres would have been readily available. Flax remains were more abundant in samples of the late Saxon to early 14th-century phases, declined in the 14th and 15th centuries, and were absent from post-Dissolution contexts. Wendy Carruthers suggests that this might represent a shift towards woollen fabrics in the later medieval period (1997b, 89-90 and table 9). Evidence for the cultivation of hemp, probably for fibre, was also noted at the Abbey Wharf excavations (*ibid.*).

The leather trades were well represented (see Chapter 5, above) and tanning and tawing were taking place on reclaimed land on the valley floor from at least the early 13th century. Most of the leather found in the Oracle excavations dates from the late 15th and early 16th century but a 14th-century dump of waste found near St Giles Mill included debris from shoe making and probably harness making. Evidence for the associated trades of butchery and skinning was identified in numerous pits at Nos 90-93 Broad St dating from the 12th to 14th centuries (Norton and Poore 2007).

There was some evidence for the operation of the metal trades in the medieval town. At Nos 99-105 Friar St fragments from a mould used for casting copper alloy vessels were found. It is suggested that there may have been a general purpose copper-alloy foundry here in the 14th century (Ford and Ford 2005 32). A large amount of copper slag and bell mould material was dumped in a pit containing pottery of the period 1200-1250 at the site at Nos 90-93 Broad St (Norton and Poore 2007, 30). Two items of medieval copper alloy jewellery found in excavations might have been made in the town. A copper alloy ring with a glass imitation gemstone of mid 12th- to 13th-century date was found in the disused Holy Brook channel at Nos 31-37 Castle St (Pine 2005b, 73), and a copper alloy penannular brooch was found in a 13th- or 14th-century context in excavations at the east end of Friar St (Atherton 1999, 2).

Medieval glazed and unglazed roof tile was found during the Oracle excavations (Vince, Chapter 8, CD-ROM) and was probably first used for the roofing of the cookshop in the later 12th century. Reading developed an early brick and tile industry; both the roof tiles and the numerous fragments of decorated floor tile that had been dumped on the site following the dissolution of the abbey (Vince Chapter 8) are likely to have been locally made.

The plant, animal, bird and fish remains from excavated medieval sites at Reading provide evidence both for the exploitation of the town's immediate and wider agricultural hinterland, and for increasing trade. Environmental samples from the period *c* 1150-1250 onwards contain much evidence for animal bedding (straw, bracken) and animal feed/dung (hay, legumes). The unreclaimed areas of the valley floor may have been largely kept for meadows, which would have been used both for the horses of visitors and the animals and geese of

the townspeople and traders at its markets and fairs. Plants associated with flora of damp, boggy ground are well represented in samples from the Oracle sites, along with plants of hay meadow, grassland and channel banksides, and willows, occasional alder and holly were growing at the channel edges (Pelling, Chapter 11; Scaife 1997, 78; Carruthers 1997a, 64). Results from a study of the wood species from the Abbey Wharf excavations showed that alder had been particularly prevalent on the floodplain in its unmanaged state, but a sharp decline in alder representation suggested that there had been substantial clearance or thinning of alder around the time of the foundation of the abbey (Carruthers 1997a, 64).

Arable weed seeds show that crops were coming from different sources, with weeds characteristic of acid, heavy and lighter well-drained soils all represented (Pelling, Chapter 5, above). All four major cereals were being used from at least the 12th century onwards. The 12th-century grain deposit from the Minster Mill provides evidence for cultivated oats, and for the cultivation of barley and oats together as a drage (Pelling, Chapter 11). Both bread wheat and rivet wheat were being used in the town, the former being preferred for bread making, and the latter for thatching because of its longer straw (*ibid.*). Vine wood found in a late medieval context at the Abbey Wharf excavations is probably from the abbey vineyards (Carruthers 1997b, 88), and there was a vineyard on the islands between the Kennet channels in the 14th century (Chapter 4, above).

Detailed dendrochronological studies for the Abbey Wharf (Groves *et al.* 1997) and Oracle excavations (Miles, this volume Chapter 5 and Chapter 11) have shown that the timbers used for the revetments of the Abbey Mill and for construction works at the Oracle sites up to the end of the 13th century probably came from the same source. It is suggested that this was naturally growing woodland owned by the abbey, possibly in the Cholsey area (*ibid.*). Cholsey was one of the estates granted to the abbey at its foundation (Kemp 1987). The timber used in 14th- and early 15th-century contexts at the Oracle excavations came from more diverse managed woodlands, possibly from the area around Mapledurham, only three miles to the north-west of Reading (Miles, Chapter 5, Chapter 11).

The animal bone assemblages from the Oracle present some difficulties of interpretation since it is likely that many of the groups represent selection for industrial purposes rather than food remains (Naomi Sykes, Chapters 5 and 10). As might be expected, the assemblages provide some evidence for integration between marketing and farming practice; both the relatively high age of the sheep and the high representation of wethers is consistent with animals from flocks kept primarily to maximise wool production. Animal remains from 13th-century deposits at 99-105 Friar St included neonatal piglet

