EAST ANGLIAN ARCHAEOLOGY

Between Broad Street and the Great Ouse: waterfront archaeology in Ely

by Craig Cessford, Mary Alexander and Alison Dickens

with contributions from
M. Allen, R. Ballantyne, M. Blackburn, P. Blinkhorn, A. Clarke, A. De-Vareilles, GSB Prospection, D. Hall, L. Higbee, A. Holton-Krayenbuhl, A. Humphrey, A.K.G. Jones, B. P.J.E. Mills, Q. Mould, M. Noel, R.G. Scaife, J. Stewart, M. Taylor, A. Vince, C. Went and R.C. Woosnam-Savage

principal illustrations by
A. Hall and M. Brudenell with contributions by I. Forbes and J. Matthews

photographs by
M. Alexander, A. Dickens, D. Webb and from the Cambridgeshire Collection

artwork contributed by
V. Ambrus and M. Edwards

East Anglian Archaeology
Report No.114, 2006

Cambridge Archaeological Unit

EAST ANGLIAN ARCHAEOLOGY
REPORT NO.114

Published by
Cambridge Archaeological Unit
Department of Archaeology
University of Cambridge
Downing Street
Cambridge CB2 3DZ

in conjunction with
ALGAO East
www.algao.org.uk/cttees/regions

Editor: Keith Wade
Managing Editor: Jenny Glazebrook

Set in Times New Roman by Jenny Glazebrook using Corel Ventura™
Printed by Geerings of Ashford Ltd., Kent

ISBN 0 9544824 3 3

Funded by East Cambs District Council and Hopkins Homes Ltd

East Anglian Archaeology was established in 1975 by the Scole Committee for Archaeology in East Anglia. The scope of the series expanded to include all six eastern counties and responsibility for publication was transferred in 2002 to the Association of Local Government Archaeological Officers, East of England (ALGAO East).

For details of *East Anglian Archaeology*, see last page

Cover illustration
Reconstruction of Jewson's area in the 16th century, by Michael Edwards

Contents

List of Figures

List of Tables

Contributors

Mary Alexander, BA
(Formerly Cambridge Archaeological Unit)
Cotswold Archaeology, Building 1, Kemble Enterprise Park, Cirencester, Glos GL7 6BQ

Martin Allen, BA, PhD, FSA
Assistant Keeper, Department of Coins and Medals, Fitzwilliam Museum, Trumpington Street, Cambridge CB2 1RB

Rachael Ballantyne, BA, MSc
Dept of Archaeology, University of Cambridge, Downing St, Cambridge CB2 3DZ

Mark Blackburn, MA, PhD, FSA
Keeper, Department of Coins and Medals, Fitzwilliam Museum, Trumpington Street, Cambridge CB2 1RB

Paul Blinkhorn, BTech
60 Turner St, Northampton NN1 4JL

Craig Cessford, BA MLitt
Cambridge Archaeological Unit, Dept of Archaeology, University of Cambridge, Downing St, Cambridge CB2 3DZ

Andrew Clarke, BA, MA
(Formerly Cambridge Archaeological Unit)

Anne De-Vareilles, BSc, MPhil
Cambridge Archaeological Unit, Dept of Archaeology, University of Cambridge, Downing St, Cambridge CB2 3DZ

Alison Dickens, BA, MIFA
Cambridge Archaeological Unit, Dept of Archaeology, University of Cambridge, Downing St, Cambridge CB2 3DZ

GSB Prospection Ltd
Cowburn Farm, Market Street, Thornton, Bradford BD13 3HW

David Hall, MA, FSA, Honorary Research Fellow University of Exeter
Cambridge Archaeological Unit Consultant, Cambridge Archaeological Unit, Dept of Archaeology, University of Cambridge, Downing St, Cambridge CB2 3DZ

Lorrain Higbee, BSc, MSc
2 Knights Cottages, Knights Farm, Fitzhead, Somerset, TA4 3JY

Anne Holton-Krayenbuhl, BA, PGCE
10 Marroway Lane, Witchford, Ely, Cambs CB6 2HU

Alice Humphrey, BSc
Dept of Archaeological Sciences, University of Bradford, Bradford BD7 1DP

Andrew K.G. Jones BSc, PhD, MIFA FSA FSA(Scot.)
Dept of Archaeological Sciences, University of Bradford, Bradford BD7 1DP

Philip J.E. Mills, BSc, AIFA
28 Park Rd, Anstey, Leicester LE7 7AX

Quita Mould, BA, MA
Barbican Research Associates, Eastmoor Manor, Eastmoor, King's Lynn, Norfolk PE33 9PZ

Mark Noel, BSc, PhD, FRAS, Hon. Prof. Geophysics University of Durham
Geoquest Associates, Rockside, Dreemskerry, Maughold, Isle of Man, IM7 1BL

Robert G. Scaife, BA, PhD
Visiting Fellow, Palaeoecology Laboratory, School of Geography, University of Southampton, Highfield, Southampton S017 1BJ

John Stewart, BSc, MSc, PhD
Department of Biology, UCL, Gower Street, London WC1E 6BT

Maisie Taylor, BA, MIFA, FSA
Flag Fen Bronze Age Centre, The Droveway, Northey Road, Peterborough, PE6 7QJ

Alan Vince, PhD, MIFA, FSA
Alan Vince Archaeological Consultancy, 25 West Parade, Lincoln LN1 1NW

Christine Went
52 Ivel Road, Shefford, Bedfordshire SG17 5LB

Robert C. Woosnam-Savage
Royal Armouries Museum, Armouries Drive, Leeds LS10 1LT

Acknowledgements

This work is based largely on the dedication of the Cambridge Archaeological Unit (CAU) excavation teams, particularly Mary Alexander, Nick Armour, Roddie Regan and Jess Tipper who directed the sites, Alison Dickens who was project manager and Norma Challands who oversaw finds processing.

The specialist information that has been incorporated into the publication and forms much of its backbone was provided by a number of people, as listed above. Particular mention needs to be made of the work of David Hall (medieval and post-medieval pottery) in ably tackling the large body of material and contributing much to the understanding of the pottery production at the site. Aileen Connor of Cambridgeshire County Council Archaeological Field Unit and Leonora O'Brien of Archaeological Solutions helpfully provided information on unpublished excavations. Hilary Healey and Andrew Rogerson supplied information on the distribution of Medieval Ely Ware and Richard Naisby, Milton Brewery, commented on the malting of barley.

The principal illustrators were Andrew Hall and Matthew Brudenell, with contributions by Iain Forbes and Jane Matthews. We are grateful for permission to use the work of Victor Ambrus, generated during the filming of the Time Team documentary of the excavation, and of Michael Edwards created on behalf of East Cambs District Council. The photographs in Figure 4 are reproduced by kind permission of the Cambridgeshire Collection, Cambridge Central Library. Finds photography by David Webb.

The Jewson's evaluation and excavations were funded by East Cambridgeshire District Council, who also funded the evaluations at the Tesco's site. Hopkins Homes Ltd funded the later watching brief at the Tesco's site, the Former Coalyard and Ship Lane were funded by Beauville Properties, the Old Eastern Electricity Depot by Freshwater Estates UK Ltd and 55 Broad Street by Neale Associates. This publication was funded by East Cambs District Council and Hopkins Homes Ltd.

Summary

A series of recent archaeological investigations in Ely has revealed Saxon and later archaeological remains between Broad Street and the river Great Ouse which make an important contribution to the study of the medieval urban development of this important settlement. Excavations revealed a deeply stratified continuous building sequence along Broad Street from the 12th century onwards, overlying Middle and Late Saxon features. Beyond this was evidence for industrial and other activities, particularly 16th- and 17th-century pottery production and 17th-century tanning. Several large channels led inland from the river for unloading and loading boats between the late 14th or early 15th to early 17th centuries.

Significant assemblages of material were recovered, particularly pottery and ceramic building material, and individually important pieces such as a sword cross and two decorated sheaths. Of particular importance is the identification and characterisation of the early post-medieval pottery industry which produced a range of earthenware, bichrome, fineware and Babylon ware products.

This volume takes an integrative approach utilising the structural, artefactual and environmental evidence from several sites plus documentary and cartographic sources to consider the topography and development of this part of Ely.

Résumé

Un ensemble de fouilles archéologiques menées récemment à Ely ont révélé la présence de vestiges entre Broad Street et la rivière Great Ouse. Ces vestiges, dont les plus anciens datent de l'époque saxonne, contribuent largement à l'étude du développement urbain, à l'époque médiévale, de cette importante implantation. Les fouilles ont permis de mettre à jour le long de Broad Street un ensemble continu de bâtiments correspondant à des couches stratigraphiques bien définies. Ces bâtiments datent au plus tôt du douzième siècle et recouvrent des éléments appartenant aux périodes saxonnes moyenne et tardive. Les fouilles ont également révélé la trace d'activités de type industriel, entre autres. Signalons en particulier le tannage au dix-septième siècle et la production de poteries au seizième et au dix-septième siècles. Entre la fin du quatorzième siècle ou le début du quinzième et le début du dix-septième siècle, plusieurs grands canaux reliaient la rivière à l'intérieur des terres pour permettre le chargement et le déchargement des bateaux.

Des ensembles significatifs d'objets ont été récupérés, en particulier des matériaux de construction en poterie et en céramique, ainsi que des pièces isolées comme une croix épée et deux fourreaux décorés. Signalons également un point important: on a pu identifier et caractériser l'industrie de la poterie remontant au début de la période post-médiévale. Cette activité a permis de créer différents types d'objets: terre cuite, terre cuite fine, poterie bichrome et Babylon ware.

La topographie et le développement de cette partie d'Ely sont l'objet du présent rapport qui aborde ces questions en combinant plusieurs approches. Aux sources documentaires et cartographiques viennent ainsi s'ajouter des éléments, provenant des fouilles de plusieurs sites, qui concernent les artefacts, les structures et l'environnement.
(Traduction: Didier Don)

Zusammenfassung

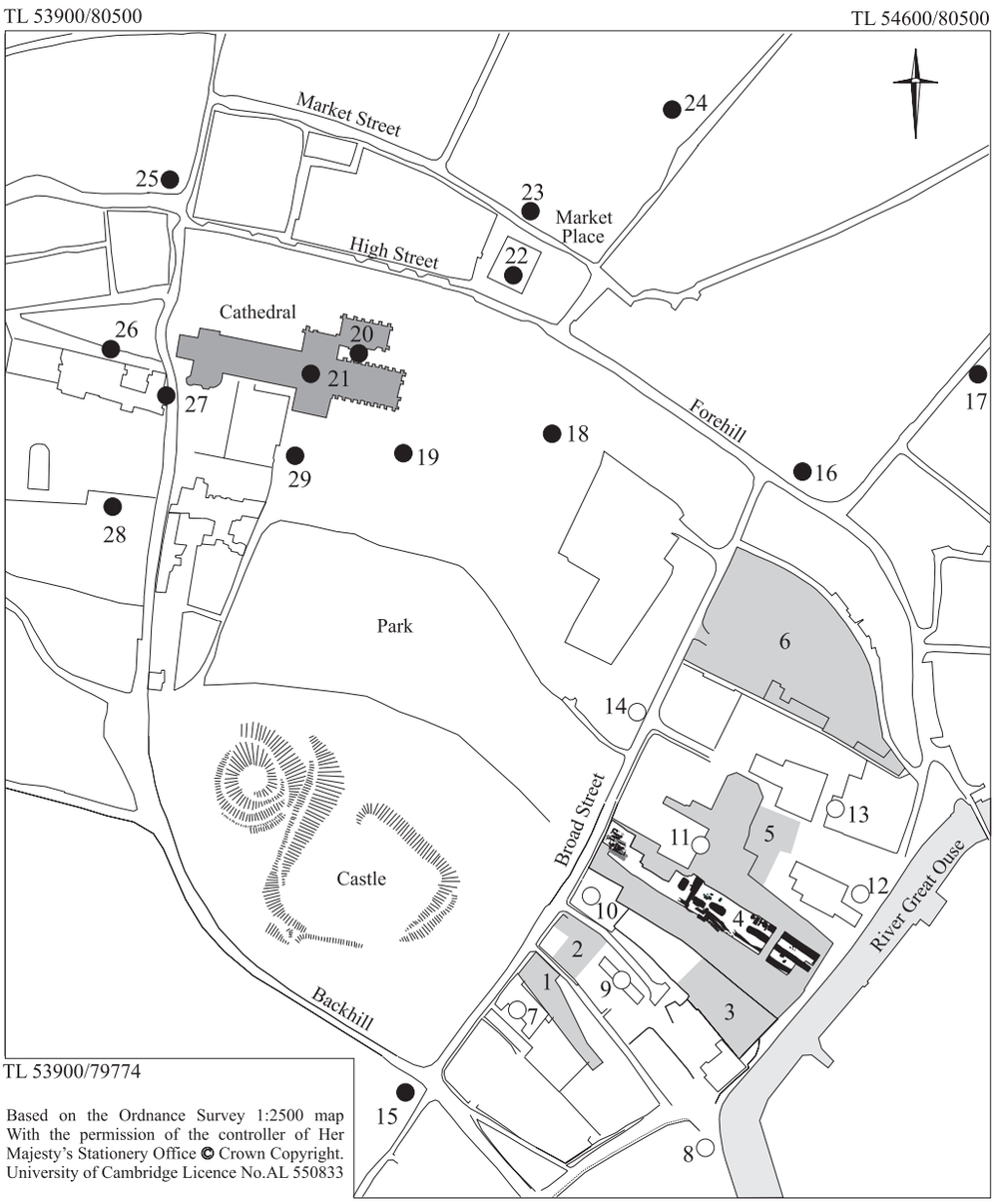
Eine Reihe kürzlich durchgeführter archäologischer Untersuchungen in Ely förderte angelsächsische und spätere archäologische Überreste zwischen der Broad Street und dem Fluss Great Ouse zutage, die einen wichtigen Beitrag zum Studium der mittelalterlichen Stadtentwicklung dieses bedeutsamen Ortes leisten. Diverse Ausgrabungen legten an der Broad Street eine tief stratifizierte, kontinuierliche Bauabfolge ab dem 12. Jh. frei, die mittel- und spätangelsächsische Strukturen überlagerte. Darüber hinaus fanden sich Belege für industrielle und sonstige Aktivitäten, insbesondere für die Herstellung von Keramik im 16. und 17. Jh. und die Arbeit von Gerbern im 17. Jh. Mehrere große Kanäle, die vom Fluss landeinwärts führten, ermöglichten vom späten 14. oder frühen 15. Jh. bis Anfang des 17. Jh. das Be- und Entladen von Schiffen.

Zum umfangreichen Fundmaterial zählten vor allem Töpferware und keramisches Baumaterial sowie bedeutsame Einzelstücke wie zum Beispiel ein Schwertkreuz und zwei verzierte Scheiden. Von besonderer Bedeutung ist die Identifizierung und Beschreibung der frühnachmittelalterlichen Keramikindustrie, die eine Reihe von Irdenware, zweifarbiger Keramik, Feinkeramik und »Babylon ware« produzierte.

Der vorliegende integrierte Bericht stützt sich auf die Gebäude-, Artefakt- und Umweltbefunde mehrerer Fundstellen sowie auf dokumentarische und kartografische Quellen zur Betrachtung der Topografie und Entwicklung dieses Teils von Ely.
(Übersetzung: Gerlinde Krug)

Based on the Ordnance Survey 1:2500 map
With the permission of the controller of Her Majesty's Stationery Office © Crown Copyright.
University of Cambridge Licence No.AL 550833

Figure 1 Location map



Sites covered in this report

1 55 Broad Street
2 Electricity Depot
3 Coalyard
4 Jewson's
5 2 Ship Lane
6 Tesco's

Other sites in Broad Street

7 57 Broad Street
8 1-8 Annesdale
9 Jubilee Terrace
10 Three Blackbirds
11 25 Broad Street
12 Maltings
13 Ship Lane (public toilet)
14 54 Broad Street

Other sites in Ely

15 Potter's Lane
16 Forehill
17 Lisle Lane
18 The Paddocks
19 Walsingham House
20 Lady Chapel
21 Cathedral, various
22 Market Place
23 White Hart Inn
24 Brays Lane
25 Lynn Road
26 Old Bishop's Palace (North)
27 Old Bishop's Palace (East)
28 Bishop's Garden
29 Canonry House Garden

Figure 2 Ely: archaeological sites mentioned in the text

Chapter 1. Introduction

The area

During the 1990s a considerable amount of archaeological work took place in Ely, Cambridgeshire, (Figure 1) greatly improving our understanding of the Saxon and later periods. Much of this work took place in what might be broadly defined as the 'waterfront' zone of medieval Ely, an area stretching from the river Great Ouse to Broad Street and bounded by the streets of Forehill and Backhill (Figures 1 and 2). Most of the interventions were relatively small scale, but in their totality they allow us to assess the urban topography and development of this part of Ely.

The area lies on Kimmeridge clay and slopes gradually down towards the river, with the current ground surface at between 7.5 and 3.75m OD. Waterlain deposits overlie the clay, some of which date to between the 9th and 14th centuries although others may be earlier.

Archaeological excavations

The potential of medieval waterfront archaeology (Bill and Clausen 1999; Hutchinson 1994, 105–10; Milne 1987; 2002; Milne and Milne 1979) was initially highlighted by the excavation of Baynard's Castle in London in 1972 (Marsden 1972), followed by other sites such as Trig Lane (Milne and Milne 1978; 1981; 1982). In a regional context there was a considerable amount of work in East Anglia during the 1970s; notably at King's Lynn (Clarke 1973; 1981; Clarke and Carter 1977) and Norwich (Ayers 1985; 1987; 1991; 1994; Ayers and Murphy 1983). Little medieval urban archaeology took place in Cambridgeshire generally or Ely specifically at this time, largely due to the absence of local archaeological units.

Previous work

In the area of Ely in question 13th-century pottery, roof fittings and water pipes were recovered on the line of Forehill close to the river (Briscoe and Dunning 1967). Small-scale excavations by local amateur archaeologists took place inside the Three Blackbirds, a late 13th-century standing building (Davis 1984; Holton-Krayenbuhl 1984a).

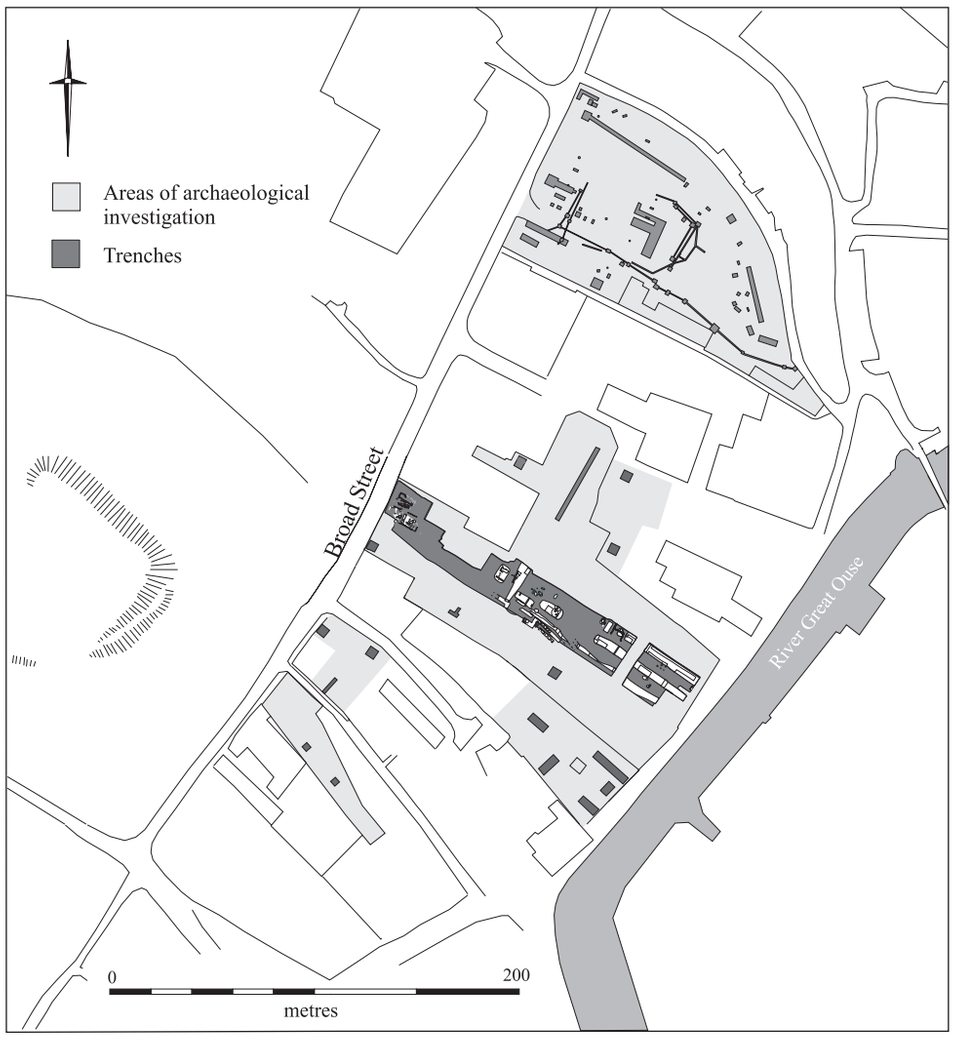
Excavations since 1990

The implementation of PPG16 in 1990 radically altered this situation and combined with a period of urban redevelopment in Ely led to a great deal of archaeological investigation within the area in question. This work has generally consisted of small scale watching briefs or trench based evaluations. These began with work by the Cambridgeshire County Council Archaeological Field Unit (CCCAFU) at the Maltings (Reynolds, T., 1994a; 1994b), Ship Lane (Hinds 1994) and Jubilee Terrace (Connor forthcoming a) (Figure 2). Subsequent work has been undertaken by the Cambridge Archaeological Unit (CAU) at the Old Eastern Electricity Depot (henceforth Electricity Depot) (Regan 1998), the Former Coalyard (henceforth Coalyard) (Alexander 1998b and 1998c), the Tesco's site (Alexander 1998a: Cessford 2003), 55 Broad Street (Armour 2002) and 2 Ship Lane (Tipper 2003). More recently evaluations have been undertaken by Archaeological Solutions (AS) at 57 Broad Street (Crank *et al*. 2004) and 1 to 8 Annesdale (Grant and Doyle 2004) in 2004. This publication is concerned primarily with the CAU excavations. Work by other organisations will be discussed where appropriate. Information from work by other organisations is derived primarily from grey reports and should be regarded as provisional.

The one exception to this pattern was the large-scale excavation of the Jewson's Yard site (henceforth Jewson's) by the CAU from 17 July to 15 December 2000 (Alexander 2002) (Figures 3 and 5), following on from an earlier evaluation (Alexander 1998a). The excavations were the subject of a Channel 4 Time Team special programme (Time Team 2001). This allowed the machine stripping of a 20m wide strip, except for areas of contamination, running some 180m from Broad Street almost to the riverbank. The entire site was planned and divided into three contiguous zones; the street frontage, the central zone and the riverside. Excavation was targeted to answer pre-determined research questions, but with a flexible approach to new discoveries and physical practicalities. The larger scale of work at Jewson's and the fact that it forms a coherent topographic block from the buildings on Broad Street to their associated river frontages (Figure 4) allows it to form a core around which the other small-scale investigations can be interpreted. This allows a consideration of the waterfront area of Ely, of particular significance as relatively little medieval waterfront archaeology has been undertaken on inland sites, with notable exceptions such as Reading Abbey (Hawkes and Fasham 1997). The area excavated is topographically similar to Coppergate in York, which stretched some 70m from Coppergate to the river Foss (Hall, R. and Hunter-Mann 2001), forming a comparable landscape unit.

Other sites

Immediately outside this area to the northeast excavations on Forehill revealed a continuous building sequence from the 12th century onwards (Alexander 2003) and more limited work on the corner of Lisle Lane and Cresswell Lane revealed a dense concentration of 12th- to 14th-century pits (Oakey 1995). On the opposite side of Broad Street work at no. 54 revealed a pit or ditch suggesting occupation from at least the 14th century (Bray and Last 1997). Further afield significant work has been undertaken at West Fen Road (Mortimer *et al.* 2005), the Lady Chapel (Regan 2001) and King's School (Dickens and Whittaker in prep).



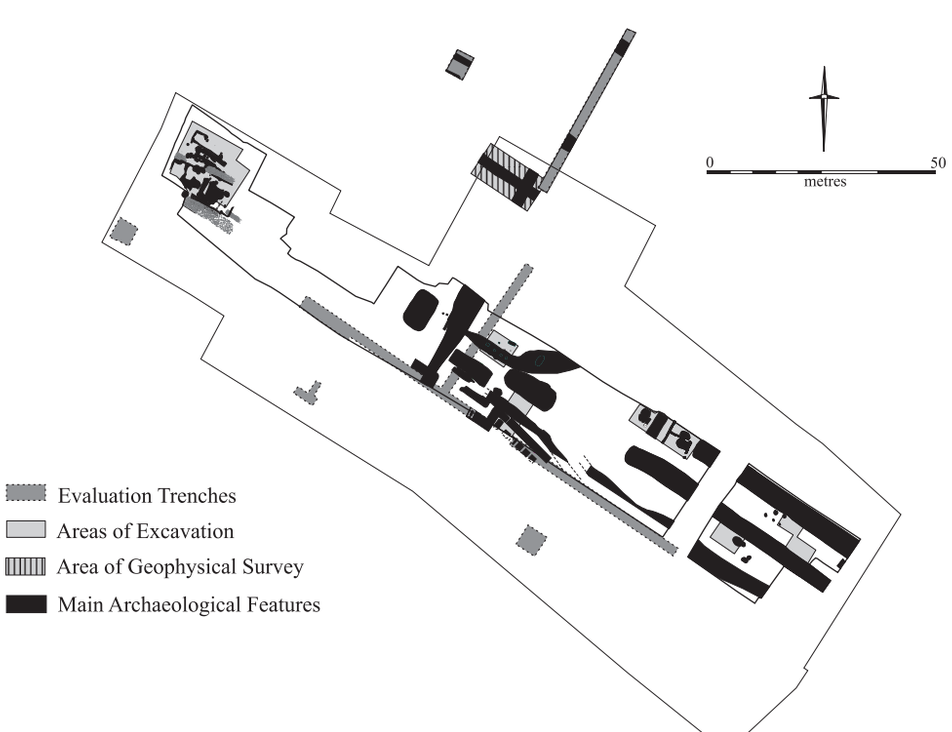


Figure 3 CAU investigations between Broad Street and the river Great Ouse, with detailed plan of Jewson's investigations

Figure 4 Broad Street frontage *c.*1910 and Frear's rod yard on the river Great Ouse *c.*1879
courtesy of the Cambridgeshire Collection

Report format

The approach adopted has been to describe all the relevant sites by phase beginning with Jewson's and to integrate all artifactual and environmental material into these descriptions. Within the description of Jewson's the area is divided into three broad zones; the Broad Street frontage, the central area and the riverside. This is followed by a more general discussion of the phase. The phases are; 9th to mid 10th centuries, late 12th and 13th centuries, 14th and 15th centuries, 16th century, 17th century and later. In order to provide a more readable narrative within the limits of this report, it has been necessary to omit a detailed justification of the dating arguments or the complex stratigraphic sequence. This detail is available in the site archive. Specialist work has been summarised and edited by the authors to facilitate integration into the main text, any errors or omissions are the responsibility of the authors. This structure provides a more readable narrative and encourages a better knitting of the various strands of evidence than the traditional format, without losing sight of the fact that this paper is very much the product of more people than its authors (see acknowledgements). In order to improve clarity plans have been simplified and only features discussed in the text are shown. The overall approach is deliberately non-traditional. This is partly a response to the rather fragmented nature of the various archaeological investigations, including the work at the Jewson's site itself, and the archaeology encountered which is not well suited to an entirely traditional approach. It is also an attempt to address certain deficiencies or limitations inherent in the traditional report format.

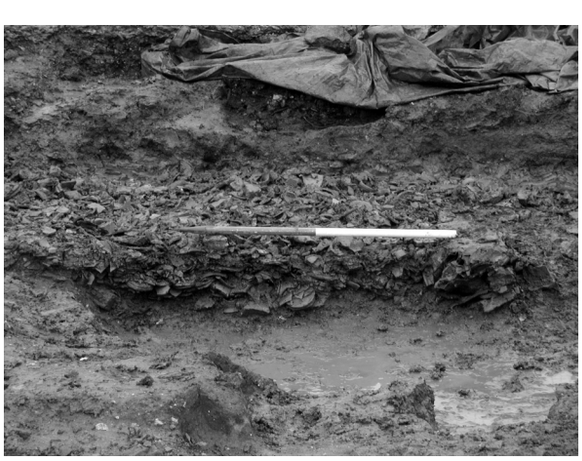
1

2

3

4

5



6

Figure 5 Jewson's during excavations
1–2) Excavations near Broad Street 3) Excavations near the river Great Ouse
4) Filming of the excavations by Time Team 5) Excavating Kiln 3
6) Wasters and other material in pit under Kiln 3

Chapter 2. A false dawn: the 9th to mid 10th centuries

Although residual prehistoric and Roman material has been recovered at several sites no features earlier than the Middle and Late Saxon periods have been found. The only evidence for this period comes from Jewson's.

Jewson's

(Figure 6)

Middle/Late Saxon activity was revealed in two sondages close to Broad Street, but is presumably considerably more extensive. In the southwest sondage the earliest feature was a pit, 0.9m in diameter and 0.3m deep containing hearth rakings, animal bone and a probable unrolled fishing line weight. Ipswich ware, which probably began to be used in Cambridgeshire between 725 and 740 and continued until the middle or late 9th century (*cf.* Blinkhorn in press), and Thetford-type ware, which begins in the 9th century and is most common in the 10th and 11th centuries (*cf.* Rogerson and Dallas 1984), occurred in the lower and upper fills respectively. The pit was cut by a gully 0.4m wide and 0.15m deep aligned northwest to southeast. This gully was subsequently cut by another gully on a similar but converging alignment. The later gully was 1.0m wide, and 0.24m deep and there were also two postholes. The later gully contained a silver cross or cross type penny of Baldred, king of Kent *c.*823 to 825.

The northeast sondage also contained a gully on a similar alignment, 0.6 to 1.2m wide and 0.24m deep containing Ipswich ware. The edge of another possible gully on a similar but converging alignment and containing probably residual Roman pottery was also revealed. A later feature that truncated these deposits produced a possible Middle Saxon hand made sherd with everted rim in dark sandy fabric with some grits and exterior finger tipped decoration on rim, broadly dated *c.*650 to 850. In total twelve sherds of Ipswich ware were recovered, nine from these deposits and three in later contexts in the same general area.

The Middle/Late Saxon occupation was covered by a thick and homogeneous flood lain deposit up to 0.6m deep containing 12th-century refuse. This suggests that the area was regularly inundated, but with activity on higher

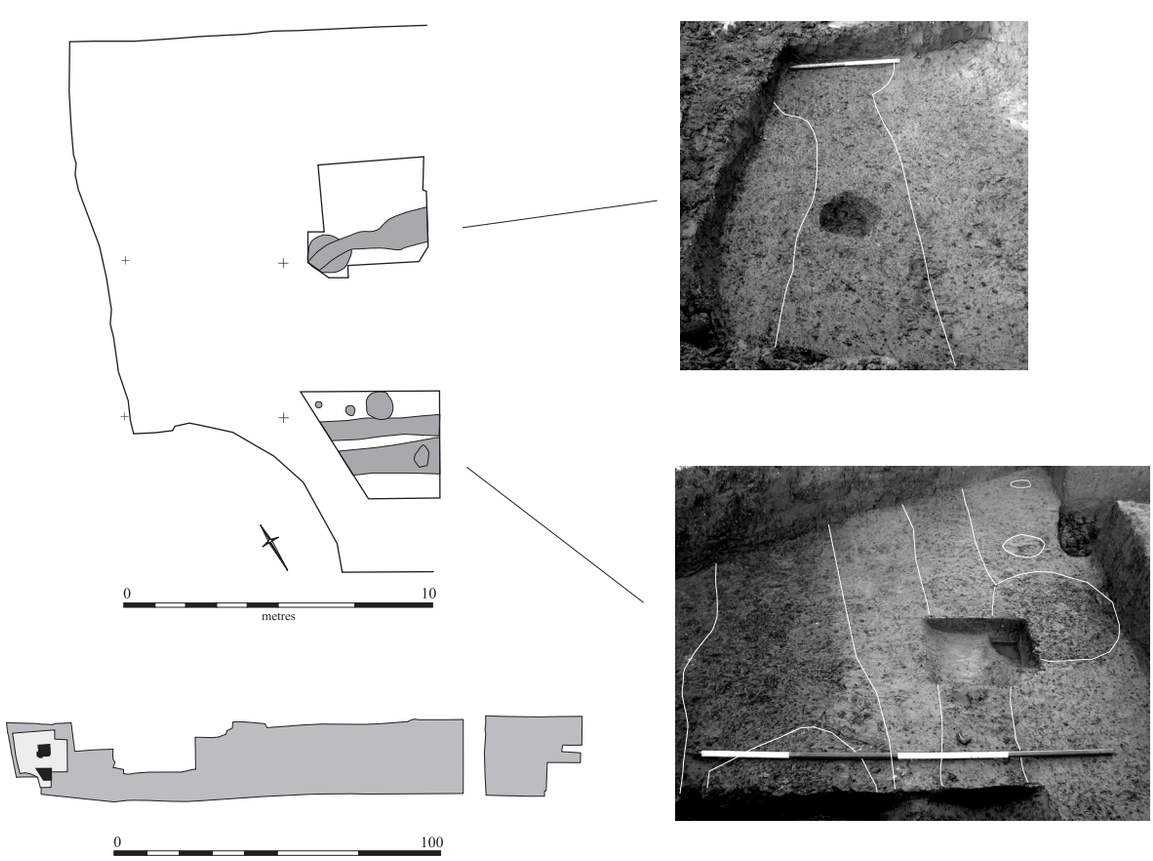


Figure 6 9th to mid 10th century at Jewson's

ground nearby. Eventually drier conditions ensued and a pit and a tree bole indicate that the area gradually came into marginal use.

Discussion

Although only a small area was revealed there is evidence for relatively intensive activity. The instances of intercutting features suggest a prolonged timespan and the possibility that some activity is earlier, potentially even Roman, cannot be entirely dismissed. The length of occupation is uncertain, but none of the material need pre-date 800. It has been shown locally that access to Thetford-type ware may be slightly earlier than to St Neots-type and Stamford-type ware (*cf*. Hall in Mortimer 2000, 24 and 27; Hall in Cessford with Dickens 2005). Since only Thetford-type ware was found, occupation may have ended by 950. St Etheldreda refounded a religious community at Ely around 673 that was subsequently burnt by the Danes, although secular priests provided continuity until 970, when Bishop Ethelwold founded a Benedictine institution with royal patronage (Blake 1962, 54 and 74–5). As far as can be determined neither the foundation nor abandonment of this phase of occupation at Jewson's relates directly to historically attested events even though they must relate to the general context of the dominant religious activity at Ely.

The early 9th-century silver cross or cross type penny of the Kentish king Baldred, was minted *c.*823 to 825 in Canterbury by the moneyer Sigestæf. The obverse reads BELDRED REX CANT (with the N and T ligated) and the reverse reads SIGESTEF. Other coins of Baldred are known locally from Thetford in Norfolk, Freckenham in Suffolk and one only identified to Suffolk. This distribution may indicate that they arrived via a trading network from the Wash. Sigestæf had an interesting career beginning by minting coins for the Mercian kings Coenwulf and Ceolwulf I between *c.*820 to 823, then anonymous Kentish coins of *c.*822–23. After minting for Baldred he produced coins for Ecgberht of Wessex between *c.*825 to 828.

The density of features, the common alignment of the gullies and the presence of domestic refuse suggest that these represent plots close to the rear of buildings, with the gullies acting as minor boundary markers. Similar contemporary features were observed at West Fen Road (Mortimer *et al.* 2005). Contemporary activity has also been observed south of the Lady Chapel, suggesting a high status religious community (Regan 2001) and Ipswich ware has been recovered at a number of other sites. The coin from Jewson's indicates activity of some status, although environmental evidence for wet conditions and seasonal flooding suggest that the settlement lay on the limits of marginal ground and was eventually abandoned due to worsening conditions. The likely overall context of Middle and Late Saxon Ely has been discussed in greater detail with regard to West Fen Road (Mortimer *et al.* 2005) and it appears likely that the activity along Broad Street relates to a secular settlement founded by the religious community to serve its needs.

Chapter 3. Wealth in a wet landscape: the late 12th and 13th centuries

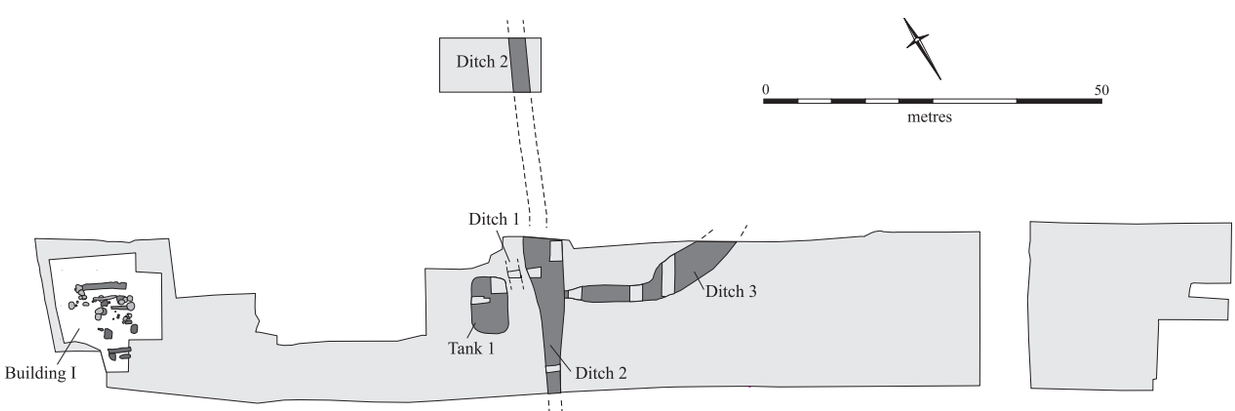
The 12th and 13th centuries represent the first activity that truly relates to the medieval urban development of this part of Ely. The focus of development was primarily Broad Street rather than the river, with buildings at Jewson's, the Electricity Depot, Jubilee Terrace, the Three Blackbirds and Tesco's. Limited evidence from nearer the river comes from Jewson's, Tesco's, 2 Ship Lane and the Maltings.

Jewson's

(Figure 7)

The Broad Street Frontage

Medieval activity begins in earnest with the construction of Building I (Figure 7), an aisled hall aligned roughly north-northeast to south-southwest dated by 13th-century pottery and coins. This was built over a solidly laid foundation and formed of large deep-set square postholes. The gable end had a deep slightly curved wall trench with two external postholes for bracing posts. A wall trench at the south-southwest end was narrower and considerably



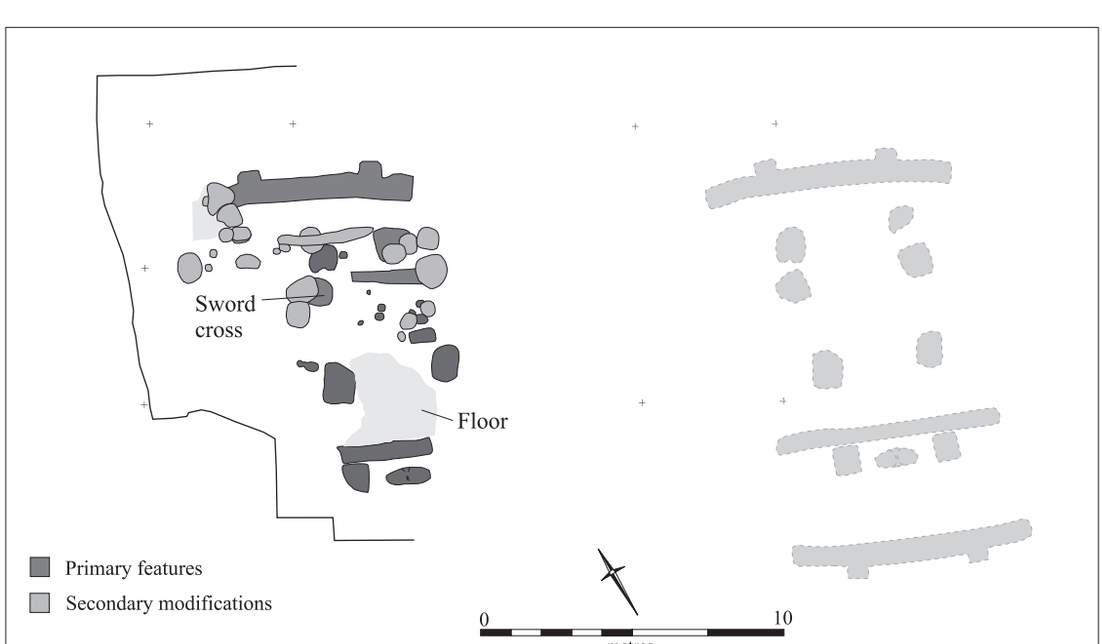


Figure 7 Late 12th and 13th century at Jewson's, with inset of Building I

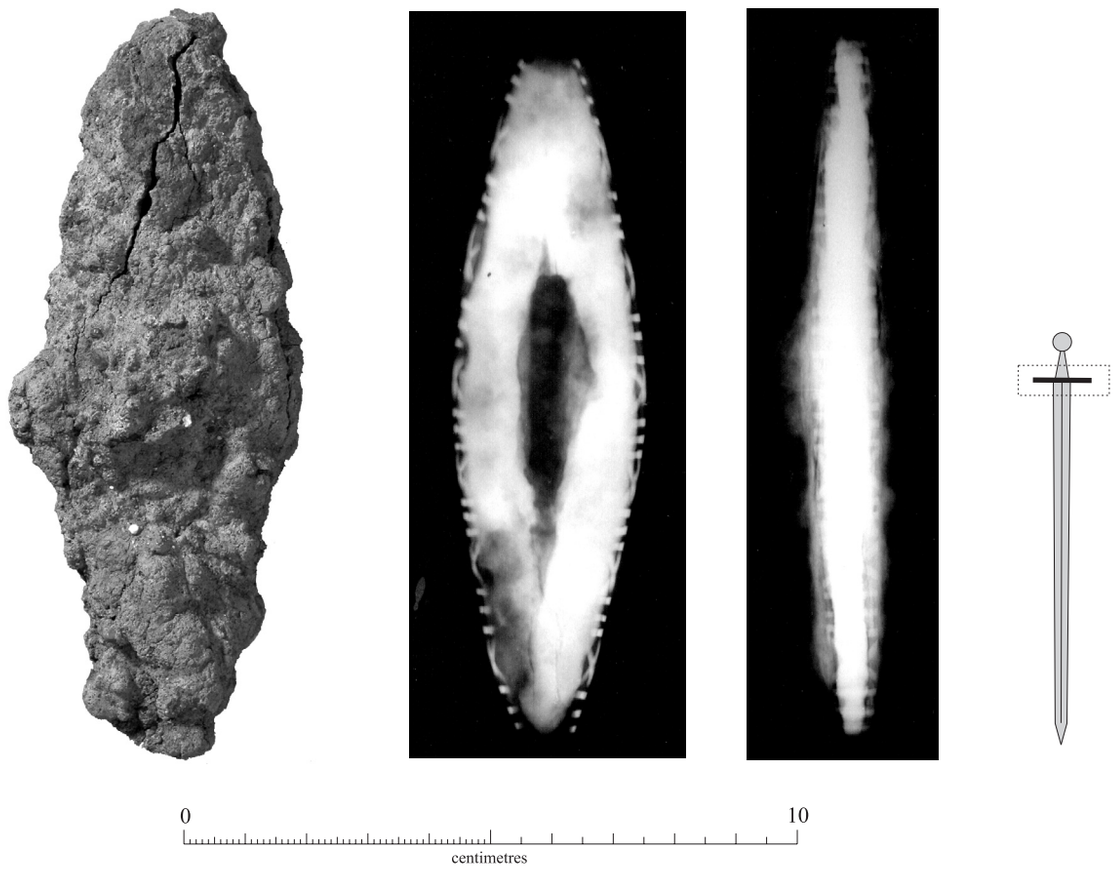


Figure 8 Iron sword cross found in a posthole of Building I

shallower. An aisle post and double posthole to the southwest of this suggest another bay that has been largely removed by later truncations. Three pairs of aisle posts supported the roof in the main bay, although the two pairs at the north-northeast end could represent a repositioning of a single pair of posts. A slightly humped layer on the northwest side represents the remains of a wall sill, but otherwise evidence for the outer walls did not survive. Various postholes and a shallow gully indicate internal features. The internal length of the bay at 8.5m is large for halls of this period, assuming a southern bay a third as long Building I would be 12 to 13m long. Although most of the material was found in later residual contexts it seems likely that Building I had a roof of reddish yellow tiles with dark green glazed crested ridge tiles, at least parts of the building probably had a brick floor. The brick and tile may have been produced locally (*cf.* Mortimer *et al.* 2005), although it has previously been suggested that the industry only began in the 15th century (Lucas, R. 1993, 157). To the north-northwest of Building I a series of postholes suggests the existence of another structure.

One posthole of Building I (Figure 7) contained an iron sword cross, the part of the hilt that guards the hand holding the grip, a rare and prestigious item (Figure 8). It was inlaid with non-ferrous metal decoration of three vertical lines and an X repeated. It has a rectangular section and is elliptically shaped with a straight guard and broad blade and is 118mm long and 38mm wide. It appears to fall into Oakeshott's style 1 (1991; 1994, 112–28) and its shape and decoration suggest a date of *c.*1050 to 1350. Crosses of ordinary fighting swords are rarely decorated, especially prior to *c.*1250, and what decoration exists is usually restrained. Sword blades are generally around 0.76m long, as the feature in which it was found is 0.4m deep by 0.35m wide and contained a number of large stones the entire sword including blade cannot have been deposited. It is probable that only the hilt was discarded. The blade, hilt and pommel of a sword are essentially independent elements and blades were long-lived items that appear to have been frequently re-hilted. At least seven swords were deposited in the river Ouse in the vicinity of Ely between Southney and Upware in the period *c.*950 to 1250 (Oakeshott 1994, 74). This concentration suggests some form of deliberate deposition, which is intriguing given the proximity of the site to the river.

The north-northwest part of Building I underwent various repairs and modifications. The north-northwest post was repositioned and supported by additional smaller posts, whilst two posts on the north-northeast side were replaced. Additional posts strengthened the eastern end of the north-northeast gable wall and the northwest end was dug out and replaced on a slightly different alignment. Building I was eventually demolished and the ground prepared for a new structure (Building IIA). The presence of some small features suggests an interval between the two structures.

The size of Building I plus the lack of a hearth and food waste remains suggest it was not a domestic structure and it may have been a barn. The levelling deposit above it, probably derived mainly from Building I itself, contained abundant grain. This was from free-threshing wheat, oats

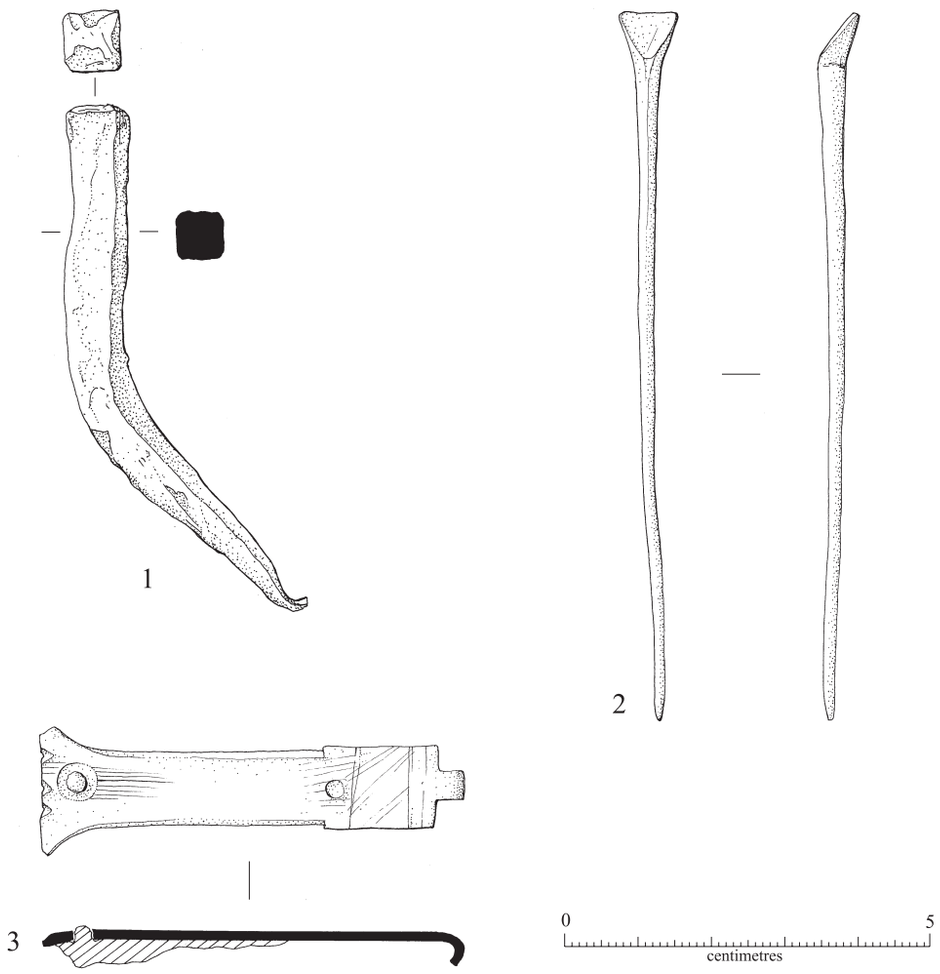


Figure 9 Items associated with literacy: 1) writing lead 2) copper alloy stylus 3) copper alloy book clasp

and particularly barley, but few weed seeds suggesting the grain was processed before arrival. It appears that there may have been a high degree of contemporary coin use, or at least loss, associated with Building I (Figure 63). Three Short Cross pennies and two cut halfpennies minted between 1180 and 1247 were probably deposited before the end of the Long Cross recoinage of 1247 to 1250. A silver farthing and two pennies of Edward I (1279 to 1307) were minted between 1279 and 1300. In principle these could have been deposited at any time until the debasement of the coinage in the 1540s, but as they appear to be relatively unworn it is likely that they were deposited between the late 13th century and mid 14th century. A silver penny that can only be broadly dated as having been minted between 1279 and 1489 is likely to belong to the period 1351 to 1361, but this is uncertain, while another silver halfpenny can only be broadly dated to between 1280 and the mid 15th century. Although many of these coins were found in residual contexts, their distribution and the contexts where they were found — often cut features that had disturbed deposits associated with Building I — strongly suggest that the loss of the coins is related to Building I (Figure 63). This implies, with the exception of the coin possibly minted between 1351 to 1361, that they were all probably lost during the 13th century when Building I was occupied, with a loss rate in the region of one silver coin per decade in a single property. This can be compared for instance to West Fen Road where a single 13th-century coin was found (Mortimer *et al.* 2005). This probable 13th-century peak, with little if any 14th- or 15th-century coin loss, is atypical as there is generally a peak in coin loss during the 14th century (*cf.* Rigold 1977).

Two writing implements in residual contexts suggest some form of record keeping. A square sectioned writing lead (Figure 9.1) with one pointed end and gradual taper is probably 9th- to late 11th-century (Biddle and Brown 1990, 736, 743–4, nos 2290–95) and a copper alloy stylus (Figure 9.2) for writing on waxed tablets has a triangular eraser, a feature more common before the end of the 12th century (Biddle and Brown 1990, 730).

The earliest identifiable reference to tenements around the area of Jewson's occurs in a charter of *c.*1250 granting rents from three contiguous holdings; one formerly held by Reginald de Len and the others held by Lady Cassandra and Robert le Blunt. Lady Cassandra was the probable holder of the area excavated; her name and title suggest high status but nothing else about her is known. Reginald de Len came from King's Lynn and was probably involved in trade.

The Central Area

Around 60m southeast of Building I was a series of ditches (Figure 7). Due to modern contamination the earliest (Ditch 1) was only observed in a machine cut section. It appeared to be aligned north-northeast to south-southwest and was *c*.1.8m wide and 0.7m deep with a steep west side. It was possibly topped by a bank and was eventually deliberately filled. 12th-century pottery was found at its base, although it may be of earlier origin if kept clean. Ditch 2 succeeded Ditch 1 on the same alignment lying slightly to the southeast. It was over 5.0m wide and 1.1m deep and stepped on its north-northwest side, probably to facilitate periodic cleaning out, and had an upcast bank on the same side. A feature identified by ground penetrating radar some 20m to the north-northeast is probably a continuation of Ditch 2. The primary fill of Ditch 2 contained 12th- to 13th-century pottery, dominated by Thetford-type ware including some large unabraded joining sherds. This suggests that it was dug soon after Ditch 1 went out of use. The fills of Ditch 2 indicate prevailing wet conditions and probable seasonal flooding, the ditch eventually silted up naturally over time. Running southeast from Ditch 2 for 15m before curving eastwards was Ditch 3, 4.5m wide and over 0.8m deep. The lower fills, containing 13th-century pottery, were laid under waterlogged conditions, while later fills contained 13th- and 14th- century pottery.

In 13th-century Ely, new drainage ditches were supposed to be 1.5m wide and 1.5m deep (Hampson and Atkinson 1953, 37), suggesting that some of these ditches were particularly wide. At Coppergate the ditches of the late 11th to 13th centuries were around 0.4m wide and 0.4m deep, and it was argued that these were kept small so that they would not prevent the movement of people and livestock but provide drainage and demarcation of boundaries (Hall, R. and Hunter-Mann 2001, 807–09). The ditches at Broad Street in contrast would have severely impeded movement. Given that butchering of cattle, sheep/goats and pigs was taking place, for consumption elsewhere, it seems likely that the ditches would have had simple wooden bridges or walkways over them. At Coppergate, wattle and stake fences were the most common form of boundary until the mid 13th century (Hall, R. and Hunter-Mann 2001, 807–09). Evidence for these is largely lacking from Broad Street, but as boundaries of this period are frequently discontinuous it is probable that they were simply not coherent enough to be recognisable.

Building I would have needed protection against flooding and must be seen as dependant on, if not connected to, Ditch 2. Ditch 1 was too small to cope with major floods and may not have been dug for that purpose, but the larger Ditch 2 and its bank would have provided protection from seasonal riverine flooding and is broadly contemporary with Building I. At a slightly later date Ditch 3 would have provided further drainage and protection. Ditch 2 may have also had significance as a boundary, since the alignment can be traced on Speed's map of 1610 (Figure 55) as the rear boundary to properties on Broad Street. A priory boundary ditch was established in the 12th century along the line of Broad Street and it is likely that the priory owned most of the area towards the river, as it did in the 15th century. Ditch 2 was established at a similar date to the precinct boundary and on a parallel alignment. It probably sought to define and reclaim this block of land as a preliminary step towards development. During the 12th century there were two phases of roadside ditches along Forehill (Alexander 2003, 138 & fig. 6) that could be part of the same general layout.

Tank 1, located just over 2m northwest of Ditch 2, was rectangular and on the same alignment as the ditch, with almost vertical sides and rounded corners measuring 8.0m by 5.4m and over 1.8m deep. Its primary purpose may have been for holding stores of live fish (*cf.* Aston 1988). Maintenance of a fishpond was a luxury only wealthy landowners could afford, and most examples occur on noble, royal or monastic estates. Bacon, writing in the 19th century, claimed there were at least forty fishponds in Ely and the lower ponds were supplied with water from Castlehithe or Monkshithe, which were connected with the ditch forming the east boundary of the monastic grounds (quoted by Atkinson 1933, 159). Whatever its role Ditch 2 would be a convenient source of water to supply the tank and the skilful management of water is common at monasteries (Bond 1989), although their role with regard to fishponds can be overstated (Currie 1989). The tank would be regularly cleaned out and material within the fill is probably later than its primary use. Nearby hemp cultivation is suggested by pollen, and the tanks or ditches could have been used for retting the material in submerged bundles, for fibre (*cf.* Ayers and Murphy 1983, 42; Higham 1989; Knight 1999). Pollen shows a local environment dominated by grasses, suggesting the surrounding area was marginal ground possibly used for seasonal grazing.

To the northeast of the main area, evaluation trenches and ground penetrating radar identified a series of other ditches perpendicular to Broad Street. Where these ditches can be dated they appear to have gone out of use in the 13th and 14th centuries. The one fully excavated example was 0.9m wide and 0.4m deep. Taken together these ditches suggest a relatively regular and planned layout of drainage and boundary ditches creating rectangular blocks arranged perpendicularly to Broad Street. Although some of these end around 60m from Broad Street, others extended at least 85m.

The Riverside

There is no evidence for any activity at Jewson's beyond Ditch 3 and there was hardly any pottery of this period even in residual contexts. It appears that the area between it and the river was subject to periodic flooding although it may have been used intermittently.

Material Culture

Pottery

The most common Saxo-Norman pottery (Table 1) was Thetford-type ware dated 900 to 1100 (Rogerson and Dallas 1984) and comprising over half the assemblage (111 sherds, 50.5%), followed by St Neots-type ware (62 sherds, 28.2%) also dated 900 to 1100 (Denham 1985) and Stamford-type ware (47 sherds, 21.4%) dated 900 to 1200 (Kilmurry 1980). This pattern is broadly similar to other sites in Ely; the relatively high proportion of Stamford-type ware and low proportion of Thetford-type ware compared to other sites in Ely may be because of the break in occupation between the 10th and 12th centuries, as it has been shown that access to Thetford-type ware may be slightly earlier locally (*cf.* Hall in Mortimer 2000, 24 and

Site	*Thetford type*	*St Neots type*	*Stamford type*	***Total***
Jewson's	111 50.5%	62 28.2%	47 21.4%	**220**
Forehill	34 36.2%	42 44.7%	18 19.1%	**94**
Lady Chapel	43 70.5%	17 27.9%	1 1.6%	**61**
West Fen	4519 64.0%	2410 34.1%	130 1.8%	**7059**

Table 1 Saxo-Norman pottery from Jewson's and other sites in Ely

27; Hall in Cessford with Dickens 2005). The pattern at Jewson's is closest to that at Forehill (Hall in Alexander 2003; Hall, D. 2001) where activity did not begin until the 12th century, although the evidence might suggest that activity began slightly earlier at Jewson's.

In the 13th century the Saxo-Norman wares were superseded, primarily by sandy wares and gritty wares from Ely (Table 2). As it is impossible to distinguish much 12th- and 13th-century material from 14th- and 15th-century material, and given the high potential for residuality, the 12th- to 15th-century material will be discussed as a single group. The medieval pottery is dominated by material made locally in Ely at Potters Lane (4804 sherds, 71.8%) (Hall, D. 2001; Spoerry forthcoming), additionally a small proportion of the Ely ware appears to be imitating Grimston ware (88 sherds, 1.3%). Ely ware is generally dated to between the 12th to 15th centuries and was presumably well established by 1280 when the street name *Potterslane* is recorded (Reaney 1943, 215) and in a survey of 1417 on the lower east side of *Potterslane* there were seven tenements, one formerly a pottery (Owen 1993, 22). The pottery is hand made with limited finishing and the glaze often very thin and patchy. The glaze is almost always opaque, sometimes green and often has a muddy, opaque white colour with a rough pimply surface. The most common forms are thick-sided bowls followed by rather squat jugs and jars. The industry was highly conservative with few changes, these generally relating to decoration.

The only other known medieval pottery kiln in Cambridgeshire is at Colne, broadly dated to the 12th to 16th centuries and producing bowls or pancheons, large jars including cisterns, jugs and pipkins that were slightly finer and less gritty than the material produced at Ely (Healey *et al*. 1998). Colne products have not been identified at Ely, suggesting that the Colne industry does not begin before the Ely industry and that the minimal superiority of the Colne products was not enough of a factor to create a market for them in Ely. It is also possible that pottery was produced in Cambridge since a *Potteres rowe* (1249) or *Potterslane* (1341) is mentioned, located on the north side of Cambridge Market Place (Bryan and Wise 2002, 84; Reaney 1943, 50). The next most common form of pottery was Grimston ware (681 sherds, 10.2%) from Norfolk (Jennings 1981, 50–60; Leah 1994). Although Grimston ware begins in the 12th century most of the material in Ely appears to date to the 14th century, when the industry was at its height, and there is also some 15th-century material. 135 sherds, nearly 20% of the Grimston ware, came from a single decorated jug found set around a 14th-century hearth, possibly to diffuse heat or for decorative effect (see Chapter 4). They represent over half the original vessel.