and some eggshell (Ford and Ford 2005, 38), which might suggest that a pig and hens were kept by the occupants on site. A review of animal bone assemblages from excavations in Reading and Windsor was published recently (Hamilton-Dyer in Preston 2005), and results from the Oracle excavations and the sites at 90-93 Broad St and 7-8 Broad St can now be added, although the latter site produced very little medieval material (this volume; Norton and Poore 1997; Scott and Hardy 1997). The three main domestic species, cattle, sheep and pig, predominate, and there is consistent evidence for the consumption of domestic poultry, possibly kept within the town and on the floodplain meadows. Sheila Hamilton-Dyer noted only a low representation of wild mammals and birds from the sites she reviewed (Preston 2005, 177-9 table 9.2), with a few bones of red, roe and fallow deer, some hare and rabbit. She comments that rabbit during the medieval period is likely to have come from managed warrens and was probably not available to most town inhabitants. Partridge and woodcock were noted by Hamilton-Dyer and were also present in deposits at the cookshop on site 29 at the Oracle. The most varied assemblages of animal bone from Reading were recovered from numerous cess and refuse pits at 90-93 Broad St (Norton and Poore 2007) and included snipe, jack-snipe, pheasant, teal and lapwing as well as small passerines. A wide variety of fish were available to the medieval inhabitants of Reading. Marine species such as cod, ling, haddock and herring were probably traded in cured or salted form, although flatfish such as plaice and flounder may have arrived fresh. Eels could have been caught locally, and fisheries at Reading are recorded in Domesday Book.

The pottery assemblages from the Oracle excavations (this volume, Chapters 5 and 7) show a distinct change from *c.* 1150, with the appearance of London ware in relatively large quantities. This is the first clear indication of substantial trade with London, but pottery continued to be brought to the town from the west (Cotswold and Newbury wares) and the Ashampstead kiln site *c.* 15 km to the west of Reading was a substantial supplier during the early 13th century. During the late 13th and 14th centuries Reading's pottery assemblages continue to suggest a range of trading contacts, with pottery from the west still present, but increasing proportions of pottery from London and from the white-ware industries of Surrey (including Kingston and Cheam). Paul Blinkhorn suggests that the pottery may be showing us how Reading was increasingly functioning as a 'lynch pin' between regional trade zones focused on London and on the west of the country (Pottery review in Preston 2005, 176). It is interesting to note that in 1228 the abbot was involved in a dispute with the bailiff of Windsor over the payment of tolls in respect of vessels of men of his lordship plying the Thames to London with goods and merchandise (Chandler 1997, 178; Kemp 1986, 413).

## Reading in the 15th and 16th centuries

### *La Kychene*

In the 15th century there was a significant change in use at the Oracle site 29. The cookshop building, a familiar part of the townscape for over two centuries, disappeared. Dating evidence suggests that this happened during the second half of the 15th century, and the plot of land that it had occupied was not built on again until around the middle of the 16th century, after the Dissolution. Instead, the area was covered in a thick loamy soil, ideal for cultivation.

Empty plots in late medieval towns are often interpreted by archaeologists as a sign of urban decline and depopulation. However, as we have seen above, the reality was much more complex than this. It is significant that the building does not seem to have been left to decay, which might perhaps have been expected if its demise was part of a wider malaise within the town. Instead it seems to have been dismantled, and the re-usable building materials taken away, perhaps to be incorporated into new building projects elsewhere. Numerous commentators have drawn attention recently to the complexity of the phenomenon of late medieval urbanism, and argue that the whole period from the 14th to the early 16th century should be seen as one of longer-term structural changes that were reflected in the social composition as well as the economic activity of towns (Astill 2000; Lilley 2000). A notable feature of this period is a decline in ecclesiastical charitable activity, with the initiative increasingly passing to town institutions such as guilds. Stricter definitions of the deserving poor were introduced, to reduce the need for charitable relief (Astill 2000, 228). At Reading, the abbey's 12th-century hospital for 13 poor people had lapsed by the middle of the 15th century, and its buildings were converted into a grammar school. Similarly, the abbey's leper hospital was no longer functioning (Astill 1978, 79). The characteristic shift to private charitable provision that we see in so many towns of this period is also evident at Reading, where a wealthy citizen, John Leche or A'Larder, left money in his will of 1477 for 8 almshouses to be built at the west side of St Mary's graveyard (Astill 1978, 79), perhaps in part to compensate for the loss of the abbey hospital.

The demise of the cookshop, a property of the almoner, can therefore be seen not as a sign of general malaise in the town, but as a reflection of more subtle change. There was clearly a general retrenchment in the abbey's charitable activity at this time, and it is also likely that by the 15th century, if not earlier, most visitors to the town would have expected to be catered for by inns rather than the abbey. If the abbey had no further need for the cookshop, the buildings may have been deliberately demolished in order to prevent unauthorised use of them. Keith Lilley asks why it

was that the authorities in late medieval towns regarded vacant and decayed buildings as such a threat. He suggests that part of the answer may be that they provided an opportunity for the increasing numbers of migrant poor to move into an area as 'squatters', which could be discouraged if suitable abandoned buildings were not left standing (2000, 254-5).

### *Occupation within the town during the 15th century*

Evidence from the main street frontages is rather fragmentary, but sufficient to suggest that there was variation in the pattern of occupation. At the west end of Friar St (Nos 99-105) the frontages of two plots on the south side of the street were vacant for a time during the 14th to 15th century, although the backs of the plots continued to be used for pit digging (Ford and Ford 2005, 19-21, 40-42). At 90-93 Broad St there were fewer backyard pits at this time, although this may reflect changes in waste disposal practices as much as levels of occupation. Continuing disposal of domestic waste implies continuing occupation of the frontages, and butchers may still have been operating in the area as some animal bone was suggestive of primary butchery waste. Food remains from a cess pit included rabbit, fallow deer, partridge and sea bass, which would suggest that at least one prosperous household was living nearby during the later medieval period (Norton and Poore 2007, 31). At 31-37 Castle St pits of late 15th- to 16th-century date had been dug within the area previously occupied by a 13th- to 14th-century building (Pine 2005b, 63-4). One of the pits contained a dagger- or sword-scabbard chape (*ibid.*, 72-3, fig. 4.8). From the 14th century onwards, the abbey's new market place and the wharfs had replaced the Old Market as the commercial centre of the town, and the Old Ward was producing the least tax (Astill 1978, 78). It is an interesting question whether the changes we see in the archaeology at these sites at this time might reflect this reorientation within the town.

### *The floodplain during the 15th century*

Evidence from the Oracle excavations suggests that during the 15th century there were no recognisable episodes of major investment in this area, but investment on a smaller scale is evident, as is continuing industrial activity. On site 12, the complex of channels taking water from the Minster Mill stream to the Kennet was maintained, with evidence for minor realignment, the building of new revetments and the construction of a holding tank and possible fish trap (Fig. 2.18). The tanning pits in this area were in use during the late 15th century, and Building 7410 was extended slightly to the south and east. It is very unfortunate that so little remained of this structure, as the finds evidence suggests that it may have been a focus of

considerable activity in the later medieval period. A mid 14th-century halfpenny and four 14th- to 15th-century jettons were present in deposits of this phase associated with Building 7410 (Table 5.1), and all nine knives from Project Phase 5 contexts were from this site. A further seven 14th- to 15th-century coins and jettons were found in layers dated to the construction of a new building on this site in the later 16th century, along with a further eight knives. Although a number of these were from makeup layers and could have been brought onto the site from elsewhere the coincidence is nevertheless notable, and suggests that Building 7410 may have been of more interest than its insubstantial foundations suggest. One of the striking features about this building is the evidence for ad hoc episodes of construction. The walls constructed at the end of Project Phase 4, an episode that is difficult to date closely but may be of the late 14th or even early 15th century, had been built in several stages and comprised variously flint, chalk and flint, and chalk, flint and tile, with presumably a timber-framed superstructure. During the 15th century an eastern extension was added using flint, tile and chalk for the surviving wall elements, and a southern extension was built in several stages.

It is interesting to compare this with the documentary evidence relating to the construction and maintenance of the gildhall, which was certainly located within this general area, and underwent episodes of new work and rebuilding on at least three occasions, in 1356-7, the 1440s and 1495-8, as well as frequent running repairs (see Chapter 4). The funds for rebuilding work in the 1440s were raised from the sale of old timber and contributions from 80 donors, and the impression is of precisely the kind of ad hoc campaigns of rebuilding and repair, using whatever could be obtained when money was available, that we see reflected in the surviving remains of Building 7410. It is probably going too far to suggest that Building 7410 itself might have been the gildhall, but the gild owned other buildings on the island, including a house and vineyard in the mid 14th century, a cottage, barns, stables and a common latrine in the 15th century, and by the early 16th century a barn, stable, piggery and dyehouse accessed by a road and gate next to the hall. It is at least arguable that Building 7410, even if it cannot be precisely identified, represents the kind of structures the gild owned in the area, the building and maintenance campaigns of the gild and its tenants, and the limited resources to which they had access. This presents a striking contrast to the buildings on site 29 and site 300, which had presumably been developed with the far greater resources of the abbey itself.

Elsewhere, a major revetment on the north side of the Back Brook (Fig. 2.19) and a further possible fish holding tank on the south side are datable to the later 15th century (site 101). There was no evidence for substantial building work at Minster Mill or St

Giles Mill at this time, although the revetments of the channels carrying water to and from them, and parts of the structure of St Giles Mill, were clearly being periodically repaired and maintained. A substantial reinforcement of the revetments associated with the abbey's wharf was undertaken in the early 15th century (Hawkes and Fasham 1997, 26-8).

### The 16th century

The 16th century sees a marked change in the nature of the archaeological evidence at Reading, and there is widespread evidence of considerable prosperity in the town, and renewed investment in its infrastructure, particularly from the middle of the century onwards. This can be seen to continue into the early 17th century. The evidence is considered in more detail below, but it is worth noting here that much of this activity dates to the decades following the dissolution of Reading Abbey in 1539 and probably represents a widespread response to the opportunities this offered. William Grey, an exceptionally wealthy citizen of the town, is known to have bought no fewer than 197 former abbey properties, including Minster Mill and St Giles Mill, for the sum of £2133 in 1545.

During the mid 16th century there was new construction on the site at 90-93 Broad St, and there is continuing evidence for affluent households nearby, with a range of glassware that included a rare type of German or Low Countries beaker datable to the period c 1550-1600, many fragments of drinking vessels, including *façon de Venise* examples, and fragments from two unusual globular jars datable to the early 17th century (Norton and Poore 2007, 20-21). Bone from rock dove (pigeon) was first present in this phase. There was new development on at least one of the plots at 99-105 Friar St during the 16th to 17th century, although evidence for its nature was limited (Ford and Ford 2005, 19-21, 40-42). Excavations at 7-8 Broad St, at the east end of the street, revealed remains of a tavern in use between the mid 16th and mid 17th centuries. Part of a large cellar and a cess pit were excavated, and produced sizeable groups of mid 16th- to 17th-century pottery beer mugs, costrels, flasks and jugs, pancheons, a few fragments from drinking glasses, including two late 16th- to early 17th-century *façon de Venise* vessels, and a small group of early to mid 17th-century clay tobacco pipes. A smaller contemporary pit contained a large number of juvenile cattle mandibles associated with mid 16th-century pottery (Scott and Hardy 2007).