Essex redwares were the commonest form of fineware (358 sherds, 5.3%); these were good quality jugs from a variety of sources, most probably Sible Hedingham (Huggins 1972) and Colchester (Cunningham in Drury 1982; Cotter 2000). Greywares were the next most common (325 sherds, 4.9%) and an origin in west Norfolk, possibly at Exning or Higham Ferrers, is probable as such coarsewares are unlikely to travel far. This material dates to between the 12th and 15th centuries, but is most likely to have been imported to Ely prior to the establishment of the local industry. 13th- to 14th-century dark sandy wares (271 sherds, 4.0%) are similar to material from Blackborough End, Norfolk (Rogerson & Ashley 1985), but not necessarily from that site. No other wares occur in significant quantities. The Toynton ware (96 sherds, 1.4%) from Lincolnshire (Healey 1975; McCarthy and Brooks 1988, 261) is dominated by 74 sherds from a single unglazed jug. This represents around half of the entire vessel, with a band of lightly scored slashed decoration, and was found at the base of a 15th-century wall cut. The Toynton ware constitutes over half the pottery from this feature, the rest being mainly miscellaneous sherds of Ely ware. There were a few sherds of 13th- to early 14th-century Scarborough wares (31 sherds, 0.5%), fine jugs from Yorkshire (Farmer and Farmer 1982). There were also a few sherds of 15th- to 16th-century Bourne ware (25 sherds, 0.4%) from Lincolnshire (Healey 1969; 1975); these mainly appear to be of 15th-century date. Additionally there were a few pieces of Lyveden ware from Northamptonshire (Steane 1967; Bryant and Steane 1969), Surrey Borders ware (Pearce 1992) and Hertfordshire fine ware (Turner-Rugg 1995). Some possible York white wares may be a variant of developed Stamford-type ware, while some green glazed reduced wares that are possibly from Newcastle are equally likely to be variants of Grimston ware. Brill and Mill Green wares, which have been recovered in small quantities at other sites in Ely, were not found. The only Continental material was two 13th-century sherds of French Saintonge ware (Chapelot 1983).

The majority of the pottery in use at Jewson's during the medieval period was produced locally within Ely itself (Figure 37.3). Although not high quality the medieval Ely ware industry had a long life, presumably because of the political and economic dominance of the religious establishments in Ely, which owned much of the fenland and southern Cambridgeshire and controlled the river Ouse. It has been suggested that the location of the kiln at Colne was at least partially related to supplying the Bishop's Palace at Somersham (Healey *et al*. 1998, 57) and it is likely that similar factors applied at Ely, although its urban location would have given it a more varied immediate market. Medieval Ely ware is found on all fenland sites and at Cambridge and elsewhere to the south. Northwards it occurs at King's Lynn and has been noted in southern Lincolnshire and west Norfolk. Material being imported to Ely came primarily via King's Lynn to the north, including the relatively common Grimston and dark sandy wares made close to King's Lynn, plus some material from further afield such as the Scarborough and Saintonge type ware. Given the export of Ely ware to King's Lynn in the 12th and early 13th century it appears that the direction of movement of relatively utilitarian

Site	*Ely*	*Ely/Grimston*	*Grimston*	*Essex Redwares*	*Grey*	*Dark sandy*	*Toynton*	*Scarborough*	*Bourne*	*Lyveden*	*Surrey Borders*	*Hertfordshire fine ware*	*Continental*	*York or developed Stamford*	*Green glazed reduced wares*	*Brill*	*Mill Green*	***Total***
Jewson's	4804 71.7%	88 1.3%	681 10.2%	358 5.3%	325 4.8%	271 4.0%	96 1.4%	31 0.5%	25 0.4%	8 0.1%	2 <0.1%	2 <0.1%	2 <0.1%	2 <0.1%	4 <0.1%	0	0	**6703**
West Fen	8365 90.5%	0	171 1.9%	87 0.9%	0	359 3.9%	11 0.1%	0	46 0.5%	189 2.0%	4 <0.1%	0	1 <0.1%	0	0	1 <0.1%	0	**9238**
Forehill	4532 72.7%	51 0.8%	601 9.6%	499 8.0%	0	437 7.0%	12 0.2%	15 0.2%	37 0.6%	38 0.6%	0	0	7 0.1%	0	0	0	4 <0.1%	**6233**
King's School	326 79.7%	0	11 2.7%	23 5.6%	37 9.0%	0	0	0	11 2.7%	0	0	0	0	0	0	0	0	**409**
Lady Chapel	10 47.6%	0	10 47.6%	0	0	0	0	1 4.8%	0	0	0	0	0	0	0	0	0	**21**
Source	Lo	Lo	KL	Cam	KL?	KL	FW	KL	FW	Ya	Cam	Cam	KL	KL	KL	Cam?	Cam	
Nature	Co	Int	Int	Fi	Co	Int	Int	Fi	Fi	Fi	Fi	Fi	Fi	Fi	Fi	Fi	Fi	

Source: Lo = Local, KL = via King's Lynn, Cam = via Cambridge, FW = via fenland waterways, Ya = via Yaxley
Nature: Co = coarseware, Fi = fineware, Int = Intermediate between coarseware and fineware

Table 2 Medieval pottery from Jewson's and other sites in Ely

pottery was effectively reversed during the 13th century as better quality Grimston wares took over. Some material such as the Essex redwares probably came via Cambridge to the south (Hall, D. 2001), although this route appears to have been less significant than King's Lynn. Lincolnshire vessels from Bourne and Toynton presumably came across the fenland waterways. Apart from the few Lyveden sherds, material from the Midlands is absent. The Lyveden ware probably came via Yaxley, which traded into the Midlands. Although it would be possible to plot the origins of the pottery found in Ely, this is probably inappropriate. Regardless of its ultimate point of origin, from an Ely perspective most imported pottery came from either King's Lynn or Cambridge (Figure 37.3). The level and source of imports was broadly similar to that at Forehill and King's School and quantitatively King's Lynn was the most important source of imported material followed by Cambridge. The pattern differs from West Fen Road where local products are much more common. Relative to the mass of coarse medieval Ely fabric, the Grimston, Essex and other wares are finewares, with some material lying intermediate between the two. Jewson's has a lower percentage of finewares than both Forehill and King's School, but a higher percentage than West Fen Road (Figure 37.2). It has a relatively high percentage of intermediate wares, comparable to Forehill and greater than West Fen Road and King's School. The overall impression is that the occupation at the Jewson's site was of rather lower status than at Forehill and King's School, but higher than at West Fen Road. Regardless of the variations between sites it remains true that medieval pottery from Ely is generally 'parochial in character' and not what might be expected for a busy market town (Jones, A.E. 1993, 132).

Food

The pattern of animal and plant exploitation is generally similar throughout the medieval period, only changing in the post-medieval period when the use of animal bone in industries begins to affect the picture. In general the pattern relates to butchery of animals on site, largely for consumption elsewhere. In total sheep/goat dominate the assemblage, but with cattle only slightly less numerous, and in some phases outnumbering sheep/goat, whilst pig is a minor element (Table 3; Figure 68). The Ely survey of 1277 (Salzman 1967, 66) suggests that sheep dominated local animal husbandry (83% locally and 73% generally), while the faunal assemblage of this period shows them as much lower (approximately 44%). Cattle (3% locally and 4% generally) are much more common archaeologically (approximately 49%) while pigs are more important in the survey (14% locally and 7% generally) than archaeologically (approximately 7%). The archaeological pattern is broadly similar to the medieval phases at the nearby site of West Fen Road (Mortimer *et al.* 2005) and it is probably from such settlements that the animals being butchered were largely obtained.

The majority of cattle were being slaughtered at prime age, between three and four years old, through all phases. Through time there is an increasing bias towards primary (skulls, metapodials and phalanges) and secondary (distal humerus and distal femur) butchery waste. Kitchen (scapula, proximal humerus, pelvis, proximal femur) and meal (ribs, vertebrae) waste are less well represented. For sheep and goats the majority of individuals were slaughtered in their prime at two to three years of age throughout all phases. Elements are represented from throughout the skeleton, in the main they are associated with primary and secondary butchery waste with less kitchen and meal waste. For pigs there is a minimal presence of very young animals and the preferred age of slaughter was one to two years old, prime meat-bearing age. Elements from throughout the skeleton are represented, but the vast majority are those associated with primary and secondary butchery with very little kitchen or meal waste present.

There were very few bones of wild animals, fallow deer and hare, suggesting that hunting was insignificant. This is in contrast to other sites in Ely, where there was a greater quantity and range including roe deer and rabbit (Dickens and Whittaker in prep; Higbee in Alexander 2003, 170). Fish remains consisted of various species including freshwater pike and eel, probably caught locally (Table 7). The absence of marine fish until the 14th century (see below) is intriguing as these are usually present on inland urban sites from the late 10th century onwards (Barrett *et al*. 2004). As they are present at this time on other sites in Ely (Mortimer *et al*. 2005) it is possible that the absence at Jewson's is due to the relatively small sample size.

It appears that cattle, sheep and pigs were brought to the site for slaughter and butchery but that consumption mainly occurred elsewhere, probably in the religious communities of Ely. At the Lady Chapel, prepared carcasses were imported ready for further butchery into individual joints (Regan 2001) and at King's School, beef and mutton were arriving as dressed cuts although pig, lamb and rabbit were arriving as whole carcasses (Dickens and Whittaker in prep). At Forehill (Higbee in Alexander 2003) beef and mutton were probably arriving largely as dressed carcasses or joints, so there was a secular market as well. This pattern may explain the lack of rabbit and the low quantities of lamb and pig in the Broad Street area. Killing these species but exporting them as whole carcasses would leave no traces.

Species	*9–10th*	*12–13th*	*14–15th*	*16th*	*17th–later*	***Total***
Cattle	19.2	16.8	16.2	8.8	13.3	**13.0**
Cattle size	3.8	6.3	7.6	6.5	2.0	**6.1**
Sheep/ goat	17.3	17.1	11.3	13.6	43.0	**14.0**
Sheep size	4.8	3.5	6.1	3.6	-	**4.6**
Pig	7.7	3.5	3.1	3.8	2.0	**3.6**
Horse	1.9	0.7	0.4	0.4	0.7	**0.4**
Dog	-	0.7	1.0	17.0	4.6	**8.0**
Deer	-	0.3	0.1		-	**0.1**
Bird	1.0	0.7	2.3	6.6	0.7	**4.0**
Fish	*	*	0.6	0.2	*	**0.4**
Cat	-	-	0.3	6.4	0.7	**3.0**
Hare	-	0.3	0.1	-	-	**0.1**
Unident-ifiable	44.2	49.7	51.5	32.6	32.5	**42.6**

*=present but not quantified

Table 3 Animal species at Jewson's by phase, expressed as Number of Identifiable Specimens (NISP) percentages

Given the presence of live animals and the relatively large open areas, at least during the 12th to 14th centuries, it is likely that much of the area was meadowland where animals were grazed and that some of the drainage efforts were directed at creating water meadows (*cf.* Hawkes and Fasham 1997, 193).

Charred plant remains from the one sampled posthole are comparable to nearby 14th- and 15th-century contexts associated with malting (see below); it is possible that these 'earlier' remains are reworked. Grains of hulled barley are most frequent, and occasionally are clearly germinated, unlike the free-threshing wheat and rye grains also present. Chaff is rare and there are few seeds, with corn spurrey, a black mustard type and possible charlock most notable. A small amount of charred great fen sedge leaf fragments may represent fuel ash.

Other Material

Metalwork includes a lead alloy flagon lid, a lead plumb bob used in building construction, a fiddlekey horseshoe nail, a lead fishing line weight and a large iron cramp with an upstanding hooked terminal at each end. Fragments of a leather shoe of turnshoe construction were found.

Other sites

The Broad Street Frontage

Everywhere that deep enough excavation has taken place along Broad Street, there is evidence for buildings. At the Electricity Depot there was an insubstantial structure of some kind lying over 13th-century dumps (Figure 61.1). There was then another dumping episode with more substantial structural evidence overlying it. The earliest phases of the standing building at the Three Blackbirds, which is 29m long and just under 8m deep with four rooms including a hall, plus a cross passage, are late 13th-century. The earliest excavated phase, which had a hearth and several scoops for holding pots and liquids and for copper working also appears to be late 13th-century. At Tesco's buildings revealed in section were cut by 12th- or 13th-century pits. A well filled with 13th- century refuse could either be associated with Baldokeslane, or more probably with a property on Broad Street around 50m away.

The Central Area

At 57 Broad Street there is a ditch aligned southwest to northeast, 1.2m wide and 0.4m deep, that is probably a combined property boundary and drainage feature. At Jubilee Terrace around 60m southeast of the buildings at the Electricity Depot there were deposits derived from river flooding containing Late Saxon and early post-Conquest pottery. Above this there was gardening or horticulture over part of the site, but elsewhere 13th-century domestic refuse was dumped to raise the height of the area by around 0.15m. Over this and aligned northwest to southeast was a large timber framed structure with rubble sill walls around 25 by 10m. It had internal partitions and postholes and a yellow gravely floor. There were no hearths or fireplaces and the floor showed no traces of wear from occupation. This suggests that it was not a domestic structure, and it may have been a warehouse. Beside the structure was a boundary ditch.

The Riverside

Towards the river at Annesdale and 2 Ship Lane there were deposits similar to those at the nearby Jewson's site suggestive of periodic flooding and inundation by the river. At the Maltings there was an open and wet environment with reeds and small trees during the 13th century and the only evidence of activity was a pit. At the south end of the Tesco's site vertical timbers, some of them squared and with sharpened ends, were noted at great depth. Although these cannot be closely dated they pre-date 14th- and 15th-century deposits. The timbers were associated with deposits indicative of running water and may be an early waterfront structure of some kind, located around 90m north of the current course of the river. Stray discoveries where Forehill meets the river suggest that this area was occupied in the 13th century, possibly with impressive structures.

Discussion

The beginnings of medieval activity appear to lie in the second half of the 12th century with a series of ditches that render the northwest part of the area at least partially protected from flooding and also act as property boundaries. This is followed slightly later by the construction of buildings along the Broad Street frontage in the early 13th century. Occupation was relatively dense and buildings have been encountered everywhere that deep enough excavation has occurred. Occupation appears to be less intensive than on Forehill, where individual property plots were built upon at different points in time rather than simultaneously (Alexander 2003) and a similar pattern of development is likely along Broad Street. Behind the street frontage is a less intensely utilised area extending around 60m with evidence for wells, boundary and drainage ditches, fishponds and warehouses. Medieval property plots were generally 5 to 12m wide and 15 to 60m long and this appears to be the case in Ely, where they seem to be a 12th- and 13th-century development according to evidence from Forehill (Alexander 2003) and the White Hart (Jones, A.E. 1993). This pattern is then remarkably stable as the survey of 1417 (Figure 26) and later cartographic sources (Figure 55) confirm. There is little evidence for any activity closer to the river, apart from some highly tentative evidence of timbers in the vicinity of *Broadhithe* and the land up to around 110m from the current river's edge was periodically flooded and utilised in an ephemeral manner. At Coppergate in York no *in situ* flood deposits were identified and it was suggested that these would not survive intact on an intensively used ground surface (Hall, R. and Hunter-Mann 2001, 793). Their survival in Ely may be suggestive of a relatively low level of activity.

Overall the evidence suggests Broad Street was subject to a planned 12th-century development, with the street frontage being divided into a series of properties. The pattern of long rectangular properties fronting onto a major street and extending as far back as the topography allows is a common pattern at this time. The best evidence for occupation comes from Jewson's, where the sword cross and coins (Figure 63) suggest a high degree of wealth. The barn and fishpond plus the evidence for cultivation of hemp, animal grazing and butchery suggest the property was used for the production and storage of agricultural products for use elsewhere within Ely. It has

been argued that West Fen Road is part of a large settlement, possibly established as a food-producing site for the nearby religious community and geared towards crop and animal husbandry (Mortimer *et al.* 2005). The area between Broad Street and the river Great Ouse can be seen as an intermediate 'suburban' location between production sites in the rural hinterland such as West Fen Road and consumption sites in urban Ely. From the 12th century onwards there is evidence for nucleation of activities within English towns and during the 12th and 13th centuries large merchants' houses and warehouses occupied waterfront areas. It is only later on that they were given over to noxious industries indicating a decline in status (Hutchinson 1994, 115–16). This certainly appears to apply to Broad Street, with the noxious industries such as pottery production and tanning being located in another 'suburb' around Potters Lane during the 13th century (Owen 1993, 11). Overall the evidence suggests that there was little true specialization of activities and employment, but there was an emerging degree of differentiation (*cf.* Britnell 2001).

In 1086 Ely was largely rural in character (Hampson and Atkinson 1953, 34) and in 1108 to 1109 the see of Ely was established and the abbey became a priory. Part of the monastic estate was awarded to the bishop, a process that was probably completed *c.*1150 (Crosby 1994, 172). The development of Ely was controlled and stimulated by these two religious bodies and the area between Broad Street and the river must be seen in this overall context, although the overwhelming majority of this area was owned by the priory (Figure 26). The monastic precinct formed a compact block extending down from the high ground to Broad Street (formerly *Broad Lane* and *Brodlane*), which is first mentioned in 1234–45. In the 15th century the prior rather than the bishop owned most of the area, and it is likely that this reflects the 12th-century situation. The earliest references to lanes running southeast to the river are 13th-century. The lanes lying between Forehill and Back Hill were Flexlane (related to the retting of flax), Annesdale, Baldokeslane (named after Baldock in Hertfordshire), Barkereslane (Barkers Lane, related to tanners involved in leather production), Wynferthing Lane, Ferrours Lane (Ironworkers Lane) and Croyse Lane (from the personal name Croyle). At the river there were a number of wharves or hithes, the main one Broadhithe, first mentioned *c.*1210 (Reaney 1943, 216), lay at the end of Forehill/Baldokeslane. Downstream was Stockhithe, whilst further away there were wharves at Quanea and Turbutsey. Upstream were Monkshithe, at the end of Barkereslane, and Castlehithe, running along the river from Ferrours Lane. By 1251 the population had increased threefold since 1086, although the settlement was still primarily rural (Hampson and Atkinson 1953, 37).

One event that would have had a major impact was the canalisation of the Great Ouse, whose flood plain was previously about one mile wide with the main channel flowing further east past Stuntney Hill. This would have required vast organisation, manpower and resources and it has been argued that the most likely periods for this are the late 10th century after the foundation of the Benedictine abbey (Holton-Krayenbuhl 1997, 120), or the 12th century after the foundation of the see of Ely (Fowler 1934, 22–23). The 12th century appears inherently more likely and there is circumstantial evidence that there was no easy river access to Ely in the 1070s. Canalisation was possibly a long-term process and some work may have been undertaken in the late 10th century. In the wider context, silting up of the Wisbech estuary had a significant impact on the fenland waterways; modifications north of Littleport by 1169 redirected the Great Ouse to flow into the Wash at King's Lynn which had become an important trading centre (Darby 1974, 94–97; Owen 1984).

The 12th- and 13th-century activity apparently represents a planned religious development with a series of properties along the frontage held by various individuals, some of them wealthy, who utilised them for a variety of domestic, agricultural and commercial purposes. This development was restricted to a strip along Broad Street with the area closer to the river remaining largely empty, except at a few specific wharves. As a caveat if vessels were drawn up on the foreshore and loaded and unloaded using carts standing in the water this would leave little obvious evidence (Ellmers 1985). A late 12th-century grant at Castlehithe conveys 'all the increase he can gain as far as his neighbours do' (Owen 1993, 16), suggesting that areas of dry land near the river area were extended by piecemeal dumping and embanking. The inhabitants of this new development in part probably derive from a refocusing of the local population of Ely linked to 12th-century decline in other areas such as West Fen Road (Mortimer *et al.* 2005). Some individuals came from King's Lynn while Baldokeslane is possibly named after an individual from Baldock, Hertfordshire.

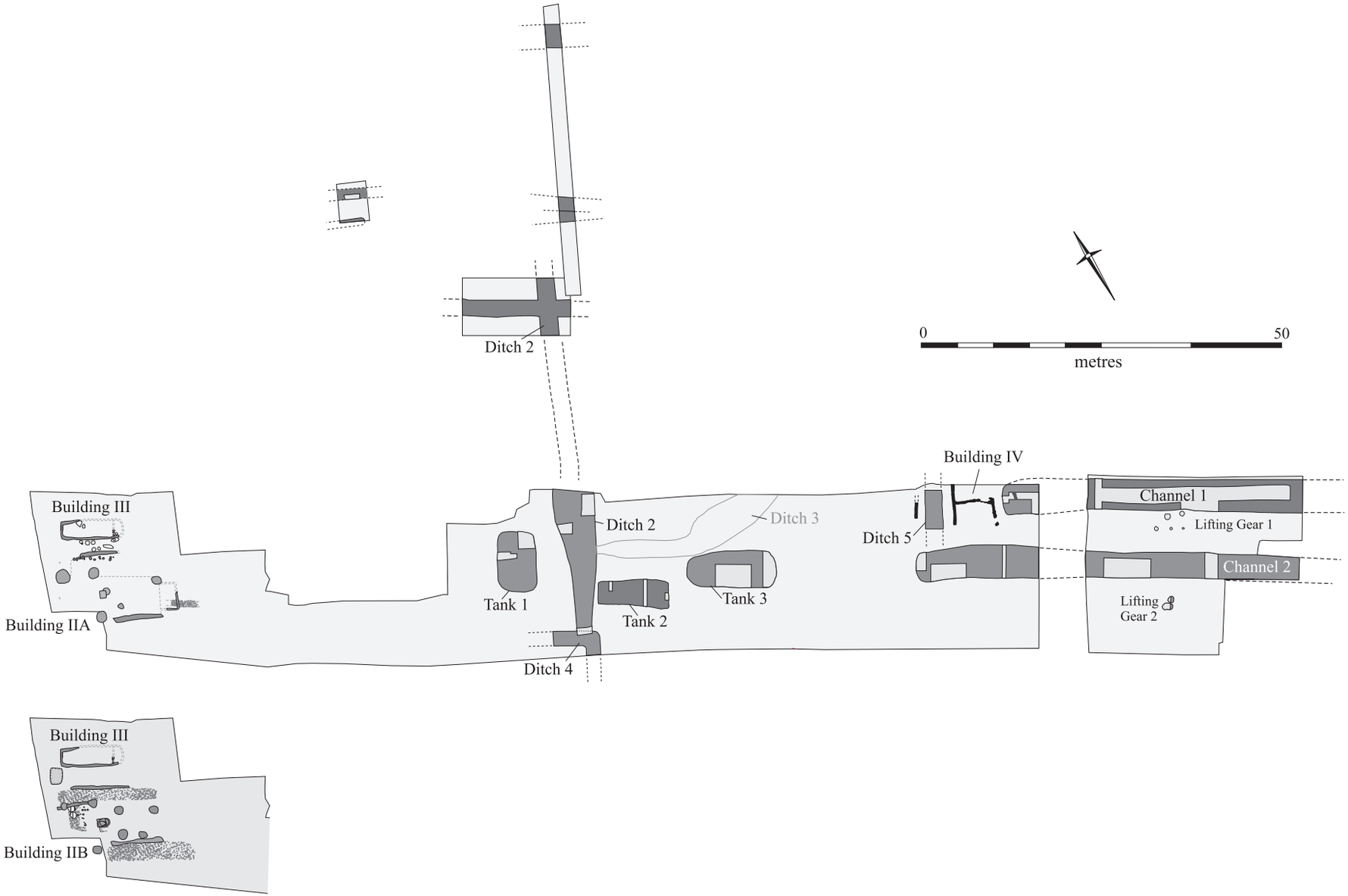


Figure 10 14th and 15th century at Jewson's

Chapter 4. Life and work on the waterfront: the 14th and 15th centuries

The 14th and 15th centuries see a continuation of activity along Broad Street and an expansion towards the river with the waterfront becoming a significant focus. The main evidence comes from Jewson's, but there is also evidence from 55 Broad Street, Jubilee Terrace, the Electricity Depot, the Three Blackbirds, Tesco's, 2 Ship Lane and the Maltings.

Jewson's

(Figure 10)

The Broad Street Frontage

Preparation for the construction of west-northwest to east-southeast aligned aisled hall Building IIA (Figures 11 and 12) was thorough. The south internal wall slot was filled with cornbrash and the whole area occupied by Building I was levelled and consolidated. Micro-morphological analysis of these deposits indicate fluctuating wet and dry conditions and it is likely that the area was still very damp and muddy at times. The principal posts were laid on make-up layers lying directly above, and in places mixed with this levelling layer. The west-northwest posts rested on shallow postpads of cornbrash gravels and clay over 1.5m in diameter. A deep cut along the west-southwest side may mark the wall beams location, later robbed out and replaced by a sill. The only surviving postholes in the east-southeast part are a smaller posthole set in from the wall and a post at the east-northeast corner. These differ from the west-northwest posts: the smaller post was set in a subtriangular posthole while the other rested on a pad of crushed clunch. Moreover, whereas the west-northwest postholes were set on base plates, the east-northeast posthole alignments were set in from the wall line.

At the building's east-southeast end a gravel path was laid running up to the rear entrance made up of reused building material including mortared building stone, Collyweston stone and glazed Ely tile. Shell, bone, a spindlewhorl and lots of 14th-century pottery accumulated on the path. Later a porch was added to the rear, cutting into the path. Along the east-northeast side of Building IIA a wall of posts and stakes with a drip gully may indicate the roofing over of a narrow corridor to the main building.

In the centre of the hall was a circular hearth filled with yellow clay and red ash, this was replaced by a square structure with a base of white clay. Fine gravel, ash, charcoal and occupation debris with 14th-century pottery was scattered over the floor to the east of the hearth. Metalwork associated with the building consists of typical domestic items, including a knife and a fragment of a copper cooking vessel.

Although the basic form of Building IIA remained the same for over a century it underwent a series of repairs and rebuilds as wooden posts inevitably decayed, ultimately transforming it into Building IIB (Figure 11). The small post in the east-southeast part was removed and reset further south on a pad of crushed clunch. It was paired with another post to the north-northeast and in line with post settings at the east-southeast end of the hall, also resting on clunch footings. All three posts at the west-northwest end were re-established in the same settings.

The west-southwest wall sill was reconstructed using a clay ridge topped with tile and ironstone cobbling. The east-northeast wall was frequently repaired and extended towards the road. The short length of threshold wall was reinforced and straightened with stone cladding, overlying a gravel layer that continued into the building strengthening the area most worn by activity. This area was divided from the main hall by a cross passage, indicated by a strip of gravel flooring and a line of small postholes and stakeholes for a light wall or screen. Heavy use of this entranceway continued and eventually two large flat flagstones, originally halves of a large boulder, were embedded in the gravels within the building leading up to the threshold. To the northwest of the threshold a short length of stone rubble wall foundation suggests the existence of a small porch wall.

The hearth was frequently repaired and substantially renovated, gaining a base of Ely tiles set on edge later replaced by sandstone blocks with fragments of half a semicircular lava quern as a hearth apron on its southeast side (Figure 13). Set in clay around this were numerous pieces of green glazed Grimston pottery, which may have diffused heat or been purely decorative. Postholes dug into the occupation deposits surrounding the hearth's east side suggest some kind of fireguard. The clay floors were worn and replaced most frequently around the hearth. An upstanding northeast to southwest clay ridge just to the northwest of the later internal division suggests some kind of screen preventing this area of floor from wearing away at the same rate. Occupation deposits on the floors were rich in charcoal and ash from the hearth, with 14th- and 15th-century pottery and bone from domestic consumption. Micromorphological analysis of the floors indicates a complex sequence of clay, fine gravel and sand floors upon which 15 to 35mm of organic refuse including urine would accumulate and be trampled into a compact layer. This would then be covered with either a layer of ash or a new surface to reduce the stench and sterilize the surface. At the end of this phase the hearth was covered with a thick deposit of silt, spread across most of the hall's central area. Traces of the south-southwest edge of a square hearth replacing the earlier hearth could be seen beneath the cut for a later fireplace that replaced it.

The style of Building IIB appears to be transitional, partly an aisled hall but with wall-fast posts for the cross passage and the cross wing beyond, suggesting a more contemporary technique of timber frame construction. The use of large post pads may indicate reuse of some of the substantial timbers from Building I, already

Figure 11 14th- to 17th-century phases of Buildings II, III, V, VI and VII

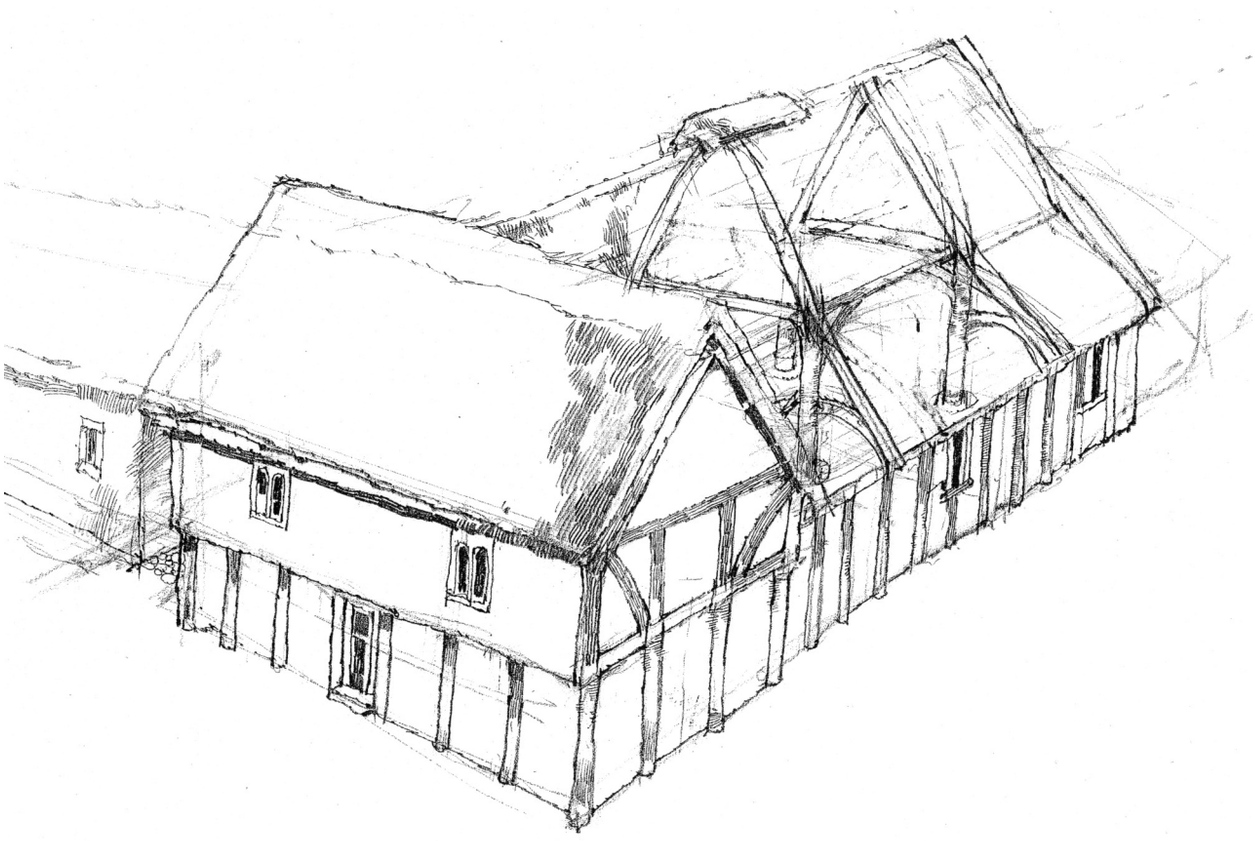


Figure 12 Reconstruction of Building II in the 14th century, *by Victor Ambrus*

foreshortened by the inevitable process of decay while supporting the original building. The building had clay floors, although periodic or partial use of floor tiles is possible given the reuse of locally made floor tiles in other features. There is nothing to suggest a particular function other than domestic occupation, supported by finds of copper alloy pins, knives, ironwork, querns and spindlewhorls, and possibly malting (see below).

The area along the east-northeast of the corridor wall and opposite the threshold into the main hall suffered from continuous wear and runoff from the roof. The resulting hollow was patched with various deposits containing horse bit fragments. A clay sill replaced the corridors post-built wall or plinth to support a beam and the surface within the corridor was entirely regraveled. To the north-northwest of the threshold to Building IIB a large oven (Oven 1) was in use; the large pit measuring 2.4m by 1.8m was clay lined and covered by a clunch superstructure that was eventually used to fill the pit. Relining in the base represents the last of a series of refurbishments during the time it was in use. Its demolition apparently coincides with the construction of an oven within Building IIC.

A smaller structure Building III (Figure 11) to the north-northeast of Building IIA comprised two beamslots aligned east-southeast to north-northwest, 2.0m apart and joined at the west-northwest end by a return wall. Some of the structure had been destroyed, but the divergence of the north-northeast wall line suggests either a bow sided wall or a wedge shaped building. Plaster with wattle impressions found within the wall trenches and a posthole suggest wattle and daub walls. Within the structure was a group of intercutting pits, three of which were filled with ash. Contemporary postholes and other features lay to the southeast and postholes suggest additional, undefined, structural elements to the northwest of a short linear cut burnt around the edges and filled with fire waste. Surrounding this were patches of pink ashy deposits that also filled a circular pit to the north. The fills of some postholes were notably rich in charcoal; one contained numerous fragments of burnt clay and small offcuts of copper sheeting from cold working. A later addition to the structure's southeast end was a post-built wall partition. The building was demolished before the gravel surface was laid over the general yard area to the northeast of Building IIC. Building III is a relatively humble construction, possibly with plastered wattle and daub walls. It was 7.5m long and 2.0m wide at its west-northwest end, but possibly wider towards the east-southeast. The east-southeast end eventually appears to be partitioned or perhaps shortened with a post-built wall. Building III probably served as an outhouse for Building II, being used as a workshop and for food preparation judging by the spindlewhorls, whetstones, and querns. The distance from Building IIA was sufficient to reduce the risk of accidental fire spreading. To the southeast of Building III, and possibly within some additional structure, a small hearth appears to have been used for the cold working of copper. Building III and Oven 1 probably functioned together and were abandoned at the same time.

An alley was established running east-southeast from the road along the west-southwest edge of Building IIB with four consecutive gravel surfaces interspersed with

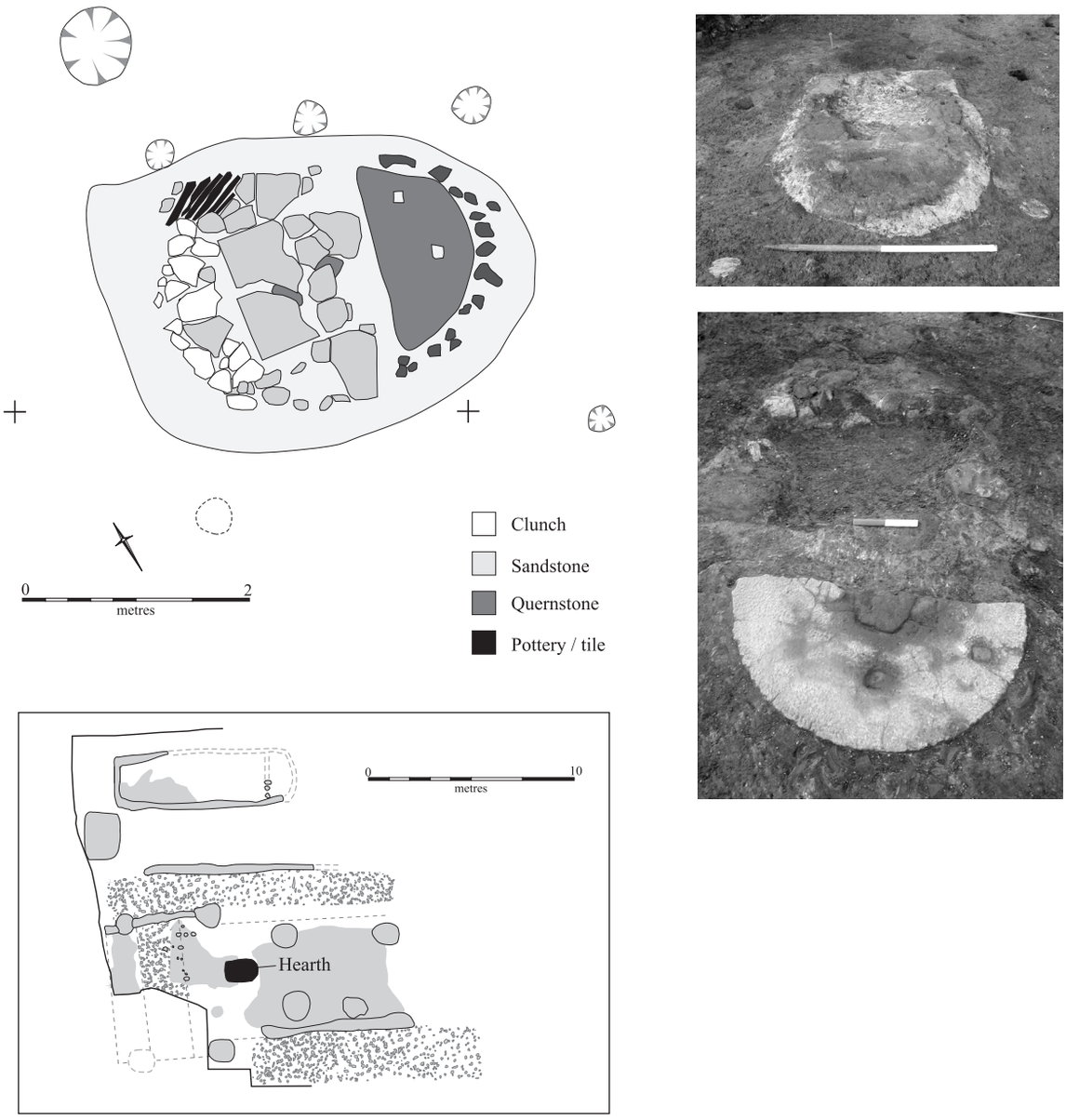


Figure 13 Hearth in Building II

silty accumulations. Preparations for resurfacing overlaid the earliest evidence for the south wall of Building IIA, but possibly the route was established earlier as part of the general rearrangement of land use at the beginning of this period. Abraded 14th- and 15th-century pottery was found, but the alley appears to have continued in use until at least the 16th century. The apparent change from ditches to gravel paths or alleys as a form of property demarcation occurs at Coppergate at broadly the same time in the late 13th and early 14th centuries (Hall, R. and Hunter-Mann 2001, 807–09). These provided unobstructed access and suggest that boundaries become notional rather than physical.

Further to the southwest an evaluation trench revealed a complicated building sequence commencing in the 14th century with some uneven cobbles, which might be a surface or wall foundations. These sealed an earlier ditch or well. Above this was a building with several phases of clay floors and a pitched tile hearth that went through several major phases.

The Central Area

Tank 1 (Figure 10) continued in use through the 13th century, but was filled with material and went out of use during the 14th century. It appears that it silted up and was used for refuse disposal, receiving 13th- and 14th-century pottery, oak and ash roundwood debris, some from coppiced trees, food waste and intestinal parasites indicating human or animal faeces. Two highly decorated leather sheaths in the base of Tank 1 are relatively expensive items, made for a person of reasonably high status. One (Figure 14) is unusually shaped, as it is wider at the base than the top, with a seam along the edge and a raised moulding demarcating the shoulder of the blade between the handle and the blade. The scabbard must have been over 190mm long and is 54mm at the widest part, narrowing to 34mm. There is elaborate decoration on both sides with stamped lozenge shaped motifs on a background of incised lines. One side has four lions rampant, one above and three below the raised moulding which divided the handle from the blade. The other side

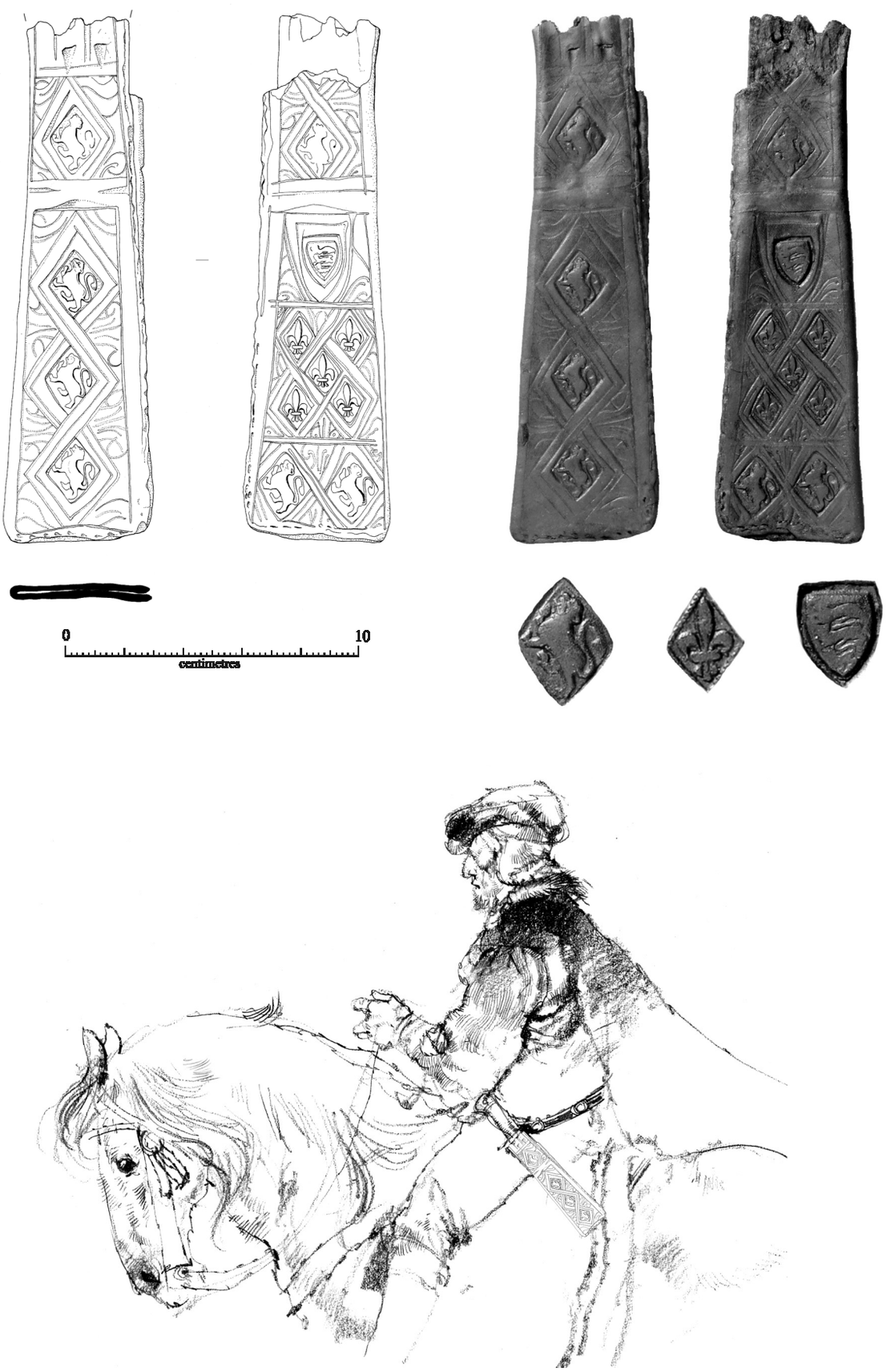


Figure 14 Decorated leather sheath from Tank 1 at Jewson's, and drawing of wearer *by Victor Ambrus*

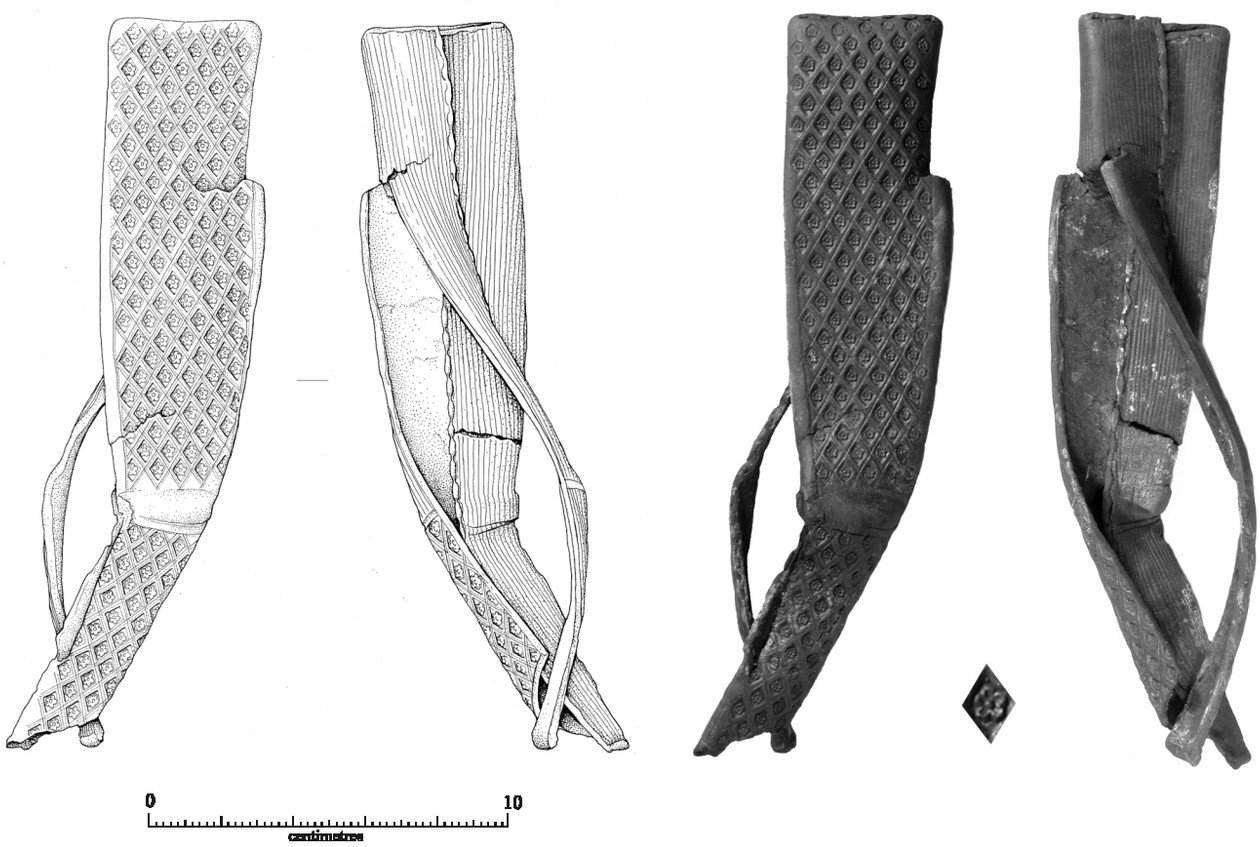


Figure 15 Decorated leather sheath from Tank 1 at Jewson's

has a lion rampant above the raised moulding on the handle area and is divided into three distinct panels beneath on the blade area. The upper panel has a shield containing three leopards, the middle panel five *fleur de lys* and the lowest panel two lions rampant. *Fleurs de lys* are the commonest form of stamped motif in London (Cowgill *et al.* 2000, nos 391–93, 395–97, 438, 440–43, 447–48 and 485). Lions are also known, however none of the examples from London are facing in the same direction as the Ely example (Cowgill *et al.* 2000, nos 394, 445, 447 and 448). The three leopards, which are the arms of England, is a rarer motif on sheaths but is also known from London (Cowgill *et al.* 2000, nos 425 and 452). The unusual broad terminal does not reflect blade shape and must be an aspect of design or fashion, a similar example is known from London (Cowgill *et al.* 2000, no. 490). The second sheath (Figure 15), apparently deliberately slighted before discard, has a central back seam and closely packed decoration of stamped lozenges with a five-petaled floral rosette or cinquefoil motif within. This is paralleled on an example from London (Cowgill *et al.* 2000, no. 486). It has a raised band quite close to its base and is 220mm long and 45mm wide at the base narrowing to 35mm. Excavated knife blades from Ely are generally not more than 110mm long and 20mm wide, so it appears that both sheaths held relatively large knives. It is possible that the decoration was originally painted or gilded although no traces survive.

Decoration on sheaths derived from heraldry first occurs in the late 13th century and is most common in the mid 14th century (de Neergaard 2000, 40). The decoration probably reflects current styles and preferences and is unlikely to have been made to the requirements of a particular individual. The decoration is so small that it is unlikely to have been distinguishable from a distance; instead it is almost textural in impact rather than visual. The use of heraldic inspired decoration is part of a wider fashion in society (Payne 1987, 56–57), for example on armorial horse furniture (Ashley 2002) and tiles (Sherlock 1980). Although the symbols do not relate directly to a particular coat of arms they involve the public display of symbols that are understood at least on a basic level and reinforce a sense of belonging to a restricted elite (*cf.* Hinton 1999, 179–80). Both sheaths appear to have been deliberately damaged prior to discard, a common pattern but one whose purpose is unclear. It seems likely that the sheaths form a set of some kind, one possibility is butchery related to hunting, which might well require more than one large knife. Intriguingly some Grimston ware from the same feature is decorated with strips, *fleurs de lys* and a shield of teardrops.

Tank 1 also contained a well-finished and shaped oak plank or board (Figure 16) with holes and pegs taken tangentially from a reasonable quality woodland tree with few knots. The five holes are sharply cut and two retain remnants of their pegs, probably hazel. The pegs precisely fit the holes and may have been hammered as they are slightly expanded and would only be extractable from one side. The plank tapers upwards at one end and all the shaping is precise and well executed. It may be derived from a fitting or piece of furniture and fits with a common contemporary furniture construction type.

Ditch 3 became substantially clogged with silty clays and was then deliberately filled with dumped soils, although it probably survived as an ephemeral damp depression. Initially Ditch 2 appears to have been well maintained, but eventually suffered signs of neglect as waterlain silts and eroded material from its bank collected in the base. At the northeast end it was then used to dispose of concentrated charcoal and ash waste from a kiln or oven mixed with 13th- and 14th-century pottery and marine shells, twigs and other organic material. At the southwest end the lower fills held less refuse, although 13th- and 14th-century pottery was also present. An accumulation of peat over these fills suggests the ditch was still waterlogged, but no longer scoured by fast running water. The pollen from it is dominated by duckweed suggesting quite still and stagnant water. Egg cases of water flea, seeds of water plantain and crowfoot are also characteristic of still water. Stinging nettle, thistle and fool's parsley suggest disturbed ground nearby. Ditch 2 was then rapidly and deliberately filled, although it appears that it was not entirely infilled and may still have existed as a shallow boundary and drainage feature. The north-northeast part contained demolition material from a nearby structure and domestic waste including 14th- and 15th-century pottery. Ditch 4 was then dug through the south-southwest end of Ditch 2, crossing it in an east-southeast direction before turning and veering off towards the south-southwest. Ditch 4 was around 2.0m wide and filled with a thick deposit of peat overlain by clay and then more peat.

Two large west-northwest to east-southeast aligned subrectangular tanks were dug to the south and east of Ditches 2 and 3. Tank 2 was probably the earlier of the two tanks and was 9.5m by 4.0m in extent and 0.6m deep. It silted up to almost its full depth with a single undifferentiated deposit of waterlain silts before being dug into and filled by a more gradual process. This began with tip lines of silty clay followed by dumps of bright red burnt clay silts with high ash content deriving from some industrial activity tipped in from the northwest. The latest dumps included 14th- and 15th-century pottery, while the earlier contained 13th- and 14th-century pottery. Above the later deposits a highly compacted gravel surface was established in a line along its centre. Tank 2 seems too shallow for a fish tank, although the primary fill was waterlain, and its function is unknown.

Tank 3 (Figure 17) was 3.0m further east-southeast and measured 12.5m by 6.0m and 1.3m deep. Dark grey almost black layered deposits at its base suggest silts and organic matter accumulating in waterlogged stagnant conditions. These indicate that Tank 3 remained water-filled for a longer period and its greater depth makes

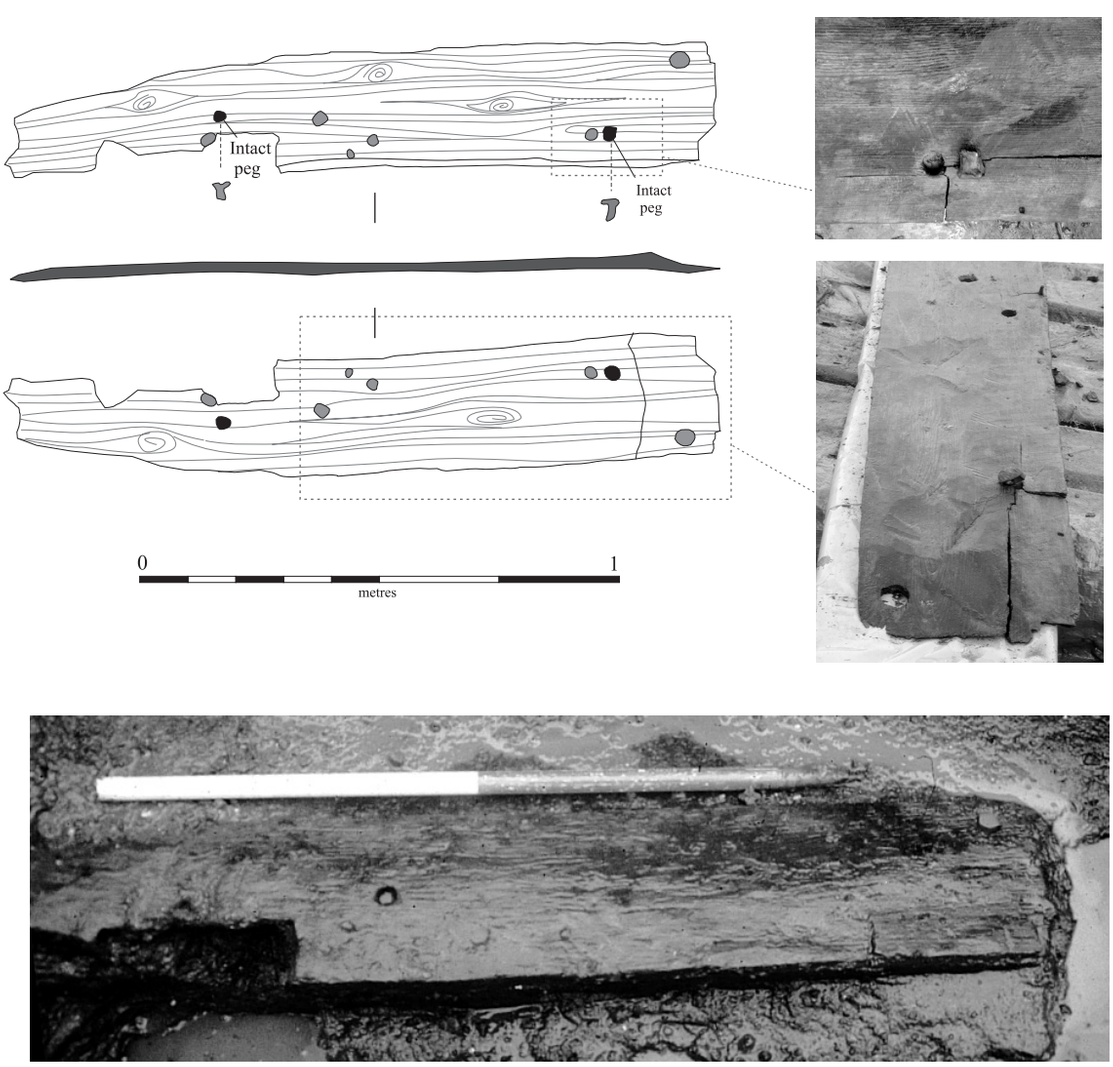


Figure 16 Oak plank or board from Tank 1 at Jewson's

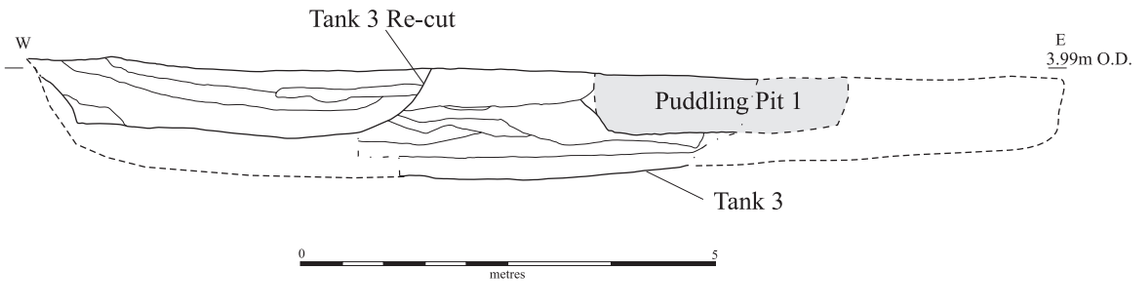


Figure 17 Section of Tank 3 and Puddling Pit 1

primary use as a fish tank more probable, although it is unclear how it was kept supplied with fresh water. High concentrations of ash had been tipped over these silts from the southeast. Above the basal silts were homogeneous waterlain layers of silty clay, overlain by deposits rich in domestic food waste, ash and burnt silts, again tipped in from the southeast. The southeast edge was consolidated with a pebble surface and a cladding of almost pure clay. A single oval posthole was dug into the later fills at the northeast corner. Almost all the fills above the basal silts had been affected by leaching, and were full of small hard concretions and ferrous staining. This is partly due to the high quantity of metal objects, including clench bolts and rove plates (Figure 24) that may indicate secondary use for boat building, repair or breaking (Figure 53). High quantities of residual pottery indicate it was filled with redeposited refuse and the evidence for boat repairs may derive from elsewhere.

Tanks 2 and 3 were created in the late 14th or early 15th century and may have partially been replacements for Tank 1. Primary use as a water-filled feature appears to have been abandoned relatively quickly in the case of Tank 2. This might relate to the reclamation of land towards the river and the subsequent drying up of a ready supply of fresh water from Ditch 2.

The Riverside

On the land between the ditch and the river there is not much evidence for 14th-century activity and a series of almost sterile clay silts suggest seasonal flooding. Closer to the river assorted dumps of redeposited clayey silts, gravels and building material reveal concerted attempts to consolidate the area. At Coppergate it was suggested that the deposits close to the river could be divided into upcast from cut features, the dumping of cartloads of refuse and more massive deliberate levelling deposits (Hall, R. and Hunter-Mann 2001, 813). The same broad pattern appears to be identifiable at Broad Street, although the action of the river has caused some mixing of deposits. A possible north-to-south aligned linear Ditch 5 sealed by deposits with 14th- and 15th-century pottery was partially revealed.

Two large channels aligned east-northeast to west-southwest (Channels 1 and 2) (Figures 18, 19, 53 and 56), were dug through these consolidation layers running perpendicular to the river. Dateable material from the deposits into which Channels 1 and 2 were dug is limited, but suggests they were dug in the late 14th or early 15th century. It is unclear if these two channels were created at the same time; a third channel was certainly added nearby at a later date and a further later example was found at the Coalyard (Figure 21). Each channel was approximately 3.5 to 4.0m wide and could accommodate a small barge or boat, although with no room to turn. Channel 1, the northeasternmost, runs around 55m from the current river's edge and its butt end sloped abruptly down to a depth of 1.6m, with a base at 2.0m OD. The steep slope at the channel end was interrupted by a step into which a permanent wattle revetment had been embedded (Figures 20 and 34). The oak revetment comprised a thick horizontal branch embedded in the channel sides and held in place by a wattle fence. It is very heavy, constructed from roundwood between 35 and 50mm in diameter and fairly roughly constructed with natural forks and coppiced ends left untrimmed. This is in the upper range of what is used for modern hurdles, which are ideally 15 to 50mm (Forestry Commission 1956). The oak is very slow growth, as slow as two rings per millimetre, slow grown wood usually comes from established woods or forests where there is a good deal of competition for light and moisture. Wattle hurdles and revetments are usually constructed from coppiced wood, generally hazel. Oak is much heavier, but weight would not be an issue in a permanent revetment. There was no evidence that the revetment was used to consolidate the bank and it probably functioned as a buffer for boats. There were also a number of wooden posts preserved along the sides of Channel 1 hinting at other timber structures.

Channel 2, lying around 6.0m south-southwest of Channel 1, extended further west-northwest, to around 65m from the current river edge. It had a steep sided butt end 1.2m deep also interrupted at the base by a step, but without evidence for a wattle buffer. Towards the river there is evidence that the channel's banks were built up with upcast material excavated from the base. Reuse of Tank 3 for boat construction or repair appears to tie in chronologically and functionally with the construction of Channel 2, and probably lay on land rented by the same individual.