By contrast, the Abbey Wharf excavations recovered evidence for decline, with the waterfronts left unmaintained and the riverside structures falling into disuse (Hawkes and Fasham 1997, 28).

### The tannery on site 29

Site 29 had been unoccupied since the demolition of the abbey's cookshop, perhaps as much as a



hundred years previously. Around the middle of the 16th century, a large industrial complex was developed on the site. This included Building 5835 (Fig. 2.9, Plate 2.16), which was probably a domestic dwelling located next to the lane. To the east of this building a complex of vats and troughs was laid out, comprising numerous barrels set into pits and waterproofed with clay, and larger clay-lined pits with no evidence for the presence of barrels that probably functioned as open tanks or troughs (Fig. 2.10, Plate 2.17). A small building adjacent to the vats and troughs contained a hearth and evidence for heavy scorching, and is interpreted as a furnace or drying room (Fig. 2.10, Plate 2.19). The north bank of the Holy Brook was reinforced with a new post and plank revetment, and evidence was recovered suggesting that the complex of vats continued on the south side of the stream. Three timbers from the revetment and a single timber sealed by the clay lining of one of the large open tanks were dated by dendrochronology and suggest that this phase of development took place shortly after 1566. Mineralised seeds found in a sample taken from a vat fill (sample 394, see Chapter 11) suggest the presence of urine, which was used as part of the tanning process, and the animal bone assemblage contained notable quantities of skull and foot remains from cattle and goats or sheep. These are indicative of industrial activities including tanning and bone boiling, which was undertaken to extract fat and grease for leather dressing (discussed by Naomi Sykes in Chapter 5).

The excavated remains of this complex are discussed in more detail in Chapter 5, above, together with a review of the evidence for primary and secondary leather waste and the products of the leather trades in Reading. It is tempting to associate the appearance of this complex on site 29 in the mid 16th century with the disuse of the earlier tanning complex on site 12 (see below), although no direct connection can be proved. The tannery on site 29 was located to either side of the Holy Brook, which had served in the medieval period as the water supply for the abbey's mill. In the aftermath of the Dissolution, as control of the town passed to its leading citizens, many opportunities must have arisen for local merchants and manufacturers to profit from the new conditions. Did this provide the opportunity for local tanners to move to this more convenient and prestigious location? Written records from the 16th and 17th centuries (see Chapter 4) indicate that most of the town's wealthy and influential community of tanners lived in St Mary's parish. By the 1570s, pollution of the river channels by effluent from dyeing and tanning had become such a nuisance that a commission was appointed in 1575 to deal with the problem. The commission prohibited the setting up of tan vats by the Holy Brook, and imposed a fine of five shillings a day on anyone allowing effluent from privies, tan vats or pigsties to flow into it. However, as Joan Dils comments (Chapter 4), the frequent fines for

breaking these rules indicate the importance of the industry in the area. A tanner like Gilbert Aldworth, who was fined 3s 4d in 1582 and again in 1584 for allowing his tan vats to run into the Holy Brook, presumably regarded the benefits of the location as outweighing the inconvenience of the occasional fine. The remains on this site have been identified as a tannery on the basis of the very close similarity with tanneries excavated elsewhere, and on the basis of associated finds. However, documentary references including the final sale of the property for the construction of the Oracle workhouse (see below) suggest there was a clothier's works on the site, which would also have needed vats and furnace houses within easy access to a regular water supply. It is perhaps most likely that the site saw mixed, or changing, use over its 100-year history.

### *A major redevelopment of the floodplain*

On the north side of the valley floor on site 12 there was evidence for a major phase of channel engineering, extending the area of reclaimed land westwards by some 20 m (Fig. 2.19; the infilled medieval channels are shown with a dotted outline, and the new 16th-century channels are in blue). The medieval tannery complex was infilled along with the disused medieval watercourses. The reclamation recycled the waste products of other activities in the town rather than using quarried raw materials. This waste attests to many of the trades and activities of the town (see below). Some of these may have been operating in the immediate vicinity, such as stabling, but others probably operated elsewhere in the urban centre. Some of the dumped material is very likely to have come from the dissolved abbey, including imported pottery, and a unique fragment of glass from a late 13th- or early 14th-century colourless finned goblet, the first to be found in this country. This would support the view that the reclamation took place towards the middle of the 16th century. The best dating evidence is offered by a substantial new post and plank revetment of the Back Brook that was installed on both sides of the channel at around this time, and probably formed part of the same operation. One timber from the northern revetment gave a felling date range of 1537-41.

Upon the newly reclaimed land, which formed what was to prove a rather unstable construction platform, a three bayed structure measuring 11 m by 6 m was erected (Fig. 2.19). Dwarf walls of mortared flints were laid within foundation trenches, and topped with a layer of roof tiles to receive a timber frame. This was the primary form of the building later known as the Yield Hall, and its construction can probably be dated to the years between the dissolution of Reading Abbey and the middle of the 16th century. This was considered for many years to have been the location of the medieval gildhall, if not the actual gildhall itself. However, the excavations have shown conclusively that this was not so.