The channels are a practical solution to the problem of making use of the waterfront in an area still prone to flooding. It allowed goods brought by boat to be unloaded away from the river's edge and closer to firmer ground where storage facilities and shops would be located. The excavation of inlets as an alternative to the construction of wharves has the added advantage of not incurring the costs of imported timber. Medieval dock basins are known from London and Portsmouth (Hutchinson 1994, 110–11), with the example from Portsmouth, where a gully or inlet with banks supported by timber or wattle fencing, perhaps providing the best parallel for the Ely channels. Man-made channels and river engineering were probably quite common by Late Saxon times (*cf.* Currie 1997, 94–96). A particularly good example from Glastonbury which was in

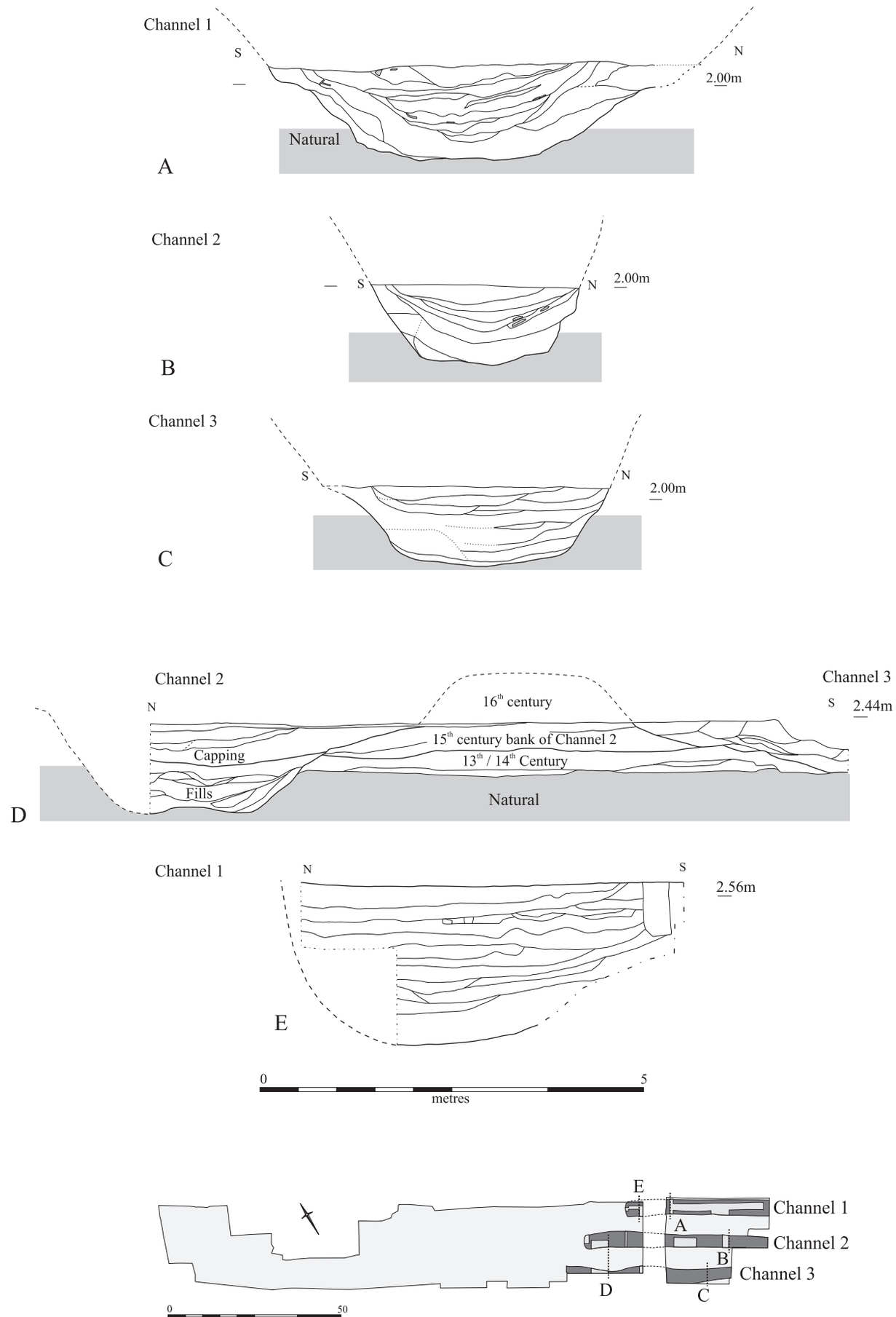


Figure 18 Sections of Channels 1, 2 and 3

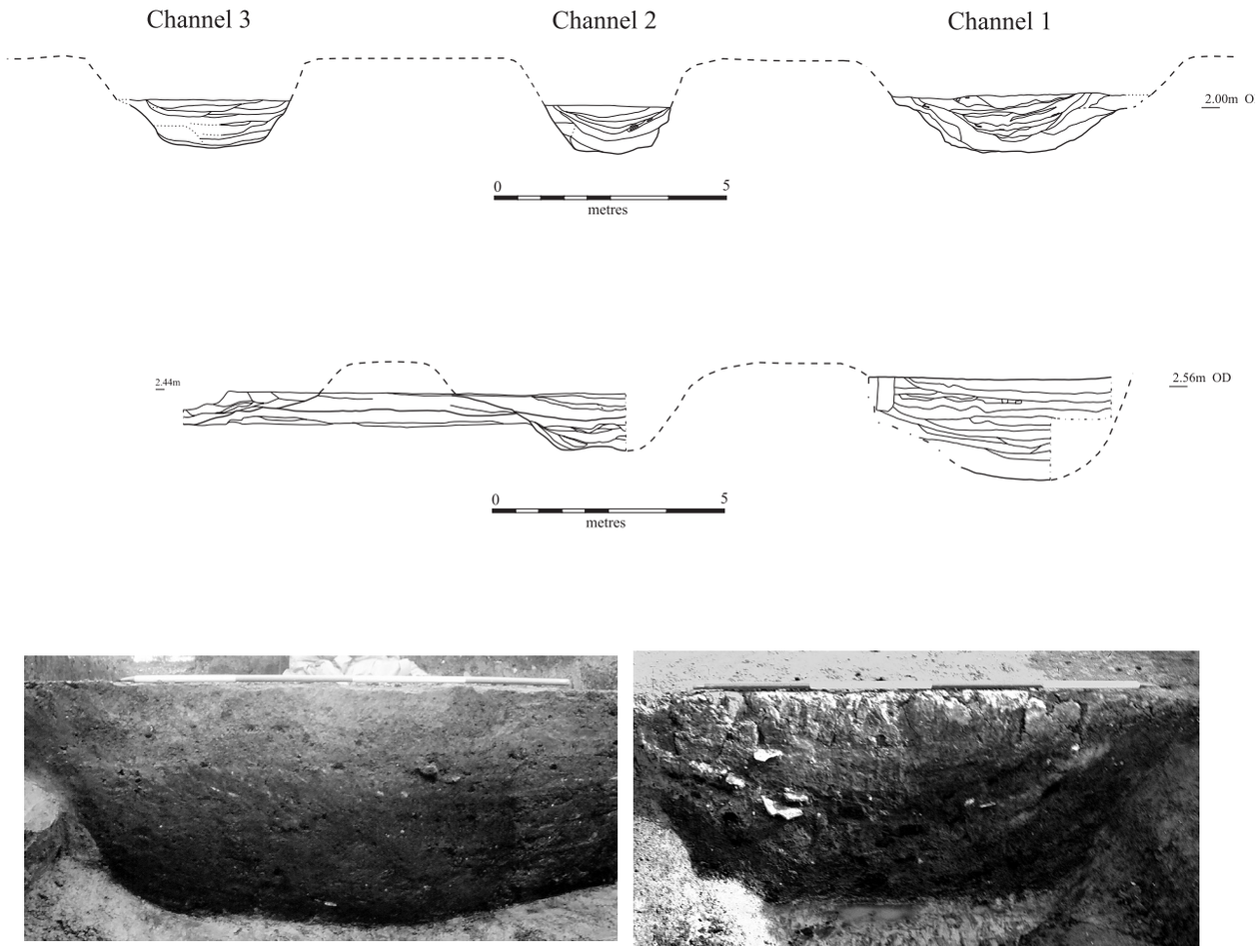


Figure 19 Overall sections of Channels 1, 2 and 3

use from the 10th to 13th centuries was *c.*6m wide and 1m deep with flat base and over 1km long (Hollindrake and Hollindrake 1993). Such features continued to develop through the medieval period and in a regional context the partially canalised water channel and associated features at Castle Acre Priory, Norfolk, (Wilcox 2002, 32–34) and the dock and wharf at Waltham Abbey, Essex, (Huggins 1972, 81–89) represent the best published examples of inland waterfronts. Both occur in religious contexts and are primarily related to the movement of agricultural produce. The 14th- to 16th- century Castle Acre Priory water channel, located on the river Nar with links to King's Lynn, provides a particularly good comparison. At 3 to 5m wide it is of approximately similar width but with plank lined timber revetments, occasional stone walls, a wharf, possible bridge, sluice gate or flash lock and timber platform at its end this is clearly on a very different scale to the Ely channels. A recently excavated channel or canal at Ramsey Abbey School probably had a wharf for unloading goods. Locally, numerous fenland hithes are known from documentary references, place-names, field patterns and other landscape features (Hall, D. and Coles 1994, 137). Few have been excavated but pottery, whetstones and querns from near Downham Hithe were interpreted as clearance of damaged cargoes (Hall, D. 1996, 18; Hall, D. and Coles 1994, 137). Medieval pottery found at the roddon of the Great Ouse near Quanea (Lethbridge and Fowler 1933) associated with a line of stakes or piles and part of an oak log boat is unlikely to represent a settlement and may be material dropped from boats (Hall, D. 1996, 40).

In the medieval fenland a great deal of effort was expended upon creating and controlling the network of large rivers and drainage channels and smaller brooks and canals that was so vital to drainage and communications (Hall, D. 1996, 136–37). Much of this work was on a far grander scale than the channels found at Ely, which in a sense can be viewed as the ultimate and smallest extensions of this system. Parallels might be sought with the lodes at Bottisham, Swaffham Bulbeck, Swaffham Priory and Burwell which are embanked on both sides, around two to three miles long and 7 to 12m wide (Oosthuizen 2000). These are associated with wharves, hithes and basins and appear to be of Late Saxon origin; they may be associated with monasteries including Ely. It appears that they were primarily related to water management, and transport or trade may have been later secondary functions (Oosthuizen 2000).

There is topographic evidence suggesting the existence of channels similar to those at Broad Street at a number of other sites in Cambridgeshire including Isleham (Oosthuizen 1993) and Reach (Taylor 1995). These appear to be medieval but some continue until as late as the 18th century. Topographically it is clear that the form of these fen edge settlements is wholly orientated to the availability of waterways for transport, trade and communications, emphasising the importance of this in the medieval period (*cf.* Langdon 1993). There are also

possible traces of the remains of similar features preserved on the opposite bank of the river to Broad Street. Recent excavations at Reach Road, Burwell, revealed a broad ditch that is possibly a medieval lode next to the postholes and slots of buildings, perhaps warehouses and loading bays. Nearby were the remains of ovens which may have been used for drying grain since large amounts of burnt grain was found in their fills (Connor forthcoming b). At St John's College, Cambridge, it has been suggested that a large broad profiled 13th- to 16th-century embanked drainage ditch that was probably around 4.5m wide may also have accommodated shallow draft boats (Dickens 1996; Evans, C. 1991). North of the river in Cambridge, another feature, known as the Cambridge Ditch, apparently allowed vessels to be brought past St Giles in the 13th century (Walker 1911).

Although it is the channels that are distinctive the areas between them are equally important. They were wide enough for lifting gear, although the earliest surviving evidence for this is 16th-century (Figure 54), and access for horses and carts (Figure 56). There is a lack of large-scale storage facilities in the vicinity, implying either that cargoes did not require secure or covered storage or that material could be removed immediately.

The type of craft these channels were designed to accommodate is uncertain, but vessels ancestral to the fenland lighters that worked on the Ouse-Nene complex of waterways at a later date are a strong possibility (Hutchinson 1994, 127; Jenkins 1988; 1991a and b, 1993a; Moseley 1990; Willan 1976, 96–105; Wilson and Faulkner 1972). Lighter signifies a barge used for lightening seagoing vessels by transhipping cargo and these flat bottomed, double ended, open or partially decked clinker or carvel built vessels were 7 to 15m long with a beam of 2.5 to 3.0m. They had an unladen draught of 0.6m and a laden draught of 1.0m, with a cargo capacity of 15 to 25 tonnes. Such vessels generally operated in gangs of up to half a dozen coupled head to tail by an arrangement of chains, poles and ropes, propulsion was generally by sail, current, or horse. The use of gangs may explain the contemporary existence of two, and later three, channels so close together. It is difficult to imagine that the absolute numbers of vessels warrants this density of channels, but if gangs of up to half a dozen lighters arrived simultaneously this might explain why several channels were necessary (Figures 21 and 56). The cost of a vessel was dependent on its size, but a fully equipped riverboat was a valuable possession with a range of between £6 and

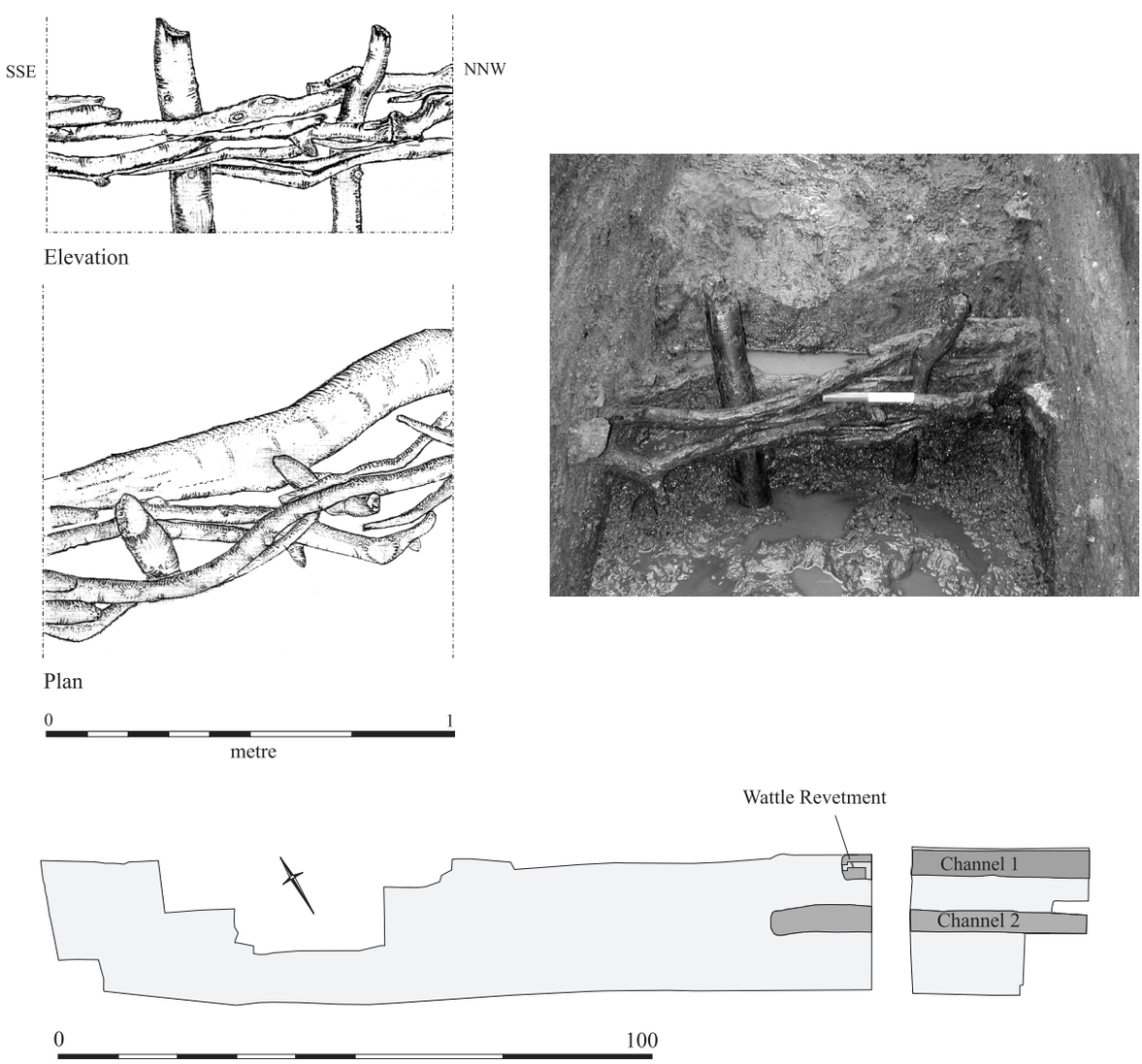
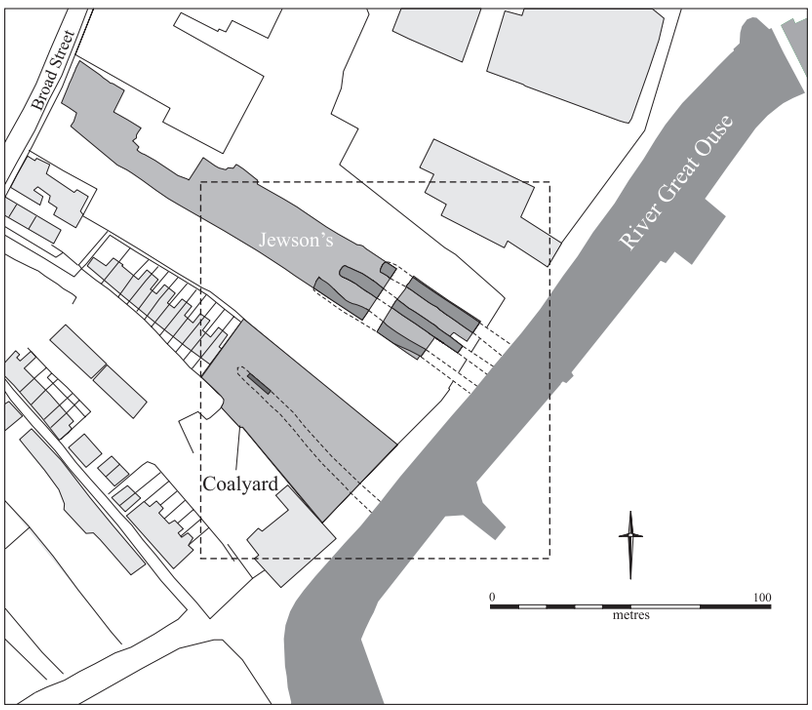


Figure 20 Wattle revetment at end of Channel 1



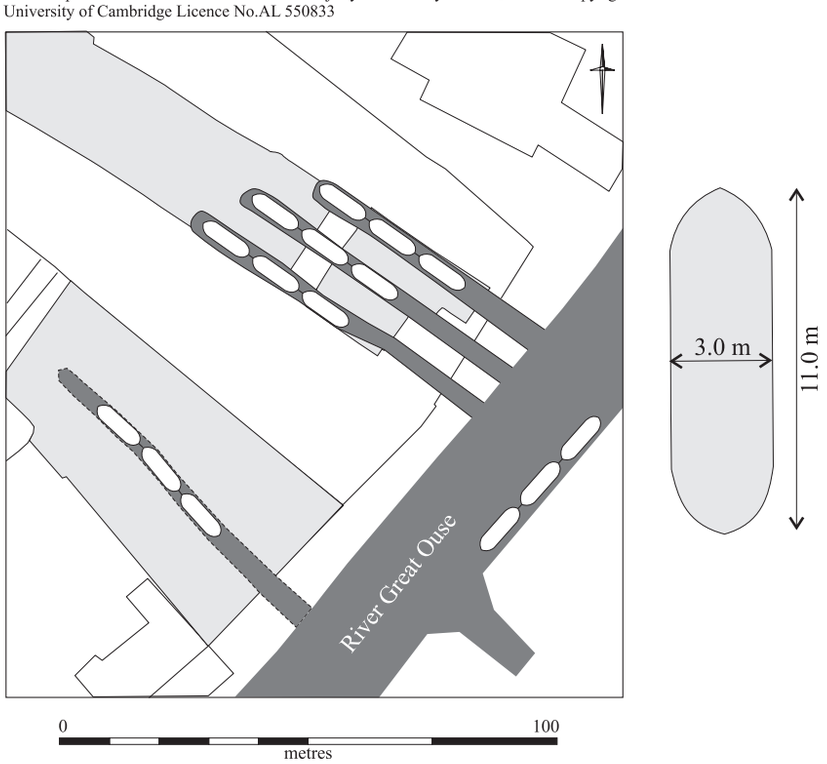


Figure 21 Channels at Jewson's and Coalyard showing groups of lighters

£250 known from 17th-century sources (Willan 1976, 104). In 1600 it was estimated that a boat cost £4.15.4 to build and its annual cost, including depreciation but not wages, was £1.12.4 (Willan 1976). The boatmen (Willan 1976, 105–13) would include the barge master who owned the vessel, bargemen and haulers.

Blocks of Barnack Stone from Whittlesea Mere (Hutchinson 1994, 121; Jenkins 1993b and c) probably indicate a sunken medieval barge and suggest a flat bottomed double ended vessel 9.0m long, with a beam of 3.0m with a draught of less than 1.0m that could carry over 7 tonnes. There are also various reports of oak log boats from the Fens. At least one from Magdalene Bend on the Great Ouse is probably Saxon or medieval and was over 4.5m long, 0.7m wide and 0.25m deep (Marshall 1878; Hall, D. 1996, 196).

At the end of Channel 1 and fronting onto Channel 2 was an open sided structure, Building IV (Figures 22, 34,

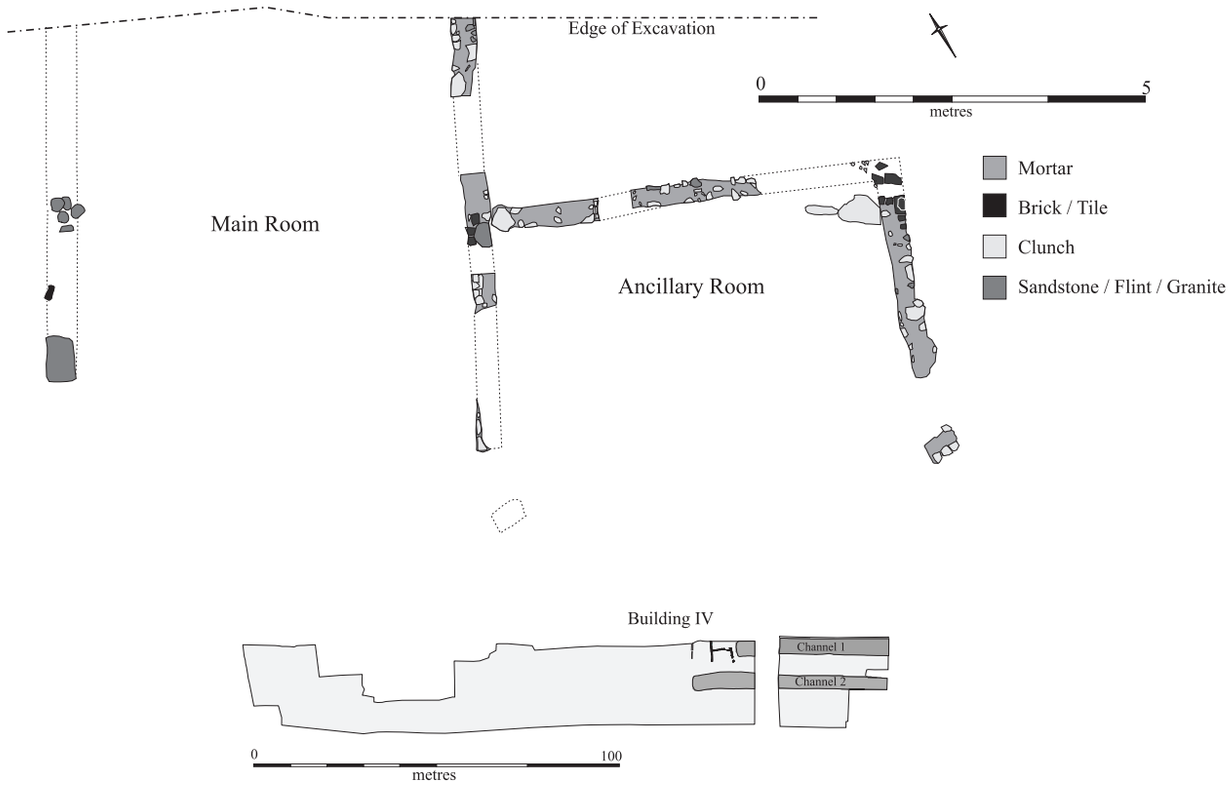


Figure 22 Building IV

53 and 56), with stone rubble foundations for walls and beaten clay surfaces in the interior that were preparations for a mortar floor. The wall foundations were built of limestone and flint with some brick set in white mortar and may have risen as low plinths supporting a timber superstructure. Building IV consisted of at least two rooms. The main room had traces of a mortar floor surviving next to the wall and was 5.0m wide and over 5.2m deep. The smaller ancillary room was 5.0 m wide and 2.5m deep. The position of the building at the head of Channel 2 would suggest that it was initially constructed to serve some function associated with the loading and

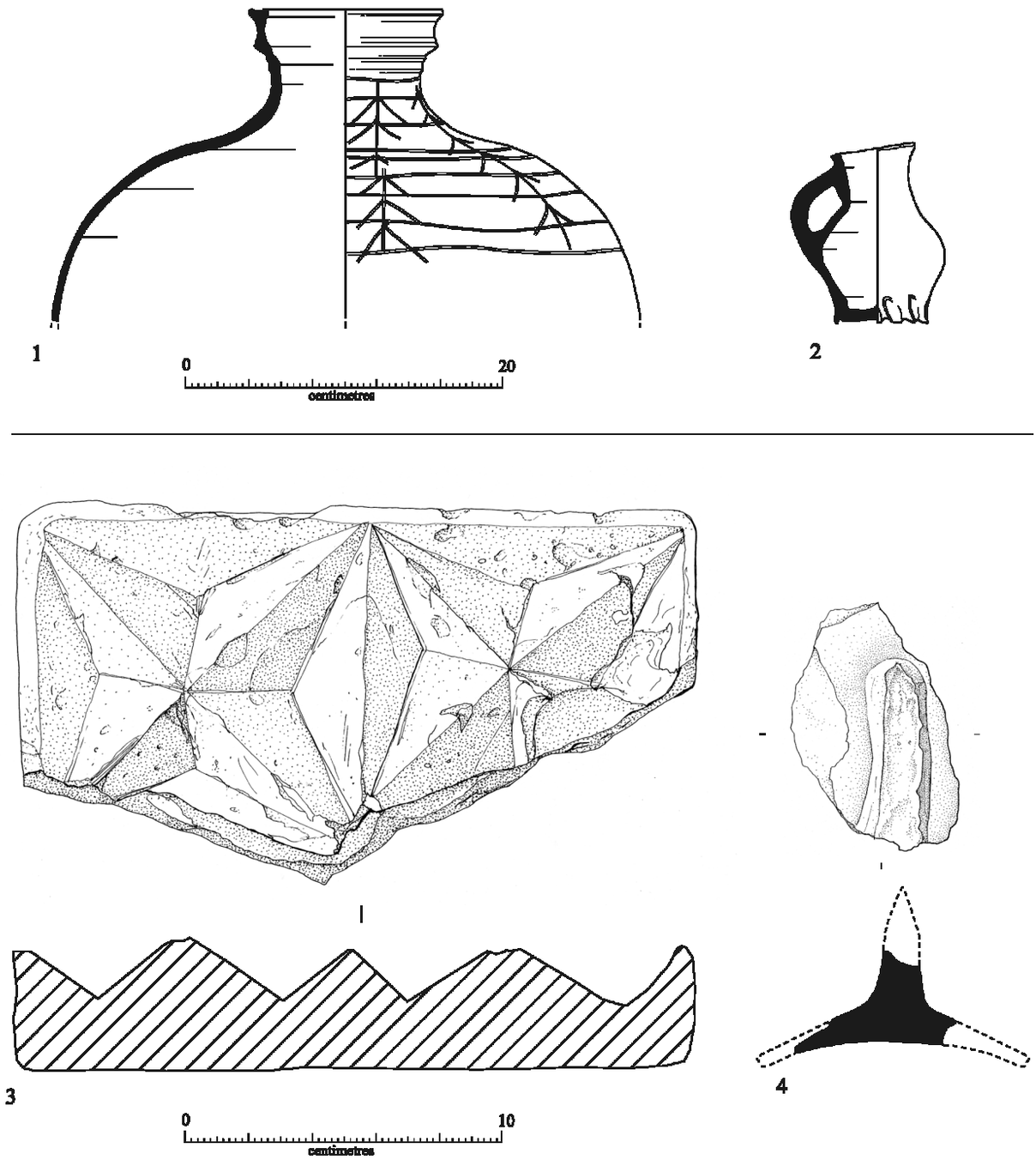


Figure 23 Medieval pottery and ceramic building material

1) Top of large Ely jug with horizontal incised bands about 1.5cm apart and upright 'fir-tree' scratched decoration. Standard gritty fabric; surface grey with buff-pink patches, patchy clear glaze on neck. From a 15th-century context 2) Small complete jug in coarse buff-pink fabric, pinched frilly base. Crude yellowish 'slip' containing sand, 14th-century. From a 15th-century context 3) Decorative moulded brick, made in fabric Ely 08 (15th–17th century), from a modern context 4) Glazed crested ridge tile, made in fabric Ely 16 (15th-century), which is similar to Medieval Ely ware. From a 15th-century context

unloading of cargo, even providing shelter for boatmen or passengers. Its position may also suggest that Channel 1 was constructed after Channel 2, as it respects Building IV.

Material Culture

Pottery

In the 14th and 15th centuries the pottery used continued to broadly follow the pattern of the 12th and 13th centuries described above. Ely ware dominates (Figure 23.1–2) with a few imports, principally Grimston ware. The only new material to appear was Bourne ware from Lincolnshire.

Fabric	*Colour*	*Feel*	*Fracture*	*Inclusions*	*Comments*
Ely 01	Yellow with light red bands, Munsell 2.5YR8/6 2.5YR6/6	Hard sandy	Irregular	Sparse moderately-sorted medium sub angular limestone, sparse moderately-sorted medium sub rounded quartz, sparse moderately-sorted medium sub angular red iron stone and abundant moderately-sorted medium angular voids	
Ely 02	Very pale brown with pale yellow margins, Munsell 10YR8/4 2.5YR7/3	Hard granular	Irregular	Abundant moderately sorted medium sub angular shell and moderate moderately-sorted medium angular voids	Ely 03 is a variant with a fine fabric and no red bands and Ely 07 is the same as Ely 02
Ely 04	Red with reddish black margins, Munsell 2.5YR4/6 2.5YR2.5/1	Hard granular	Irregular	Sparse well-sorted medium rounded black iron stone, moderate poorly-sorted medium sub angular limestone, and abundant poorly-sorted medium sub angular quartz	
Ely 05	Light red core with very pale brown surface, Munsell 2.5YR6/8 10YR7/5	Hard smooth	Fine	Moderate moderately-sorted medium rounded mica, sparse moderately-sorted medium sub angular quartz, moderate moderately-sorted medium sub rounded shell and moderate poorly-sorted medium angular voids	
Ely 06	Red, Munsell 2.5YR5/8	Hard sandy	Irregular	Moderate well-sorted medium sub angular black iron stone, abundant well-sorted fine sub angular quartz, abundant moderately-sorted medium sub angular shell	Gloss green glaze (Munsell 5G3/2) all over one side dark grey green slightly burnt on one side. Variants (Ely 061-063) with coarser fracture and/or inclusions. Ely 09 and Ely 20 are the same as Ely 06 and Ely 30 is a red sandy variant
Ely 08	Red, Munsell 5YR5/1	Hard granular	Irregular	Moderate well-sorted medium sub angular limestone and abundant well-sorted fine sub angular mica	
Ely 10	Dark reddish brown with grey surface, Munsell 5YR3/4 5YR4/1	Very hard smooth	Fine	Abundant moderately sorted coarse sub angular limestone, abundant well-sorted fine rounded mica and sparse poorly sorted medium sub angular quartz	
Ely 11	Red with light reddish brown surface, Munsell 2.5YR5/8 2.5YR7/3	Very hard smooth	Fine	Sparse moderately-sorted fine sub angular mica, sparse moderately-sorted medium sub angular quartz and sparse moderately-sorted coarse angular shel	Variants Ely 111 which is red and Ely 112 which has coarser inclusions
Ely 12	Dark grey, Munsell 5YR4/1	Very hard smooth	Fine	Abundant poorly sorted coarse sub angular limestone, moderate moderately-sorted medium rounded quartz, moderate moderately-sorted medium rounded red iron stone	
Ely 13	Very dark grey with reddish yellow surface, Munsell 5YR3/1 5YR7/6	Hard sandy	Irregular	Sparse moderately-sorted medium sub angular limestone, sparse moderately-sorted medium sub angular quartz, sparse poorly-sorted coarse sub rounded shell	Similar to fabric observed at Boston and Wainsfleet (Lincolnshire) and King's Lynn, (Norfolk), dating to the14th to 15th centuries and used peg tiles, ridge tiles and floor tiles. Variants Ely 131 with sparser lime inclusions, Ely 132 which is higher fired with a rougher fracture. And mainly used for the green glazed ridge tiles, including crested examples and Ely 132 a pale variant
Ely 14					Much less well levigated variant of Ely 08 with a much courser fracture and coarser inclusions. It and its variants were used for bricks. Variants Ely 141 which is highly fired, Ely 142 which is red and sandier and Ely 143 which is highly fired and purple
Ely 15	Red margin with dark reddish grey core, Munsell 2.5YR8/2 2.5YR5/6	Hard soapy	Irregular	Inclusions of moderate poorly-sorted coarse rounded grog, moderate poorly-sorted coarse sub angular limestone, abundant well-sorted fine rounded mica, moderate poorly-sorted medium sub angular quartz and moderate poorly-sorted medium sub angular quartzite	Similar to a fabric found at Forehill in Ely and to Grimston ware (Norfolk). A similar fabric was used for a roof finial from King's Lynn (Norfolk) (Clarke and Carter 1977, 300)

Fabric	*Colour*	*Feel*	*Fracture*	*Inclusions*	*Comments*
Ely 16	Reddish brown grey core with red surface, Munsell 5YR5/4	Hard granular	Irregular	Abundant poorly sorted coarse sub angular limestone and abundant poorly sorted medium rounded quart	Similar to a fabric found at Forehill in Ely. Similar to 13th and 14th century Ely pottery fabric
Ely 17	Red, Munsell 10R5/6	Hard granular	Irregular	Moderate moderately-sorted medium sub angular grey stone, moderate moderately-sorted medium sub angular grog and abundant moderately-sorted medium sub angular quartz	
Ely 18	Light red, Munsell 10R6/6	Soft granular	Irregular	Abundant moderately sorted fine sub angular limestone and abundant moderately sorted fine sub angular quartz	Fabric also observed in possible Flemish type bricks, and may be equated with a fabric seen in Norfolk (Drury 1983)
Ely 19	Yellow, Munsell 2.5YR8/6	Soft sandy	Irregular	Sparse well-sorted medium sub angular grog, and sparse well-sorted medium sub angular limestone	Equivalent to Flemish fabric observed in bricks probably imported from the Netherlands (Dury 1981). This fabric has been observed in Norfolk (Drury 1983) including King's Lynn in contexts dating from 1340 to 1600
Ely 21		Sandy		Common coarse lime	
Ely 22	Red with grey core			Common lime	Variants Ely 221 which lacks the grey core and Ely 222 which has a coarser fracture and less well finished surfaces

Table 4 Ceramic building material fabrics from Jewson's

Fabric	*Peg Tile*	*Curved Tile*	*Ridge Tiles*	*Hip Tiles*	*Floor Tiles*	*Brick*	*Unidentified*	***Total***	*Earliest Occurrence*
ELY 01	105	0	0	0	0	0	36	**141**	15th century
ELY 02/03/07	1621	3	2	0	0	0	1062	**2668**	15th century
ELY 04	4	0	0	0	0	13	1	**18**	16th century
ELY 05	420	0	1	0	1	0	308	**730**	15th century
ELY 06/09/20//30	11	0	0	0	16	181	54	**262**	15th century
ELY 08	1	0	0	0	55	162	67	**285**	15th century
ELY 10	0	0	0	0	0	0	1	**1**	Unknown
ELY 11	330	6	6	0	6	0	506	**854**	15th century
ELY 12	0	0	0	0	0	0	4	**4**	15th century
ELY 13	135	12	39	0	10	0	703	**899**	14th century
ELY 14	9	0	0	0	12	433	98	**552**	15th century
ELY 15	0	0	0	0	6	0	5	**11**	16th century
ELY 16	0	0	1	0	0	0	0	**1**	15th century
ELY 17	3	0	0	0	0	0	1	**4**	15th century
ELY 18	0	0	0	0	0	0	4	**4**	15th century
ELY 19	0	0	0	0	0	15	4	**19**	16th century
ELY 21	13	1	0	0	17	0	42	**73**	15th century
ELY 22	514	9	2	132	3	0	550	**1210**	15th century
Total	**3166**	**31**	**51**	**132**	**126**	**804**	**2896**	**7736**	

Table 5 Ceramic building material types from Jewson's by fabric

Brick and Tile
(with Phil Mills)
Although there was some earlier evidence for the use of brick and tile for Building I (see chapter 3), this period and particularly the 15th century sees a great rise in the quantity of ceramic building materials at the site (Tables 4 to 6). Some of this probably relates to the construction, repair and modification of buildings at the site, but it is also likely that material from further afield was being dumped at the site. The material includes peg, ridge, hip and floor tiles plus bricks. This rise in use relates to the more general age of 'transition' in ceramic building material use *c.*1400–1520 (Drury 2000, table 1).

The most common finds were peg tiles; slabs of fired clay used for roofing, with one or two holes pierced through the upper part of the tile. Wooden pegs would then have been used to fix the tiles into place. The peg tiles measured between 220 to 240mm by 120 and were 11 to 15mm thick. There was also a smaller type, which had a width of *c.*65mm. A number of different peg arrangements were recognised:

two round peg holes situated near the upper corners

two round peg holes inset in the upper centre of the tile

two square peg tiles in the upper corners of the tile

one square peg hole in the upper centre of the tile

one round peg hole in the upper centre of the tile

Only one fabric can definitely be assigned to the 14th century, but this had expanded to six fabrics plus several variants by the 15th century when there is the earliest documentary evidence for the local industry (Lucas, R. 1993, 157). Documentary sources record that in the 14th century ceramic building materials were imported from Wisbech (Lucas, R. 1993, 157). As well as flat peg tiles a smaller number of curved tiles, including ridge tiles and hip tiles, were used. Ridge tiles, some of them crested, were between 11 and 20mm thick and some had a thick gloss green glaze applied over the entire upper surface (Figure 23.4). Hip tiles were usually used on gable ridges and are first found in the 15th century.

Floor tiles appear to come in three main sizes; 205 by 130mm and 30mm thick, 220 by 110mm and 30mm thick and 120 by 120mm and 40mm thick. There was also a form that was *c.*20mm thick. Glaze was found on some floor tiles; these tended to be *c.*40mm thick and the glaze could be brown, green or black. Floor tiles were sometimes made in the same fabrics as peg tiles, but otherwise occurred in fabrics used solely for floor tiles.

Three sizes of brick were found; *c.*120 by 110mm and 45mm thick and *c.*220 by 110mm and 50mm thick and *c.*280 by 120mm and 50mm thick. There are a few examples of moulded bricks that have been made using specific moulds to create a decorative architectural impact (Figure 23.3). Some of the fabrics used were the same as for tiles, but some coarser fabrics were used solely for bricks. Some highly abraded bricks in Flemish fabrics may represent ballast.

There are a number of accidental finger marks left by the original tiler plus a couple of dog prints. A number of tiles appear to have been painted, either white or red, possibly as an attempt to match other tiles in a single roof. A number of tiles used as kiln seaters, spacers or separators were found in 15th-century deposits. These occur near Broad Street and appear to have been brought in from elsewhere for use in walls and paths.

Food
The animal bone is the same as from earlier periods (Table 3; Figure 68), with the exception of the non-food species cat, which makes its first appearance. Some deposits associated with Building IIB contain numerous fish bones and scales, debris from the preparation of fish for consumption. The fish remains (Table 7) were dominated by freshwater species, these include the pike and particularly eel present in earlier phases, but also perch, carp family and burbot (*Lota lota,* freshwater cod), which is now extinct in eastern England. There were also a few marine fish, including herring and whiting. Large fish are rare and high status species are absent, in marked contrast to the King's School site. Domestic chicken was the most common bird (Table 8) and a number of immature individuals were present, which could either mean that birds from the standing flock were being killed for meat before maturity or that young carcases or live birds were being brought in to the site for meat. Geese, probably domesticated greylag geese, and ducks, probably either wild or domesticated mallards, were also present.

Fifteen bulk samples were analysed for environmental remains, these came from a variety of building contexts, an oven and cut features. Each grouping is discussed in turn. Bulk samples were processed on-site using bucket flotation; flots were collected by a 300µm sieve, and the heavy residues over 1mm mesh. When good waterlogging was present, samples were wet-sieved through a stack of 2mm, 1mm, 500µm and 300µm sieves. Dried flots, and wet organic residues, were examined using a low-power microscope, with identifications made using the reference collection of the Pitt-Rivers Laboratory, Dept. of Archaeology, University of Cambridge. Fully quantified results for all phases are listed in Tables 9 and 10 (see Appendix), and include Latin taxonomic names following Stace (1997).

Two layers and a posthole within the frontage buildings contain large, evenly distributed amounts of charred hulled barley grain. Although chaff is absent, the lack of twisted grains suggests a two-row variety; a barley type increasingly cultivated during the medieval period in southern Britain (Greig 1991). There is good evidence for

Date	*Peg Tile*	*Curved Tile*	*Ridge Tile*	*Hip Tile*	*Floor Tile*	*Brick*	***Total***
12th–13th	2	0	0	0	0	0	**2**
14th–15th	311	12	15	101	30	273	**742**
16th	1890	7	22	1	81	499	**2500**
17th+	349	7	0	0	6	31	**393**

Table 6 Ceramic building material types from Jewson's by phase

	Thornback Ray *Raja clavata*	Herring *Clupea harengus*	Pike *Esox lucius*	Carp family *Cyprinidae*	Eel *Anguilla anguilla*	Whiting *Merlangius merlangius*	Burbot *Lota lota*	Perch *Perca fluviatilis*	Flatfish *Pleuronectidae*	***Total***
12th–13th	1	0	1	5	7	0	0	0	1	**15**
	6.7%		6.7%	33.3%	46.7%				6.7%	
14th–15th	0	80	21	115	180	5	4	17	10	**432**
		18.5%	4.9%	26.6%	41.7%	1.2%	0.9%	3.9%	2.3%	

Table 7 Number of elements of fish species from Jewson's by phase

Phase	Great Cormorant *Phalacrocorax*	Bittern *Botaurus*	Undet. Duck *Anatinae*	Undet. Goose *Anserinae*	Chicken *cf. Gallus gallus*	Undet. Partridge *Perdicina e*	Undet. Pigeon *Corvus*	Rook/ Crow *Columba*	Undet. Song bird *Small passeriforme*	Unidentified
9th–10th	0	0	1	1	0	0	0	0	0	1
12th–13th	0	0	0	0	1	0	0	0	0	1
14th–15th	0	0	7 (2)	10 (1?)	27 (4?)	0	0	0	1	9
16th	1	4 (2)	16 (3)	2 (2)	21 (3)	1	1	57 (6?)	0	16
17th+	0	0	0	1	0	0	0	0	0	0
Total	**1**	**4**	**24**	**14**	**49**	**1**	**1**	**57**	**1**	**27**

Table 8 Number of elements of bird species from Jewson's by phase, Minimum Number of Individuals (MNI) inside brackets ignoring context and size of elements

malting, provided by 51 to 80% clearly germinated grain in the samples (*cf.* Murphy 1985, 230). However, many grains were omitted from this calculation due to the loss of the embryo end of their dorsal side, despite perfect preservation of the ventral side by charring. This patterning may indicate rapid, high-temperature roasting for malt; crystal malt often has parts of the grain 'blown off' during roasting, and the area around the germinated embryo is particularly prone to loss due to the conversion of nearby starches into sugar. The percentage of germinated grain within the originally charred barley may thus have been much greater.

A very limited range of other charred plants occur within the building layers, indicating that it was clean barley grain brought from elsewhere. The two most frequent taxa, Italian rye grass and wild/cultivated oat, are also sometimes germinated and so were probably roasted as contaminants of the malt. Both have a similar morphology to cereal grains, and would be difficult to remove from the harvested crop (Jones, G. 1984). Low amounts of other cereals and wild plant seeds showing no signs of germination are present, these might derive from a non-malting source such as food preparation. There are grains of free-threshing wheat, occasionally rye, and arable 'weed' seeds of corncockle, cleavers, vetch/wild pea and stinking mayweed. The wild taxa are represented due to the difficulty of removing them from a crop, and not necessarily their abundance in the field. A charred celtic bean, (an early type of broad bean) and fragments of hazelnut shell provide further evidence for cooking activities.

One pit within Building II is rich with great fen sedge ash (henceforth 'sedge ash'), identifiable by its distinctive serrated leaf edges. The few other charred items include a small number of barley and wheat grains, and seeds of a dock type and stinking mayweed. Low amounts of sedge ash are present in many of the sampled contexts, and it was probably abundant as surface debris in the past. It is unlikely that the sedge would have been used as a malting room fuel, since a steady, moderate temperature is required during roasting. Sedge leaves contain volatile oils, and burn rapidly at a high temperature. During the medieval and post-medieval periods, the management and harvesting of sedge beds in the fens provided thatching, strewing material, and a fuel favoured in local bread ovens (Rowell 1986). The pit appears to have been a dump for such ash. Whilst peat may have also been used as a fuel, it is difficult to identify in the absence of distinctive red peat ash. Some limited evidence has however been identified within Oven 1 (see below).

Floor samples within Building II contain an unusual mixture of charred plants. There are low amounts of grain, peas and beans, accompanied by numerous seeds of wetland plants; *e.g.* great fen sedge, true sedges, common spike-rush, bog bean, lesser spearwort, and mint. The richest remains are from the north-northwestern end of the floor, and although the grain and pulses might be associated with cooking, the many wetland plants are difficult to explain. Few charred sedge leaf fragments have been found, and so assigning the seeds to sedge ash is tenuous. Other possible sources could include debris from thatching or strewing preserved by incidental charring, or the possibility of peat as fuel, although experiments have suggested that seeds in peat char badly (Smith 1990). Neither explanation is particularly convincing, yet the wild seeds do clearly indicate the charring of a collected fen resource.

Two fills from Oven 1 were examined, one of which contains a lower concentration of the charred germinated barley found in the frontage buildings. The oven may have been used for malt roasting, or this could be reworked debris from the nearby grain rich layers. The few other charred plants include free-threshing wheat grains, and one celtic bean. There is no sedge ash, however, numerous tiny burnt soil fragments, occasional iron-replaced wood fragments, and a charred algae 'seed' suggest that ash

	Location	*Tank 2*	*Kiln 3*	*Kiln 3*	*Channel 2*	*Channel 3*
	Phase	*14th/15th*	*16th*	*16th*	*15th*	*16th*
	sample volume (litres)	5	8	15	0.4	0.4
	% flot fraction examined	100	50	100	50	50
Taxon	**Habitat**					
Bithynia tentaculata (L.)	quiet rivers and still, but large waters	1			- u	
Bithynia tentaculata operculum	quiet rivers and still but large waters				+ u	- u
Valvata cristata (Müller)	slow, muddy water with vegetation		1	++ u		
Lymnaea truncatula (Müller)	shallow waters and flooded pastures	1 & - u		++ u	- u	- u
Lymnaea palustris (Müller)	marshy areas, ponds and ditches			- u		
Aplexa hypnorum (L.)	ponds and ditches			+ u		
Planorbarius corneus (L.)	hard water, both moving or stagnant				- u	
Planorbis vortex (L.)	hard, running water with weeds			+ u		
Planorbis leucostoma Millet	seasonal ponds and ditches	1			- u	- u
Planorbis albus (Müller)	oxygen-poor freshwater, in weeds		- u	++ u		
Segmentina complanata (L.)	hard water	- u		++ u		
Succinea sp.	damp, waterside vegetation	1	1			
Carychium minimum/tridentatum	generally well vegetated; wet/damp		30	++ u		
Cochlicopa lubrica/lubricella	catholic			++ u		
Vertigo antivertigo (Draparnaud)	marshes and wet areas	8 & - u	21			
Vallonia pulchella (Müller)	wet and damp places		1			
Vallonia exentrica/pulchella	open, damp and/or dry habitats		- u			
Aegopinella/Oxychilus sp.	moist and shady places	- u	- u	+ u		
Hygromia hispida TYPE	catholic		+ u & 1	+++ u		
juvenile indet.	-		3	+++ u		

Table 11 Mollusc rich contexts

from peat fuel may be present. The second fill is quite different with fewer charred remains, although numerous small, concreted items suggest that this absence may be due to high combustion temperatures. There are similarities between the wild, wetland plant seeds and those in the sedge ash, including seeds of bog bean, black bog-rush, common spike-rush and great fen sedge. No identifiable sedge leaves survive, but there are stem joints of reeds, great fen sedge and cereals. The contrast in composition between the two fills suggests a mixture of formation processes; one contains malted barley and possible peat ash, the other wetland seeds and few cereal grains. It is worth noting that a number of other medieval malting ovens have been excavated, and the Broad Street ovens are broadly comparable to these, including in some cases the plant remains (Atkins *et al*. 1998; Bolton 1960; Hayes 1986; Jones, C. *et al*. 1997; Murphy 1985; 1991; Niblett 1993; Schneider 1999).

Ditch 2 contains few charred items, including barley and free-threshing what grains, and the ubiquitous sedge ash. There are waterlogged seeds from the local environment, and the crowfoot and nettles compare particularly well to samples from the channels near the river. Crowfoots are found in a variety of still waters, whilst nettles are common on disturbed, nutrient enriched soils near settlements. However, in contrast to the channels (see below), Ditch 2 includes a range of aquatic taxa associated with still or slow-flowing water including water plantain, pondweed and duckweed. Tank 2 shows no sign of waterlogging, however there are large amounts of sedge ash with associated charred marsh and freshwater molluscs (Table 11).

Waterlogged samples from Channels 1 and 2 are similar, both in their lack of charred remains other than small charcoal fragments, and their lack of evidence for cess or occupation waste. The most abundantly represented plants are stinging nettles (discussed above) and the accompanying seeds represent other plants growing in or around the channels. The range of taxa suggests that the channels may have been kept clear during their use, and that much of their peaty fill relates to later silting up; twigs and wood fragments also become common. Aquatic channel plants include celery-leaved buttercup, crowfoot, marsh pennywort, water plantain and duckweed; all of which favour still or slow-moving water. Land plants are better represented in Channel 2 than in Channel 1, and include redshank, silverweed, hemlock, bittersweet and mint, which are consistent with a shaded,

damp environment. The aquatic plants contrast in particular with the later waste-rich Channel 3 fills (see Chapter 5).

The plant assemblage provides clear evidence for barley malting (probably of a hulled, two-row type) and for the burning of great fen sedge. There is limited evidence for peat fuel, and for the wider use of collected fen resources. Other plant foods charred include free-threshing wheat and rye grain, beans, peas and hazelnut shells. The virtual absence of chaff, and the few weed seeds, strongly indicates that grain was brought fully processed to this location. The range of crops corroborates those known from documentary sources to have been grown locally, and their uses, including wheat (for bread), barley (mainly for malting, but also fodder), rye (for bread, usually mixed), peas (fodder), dredge (mixed barley and oats) and maslin (mixed wheat and rye) (Salzman 1967, 60–63). There is similarity in crops and sedge ash to the 12th- and 13th-century phases at West Fen Road, Ely (Ballantyne 2004; Mortimer *et al*. 2005), although evidence for malting was absent there.

Metalwork

Iron clench bolts and roves (Figure 24) were found in 14th- to 17th-century deposits, in total there were eleven clench bolts and seventeen rove plates, mainly from close to the river. Although much of the metalwork is residual it does suggest a broad patterning of activities (Table 12). Some roves had no shank within the central hole suggesting they were unused rather than broken from complete clench bolts.

Clench bolts were used in plank built construction for carts, doors, shutters and well lids as well as in boat construction (Ottaway 1992, 615–18; Ottaway and Rogers 2002, 2830). Having said this the vast majority of clench bolts and roves from York came from the riverine sites of Coppergate (129) and Fishergate (43) rather than elsewhere such as Piccadilly (2) or the Bedern (1) (Ottaway and Rogers 2002, 2830). The same pattern appears to be true of other towns such as Norwich where they are apparently concentrated at Bishopsgate and Alms Land close to the River Wensum (*cf.* Goodall 1993). This pattern is repeated in Ely, no clench nails or rove plates were found at other sites away from the river such as Forehill (Alexander 2003) or King's School (Dickens and Whittaker in prep). One clench bolt and a rove plate were found at West Fen Road (Mortimer *et al*. 2005) and another clench bolt at Jubilee Terrace. Although only small numbers of clench bolts and roves have been found, most iron would be recycled rather than discarded and their occurrence along with other woodworking tools so close to the river suggests the construction, repairing or breaking up of boats was being undertaken nearby and parallels discoveries at King's Lynn (Goodall and Carter 1977, 297). This area might have seen intermittent use as a form of foreshore shipyard without major installations where vessels were simply pulled out of the water (Hutchinson 1994, 23–26; Milne 2001).

At King's Lynn they were found in domestic contexts suggesting reuse of timbers either structurally or as firewood (Goodall 1977, 297) and in one instance a length of wood around a metre long with four clench bolts and rove nails appears to have been reused. The examples from York were mainly 25 to 45mm long, although some were up to 95mm, and diamond and rectangular/square-headed types occurred in about equal quantities (Ottaway and Rogers 2002, 2830). The clench nails from Ely were generally around 50mm long and where they were complete with rove plates it appears that they held planks around 40mm thick. As at York both diamond and rectangular/square-headed types were found. In total the eleven clench bolts and seventeen rove plates from Jewson's form a relatively small number, representing a loss rate of less than one every twenty years. Even a small boat contained a substantial quantity of iron and when these were broken up it is likely that the vast majority of the iron was recycled.

A small amount of evidence for the working of lead alloy was recovered, consisting of folded scrap sheets and spillages of lead alloy. Metalwork includes a cheaply produced lead chape for a scabbard, a possible pewter vessel lid, an iron shank with a faceted head, possibly the head of a kitchen spit, and the highly fragmentary remains of a copper alloy annular brooch. A spoon drill bit from close to the river is a woodworking tool used to bore holes and could be used in boat repair. Various pieces of copper alloy jewellery of this period were found, particularly buckles. These are generally of common relatively cheap mass-produced types such as a mid 14th- to early 15th-century oval buckle with composite plate (Figure 70.1).

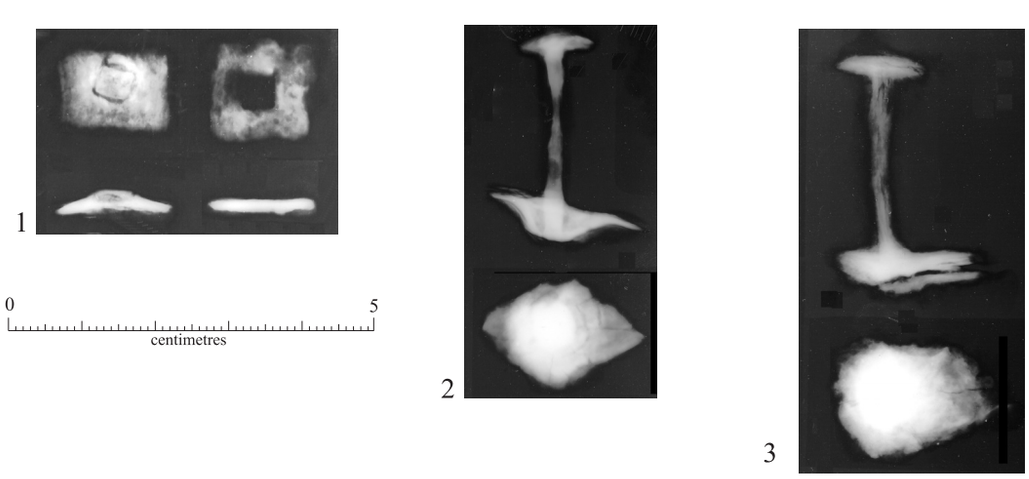


Figure 24 Iron clench bolts and roves
1) Two rove plates, from a 14th–15th-century context 2) Clench bolt, from a 16th–17th-century context
3) Clench bolt, from a 16th-century context

Activity	*9th-10th*	*12th-13th*	*14th-15th*	*16th*	*17th+*
Fishing	Broad Street	Broad Street	Broad Street (+) Central Area (+) Riverside	Broad Street (+) Riverside (+)	Broad Street
Boats	-	-	Broad Street Central Area Riverside (+)	Broad Street (+) Central Area (+)	Central Area
Horses	-	Broad Street	Central Area	Central Area Riverside (+)	Central Area
Tools	-	Central Area	Riverside	Central Area (+)	Central Area (+)

(+) indicates considerable evidence

Table 12 Metalwork evidence for selected activities by phase and area at Jewson's

Other Material

The 15th century sees the first occurrence of building stone being reused in paths and other features. This includes dressed clunch blocks and moulded limestone fragments from windows suggesting the demolition or alteration of a substantial stone building somewhere in the vicinity.

Beginning in the 15th century, French and later German copper alloy jettons and lead alloy tokens and seals were in use. These include two late 15th- to mid 16th-century 'Boy Bishop' tokens, which resemble money. They may have played a role in the rites and customs of the Boy or Childe Bishop (*cf.* Rigold 1978), although this is a matter of debate and they may be associated with a charitable dole, not connected with the Boy Bishop ceremonies. The examples from Jewson's were made at Bury St Edmunds like those from West Fen Road (Mortimer *et al.* 2005), but in contrast to an example from Forehill made in Ely (Alexander 2003). Another find of a religious nature was the possible mouth of an ampulla, a pilgrimage souvenir containing holy water.

A fragmentary socketed implement, possibly an armour piercing arrowhead (*cf.* Jessop 1996), was found. Similar items were recovered at Forehill (Alexander 2003, 164) and West Fen Road (Mortimer *et al.* 2005). Such items are usually interpreted as weapons, but their frequent recovery suggests that rather than being linked to specific acts of violence they may be stray losses or could have been reused as piercing tools.

Environment

The pollen from the southwest bank of Channel 2 shows that trees and shrubs are more important in the later part of the sequence; with oak and hazel the most important. Herbs comprise grasses with dandelion types and sedge with some cereal type, plantain and other ruderals. Marsh/aquatic taxa consist of sedge with occasional buckbean, narrow leaf cat's-tail/bur-reed type and pondweed type. There are substantial numbers of spores including monolete fern type, including bracken, and occasional sphagnum moss. The sphagnum moss is unlikely to have been growing locally and might have been imported for sanitary purposes, wound dressings, plugging holes *etc*. Fern type spores and the dandelion types may be a reflection of differential preservation in favour of more robust types. There are low values of tree and shrub pollen, of which oak is most important. Along with hazel, pine and alder this represents woodland growing at some distance. Herbs are dominant with grasses and cultivated cereal being most important. The latter along with segetals such as brassica family and black bindweed are characteristic of disturbed and arable ground. This pollen may derive from secondary sources such as domestic waste including ordure, food material, floor sweepings, thatch, animal feed or crop processing.

Other Sites

The Broad Street Frontage

At 57 Broad Street there is evidence for a substantial stone building. Although not closely dated it overlies a ditch whose upper fills contained Grimston ware which probably dates to the 14th century, so a 14th- or 15th-century date is likely. The building was aligned north-northwest to south-southeast and parts of its western and southern wall foundations were revealed. The western wall foundations were 1.3m wide and 0.75m deep with vertical sides and a flat base, running parallel to these footings to the west was a 1.7m wide gravel pathway. The southern wall footings were 1.1m wide and 0.65m deep with vertical sides and a flat base. The walls appear to have consisted of clunch or limestone blocks with small greensand facing stones on the inside. The building was over 10.5m by 4.3m in extent and if it fronted onto Broad Street it must have been *c.*18m long. It appears that this building was demolished and levelled in the 15th century and a new structure built in the same location, although no walls of the structure were found and only its clay floors were identified.

At 55 Broad Street around 35 to 38m from the current frontage there were dump layers containing 14th- and 15th-century pottery sealed by garden soils with 15th- and 16th-century material. Beneath these was a 14th-century ditch parallel to Broad Street, which might delimit the rear of a property, around 36m from the current street frontage. Some 59 to 62m from the frontage there was a similar sequence of dump layers followed by garden soils.

At the Electricity Depot there were several phases of activity and build up over the floors of the existing building, containing 14th-century pottery (Figure 61.1). There was then another substantial dumping episode containing 15th-century pottery, over this was a substantial building (Figure 25) with wall footings of mortared limestone blocks. It was over 5.0m long on the axis parallel to Broad Street, whilst its rear wall was about 4.0m from the current frontage. The structure probably extended around 4.0m further to the junction of Cutter Lane and an unknown distance in the other direction. It was subdivided into at least three rooms; no floors survived in the southwest space, the central space had mortar and gravel floors containing 15th- and 16th-

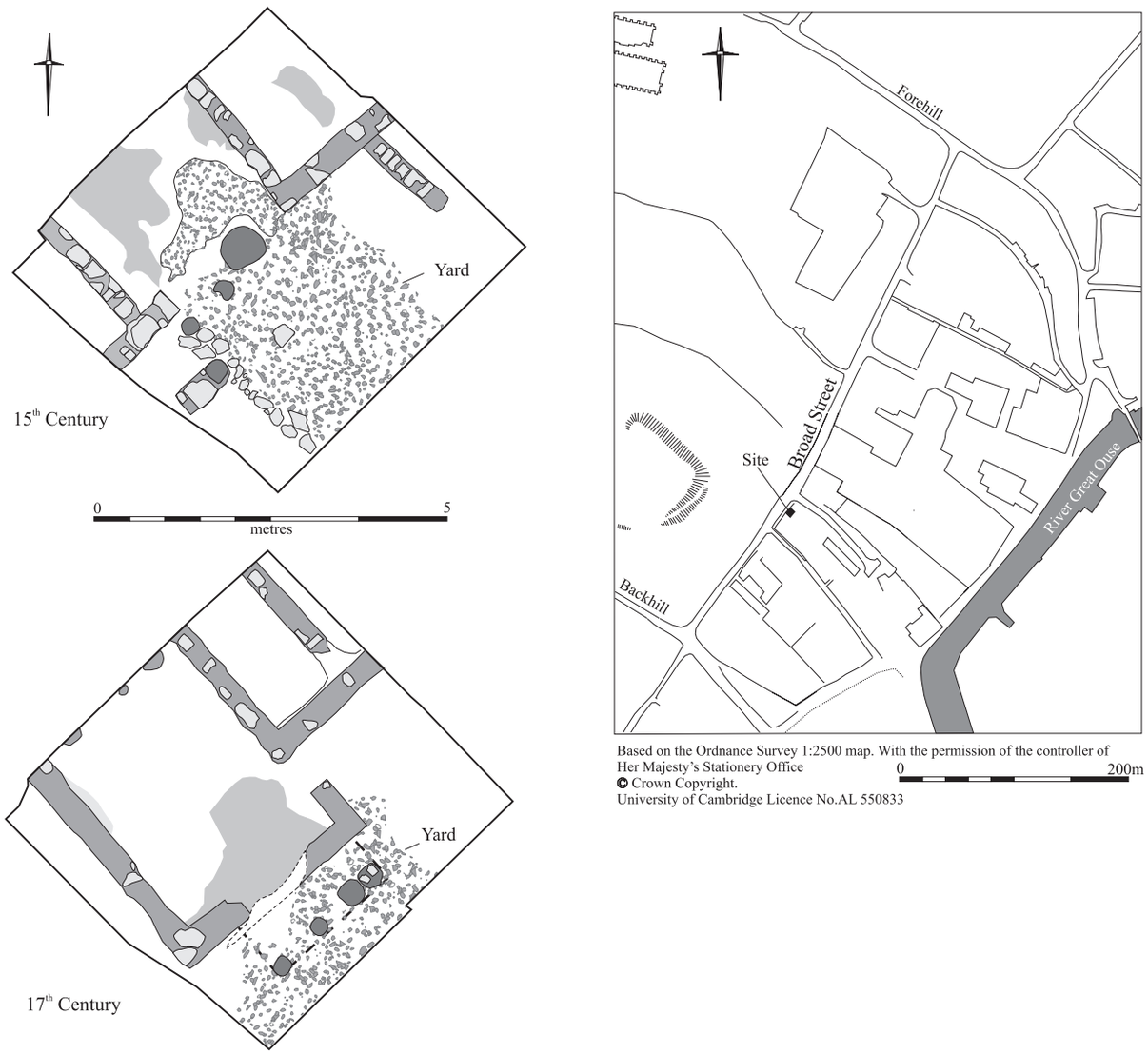


Figure 25 15th- and 17th-century phases of building at Electricity Depot

century pottery and the northeast space probably had timber floors and may have contained a hearth or oven. Behind was a cobbled yard, accessed from the central space, with structural evidence suggesting the area was covered. Pottery on the yard dated to the late 15th and early 16th centuries. The building's long axis is parallel to Broad Street, suggesting a relatively wide property plot and little pressure on frontage space. Although the plan is incomplete the most likely option is that this is an open hall house, with the southwest space being the service end, the central space being the cross passage and the northeast space being the hall.