It is probably the case that when the gildhall moved to the Greyfriars the nearest building adopted its name. The initial development was small, but the limited evidence of its form and the provision of a wooden floor in at least one of the rooms suggests that it may have served a dual purpose as a residence and workshop. A deposit of broken pins and other copper alloy fragments from above the first floor of Room 3 may suggest that craft working activities were taking place here. The location in the valley floor was not a prime area for development, but documentary evidence confirms that there were houses and gardens here in the 16th century (see Chapter 4). During the later 16th century a corridor-like structure was added to its southern side, and a new room (Room 4) was added to the west (Fig. 2.20). A lean-to service aisle formed by an outshut at the back of a hall was a regular feature of small 16th- or 17th-century houses (Wood 1965, 219), and that may be what is represented here. The new west room was large and constructed of a mixture of flint and brick walling, with a large opening on the north side. Like the west end of the corridor or lean-to, it was floored with brick. No internal features survived, but the existence of the large opening suggests it may have served as a store, cartshed or possibly a stable.

Further evidence of renewed investment at this period comes from Building 7410, which was extensively rebuilt during the second half of the 16th century for the installation of new industrial equipment (Fig. 2.20). This comprised a timber structure associated with two hearths and a tiled working surface. Although these remains were well preserved their original function remains uncertain, although they could have been part of a dyehouse. Building 7410 was located only a relatively short distance away from the Yield Hall, and the coincidence of the redevelopment of both buildings at approximately the same time suggests that they could have been in the same ownership. No evidence was recovered for any alterations or repairs to Minster Mill or St Giles Mill during Project Phase 6.

### *The economy of Reading in the 15th and 16th centuries*

One of the most striking changes in the archaeology of Reading at this time is the increasing evidence for prosperity reflected in the presence of a much wider range of consumer goods in finds assemblages, including items that were both fashionable and even luxuries. Imported pottery was relatively rare throughout the Oracle excavations, but a sherd of a decorative Ligurian maiolica dish (Fig. 5.10 No. 24) was found in contexts associated with the sandstone house at site 29. Fragments of glass beakers, goblets and tankards dating between the late 15th and early 17th centuries were also found at the site, mostly from contexts associated with tan vat fills (Fig. 5.12). Seven fragments are from

vessels in the *façon de Venise* tradition typical of the Antwerp and Amsterdam industries of the period. Hugh Wilmott comments (Chapter 5) that although *façon de Venise* glass is not particularly rare, it is nevertheless an indicator of the presence of people with the means to acquire fashionable imported luxury goods. A market for fashionable goods is also hinted at by the presence of decorative purse frames at the site, including examples in copper alloy with probable niello inlay (see Fig. 5.34 Nos 17-19). Purses such as these were fashionable from the late 15th to the late 16th century, and their presence at the site suggests that they were being manufactured nearby. Leigh Allen (Chapter 5) comments that 16th-century contexts at site 29 also produced almost the only notable personal items from the whole of the Oracle excavations, comprising a decorated pin, a highly ornate belt chape and a sickle-shaped toothpick or earscoop (Fig. 5.34 Nos 13, 12 and 21).

This is mirrored at other contemporary sites in the town. Glassware found at 90-93 Broad St and at the probable tavern site at 7-8 Market St also included a number of imported items (see above). Large dumps of waste leather, most of it from the backfilled tanning pits and obsolete watercourses on site 12, show that a wide range of leather goods were being made in the town at the time. Products represented in these assemblages included not only shoes, boots, belts and straps, but also horse harness and saddles, garments such as leather jerkins, gloves, fine and everyday bags, cases and purses, sheaths and scabbards. An increasing market for fashionable leather goods is suggested from the late 15th century onwards. A fragment of sheep or goatskin from site 12 showed very fine workmanship, and was probably from a luxury purse or case of the late 15th century. Some of the shoes of this date had fashionable extended toes stuffed with moss, although these were not as extreme as the exaggerated long 'poulaine' toes of the period (Mould, Chapter 5). Two calfskin shoes of late 15th-century style (as Fig. 5.16 Nos 1 and 2) were another fashionable type, with buckle and strap fastenings, and an uncommon style of ankle boot (as Fig. 5.15.No. 8) had hardly been worn prior to discard. Fashionable styles were also evident amongst the early 16th-century shoe types (Fig. 5.23 No. 17), and some low-cut shoes were probably for dress or summer wear (Fig. 5.17 Nos 2 and 3).

A little additional evidence for the late medieval cloth trade is provided by a small fragment of perforated leather found in the Abbey Wharf excavations, which is thought to have come from a carding comb used to prepare wool for spinning (Mould 1997, 118, fig. 66 no. 33). Fragments of coarse knitting from the 16th century at Oracle site 12 provide evidence either for the introduction of a new craft, or at least the arrival of new traded goods, in the town at the time. The craft of knitting is thought to have become established in the 15th

century, and the excavated fragments may have been from knitted stockings (Walton-Rogers Chapter 5 and Chapter 9). The earliest probable *in situ* deposits of the copper alloy wire wound 'sewing' pins that are abundant in the town in the post-medieval period suggest that the manufacture and use of these items began in Reading in the 16th century. This period may also have seen a general increase in metalworking in the town. A brass and bronze casting workshop was established just inside the abbey precinct in the late 16th or early 17th century (Pine 2005a), and a large dump of bell mould fragments was dumped on site 12 of the Oracle excavations during the major land reclamation operations of the mid 16th century.

The pottery assemblages of the 15th and early 16th centuries at Reading are dominated by wares from Surrey, including Surrey Whiteware and the slightly later 'Tudor Green' tradition, with an increasing presence of late medieval Redwares, well-fired sandy wares possibly supplied locally and from London (Blinkhorn, Chapter 5; Table 5.3). By the later 16th century, 40% of the pottery at the Oracle comprised utilitarian post-medieval Redware. Most of this was probably supplied from local Berkshire sources; a production site is known near Newbury, and the Kennet valley would have been a likely area for these potteries to be established (Brown and Thomson, Chapter 5). Other pottery was being supplied from the Surrey Borderware industry, located around Farnham and Farnborough. By the 15th century the earlier sandy wares industries (London ware, Cotswolds and Newbury wares) had gone out of production, and the products of Surrey potters, based in places like Kingston and Cheam, were marketed very widely. How far this evidence can be seen as reflecting the orientation of Reading's trading contacts is therefore hard to assess, since it also reflects changes in the pottery industry itself. It is interesting to note, however, that there is a strong contrast between pottery of this period at Reading and contemporary assemblages from Merton College, Oxford (Blinkhorn 2006), where nearly 75% of a large 15th- to mid 16th-century assemblage came from the Brill-Boarstall kilns on the Oxfordshire/Buckinghamshire border. By contrast, Surrey 'Tudor Green' wares represented just 2% of the pottery from this period at Merton College, and only 47 sherds of Surrey Whitewares were present in the entire site assemblage of 6000 sherds.

This period at the Oracle also sees an increase in pottery from abroad, although most of this is represented by German stonewares, which were imported in very large numbers for use as beer mugs. Vessels from Spain, Holland and France were also present in small quantities at the Oracle excavations. The meaning of this is unclear, as much of the imported pottery (and indeed much of the regionally imported Surrey Whiteware) was recovered from make-up layers for the construction of the Yield Hall in the mid 16th century. The same layers

included a sherd of a very rare late 13th- to 14th-century glass goblet, and it is very likely that the make-up material had been brought to the site from elsewhere, and arguably from the dissolved abbey itself. The relatively high representation of imported pottery may, therefore, reflect the abbey's sources of supply rather than those of the townspeople. However, comparative evidence from the site at 90-93 Broad St, where the pottery derived from adjacent tenements, does show a very similar pattern, with Surrey Whitewares and 'Tudor Green' wares accounting for 45% of the 15th-century pottery, and German stoneware accounting for 5.5% (Blinkhorn 2007a, table 1).

The suggestion that the post-medieval Redwares that appear at the Oracle from *c* 1540 may have come from the Kennet valley can be compared with similar evidence from the dendrochronological study for a change in timber sources. Unlike the timbers from the 14th and early 15th centuries, which probably came from managed woodland in the middle Thames Valley, timbers used in constructions of the mid 15th to early 17th centuries showed excellent matches with sites along the Kennet Valley towards Newbury (Miles, Chapter 5).

#### Project Phase 7: *c* 1600-1680

The phase of new investment that we can see in the second half of the 16th century continued into the early 17th. Much of the direct evidence recovered in the Oracle excavations relates to the cloth trade, and suggests that there was continuing confidence in cloth as the source of the town's wealth, although the trade was in difficulties by the 1620s and went into decline after the Civil War (Chapter 4, above). William Grey's property, including Minster Mill and St Giles Mill, passed through a marriage alliance into the ownership of the Blagrove family, who seem to have been responsible for several of the initiatives represented by the archaeology of this period. It is under this new ownership that the two mills were rebuilt, and both mills were probably still in use for fulling at this time (see Chapter 4, above). At the Minster Mill, a phase of works at this time included the installation of a new timber tailrace channel, while at St Giles Mill the medieval structure was dismantled and new timber mill races were built over its remains (Chapter 3, above). Timbers used at the Minster Mill and St Giles Mill were from the same tree and dated by dendrochronology to *c* AD 1611. Two photographs taken *c* 1900 (Plates 3.36 and 3.40) show St Giles Mill shortly before demolition, with the larger 18th-century mill (see below) abutting an older and smaller structure to the south. The southern element is entirely clad in weatherboarding, some of which has fallen away to reveal the timber frame of the early 17th-century mill beneath, visible on Plate 3.36, while Plate 3.40 shows the two mill races associated with this older structure. Repairs were also being undertaken to the tailrace channel at this time.

The best structural evidence for Reading's cloth trade came from a dyehouse excavated at site 78 towards the western edge of the Oracle excavations (Fig. 3.2, Plate 3.18). This relatively simple mechanism consisted of two pits, which probably contained large vessels holding liquid, linked by a hollowed-out oak timber that sloped slightly from west to east. A sheet of perforated lead covered the east end of the channel, suggesting that liquid was run off along the channel from the western pit and strained before entering the eastern pit. The liquid then probably drained out of the eastern pit into the Minster Mill Stream. The timber channel gave a dendrochronological date of 1611, and the wood used for its construction had come from the same tree as a timber from St Giles Mill. This suggests that there had been a phase of investment by the Blgrave family in facilities for cloth making in Reading. Elsewhere continuing maintenance and exploitation of the valley floor is suggested by the insertion of a new revetment of coursed brick on the north bank of the Back Brook, and the construction of a platform at the water's edge, built firstly of timber and later rebuilt in brick.