A second trench was located 25 to 30m from the current frontage beside Cutter Lane. The earliest activity consisted of floor deposits containing 14th-century pottery sealed by a series of dumps containing 13th- to 15th-century pottery. Over this was a 15th-century timber building with a beaten earth floor, a cobbled surface, postholes, a beam slot and pits including one with a clay lining. Before the 16th century this area was given over to gardening or horticulture. The third trench was located 23 to 25m from the current frontage next to Jubilee Terrace. The earliest activity was a large pit sealed by dumps containing 14th-century pottery. Over these were surfaces associated with a brick wall, a substantial oval oven, 1.4 by 1.1m, and 15th- or 16th-century structural timbers.

At the Three Blackbirds, the standing building was modified during the 14th century and excavation revealed four phases of activity with various floors, hearths and pits, before it was abandoned in the late 15th century. At Tesco's there is strong evidence for the occupation of the frontage by domestic structures during the 14th and 15th centuries (Figure 61.3). There was also activity along the northwest parts of Hythe Lane and Back Lane, the latter of which was located to the southeast of its current alignment.

The Central Area

At 57 Broad Street some 60m from the current street frontage there was evidence for several phases of stone building that probably date to the 14th and 15th centuries. The earliest phase consisted of some north-to-south aligned unbonded limestone and clunch rubble footings (0.6m wide) which were cut by some later northwest-to-southeast aligned footings of limestone rubble set in clunch (0.7m wide) with evidence of a return aligned

southwest to northeast. There was also another set of limestone rubble footings with rammed chalk and clunch aligned north-northwest to south-southeast and 0.6m wide.

At Jubilee Terrace the large 13th century building was substantially altered, probably in the 14th century, with the main walls and internal partitions being altered. A clay foundation and chalky surface were laid. Various scoops and other features, some of which had burning episodes within them, cut this surface. The building does not appear to have been for domestic occupation and appears to have fulfilled some form of industrial function. Outside it were metalled surfaces that might be a yard or path. By the 15th century the area was levelled and given over to horticulture. A possible clench nail and rove plate parallels the evidence from Jewson's.

At 2 Ship Lane there was a large feature aligned northwest to southeast, probably a ditch, that could have acted as a boundary or a drainage feature. The environmental remains suggest that it contained stagnant water and there was evidence for continued periodic inundation.

The Riverside

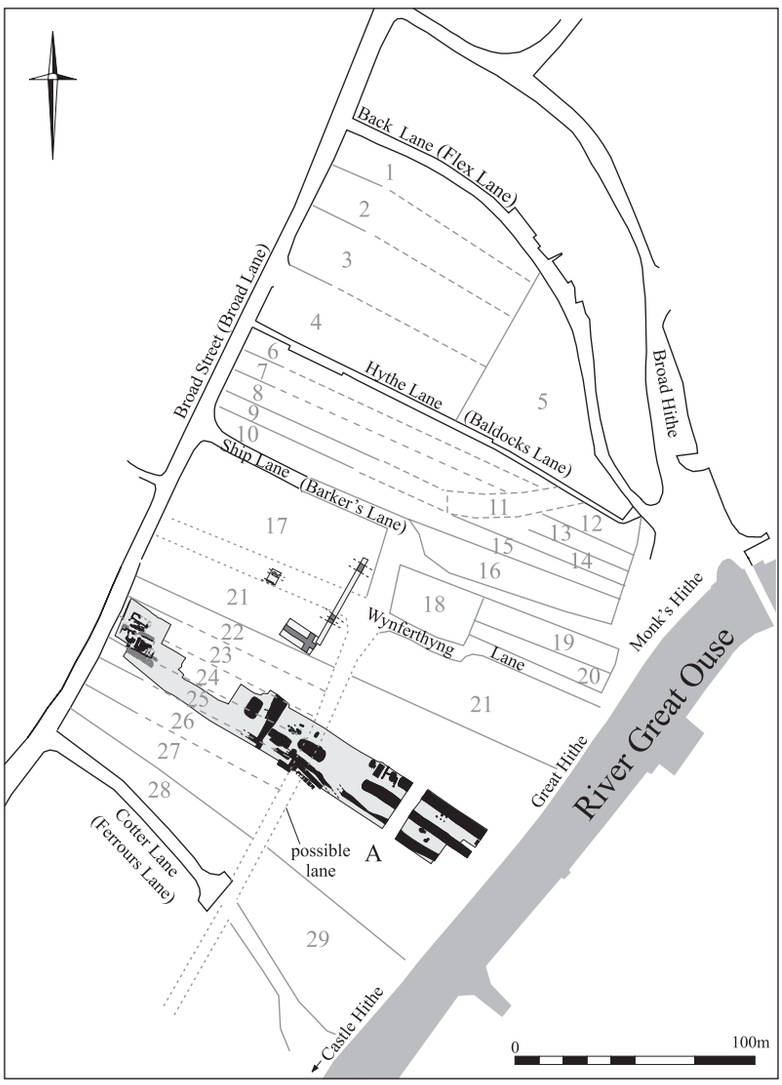
At the Coalyard there was a series of dumps intended to raise the height of the area and low clay banks to provide protection against flooding. In 1417 it was a vacant plot owned by the prior. Following this there were some shallow intercutting pits. At the Maltings a low clay bank 0.4m high and 10.5m wide was constructed parallel to the river in the early 14th century. The bank was subsequently raised and there followed a period of use with puddling and erosion of the bank. In the late 14th or 15th century the area on the landward side was raised to the height of the bank and there was dumping on the river side as well, extending the area outwards into the river. At Tesco's some material of this date was found towards the river. While there was no domestic occupation there are features such as drainage ditches suggesting that activities took place.

Discussion

The 14th and 15th centuries generally appear to represent overall continuity along the Broad Street frontage and in the central part of the area, with broadly similar types of buildings and features to those of the 12th and 13th centuries. The transition from Building I to Building IIA marks the beginning of domestic rather than commercial occupation at Jewson's and the shift in layout from parallel to the street to perpendicular to it hints at a greater density of occupation. Additionally Tanks 2 and 3 indicate that the area of land in use was spreading gradually towards the river. The major change, however, appears in the riverside area with the construction of the large channels from the river and associated structure in the 15th century. Prior to this, riverside facilities had presumably been limited to the hithes known from documentary sources. The channels seem to mark an expansion of such facilities into a new area and suggest a period of growth. Other areas, however, appear to be given over to gardening or horticulture during the 15th century, a pattern that continues in the 16th century, suggesting decline. Ely fell from being the 30th or 32nd most important English town in the 14th century to the 48th in the 16th century, possibly due to agrarian crises, flooding and the Black Death (Dyer 2000; see also Britnell 1994). It would be tempting to link the evidence for either expansion or decline to discussions of late medieval urban decline (*e.g.* Dyer 1991), but it seems likely that decline is too simplistic a concept and instead what the mixed pattern represents are alterations of emphasis in the economy and the urban landscape.

Documents show that the area was mainly in the hands of the priory (Figure 26) and the sequence of changes must be understood in terms of their commercial objectives. The apparently more intensive use of the Broad Street frontage and the extension of activity towards the river may be linked to changes elsewhere, such as the reorganisation of farmland at West Fen Road into regularly sized plots (Mortimer *et al.* 2005), in tandem with a shift of population. Exploitation of land for commercial gain by ecclesiastical communities is a common occurrence and a significant impetus to the development of many medieval small towns in eastern England, such as Bury St Edmunds, St Neots and Great Dunmow (Aston 2002, 149–52; Aston and Bond 1976, 74–77; Beresford 1967, 130–33 and 326–27). The reasons for a relatively late 14th- or 15th-century date for developing the land at the river edge may have its origins in a variety of causes; the most obvious explanation is that the river frontage was not suitable for development until the ground had been sufficiently drained. Flood deposits sealing the Middle/Late Saxon layers suggest this stretch of ground was particularly problematic as it was prone to flooding right up to Broad Street. Ditch 2 allowed ground to its landward side to be built over from the 12th century onwards, but no activity was witnessed on land towards the river until the late 14th century at the earliest. Although the land between the ditch and the river was unsuitable for permanent construction it would have provided grounds for seasonal grazing, a useful resource so close to the town and monastic centre especially as cattle were butchered on site. Land reclamation near the river appears to represent a cumulative process of small scale piecemeal events over time, similar to the pattern in London (Milne and Milne 1979). The earlier Building I was a structure of some importance, perhaps a barn. It may have had a fossilising effect on this area, preventing or obviating the need for further commercial enterprise until a later date, when population growth or other factors forced change.

The survey of 1417 gives a street-by-street record of all the tenants of the priory and bishopric (Figure 26). This suggests that the area is divided into two distinct blocks, separated by Segwyk, a tenement that stretched from Broad Street to the river. To the northeast, the pattern of occupation is denser, with lanes running between the street and the river. To the southwest of Segwyk, tenements extend from the street frontage towards the river, but without lanes. There were six narrow tenements all owned by the prior and held by John Cranewell senior, John Cranewell junior, Bartholomew Bolour/Barlow, William Everard and Thomas Hervey. There was then another block before Ferrours Lane; the plot on Broad Street was held by Hugh Berkere and it backed onto a vacant plot running to the river. The six narrow tenements ended at about half way between Broad Street and the river on the possible line of a lane called Autresdale, although it is not certain that this extended northeast of Ferrours Lane. The probable holders of the plot excavated at Jewson's



1. Tenement of John Rounyng ? (prior)
2. Tenement of Katharine Puddying (prior)
3. 4 cottages under 1 roof (prior)
4. 3 tenements under 1 roof (bishop)
5. Tenement of Agnes Northeneye (prior)
6. Tenement of John Barkere (bishop)
7. Tenement of Robert Dowe (prior)
8. Tenement of Robert Brame (prior)
9. 'Le Storyerd' (chapel of St. Mary)
10. 'Ex opposito Shene (prior)
11. Garden (tenure uncertain)
12. Tenement of John Turfyn (prior)
13. Tenement of John Feltewell (prior)
14. Tenement of John Shipwrighte (prior)
15. Tenement of Dulcie Kempstere (prior)
16. Tenement of John Feltewell (prior)
17. Capital messuage of John Shene
18. Tenement of John Borgh (prior)
19. Tenement of John Bokyngham (prior)
20. Tenement of John Mason (prior)
21. Tenement known as Seghwyk (prior)
22. Tenement of John Cranewell Snr (prior)
23. Tenement of John Cranewell Jnr (prior)
24. Tenement of John Spor(l)e (prior)
25. Tenement of Bartholomew Bolour (prior)
26. Tenement of William Everard (prior)
27. Tenement of Thomas Hervey (prior)
28. Tenement of Hugn Barkere (prior)
29. Vacant plot

A. Plots 22 - 28 may extend into this area or there may be further sub-divisions

Figure 26 Reconstruction of probable layout of properties in the area between Broad Street and the river Great Ouse based upon the 1417 arbitration, from information supplied by Christine Went

were John Cranewell junior, John Sporle and Bartholomew Bolour/Barlow. In 1449–50 John Pyper paid four shillings for a cottage *sub eodem tecto* (under the same roof), lately of John Cranewell, and then of John Vincent. In 1473–74 the rents had decreased to eight and three shillings. The 1449–50 account roll suggests that the tenements listed as separate entities in 1417 formed a single building, the decline in rental value has parallels elsewhere in Ely.

Two watercourses crossed the block of land southwest of Segwyk, the common gutter near the boundary of Segwyk and the stream draining Cawdle fen flowing into the river at Castlehithe. At a more general level the 1417 survey indicates that whilst Broad Street was densely occupied by properties the lanes running from it to the river were less densely occupied, and that buildings by the river were confined to a few locations. Forehill was more densely occupied; the lanes with seventeen properties between Broad Street and the river and the roof fittings and water pipe found there suggest that the buildings were of higher status. Between Monkshithe and Castlehithe there was an area at the end of Segwyk and the other properties called the Great Hithe where the excavated channels were found. The meaning of the term Great Hithe is unclear and it is uncertain if it relates to the channels.

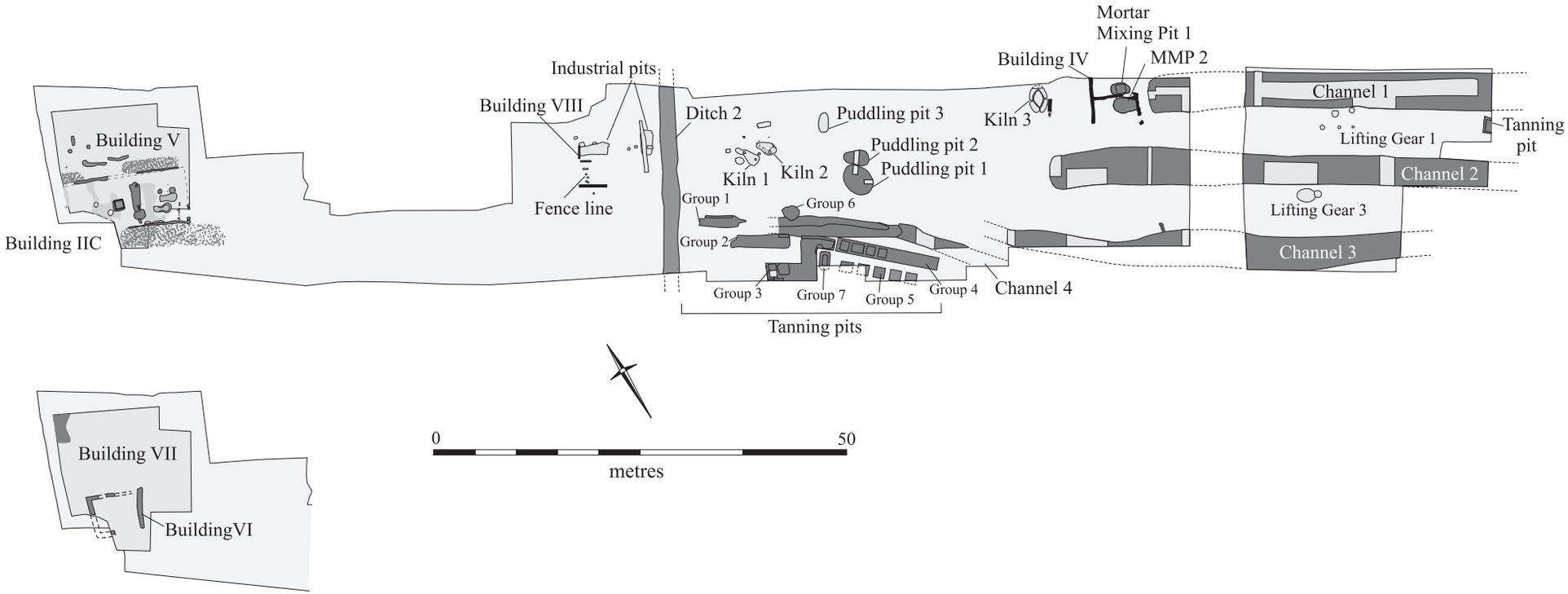


Figure 27 16th century and later at Jewson's

Chapter 5. A post-medieval pottery industry by the river: the 16th century

The 16th century generally represents a continuation of the 14th- and 15th-century patterns of activity, with the notable addition of a pottery kiln. The main evidence comes from Jewson's, there is also evidence from the Coalyard, the Electricity Depot, the Three Blackbirds and Tesco's.

Jewson's

(Figure 27)

The Broad Street Frontage

Major renovations to Building IIB transforming it into Building IIC (Figure 11) began with the division of the main hall into two rooms. The dividing wall rested on a clay sill line with a core of building rubble incorporating dressed clunch and limestone from earlier structures. The existing structural post at the southwest end of this wall was re-established and the pair of aisle posts to the southeast were removed. Both the northeast and southwest beam sills were built up and subject to minor repairs. A small patch of yellow clay may be all that survives of a flattened sill of the rear wall. The floor of the southeast room was levelled with a heavily compacted layer of clay surfaced with mortar. Mortared tiles along the edge of the southwest beam sill suggest the floor was initially partially or completely tiled. Scant respect was subsequently paid to this surface, judging by the numerous cut features.

Later, after a build up of occupation deposits, a figure-of-eight shaped oven (Oven 2) (Figure 28, see also Figure 11) comprising a semicircular hearth and adjoining rake-out pit was dug and lined with clay, with a cladding of rubble. Somewhat later a second figure-of-eight oven was built to the southwest (Oven 3), with stone, brick and tile rubble walls and fuel waste accumulated within it. In both ovens the opening and rake-out pit was to the northwest, away from the building's rear entrance, and the ovens were further protected from draughts by a screen or baffle marked by a row of stakeholes. Oven 2 was recut and both may have operated concurrently for a limited period. A doorway at the rear of the east-southeast room is indicated by two pairs of postholes flanking the position of the earlier path and in line with the end of the west- southwest wall.

The division into two rooms is a common renovation for the period, interpreted as a physical manifestation of a general reordering of household space closely linked to changing aspirations and lifestyle, or, more prosaically, as a response to pressures of space (Schofield 1997, 135–39: see also Johnson 1993). Division of the hall was normally accompanied by, and indeed accomplished for, the insertion of a second floor. This restructuring required a shift from a central hearth to a wall-fast chimney, either built against an outside wall or into the new dividing wall to allow smoke to be carried past the second floor to the roof. In Building IIC the retention of the central hearth suggests the erection of a dividing wall was not accompanied by the construction of a second storey and hearth smoke still escaped from an opening in the hall roof. By this time this was distinctly old-fashioned (Schofield 1997, 135–36) and may be a measure of relative poverty, the lack of innovation may reflect the general decline affecting Ely.

The west-northwest room created by the internal wall continued to house a central hearth, rebuilt as a square structure, with a mortar floor and brick surround. The corridor continued to be maintained with repairs to the exterior wall and the gravel surface.

Ovens 2 and 3 seem to supersede external Oven 1, which was filled in as part of a more general levelling process. Gravel surfaces to the north of Building IIC were worn and replaced and cut into by postholes, stakeholes and small scoops, indicating constant intensive activity consistent with use as a yard. A short length of rubble wall and some clay footings suggests a small structure or outhouse (Building V). The gravel yard peters out towards the northeast corner of the excavated area, where soil layers survived between a multitude of intercutting pits. The alleyway along the side of Building IIC was resurfaced with rough cobbling overlaid by a compacted, pebbled gravel surface.

In the late 16th century Building IIC was completely demolished and replaced with a smaller structure Building VI (Figure 11). Building VI survives very poorly as it was later robbed. Ovens 2 and 3 were filled with tile and burnt clay, the demolished superstructure forming spreads above the floor. In the west-northwest room a linear cut, with a slightly diverging alignment, ran along the edge of the dividing wall, possibly marking the removal of an internal feature. The whole area including the west-northwest room was then levelled.

New walls were constructed for the northwest room on a different alignment; with the east-northeast wall shifting west-southwest. Within this room a wall-fast fireplace was constructed with a hearth surround of tile with tile edging and a brick floor. The new walls were robbed later, but judging from the robber trenches this was a substantial construction. Despite these fundamental changes the cross wing continued in use with a series of floors. The central hearth's replacement with a wall-fast chimney accompanies radical alterations to Building II. The east-southeast room's demolition represents an apparent contraction, but this may not be the case if the wall-fast fireplace is an indication of an additional second storey, as the robber cuts for the walls suggest.

The alleyway to the west-southwest may have gone out of use and was covered with a layer of mixed silts. Its alignment, and that of the wall of the east-southeast room to Building II, continued to be respected by a row of fence posts edging an area of pitting. The intense pitting activity and the yard surfaces in the northwest part of the site were

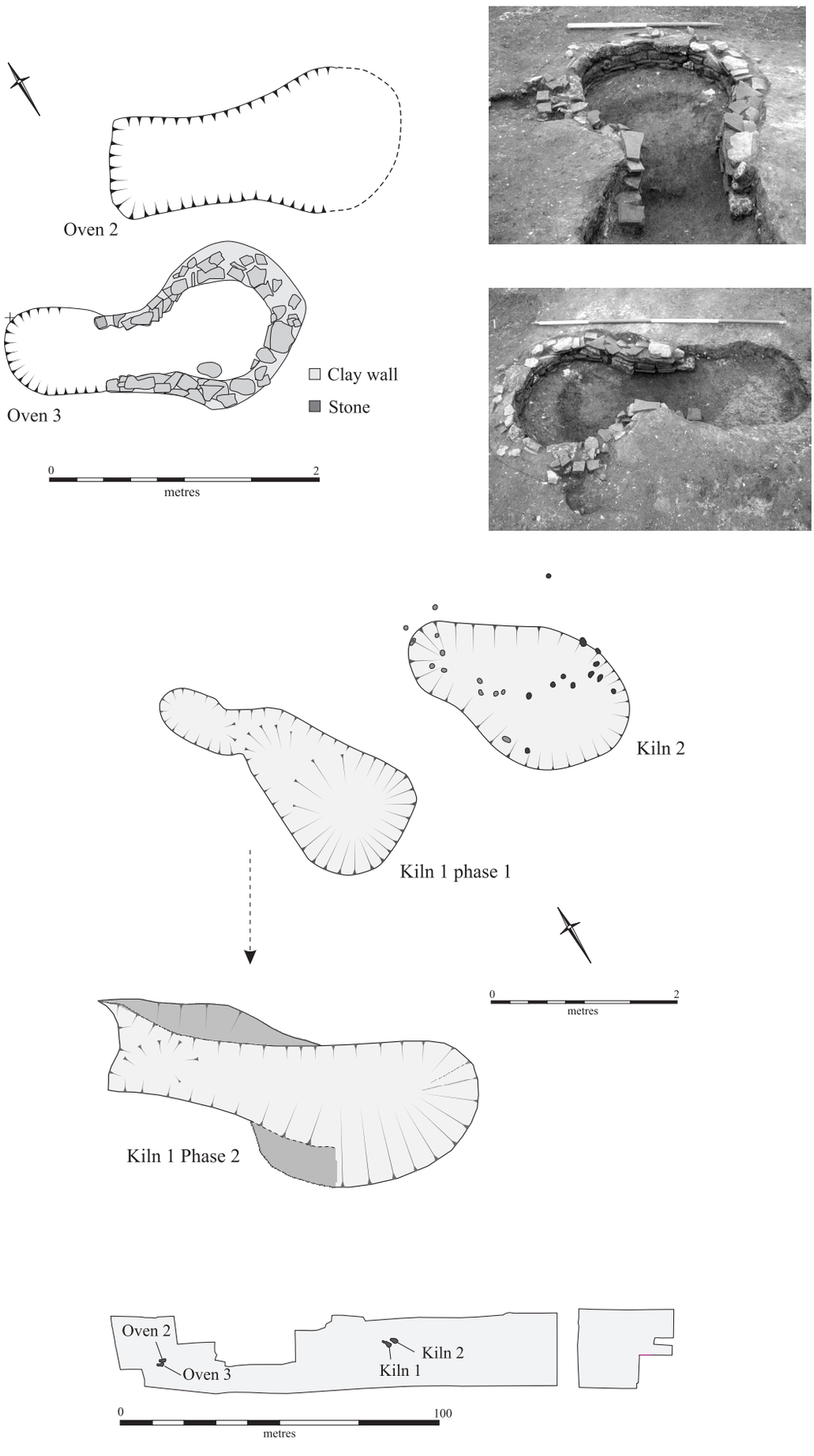


Figure 28 Ovens 2 and 3; Kilns 1 and 2

buried beneath a layer suggestive of use as a garden or for horticultural activity, before being levelled for the construction of Building VII (Figure 11) at the limit of excavation. Substantial wall foundations were seen in section with some remnants of floors between them. Behind the east-southeast wall was a wall of unshaped stones, which could represent the wall of a yard extending behind the building where there was also pitting. Approximately 1.5m to the southwest of the west-southwest wall is the foundation cut for a possible corridor along the building's side. Later this foundation was replaced by a beamslot and another beamslot was inserted into the southeast side of the east-southeast wall foundation. In an evaluation trench to the southwest there was the rear wall of a building on Broad Street with a cobbled yard or path.

The Central Area

Ditch 2, although largely filled up, still appears to have existed as a narrower and shallower feature. Some postholes running parallel to Ditch 2 suggest a distinct strip *c.*5m wide running south-southwest to north-northeast bounded by Ditch 2 and a fence. Within this strip were a building and two large pits. Building VIII (Figure 29) was constructed over Tank 1. There was the clay base of a 4.0m long wall roughly bisecting the length of the tank, which also mounted the south-southeast sloping edge of the tank. The wall's east-northeast face was plastered and the plaster appeared to continue on as a contiguous floor. Some 3.0m to the south-southwest were the parallel remains of the footings of a less substantial wall. A shallow clay filled slot running south-southwest to north-northeast on the tank's north-northwest side suggests a return to this wall that was over 1.6m long. To the southwest of this wall was a series of deposits composed of redeposited orange red and yellow burnt clay

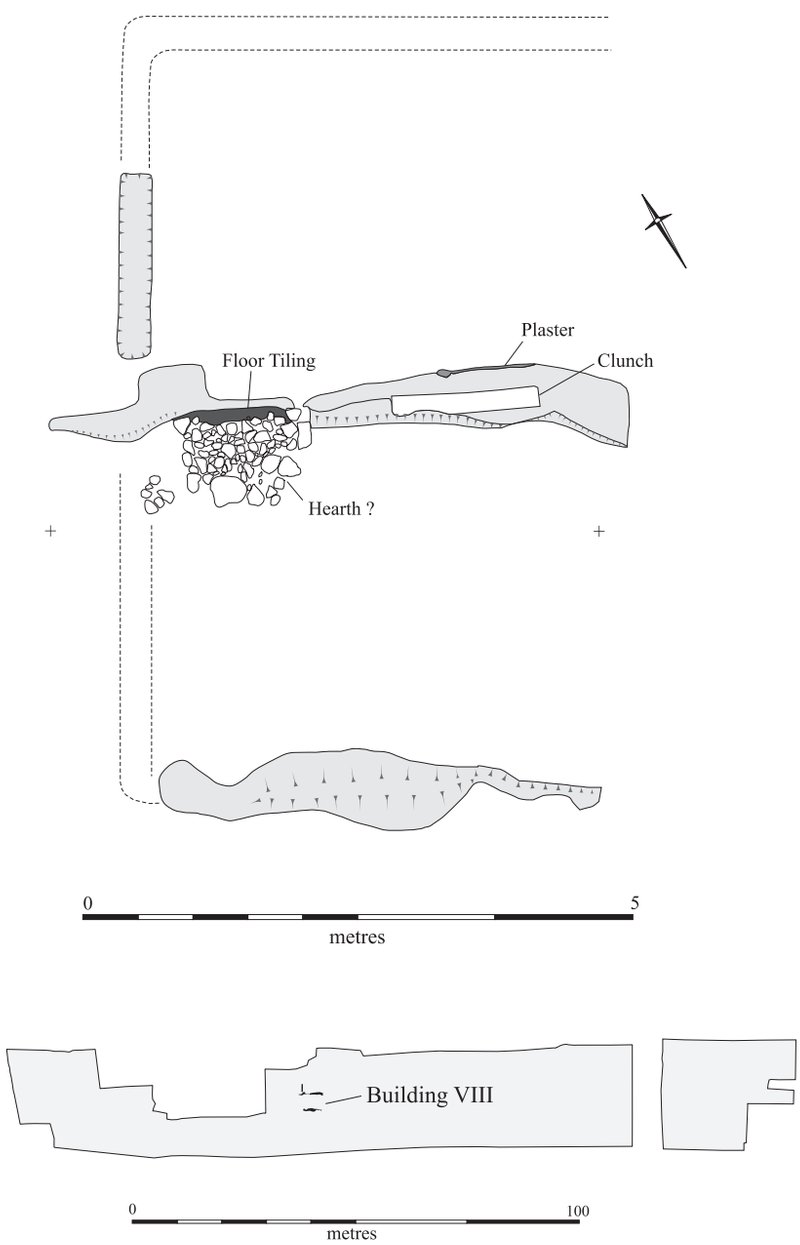


Figure 29 Building VIII

interleaved with burnt red sand and black ash. These were tipped in from the west and derive from a kiln or oven. As this waste accumulated, a doorway was dug into the wall and edged by a threshold of upright Ely tiles, bordering an area of hard standing comprised of a single layer of cobbles, clunch, flint and mortar. Building VIII appears to be a two roomed open sided structure facing east-southeast that was at least 4.6m by 4.0m in extent. It is unlikely to be for domestic occupation and probably relates to nearby industries. The plastered wall was demolished in the late 16th century and the area filled in with mortar rich deposits, presumably from the demolished building. Contemporary with this at Tank 1's southwest end, levelling layers composed of burnt clay, cess stained deposits and ash represent a concerted effort to fill the tank. The deposits may derive from occupation nearby or even the clearing of Ditch 2, which may still have functioned as a storm drain.

Nearby were two large rectangular vertically sided pits with flat bases, 3.0 by 1.4m and 3.5 by 1.3m, both 0.9m deep. The function of these pits is unclear, but their size suggests that they were industrial. When they went out of use they were filled with large chunks of charcoal and orange burnt material representing industrial waste. After this a line of postholes and some wall footings indicate a structure of some kind.

To the east-southeast of Ditch 2 there were two kilns (Figure 28) that continued in use into the 17th century. Only the base of the earliest (Kiln 1) survived, as a shallow elongated keyhole shaped scoop approximately 3.0m long and up to 1.5m wide. It was orientated with the rake-out or flue end to the northwest and had been recut at least once and relined with clay. Near to its flue was a shallow ovoid cut with clay in its base that may be related to it. The later (Kiln 2) was also badly truncated to a pointed egg shaped cut 0.2m deep, 2.5m long and 1.5m wide. A line of stakeholes across its base may have supported the clay roof during construction and before firing. Black residues of charcoal overlay the silty deposit at the cuts base. Both structures were accompanied by quantities of burnt clay and ashy deposits and some material in Tank 3 may derive from this activity. No evidence for the function of these kilns was found, their location over 60m away from the nearest buildings suggests that they are not domestic structures.

The Riverside

Pottery Production (with David Hall)

Several dumps of waste material indicating 16th-century pottery production were found (Table 14); additionally a single kiln plus a number of possibly associated features were identified. It appears that after firing, wasters were initially dumped in piles near the kiln. After this if a convenient hole became available nearby then groups of material were used to fill it. Ultimately if the volume of wasters in surface dumps became too great they were probably moved by barge for dumping elsewhere. In addition to these large groups, smaller quantities of material were probably incidentally incorporated into a wide range of nearby contexts. Similar wasters and kiln furniture were recovered in the late 19th and early 20th centuries in a district called Babylon (Cambridge University Museum of Archaeology and Anthropology (CUMAA), accession numbers Z 854, Z 31581 and 1929.523). These were for the production of black glazed red earthenware, similar to Cistercian type. This material appears to have been largely ignored until the publication of material from King's Lynn when it was called Babylon Ware (Clarke and Carter 1977, 262). This distinctive name has since been used to differentiate the fabric from true Cistercian ware produced in Yorkshire and elsewhere (Brears 1967). Waster sherds and tiles used as kiln spacers were discovered when the marina near the Maltings, adjacent to Babylon and near to the Jewson's site, was developed in 1982 (Hall, D. 1996, 38; CUMAA, accession numbers 1982.2927, 1982.2930 and 1982.2931).

In general terms the 16th-century pottery produced in Ely fits wider patterns. At this time there was a 'radical diversification and refinement' in pottery production with an increase in demand for high quality tablewares that were colourful, thin walled and untempered (Barton 1992; Cumberpatch 2003; Gaimster 1994; Gaimster and Nenk 1997). This transition in form and fabric probably reflects changing social aspirations, but despite the changes the Ely industry was one of the 'numerous producers whose methods and location are reminiscent of their medieval forebears' (Crossley 1990, 243). Two broad phases of 16th-century production can be identified.

The earliest evidence for pottery production in the area comes from two dumps of material in the lowest fills of Channel 1. These dumps probably built up while Channel 1 was still in use and stratigraphically pre-date the main evidence for pottery production. Broad Street Gritty Red Earthenware (50.5% and 72.0% of the two channel assemblages), containing quantities of white quartzose grits similar to medieval Ely fabric, dominated these dumps (Figure 37.1). Some sherds were reduced and others were pink, they were softer than the later wares and a variant of the fabric contained some fine sand. The forms are post-medieval, mostly shallow bowls plus some pancheons or dishes, jars and jugs (Figure 30). These assemblages also contained pottery fabrics mainly associated with the second phase of pottery production including Broad Street Glazed Red Earthenware (10.2% and 25.1%) and Plain Red/Pink ware (38.8% and 0%), both without grits, and a small quantity of Babylon sherds (0.5% and 2.9%).

None of the other pottery dumps contained Broad Street Gritty Red Earthenware and sherds were only recovered from four other contexts. This was probably a short lived transient phase of pottery production that appears to lie at the cusp of the change from the medieval to the post-medieval ceramic tradition, with the white gritted fabric representing a link between the medieval and later Ely pottery manufacturing traditions. This may mark the relocation of pottery production to this area. Both the fabric and the glaze used demonstrate influences from the medieval industry. These dumps are likely to date to the early 16th century and were associated with other 15th- and early 16th-century pottery. The remains of a welted shoe for the left foot of a style worn *c.*1520 to 1545 and most popular in the 1530s was found with them (Figure 31).

The next phase of pottery production is represented by Kiln 3 (Figures 5.5–6 and 32 to 35) archaeomagnetically dated to 1510 to 1590 (Figure 33) and situated immediately to the northwest of Building IV. The construction of Kiln 3 partially damaged the northwest wall of Building IV cutting into it slightly, although it

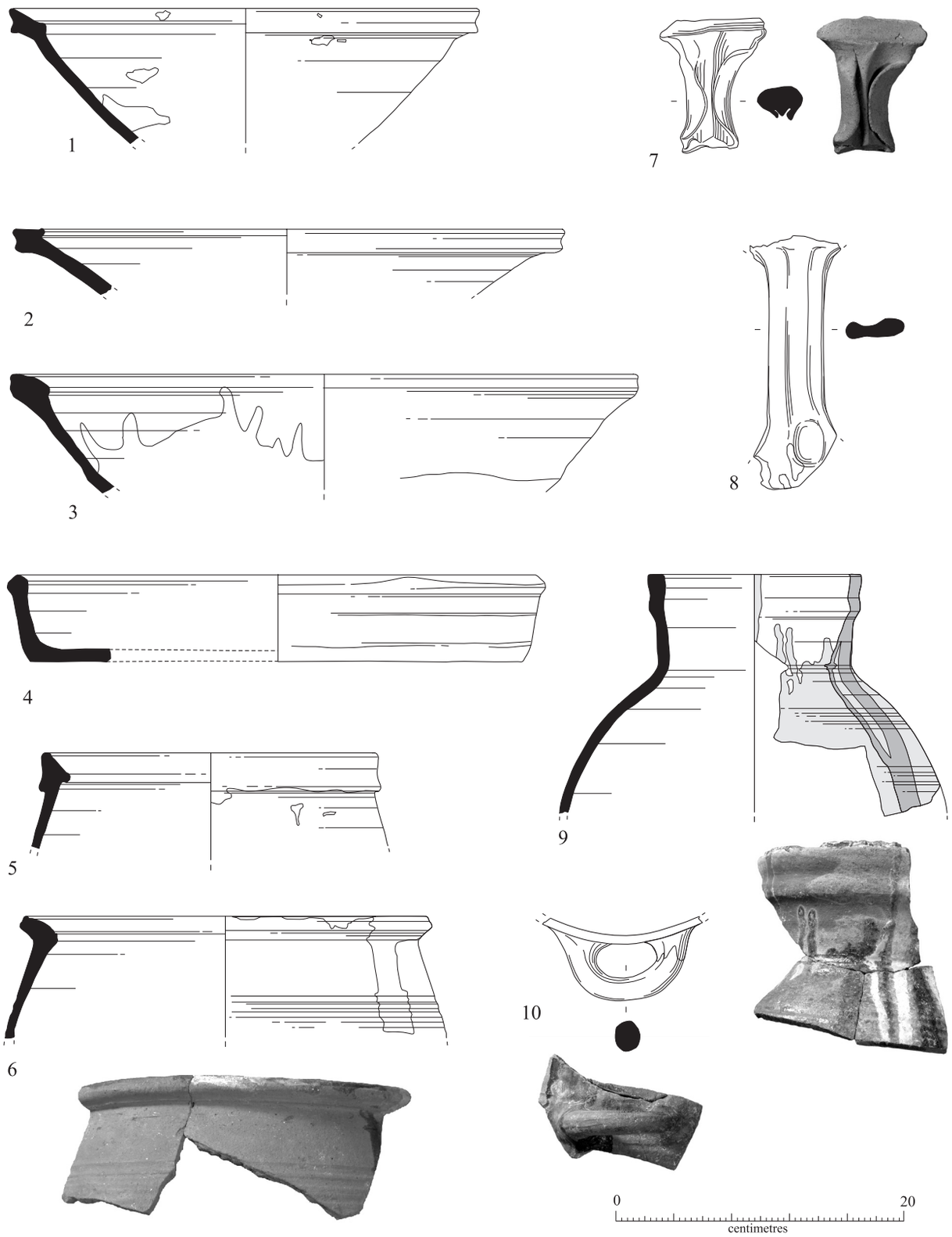


Figure 30 Broad Street Gritty Red Earthenware

1) Bowl or pancheon with internal sloping flanged rim in pink-buff gritty fabric, not very hard 2) Bowl or pancheon in pink fabric, slightly harder than 30.1 with only a few grits. Small area of patchy glaze on the inside 3) Bowl rim with sloping flange in gritty fabric, internal opaque green glaze of Medieval type 4) Shallow dish in gritty fabric, possibly a basting dish 5) Jar with thick rim in gritty fabric with surfaces reduced; external patchy green glaze 6) Jar rim with two bands of rilled decoration 7) Handle in pink unglazed gritty fabric 8) Strap handle in gritty fabric with grey reduced surface, one slash of glaze. May belong to jug 30.8 9) Jug in hard fabric, a few grits. Mostly reduced internally with thin oxidized layer and all of exterior surface grey; pink-red rim shading into purple inside. Vertical slip stripe with patchy green glaze over them, one patch of opaque green glaze inside, the glaze being in the poor quality Medieval Ely tradition 10) Horizontal looped handle in gritty fabric; external surface reduced, splash of 'muddy' glaze

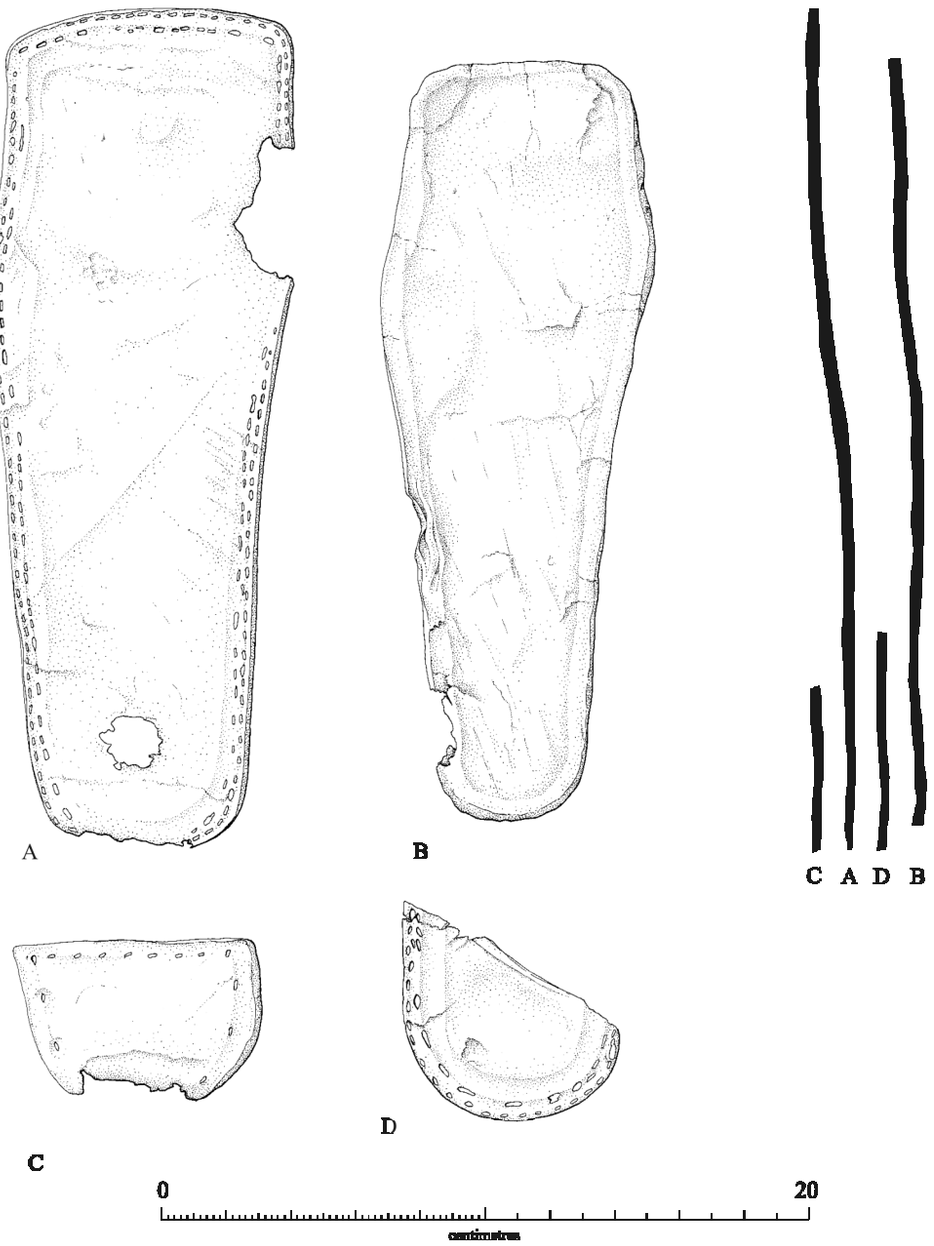


Figure 31 Welted shoe

appears that the building was still standing. It seems likely that its location was designed to take advantage of Building IV, probably both as a windbreak and a workshop (Figure 34). It is likely that more generally it was making use of the nearby Channels 1 and 2. Other close associations between kilns and channels or hithes are known locally at Downham and Turbutsey and the pottery industry in Ely was only part of a larger industry spread across the northern part of the Isle of Ely (Figure 36).

The construction of Kiln 3 began with the cutting of an irregular subcircular flat bottomed pit 3.1m by 2.9m in extent and 0.25m deep. In the vicinity there were also a number of postholes that may relate to the construction of Kiln 3. The pit was primarily filled with pottery wasters, saggars, tile kiln seaters, fragments of brick and tile, plus some burnt clay and ash (Figure 5.6). In the half of the feature that was carefully excavated there were nearly 400 pieces of ceramic building material weighing 30.6kg, of which just over half were definitely tile kiln seaters weighing 13kg. There were just over 4000 pieces of pottery and saggars weighing 85.3kg. Only 23 sherds were not related to the local kilns; these were generally residual sherds of medieval Ely, Grimston and Toynton wares. The pottery produced in local kilns consisted of five fabrics (Figure 37.1). The most common were red earthenwares: Broad Street Glazed Red Earthenware (BSGRE) (31.0%) plus a Bichrome variant (2.0%). Additionally a Plain Red/Pink ware (26.7%) probably represents a mixture of various unglazed parts of any of the Glazed Red Earthenware forms — especially jugs, which were only glazed on parts of the body. It is also possible that some entirely plain unglazed vessels were produced, mainly jugs. The other common fabric was Babylon ware (31.0%) with a small amount of Fineware (13.1%). The material in the pit indicates that Kiln 3 was not the first kiln in the vicinity. The kiln fitted neatly over

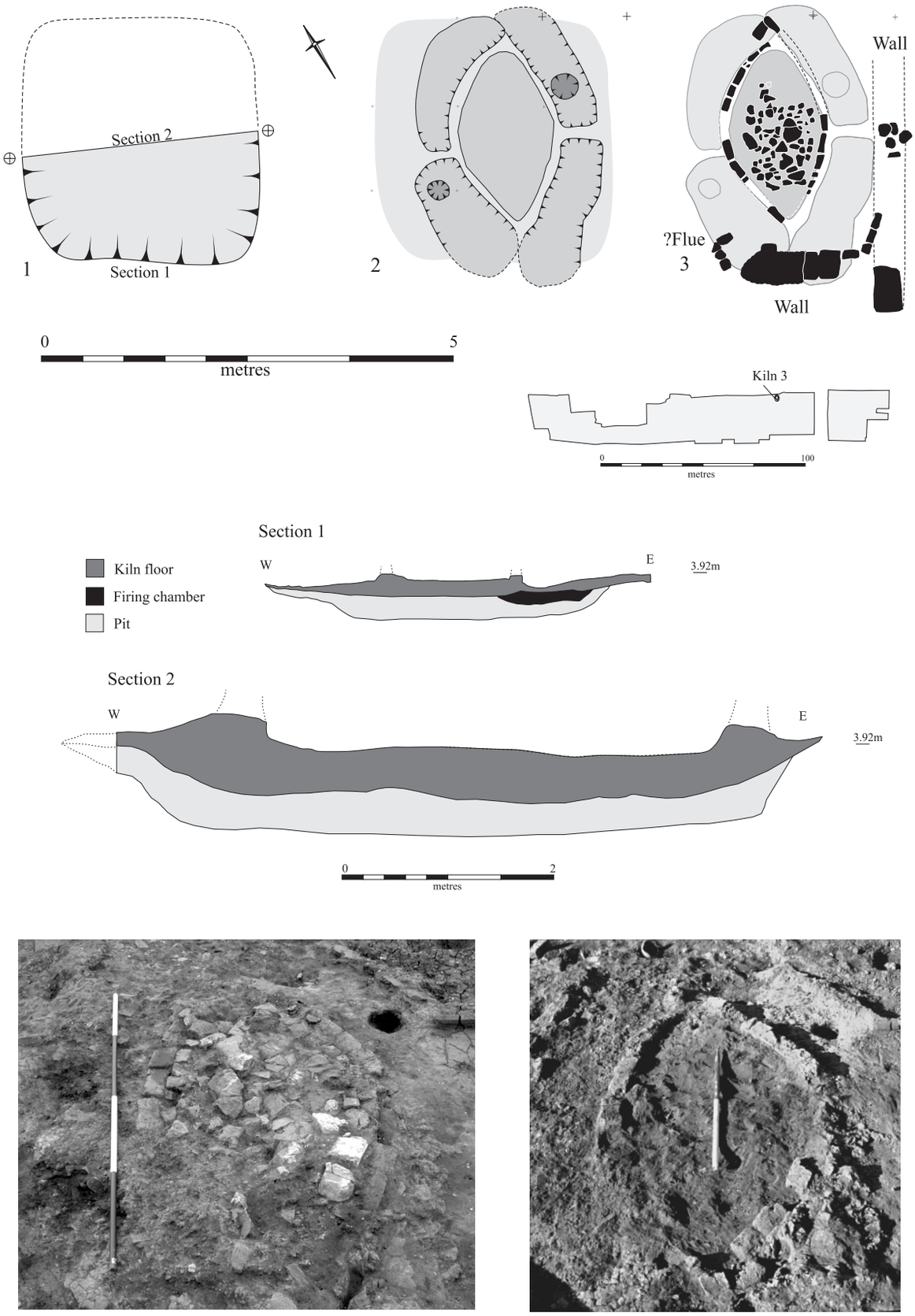


Figure 32 Kiln 3

Ware	*Bowls*	*Jars/ cooking pots*	*Pipkins*	*Lids*	*Jugs*	*Dishes*	*Pancheons*	*Basting dishes*	*Chafing dishes*	*Tygs*	*Tankards*	*Strainers*	*Other*
Medieval Ely ware	Freq	Freq			Moderate			Occ					Curfews, cisterns, ridge tiles
Broad Street Gritty Red Earthenware	Freq	Freq			Freq	Occ	Occ	Occ					
Broad Street GRE	Freq	Freq	Occ	Occ	Occ	Freq	Occ	Occ				Occ	Pipkins, lamps/candlesticks, ?churns
Plain red/pink		Freq	Occ	Occ	Freq								
Broad Street GRE Bichrome		Freq		??		Occ						Occ	Globular vessels
Babylon ware		Occ			Occ					Freq	Freq		Costrels
Broad Street Fine Off-White ware	Freq	Freq	Freq?			Occ			Occ				Jugs, pipkins, chafing dishes
Slipped Broad Street GRE	Freq	Freq	Occ	??		Occ	Freq		Occ				

Freq = frequent, Occ = occasional, ?? = uncertain

Table 13 Pottery forms produced at Broad Street by fabric type

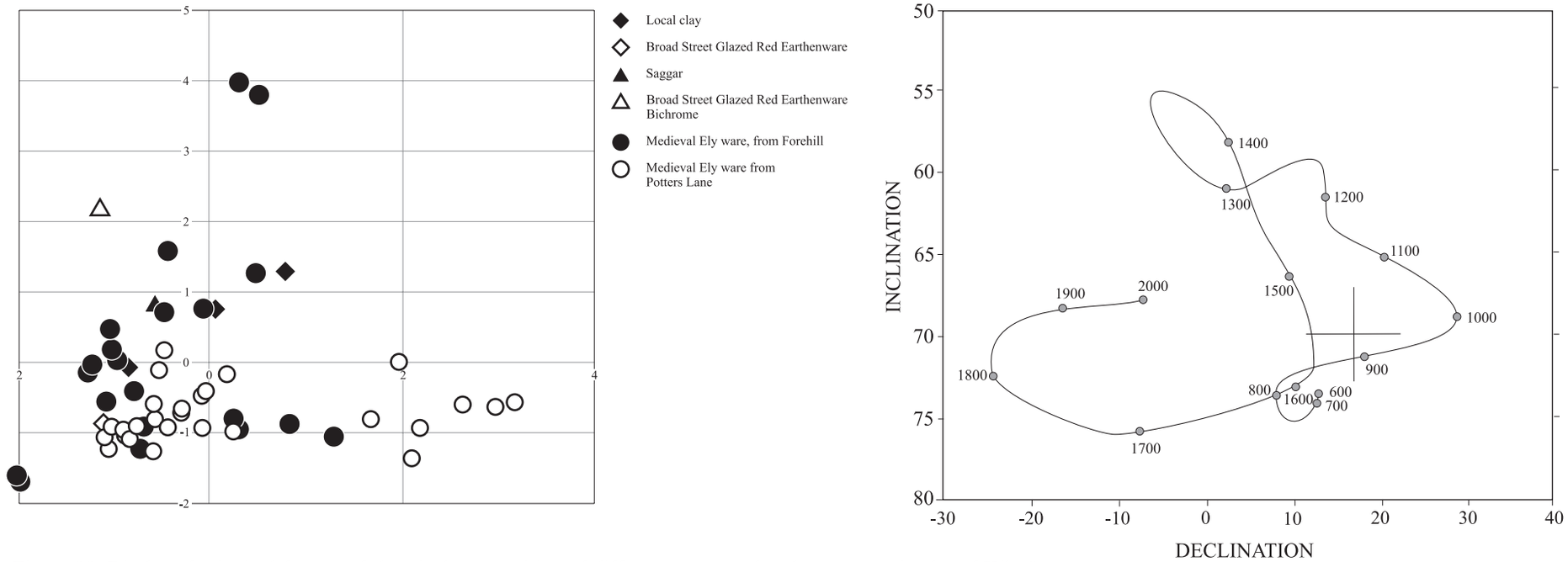


Figure 33 Bi-plot of principal factors of chemical composition of different wares and archaeomagnetic plot of Kiln 3

Context	*Wt (g)*	*Sherd count*	*Mean sherd weight (g)*	*Broad Street Gritty Red Earthenware*	*Babylon*	*Broad Street GRE*	*Plain red/pink*	*Broad Street GRE Bichrome*	*Broad Street Fine Off-White ware*	*Saggars*
Basal fill of Channel 1	8,058	206	39.1	104 50.5%	1 0.5%	21 10.2%	80 38.8%	0	0	0
Basal fill of Channel 1	6,354	207	30.7	149 72.0%	6 2.9%	52 25.1%	0	0	0	1
Pit under floor of Kiln 3	82,646	4091	20.2	0	1270 31.0%	1112 27.2%	1094 26.7%	81 2.0%	534 13.1%	432
General infilling of Channel 1	69,205	1187	58.3	0	75 6.3%	987 83.2%	33 2.8%	92 7.8%	0	48
General infilling of Channel 1	7,918	118	67.1	0	2 1.7%	51 43.2%	59 50.0%	6 5.1%	0	23
Dump layer	9,523	178	53.5	0	9 5.1%	168 94.4%	0	0	1 0.6%	0
General infilling of channel at Coalyard	31,682	1039	30.4	0	1.2	98.3	0	0	0.5	8
Totals from Jewson's	-	10,748	-	408 3.8%	2030 18.9%	5518 51.3%	1789 16.6%	247 2.3%	756 7.0%	796

Table 14 Broad Street wares from selected large assemblages at Jewson's

the pit, which was obviously integral to its construction, providing a soakaway to keep the kiln dry, which is paralleled at other sites (*e.g.* Green 1999, 17–20).

The waste debris from the pit under Kiln 3 was collected in 43 large plastic sacks. Six sacks were analysed in detail to establish the relative proportions of the kiln products. The others were washed and selected for large pieces potentially worthy of drawing, and also for any rare forms, fabrics, glazing or decoration, so as to establish the full range of material produced. The assemblage was analysed for forms using a rim count. With so much material it was not possible to calculate EVEs, it being assumed that each rim represents a single vessel (after checking for cross-fitting). This is certainly the case with Broad Street Glazed Red Earthenware forms that have large pieces, enabling cross-fitting sherds to be easily spotted; with Babylon tygs it is more difficult to determine whether some of the small pieces fit. The analysis is therefore an approximate statement.

A range of fabrics and forms were produced in the area (Figures 37 and 38; Tables 13 to 16), the commonest form of coarse pottery during the 16th to early 18th centuries

Site	*Broad Street GRE (inc red ware)*	*Babylon ware*	*Broad Street Fine Off-White ware*	*Broad Street GRE Bichrome*	*Broad Street Gritty Red Earthenware*
Jewson's street frontage, Ely	363 (84.6%)	45 (10.5%)	17 (4.0%)	4 (0.9%)	0
Forehill, Ely	887 (88.7%)	113 (11.3%)	0	0	0
King's School, Ely	171 (78.1%)	9 (4.1%)	39 (17.8%)	0	0
Lady Chapel, Ely	188 (96.4%)	7 (3.6%)	0	0	0
Tesco's, Ely	89 (81.7%)	14 (12.9%)	6 (5.5%)	0	0
Electricity Depot, Ely	90 (89.1%)	11 (10.9%)	0	0	0
Chesterton, Cambridge	548 (96.6%)	19 (3.4%)	0	0	0
Pembroke College, Cambridge	132 (75.9%)	22 (12.6%)	20 (11.5%)	0	0
Castle Hill, Cambridge	360 (73.6%)	78 (15.9%)	50 (10.2%)	1 (0.2%)	1 (0.2%)
Corpus Christ College, Cambridge	149 (55.8%)	66 (24.7%)	52 (19.5%)	0	0

Table 15 Broad Street wares from sites in Ely and Cambridge

Figure 34 Reconstructions of Kiln 3 showing potters at work: throwing pots, packing the kiln for firing and loading boats *by Victor Ambrus*

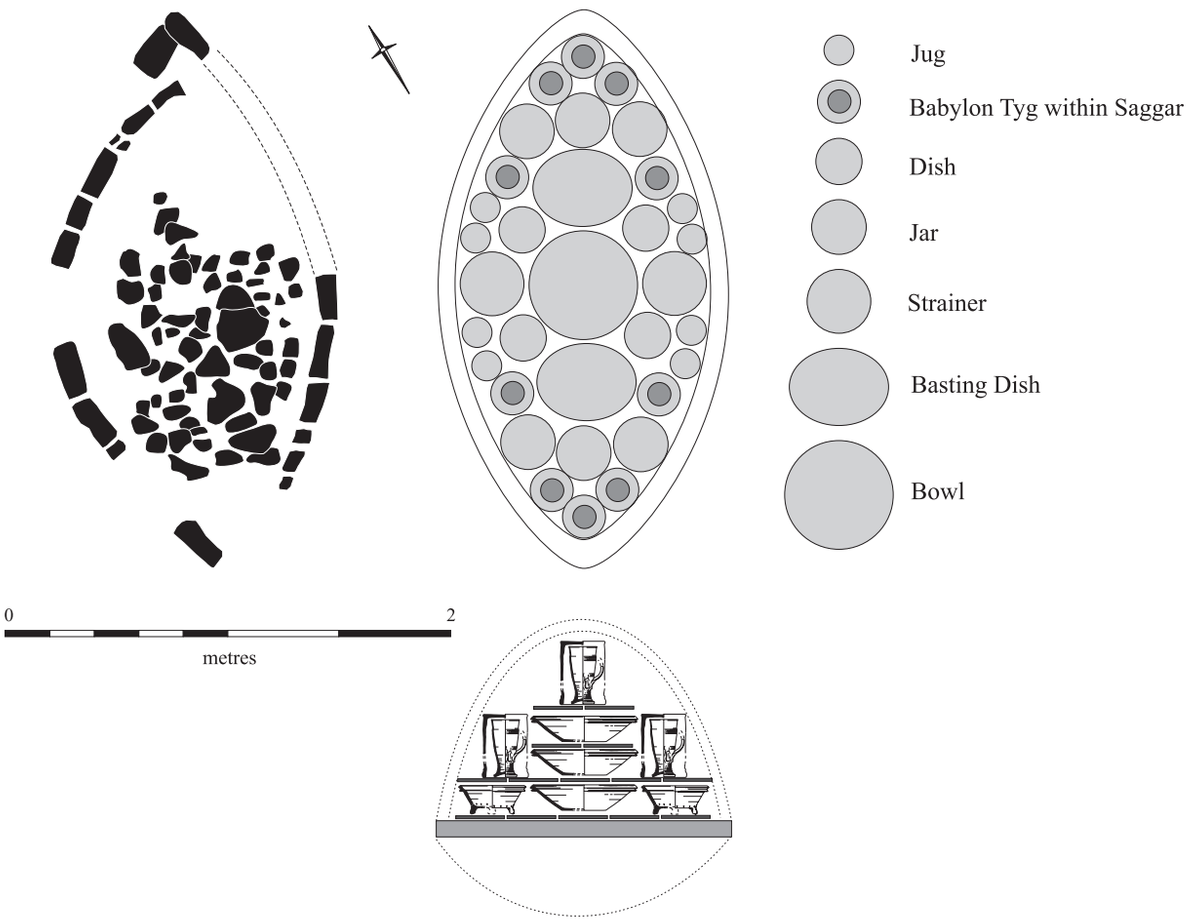


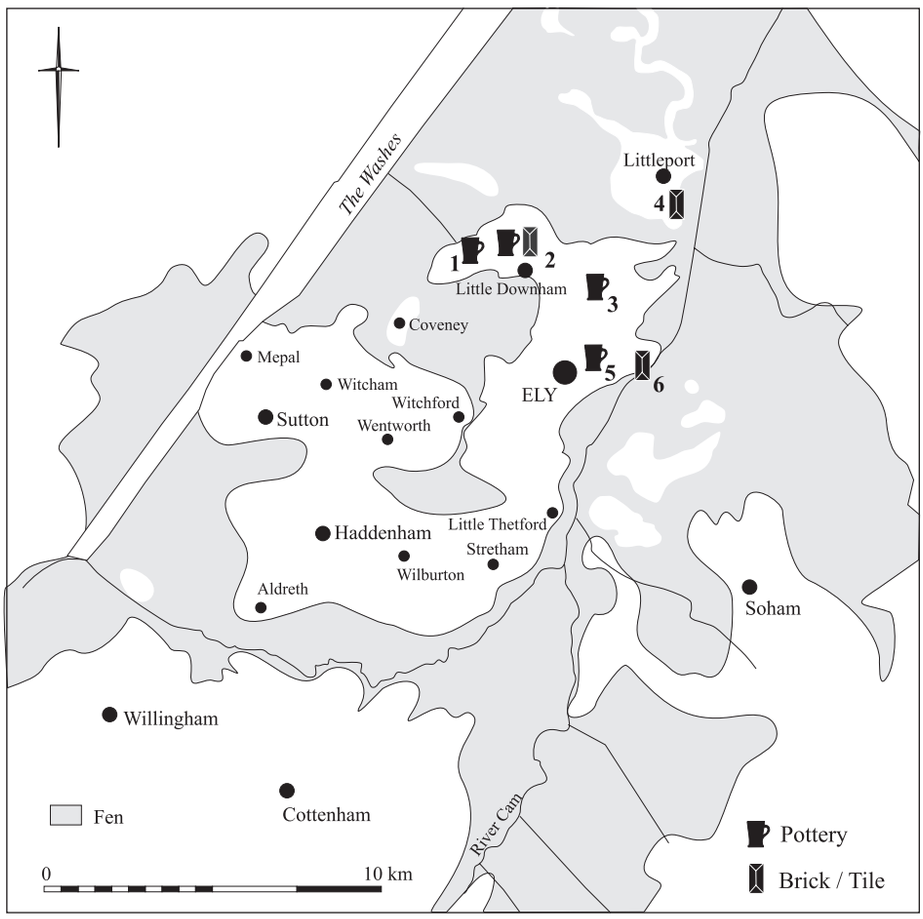
Figure 35 Reconstruction of Kiln 3 indicating the stacking of pottery within it

was glazed red earthenware (*cf.* Crossley 1990, 250), which is ubiquitous in East Anglia and was the dominant Ely product. Broad Street Glazed Red Earthenware was fashioned into a wide range of forms, but mainly bowls and pancheons (large shallow bowls used for household and particularly dairying purposes; *cf.* Crossley 1990, 250), large jars (cooking pots), shallow dishes, basting dishes and jugs (Figures 39 to 46). Glazes were either clear or greenish, brown iron flecks often occur under the glaze giving a dark speckled appearance, sometimes streaky. The assemblage under Kiln 3 contained 115 vessels; 49% were jugs with strap handles, 44% bowls and 7% jars. There were also some Plain Red/Pink ware sherds, it is unclear if these represent complete deliberately unglazed vessels or are simply unglazed sherds of Broad Street Glazed Red Earthenware. The 127 Plain Red/Pink vessels were 83% jugs and 7% jars. A few grey reduced sherds appear to be over-fired wasters from jugs and were probably intended to be Broad Street Glazed Red Earthenware rather than genuine reduced vessels.