In 1624, John Kendrick (another very successful merchant and clothier from Reading) left a bequest of £7500 to Reading Corporation 'to build a strong house of Bricke fit and commodius for the setting of the poore on worke therein'. The money was used to buy land on Minster Street from Kendrick's brother William, and in 1628 the workhouse was constructed on the site of the 16th-century tannery, by now functioning as William Kendrick's cloth works. The workhouse, originally constructed as the Kendrick Cloth Workhouse, was intended by its founder to provide work for the poor in the cloth trade. A series of rooms with equipment were leased to various clothiers who employed poor skilled craftsmen to produce broadcloths and Spanish cloths (see Chapter 4). However, the decline in the cloth trade meant that alternative uses soon had to be found for the workhouse, and a century later it was occupied by poor craftsmen making pins, silk and sailcloth, and sacks, rope and light fabrics such as satin and silk were made there in the later 18th and 19th centuries. The Oracle was pulled down in 1850 and replaced by a row of shops. Unfortunately, large basements that had been dug into the area during the 19th century had destroyed much of the archaeological evidence for the workhouse, although some structural fabric of the east, west and south ranges remained (see Chapter 3). The excavations uncovered evidence for the layout of the courtyard, which had cobbled paths around the outside and narrower paths forming an X shape inside. Three semi-celled rooms were discovered that are not represented on historic maps, and a record was made of the surviving bridge (Plate 3.8) across the Holy Brook that has since been demolished. Although the archaeological results from excavation were fairly limited, some evidence of the pin making trade was found in the

form of a furnace and quenching pit, and large numbers of finds of the pins themselves.

Building 7410 continued in use during the 17th century, with the probable rebuilding of a timber-framed room to the east of the main structure. Some interesting evidence for activity in the area at this time came from a pit (8513) containing a densely packed deposit of horncores (Plate 3.22) and a group of pottery including Surrey border ware, brown-glazed redware and plain white tinglazed ware, suggesting a date after *c* 1630. This suggests that tanning was still taking place in the vicinity, but also provides some evidence for nearby domestic occupation. A small group of 17th-century shoes was recovered during the Abbey Wharf excavations (Mould 1997, 119-22).

The pottery might well have come from the nearby Yield Hall. Changes during the 17th century show that the house was continually modified to counteract the effects of subsidence, but also to keep in step with changing fashions in domestic architecture. A fifth room constructed in coursed brick was added, turning it into an L-shaped building (Fig. 3.6; Plate 3.23), and floors of brick or tile were laid in both Rooms 5 and 4 in what was now a west wing to the house. A brick chimney was subsequently inserted into Room 5 (Fig. 3.7; Plate 3.23), with fireplaces to either side, serving both Rooms 4 and 5, and a new porch was built in the angle between the new wing and the old north wall. This provided a new entrance into the building immediately east of the chimney, and it was notable that the east wall of the chimney was more carefully finished than the other faces. This evidence would all combine to suggest the modification of the house to create the fashionable 'lobby entry plan' of the period, in which the main door gave onto a lobby next to a chimney, with living rooms to either side of the lobby and a stair to an upper storey on the other side of the chimney. There was no evidence for a stair in this position in this phase, but two small walls joining the west wall and the chimney were present in the succeeding rebuild of this wing (see below), and are likely to have supported a stair. A half cellar was installed in the north-eastern corner of Room 2, in which a large number of early wine bottles of late 17th- or early 18th-century date were found (Plate 3.27). Throughout the 17th century the building suffered from problems of subsidence, and evidence was recovered for numerous attempts to reinforce the walls and floors.

A new industry that appeared in Reading at this time was the manufacture of clay tobacco pipes (Higgins, Chapter 5 and Chapter 9). This was in existence by 1623, and by the 1630s there were at least four pipemakers working in the town. David Higgins comments that this is a large number compared with most other towns of the period. Two of these men seem to have moved to the town to set up their business there; one, named Ferdinando Hulyns, is clearly not local, while the bowl form and maker's mark used by the other, John Perry, suggest

that he came from the West Country. Reading's pipemakers were not just producing for local consumption, but probably also for regional export and examples of Reading pipes have been found in London. Although most of the pipes produced in Reading were plain and ordinary, there were some better products designed to cater for the top end of the market as well. The sizeable assemblage of clay pipes from the Oracle excavations is the largest from Reading, and one of the largest groups in the country. An abbreviated report on the assemblage can be found in Chapter 5, and the full report is available in Chapter 9.

The pottery used in Reading during the 17th century was dominated by the ubiquitous functional post-medieval Redware, but the products of the new English tin-glazed industry appear in the town at this time, and are likely at first to have been imported from London, or possibly Bristol (Brown and Thomson, Chapter 5).

### **Project Phase 8: c 1680-1750**

The Minster Mill underwent a major reconstruction during Project Phase 8 (Fig. 3.5; Plates 3.20-3.21). Associated pottery suggests a date in the early 18th century, which is supported by a dendrochronological date of 1700 from a timber of the foundation frame of the new mill. The excavations recovered evidence of a new wheelpit channel with substantial brick walls, and to its west the end of the headrace channel, or penstock, which was constructed with a floor of wooden planks and walls of brick. The position of a sluice gate controlling the flow of water between the headrace and the wheelpit was also identified. Unfortunately the remains of the mill buildings and other channels had largely been destroyed by modern intrusions, although some evidence of a spillway channel was seen to the north of the wheelpit. The Minster Mill does not appear on Roque's map of 1761 (Plate 1.4), but the Coates map of 1802 (Plate 1.5) shows the mill extending across the stream, with the main mill buildings apparently on the north bank. This may well represent the form of the mill following the reconstruction of Project Phase 8; further phases of repair to the mill race walls were undertaken throughout the 19th century. Evidence for continuing revetment of the Back Brook during the late 17th and early 18th centuries was also recovered, and the remains of a race for the short-lived water pumping mill constructed during the 1690s on Mill Water, a short distance upstream of St Giles Mill, were recovered in limited Test Pit excavations.