Site	*Broad Street Unglazed Gritty Red Earthenware*	*Broad Street Glazed Red Earthenware*	*Plain red/pink ware*	*Bichrome GRE*	*Babylon ware*	*Ely Fine Ware*	*Stoneware*	*Other PM*	***Total***
Jewson's	404 3.6%	5451 49.2%	1786 16.1%	245 2.2%	2025 18.3%	754 6.8%	44 0.4%	374 3.4%	**11083**
King's School	0	171* 43.5%	-	-	9 2.3%	39 9.9%	21 5.3%	153 38.9%	**393**
Forehill	0	887* 82.7%	-	-	113 10.5%	0	63 5.9%	10 0.9%	**1073**
**Lady Chapel	0	188* 77.7%	-	-	31 12.8%	0	17 7.0%	6 2.5%	**242**

* Broad Street Glazed Red Earthenware not distinguished from Plain red/pink ware and GRE Bichrome
** Identifications provisional as studied by other specialist

Table 16 Post-medieval pottery at Jewson's and other sites in Ely



1 Little Downham site 12, 17th century
2 Little Downham site 13, 15th-16th century
3 ? Chettisham, 16th century
4 Shippea, 17th century
5 Thistle Corner, 17th century
6 Turbutsey, 17th century

Figure 36 15th- to 17th-century pottery, brick and tile kiln sites on the Isle of Ely

For both Broad Street Glazed Red Earthenware and Plain Red/Pink wares there were many pipkin feet, lids and handles. Lids were both glazed and unglazed with knobs on top for lifting (Figure 46). Handles were commonly hollow and affixed to the vessel with a thumb pressed 'rosette' decoration. Pieces of these handles could be mistaken for cisterns, but cistern spouts and perforated vessels are rare. Large Broad Street Glazed Red Earthenware vessels had lug handles, often thumbed, and also handles in horizontal loops, frequently thumbed. There were also Broad Street Glazed Red Earthenware strainers, small bowls, oval and rectangular basting dishes, single possible examples of a churn and a lamp or candlestick. There was also a grotesque apparently horned face with concave back that was probably embossed decoration on a large vessel (Figure 47.1). A fired clay mould for a similar face was found (Figure 47.2); the use of fired clay for the moulds produced a relatively crude result in comparison to other faces on pottery vessels where the moulds were made from materials such as chalk (*cf.* Green 1999, 201–02). Although the face was probably decoration it appears to have been chipped out for reuse and it is notable that no examples of such faces on actual vessels have been found. It is conceivable that the faces were stand alone objects, perhaps some form of kiln 'charm' or 'sprite' to ward off bad luck or spirits. In rare instances Broad Street Glazed Red Earthenware sherds had slip decoration. In some dumps slip decoration occurs on nearly 10% of sherds, but the figure is usually much lower.

Production of glazed red earthenware may have been inspired by Dutch Glazed Red Earthenwares, although this relates mainly to colour and texture rather than specific forms (*cf.* Cumberpatch 2003; see also Baart 1994). Some of these reached Ely and are distinguished from local products by being slightly better made and having a lustrous glaze. At Forehill they occur in phases just prior to the appearance of locally produced Broad Street Glazed Red Earthenwares (Alexander 2003, 144–45; Hall in Alexander 2003, 156). This suggests that they at least inspired the demand for the local products. 31 sherds of Dutch Glazed Red Earthenware were recovered from Jewson's, mainly from small bowls but also jugs, a strainer and possibly a cup. Some of these are from 15th-century deposits that pre-date the local production of Broad Street Glazed Red Earthenware. Unlike Yorkshire (*cf.* Cumberpatch 2003) the general forms of local and imported glazed red earthenware are quite similar so there may be a more direct relationship at Ely.

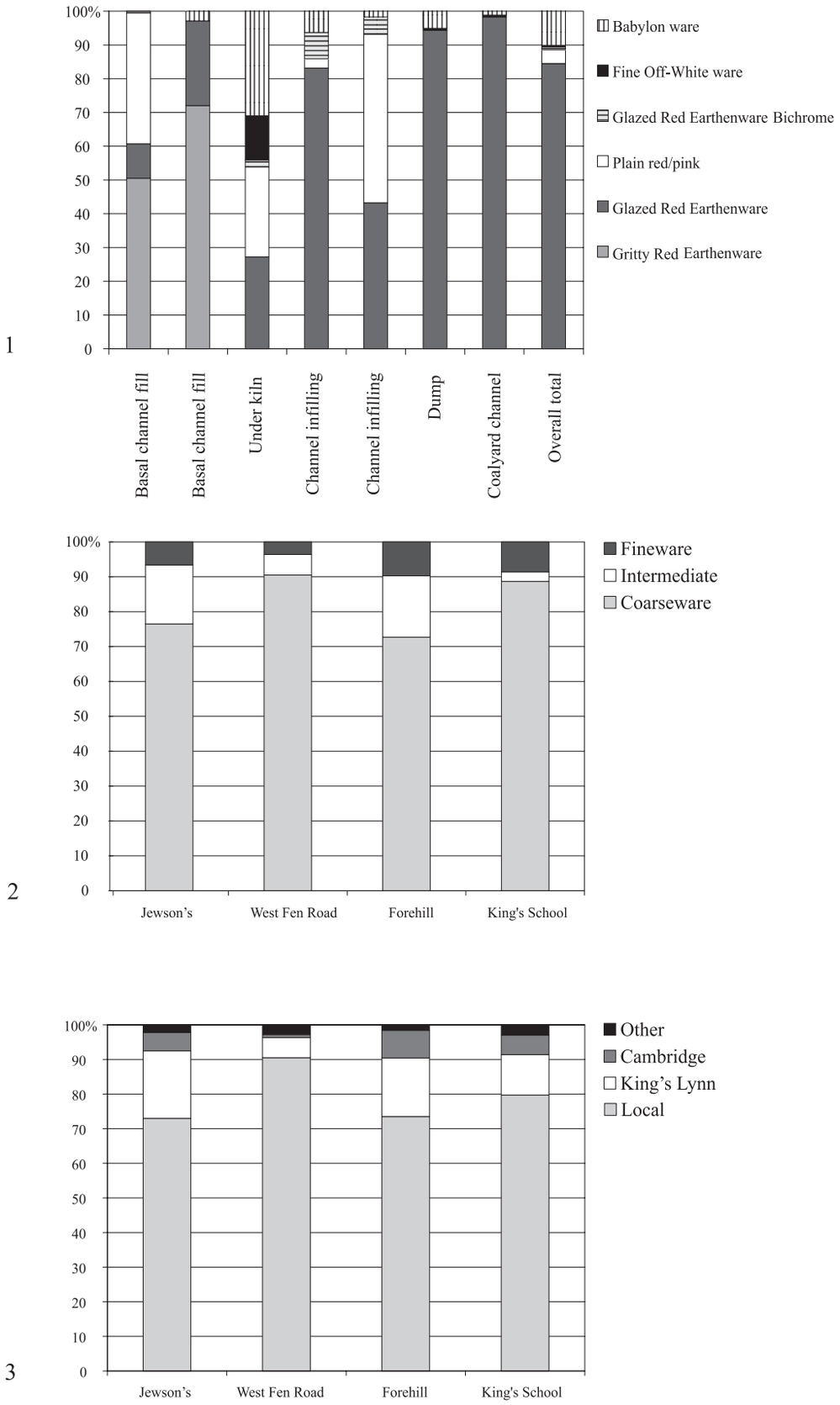


Figure 37 Pottery quantification
1) Broad Street wares in various contexts at Jewson's and the Coalyard
2) Coarsewares versus finewares at sites in Ely
3) Sources of pottery at sites in Ely

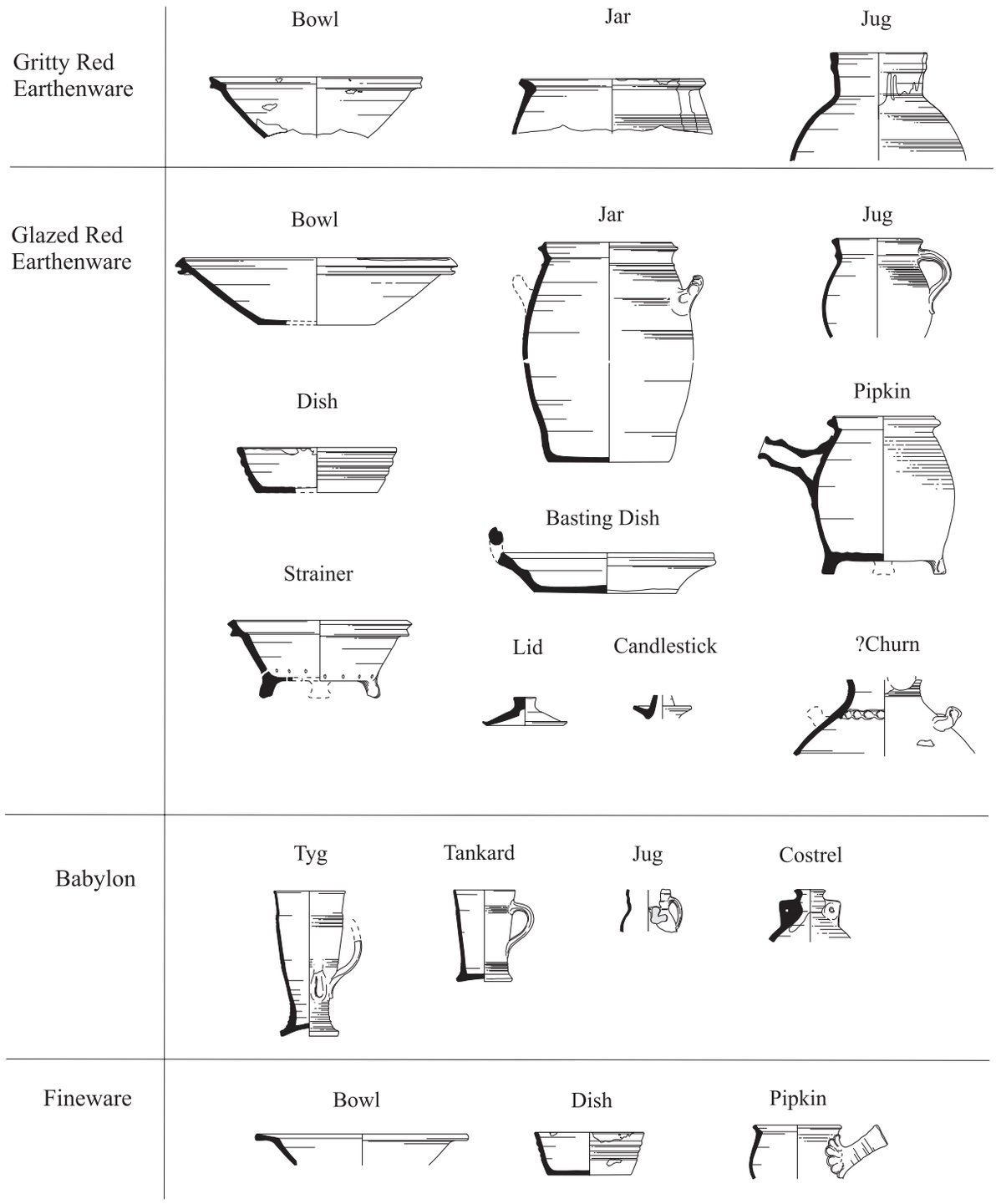


Figure 38 Broad Street ware pottery forms

A quantity of very fine red earthenware termed Broad Street Glazed Red Earthenware Bichrome was produced with green glaze on the outer surface and clear glaze inside. This fabric was recognized in the 1960s at King's Lynn, when it was called 'West Norfolk Bichrome' (Clarke and Carter 1977, 238; see also James 1987, 67). Forms are mainly jars with seats in the rim for a lid, but bowls and dishes were also produced (Figure 48). As well as King's Lynn this pottery supplied the local needs of Ely and surrounding villages and was exported to Cambridge (Hall, D. 2001, 90–91). It has also been found at Norwich (Clarke and Carter 1977, 262), Baconsthorpe Castle (Dallas and Sherlock 2002, 45) and Thetford (Lentowicz 1999, 54, tables 5 & 10).

Babylon ware is a red earthenware with a black iron-based glaze, occasionally vitrified, which is similar to Cistercian ware. Forms are most commonly tygs, tall multi-handled flared cups that were 'decorative as much as useful in form' (Crossley 1990, 246), tankards and a few costrels, jars and jugs (Figure 49). As adjudged by rim count, the assemblage under Kiln 3 contained 101 Babylon vessels; 89% tygs with one or more handles, 9%

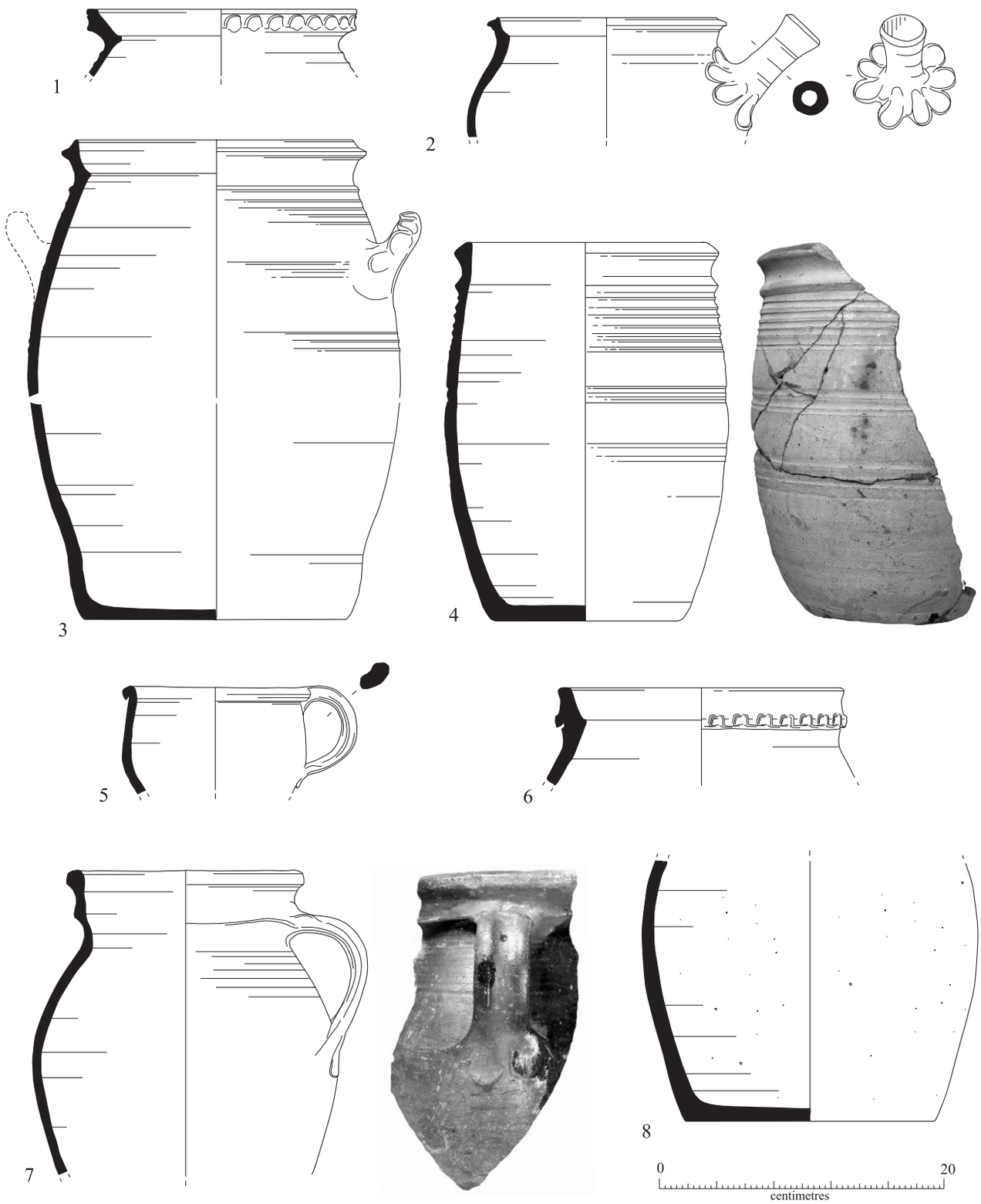


Figure 39 Broad Street Glazed Red Earthenware jars

1) Jar with hollowed rim for a lid, mostly grey fabric with pinkish surfaces, some rills. Small amount of thin green glaze on rim top and a line of finger tipping underneath the rim 2) Jar with rosette handle, orange fabric. Externally a few green speckles in clear glaze and a clear internal glaze so nearly a bichrome 3) Jar with ed orange fabric with brown glaze both sides. Hollowed rim, multiple external rill bands, looped frilly handle. Used as receptacle for lime 4) Jar with rib and rilling decorative lines externally and completely rilled internally. Clear internal glaze, none outside 5) Small jar with looped handle 6) Hollowed jar rim type with decorated rim. Small areas of speckled green glaze on both sides 7) Strap handled jar, red fabric with a few pebbles, iron dusted; a little brown glaze outside, and all over internally except for the upper part. Same profile often has a rosette handle 8) Jar with slightly reduced outside causing a green glaze to appear dark

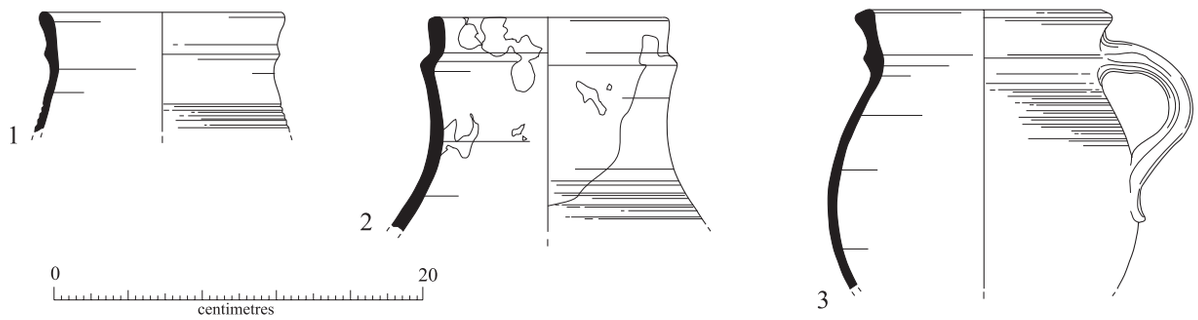


Figure 40 Broad Street Glazed Red Earthenware jugs

1) Rounded jug rim with one rib and incised rills below the rim, apparently plain without glaze 2) Large jug with lipped rim. Orange fabric with a few white grits and iron flecks. Rilled decoration, partly glazed both sides with clear green 3) Jug with one rib under rim, simple strap handle with one thumb-press, a band of rilled decoration, orange fabric but reduced grey all over. Intended to be a plain red jug?

jars and 3% jugs. One handle with an embossed knob contains a unglazed fired clay tube (Figure 49.10), the function of this is uncertain but it may have been a whistle of some kind. Cistercian ware represents one of the most significant developments in the use of pottery vessels since the emergence of the medieval tradition in the 11th century. The origin of Cistercian ware is poorly understood and it emerges in a fully established form north of a line running from London to Bristol with no clear native or Continental antecedents, generally dating *c.*1475 to 1550 (Brears 1971, 18; Crossley 1990, 2457; Cumberpatch 2003). This material represents an increase in complexity from medieval practices in terms of the use of very fine clays and of saggars. Although Cistercian ware has been found at sites in Cambridgeshire it appears to have been relatively rare, as Tudor Greenwares are dominant in the region (*cf.* Barton 1992). No definite Cistercian ware was identified at Jewson's, although it is likely that some was imported for copying.

Babylon ware is later than the main *floruit* of Cistercian ware, which evolved over the 16th and 17th centuries into a variety of blackware and slipware vessels with some production continuing into the 18th century (Crossley 1990, 245). It has been suggested that within this tradition Babylon ware is a blackware rather than a true Cistercian ware (Crossley 1990, 247). The nearest known production centre of Cistercian ware is Potterspury in Northamptonshire (Mayes 1968). Blackwares were produced at Wroxham and Fulmodeston in Norfolk, Stock in Essex and Yardley Gobion and Paulerspury in Northamptonshire (Crossley 1990, 247). Babylon ware has been found at sites in and around Cambridge (Edwards and Hall 1997, 158; Hall in Cessford with Dickens 2005) and at King's Lynn (Clarke and Carter 1977, 262).

Broad Street Fineware was made from clay that fired off-white or light pink rather than the red fabric of the other Broad Street wares. The vessels were lead glazed, usually with copper added to give a specked green colour. Some vessels were green glazed externally and had a clear glaze internally (giving a finish in a light yellow) and so were 'bichromes', being yellow and green. Broad Street Fineware is largely restricted to relatively small and ornate vessel forms, mostly jars with a single handle, dishes, bowls and pipkins but skillets and chafing dishes were also produced (Figure 50). The fabric is probably the same as material identified at King's Lynn in the 1960s, then called 'NS Ware' (Clarke and Carter 1977, 238). Often the attachments were in red firing clay, used for decorative effect. The assemblage under Kiln 3 included 80 vessels; 56% jars and 44% bowls. Many of the jars were pipkins, some with feet and handles in red clay, and few of the bowls and jars were bichrome. There was a small quantity of jugs and chafing dishes. A limited number of contexts produced the Broad Street Fineware, this being the largest, only one or two sherds were found in the other dumps analysed and just over 300 other sherds were recovered.

The pottery produced at Broad Street, and indeed by the earlier medieval industry at Potters Lane, is exclusively domestic in nature with no traces of horticultural (*cf.* Crossley 1990, 255–56; Currie 1993; Moorhouse 1991) or industrial wares, such as crucibles or those associated with sugar refining (*cf.* Brooks 1983; Crossley 1990, 256). This suggests that there was no great use of horticultural wares locally, something borne out by their absence from excavated assemblages, and that certain industries were not present locally, again borne out archaeologically. This meant that the industry was limited to producing domestic material; this can be subdivided into storage vessels, items used in the kitchen, serving vessels, tablewares, vessels used for serving drink and lighting.

All the wares are wheel thrown with no evidence for moulds apart from minor decorative elements, and there is little consistency of form as shown by the variety of rim types on some vessels. Liquid glaze was apparently poured into open forms and there are various kinds of decoration, including lines incised with a comb in horizontal, diagonal and sinuous patterns, plus applied pads of clay shaped by thumbing. The wares can be characterised as relatively coarsely made and finished relative to other contemporary products. Although in a local context the industry appears highly innovative set against the background of the conservatism of the medieval tradition, when viewed in a broader context it is late and reactive in terms of its products.

There was an abundance of saggars (Figure 51.1–8) that would have been required for the firing of Babylon ware and Broad Street Fineware in particular. These were cylindrical vessels that would have been placed over the pot being fired with the open end facing downwards. Many were an oxidized, slightly yellow colour; others were reduced to a light grey and the clay used does not appear to be local. Many vessels had complex vents and a few had simple round holes about 10mm diameter made in

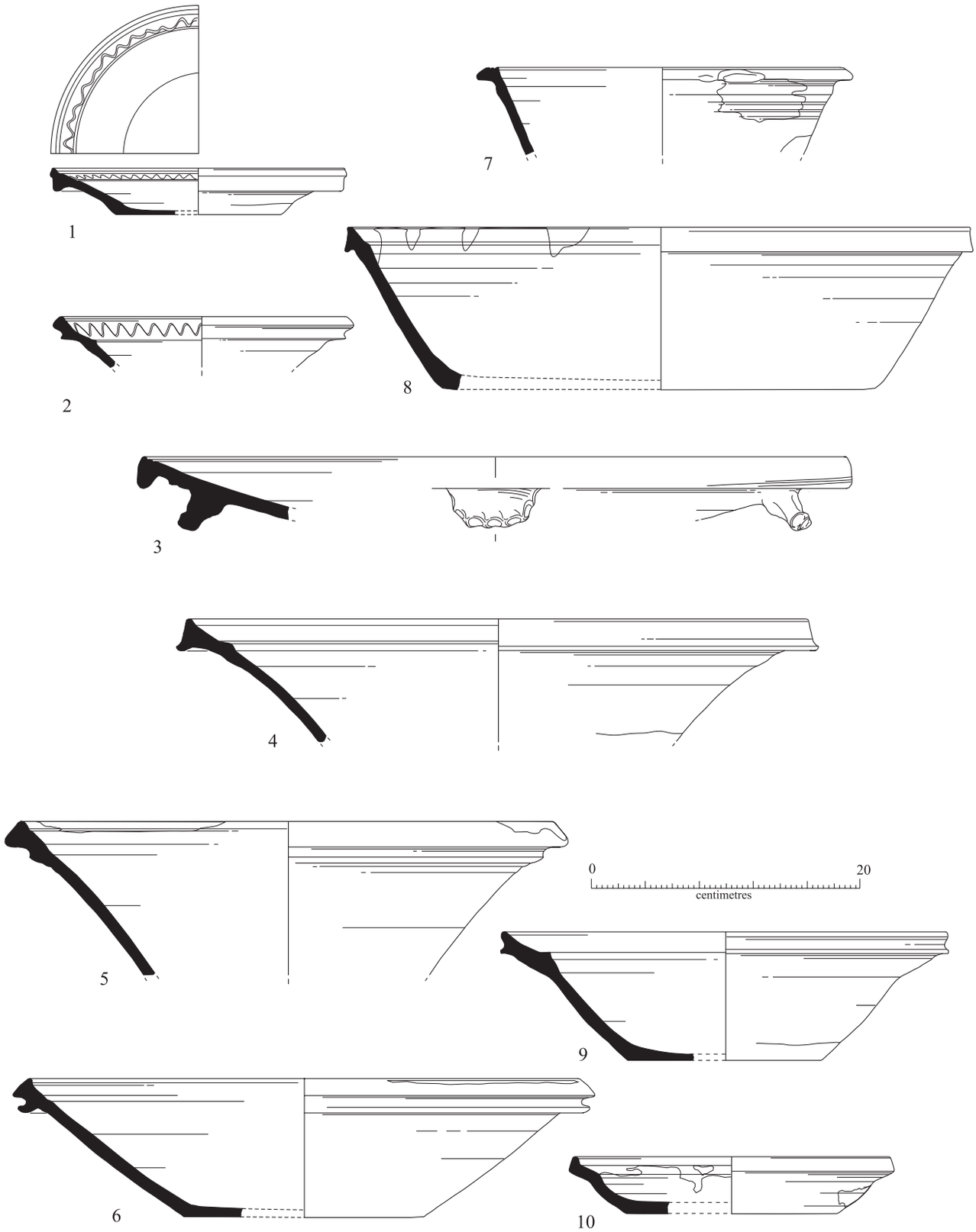


Figure 41 Broad Street Glazed Red Earthenware bowls and small pancheons

1) Small bowl in orange fabric with internal clear glaze with iron flecks under. Sloping rim with wavy decoration rim in the Medieval Ely tradition 2) Small bowl with sloping rim decorated with an internal wavy line. Clear glazed over patches and streaks of black-green 3) Large bowl, red-purple fabric with all over grey surfaces. Plain with stub handle; an overfired waster abandoned before glazing 4) Bowl with plain red fabric externally and grey internal covered with green glaze, internal ridge. Many variants of clear and green glaze occur 5) Large bowl with complete sides surviving, orange fabric with clear internal glaze and iron flecks under the glaze 6) Bowl with diagonal streaks of brown iron decoration under clear and green lustrous glaze 7) Bowl that cracked in the kiln allowing glaze to run in. Coarse fabric with iron and a few white grits clear internal glaze, patches of external glaze, and external band of rilling 8) Bowl in red-orange fabric with some reduced inside lower. Green internal glaze with near vertical dark green streaks 9) Bowl profile with hollowed rim, orange fabric, with a few iron speckles internally, clear internal glaze. Glaze has run between fitting sherds in a crack 10) Small bowl with reduced outer surface, clear internal glaze

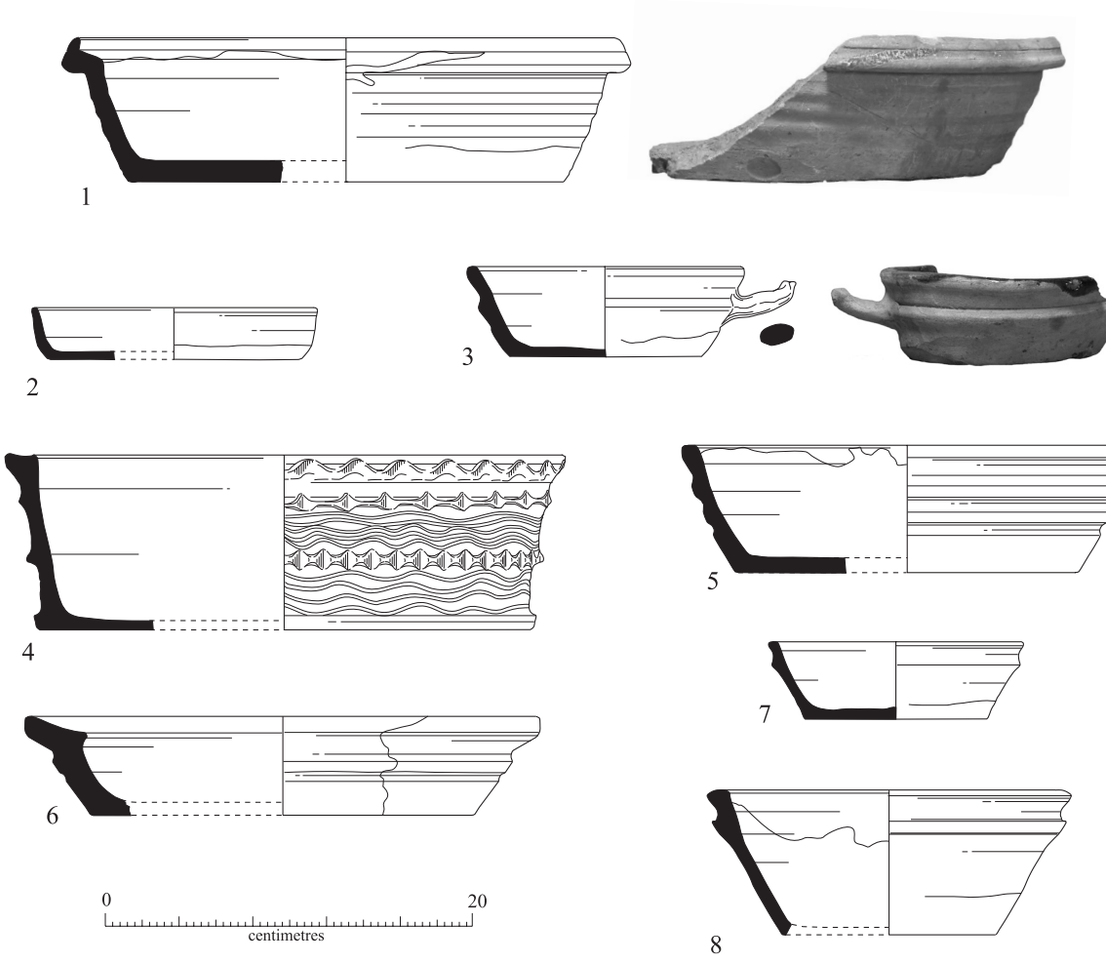


Figure 42 Broad Street Glazed Red Earthenware dishes

1) Large dish with clear internal glaze. Orange-buff fabric with very few white grits 2) Very small dish in orange fabric with iron flecks, bichrome with green glaze on exterior and clear internally 3) Small dish with tiny stub handle. Orange fabric with grey exterior and green-brown glaze over brown flecks internally 4) Small dish in orange fabric, clear glaze both sides with brown flecks. Complex moulded pattern on the exterior with thumbing under rim, two ribs with pinched and rilled waves between 5) Small dish in orange fabric. Dark charcoal patches under clear glaze internally 6) Thick dish rim in orange fabric, clear glaze both sides with green edging on rim 7) Orange dish with a few iron flecks, partial internal clear glaze over black smudges 8) Small dish with internal green glaze, fabric exterior pink internal grey

the side. They are typical of post-medieval saggars found at most 16th- to 19th-century pottery production sites. There were also numerous spacers in the form of a subcircular annulus, rounded one side and cut flat the other, with a brown glaze on the rounded side (Figure 51.9). These are a common form of post-medieval kiln furniture and at some sites they have been found adhering to saggars. Saggars, whilst allowing the production of more complex vessels, take up a large amount of space in the kiln. Unless kiln size increased this would have decreased the number of vessels that could be produced and would have increased fuel requirements per vessel, which suggests that such vessels were more valuable to compensate for the loss (*cf.* Cumberpatch 2003). The use of saggars seems to have been restricted to high quality items until the late 17th century (Green 1999, 183).

Similar saggars and some wasters were found during small scale investigations at Canonry House Garden on the hill top near the Cathedral (Hall in Kemp and Hunter 1990). These are unlikely to derive from the Broad Street area and suggest that production was occurring in more than one part of the town.

One other requirement was for tiles for use as seaters, spacers or separators (Figure 52). In total nearly 1,800 pieces weighing almost 110kg with splashes of glaze were recovered, with over 200 of these weighing 13kg from below Kiln 3. The majority of these were peg tiles and the presence of mortar on some pieces shows that they were reused after their initial role as roofing material. The high number of corners, compared to other dumped tile, and the number of straight sides suggests that the tiles were being selectively collected and recut for reuse. Two examples of 60mm diameter circles cut into tiles may have been used for spacing the pottery. A number of overlapping rings and splashes of glaze on both sides of the tiles suggest that many of the tiles were reused repeatedly for this purpose. Wasters still attached to the tiles show that pottery was stacked both upright and upside down. It appears that vessels were stacked as mixed loads to accommodate the maximum number in the kiln, and some forms were even

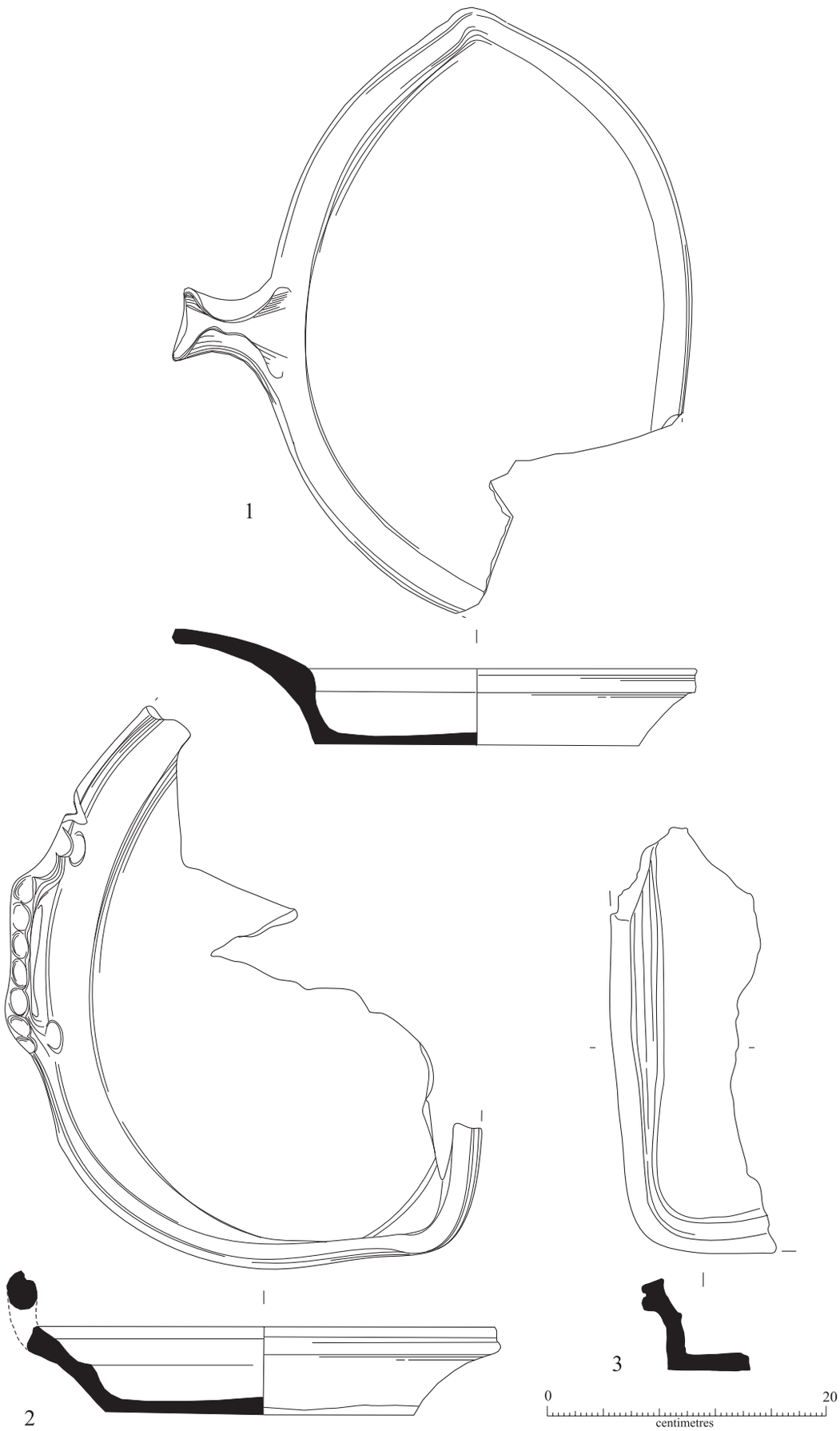


Figure 43 Broad Street Glazed Red Earthenware basting dishes

1) Unglazed oval basting dish, near complete, red-orange fabric. Pinched stub handle. Internal base covered with black streaks and white streaks that on other vessels has been glazed as a decoration. 2) Basting dish with a lip at one end of the oval and an upright looped handle with finger presses on the side. Orange fabric containing iron flecks, clear glaze internally only. Cracked in kiln with glaze penetrating some cracks. With two thumb presses inside; internal clear glaze, slightly reduced/blackened outside. 3) Corner of basting dish

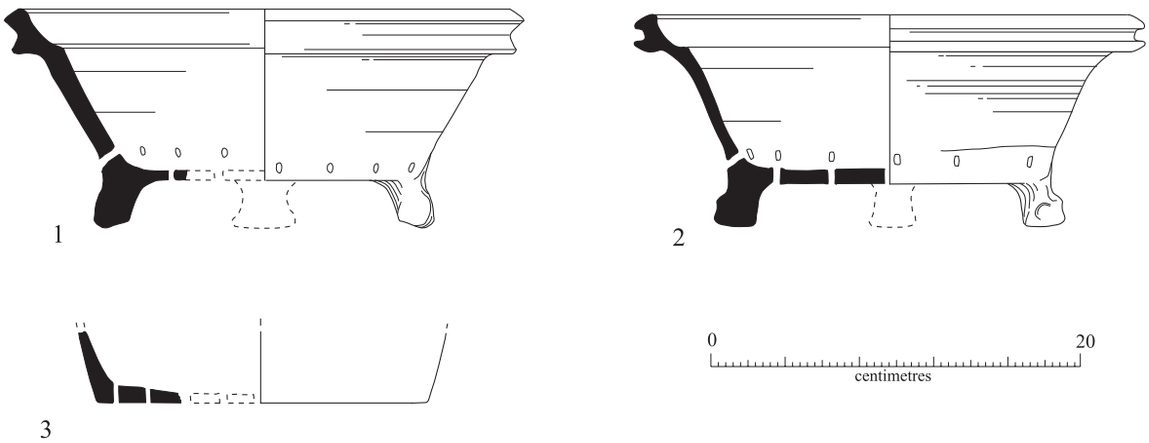


Figure 44 Broad Street Glazed Red Earthenware strainers

1) Strainer with feet, orange fabric with high quality clear glaze. The form also occurs in a bichrome 2) Strainer with complete base with many holes in orange fabric with a slight internal glaze; and base piece with a foot; in orange fabric with a slight internal glaze 3) Strainer

placed on their sides (Figure 35). The majority of pots identified by glaze rings on tiles were black from Babylon ware vessels with a diameter of *c.*60mm from tyg bases. There were also a few with a diameter of *c.*300mm from larger vessels.

The vast majority of the tiles (92.4%) were made in fabric ELY 02, the next most common fabrics were ELY 05 (4.4%) and ELY 11 (1.0%) with no other fabric representing more than 1% of the assemblage. Fabric ELY 02 represents only 60.6% of the peg tile from the site that was not reused so it appears likely that some form of selection was going on, although this might simply be because destruction of a particular building nearby with a roof made of this fabric coincided with pottery production at the site. At other pottery kilns the tiles used appear to represent *ad hoc* reuse (*cf.* Jarrett in Divers 2004, 118), but at Broad Street there appears to be at least an element of selection even if this need not necessarily indicate that the potters were purchasing batches of tiles.

There is a small quantity of 15th-century kiln seaters, but this occurs near Broad Street and appears to have been brought in from elsewhere for use in walls and paths. Most kiln seaters occur in 16th- and 17th-century deposits located in the vicinity of the kiln and the channels leading to the river. Kiln seater material in 18th-century and later contexts is generally fragmentary and abraded and occurs in low quantities, suggesting it is residual. All the substantial groups of tile seaters were associated with predominantly 16th- and 17th-century pottery assemblages and this dating is supported by associations with a Nuremberg jetton dated *c.*1550 to 1590 and a number of pipe bowls dated *c.*1660 to 1680 and *c.*1680 to 1710. A number of the clay pipes are poor quality being badly finished and with badly formed 'lipping' over rims and a slightly reddened colour. Clay pipe production is first documented in Ely in the 1670s and was based in the area between Broad Street and the river (Cessford 2001). Although the number of pipes is small it is possible that on occasion pipe makers may have shared kilns with potters during the early stages of the pipe industry in Ely.

Above the backfilled pit a compacted grey clay floor was laid to create Kiln 3 (Fig. 32). Around the pit a set of low mortared brick wall footings 0.5m wide and 0.3m was constructed. On the southeast side was an L shaped brick feature that could be the remnants of a stoke hole or flue and was filled with peat ash. An elliptical eye shaped wall of mortared bricks 2.5m by 1.4m was constructed over the footings. On the inside of this was a layer of burnt brick and clay cladding and there were a series of hollows that appear to be firing chambers around 1.6m long by 0.6m wide and 0.10m deep. The overall effect was an eye shaped plan with a central raised pedestal for the stacked pottery, surrounded by a ring of firing chambers separated by baffle walls with a flue at the southwest point of the kiln. The internal firing area was 2.05m by 1.10m in extent, giving an area of 1.6 square metres. Later damage means that it is impossible to determine exactly how many flues the kiln had and what type it belongs to (*cf.* Musty 1974). It may have only had one flue, in which case it could belong to type 1a, which is characteristic of East Anglia although unusual for such a late date. It is perhaps more likely that this is a type 2c double or opposed flued kiln (Musty 1974, 44–46 and 63; see also Crossley 1990, 269–70), with one flue having been destroyed. Type 2 kilns begin in the 13th century and continue until the 18th, with type 2c examples known relatively locally from Brill, Buckinghamshire, dating to the 14th and 15th centuries and Lyveden, Northamptonshire, from the 14th century (Musty 1974). The double flue would have given a more even distribution of heat than a single flue. Pottery kilns of this date are predominantly circular or oval with other examples being 2.2 to 2.5m in diameter if circular or 4.4 by 3.3m to 3.68 by 0.88m if oval (Anderson *et al.* 1996, 5–6; Jarrett and Sabel in Divers 2004, 117–18).

Kiln superstructures could be either a clay dome or a temporary cover made of such elements as wasters, bricks, tiles or turves (Crossley 1990, 271–72). There was no evidence of large quantities of fired clay associated with material dumped from the kilns, so it appears likely that there was a temporary cover made of one of the readily available materials. As some vitrified brick was found in associated with Kiln 3 and the pottery dumps it is likely that the superstructure was at least partially constructed from these. When the kiln was ultimately abandoned it was backfilled with a deposit of burnt brick, tile, stone and pottery wasters dominated by Broad Street Glazed Red Earthenware.

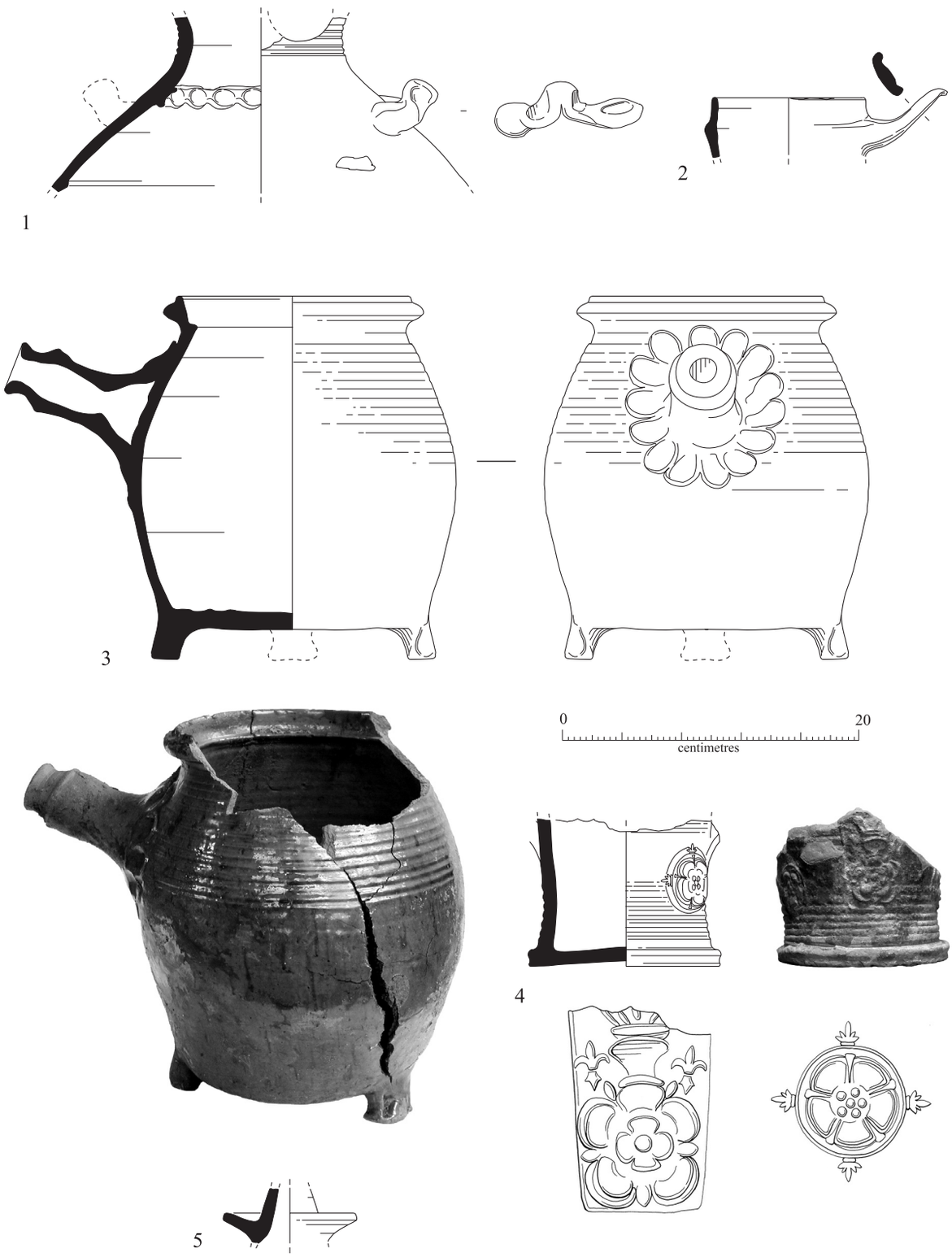


Figure 45 Broad Street Glazed Red Earthenware miscellaneous

1) Probable churn with a pinched handle and decorative applied rib inside that is probably a churn, buff orange fabric. Saggar type hole near rim. One patch of green glaze externally, clear internal glaze over most of surface 2) Small pipkin with stub handle. Dark fabric with a few grits; patchy internal glaze 3) Large pipkin with a single spout-type handle, three feet, hollowed seat for a lid. Cracked in kiln and glaze ran in. Orange fabric containing a few large brown grits. Clear very light green glaze with a few iron spots than ran into small 'tear drops'. Glazed inside and out including base but excluding most of handle. Rilled decoration on top 6cm. Handle thumbed pressed on
4) Base of jar or large jug, rilled and dark green glaze both sides, three rosettes of decoration, there were probably six in total, orange fabric
5) Lamp or part of a candle stick, orange-red fabric, dark green glaze all over

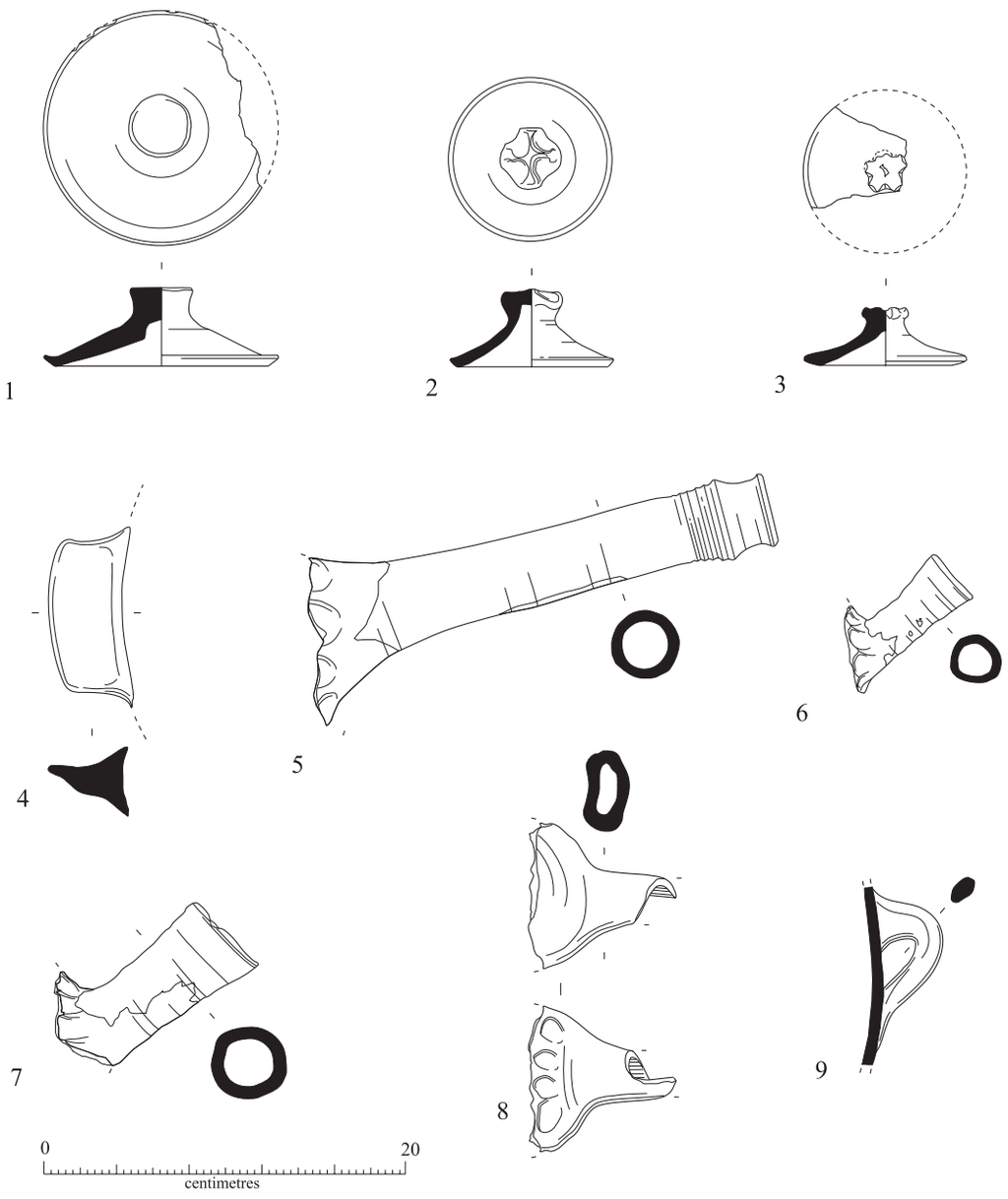


Figure 46 Broad Street Glazed Red Earthenware lids and handles

1) Lid in red fabric with buff surface. Underside unglazed, clear glaze on upper side, light green with a very few copper speckles 2) Lid in red fabric with buff surface. Underside unglazed, clear glaze on upper side, light green with a very few copper speckles 3) Lid in orange fabric with pinched top, upper green-brown glaze 4) Plain red stub handle from large vessel 5) Very large hollow handle, finger presses where broken for a rosette attachment; glazed dark green; orange fabric with biscuit coloured surface externally 6) Handle in orange fabric, traces of rosette fixture, slightly rilled, near the vessel, speckles and patches of green glaze 7) As 46.5 8) Handle with pink surface with patchy green glaze 9) Simple strap handle

Such a kiln could not have fired large quantities of pottery at a single go. It has been suggested that broadly similar kilns at Laverstock fired 25 to 30 jugs per load (Musty *et al.* 1969, 92–3) and the largest type 2 kilns could fire up to 600 vessels (Orton 1982). Kiln 3 could probably have held between around five and fifty vessels depending on type on a single level, with a mixed load of around 30 vessels of different types perhaps the most likely scenario (Figure 35). It is uncertain how many levels could have been stacked, but in total a load of 100 to 200 vessels seems feasible. The pit beneath Kiln 3 held the remains of over 300 vessels and a similar number was present in the largest of the other dumps. In terms of the scale of trade a crate of pottery contained approximately 100 pieces, a cask or hogshead 500 to 1,000 pieces and a cart load was 200 to 240 crates (Weatherill 1983).

The superstructure of such kilns was probably substantially rebuilt each year. Their overall lifespan was probably between five and ten years (McCarthy and Brooks 1988, 46), before they had to be replaced, usually in a different location, due to breakdown of the kiln floor. This means that the deposition of the pottery in the pit

Figure 47 Grotesque face and mould

1) Grotesque face with concave back, probably chipped off a large vessel where it formed an embossed decoration. Buff surface, orange fabric, spot of clear glaze on the nose 2) Mould for grotesque face in orange fabric with a splash of clear glaze. From modern feature

beneath the floor dates from 1500 to 1585. Given that the pottery industry in the Broad Street area spans several centuries and the scale of dumping identified it is likely that several dozen kilns must have existed over time but only one kiln definitely associated with pottery production has been found. Whilst some may have been entirely destroyed and it is possible that insubstantial clamp kilns were still in use (*cf.* Crossley 1990, 268) the failure to discover more kilns is perplexing. Possibly the core of the industry lies in an uninvestigated area.

It is impossible to categorically link any pottery wasters with Kiln 3, but there are a number of broadly contemporary dumps. These include two groups from the backfilling of Channel 1 and a general dump around 30m southwest of Kiln 3 (Figure 37.1). The larger dump in Channel 1 contained nearly 1200 sherds weighing over 69kg, plus 48 saggar fragments. Broad Street Glazed Red Earthenware is the dominant fabric (83.2%) with some Plain Red/Pink wares (2.8%) and some Broad Street Glazed Red Earthenware Bichrome (7.8%). There was also some Babylon ware (6.3%), but no Broad Street Fineware. There were 259 Broad Street Glazed Red Earthenware vessels; 59% bowls, 36% jars, 3% basting dishes and 3% jugs. The 20 Plain Red/Pink ware vessels were 55% bowls and 45% jars. Of the Broad Street Glazed Red Earthenware Bichrome, 73% were globular vessels and 27% jars. The other smaller assemblage from Channel 1 consisted of just over 100 sherds weighing nearly 8kg,

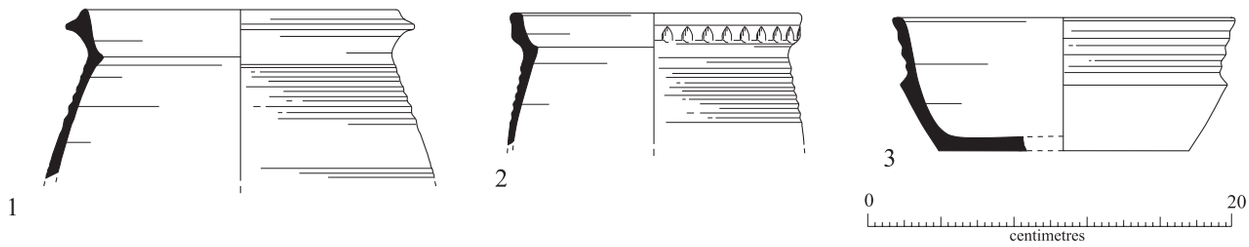


Figure 48 Broad Street Glazed Red Earthenware Bichrome

1) Hollowed jar rim, rilled bands externally. Orange with some iron flecks, smudgy patches of iron or dark green under clear green glaze exterior and a little inside at top 2) Jar in orange fabric with very occasional grits. Everted rim decorated outside with knife nicks and many rows of horizontal rills. Dense green external glaze and clear internal glaze 3) Small dish, orange fabric with a few white grits. Clear internal glaze with a few small iron flecks. Exterior rib and rilled decoration. Dark green glaze with dark diagonal streak of darker green and a few brown streaks

plus 23 pieces of saggar. Broad Street Glazed Red Earthenware is the most common fabric (43.2%), plus Plain Red/Pink wares (50.0%) and some Broad Street Glazed Red Earthenware Bichrome (5.1%). There was also some Babylon ware (1.7%), but no Broad Street Fineware. The other dump consisted of 178 sherds weighing over 9.5kg and was dominated by Broad Street Glazed Red Earthenware (94.4%), some Babylon ware (5.1%) and a single sherd of Broad Street Fineware.

It appears that two broad phases of 16th-century pottery can be identified; with a continuity of production and overlap of wares between the two. The earliest phase is dominated by Broad Street Gritty Red Earthenware, but with Broad Street Glazed Red Earthenware, Plain Red/Pink wares and Babylon ware present. The second phase sees the disappearance of Broad Street Gritty Red Earthenware and the increasing importance of Broad Street Glazed Red Earthenware and the associated Plain Red/Pink wares. Babylon ware is also a significant component, whilst Broad Street Glazed Red Earthenware Bichrome and Broad Street Fineware are relatively minor elements. The pottery in the pit under the kiln floor is distinctive with Babylon ware and Broad Street Fineware being more common than in other deposits. It is possible that this represents a brief period of greater diversity within the overall phase. It also appears that Broad Street Glazed Red Earthenware Bichrome may have had a short lived, but rather different, *floruit*. This pattern continues into the 17th century when Broad Street Glazed Red Earthenware dominates (see below). At Forehill Babylon ware appears slightly earlier than Broad Street Glazed Red Earthenware (Alexander 2003, 144–45), suggesting that the period when Babylon ware is most common may be relatively early.

Although it is impossible to date the two phases precisely there are a number of pieces of dating evidence, both from Jewson's and at other sites where the pottery has been recovered. It must however be borne in mind that there is a potential time lag between the *floruit* of wares on production and consumption sites. This time lag is probably not long and may be measured in years rather than decades (*cf.* Mills 1989), with a likely ceramic lifespan from production to discard of perhaps 15 to 25 years (*cf.* Adams 2003). The earliest phase represents continuity with the medieval industry based at Potters Lane, but as there is no clear evidence when production there ended other than a general ascription to the 15th century, this is not very helpful. The only independent evidence is the association with a shoe *c.*1520 to 1545 and most popular in the 1530s (Figure 31). The second phase is sealed by the kiln floor archaeomagnetically dated to 1510 to 1590, suggesting that the waste was deposited between 1505 and 1580. A pit group at Pembroke College, Cambridge, where 93% of the pottery was Broad Street wares, is dated to the late 16th century (Hall, D. in Hall, A. 2002). Broad Street Glazed Red Earthenware dominates (132 sherds, 70.1%) with a substantial component of Babylon ware (22 sherds, 12.6%) and Broad Street Fineware (20 sherds, 11.5%). This group most closely matches the second 16th-century phase of production and the Pembroke pit assemblage contained late 16th-century imported pottery; including sherds of German stonewares from Frechen, decorated Netherlands maiolica type and a scalloped bowl in off-white fabric with a turquoise tin glaze. There were also two 16th-century Nuremberg jettons dated 1570 to 1635 and 1585 to 1635, indicating that the assemblage was deposited after 1585. At the Folk Museum, Cambridge, Broad Street wares were mainly associated with a phase that appears to correspond with a depiction of the area in 1592 and also produced 16th- or 17th-century jettons, including one dated 1585 to 1635. At Jewson's an assemblage associated with a Nuremberg jetton dated *c.*1550 to 1590 was dominated by Broad Street Glazed Red Earthenware (84.1%, plus 4.1% Plain Red/Pink ware), with a substantial Babylon ware component (10.1%) and a little Broad Street Glazed Red Earthenware Bichrome (0.9%) and Broad Street Fineware (0.4%). A smaller group consisting solely of Broad Street Glazed Red Earthenware (51.7%, plus 13.8% Plain Red/Pink ware) and Babylon ware (34.5%) was associated with a late 16th-century jetton. In 1649 the Segwyk holding (Figure 26) included 'one workeinge house for potters', indicating continued pottery production in the Jewson's area. Material containing clay pipes dated *c.*1660 to 1680 and *c.*1680 to 1710 and copper farthings dated 1672 to 1775 and 1695 to 1700 seal the deposits related to pottery production. This suggests that pottery production ended in the vicinity prior to the late 17th century, although it is possible that it ended considerably earlier than this. Overall it appears likely that the earliest phase dominated by Broad Street Gritty Red Earthenware should be dated to the first half of the 16th century *c.*1500 to 1550, although given the general rarity of Broad Street Gritty Red Earthenware the phase is likely to be much shorter than this date range suggests. The second phase dates to the second half of the 16th century

Figure 49 Babylon ware

1) Babylon jug, almost complete, with one handle and a slight lip. Red fabric, various cracks; bottom broken away in kiln and glaze ran over the exposed. 2) Large jug or jar with spacer tile stuck to it. Possibly four handle scars and remnants of small rosette and leaf embossed decoration. Grey hard partly vitrified fabric. 3) Small Babylon jug with looped handle and two blobs of yellow slip, possible of fleur de lys. 4) Small tankard in red earthenware; black glaze inside and out except for exterior of the base. 5) Almost complete straight sided tankard with one handle, a few rills at the bottom, orange fabric, iron dusted, rather patchy brown glaze. 6) Complete base, two adjacent handle scars, orange fabric, dense black lustrous glaze. Rim piece does not join, band of rilled decoration. 7) Near complete tyg with two handles, the surviving one twisted; several bands of rilled decoration, Orange fabric, lustrous black glaze. 8) Costrel rim; orange fabric, two small pierced lugs, external rills, black external glaze with a small splash internally. 9) Finial. 10) Part of handle with embossed knob; green-black glaze, orange fabric. 11) Typical base. 12) Typical base

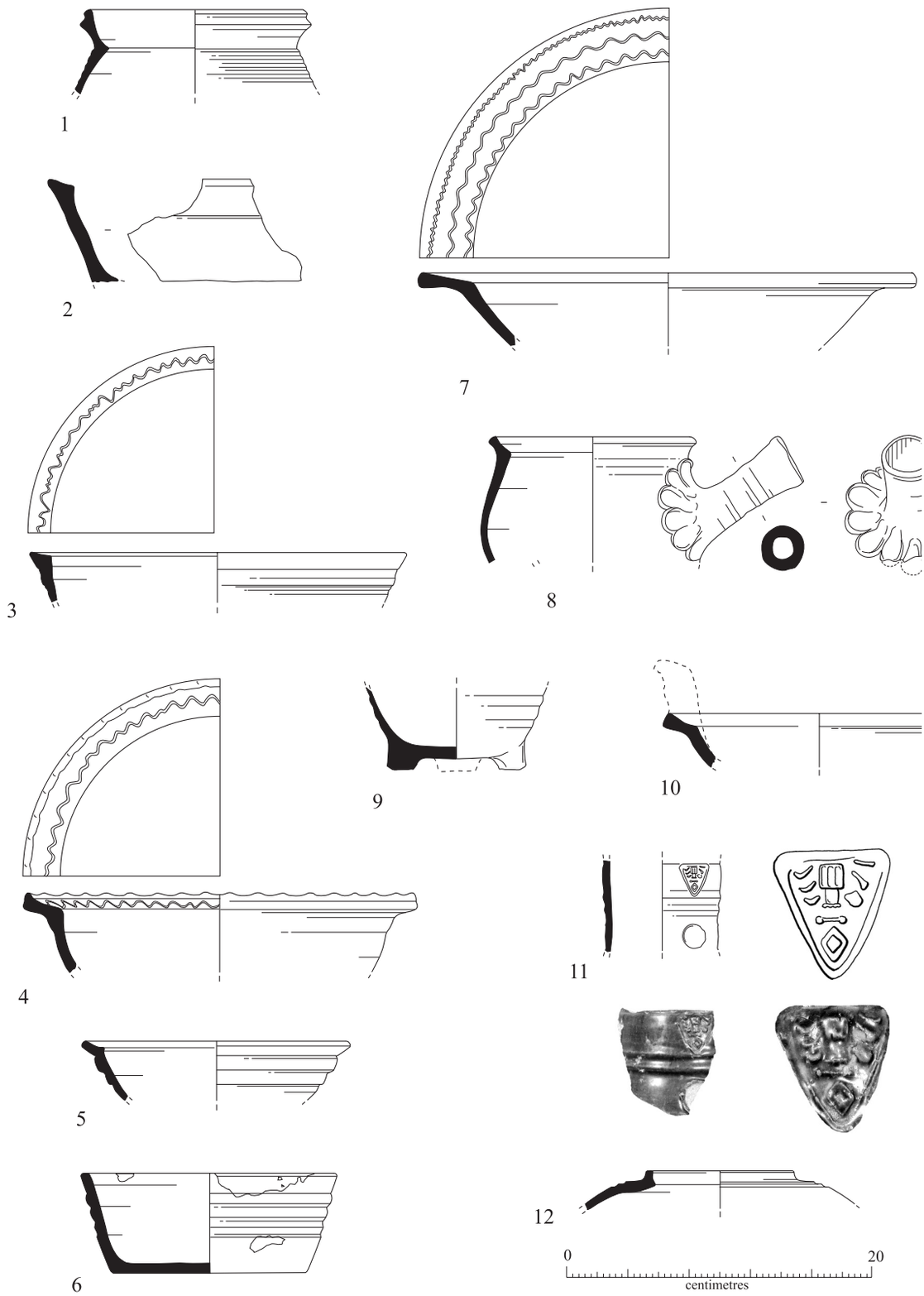


Figure 50 Broad Street Fineware

1) Hollowed jar rim in buff fabric, rilled externally. Dense green glaze, slight tipped decoration on rim, clear internal glaze, a bichrome. 2) Dish in light pink fabric, dense green both sides, narrow flat rim. 3) Dish in off-white fabric, incised decoration on top of flat rim, all-over light green glaze with darker patches of green. 4) Rim of small dish with everted rim; off-fabric with one pink patch. Wavy decoration on rim and topped with brown iron blobs on slightly wavy rim edge. Green glaze all over. Similar undecorated rims are common. 5) Small dish green glazed both sides. 6) Dish, off-white with pink-buff surfaces where exposed. Green glaze both sides with a few iron flecks. 7) Everted flanged rim bowl with three rows of decoration. 8) Small pipkin, off-white with hollow applied handle in orange-firing fabric, dark green glaze both sides, petering out on the handle. This is the commonest rim form of which there were a large number, some of which were bichromes with internal clear glaze of light green contrasting with the dark green of the exterior and one had a handles scar in red clay attached to the rim. Probably used as a skillet. 9) Skillet base with three feet in red clay and body rising to rills, off white. 10) Chafing dish, off-white with applied red-clay handle/finial, specked green glaze both sides. 11) Jug with armorial-type decoration. Off white with hint of pink. Dense green glaze both sides. 12) Globular jar rim in orange fabric with green glaze on the outside only, probably a fine ware

*c.*1550 to 1600, within this it appears that the *floruits* of Broad Street Fineware and Broad Street Glazed Red Earthenware Bichrome were relatively short-lived events.

It has been suggested that in the period 1450 to 1550, sometimes referred to as the 'post-medieval Ceramic Revolution', wealth became increasingly concentrated in towns and there was an increasing mercantile and artisan elite (Gaimster 1994; Gaimster and Nenk 1997). This elite sought to use conspicuous display of consumer goods including ceramics to represent their status. At the same time there was increasing formality in dining, including the use of individual place settings with individual vessels and utensils. The lower middle classes, who could not afford more expensive metal vessels, could use ceramic vessels to emulate the upper middle classes.

In the late 16th century a number of documentary sources begin to be produced which name individual potters (Table 18). The earliest named potter in Ely is Richard Bateman, who was buried on 12 February 1594 at Holy Trinity. Baptismal records suggest that he had been in Ely since 1560, implying a career spanning at least three decades. There are no records that he was born or married in Ely suggesting that he was an incomer. The next potter, John Stivers, died in 1610 and had been active since 1588, again based upon baptismal records, suggesting a career of around two decades. He overlapped with Richard Bateman, perhaps because Bateman had become too ill or elderly to work. After this documentary sources indicate that pottery production continued uninterrupted into the second half of the 19th century. Some of these sources shed light upon the nature of the pottery industry, which was probably substantially similar to the 16th-century situation (see below).

Kiln 3 and 16th-century pottery dumps indicate that the Ely pottery industry successfully made the 'leap' from medieval to post-medieval that some other industries such as Grimston failed to, perhaps due to conservatism (Leah 1994, 122–23). It was also at this time that production at Colne ended (Healey *et al*. 1998). During the 12th to 15th centuries pottery production was focussed in the Potters Lane area (Spoerry forthcoming). The shift in focus to the area between Broad Street and the river Great Ouse, a relatively short distance of just under 300m, must have represented a major dislocation. It is tempting to link this spatial transition to the 'leap' from medieval to post-medieval pottery production. The primary factor in the location of pottery industries was the supply of clay, with water and markets also being important (Moorhouse 1981, 96). The shift makes little sense in terms of access to clay, as it was apparently obtained from fields more easily accessed from Potters Lane. Water was more readily available closer to the river, but the main factor would seem to be the better transport links provided by the river and especially the nearby channels for boats. There is some evidence linking the medieval and post-medieval industries, as the Broad Street Gritty Red Earthenware fabric contains similar inclusions to medieval Ely ware. Although the Broad Street products are distinctively post-medieval, the organisation and nature of the Ely pottery industry appears to be essentially medieval in character throughout, representing localised essentially non-industrial production into the 19th century (*cf.* Martin and Martin 1996).

Of the pottery produced here, Broad Street Glazed Red Earthenware is the most common discovery at other sites in Ely (Table 15), with Babylon ware a ubiquitous occurrence in low quantities. Broad Street Fineware is found occasionally, but Broad Street Glazed Red Earthenware Bichrome and Broad Street Gritty Red Earthenware have not been found. A similar pattern is found at sites in Cambridge (Table 15). Unfortunately limitations on visually distinguishing some of the Ely products, particularly Broad Street Glazed Red Earthenware, from similar wares produced elsewhere limit discussions of the trade in this material. As similar wares were produced at a wide range of kilns in East Anglia, it is likely that its distribution was relatively limited. It is only the rarer and more readily identifiable products, such as Broad Street Glazed Red Earthenware Bichrome identified at King's Lynn, Norwich, Baconsthorpe Castle and Thetford, that give some idea of distribution. In certain respects the post-medieval Ely pottery industry follows a similar trajectory to its medieval predecessor. At a time of major transition in pottery industries nationally the Ely industries flourish and their products achieve a considerable distribution both northwards and southwards via river networks. This initial success, although it is maintained for perhaps a century or so, eventually fails in the face of external competition and Ely products become confined to local markets where they continue to exist on a more limited scale for centuries. This suggests that the geographical situation of Ely meant that it was able to respond relatively rapidly to large scale national changes giving it an initial dominance, but in the long term it suffered from weaknesses that meant it could not compete with other industries.

Although Kiln 3 is the only feature definitely associated with pottery production there are a number of pits and a building that may be associated with it. After clay was obtained it would be left to weather in heaps, this would probably take place in the winter when weather conditions made firing impractical, but were well suited to weathering. The clay was then mixed with sand temper and water in puddling pits before being shaped in a workshop. Several possible puddling pits were located around 20m to the southwest of the pottery kiln. Two of these, Puddling Pits 1 and 2 (Figures 17 and 27), were located together and were shallow, roughly oval, measuring around 3.0 by 4.0m and 2.0 by 3.0m and in excess of 0.2m deep filled with mottled blue and light brown clay with no inclusions. Puddling Pit 3 was a shallow sub oval 2.3m by 1.1m and over 0.4m deep with dark grey and tan clay in its base.

Although the construction of Kiln 3 impacted upon Building IV, sections of its walls were repaired at roughly the same time and it continued in use whilst Kiln 3 was in operation. The owner of Building IV presumably also controlled Kiln 3, even if they were not the actual potter. Given the impact that Kiln 3 had on Building IV it is quite likely that they made some use of the structure as a workshop, although it may still have fulfilled some functions with regard to the nearby channels. After shaping, glaze would be applied and the pots dried by being stacked on shelves in an airy place for some time, a function for which Building IV would have been well suited. The pots would then be fired. A single firing in a structure such as Kiln 3 would take just over a day with around eight hours for stacking, two to three hours to warm up, ten hours of firing and six hours to cool down so that pots can be removed (Mayes 1968, 69). Firing probably only took place for part of the year due to weather conditions.

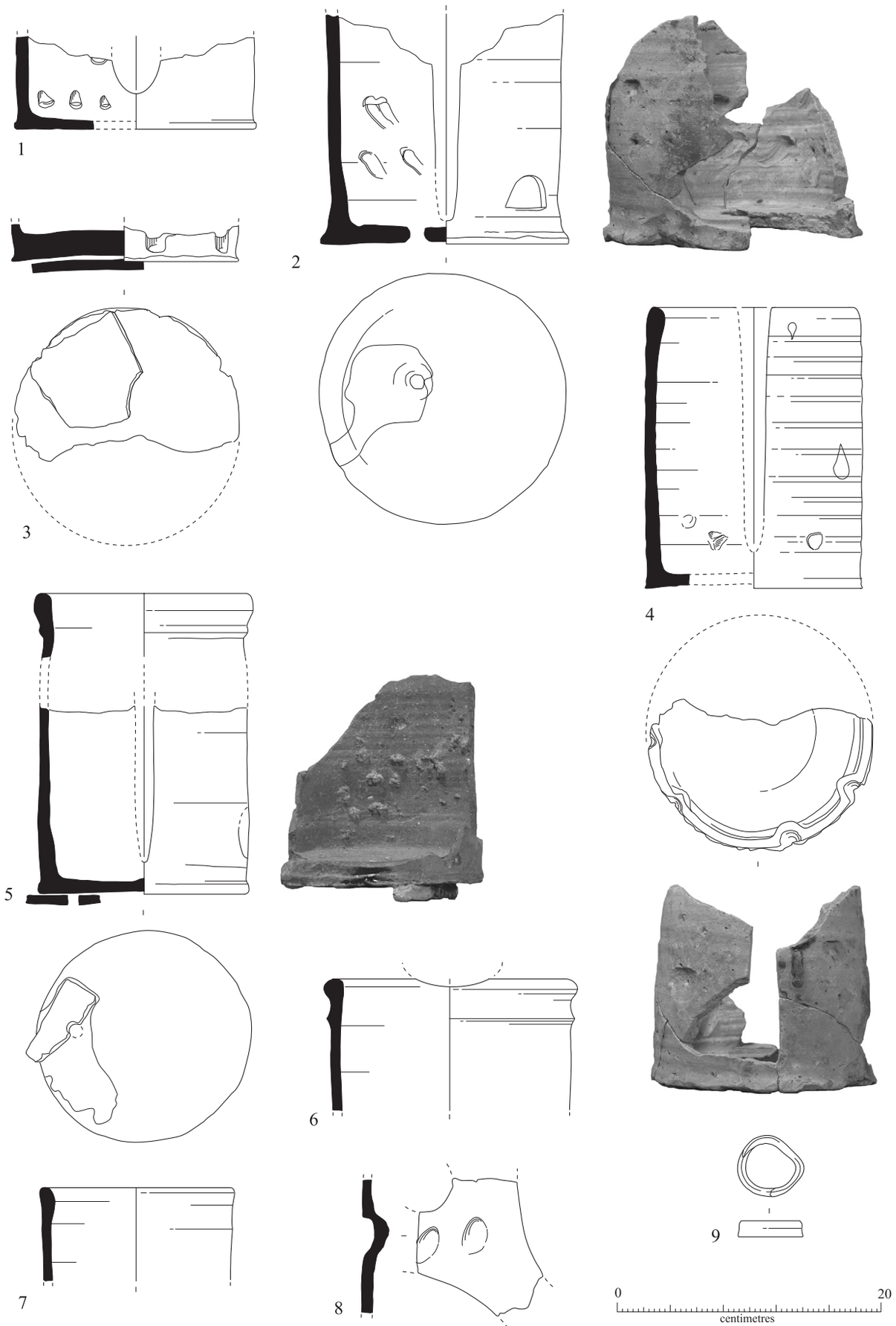


Figure 51 16th-century saggars; all light yellow biscuit fabric unless otherwise described (see facing page)

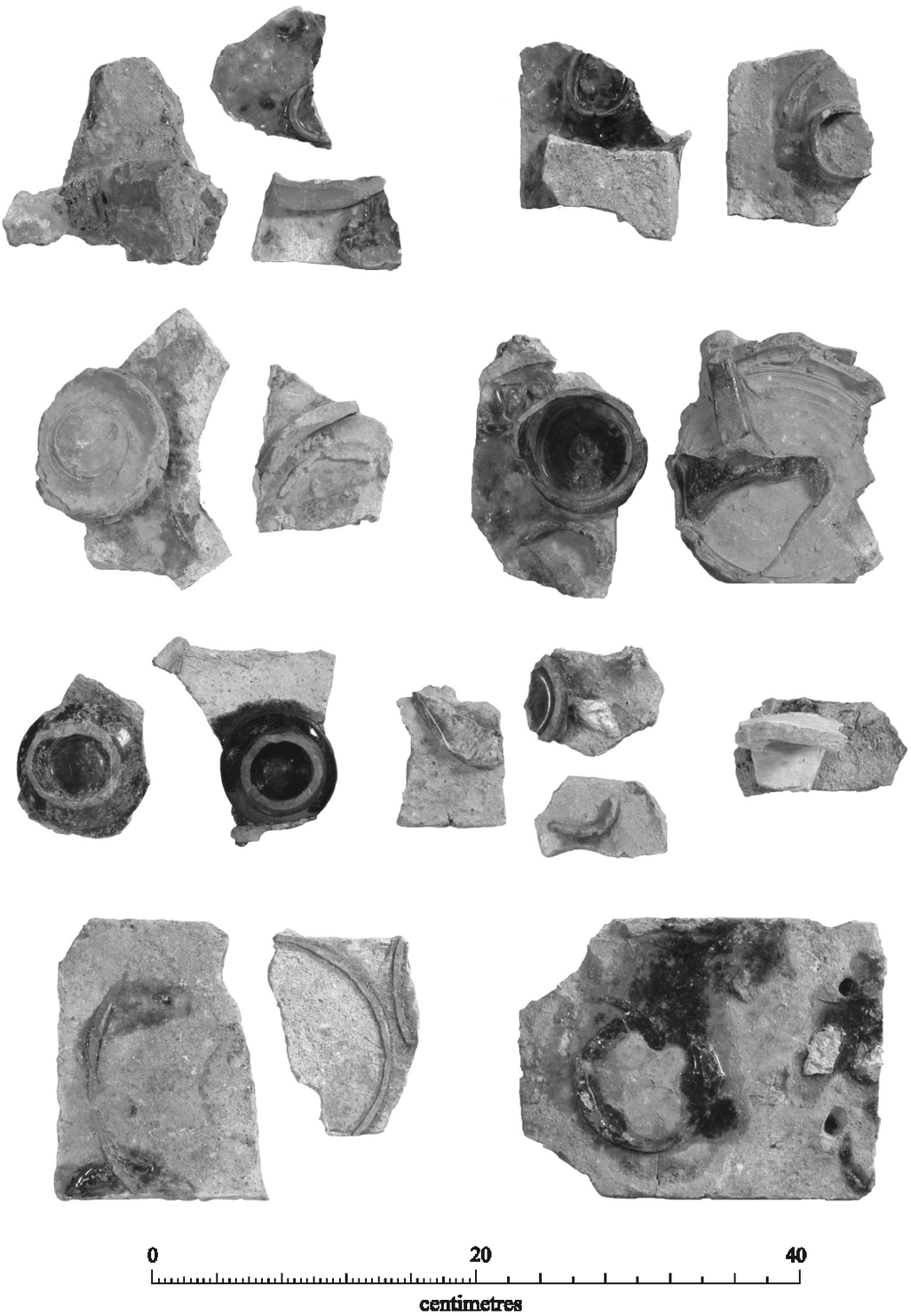


Figure 52 Tile seaters, spacers or separators

Figure 51 (opposite) 1) Base with one edge of a low placed vent, probably belongs to a rim with ridge below it. 2) Near complete apart from rim; hole in base, two vents in side of different shape. Some gravel pieces in fabric. 3) Coarse yellow fabric; base with holes made on edge. 4) Complete profile. Hard grey fabric with a few white grits, internal and external rills. One long vent almost from top to bottom and a small one at the top; at least two raised thumbed ledges inside, probably for lodging a vessel. A few small patches of green glaze externally and one on the base. 5) Red fabric with grey surfaces, base near complete coarse with white grits and spacer tile with peghole stuck to it, at least two large vents. 6) Upright rim. 7) Upright rim. 8) Profile with parts of three vents and two thumb pressed lodges with some green glaze splashed on. 9) Subcircular annulus rounded one side and cut flat on the other side, brown glaze on the rounded side

Channels

Channels 1 and 2 (Figures 18, 19, 27 and 53) continued in use into the 16th century. Their earliest fills, which probably accumulated at this time, were waterlain silts with some preserved plant material, suggesting flowing water. At this time Channel 3 was dug 7m to the southwest of Channel 2, cutting through its bank (Figure 18, 19, 53 and 56). Channel 3 is similar to the earlier channels, over 4.0m wide and 1.5m deep. It was at least the same length as Channel 1, but appears to be considerable longer, probably running around 70m from the current rivers edge although it becomes somewhat irregular. Clay excavated from the base of Channel 3 was used to line the banks. After a period when clay silts had built up at the northwest end of Channel 3, another channel was dug. This channel (Channel 4), extended northwest for at least 24m, but veered off sharply to the southwest where it cut Channel 3. Between Channels 1 and 2 was Lifting Gear 1, a row of three postholes approximately 3.0m from the edge of Channel 1 and two large postholes or pits approximately 1.5m from the channel edge (Figure 54). Some of these probably mark the position of a small platform or some kind of winch or crane for unloading cargo, probably a hoisting spar (Figure 56) (Ellmers 1981 93–95; 1989; Hutchinson 1994, 111–13). Between Channels 2 and 3 two pits were dug and may be part of a similar structure Lifting Gear 2 (Figure 54), although ultimately they were used for the disposal of waste.

The accumulation of peat layers in Channels 1 and 2 show that eventually any measures to keep the bottoms clear of vegetation were abandoned and the banks began to erode, contributing to the channels gradual infilling. Channel 2 was recut and widened at the river end, but shortly after peat deposits built up. In the late 16th century ashy deposits accumulated in Channels 2, 3 and 4, deriving from Kiln 3 or other nearby industries. The later fills of Channel 2 were deposited under dry conditions, and may indicate the channel was blocked off at the river end. In Channel 3 the same sequence was witnessed, but a horizon of water snails below the latest fills suggest at least one episode of flooding.

It is difficult to tell exactly how long the channels were in operation. Regular cleaning would keep them clear of material while in use and any dateable material within the fills probably belongs to the later period when the channels were neglected and allowed to fill up. Deliberate filling of these is likely to include the use of material discarded elsewhere at a much earlier date and any evidence from this type of deposit must be treated with caution. It is impossible to determine whether Channel 1 was still a functioning navigable channel when Kiln 3 was in use or not. As a result the dumps of material in the upper fills of Channel 1 could be contemporary with or later than Kiln 3. Overall it seems that at least some of the channels survived for over a century.

A survey of 1565 recorded that Ely had one wharf and three barges, with a combined capacity of 22 cart loads (Summers 1973, 39). This provided employment for eight people, mainly transporting grain to King's Lynn. Although the excavated channels need not have been regarded as wharves the impression is that the river trade from Ely had declined substantially by 1565. The channel infilling occurred in the late 16th century, this probably followed prolonged decline and disuse and it may be that none of them were in use by 1565.

A primary waterlain fill of Channel 1 contains seeds of mainly sedges and knotweed with low numbers of lesser spearwort, stinging nettle and chickweed suggesting damp to wet soil, rather than watery conditions. A similar primary waterlain fill of Channel 2 includes egg cases of water flea; there are also seeds of hemlock, a plant characteristic of damp and disturbed ground, and an indeterminate Carrot Family plant. Seeds of the water living lesser spearwort and of crowfoot are also present, as are a small number of aquatic molluscs. This suggests open, standing water with disturbed soils nearby.

Pollen from Channel 3 is dominated by herbs, with small numbers of trees and shrubs. The trees were mainly oak with hazel type and willow, plus sporadic occurrences of other trees and shrubs including walnut. These probably represent remaining woodland in the region and the low values suggest Ely was devoid of trees and some distance from the nearest growth. Walnut may be an exception; these were grown in Britain from the 13th century and could have been ornamental or provided nuts, walnuts were found in 14th-century contexts at Forehill (Stevens in Alexander 2003, 166). The herbs are diverse and dominated by grasses with dandelion types and cereal type is present throughout. Other peaks of mustard type, meadowsweet, Carrot Family, plantain and composite family types are present. Marsh/aquatic taxa comprise sedge with occasional plantain type and narrow leaf cat's-tail/bur-reed type. There are small numbers of spores of monolete fern type including bracken. The pollen taphonomy is complex, with the possibility of pollen transport via fluvial and airborne means. It is likely that sedge and other marginal aquatics including water plantain, reed mace and/or bur-reed fringed the river and channel edges. The adjacent area was open disturbed and waste ground. The intestinal parasite round worm occurs sporadically, indicate the presence of faeces. Small quantities of cereal pollen and the weeds of waste ground may also derive from secondary sources, such as domestic waste or cereal processing.

At the landward end of Channel 1 total tree and shrub pollen values are slightly higher in the lower part of the profile. The most important taxa are oak, alder and hazel type. Other trees include sporadic birch, pine, ash, hornbeam and beech. Herbs are dominant with grasses and sedge being the most important taxa. The herbaceous diversity is moderately high consisting largely of ruderals, mustard type and plantain. Of note are cereal type and hemp type. Marsh and aquatics comprise sedge and occasional Eurasian water milfoil, buckbean and narrow leaf cat's-tail/bur-reed. There are relatively small values of ferns, including bracken. At the river end, trees and shrubs have lower values but with oak and hazel most important, willow is also important early on. Herbs are dominant with grasses and dandelion types becoming important later. Also of note are peaks of mustard type, hops/hemp type in the earliest level and cereal type. Fen/aquatic taxa are dominated by sedge with occasional pond water-starwort, buckbean and narrow leaf cattail. Spores comprise monolete fern type, including bracken.

The two ends of Channel 1 might be expected to have comparable pollen. This is to some extent the case, although there are differences due to the complex stratigraphy. The landward end has higher percentages of trees and shrubs, the taxa are the same representing a background of oak and hazel, possibly managed

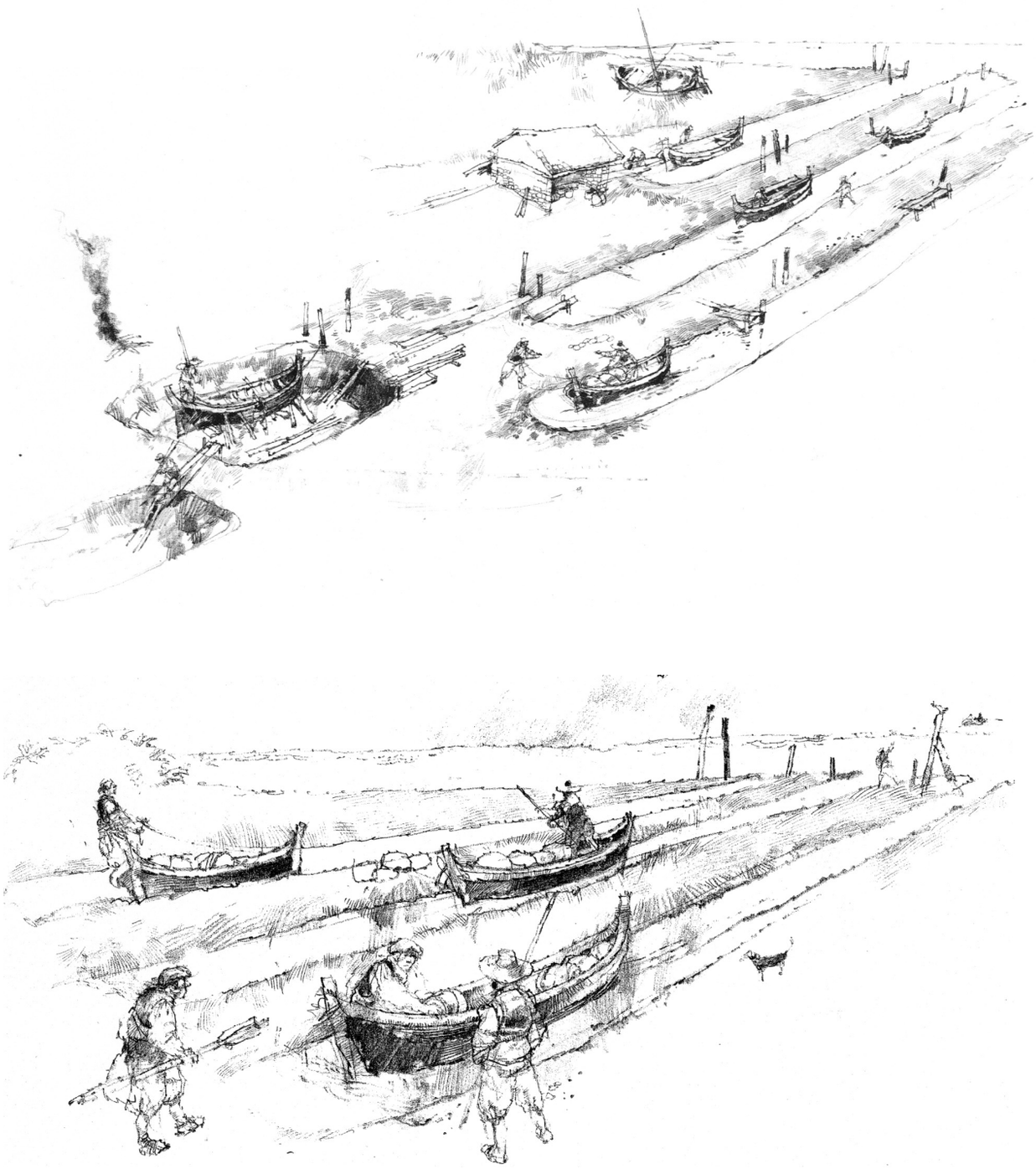


Figure 53 The area near the river in the 16th century, *by Victor Ambrus*

woodland, within the regional context. Other less well represented taxa include beech, ash, hornbeam, willow and Guelder rose, which may have been locally present or transported by water from further afield. The diverse range of herbs dominated by grasses and weeds of waste and disturbed ground are typical of an urban environment. Cereal pollen and the pollen of arable weeds are at least partially of secondary origin from domestic waste. Hop or hemp is sporadically present and may be from hemp cultivation or hops from brewing. Sedges and other marginal aquatic and aquatic taxa attest to the watery environment. Peaty silts at the river end contain higher values of willow; this is largely underrepresented in pollen spectra and was probably growing along the channel edges. In 1599 Camden commented that 'willow grows in great abundance, either growing wild or set on the banks or rivers to prevent overflowing'. It was probably utilised for basket making (Page 1967, 361) and photographs show osiers, willows with long rod-like twigs favoured for basketry, being landed in the late 19th century (Figure 4). The pollen spectra have a diverse range of weeds of waste and disturbed ground with grasses extremely important, some of which may be local. The river end displays a sharp expansion of dandelion types, mirroring the change from peat to alluvial minerogenic sediment. Pollen preservation is poorer and the increases of dandelion types and fern

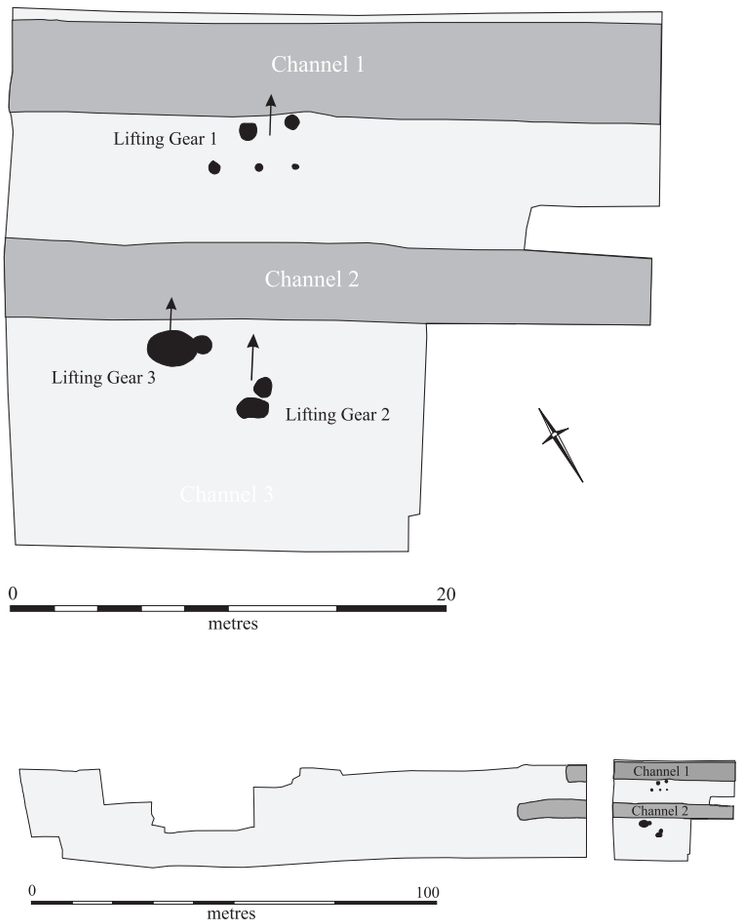


Figure 54 Lifting Gear 1, 2 and 3

spores indicate differential preservation in favour of these type. Less robust types, for example grasses and sedges remain and it is most probable that robust types are residual, and possibly reworked from older deposits.

Material Culture

Three weights (Figure 69) suggesting commercial activity were found and iron tools recovered close to the river include a file, a punch possibly for metalworking, a large blade possibly a broken draw knife or spoke shave, a possible chisel and a spoon drill bit, perhaps for boat repair. Evidence for warfare comes from the lead alloy cap of a musketeer's powder holder. A decorated copper alloy book clasp with minerally preserved organic remains from the leather book cover (Figure 9.3) represents the first evidence for literacy on the site since the 11th century.

A small amount of evidence for the working of copper alloy and lead alloy was recovered. Two rectangular pieces of leaded bronze cut from ingots or cast vessel legs are scrap metal awaiting recycling. A small piece of copper alloy slag, also a leaded bronze, was found in the same context. A conglomeration of articulating iron mail rings may have been used to polish metalwork. A small amount of spillages of lead alloy were found plus two sprues of pewter from two-part mould castings. A small quantity of 16th- and 17th-century bar iron was found.

Some groups of mainly domestic metalwork were found, but as these contain identifiable 13th- and 14th-century elements it is likely they are largely residual. Iron items include horseshoes, a large rotary door key, a fragmentary padlock slide key, a large U shaped staple, a decorative box binding of non-ferrous plated iron, a pierced spike from a window grille, and a small L shaped hook variously interpreted as a tenter hook, tile pin or hook to hold wall hangings and tapestries. A fragment broken from a lead alloy openwork grille or ventilator was also found. Copper alloy finds include numerous dress items such as pins and brooches or buckles and a length of chain with a suspension fitting, possibly for suspending a lamp.

The products of the local kilns (see above) dominated the post-medieval pottery assemblage and other material accounts for less than 4% of the Jewson's assemblage (Table 16). Six tin glazed earthenwares, mostly English, were found and a few 17th-century sherds from Staffordshire. From the Continent there were 31 sherds of Dutch Glazed Red Earthenware and 35 15th- to 17th-century stonewares from Raeren (19), Langerwehe (11), Frechen (4) and Siegburg (1). There were also five English stonewares.

The animal bone shows some changes from earlier phases. Cattle horn cores increase dramatically, accounting for 42% of this species in the central area of the site. This is a strong indication, especially as some of the horn cores are cut, of the production of horn artefacts, although it is likely this was also linked to tanning of cattle skins (*cf.* Coy and Allen 1997). The horns would be soaked in water filled pits for weeks after which the sheaths were removed and boiled before being turned into various products such as combs,

lanterns and windows (MacGregor 1985). 71% of the sheep/goat bones from the same area are metapodials, related to tanning, since the feet remain attached to the hide when an animal is skinned. Several complete or partial dog skeletons were found indicating several breeds are present, with differences in skeletal conformation and shoulder heights of between 582 and 700mm (*cf.* Harcourt 1974). It is impossible to say whether these dogs were owned or strays. As the majority are quite large breeds they may be guard dogs. Chickens, geese and ducks are still present but wild wetland birds in the form of bitterns and great cormorant are also present. A large number of bones probably from at least six immature carrion crows or rooks were found in a single deposit. This might be the remains of a meal, such as a rook pie, or the birds may have been taken from a nest and killed because they represented a threat to young poultry or wild game. The remains represent the more distal parts of these birds which supports the idea that they are the discarded parts of birds taken for the table.

Environmental samples have been examined from Oven 3 and Kiln 3, the latter containing few charred plants. In contrast, Oven 3 is rich in charred remains of wetland plants and mollucs, and is a characteristic 'sedge ash' context. The fuel appears to have been a mixture of great fen sedge with other plants, particularly black bog-rush and both reeds and straw, which survive as stem joints. The few cereal grains are predominantly of barley, the only well preserved barley chaff was also recovered from this context. Three rachis internodes are clearly the two-row type, this is consistent with the straight grains within the earlier malting remains (see Chapter 4).

Two waterlogged contexts within Channel 3 have produced similar results, with low amounts of charred plants, largely charcoal fragments and sedge ash. The remains may derive from background debris or deliberately tipped material, previous to which maintenance would have kept the channel clear of both vegetation and silting. The waterlogged seeds are mainly plants of damp, shady and disturbed soils, and clearly relate to the infilling and disuse of the channels; for example, lesser spearwort, stinging nettle, bittersweet, hemlock, dead-nettle and common spike-rush. There are also numerous wood and leaf fragments, suggesting that shrubs or trees grew nearby. There is little to distinguish between the two sampled fills of Channel 3, the earlier one contains slightly more wet-soil plants, and large rhizomes that indicate reed encroachment. Although the base was damp enough for the preservation of organic items, the lack of aquatic plants suggests a damp, overgrown ditch by the time of sediment formation, rather than a functioning water channel.

Although all the sampled contexts have been scanned for mollusc shell, only three contain numerous, clearly archaeological remains (Table 11). One of these, Tank 2, is earlier (see Chapter 4), but has been included here for coherence of discussion. Taxonomy follows Beedham (1972). In both Tank 2 and Oven 3 sedge ash was identified from the plant remains, and the charred molluscs appear to have been harvested with the sedge. The more frequent taxa are *Vertigo antivertigo*, *Carychium minimum/tridentatum* and *Succinea* sp., all of which favour damp or wet vegetation. A small number of uncharred aquatic shells in both contexts, such as *Segmentina complanata* and *Planorbis albus*, could also be from sedge fuel, but may equally have derived from separate flooding events.

The only good mollusc assemblage from the local environment was recovered in Kiln 3, where all the shells are uncharred. The most abundant shells are *Hygromia hispida* type, a taxon that widely occurs in terrestrial habitats. Most of the other species are of shallow, muddy waters (*e.g. Valvata cristata, Lymnaea truncatula*) or of damp to wet vegetation (*e.g. Carychimum minimum/ tridentatum*). The shells are most likely to have been brought by flooding, and not with heaps of uncharred sedge fuel, since there is some disparity of species to those in the sedge ash.

A layer related to the construction of a wall of Building VII produced carpentry offcuts. The debris is tangentially sawn and split across the grain and has an iron nail knocked through it. One piece of possible coppice wood had been modified by thinning on three sides and a wooden fork made from a modified natural fork is a possible tool. The channel fills contained a mixture of roundwood, bark and debris. In one, the roundwood is of various diameters (12 to 45mm), and a couple of pieces are trimmed on one end and in one direction; the bark is 15 to 22mm thick and there was debris in the form of radial and cross-grained woodchips. In another fill the roundwood is 36 to 95mm in diameter; one piece has been trimmed from two directions, another is the curved end of a coppice pole that has been trimmed off. There is one piece of bark, 18mm thick, and the remainder of the debris consists of sawn and broken offcuts from woodworking, and trimmed roundwood fragments — one of which also shows signs of coppicing. A stake from Channel 1 was made of substantial roundwood, 68mm diameter, trimmed on one end in one direction by several axe blows.

Other Sites

The Broad Street Frontage

In general there is a continuity of occupation of earlier buildings along Broad Street as at the Electricity Depot, although the building at the Three Blackbirds was apparently unoccupied. At 57 Broad Street the building was demolished, although it is likely that the actual frontage continued to be occupied. There is evidence for disposal of tanning waste at the Tesco's site with sheep/ goat metapodials in a pit.

The Central Area

The areas of 57 Broad Street, 55 Broad Street, Jubilee Terrace and 2 Ship Lane were given over to gardening or horticulture as were parts of the Electricity Depot and large areas at Tesco's, leading to the build up of considerable depths of garden soil. Some kiln waste associated with local pottery production was found at Jubilee Terrace and the faunal material suggests a change in butchery practices, with vertebrae being spilt down their dorsal-ventral axis.

The Riverside

At the Coalyard there was a channel perpendicular to the river, similar to those at Jewson's, it is over 50m long and was probably of roughly the same dimensions. A large clunch foundation pad at the same site suggests a structure of some kind, but most of the area appears to have been open with some ditches to improve drainage. The riverside at Tesco's seems to become the focus of industrial

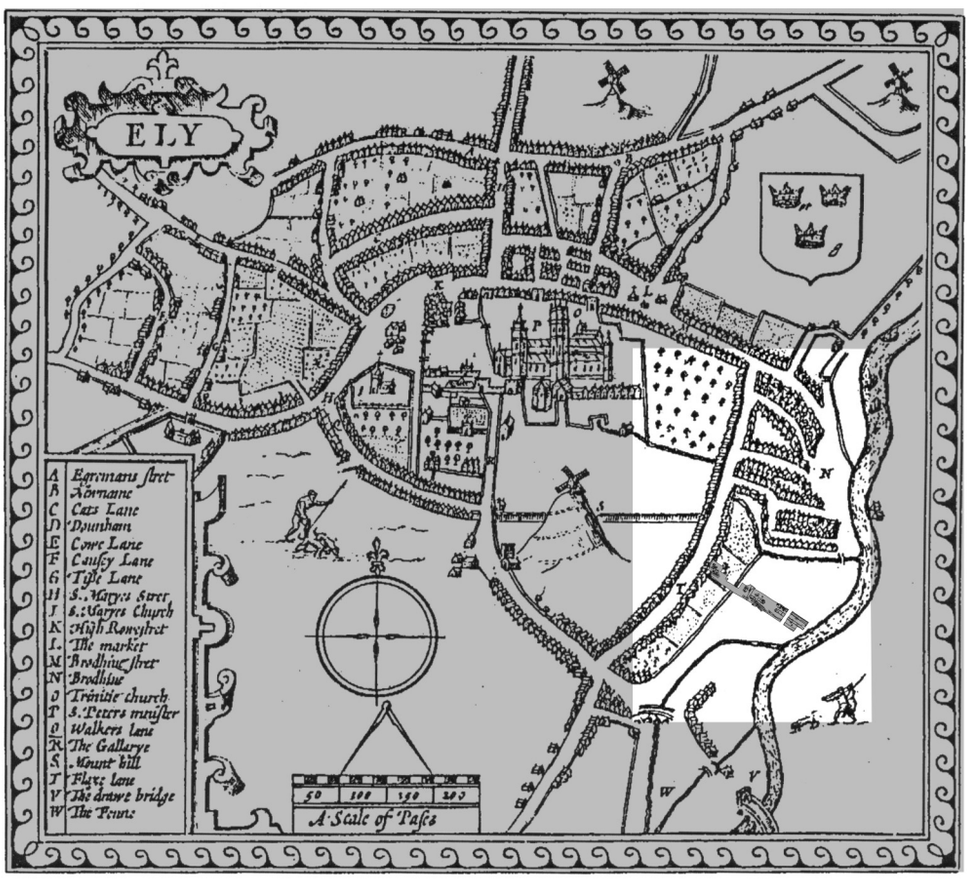


Figure 55 John Speed's plan of 1610

production, with large features that were filled with water. Some of these contained cattle horn cores suggesting that the features may have been used for horn working.

Discussion

Although in broad terms the 16th century represents a continuation of the pattern established in the 14th and 15th centuries, there appears to be a distinct change in emphasis. In many areas the appearance of thick humic soils indicative of gardening or horticulture represents shrinkage or lessening of occupation and activity. Much of this may be relatively localised, nonetheless the overall impression from several sites is convincing, especially given the environmental evidence for waste and disturbed ground. In contrast the area near the river, especially at Jewson's but also perhaps at the Coalyard, appears to flourish at least until the latter part of the 16th century. It would be tempting to link this to ideas of late medieval urban decline (*e.g.* Dyer 1991) but it seems likely that decline is too simplistic a concept and instead what we see are changes in emphasis in the economy and the urban landscape.

This period is usually characterised as one of general decline in economic wealth affecting Ely as a whole. Ely priory was dissolved in 1539, but since a college of Dean and Chapter replaced it in 1541 and the town remained the centre of a bishop's see, the impact of the dissolution was probably minor. Archaeologically the decline appears to be a long term process rather than relating to a single historical event. More general economic and social changes led to Ely becoming relatively isolated and the powers the bishopric held until 1836 probably stunted development, with Ely acting as a small market town serving an agricultural hinterland. The evidence for pottery production and tanning suggests a shift in this period, with substantial areas close to the river being given over to industrial activities which had previously been based in the Potters Lane area. One reason for this is so that the prevailing wind would have taken odours away from the high status areas of Ely (*cf.* Bartosiewcz 2003, 180–82). The discovery of the 16th-century pottery kiln and wares represents a major advance in our understanding of the post-medieval industry. Development in and around Ely itself has led to a focus upon the urban industry. This should not however obscure the fact that there was also a significant dispersed rural industry producing pottery, brick and tile which has seen less investigation (Figure 36).

A rental of priory properties of 1523 indicates that the layout was broadly the same as in 1417, although the area of the Great Hithe is now termed common shore and there are a number of possible changes which may simply reflect differences between the two surveys rather than real changes. Although the first detailed plan of Ely by John Speed in 1610 (Figure 55) post-dates the 16th century, it probably provides a good impression of the 16th-century situation and the excavations at Jewson's allow this to be fleshed out (Figure 56).

Figure 56 Reconstruction of the Jewson's area in the 16th century, *by Michael Edwards*

Chapter 6. A river runs by: the 17th century and later

The 17th century witnesses continuity along Broad Street, but major changes near the river. Industrial activity continues with tanning and lime-kilns.

Jewson's

(Figure 27)

The Broad Street Frontage

In the 17th century the rear portion of Building IIC was replaced by a separate freestanding structure Building VI and to the north Building V was replaced with a structure of which only small fragments survive (Building VII) (Figure 11). These buildings continued to be occupied into the 19th century. Some pits were dug at the rear end of Building VII, including a cat burial.

The Central Area

Tanning and Horn Working

The main activity in the 17th century relates to tanning and horn working. On the south edge of the area of excavation there was what appears to be a major tanning complex. Its overall extent is unclear and although the features all appear to be in use at the same time it is not certain that they were all constructed as a single group.

A series of large rectangular features was dug, several of them through the backfilled Channel 4, in a staggered arrangement on a northwest to southeast alignment. These were then filled with clay and groups of smaller square or rectangular features were dug into the clay creating clay lined tanks. In some cases the clay lining and individual tanks were poorly preserved, probably because they had collapsed prior to or during infilling. Given the slope of the ground it is likely that they ran in a sequence from the northwest and it is in this order that they will be discussed.

Tanning Group 1 is over 5.6m long and 1.4m wide with traces of a lining of dark blue clay 0.2 to 0.25m wide. Tanning Group 2 is 7.2m long and 1.5 to 1.7m wide with a lining of light blue grey clay 0.35m wide. Three tanks were distinguishable within this but it is likely that there were originally more. One was 1.6 by 1.0m with vertical edges, a lower ledge and a flat base. The surviving depth was 0.7m with the lower step being 0.1m high. There were post impressions in two corners suggesting a timber lining, and a shallow gully 0.25m long, 1.0m wide and 0.1m deep led into another tank set perpendicular to the first and probably 1.9m long. The fill of the first tank contained 17th- and 18th-century pottery. A third tank was 1.3 by 1.4m and its fill contained 17th-century pottery.

Tanning Group 3 appears to be S shaped and some 4.1m long northwest to southeast by 1.4 to 1.5m wide. It then ran towards the southwest and was over 3.8m long. It had a grey clay lining 0.3m wide. The best preserved area was Tanning Group 4. It was 8.2m by 1.7m and 0.8m deep and filled with firm yellow grey clay. Within this at least four and probably five square or rectangular tanks 1.1m by 1.0 to 1.4m by over 0.5m deep were dug, leaving clay edges at least 0.3m wide. These were lined and floored with timber planks and with recessed square timber posts in the corners with iron fittings. Pressure eventually caused the sides of the pit to collapse inwards. After this the pit was filled with a mixture of dark soil and building rubble. Dating for this is provided by a clay pipe bowl *c.*1730 to 80 that appears to bear the initials EF, probably Edmond Field working locally between around 1732 and 1754 (Cessford 2001). In general the tanks were around 0.5m deep and the clay base was 0.3m thick.

0.4m southwest of Tanning Group 4 was a parallel area of yellow clay over 4.5m long that probably represents a similar feature, Tanning Group 5. There were also two individual clay lined pits. Around 2.6m to the northeast of the gap between Tanning Groups 2 and 3 was Tanning Group 6, a circular pit 1.9m in diameter with a grey clay lining 0.3m wide. To the southwest of Tanning Group 4 and between Tanning Groups 3 and 5 was a rectangular clay lined pit, Tanning Group 7, aligned southwest to northeast. It was over 1.7m long and 1.2m wide with a grey clay lining 0.3 to 0.4m wide.

Although no stratigraphic relationships survive it is probable that Tanning Groups 1, 2 and 4 represent a single construction event and are among the earliest of the tanning related features. Tanning Group 3 appears to have filled a gap between Tanning Groups 2 and 4 and is probably a later addition while Tanning Group 5 appears to be later than Tanning Group 4. Tanning Group 7, which fills the area between Tanning Groups 3, 4 and 5, is probably the latest feature. The circular pit Tanning Group 6 appears to relate to the gap between Tanning Groups 2 and 3, or at least the end of Tanning Group 2, and is probably later than it.

The tanning complex represents a major operation; taking just the major Tanning Groups 1, 2 and 4 these involved digging out over 26m^3 and filling that space with clay. Although it is impossible to be sure it is likely that there were over twenty individual tanning pits, providing around 13 square metres of space. Locally small groups of tanning pits are known from sites such as St Mary's Street, St Neots (Jones, A.E., 2000, 4–6 and 23–24). At the best known example of a tanning complex at The Green, Northampton (Shaw 1996; Thomson 1981; see also Clarkson 1960; Gomersall 2000) there were up to 27 pits in use at any time and documentary sources suggest that tanning complexes could have around 30 to 50 pits, mainly for tanning but with a few used for liming and mastering (Shaw 1996, 118). Although they were frequently arranged in linear patterns, most were constructed individually with only a few in common construction trenches, whereas this seems to be the dominant method at Jewson's. There are indications at The Green and other sites such as North Lane, Canterbury, of a switch in the 16th or 17th centuries with rectangular

Name	*Dates*	*Location*	*Source*
Apsey, George	d.1764	Holy Trinity	EHT
Dennis, Jeffrey	d.1732	Holy Trinity	EHT
Thomas Disse	d.1685	Ely	PR
Thomas Doo	a.1746 d.1748	Babylon	OT, PR
John Leggett	d.1554	Holy Trinity	PR
William Redditt	d.1674	Ely	PR
Andrew Salisbury	d.1722	Ely	PR
Richard Spede	d.1546	Ely	PR
William Stephensone	d.1546	Ely	PR
Turkington, William	d.1786	Holy Trinity	EHT
William Yeomans	d.1535	Holy Trinity	PR

Table 17 Tanners working in Ely, for key see Table 18

pits becoming more common than circular examples (*cf.* Shaw 1996, 112–14). The dominance of rectangular pits at Jewson's would fit this pattern.

Although there is evidence for tanning and horn working elsewhere between Broad Street and the river it is appropriate to discuss the overall industry in more general terms in relation to this complex. Tanning was taking place in Ely as early as 1251 when tannery pits are mentioned on Potters Lane (Owen 1993, 11). This association is interesting, as post-medieval evidence shows that tanning and pot making were still taking place in close proximity. The street name Barkerslane indicates the presence of barkers or tanners involved in the first stage of leather production in the 12th or 13th centuries. In the post-medieval period there is a series of documentary references to tanners in the parish of Holy Trinity (Table 17). There were four individuals who died between 1535 and 1554; after this apart from two individuals who died in the second half of the 17th century (1674 and 1685) there is no evidence for tanners until the 1720s, when a series of references shows the continual presence of tanners into the 19th century. These sources make it clear, however, that tanning on the Isle of Ely was predominantly a rural occupation that only took place sporadically within Ely itself with two *floruits*, *c.*1520 to 1554 and 1660 to 1685, before becoming established on a permanent basis around 1710. At least some of the mid 18th-century tanners were based across the river in the Babylon area.

The archaeological evidence for tanning consists of the clay lined pits in which tanning took place and discarded animal bones associated with the preparation of animal skins. Tanning involves a number of stages, not all archaeologically visible. The skins would first have to be trimmed leading to unwanted piles of rotting offal. At this stage the bones that were still present, principally the leg bones, would be removed. Assemblages of such bones have been found in a number of areas. At Tesco's a 16th-century pit contained 46 metatarsals (from the hindlimbs) and 37 metacarpals (from the forelimbs), representing at least 23 sheep or goats. At the Coalyard a 17th-century channel fill contained 32 metatarsals and 35 metacarpals, representing at least 17 sheep or goats. Although no such discrete groups were found at Jewson's, the 16th- and 17th-century sheep and goat bones from the central area are heavily dominated by metapodials (71%). In general, individual deposits produce numbers of bones suggesting the processing of the skins from around seven to ten animals. Concentrations are found in the uppermost fills of the channels leading to the river and various other contemporary deposits. The low numbers or total absence of foot bones such as carpals, tarsals and phalanges suggests that the feet were also processed to provide the neatsfoot oil used in leather dressing (Serjeantson 1989, 136–41; also Pinter-Bellows 2000, 20).

As well as metapodials, six sheep or goat horn cores were found in the same deposit at the Coalyard. Three of these had been cleanly sawn from the skull and two had cut marks around the base, suggesting that the horn sheath was removed to be used in making objects. A number of other deposits of horn cores have been found indicating horn working; these are all from cattle rather than sheep or goats. By the 16th century, horn cores account for 42% of the cattle bone in the central area of Jewson's and a number of these are cut. Some individual deposits have produced around 30 horncores suggesting 15 or so animals. Many of these occur in the lower fills of the channels leading to the river, which accumulated while these were still in use. This suggests that the *floruit* of the horn working is slightly earlier than the tanning of sheep skins, although the recovery of some from the fills of a pit in Tanning Group 3 suggests that it was still taking place and probably spans the 16th and 17th centuries. Other concentrations of cattle horn cores of similar date were found at 2 Ship Lane and Tesco's.

The general distinction between sheep leg bones and cattle horn cores suggests a preference for difference species for different functions, with sheep skins being preferred for tanning and cattle horn core sheaths being preferred for horn working. Although there was sometimes a symbiotic relationship between tanners and horners (Schofield and Vince 1994, 123) there need not be any particular link between the two activities given the species distinction, a fact suggested by their rather different *floruits* and spatial distributions. Both tanning and removing of horn sheaths involve immersion for considerable periods in water and it is therefore possible that the industries shared common facilities. The major pit complex at Jewson's is on too large a scale to be related to the removal of horn sheaths and must be linked to tanning of sheepskins. It is possible that some of the pits were also used for horn sheath removal; alternatively this may have taken place elsewhere. The horns would be soaked in water filled pits for weeks, after which the sheaths were removed and boiled before being turned into various products such as combs, lanterns and windows (*cf.* MacGregor 1985).

After trimming the sheepskins would be washed and soaked in lime and water solution in pits. During the 16th century the soaking process took between six months to several years depending on the type of leather and its ultimate purpose (Clarkson 1960, 246). Excavated examples show that such pits are generally circular with a diameter of 1.2 to 3.0m or rectangular with dimensions of 1.8 to 3.0m by 1.2 to 1.8m. Both types are generally between 1.2 and 3.0m deep. Soaking involved a series of different concentrations of lime; this could either involve a series of pits or changing the solution within a single pit. After soaking the skins would then be scraped, relimed, washed, treated in an alkaline solution, washed again and worked over.

As well as animal skins tanning also requires lime, bark, urine and dog faeces. Bark was available as a byproduct of woodworking and was a common component of the wood found at Jewson's, legally only oak bark could be used at this time. Urine would also be readily available, although there is no specific evidence for its collection. Dog faeces would also have been available; indeed there is an increased prevalence of dog bones in the 16th century. The 14th-century warehouse at Jubilee Terrace indicates possible storage of lime, but apart from this there is little evidence for lime production and storage prior to the 17th-century dumps and kilns at the Coalyard (see below). Some of the 16th-century Glazed Red Earthenware jars have residues indicating that they were used for storing lime (Figure 39.3). Tools mentioned in tanners' inventories consist of pits, vats, knives, poles and other tools plus possibly devices for grinding bark (Clarkson 1960, 248–49). These are generally of low value, the main assets of tanners being raw hides and part tanned leather.

Leatherworking waste from cobbling, including primary offcuts produced during initial rough trimming of the hides, was found at Forehill (Carlisle in Alexander 2003), suggesting the destination of some of the tannery products. Late medieval leatherworking is suggested at West Fen Road by a horn handled punch and a specialist thimble found in the same feature (Mortimer *et al.* 2005). During the 16th century it was not unusual for 10–20% of a town's population to be in leather related trades (Thomson 1981, 174). Although the large pits required for washing and soaking skins make tanning an archaeologically distinctive activity, the prolonged period over which the skins had to be soaked means that even tanners operating on a relatively small scale would create an impressive archaeological impact.

Other Activities

Kiln 2 probably went out of use during the 17th century and a hollow above Channel 4 was laid with gravel for use as a path and then filled in with two phases of walls across the line of the ditch.

The Riverside

Lifting Gear 1 probably continued in use as long as Channel 1 was in operation but Lifting Gear 2 was replaced at some stage by an oval pit plus a posthole around 0.5m from the edge of Channel 2**,** Lifting Gear 3 (Figure 54). The 17th century sees the final infilling of the channels leading to the river. Channel 2 was capped with clay; a series of small pits in the backfill of Channel 3 was also filled with clay. Channel 4 continued to fill up with burnt ashy deposits and sand. The butt end of Channel 1 continued to be filled, mainly with waste from two deep mortar mixing pits lying within Building IV, now partially ruinous, that might be linked to the lime-kilns at the Coalyard. Such pits are known from the White Hart site associated with 16th-century building activity (Jones, A.E. 1993, 132) and although the use of mortar appears to have been relatively widespread in domestic buildings in Ely from the 14th century onwards it appears that in the post-medieval period mortar production increased in scale requiring large and easily identifiable pits. The larger example (Mortar Mixing Pit 1) was oval in shape with a flat base 2.3m by 1.8m in extent and 1.4m deep. In its base was very hard greyish blue cement-like residue and above this a brown mortar deposit. During its use the pit was extended making it 2.8m long. Just to the north was Mortar Mixing Pit 2 (Figure 57), a subcircular pit 2.4m by 1.7m in extent and 1.1m deep with similar fills to Mortar Mixing Pit 1.