During the early 18th century, the subsidence problems that were affecting the Yield Hall led to the demolition and complete reconstruction of the west wing (Fig. 3.9; Plate 3.28). Plates 3.23 and 3.28 show the substantial brick walls of this rebuild encasing the slighter 16th- and 17th-century foundations, but unfortunately the rebuilding did not solve the problems, and Plate 3.29 shows the

effects of subsidence on the walls of both builds. The chimney and fireplaces of the west wing were relocated some 2 m south of their former position, and Room 4 was extended across the area of the former corridor or outshut. It is possible that the internal wall of this outshut was demolished entirely in this phase since it had clearly been removed from Rooms 1 and 3 by the time the plan of the house appears on a Reading Corporation Terrier of 1807 (Plate 3.30). Further modifications took place in the older eastern wing of the house. The north wall was rebuilt in coursed brick, and a new doorway, possibly a new main entrance, was constructed north of the fireplace in Room 3. These alterations, as well as being necessitated by subsidence, would also have given the house a more fashionable appearance for the period. Building 7410 continued in industrial use at this time, with evidence that the hearth and furnace in their late 16th-century emplacements were continuing to function.

### **The industrial period: Project Phases 9 and 10 c 1750-1900**

Only limited evidence was recorded from Project Phases 9 and 10, since the research aims of the project were largely focused on the medieval and early post-medieval form of the Yield Hall, Oracle and mills.

The trend for the town to expand southwards into this low-lying area continued. Roque's map of 1761 (Plate 1.4) shows the valley floor to be still largely open ground, with meadows and gardens occupying most of the space between the Minster Mill Stream and the Kennet. However, Coates' map of 1802 (Plate 1.5) shows that industrial build-up of the valley floor was well underway, and the Corporation Terrier of 1807 (Plate 3.30) provides a detailed view of the complex of workshops and warehouses into which the Yield Hall and Building 7410 had been integrated. The availability on the valley floor of relatively large empty spaces, close to the urban core and with access to water, was an important factor in many of the activities that developed. The arrival of large-scale industries such as Wilder's Foundry and Simonds brewery from the late 18th century would have required further land reclamation. This had been a consistent feature of the medieval reclamation of the area, but in this period it would have been on an unprecedented scale. Many of the familiar smaller channels disappeared, as they were buried within underground culverts, or simply infilled. The main course of the Kennet became increasingly important for trade, and it was eventually canalised as part of the Kennet and Avon Canal. This was coupled with the construction of a new stone bridge called High Bridge at the northern end of London Street. River craft could now pass this medieval restriction, and wharfage provision in the town increased as wharves spread from their medieval location

around the southern limits of the abbey precinct, onto the banks of the Kennet within the project area.

Many of the historic structures revealed from earlier phases, such as the Oracle workhouse, Minster and St Giles Mills, the Yield Hall and Building 7410 remained within the landscape and continued in operation. The workhouse on site 29 remained fairly unchanged and was home to a large number of small-scale craft workshops and activities until 1850, when it was demolished. In the late 18th century a foundry developed in the area of site 12. Much of this lay outside the excavation area to the east, although the evidence of the 1807 Terrier shows that Building 7410 was incorporated into the foundry complex. Evidence for steam-powered machinery was recovered. However, limited understanding was gained of the process through these limited archaeological remains. The early 19th-century form of the Yield Hall, then known as Hill Hall, can be seen clearly on the Terrier. This is discussed in comparison with the archaeological evidence in Chapter 3, above. By 1821, James Wilder, an iron founder, is recorded occupying property at Hill Hall, and the Wilder iron foundry was to occupy the site until 1938. During the excavations, ironworking remains were found in a corner of Room 2, suggesting that domestic occupation was replaced by industrial use during the later 19th century.

St Giles Mill underwent massive expansion in the mid 18th century, and it was probably at this time

that it changed from undershot to breastshot waterwheels, which allowed a much more efficient use of the available water resource. The mill was doubled in size, with a new four-storey mill building added to the north side of the old mill, and the old bypass channel was modified to create three additional new races running through it (Fig. 3.11). Plates 3.36 and 3.40 show the new 18th-century mill added to the north side of the older 17th-century structure. The retaining walls of the races were constructed in brick, but timber was used for the ground beam and post foundations. However, the days of waterpowered timber engines were numbered and during the 19th century steam engines were installed. Evidence for the primary phase of boiler and engine placements was recovered in the excavations, and on the north bank a new structure was built to incorporate the chimney. By the end of the 19th century the mill was defunct and the site was redeveloped, becoming home to the Reading Tramways Depot (Plate 3.48). This change allowed for significant infilling and culverting of the mill leats as these elements of the landscape became redundant. During the 20th century the complex grew and changed as buses were introduced and the electric trams were decommissioned. Eventually the bus depot covered the entire area between the canalised river Kennet, Mill Lane, Seven Bridges and London Street. The buildings and activities that comprised the Reading Bus Depot as it had become by 1998 were recorded and form part of the archive.

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ISBN 978-1-905905-27-0



£25.00

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Janus House, Osney Mead, Oxford OX2 0ES