Further towards the river the filling of the channels was more systematic and progressed riverwards in a series of stages, with lines of stakes indicating temporary revetments. Most of the material used as fill derived from

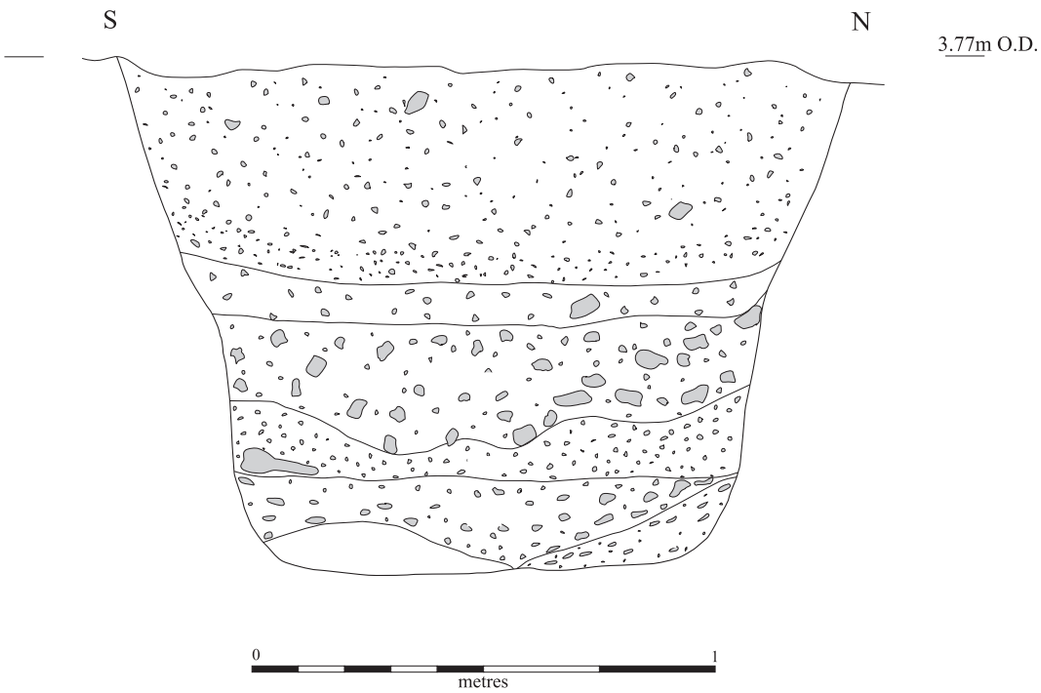


Figure 57 Section of Mortar Mixing Pit 2, for location see Figure 27

the potteries and included fuel waste, structural brick fragments, spacers and wasters. Individual episodes of disposal could be distinguished by the predominance of a particular product or element of the process, for instance tile spacers or pot lids, implying minimal reworking. Material may have entered the channel while the potteries were still in production, but this rules out the channel serving as the outlet for cargoes of pottery. Alternatively the waste may represent systematic demolition of the kiln or kilns after production had ceased and even after they had lain derelict for a time. The final filling, probably a less rapid process, included dumps of soil in which tile and clay predominate. Soil was also used to complete the infilling of Channel 2 over the clay capping. Whilst the use of debris from pottery production could simply represent expedient disposal it is likely that its usage improved drainage of the area by creating soakaways and this may well have been a deliberate strategy.

Another probable clay lined tanning pit was located close to the river between Channels 1 and 2; the pit was 1.4m wide with a 0.3m wide clay lining. As it would have blocked access along the strip between Channels 1 and 2 it probably post-dates their backfilling and is likely to be 17th- or 18th-century. The area nearby, immediately to the northeast of Jewson's and adjacent to the river, is marked as a 'tan yard' and 'tannery' on maps of 1851, 1885 and 1901.

Material Culture

The 17th-century pottery was a mixture of locally produced earthenware and finer imported material (see above). Smoking using clay pipes begins *c.*1660 to 1680 and coin use appears to increase in the late 17th century, with the loss of copper farthings.

Other Sites

The Broad Street Frontage

At the Electricity Depot the existing building was heavily modified in the 17th century (Figure 25), reusing some walls of the earlier buildings, and occupied throughout the 17th and 18th centuries. These changes meant it was now a closed lobby entry building, mirroring more general architectural and societal changes and fitting with local patterns.

The Central Area

At 2 Ship Lane there was a large ditch or clay lined tank that was probably dug in the 17th century and filled in the 18th century. Animal remains were dominated by cattle horn cores and metapodials. There was also some insubstantial structural evidence. In one area at Tesco's there was an extensive chalk surface associated with a clay lined pit suggesting activity on quite a large scale.

The Riverside

Pottery production (with David Hall)

At the Coalyard the large channel perpendicular to the river was filled in. The fills included several substantial deposits of lime, similar to deposits from St Mary's Street, St Neots (Jones, A.E. 2000, 7), and layers containing large quantities of Glazed Red Earthenware, saggars, tiles used as kiln seaters and animal bone, particularly sheep metapodials and cattle horn cores. After this the area was given over to gardening or horticulture.

Just over 1,000 pieces of pottery were recovered weighing nearly 32kg, plus eight pieces of saggars. The pottery is almost entirely Broad Street Glazed Red Earthenware (98.3%) plus some Babylon ware (1.2%) and just two sherds of Broad Street Fineware (Figure 37.1). About 30% of the Broad Street Glazed Red Earthenware forms had slipped decoration (Figure 58). Although slip decoration was found on some of the 16th century material it was much rarer, only occasionally rising to nearly 10%. The colours varied considerably with yellow, green, black, dark brown, reddish brown and orangey brown being used; the patterns also varied considerably. A sherd of 17th-century Staffordshire slipware from the same deposit (Figure 58.1) was probably being used as a 'bench piece' for the Ely slipwares (*cf.* Stephenson 2000), although the pattern of this particular Stafford ware was not exactly copied on any of the recovered Ely sherds. Bowls or pancheons with flanged or complicated rims were the most common (39%) followed by jars with seats for a lid (31%) and small bowls and dishes with simple rounded rims (28%). This was the only collection to produce very small bowls, while jug rims were absent. Among the handle types were 'cistern' type, looped type and strap handles. There were two pedestal bases, probably from chafing dishes, and several vessels had feet, indicating that they were pipkins. This is a much more homogeneous assemblage in terms of fabric than the 16th-century dumps, indicating that the 17th-century industry was more restricted in its output.

There were also some saggars associated with the 17th-century industry. These differ from those associated with the 16th-century industry as they include rough and distorted lids with crudely finished handles (Figure 59.1) and pieces with inner concentric raised ribs and central finials of knobs that were probably intended to support inverted vessels of different sizes at the same time (Figure 59.2–3). Similar saggars with 'deeply corrugated interiors' have been found at Sutton Heath, Suffolk, where they are described as 'unusual, and so far unparalleled' (Anderson 2003, 304). The same site also produced an unglazed lid which may parallel the Broad Street lids (Anderson 2003, 304). The indications are that by the 17th century the saggars used in Ely had become considerably more sophisticated than their 16th-century predecessors.

A number of 17th- to 19th-century documents shed light on the Ely pottery industry. Probate inventories of the late 17th and 18th centuries refer to the use of 'Gault clay' and 'Blue clay'. Gault clay was available locally in fields to the north and west of the city (Gooch 1811, 22, Vancouver 1794, 138). The white bricks, which Vancouver says were made of the same clay as the pottery (1794, 140), were made of Gault clay (Lucas, R. 1993, 158; Page 1967, 367). Locally, Gault clay is stiff and blue, so it is possible that 'Gault clay' and 'Blue clay' are the same material, although some of the inventories suggest that they were at least perceived of as different. The other raw material that is sometimes listed is lead. Lead glaze was made from lead ore (galena) or lead oxide (litharge) and had the advantage of being relatively cheap and having a low melting point of under 900º centigrade. Although this could potentially have been obtained through recycling it is more likely that it was obtained from Derbyshire or Yorkshire via Hull (*cf.* Burt 1969;

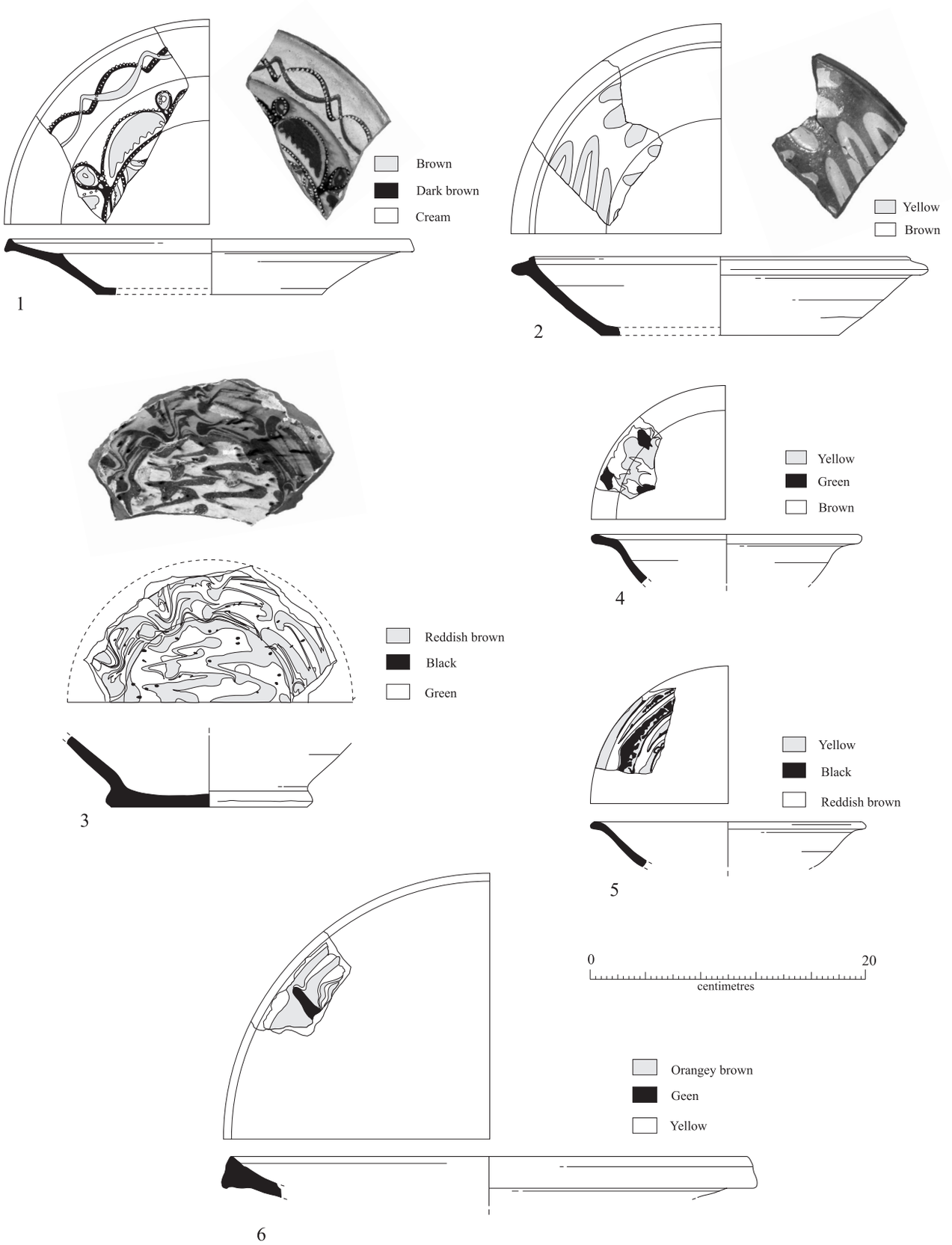


Figure 58 Broad Street Glazed Red Earthenware slip wares

1) Dish, buff fabric containing layers of yellow clay, internal all over slip with complex brown foliage decoration and intertwined curves on rim, one with yellow dots on the brown. Clear glaze. Probably from Staffordshire. 2) Bowl or dish, orange, curvilinear blob slip decoration and clear glaze. 3) Orange fabric bowl base with all over slip, and complex decoration in brown streaks and green blobs. Clear internal glaze. 4) Small bowl, hard orange- purple fabric with iron dusting, internal yellow slip decoration in pseudo-foliage with green blobs. 5) Bowl, orange fabric, internal slip with applied streaky brown and green motifs, clear glazed. 6) Very small bowl, orange fabric, upper part slipped, internal slip lines with the blackened areas on top of them, clear glaze over

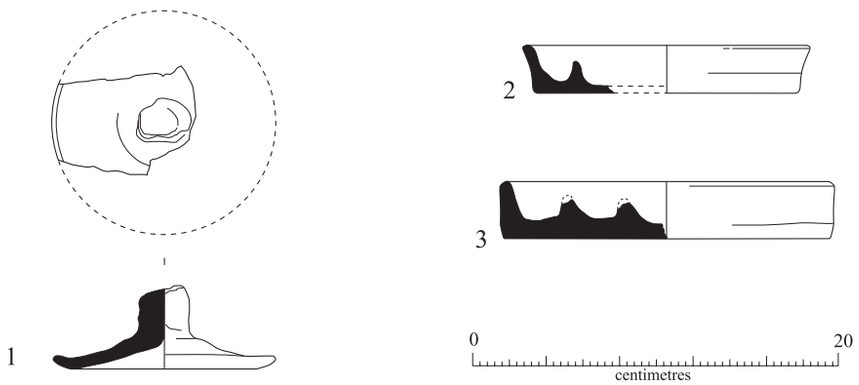


Figure 59 17th-century saggars

1) Rough and distorted lid with crudely finished handle. Plain red ware with partly reduced grey surface. 2) 'Dish' with inner concentric raised rib. 3) 'Dish' in unglazed orange fabric with two inner concentric raised ribs

Crossley 1990, 186–94), or perhaps Boston or Stourbridge Fair (*cf.* Hampson and Atkinson 1953, 40). It would have required preparation in the form of crushing and raking (*cf.* Coleman-Smith 2002) nearby although no evidence of this was found. Earthenware glazes generally contained 20% red lead (Burt 1969, 262–63). Iron, which was used in the glaze of Babylon wares and may have been obtained from Stourbridge Fair (*cf.* Hampson and Atkinson 1953, 40), is not mentioned in inventories, supporting the idea that these wares were no longer being produced in the late 17th century.

Probate inventories indicate that peat, which was used at other pottery kilns (Le Patourel 1968, 117–19), was the most important fuel, with potters owning between 9,000 and 12,000 turves. The size of turves varied, but they were generally about 0.5m long by 0.1m wide and 0.1m deep (Gooch 1811, 175–6). This would mean that for storage purposes there would be 200 turves to the cubic metre, so potters would need between 45 and 60m^3 of storage, probably in the form of simple covered stacks or open sided sheds similar to those used for the initial drying of turves (*cf.* Day 1999, 28–29). In 1345 each villein in Cottenham was allowed to make a stack of turves 11m long by four turves broad and 21 turves high for domestic use (Salzman 1967, 70). This would be around 1850 turves, or just over 9m^2. The amounts associated with potters are therefore approximately five or six times those associated with domestic usage. Around 11,000 turves would be the normal cargo for a group of three fenland lighters (Day 1999, 21), roughly equivalent to the amounts recorded in potters' inventories. Post-medieval documentary sources frequently refer to turfmen and turf merchants living in Ely, so this material would have been readily available. Wood is also referred to in some probate inventories and was probably loppings, brushwood woodworking waste and other debris. Some remains of these were recovered in waterlogged contexts at the site in low quantities; the small amounts may be because any available wood was used in the kilns and not dumped. The generally low use of wood probably reflects the lack of local trees. By the medieval period it is likely that the Isle of Ely was an open cleared agricultural landscape with sporadic oak and hazel. Coal, which only became widely used locally with the arrival of the railways in the mid 19th century, is never mentioned in inventories and was not recovered in significant quantities from deposits associated with the pottery kiln or waster dumps. It has occasionally been suggested that pottery kilns that used peat as a fuel tend to be multi-flued, while single or double flued kilns are wood fired (Clarke 1984, 155; La Patourel 1968, 118). Kiln 3, which was certainly not multi-flued, does not support this as it was almost certainly peat fuelled. At the time of operation the kiln appears to have been located in a largely empty area. Although some of this emptiness can be explained in terms of factors such as storage and access it may also represent a deliberate strategy to limit the inherent dangers of fire. Water, readily available from channels leading to the river, was required to prepare the clay.

Documentary evidence suggests that a pottery industry continued in Ely until the 19th century (Table 18), with the last potter being Robert Sibley who ceased work in 1863 (Hughes and Hughes 1909, 103; Page 1967, 367) and whose stamped pottery was recovered in the Babylon area in 1898 (CUMAA, accession number Z 31581). Probate records (Leedham-Green and Rodd 1994–96; Thurley and Thurley 1976) include around eighty individuals named as potters, all based in Ely, suggesting a virtual monopoly of production within Cambridgeshire, at least as a full time occupation. The earliest named potters were active in the late 16th century and after this it is clear that there was always a potter active in Ely with no gaps. There appear to have been between one to three actual potters, each probably employing three or four workers. Given the Ely pottery industry's origins in the 12th century its survival into the late 19th century represents a remarkable degree of longevity. Although many pottery industries survive for several centuries when established (La Patourel 1968, 124 and table IV) the seven centuries of pottery production in Ely is definitely unusual, although not unparalleled. A comparable example is Brill, Buckinghamshire, where an industry first attested in 1254 survived into the 1860s (Farley 1979). Nationally there was an increase in employment related to coarse earthenware manufacture *c.*1660 to 1710 followed by stable levels until at least *c.*1820 (Weatherill 1983, 24). This pattern probably holds true for Ely when allowance is made for the changing nature of the available documentary sources over time.

Probate inventories indicate that potters generally lived in buildings with at least five rooms; typically a hall, hall chamber, parlour, parlour chamber and kitchen. This

Name	*Description*	*Dates*	*Location*	*Source*
Adams, John	Potters labourer	b.1834, a.1851	Broad Street	C
Adams, William	Potmaker	d.1828, a.1851	Back Lane	C
Adams, Matthew	Pot burner	b.1802, a.1851	Back Lane	C
Aungier/Anger, Robert	Potter	d.1747	Holy Trinity	EHT
Aungier, John	Potter	a.1763, d.1766	Holy Trinity	PR, EHT
Aungier/Anger, Robert	Potter	d.1747	Holy Trinity	EHT
Aungier, Robert	Potter	ap. 1785, d.1787	Holy Trinity	EHT, AP
Aungier, William	Potter	d.1776	Holy Trinity	EHT
Bateman, Richard	Potter	a. 1560, d.1594	Holy Trinity	PR
Beesly, Matthew	Potter	d.1652	Holy Trinity	PR
Blarch, Matthew	Potter	d.1747	Holy Trinity	EHT
Bradshew, Samuel	Earthen-potter	d.1722		PR
Bullis, Hutton	Potter	d.1760	Holy Trinity	EHT
Buttey, John	Earthen-potter	a.1682, d.1699		PR
Buttey, John	Potter	d.1715		PR
Buttey, John	Potter	a.1719, d.1742	Holy Trinity	PR, EHT
Butty, John	Potter	d.1769	Holy Trinity	EHT
Buttey, John	Potter	d.1782	Holy Trinity	EHT
Buttey, Richard	Potmaker	a.1702, d.1729		PR
Butty, Richard	Potter	d.1744	Holy Trinity	EHT
Butty, Thomas	Potter	a.1724, d.1729	Holy Trinity	EHT
Buttey, Thomas	Pot maker	a.1739, d.1769	Holy Trinity	NC, EHT
Buttey, William	Potter	d.1783	Holy Trinity	EHT
Clarke, Joshua	Potter	d.1661		PR
Collingwood, William	Potter	d.1761	Holt Trinity	EHT
Collingwood, William	Potter	d.1764		PR
Constable, William	Potter	d.1778	Holt Trinity	EHT
Constable, William	Pot maker	b.1816, a.1841	Backhill	C
Colson, James	Pot maker	a.1785		AP
Coulson, William	Potter	d.1782	Holt Trinity	EHT
Crople, William	Potter	d.1638		PR
Dawkyns, Jonathon	Earthen-potter	d.1630	Holy Trinity	PR
Dench, Jonas	Potter	d.1765	Holy Trinity	EHT
Este, William	Earthen-potter	d.1688		PR
Fisher, Christopher	Potter	d.1650		PR
Gooden, Robert	Pot maker	b.1781, a.1841	Backhill	C
Gooden, George	Pot maker	b.1828, a.1841	Backhill	C
Hardin, John	Potter	d.1728	Holy Trinity	EHT
Hawkins, William	Potter	d.1757	Holy Trinity	EHT
Heath, George	Earthen-potter	d.1722		PR
Hadder, Isaac	Potter	b.1711, a.1741	Annesdale	C
Helder/Hellder, John	Potter	a.1664, d.1679		PR
Humfre, John	Potter	d.1648	Holy Trinity	PR
Johnsonne, Francis	Earthen-potter	a.1664, d.1669		PR
Kilborne, Edward	Potter	a.1664, d.1667		PR
Lambe, Thomas	Potter	d.1648		PR
Lawrance, Thomas	Potter	d.1664		PR
Lea, James	Potter	d.1650		PR
Lewkace, John Race	Potter	b.1782, d.1821		PR
Lucas, Mary	Earthenware pot manufacturer, potter	b.1753, a.1830-40	Ansdale	Dir
Lucas, Richard	Potter	b.1753, ap.1763-84, d.1812/13	Holy Trinity	PR, EHT
Mears, John	Potter	d.1701		PR
Merry, John	Potter	d.1789	Holy Trinity	EHT
Mitchell, James	Potter	b.1806, a.1851	Broad Street	C
Molineux, Francis	Potter	d.1773	Holy Trinity	EHT
Myles, Nicholas (alias Pope)	Earthen-potter	d.1678		PR
Oldcorre, Richard	Earthen-potter	d.1645		PR

Papper, John	Potter	d.1727		PR
Papworthe, Henry	Earthen-potter	a.1676, d.1699		PR
Papworth, John	Pot maker	a.1722-39		NC
Peck/Prike	Pot maker, potter	a.1816		
Pratte, William	Earthen-potter	d.1725		PR
Procter, Richard	Earthen-potter	d.1649		PR
Robynson, Richard	Potter/earthen-potter	d.1716		PR
Rook, Mark	Potter	d.1756	Holy Trinity	EHT
Rookes, Robert	Earthen-potter	d.1708		PR
Rooke, Thomas	Potter	d.1741	Holy Trinity	EHT
Sayre, John	Potter	d.1683		PR
Sibley, Robert	Earthenware pot manufacturer, brown earthenware pottery, Potter	b.1797-1801, a.1830-63	Broad Street	Dir, C
Smith, William	Potter	b.1821, a.1841	Broad Street	C
Sparrowhawk, James	Potter	d.1748	Holy Trinity	EHT
Sparrowhawk, James	Potter	d.1783	Holy Trinity	PR, EHT
Stivers, John	Potter	a.1588, d.1610	Holy Trinity	PR
Toone, Hugh	Potter	d.1680		PR
Watson, Robert	Potter	d.1760	Holy Trinity	EHT
Watson, William	Potter	d.1764	Holy Trinity	EHT
Willson, Heard	None	b.1718, ap.1731-42	Holy Trinity	EHT
Willson, Thomas	Potter	d.1772		PR, EHT
Winters, William	Potter	d.1769	Holy Trinity	PR, EHT

Dates: a – active, ap - Apprentice, b – born, d – died
Source: AP – apprenticeship record, C – census, Dir – directory, EHT – Ely Holy Trinity records, NC – Needhams Charity records, PR – Probate records

Table 18 Potters working in Ely

is supported by the Hearth Tax of 1664 (Evans, N. & Roe 2000) where the three potters paid tax on houses with four or five hearths, which is a relatively high number suggesting that these were prosperous individuals living in large houses (Spufford 1962). This contrasts strongly with some potters of the period, as it has been argued that typical 17th-century potters' cottages such as those at Potovens were a single living cum sleeping room (Brears 1967, 6–7), although some of these were ultimately expanded to include more rooms (Bartlett 1971, 9–10). Although it is not possible to demonstrate that potters occupied any of the excavated buildings along Broad Street, the documentary sources indicate that these were the general size and type of properties that they would have lived in. The tools that the potters owned are not generally listed in detail in probate inventories and in any case many important tools such as knives would be indistinguishable from everyday domestic objects. There are references to wheels, stools, bowls, wheelbarrows, lead troughs, sieves and washing tubs.

Although the pottery industry survived in Ely until the 1860s it appears to have been on a small scale, supplying a restricted range of low status earthenwares. Although the industry made the 'leap' from medieval to post-medieval in the 16th century it failed to make the subsequent 'leap' to producing later finewares in the 17th century. It also failed to shift to more industrialized production in the mid 18th century, where specialized repetitive tasks create identical serial objects, an essential quality for the emerging consumer society (*cf.* Barker 1999; Crossley 1990, 255–56; McKendrick 1983; Weatherill 1983). This consigned the industry to solely local significance, remaining one of the 'many traditional producers (that) continued to manufacture their wares for local markets, and were to do so throughout the eighteenth and nineteenth centuries' (Crossley 1990, 247). It is probably wrong to see this in terms of 'revolutions' that produced large scale discontinuities (*cf.* Weatherill 1983, 29) and there was no specific moment at which the Ely industry 'failed' to develop. Instead it was an ongoing process whereby it fell further and further behind what might be viewed as cutting edge ceramic developments. The reasons for this 'failure' are unclear, the most likely reason is that as post-medieval Ely became isolated from the centres of development, and the exceptional powers retained by the bishopric stunted development, Ely remained a small market town for an agricultural hinterland. The Ely industry was therefore probably simply too small and isolated to have the resources needed for the experimentation, research and development required for newer 17th- and 18th-century types of pottery (*e.g.* Green 1999; Tyler 2000) remaining essentially pre-Industrial (*cf.* Martin and Martin 1996).

Lime-kiln

Close to the river were brick walls and floors associated with a lime-kiln (Figure 60), representing at least four structural phases, although earlier deposits of lime show this was not the beginning of lime production in the vicinity. This kiln was constructed in the 17th century and probably consisted of a high updraught circular brick chamber (*cf.* Crossley 1990, 208–11; Williams 1989).

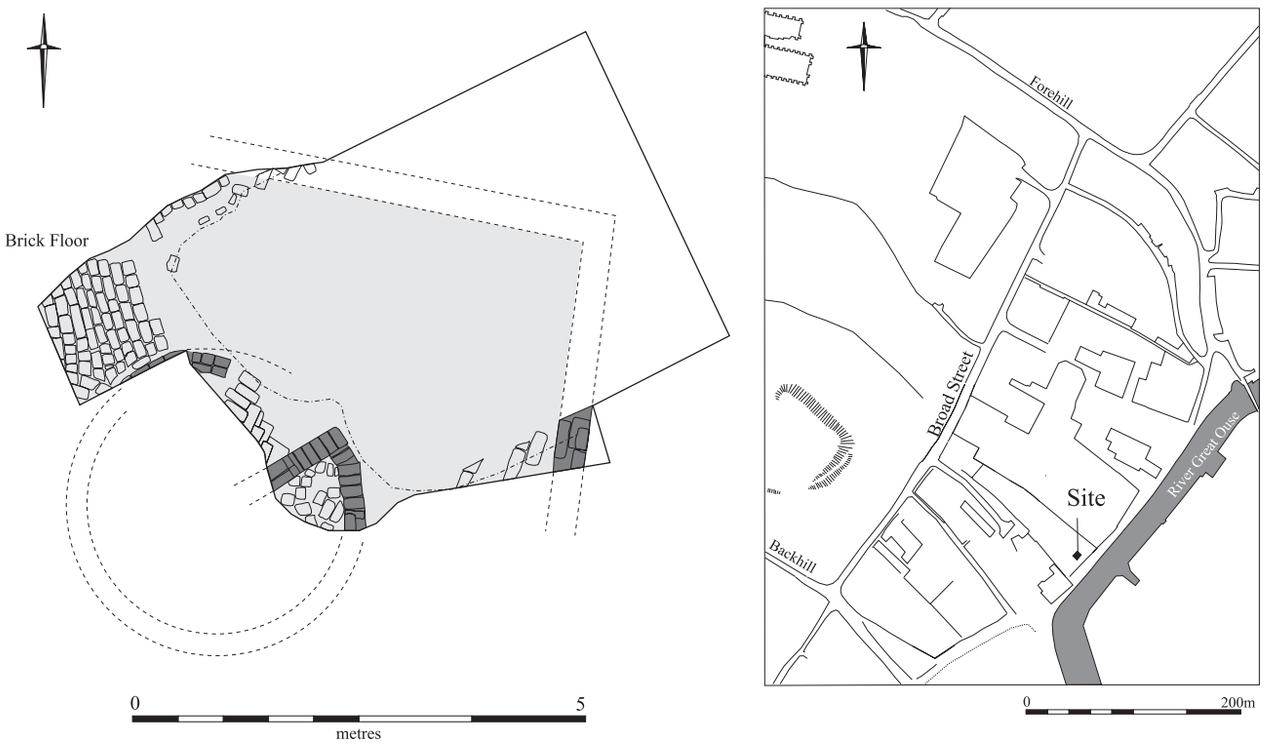


Figure 60 Lime-kiln at the Coalyard

What was revealed was the surrounding area of brick flooring, some of which was laid in a circular pattern relating to the kiln, and an enclosing wall indicating a square or rectangular area. The quicklime, produced by burning the chalk or limestone at 900º centigrade, was ground and slaked on site rather than being sold as lump lime. Deposits of sand and mortar suggest mortar was also produced, by mixing sand with slaked quicklime. Two circular lime-kilns in a rectangular enclosure are depicted on maps of 1851, 1885 and 1901 but had gone by 1927. It is likely that the remains encountered are peripheral elements of the northeast kiln. Additionally three other lime-kilns are depicted on the maps of 1851 and 1885. The earliest documentary evidence for lime-kilns is the death of the lime burner Thomas Foulgham in 1791, given the lack of earlier references it is likely that lime burning was only established in Ely in the second half of the 18th century.

In the 16th to 19th centuries there was an increasing demand for lime for soil dressing, building and tanning (Crossley 1990, 208; also Shaw 1996). Given the urban location of this kiln its products were probably used in building and tanning. These lime-kilns are somewhat atypical as they are not located close to the chalk and limestone sources, but closer to the final market for the products. The access to supplies provided by the river makes their location broadly comparable to coastal lime-kilns and other riverine examples such as a late 16th-century lime-kiln from Exeter (Henderson 1991, 127–28). As the Coalyard kiln was free standing rather than built into a slope, a sloping earth tail was probably constructed to provide access to the top of the kiln. Although charcoal and coal were recovered the quantities are not large enough to determine which fuel was used. Water for slaking would be readily available from the river; the requirement for relatively large quantities of reasonably clean water may explain the location at the upstream end of the river in Ely, where pollution would be lowest. Large scale lime production in the early 20th century put most local kilns out of business, which agrees with the maps. Excavations at Forehill revealed that in the 16th or 17th centuries an outhouse was used for the storage of lime (Alexander 2003, 144), perhaps from these kilns.

Other activities

At Tesco's in the 17th century, the area close to the river appears to have ceased to be used for industrial activities. These probably shifted to the northwest, where there is evidence for industrial activity with an extensive chalk surface associated with at least one clay lined pit. There are indications of increased levels of activity and occupation on the frontage. This pattern continues into the 18th century.

Discussion

The 17th century sees the first cartographic source for Ely with Speed's plan of 1610 (Figure 55). Broad Street is shown intensively built up with properties, as are the lanes leading down to the river in the northeast part of the area. In the southwest part there are no lanes and the properties on Broad Street have plots to their rear with an empty area between these and the river. No detail is provided of the river frontage. In general this agrees with the archaeology, although Speed presumably omitted features he regarded as insignificant. The infilling of the channels to the river at Jewson's and the Coalyard represents a major change and it is unfortunate that it is impossible to be certain if their omission from Speed's plan can be considered reliable. If these channels related to individual properties then their

disappearance, with the attendant implication of greater centralisation of river facilities, represents a major shift of power and control. The amount of traffic on the Great Ouse was in decline by the second half of the 16th century and by the 17th century the situation was giving rise to strong concerns, resulting in surveys in 1605 and 1618 (Summers 1973, 40–44).

A survey of Ely was carried out in 1679. Comparison with the 1417 survey shows the plot layout had remained roughly constant. The tenants of the Jewson's building were probably William East, who also had a tenement abutting the river at the end of his yard, and the wife of Thomas Spencer whose tenement was on the 'upper house of William East towards the south'. This suggests the arrangement of two tenancies within the same building had persisted from the 15th to the 17th century. Robert Piggott, a fellmonger (*ffelm*) or dealer in animal hides, held the tenement south of William East. A tannery is shown on Bidwell's map of 1851 and on the 1885 first edition of the Ordnance Survey map.

There was a continuing pottery industry in this part of Ely until the 19th century. Probate records exist for around forty individuals, and although it is impossible to be certain where they lived the majority probably lived between Broad Street and the river.

Chapter 7. Conclusion

Themes

The archaeological investigations between Broad Street and the river Great Ouse allow an understanding of one part of the medieval settlement. Together with work on other parts of the town, such as the domestic area of Forehill (Alexander 2003), the religious centre in and around the cathedral (Cessford with Dickens in prep; Dickens and Whittaker in prep) and the rural hinterland to the west (Mortimer *et al*. 2005) it contributes to building up a picture of Ely as a whole. Within the scope of this publication whilst it is important to conclude with some general themes such as the urban origins and development of Ely most attention must focus on the specific area under consideration, driven by the themes that are most significant to it including urban topography, wealth and status, transport, trade, industry, domestic occupation, religion and waterfront archaeology.

The archaeological sequence

The investigations between Broad Street and the Great Ouse allow a broad understanding of the area's development. After some 9th- to mid 10th-century occupation which was abandoned due to flooding, development began properly in the late 12th century. Focussed upon Broad Street, this appears to be a planned settlement of narrow burgage plots with activity stretching for some 60m from the street frontage. This gradually expanded and by the late 14th or early 15th century the waterfront became the scene of intensive activity, with the creation of channels for boats. The 16th century sees declining levels of occupation, with the areas of domestic occupation shrinking and the channels eventually going out of use. The presence of a pottery kiln, although of considerable archaeological significance, should not obscure the general pattern. The area never became densely occupied in the way other town waterfronts or even other parts of Ely did. Properties on Broad Street were often arranged parallel to it rather than perpendicular and the addition of second storeys was a late development. Closer to the river there were large extents of unoccupied open ground and although these were undoubtedly utilised for certain purposes, in a thriving waterfront area they would have become densely occupied with multi-storey structures. Overall the impression is of an active, but only locally thriving, urban area that follows the typical medieval 'development cycle' of growth after the Norman Conquest and decline in the late medieval period (*cf.* Ayers 2000, 28).

The urban origins and development of Ely

Discussions of the origins of Ely have tended to focus upon the successive religious institutions known from documentary sources. It is possible to construct an alternative, more archaeological, narrative that takes as its focus the Isle of Ely rather than Ely itself, thus allowing Ely to be more firmly grounded. One dominant factor is the rise in sea levels from *c.*2.0m OD in the Roman period to 3.0m OD in the Late Saxon period and 3.6m OD in the medieval period (*cf.* Hall, D. 1996, 8). It is within this ever changing and generally shrinking landscape of the Isle of Ely that Ely itself must be located. The pattern of Early Saxon settlement on the Isle is relatively poorly understood (*cf.* Hall, D. 1996), but the Early Saxon burial pattern is perhaps more informative. Whilst small numbers of burials are known from various sites such as Little Downham (Hall, D. 1996, 17–18) and Haddenham (Robinson, B. and Duhig 1990) the two largest cemeteries known are located near Ely. At Witchford Aerodrome 3km to the southwest of Ely about 30 5th- to 7th-century inhumations were discovered (Fowler 1947) and an 8th-century pendant from nearby may relate to a high status burial (Lethbridge 1952). Around 1.5km to the north of Ely is what appears to be a substantial 6th-century cemetery (Cra'ster and Bushnell 1959). These cemeteries suggest that during the Early Saxon period the area around Ely was already a focal point for the isle and that the Christian ecclesiastical sites were located with regard to an existing secular landscape. Both these cemeteries are probably associated with nearby settlements (Hall, D. 1996, 36) and the southern of the two settlements at Bedwell Hay Farm may well be the site of *Cratendune* (Hall, D. 1996, 36). In 673 when Etheldreda established her monastery on a new site it appears that it was being placed between two existing settlement and cemetery complexes.

During the Middle and Late Saxon periods there is evidence for an extensive, if not necessarily intensive, settlement presence in a west to east aligned strip some 1.75km long and 0.5km wide stretching from West Fen Road to Broad Street (Mortimer *et al.* 2005). Sites to the north and south of this strip have produced no Middle or Late Saxon remains. The nature of this settlement is uncertain given the patchy nature of investigations but the main elements revealed so far are a relatively small number of buildings set within large ditched enclosures. There are some indications of high status areas based on the presence of North French Blackware near the cathedral. The settlement is not classically 'urban' in appearance, but could be a 'small town' similar to the more extensively investigated Steyning in West Sussex (Reynolds, A. 1999, 170–74). The earlier settlement and cemetery complexes to the north and south may have influenced the east to west linear arrangement of the settlement as these may have had a confining role. The role of the successive religious institutions at Ely in this development is unclear; while it is possible that they were the driving force behind the entire development, at the very least the presence of a wealthy and powerful group of consumers will have stimulated development.

From the various documentary surveys it has been suggested that in 1086 Ely was 'purely rural', in 1251 it was 'largely rural, though with marked urban beginnings'

and in 1416 it had assumed much of its modern form, but 'with the early possibilities of normal municipal development unfulfilled' (Hampson and Atkinson 1953, 34). This was supported by the excavations at Forehill, where it was argued that the 13th century was a period of development with a network of streets and settlement in several areas and that by the end of the 14th century it was a fully formed small town (Alexander 2003, 173). The picture that emerges from the archaeological investigations between Broad Street and the river largely supports this. At the time of Domesday Book the area was apparently not occupied at all, with activity beginning in various areas between the second half of the 12th and the early 13th century. Much of this activity appears to be agricultural and mercantile, fitting with the idea that 'Ely was better situated for commerce than for industry' (Hampson and Atkinson 1953, 36). Development continued throughout the medieval period and by the 14th and 15th centuries the density of occupation allows the area to be characterised as urban, although the nature of the area had not changed radically. Industry arrived in the 16th century, however the scale and nature of the pottery industry does not particularly distinguish it from contemporary suburban or even rural industries and it is only with the 17th century tanning industry that activity occurs on a scale that is distinctively urban.

Urban topography

The urban topography of this part of Ely is relatively simple. Two focal strips, Broad Street and the Great Ouse, broadly defined it. Both are 12th-century constructs and the growth of this area may be linked to the decline of other areas such as West Fen Road (Mortimer *et al.* 2005). In this respect it differs from most other parts of the town where there was generally a single main focus, in the case of Forehill the street (Alexander 2003) or in other parts of the town the cathedral. Broad Street was a continual focus, whereas the river played a more intermittent role. In between these two there developed an industrial zone whose associations are more with the river than the street.

The natural topography of the area sloped gently down from Broad Street to the river. Such a gentle slope will have provided relatively little protection against flooding and it is likely that seasonal flooding of a large area was common. Natural and cultural deposition of material gradually raised the height of the entire area (Figure 61, see also Figure 18). The earliest 8th- and 9th-century occupation had relatively little impact on the height of the area, and until the 12th century the major mechanism was natural flood deposits which appear to have generally raised the area by some 0.6m but left the slope relatively affected. From the 12th to the 17th centuries the area was raised mainly by the cultural deposition of material, although flood deposits still had an impact in the area closest to the river. It appears that initially the area closest to Broad Street was raised more rapidly, but eventually this was reversed. In general between the 13th and 17th centuries the whole area was raised between 1.0 and 2.0m and at the end of this the slope was generally about the same as at the beginning. Through time, the area sufficiently protected from flooding to be secure for major activities increased as land was reclaimed. The extent of the 8th- to 10th-century area is unclear, but it need not be more than 15 to 20m from Broad Street. By the late 12th century this had extended to some 70 to 80m from Broad Street while in the 14th and 15th centuries it extended all the way to the current line of the river Great Ouse, some 180m, although it is possible that the area closest to the river was still relatively wet. This block of land is around 475m long at Broad Street narrowing to around 275m at the river, giving an area of approximately 67,500 square metres. The expansion can be thought of as 9th- to mid 10th-century *c.*9,500 square metres (14%), mid 10th- to late 12th-century retraction when none of the area was occupied, late 12th- and 13th-century expansion to *c.*35,635 square metres (53%) and 14th- and 15th-century expansion to 67,500 square metres (100%) (Figure 62). Between the 12th and the 17th centuries around 100,000m^3 of material was dumped in the area or nearly 1,700m^3 per annum on average. Although some of this was artifactual in the form of pottery and stone, in general most of the deposits contain low densities of inorganic material. The vast majority of the deposits were organic in nature, which is unsurprising given that it has been estimated that during the medieval period 100 households would generate 0.8 tons of wood ash, 3.6 tons of faeces, 4,150 gallons of urine, 300,000 gallons of waste water and 18,250kg of solid organic food waste (Brothwell 1982). In London between the 10th and 15th centuries up to 100m of land were reclaimed along the waterfront using a series of timber and stone revetments (Milne 2003, 18–20 and 135–46). This was a very different process than happened at Ely, where revetments were not used and the distance is also much less substantial.

Elsewhere on the Ouse it appears that during the Roman period there was a rising water table, followed by flooding but no alluviation during the Saxon period. In the medieval period there was extreme alluviation. By the post-medieval period there was a return to flooding but no alluviation (Robinson, M. 1982; Roseff 2000). This broadly fits the pattern observed at the Jewson's site, with the flood lain deposit overlying the Middle/Late Saxon and numerous examples of medieval alluviation, although cultural activities moderated the picture and generally prevented post-medieval flooding.

Although Ely possessed no clearly defined boundaries in the form of walls and it was not legally outside the town the area between Broad Street and the river Great Ouse is in appearance a classic medieval mercantile or industrial suburb, where the key factors relating to expansion were transport and marketing (Crossley 1990, 82–84; Keene 1976; Schofield and Vince 1994, 52–54). This is a fringe or marginal area that was particularly attractive to certain trades such as tanners and fullers or potters (Keene 1976, 81). Medieval property plots were generally 5 to 12m wide and 15 to 60m long and this generally appears to be the case in Ely, as excavations elsewhere (Alexander 2003), the survey of 1417 and later cartographic sources confirm. This is broadly the pattern between Broad Street and the river when the area is first laid out in the late 12th and early 13th centuries. The subsequent reclamation of land meant the length of at least some properties could be greatly expanded.

Much of the area between Broad Street and the river during the medieval and post-medieval periods is apparently empty or blank space. Although archaeologically attention focuses on the features and structures it must be remembered that open space was always dominant. This apparently blank space could be

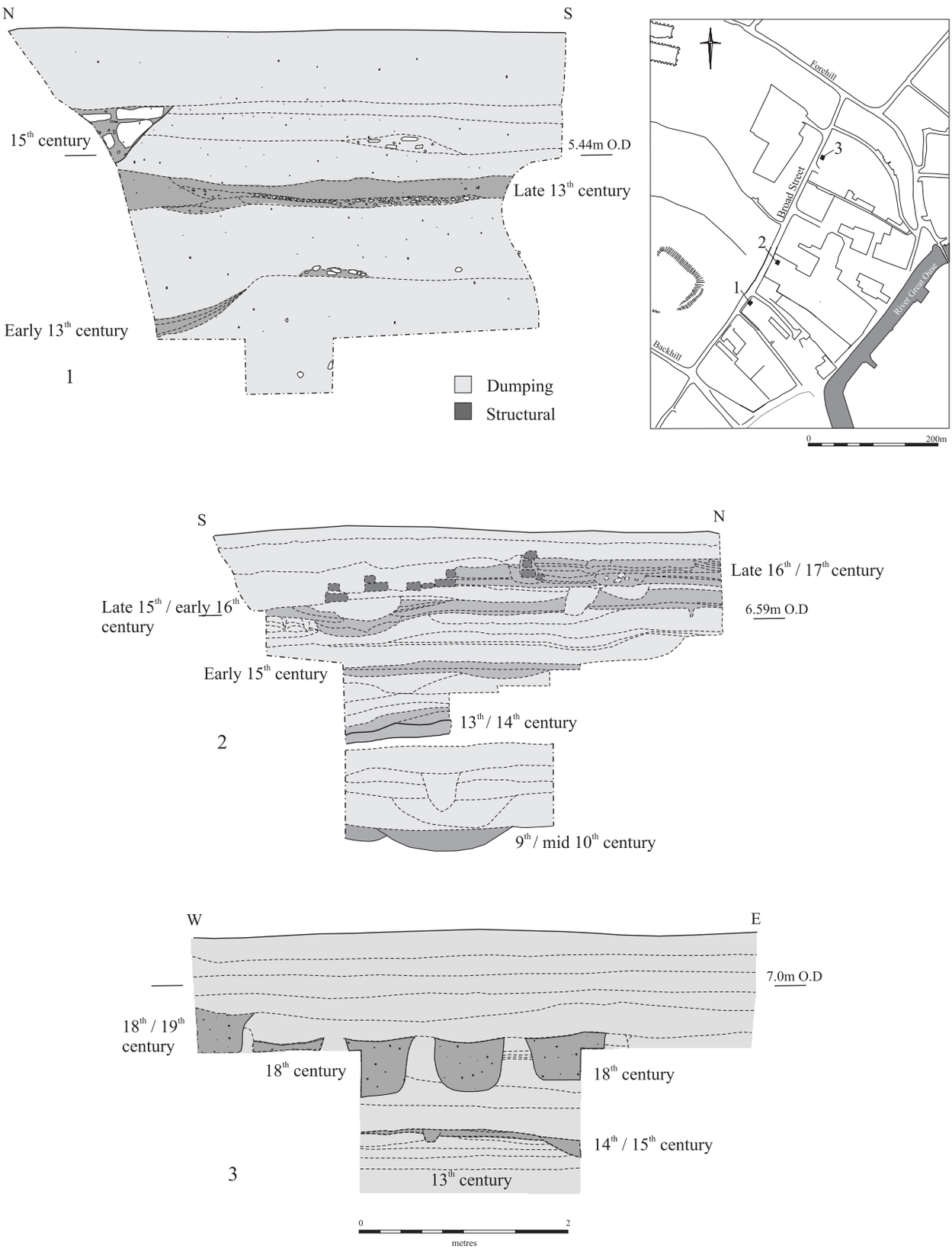


Figure 61 Sections through deposits at Broad Street frontage
1) Electricity Depot 2) Jewson's 3) Tesco's

used in a wide range of ways such as growing fruit and vegetables, keeping livestock, storing merchandise, domestic recreation and limiting the risk of fire; none of which leave obvious archaeological traces but which are important aspects of medieval urban life.

The area between Broad Street and the river lies at the cusp between wet and dry within Ely, just as Ely itself does in a wider context. Clearly the wet in the form of both the river Great Ouse and the more general fenland was important in terms of transport, communications and

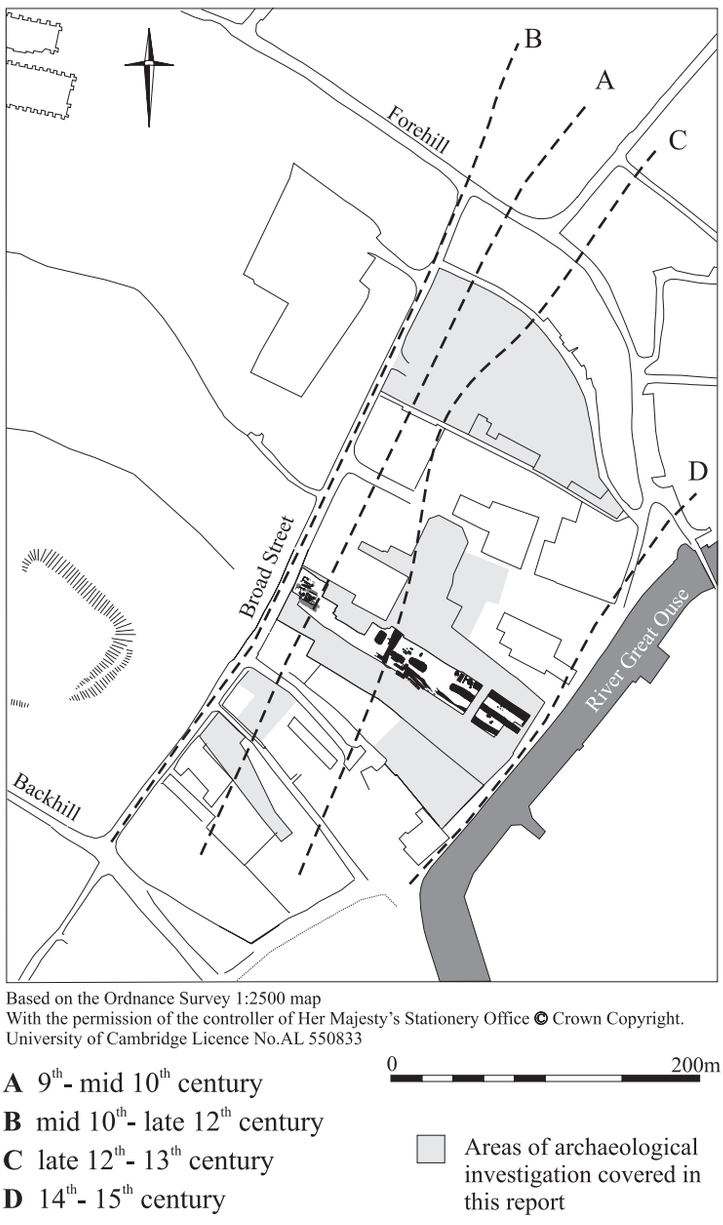


Figure 62 Approximate boundary of dry ground between Broad Street and the river Great Ouse over time

trade. Aside from the use of reeds and sedge for roofing, flooring and fuel there is relatively little evidence for the exploitation of wild fenland produce, although even this represents an increase from the Middle and Late Saxon period (cf. Ballantyne 2004). Although considerable numbers of line weights (Figure 67) were recovered, fish are not present in large numbers and what developments there are through time relate to marine rather than freshwater species. A similar pattern emerges for birds, where there is relatively little consumption of wild species, and wild animals are limited to fallow deer and hare. This contrasts with the situation at Forehill (Higbee in Alexander 2003, 170–71; Jones in Alexander 2003) and more especially at King's School (Dickens and Whittaker in prep). The pattern is one of infrequent incidental exploitation of wild resources paralleling earlier communities nearby, such as the Iron Age site of Wardy Hill (Evans, C. 2003, 132–38), and the Isle of Ely is perhaps best viewed as an 'island of agricultural familiarity within a wilderness' (Ballantyne 2004, 197).

Wealth and status

A number of pieces of evidence including the sword cross (Figure 8), knife sheaths (Figures 14 and 15), coins, imported Continental pottery, evidence of literacy (Figure 9), possible barn and fishponds all point to relatively high wealth and status at the Jewson's site in the 12th and 13th centuries (Figure 63). There is no evidence for such high wealth and status in the 14th and 15th centuries, contrasting with other sites in Ely such as Forehill where there is a 14th-century peak in wealth and status (Alexander 2003, 175–77). This 12th- and 13th-century peak reflects a more general phenomenon, whereby waterfront zones declined in status through the medieval

period (Hutchinson 1994, 115–16). This early peak in wealth and status at the Jewson's site is confirmed by the fact that many later innovations in building forms and materials appear to occur later on Broad Street than on Forehill. With the exception of the 12th and 13th centuries the area seems to be of lower status than Forehill and the religious community as indicated by King's School. In particular it produced little or no evidence for high status foods such as various types of fish, bird and deer or fruits such as fig and grape. This is also supported by the ceramic evidence since the proportion of finewares indicates that the Jewson's site was of rather lower status than Forehill and King's School, but higher than West Fen Road (Figure 37.2).

Transport

Transport, trade and industry are all interrelated and mutually dependent. In a sense transport is simple as the area is bounded by two major arteries, Broad Street and the Great Ouse. Both arteries have complimentary perpendicular elements in the form of alleys and channels. Unfortunately, in common with much urban archaeology, these major arteries have not been investigated as they lie outside the areas of development. Both road and river transport have direct material manifestations, with horse bones, horseshoes plus fiddlekey nails, a harness pendant and suspension mount for land transport and clench bolts and roves (Figure 24) for river transport, although as river vessels were frequently horse-drawn the opposition is potentially illusory and much of the later evidence for horses comes from the river area. Equally clench bolts and roves could be used for carts, further challenging this. However it is clear that when compared to other sites such as Forehill (Alexander 2003, 164), the balance between Broad Street and the river is much more towards water than land, although the channels from the river which could have accommodated strings of small barges known as 'lighters' represent the interface between water and land.

Trade

The Ouse-Nene complex of waterways was one of the most important in medieval and post-medieval Britain (Willan 1936; 1976). Documentary sources relating to King's Lynn show the trade was mainly in archaeologically invisible material. The trade was primarily coal for corn with coal, wine, fish, salt, soap, iron and groceries being imported and corn (wheat, oats, barley and rye), butter and cheese exported (Willan 1976, 17–18; also Carus-Wilson 1963). In 1585 King's Lynn was serving Boston, Sleaford, Peterborough, Oundle, Northampton, St Ives, Cambridge, Newmarket, Thetford and Ely (Willan 1976, 17–18). The links from Ely are less clear, but it is likely that as well as downriver to King's Lynn there were links along the Great Ouse to St Neots, the Little Ouse to Thetford and the Cam to Cambridge.

In terms of trade the origins of the material deposited at the site in different periods can be identified. During the 9th and 10th centuries the site was receiving Ipswich and Thetford ware, both common in this area with a large amount of Ipswich ware for an inland site coming from near the Lady Chapel (Regan 2001). The Ipswich ware was probably acquired via a coastal and riverine route, whilst the Thetford-type ware was probably acquired by a riverine route. Other coins of Baldred are known from Freckenham (Suffolk), Suffolk generally and Thetford (Norfolk) (EMC), so the coin may have arrived with pottery from Ipswich or Thetford. Querns were also being imported from the Continent.

Between the 12th and 15th centuries the main type of pottery used was medieval Ely ware from Potters Lane, but material also came from Grimston (Norfolk), Lyveden (Northamptonshire), Toynton (Lincolnshire) and various sites in Essex plus a little material from Yorkshire and Surrey and a few French imports. Most of this material travelled via King's Lynn; exceptions are the Lyveden ware, which probably arrived via the hithe at Yaxley, and the fine Essex redwares, probably from Hedingham and Colchester, that travelled overland to Cambridge and then via the Cam (Figure 64, see also Figure 37.3). In the 14th century, ceramic building materials were imported from Wisbech, but local production was also significant and probably began in the early 13th or even 12th century. Several fabrics have parallels with material from Norfolk and Lincolnshire and are likely to have arrived via King's Lynn, as did some Flemish bricks that may be ballast. The worked stone consisted mainly of querns, primarily from the Mayen region of Germany, whetstones that are largely local but some may be Norwegian, and pestles and mortars from a variety of English and Continental sources, these are from similar sources to those found in King's Lynn and probably arrived via this route. The majority of the worked stone is probably medieval, but it generally occurs in

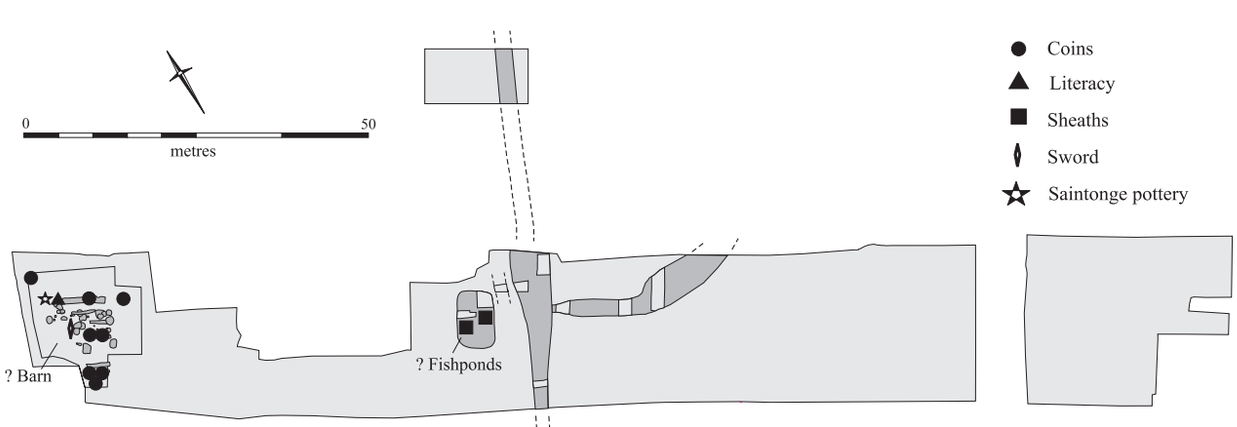


Figure 63 Evidence of high status at Jewson's in the 12th and 13th centuries

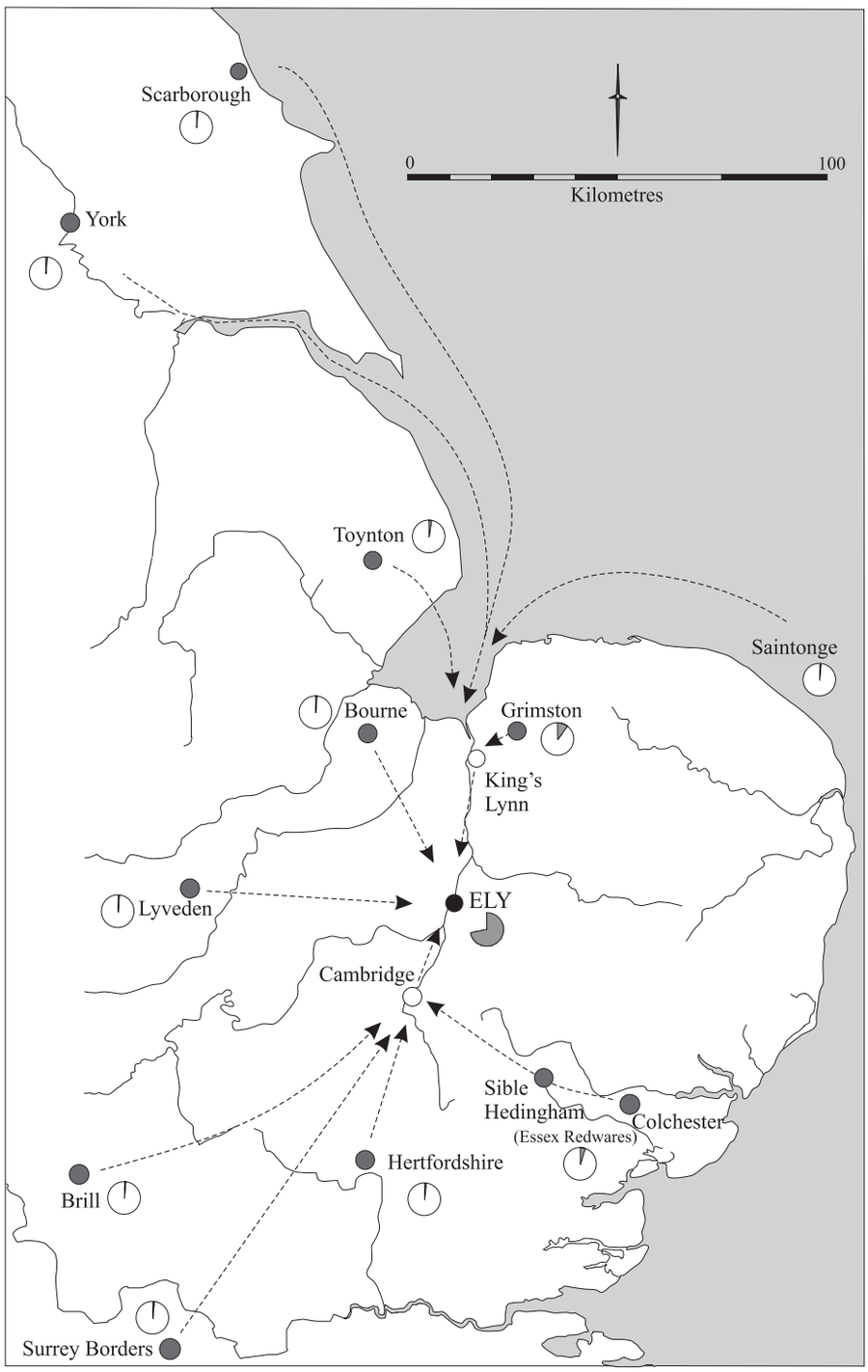


Figure 64 Sources of 13th- to 15th-century pottery found at Jewson's

residual contexts reused for construction. For instance increased centralisation and control of the milling of cereals makes it unlikely that domestic milling would be taking place during the time when the majority of quern fragments were deposited.

Where identifiable the 13th-century coins were minted in London and the 15th- and 16th-century jettons are mainly French, with one example from Tournai, plus one from Nuremberg, whilst the Boy Bishop tokens come from Bury St Edmunds. The large timbers, mainly of oak, used in building construction are unlikely to have been available locally and probably arrived via the river; some oak is known to have come from Stourbridge near Cambridge and Chicksands Priory, Bedfordshire. The animals that were being butchered presumably travelled overland from the rest of the Isle of Ely or along various causeways. Fish, both freshwater and marine, were being consumed but marine fish only appear in the 15th and 16th centuries and even then are relatively rare.

In the 16th century the majority of the pottery was produced in the area between Broad Street and the river, other material included continental pottery from Holland

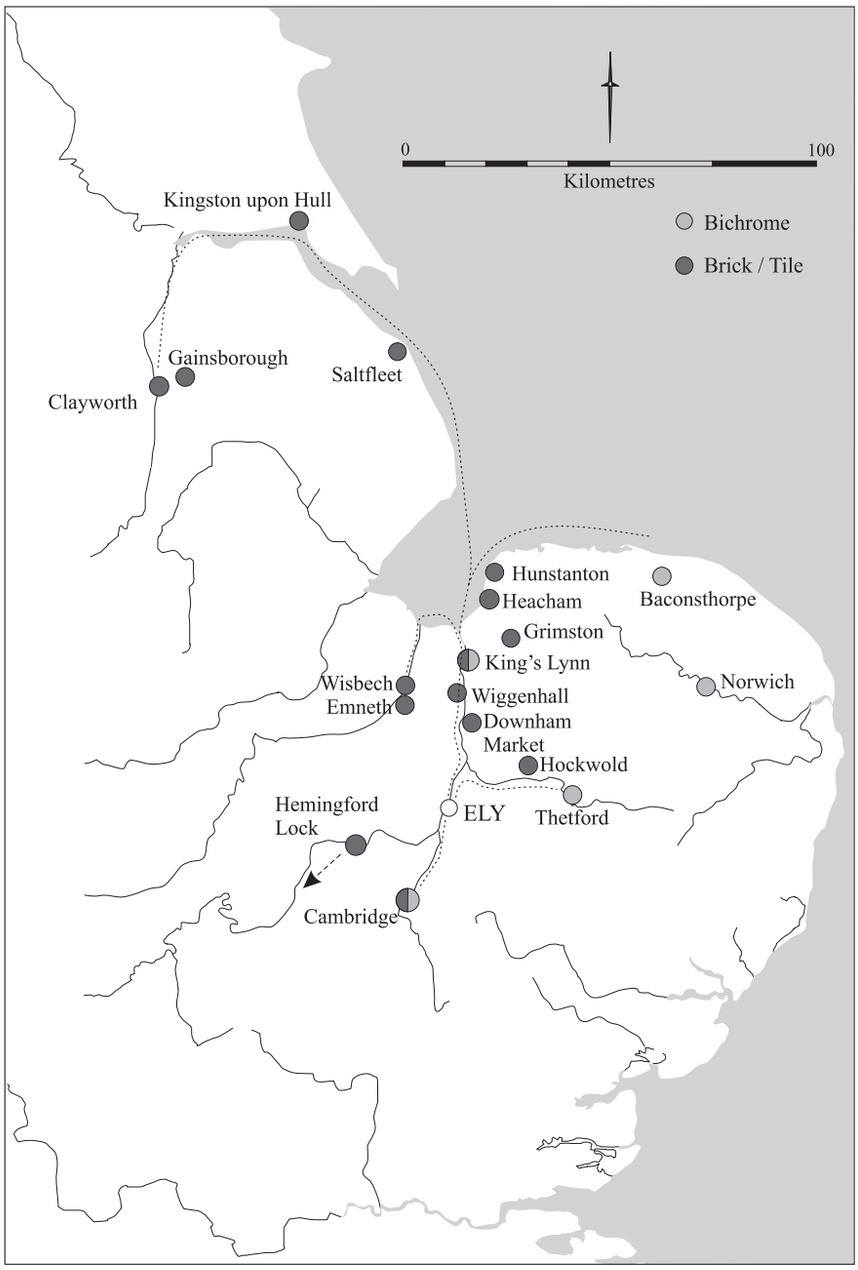


Figure 65 Exports of post-medieval pottery and ceramic building material from Ely, partly based upon Lucas (1993, figure 1)

and Germany. The clay tobacco pipes are all apparently Ely products unlike Forehill, which included Cambridge products.

By definition material being exported leaves less evidence at the site. Pottery from the kiln was being used elsewhere in Ely and was reaching King's Lynn and Cambridge. It is likely that its distribution was broadly similar to, although more restricted than, the distribution of brick and tile from Ely (Lucas, R. 1993) (Figure 65). Lime, leather and agricultural produce are all likely to have been exported to the rest of Ely and perhaps further afield.

Industry

A large range of activities and industries took place and a degree of spatial and temporal patterning can be detected (Figure 66), although in many cases this is hampered by issues of residuality, the deliberate movement of material to fill features, create soakaways that improve drainage or provide firm foundations. From the 12th century onwards there is evidence for nucleation of activities within English towns. During the 12th and 13th centuries waterfront areas were occupied by large merchants' houses and warehouses, it is only later on that they were given over to noxious industries indicating a decline in status (Hutchinson 1994, 115–16). These industries have been identified at numerous towns such as Norwich (Ayers 1991), although in contrast the riverine site of

Coppergate in York produced limited evidence of craft or industrial activities such as baking, cooking, leatherworking and metalworking (Hall, R. and Hunter-Mann 2001, 860–61) so a link between riverside areas and industry is not ubiquitous. Waterfronts were popular due to ease of transport of raw materials and final products, availability of water necessary for some purposes and the river's ability to remove waste products. From the archaeological evidence in Ely, fishing, butchery, pottery production and tanning all appear to be significant with other activities occurring on a more domestic scale.

Street names provide evidence for the 12th and 13th centuries when there is little archaeological evidence. Flexlane relates to the retting of flax to produce fibre for weaving linen, Barkerslane indicates barkers or tanners involved in the first stage of leather production whilst Ferourslane relates to ironworking. In the early 15th century we know of butchers (*bocher*) and maltsters (*malstere*). Trades specifically related to the river include steersman (*steresman*) and fisherman (*piscator*) in the 13th century, the surnames ship builder (*schipwryghte*) and Mariner in the 15th century and the trades of fisherman (*ffeschere*) and waterman (*waturman*) in the 16th century.

Fishing is indicated by fifteen lead line weights, six partly rolled and nine unrolled examples and up to sixteen small rectangular pieces of sheet that might be for making weights (Figure 67). These occur all over the Jewson's site during all phases, although they are concentrated towards Broad Street showing that nets were being set and mended at the site and probably away from the river. Although large in comparison to other sites in Ely, the number is small compared to the 500 plus from Whittlesea Mere (Lucas, G. 1998) or Holme site 2 (French 1992; Tribe 1997) or nearly 2,000 from the 15th century Blackfriars III vessel (Hutchinson 1994, 140) and represents a loss rate of less than one per decade for these relatively small and inexpensive items. Although the low melting point of lead makes it particularly prone to recycling (Woodward 1985, 183–84) this is relatively unlikely for such small items. No other fishing equipment such as hooks or stone weights were found, in contrast to other sites such as York where the fishing equipment, mainly from the riverine sites of Coppergate and Fishergate, includes up to ten lead line weights but also eight iron fish hooks and three stone weights (Ottaway and Rogers 2002, 2747–49) or Fullers Hill, Great Yarmouth, where one lead weight and forty five iron fish hooks were found (Rogerson 1976, 162 and 166). The absence of stone weights, known from the Great Ouse and other rivers in the region and interpreted as plugs and sinkers associated with basketwork fish traps (Mynard 1979), and iron hooks suggest that the fishing that took place was of a specific type that did not involve these elements. The number of lead weights suggest that fishing was taking place on the riverside using 'weres', stake fences in water on which nets could be hung (Salzman 1967, 69). Such fine mesh nets, possibly made from cattle hair (*cf.* Tribe 1997) could be made from products derived from nearby butchery. The weights come in a range of sizes, this could either indicate the use of nets with different mesh sizes or the use of different sized weights on a single net (*cf.* Milne 2003, 112).

The putative fishponds suggest that fish were also being reared. Shellfish were also consumed, mainly European oyster but also common mussel, common whelk and edible cockle. Marine, estuarine and riverine fish have been identified in Ely (Dickens and Whittaker in prep; Jones in Alexander 2003; Mortimer *et al.* 2005) with the importation of fresh and dried marine fish. At King's School, pike and eel from nearby rivers or marshes were present from the earliest deposits with marine species such as herring, whiting and flatfish appearing in the 14th century often in the form of heads presumably removed prior to cooking. In the 15th century other species such as cod and ling appear plus rare and prized species such as sturgeon, carp and turbot. At Jewson's there is a restricted range of freshwater fish, pike and eel, during the 12th and 13th centuries. By the 15th century some marine fish is present although freshwater fish, particularly eel, dominates. Fish bone and scale, debris from the preparation of fish for consumption, are concentrated in 15th-century deposits associated with Building II. It appears that the eels were slightly larger than those being consumed at the King's School while the pike were smaller. It is likely that the eels were caught using the fine mesh nets indicated by the lead weights (Figure 67) and the small pike were probably incidental catches during netting for eels.

Butchering of animals took place on site from the 12th century onwards. Sheep/goat dominate although cattle are only slightly less numerous and in some phases outnumber sheep/goat, whilst pig is a minor element (Figure 68). The predominance of primary and secondary butchery material rather than kitchen waste indicates that the animals were probably transported to the site live on the hoof from nearby settlements such as West Fen Road. They were probably grazed at the site on areas of open water meadows before being slaughtered and butchered. Although some material was consumed at the site much of it was probably transported onwards for consumption elsewhere, probably by the more high status elements of both the religious and secular communities of Ely where there is evidence of meat arriving as individual joints and dressed cuts. There is also evidence for the storage of food products on site and their preparation for consumption. The area between Broad Street and the river Great Ouse can be seen as an intermediate 'suburban' location between rural production sites and urban consumption sites.

Sedges grew towards the river in osier beds. One of the tasks villeins had to perform in 1251 was cutting, stacking and carrying sedge (Hampson and Atkinson 1953, 37) and a storehouse was repaired in 1393–94 by an individual responsible for supplying the priory with rushes and peat (Atkinson 1933, 13). They were harvested for use as fuel — sedge burns rapidly at high temperatures — and also perhaps for thatching, animal litter, drain lining, protection and buffering of various kinds and fodder (Rowell 1986). Whether the sedges represent natural growth or were encouraged is unclear. It is also unclear whether the walnut trees growing locally were natural occurrences or encouraged for their nuts. Hemp also appears to have been grown locally; its fibre would have been used for rope and coarse textiles (Schofield and Vince 1994, 117). It appears that hemp was 'chiefly' a garden crop (Salzman 1967, 70), which could have been grown on the areas of open land in the vicinity. One major use of rope was for boats and the cultivation was probably for this. The surname Roper is attested in 1327 (Hampson

Figure 66 Location of industries
1) Horn working, indicated by concentrations of horn 2) Lime, indicated by kilns 3) Pottery, indicated by kilns and dumps of wasters 4) Tanning, indicated by tanning pits and concentrations of bone

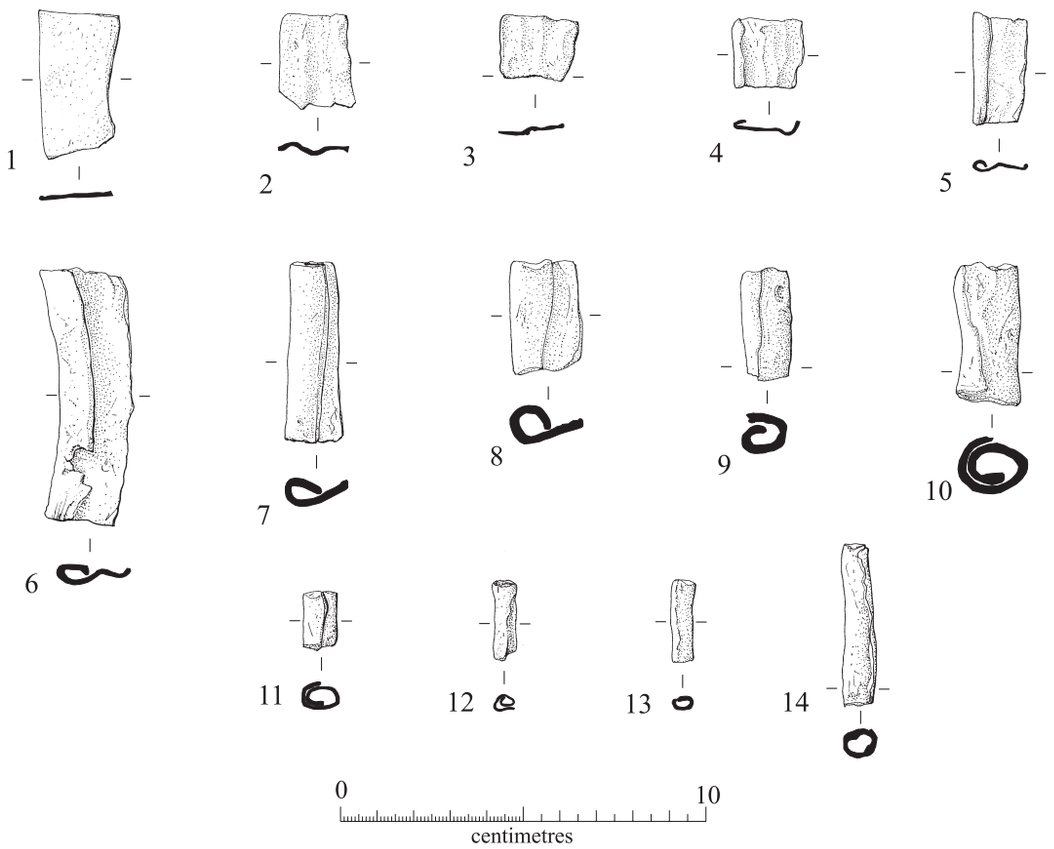


Figure 67 Lead fishing line weights
1–3) Unrolled fishing line weights 4–8) Partially rolled fishing line weights 9–14) Rolled fishing line weights

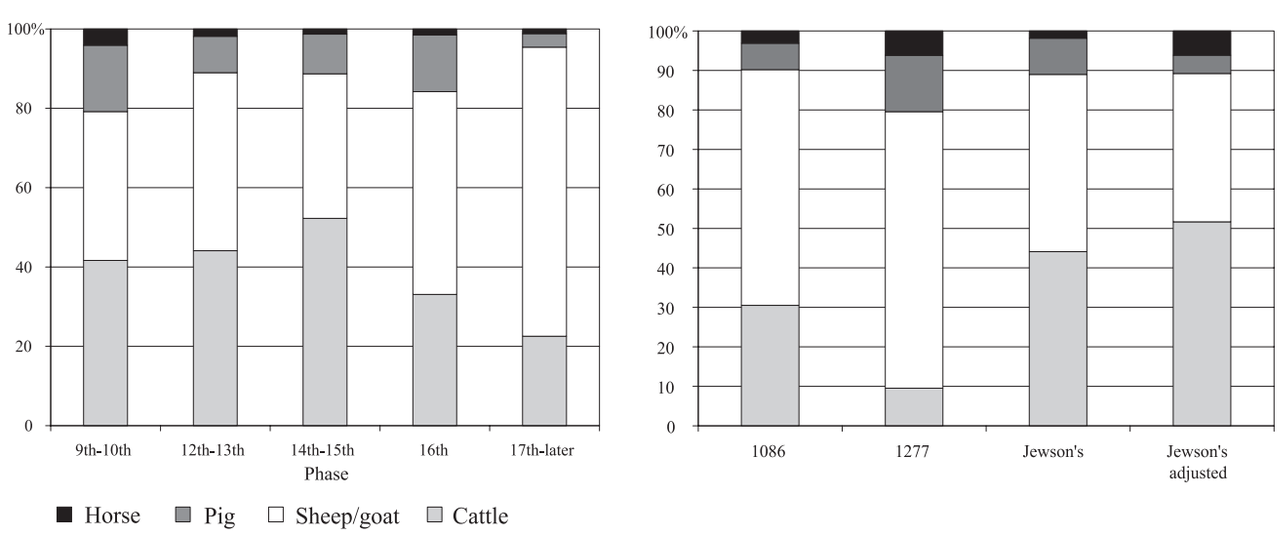


Figure 68 Animal species showing main species by NISP by phase at Jewson's and main species in the 12th and 13th centuries, including adjustment for different typical lifespans of different species, compared to Domesday Book (1086) and the Ely Survey (1277)

and Atkinson 1953, 40), but rope production leaves few traces. A small number of spindlewhorls indicate textile production, but on a very limited domestic scale.

Several tools including spoon drill bits indicate woodworking — chisels, a file and a large blade possibly a broken draw knife or spoke shave. Woodworking would have been necessary for constructing buildings and other structures, but most come from close to the river. This area also produced roundwood and woodchips which show signs of trimming and working indicating coppicing and small timber working, as well as a wattle revetment (Figure 20) and stakes. These tools could also be used for boat construction, repair and breaking. Eleven clench bolts and seventeen roves (Figure 24) occur from the 14th century onwards and are generally located towards the river. Their location suggests they are related to boats rather than domestic items such as doors, hatches or covers. At King's Lynn clench bolts and roves were found in domestic contexts suggesting reuse of timbers either structurally or as firewood (Goodall and Carter 1977, 297) and in one instance a length of wood around a metre long with four clench bolts and rove nails appears to have been reused. Some of the roves found had no shank within the central hole, suggesting they were unused rather than broken from complete clench bolts, and both square and diamond shaped roves were found. Where clench bolts and roves were found together they indicate timbers around 40mm wide. A relatively small number was found, representing a loss rate of less than one every twenty years, Although even a small boat contained a substantial quantity of iron, when these were broken up it is likely the iron was recycled.

The 16th-century kiln indicates pottery production. It seals deposits of wasters and furniture from an earlier kiln and there are three other dumps of 16th- or 17th-century wasters and kiln furniture. During the 12th to 15th centuries pottery production was focussed in the Potters Lane area (Spoerry forthcoming) and pottery production only moved to the area close to the river in the 16th century, where it continued until the 1860s.

A small amount of evidence for the working of copper alloy and lead alloy was recovered from 15th-century and later deposits all over the site. The quantities involved are too small to establish the nature of the enterprises being undertaken; given the large amounts of slag and other debris such activities generate, the amounts involved are minimal. Some iron mail could be for polishing metalwork and some punches may be metalworking tools. A small quantity of bar iron was found in 16th-century and later deposits. The quantities of metalworking cannot be related to long term or large scale production, despite the proximity of Ferrours Lane. They could be related to itinerant workers or craftsmen working on the construction or modification of buildings or other structures at the site.

Trading is indicated by coins, jettons and weights. The loss of coins is concentrated in the 13th century suggesting a peak in commercial activity. Although generally residual the weights are medieval and could be 13th-century as well. They represent a range of types and were probably used for a range of purposes. Examples include a truncated conical lead example marked with a chisel cut and two holes that might be a one pound weight (Figure 69.1), a perforated cylinder of lead possibly represents a crude two ounce weight (Figure 69.2) and a piece of lead caulking may be a crude half ounce weight (Figure 69.3). There were also a lead hide-shaped one avoirdupois ounce weight used to weigh small items (Figure 69.4), a lead alloy 'pear-shaped' weight comprising a centrally-pierced sphere with central knob (Figure 69.5), and a small cast copper alloy cup quarter avoirdupois ounce weight with ring and dot decoration around the rim that was originally part of a nested set of weights used to weigh coins and small quantities of precious metal scrap (Figure 69.6). Jettons from the 15th and 16th centuries occur in small numbers on a wide range of sites (Schofield and Vince 1994, 131–33) so the numbers found are not indicative of particular activities.

From the 17th century onwards, clay lined pits and groups of sheep/goat metapodials located towards the river indicate tanning, although the name Barkereslane indicates much earlier origins for this industry. As well as animal skins tanning also requires lime, bark, urine and dog faeces. Tanners are documented in Ely during the middle of the 16th century, with four individuals who died between 1535 and 1554. Apart from two individuals who died in the second half of the 17th century there is then no evidence for tanners until the 1720s. After this a series of references indicates the continual presence of tanners into the 19th century, some of whom were based across the river in the Babylon area. Documentary sources make it clear that tanning on the Isle of Ely was predominantly a rural occupation and it appears that it only took place sporadically between Broad Street and the river Great Ouse with two early *floruits*, *c.*1520 to 1554 and 1660 to 1685. Although the large pits required for washing and soaking skins make tanning an archaeologically distinctive activity, the prolonged period of soaking required means that even tanners operating on a relatively small scale would create an impressive archaeological impact. Increasing quantities of cattle horn cores in the 16th century, some of which are cut, indicate that items were being made from horn.

Elsewhere in Ely, excavations at Forehill revealed small scale metalworking, woodworking including barrel making, textile working, leatherworking and trading with the earliest industry on a larger scale being brewing in the 15th century (Alexander 2003, 163 and 174–75). At the King's School activity appears to be entirely kitchen related (Dickens and Whittaker in prep). At West Fen Road (Mortimer *et al.* 2005) in the Middle/Late Saxon period there was mainly food production plus weaving and spinning, small scale iron smithing, bone and antler working. In the Saxo-Norman and medieval periods the settlement focussed on food production with an increasing importance of wool and textile production. The pattern appears to show clear spatial differences, with the land between Broad Street and the river fulfilling the typical roles of a waterfront area. In particular the animal bone, pottery and leather show that it was supplying many of the basic needs of the rest of Ely. Although some of the small scale activities could just be domestic production for domestic consumption, as appears to be the case for some activities at Forehill (Alexander 2003), it is clear that much of the activity between Broad Street and the river was on a much larger scale.

The earliest detailed information on employment is the 1841 census, which lists over 200 individuals involved in 60 different trades in the area between Broad Street and the river Great Ouse. The vast majority of trades involved

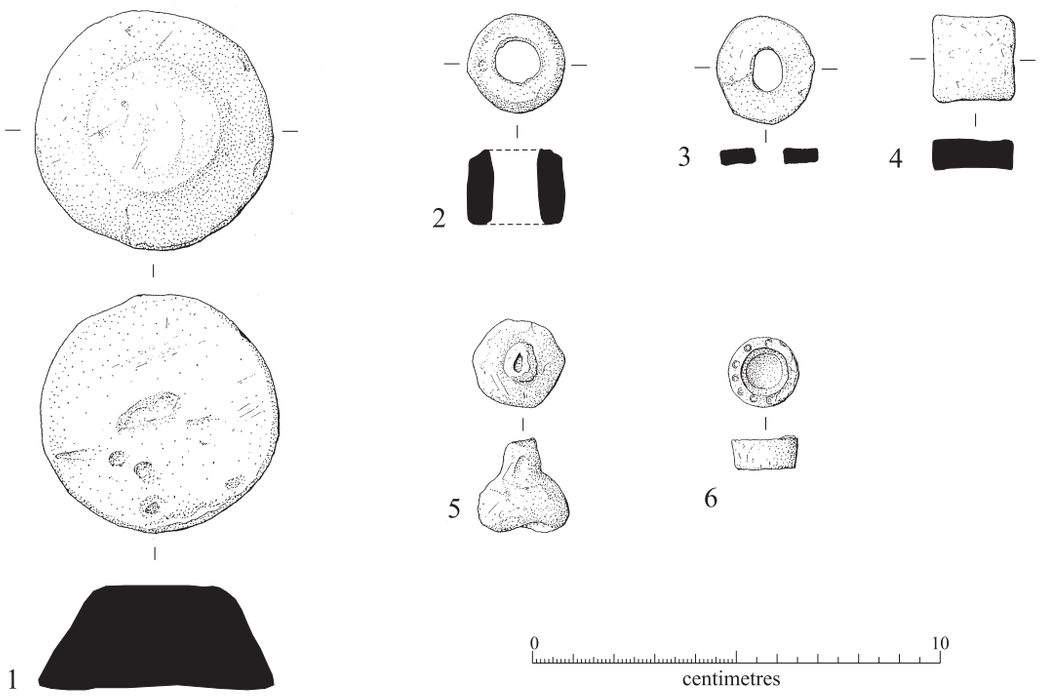


Figure 69 Weights
1) Truncated conical lead weight 2) Perforated lead cylinder 3) Lead caulking 4) 'Hide-shaped' lead weight
5) Lead alloy 'pear-shaped' weight 6) Copper alloy cup weight

one or two individuals, the only areas of major employment were watermen and related river trades (41, 19.6%), agriculture (28, 13.4%), general labourers (23, 11.0%) and hawkers (12, 5.7%). The occupations that have left distinctive archaeological traces such as potter, lime burner *etc*. employed only eight individuals (3.8%). Although the employment situation had undoubtedly changed between the period of the archaeological evidence, primarily the 16th and 17th centuries, and 1841 it is quite likely that the overall pattern may be similar. It is quite probable that the area always had a wide mixture of trades and that the river and agriculture were major employers. The trades that are highly visible archaeologically probably never employed large numbers of individuals judging by the scale of the remains and it is important not to confuse archaeological visibility with economic significance. The slightly earlier Pigot's Directory of 1823–24 reveals a similar picture with 40 businesses covering 21 different trades, of these only three businesses relate to trades recognised archaeologically.

Domestic occupation

The domestic structures (Figures 11 and 25) have not been as intensively investigated as on Forehill (Alexander 2003), but generally parallel the developments there. The types of wall construction, roofs, floors, hearths (Figure 13), ovens (Figure 28), stairways and external surfaces are all broadly similar, although some structural innovations occurred rather later on Broad Street, suggesting a less prosperous area. These changes occur much later in Ely than in other towns (Schofield 1997). With the possible exception of the Jubilee Terrace structure the buildings show no signs of being high status merchant's houses and warehouses as are known from ports such as King's Lynn (*cf.* Panlin 1963). Some of the earlier buildings were aligned parallel to the frontage rather than perpendicular to it, suggesting less pressure on frontage space than on Forehill and elsewhere, and a less densely occupied area.

Religion

Any discussion of Ely must consider the role of religion, as the Cathedral inevitably overshadows all parts of the town (Figure 56), although direct evidence is largely lacking. The priory owned most of the area and initial occupation and subsequent development must have been largely at its instigation. In general terms many of the activities and industries represented were probably largely related to supplying the needs of the religious institutions. This is, however, largely inferential and the fact that the two main foci of Ely were religious rather than secular had little impact on what took place. The only objects with direct religious associations are the possible mouth of an ampulla, a lead alloy cast foot possibly from a cheap pilgrimage memento and two Boy Bishop tokens, from Bury St Edmunds rather than Ely. The early evidence for literacy may suggest religious links (Figure 9.1–2), as might some faunal and botanical remains. In overall terms the distinctive and identifiable religious impact is no more than might be expected in any medieval urban setting and parallels that at Forehill (Alexander 2003, 164–65). Indeed for every element with religious connotations there are many more, such as the sword cross, that speak of the secular world. A 16th- or 17th-century hooked tag decorated with a hexagram could potentially be a Jewish item if this is a *Magen David* (Star of David) (Figure 70.2). Jews were readmitted into England in the 1650s, but have left few clear artefactual traces with the exception of seals or plates with Hebrew lettering (*cf.* Pearce 1998, 106–7).

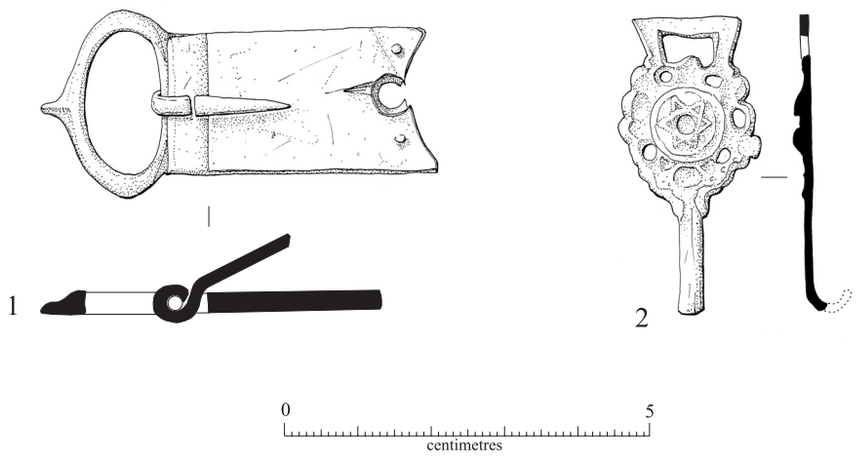


Figure 70 Items of personal adornment
1) Oval buckle 2) Hooked tag decorated with hexagram

The hexagram is less reliable evidence for a Jewish presence, however the hexagram had been relatively widely adopted as a Jewish symbol by this time and decoration on items such as hooked tags was frequently meaningful at this time rather than being purely decorative (*cf*. Robinson, P. 2000). While it is unlikely that there was a permanent Jewish presence in Ely and there is no documentary evidence for one, it is quite possible that Jews from London may have travelled to Ely.

Waterfront archaeology

The classic view of medieval urban waterfronts, largely inspired by work in London, has tended to focus on the timber and later stone revetments and other structures with substantial dumps rich in material remains between them (Milne and Milne 1979; Milne 2002). In contrast the Ely waterfront, in common with other sites such as Coppergate in York (Hall, R. and Hunter-Mann 2001, 858–59), has limited structures and the channels seem designed to minimise the requirement for timber. In part this may be because such structures lie beyond the limits of investigation, or because no hithe areas have been investigated. Whilst possible the absence of waterfront structures is still striking. Deposits rich in material remains were also extremely limited, being largely restricted to specific features such as some of the channels and tanks and linked to specific industrial activities rather than general refuse disposal. Most of the general layers dumped near the waterfront were no richer in material than those in other parts of Ely. Why this was the case is unclear, in part it may relate to issues of preservation, but overall it suggests either that medieval Ely was not generating large quantities of refuse or that the disposal strategies were different. There is probably a relationship between the volume of reclaimed land in cubic metres and the activity and growth of urban settlements as a whole (Schofield and Vince 1994, 57–59). If this is accepted then in broad terms we might see the 12th to 14th centuries as representing the peak for Ely, but only in terms of reclamation not refuse disposal. The view of medieval waterfront archaeology that emerges from Ely is one where the elements previously identified as making such areas interesting are largely absent, but the area is nonetheless fascinating.

Conclusion

The revolutions in British urban and waterfront archaeology that began in the 1960s and 1970s largely bypassed Ely, and indeed the rest of Cambridgeshire, until the 1990s. This means that in terms of both excavation methodologies and research agendas the towns of Cambridgeshire have lagged considerably behind some other British urban centres. Schofield has suggested that the 'archaeological investigation and study of medieval towns should go through three consecutive stages … data gathering, the construction of chronologies and typologies, and the study of specific activities and groups which functioned within towns' (1994, 195), this report however is an attempt to tackle all three stages in a concurrent manner in a town where it is recognised that 'work has only just begun' (Ayers 2000, 28).

Much of the impetus for urban and waterfront archaeology prior to the 1990s, was on centres that are much larger than Ely, which in terms of an overall urban hierarchy can principally be characterised as a relatively small inland riverine town. It therefore needs to be recognised that Ely represents a rather different type of archaeological challenge to those of larger centres such as London or York, or in a regional context Norwich. It is unlikely even in the medium to long term that development-led archaeology in urban centres in Cambridgeshire will lead to anything like the scale and number of archaeological investigations that have already taken place elsewhere. This report combined with other recent excavations (Alexander 2003; Mortimer *et al.* 2005) has certainly improved our understanding of the origins and development of Ely. It is perhaps unrealistic to imagine that Ely will ever make a major contribution to our understanding of urban archaeology in the way that larger towns do. What can be achieved, however, is to shed significant light on both Ely itself and one aspect of the urban hierarchy — small inland riverine towns.

Appendix: plant remains

	Location	*Posthole*	*Posthole*	*Hearth layer*	*Levelling layer*	*Levelling layer*	*Levelling layer*	*Pit*	*Floor*	*Floor*	*Floor*	*Oven 2*	*Oven 2*	*Tank 2*	*Kiln 3*	*Kiln 3*
	Phase	*12th/13th*	*14/15th*	*14/15th*	*14/15th*	*14/15th*	*14/15th*	*14/15th*	*14/15th*	*14/15th*	*14/15th*	*16th*	*16th*	*14th/15th*	*16th*	*16th*
	sample volume (litres)	12	13	17	7	15	4	13	12	10	10	15	15	5	8	15
	% of flot fraction examined	100	100	100	25	12.5	12.5	100	100	100	100	100	100	100	50	100
Economic Plants																
germinated *Hordeum vulgare sensu lato* grain	germinated barley grain	8	5	92	122	92	134						19			
ungerminated *Hordeum vulgare s.l.* grain	ungerminated barley grain	11	3	62	76	62	128						12			
indeterminate *Hordeum vulgare s.l.* grain	indeterminate barley grain	12	12	135	129	135	104						45			
Hordeum vulgare sensu lato grain	barley grain in non-malting contexts							9	11	3	7	6		5	20	
Triticum aestivum sensu lato grain	free-threshing wheat grain	20	16	21	17	7	6	11	28	19	5	3	34	1		8
Triticum sp. grain (of which germinated)	wheat grain (of which germinated)			2									20	4 (1)		
Triticum/Hordeum sp. grain	wheat/barley grain		3		2	4	4	4	3		3	4			15	
Secale cereale grain	rye grain	1		1	1		1		2							
Avena/Hordeum sp. grain	oat/barley grain			2					1							
Secale/Triticum sp. grain	rye/wheat grain			4	2	7			3							
Avena sp. grain (of which germinated)	oat grain (of which germinated)	28	4	5 (2)	7	6 (1)	7 (3)	5	2 (1)	6 (1)	1		1			
cereal grain indet.		4		16					13	4	1			2	12	5
Hordeum distichon L. rachis internode	2-row barley chaff														3	
Hordeum vulgare sensu lato rachis internode	barley chaff								5	2					9	
Triticum dicoccum spikelet fork	emmer wheat chaff		1 c.f.				1 c.f.									
Trititcum spelta glume base	spelt wheat chaff													1		
Triticum monococcum/dicoccum spikelet fork	einkorn/emmer chaff									2						
Triticum aestivum TYPE rachis internode	hexaploid wheat chaff		1					1	2							
Triticum turgidum TYPE rachis internode	tetraploid wheat chaff									2					1	
Triticum aestivum sensu lato rachis internode	free-threshing wheat chaff	1	1						4	5						
cereal indet. culm node	straw joint	2	2					3	1			5		2	6	
Corylus avellana L. nutshell	hazelnut	-	-	+	+	-			+	+	-					
Vicia faba var. *minor*	Celtic bean					1			3				1			
Pisum c.f. *sativum*	garden pea								2						1	
large legumes indet. (>4mm)	*c.f.* celtic bean/pea								1	2	2	1		1	1	
Linum usitatissimum L.	flax	1														

Other Plants																
large *Ranunculus* c.f. *bulbosus/acris/repens*	*c.f.* bulbous/meadow/creeping buttercup								3							
Ranunuculus sardous Crantz.	hairy buttercup										1					
Ranunculus flammula L.	lesser spearwort								10					1	8	
small *Ranunculus* sp.	small-seeded buttercup														1	
Chenopodium ficifolium Sm.	fig-leaved goosefoot								- u/w							
Chenopodium album L.	fat hen											- u				
Chenopodium sp	goosefoot	1	1						1	3					2	1
Atriplex patula/prostrata	common/spear-leaved orache									1					3	
Spergula arvensis L.	corn spurrey	2														
Agrostemma githago L.	corncockle	1				1										
Silene vulgaris Garcke	bladder campion								2							
Silene sp.	campion									1						
large Caryophyllaceae indet. (>3mm)	large Pink Family seed	1														
small Caryophyllaceae indet. (<1mm)	small Pink Family seed															4
Persicaria maculosa Gray	redshank						1		1	1						
Persicaria lapathifolia (L.) Gray	pale persicaria								1							
Polygonum aviculare L.	knotgrass						1									
Polygonum sp. kernel	knotgrass kernel										1					
Rumex acetosella L.	sheep's sorrel								1							
Rumex conglomeratus Murray (with tepals)	clustered dock													1		
Rumex sanguineus/conglomeratus/obstutifolius	small-seeded dock				1			2	9			26			1	
Rumex sp. kernel	dock kernel									1						
small *Rumex* sp.	small-seeded dock type		1	3												1
Malva sp.	mallow					1										
Coronopus squamatus (Forssk.) Asch.	swine-cress								1							
Brassica nigra type [coarse textured form]	black mustard	9		1												
small *Brassica/Sinapis* sp. (c. 2mm)	wild cabbage/mustard type						2		1 min & 1			2		2	2	
Sinapis arvensis L.	charlock	2 c.f.			1											
small, flat Brassicaceae indet.	small, flat Cabbage Family seed			1								- u				
small Brassicaceae pod fragments									+							
Anagallis arvensis L.	scarlet pimpernel									1						
Potentilla sp.	cinquefoil								1							
Prunus padus L.	bird cherry					1										
Vicia cf. *sepium* L.	bush vetch							1							1	
medium *Lathyrus* sp. (3-4mm)	wild pea												3			
medium *Vicia/Lathyryus/Pisum* sp. (3-4mm)	vetch/wild pea/pea	1		9		4			2	5	1		2	3		2
small *Vicia/Lathyrus* sp. (<3mm)	vetch/wild pea		1		1	2	1		10						1	
Medicago cf. *lupulina* L.	black medick								5							
large*Trifolium/Medicago* spp. (2-3mm)	medium-seeded clover/medick								1							
small *Trifolium* spp. (<1mm)	small-seeded clover	1					1		8	6	2				1	

Euphorbia peplus L.	petty spurge												- u						
Hydrocotyle vulgaris L.	marsh pennywort									1									
Conium maculatum L.	hemlock									- u/w									
small Apiaceae indet. kernel	small Carrot Family seed										2								
Hyoscyamus niger L.	henbane									1									
Solanum nigrum L.	black nightshade												1						
Solanum dulcamara L.	bittersweet									- u/w									
Menyanthes trifoliata L.	bogbean	2	1	1						12	3	1	1						
Lithospermum arvense L.	field gromwell									1									
Stachys arvensis (L.) L.	field woundwort	1																	
Lamium album/purpureum	white/red dead-nettle									- u/w			+ u						
Lycopus europaeus L.	gypsywort									2									
Mentha sp.	mint									5 & - u/w	2	1							
Plantago major L.	greater plantain												2						36
Plantago cf. *lanceolata* L.	ribwort plantain											1							
Plantago sp.	plantain																		1
Scrophularia sp.	figwort										1								
Veronica sp.	speedwell											1							
Odontites vernus (Bellardi) Dumort.	red bartsia							1			1								
Galium cf. *odoratum* (L.) Scop.	woodruff			1						1	1	1			1	1			
Galium palustre L.	common marsh bedstraw									3									
Galium aparine L.	cleavers	1		2		1				4									
Sambucus nigra L.	elder	+ u & 1	- u							- u/w			+ u						
Knautia arvensis (L) Coult.	field scabious			1															
Centaurea nigra L.	common knapweed	1		1			1				2								
Anthemis cotula L.	stinking chamomile				3			2		6	8								
Chrysanthemum segetum L.	corn marigold									1									
Tripleurospermum inodorum (L.) Sch. Bip.	scentless mayweed										1								
small Asteraceae indet.	small Daisy Family seed			1						4							4		
Alisma plantago-aquatica L.	water plantain									3	1								
Luzula sp.	wood-rush							1											
Eleocharis cf. *palustris* (L.) Roem. & Schult.	common spike-rush									29	4		3						
Eleocharis cf. *quinqueflora* (Hartmann) O Schwartz	few-flowered spike-rush									1							2		
Eleocharis sp.	spike-rush			1															
cf. *Blysmus compressus* (L.) Panz. ex Link	flat sedge									1	2								
Schoenus nigricans L.	black bog-rush			1						2			9		2		41		
vegetative *Cladium mariscus* fragments	great fen sedge leaves	+	++		+	++	+	+++		++	++	+			+++		+++		
Cladium mariscus culm node	great fen sedge stem joint												1 c.f.						
Cladium mariscus (L.) Pohl	great fen sedge		3	2	4	1		12		352	50	8	70		3		16		
Carex spp.	true sedges	1								31	6	5	4		2		34		

Cyperaceae culm base	sedge stem base								1							
Cyperaceae indet.	sedge									4						
small *Festuca* sp.	fescue							1		1		1			1	
Festuca/Lolium sp.	fescue/rye grass								10		2			3	2	
Lolium cf. *multiflorum* Lam (of which germinated)	Italian rye grass		2 (1)	61 (5)	29 (6)	20 (3)	36 (1)			1						
Lolium cf. *temulentum* L. (of which germinated)	darnel						40 (15)									
Lolium sp.	rye grass					5										
Poa spp.	meadow grass								5	1	1	3				
Phleum cf. *bertolonii* DC.	lesser cat's-tail	1	1													
Phleum sp.	cat's-tail															1
Anisantha cf. *sterilis* (L.) Nevski	barren brome								1							
Phragmites TYPE culm node	reed stem joint							1	2			5			10	
large Poaceae indet (>4mm)	Large Grass Family seed					1			5							
medium Poaceae indet. (c. 4mm)	medium Grass Family seed								4		1		2	2		
small Poaceae indet. (c.2mm)	small Grass Family seed								1							
Poaceae culm node	Grass stem joint					1										
small seed indet. (<3mm)		1	1	1	1				10	9				6	14	8
large seed indet. (>3mm)				1												
small twigs												+				
large Monocot. culm node indet.	Large grass/sedge stem joint					2			1		1	4				
Monocot. culm node fragments	large grass/sedge stem joint fragments								+			++				
Roots		-							++							
indet. iron-replaced wood fragments													+			
stem fragment									+							
Charophyte oogonium	green algae 'seed'							1 & -u		1	1	1		- u		
charcoal fragments																
large charcoal (>4mm)		++	++	+	+	+	+	++	++	+	+	+	-	+	+	+
med. charcoal (2-4mm)		+++	+++	++	++	++	++	+++	+++	+++	+++	++	++	+	++	++
small charcoal (<2mm)		+++	+++	++	+++	+++	++	+++	+++	+++	+++	++	+++	++	+++	+++
- vitrified charcoal				+									++		+	++
- twiggy charcoal														+		
moss															++	

- 1 or 2, + less than 10, ++ 10-50, +++ more than 50, w waterlogged, u uncharred, min mineralised

Table 9 Charred plant remains from non-waterlogged contexts

	Location	***Ditch 2***	***Channel 2***	***Channel 1***	***Channel 3***	***Channel 3***
	Phase	*14th/15th*	*14th/15th*	*14th/15th*	*16th*	*16th*
	sample volume (litres)	10	0.4	0.4	0.4	0.25
	% of flot fraction examined	25	50	50	50	50
large *Ranunculus* c.f. *bulbosus/acris/repens*	*c.f.* bulbous/meadow buttercup	- w		- w	+ w	- w
Ranunculus flammula L.	lesser spearwort		- w	+ w	++ w	+ w
Ranunculus scleratus L.	celery-leaved buttercup	++ w	- w	- w		
Ranunculus subgen. *BATRACHIUM*	crowfoot	++ w	++ w	- w		
Thalictrum flavum L.	common meadow rue	- w	- w		- w	
Papaver dubium L.	long-headed poppy	- w				
Urtica dioica L.	common nettle	++ w	++ w	++ w	+ w	++ w
Urtica urens L.	small nettle				- w	
Chenopodium sp.	goosefoot	- w			- w	+ w
Stellaria media (L.) Vill.	chickweed			+ w	- w	
Persicaria maculosa Gray	redshank		- w	++ w		- w
Persicaria lapathifolia (L.) Gray	pale persicaria			- w		
Persicaria maculosa/lapathifolia	redshank/pale persicaria				- w	
Persicaria hydropiper (L.) Spach	water pepper			- w		- w
Polygonum sp. kernel	knotgrass kernel			- w		
Rumex acetosella L.	sheep's sorrel					- w
Rumex hydropathalum Huds.	water dock			- w		
small *Rumex* sp.	small-seeded dock type		- w			
Malva sylvestris L.	common mallow			- w		
Bryonia dioica Jacq.	white bryony					- w
Salix spp. bract	willow		- w	- w		
Brassica nigra type [coarse textured form]	black mustard			- w		
Brassica/Geranium TYPE	cabbage/cranesbill type		- w			
Potentilla anserina L.	silverweed			+ w		- w
Potentilla sp.	cinquefoil		- w	- w		- w
small *Trifolium* spp. (<1mm)	small-seeded clover				- u	
Geranium rotundifolium/columbinum	round-leaved/long-stalked cranesbill		- w	- w		
Hydrocotyle vulgaris L.	marsh pennywort		- w	- w		
Anthriscus cerefolium (L.) Hoffm.	garden chervil	- w				
Sium latifolium L.	greater water parsnip	++ w			- w	
Oenanthe fistulosa L.	tubular water dropwort			- w		
Conium maculatum L.	hemlock		+ w	- w	- w	- w
Apium nodiflorum (L.) Lag.	fool's watercress	- w				
Hyoscyamus niger L.	henbane	- w			- w	
Solanum dulcamara L.	bittersweet	+ w		+ w	++ w	+ w

Menyanthes trifoliata L.	bogbean	- w	- w			
Myosotis sp.	forget-me-not					-w
Stachys c.f. *palustris*	marsh woundwort	- w				
Lamium album/purpureum	white/red dead-nettle			- w	+ w	
Lycopus europaeus L.	gypsywort	+ w			- w	
Mentha sp.	mint	- w	- w	+ w		
Plantago major L.	greater plantain	- w				
Sambucus nigra L.	elder	+ w		- w		- w
Carduus/Cirsium spp.	thistle			- w	- w	- w
Lapsana communis L.	nipplewort		- w			
Leontodon autumnalis/hispidis	autumn/rough hawkbit			- w	- w	- w
Sonchus asper (L.) Hill	prickly sowthistle		+ w			
Alisma plantago-aquatica L.	water plantain	+ w	- w	+ w		
Potamogeton spp.	pondweeds	+ w				
Lemna sp.	duckweed	+++ w	+ w	- w		
Eleocharis c.f. *palustris*	common spike-rush			++ w	++ w	+ w
Cladium mariscus (L.) Pohl	great fen sedge			- w		- w
Carex spp.	true sedges		+ w	+ w	+ w	++ w
Phragmites TYPE culm node	reed stem joint				- w	
Phragmites sp. rhizome fragments	reed underground stem			+ w		+ w
medium Poaceae indet. (c. 4mm)	medium Grass Family seed				+ w	
small seed indet. (<3mm)		+ w				
large seed indet. (>3mm)			- w			
small twigs			+ w	++ w		+ w
wood fragments		+ w	++ w	+ w	+ w	++ w
wood chip						- w
leaf fragments			+ w	+ w	+ w	++ w
Moss						- w
Daphnia sp. egg cases	water flea	++ w	++ w			- w

None of these contexts produced significant charred material and it has not been included in this table

Table 10 Contexts with waterlogged material

Bibliography

Adams, W.H., 2003 'Dating historical sites: the importance of understanding time lag in the acquisition, curation, use and disposal of artefacts', *Hist. Archaeol.* 37, 38–64

Alexander, M., 1998a *An evaluation of the archaeology at Broad Street, Ely, Cambridgeshire*, Cambridge Archaeological Unit Report 257

Alexander, M., 1998b *An archaeological evaluation at the former Coalyard, Jubilee Terrace, Ely Cambridgeshire*, Cambridge Archaeological Unit Report 275

Alexander, M., 1998c *Second stage evaluation at the former Coalyard, Jubilee Terrace, Ely, Cambridgeshire*, Cambridge Archaeological Unit Report 290

Alexander, M., 2002 *Excavations at the former Jewson's Yard, Broad Street, Ely. Post-Excavation Assessment*, Cambridge Archaeological Unit Report 491

Alexander, M., 2003 'A medieval and post-medieval street frontage: investigations at Forehill, Ely', *Proc. Cambridge Antiq. Soc.* 92, 135–82

Anderson, S., 2003 'Glazed redware pottery and kiln waste from Sutton Heath, Suffolk', *Proc. Suffolk Inst. Archaeol.Hist.* 40, 301–5

Anderson, S., Breen, A.M., Caruth, J. and Gill, D., 1996 'The late medieval pottery industry on the north Suffolk border', *Medieval Ceramics* 20, 3–12

Armour, N., 2002 *An archaeological evaluation at 55 Broad Street, Ely, Cambridgeshire*, Cambridge Archaeological Unit Report 480

Ashley, S., 2002 *Medieval Armorial Horse Furniture in Norfolk*, E. Anglian Archaeol. 101

Aston, M., (ed.) 1988 *Medieval fish, fisheries and fishponds in England*, Brit. Archaeol. Rep. British Ser. 182

Aston, M., 2002 *Monasteries in the landscape* (Stroud, Tempus)

Aston, M. and Bond, J., 1976 *The landscape of towns* (London, Dent)

Atkins, R., Chapman, A. and Holmes, M., 1998 'The excavation of a medieval bake/brewhouse at The Elms, Brackley, Northamptonshire, January 1999', *Northamptonshire Archaeol.* 28, 5–24

Atkinson, T.D., 1933 *Architectural history of the Benedictine monastery of Saint Etheldreda at Ely* (Cambridge, Cambridge University Press)

Ayers, B., 1985 'The growth of a Saxon port', in Herteig 1985, 46–54

Ayers, B., 1987 *Excavations at St Martin-at-Palace Plain, Norwich, 1981*, E. Anglian Archaeol. 37

Ayers, B., 1991 'From cloth to creel — riverside industries in Norwich', in Good *et al.* 1991, 1–8

Ayers, B., 1994 *Excavations at Fishergate, Norwich 1985*, E. Anglian Archaeol. 68

Ayers, B. 2000 'Anglo-Saxon, Medieval and Post-Medieval (Urban)', in Brown, N. and Glazebrook, J. (eds), *Research and Archaeology: a framework for the Eastern Counties, 2. research agenda and strategy*, E. Anglian Archaeol. Occasional Paper 8, 27–32

Ayers, B. and Murphy, P., 1983 *A waterfront excavation at Whitefriars Street Car Park, Norwich, 1979*, E. Anglian Archaeol. 17

Baart, J.M., 1994 'Dutch Redwares', *Medieval Ceramics* 18, 19–27

Ballantyne, R., 2004 'Islands in wilderness: the changing medieval use of the East Anglian peat fens, England', *Environmental Archaeol*. 9, 189–98

Barker, D., 1999 'The ceramic revolution 1650–1850' in Egan, G. and Michael, R. (eds), *Old and New Worlds* (Oxford, Oxbow Books), 214–25

Barrett, J.H. Locker, A.M. and Roberts, C.M., 2004 'Dark Age Economics revisited: the English fish bone evidence AD 600–1600', *Antiquity* 78, 618–26

Bartlett, K.S., 1971 'Excavations at Potovens, near Wakefield 1968', *Post-Medieval Archaeol.* 5, 1–34

Barton, K., 1992 'Ceramic changes in the western European littoral at the end of the middle ages. A personal view', in Gaimster, D. and Redknap, M. (eds), *Everyday and exotic pottery from Europe. Studies in honour of John G. Hurst*, (Oxford, Oxbow Books), 246–55

Bartosiewcz, L., 2003 'There's something rotten in the state… bad smells in Antiquity', *European J. Archaeol.* 6, 175–95

Beedham, G.E., 1972 *Identification of the British Mollusca* (Amersham, Hulton Educational)

Beresford, M., 1967 *New towns of the Middle Ages. Town planning in England, Wales and Gascony* (London, Lutterworth)

Biddle, M. and Brown, D., 1990 'Writing equipment and books', in Biddle, M. (ed), *Object and Economy in Medieval Winchester*, Winchester Studies 7.II, 729–59

Bill, J. and Clausen, B., (eds) 1999 *Maritime topography and the Medieval town*, National Mus. Denmark Stud. Archaeol. Hist. 4

Blake, E.O., (ed.), 1962 *Liber Eliensis* (London, Royal Historical Society)

Blinkhorn, P.W., in press *The Ipswich Ware project: ceramics, trade and society in Middle Saxon England*, Medieval Pottery Research Group Monograph

Bolton, E.G., 1960 'Excavation of a house and malt kiln at Barrow, Rutland', *Medieval Archaeol.* 4, 128–31

Bond, C.J., 1989 'Water management in the rural monastery', in Gilchrist and Mytum 1989, 83–111

Bray, S. and Last, J., 1997 *Medieval and later deposits at 54 Broad Street, Ely: an archaeological recording brief*, Cambridgeshire County Council Archaeological Field Unit Report A110

Brears, P.C.D., 1967 'Excavations at Potovens, near Wakefield', *Post-Medieval Archaeol.* 1, 3–43

Brears, P.C.D., 1971 *The English Country Pottery*, (Newton Abbott, David Charles)

Briscoe, G. and Dunning, G.C., 1967 'Medieval pottery, roof-fittings and a water-pipe found at Ely', *Proc. Cambridge Antiq. Soc.* 40, 81–89

Britnell, R.H., 1994 'The Black Death in English Towns', *Urban Hist.* 21, 195–210

Britnell, R.H., 2001 'Specialization of work in England, 1100–1300', *Engl. Hist. Rev.* 54, 1–16

Brooks, C.M., 1983 'Aspects of the sugar-refining industry from the 16th to the 19th century', *Post-Medieval Archaeol.* 17, 1–14

Brothwell, D., 1982 'Linking urban man with his built environment', in Hall, R.A. and Kenward, H.K. (eds), *Environmental Archaeology in the Urban Context*, Counc. Brit. Archaeol. Res. Rep. 43, 126–29

Bryan, P. and Wise, N., 2002 'A Reconstruction of the Medieval Cambridge Market Place', *Proc. Cambridge Antiq. Soc.* 91, 73–87

Bryant, J.G. and Steane, J.M., 1969 'Excavations at the deserted medieval settlement at Lyveden: a second interim report', *J. Northampton Mus. Art Gall*. 5, 1–50

Burt, R., 1969 'Lead production in England and Wales 1700–1770', *Econ. Hist. Rev.* 22, 249–67

Carus-Wilson, E.M., 1963 'The medieval trade of the ports of the Wash', *Medieval Archaeol.* 6–7, 182–201

Cessford, C., 2001 'The clay tobacco pipe industry in Cambridgeshire and Huntingdonshire', *Cambridgeshire Local Hist. Soc. Rev.* 10, 3–19

Cessford, C., 2003 *The Old Tesco site, Broad Street, Ely. Watching brief 2000–2001*, Cambridge Archaeological Unit Report 529

Cessford, C. with Dickens, A., 2005 'Cambridge Castle Hill, excavations of Saxon, medieval and post-medieval deposits, Saxon execution site and a medieval coin hoard', *Proc. Cambridge Antiq. Soc*. 94, 73–101

Cessford, C. with Dickens, A., in prep. *Ely Cathedral and environs: recent investigations*

Chapelot, J., 1983 'The Saintonge pottery industry in the later Middle Ages', in Davey, P. and Hodges, R. (eds), *Ceramics and trade. The production and distribution of later medieval pottery in north-west Europe. Papers derived from the Proceedings of the Medieval Pottery Research Group's annual conference at Hull, 1980* (Sheffield, University of Sheffield), 49–53

Clarke, H., 1973 'The changing riverline of King's Lynn, Norfolk in the Middle Ages', *Internat. J. Naut. Archaeol.* 2, 95–106

Clarke, H., 1981 'King's Lynn', in Milne and Hobley 1981, 132–36

Clarke H., 1984 *Archaeology of Medieval England* (London, British Museum)

Clarke, H. and Carter, A., 1977 *Excavations in King's Lynn 1963–1970*, Soc. Medieval Archaeol. Monograph Ser. 7 (London)

Clarkson, L.A., 1960 'The organization of the english leather industry in the late sixteenth and seventeenth centuries', *Econ. Hist. Rev.* 13, 245–56

Coleman-Smith, R., 2002 'Excavations in the Donyatt potteries: site 13', *Post-Medieval Archaeol.* 36, 118–72

Connor, A., forthcoming a *Excavations at Jubilee Terrace*, Cambridgeshire County Council Archaeological Field Unit Report

Connor, A., forthcoming b *Excavations at Reach Road, Burwell*, Cambridgeshire County Council Archaeological Field Unit Report

Cowgill, J., de Neergaard, M. and Griffiths, N., 2000 *Medieval Finds from Excavations in London: 1. Knives and Scabbards*, (Woodbridge, Boydell Press)

Cotter, J. P., 2000 *The post-Roman pottery from excavations in Colchester 1971–85*, Colchester Archaeol. Rep. 7

Coy, J.P. and Allen, M.J., 1997 'Cattle horn cores', in Hawkes and Fasham 1997, 104–05

Crank, N. Doyle, K. Grassam, A. O'Brien, L. and Williamson, I., 2004 *Fenland Pine Premises, 57 Broad Street, Ely, Cambridgeshire*, Archaeological Solutions Report 1510

Cra'ster, M.D. and Bushnell, G.H.S., 1959 'Pagan Saxon Burials at Ely', *Proc. Cambridge Antiq. Soc.* 59, 57

Crosby, E.U., 1994 *Bishop and Chapter in Twelfth-Century England. A study of the Mensa Episcopalis*, (Cambridge, Cambridge University Press)

Crossley, D., 1990 *Post-Medieval Archaeology in Britain*, (London, Leicester University Press)

Cumberpatch, C., 2003 'The transformation of tradition: the origins of the post-medieval ceramic tradition in Yorkshire', *Assemblage* 7, http://www.shef.ac.uk/assem/issue7/cumberpatch.html

Currie, C.K., 1989 'The role of fishponds in the monastic economy', in Gilchrist and Mytum 1989, 147–72

Currie, C.K., 1993 'The archaeology of the flowerpot in England and Wales, *circa* 1650–1950', *Garden Hist*. 21, 227–46

Currie, C.K., 1997 'A possible ancient water channel around Woodmill and Gater's Mill in the historic manor of South Stoneham', *Proc. Hampshire Field Club Archaeol. Soc.* 52, 89–106

Dallas, C. and Sherlock, D., 2002 *Baconsthorpe Castle, Excavations and Finds, 1951–1972*, E. Anglian Archaeol. 102

Darby, H.C., 1974 *The Medieval Fenland*, (Cambridge, Cambridge University Press)

Day, A., 1999 *Fuel from the Fens. A Portrait of the Fenland Turf Industry in Cambridgeshire*, (Seaford, SB Publications)

Davis, E.M., 1984 'Development of the building', in Holton-Krayenbuhl 1984b, 13–24

de Neergaard, M., 2000 'The decoration of Medieval scabbards', in Cowgill *et al*, 40–44

Denham, V., 1985 'The Pottery' in Williams, J.H. Shaw, M. and Denham, V. (eds), *Middle Saxon Palaces at Northampton*. Northampton Development Corporation Monograph Ser. 4, 46–64

Dickens, A., 1996 *Archaeological Excavations at St John's College, Cambridge*, Cambridge Archaeological Unit Report 175

Dickens, A. and Whittaker, P., in prep. *Palace and kitchen: excavations at Ely King's School*

Divers, D., 2004 'Excavations at Deptford on the site of the East India Company dockyards and the Trinity House Almshouses, London', *Post-Medieval Archaeol.* 38, 17–132

Drury, P.J. 1982 'Aspects of the origins and development of Colchester Castle', *Archaeol. J.* 139, 358–80

Drury, PJ., 2000 'Aspects of the production, evolution and use of ceramic building materials in the Middle Ages', *Medieval Ceramics* 24, 56–62

Dyer A., 1991 *Decline and Growth in English Towns 1400–1640*, (Basingstoke, Macmillan)

Dyer, A., 2000 'Appendix: ranking lists of English Medieval towns', in Palliser, D. (ed), *The Cambridge Urban History of Britain: Volume 1 600–1540* (Cambridge, Cambridge University Press), 747–70

Edwards, D. and Hall, D., 1997 'Medieval pottery from Cambridge', *Proc. Cambridge Antiq. Soc.* 86, 153–68

Ellmers, D., 1981 'Post-Roman waterfront installations in the Rhine', in Milne, G. and Hobley, B. (eds), *Waterfront Archaeology*, Counc. Brit. Archaeol. Res. Rep. 412, 88–96

Ellmers, D., 1985 'Loading and unloading ships using a horse and cart, standing in the water', in Herteig 1985, 25–30

Ellmers, D., 1989 'Development and usage of harbour cranes', in Villain-Gandossi, C., Busuttil, S. and Adam, P. (eds), *Medieval ships and the birth of technological societies. Volume I: Northern Europe*, (Malta, Foundation for International Studies), 43–69

EMC., Corpus of Early Medieval Coins. http://www-cm.fitzmuseum.cam.ac.uk/coins/emc.html

Evans, C., 1991 *Archaeological Investigations in Chapel Court St John's College, Cambridge*, Cambridge Archaeological Unit Report 26

Evans, C., 2003 *Power and Island Communities: Excavations at the Wardy Hill Ringwork, Coveney, Ely*, E. Anglian Archaeol. 103

Evans, N. and Roe, S. (eds), 2000 *Cambridgeshire Hearth Tax Returns, Michaelmas 1664*, (London, British Records Society)

Farley, M., 1979 'Pottery and pottery kilns of the post-medieval period at Brill, Buckinghamshire', *Post-Medieval Archaeol.* 13, 127–52

Farmer, P.G. and Farmer, N.C., 1982 'The dating of the Scarborough ware pottery industry', *Medieval Ceramics* 6, 66–86

Forestry Commission, 1956 'Utilisation of hazel coppice', *Forestry Commission Bull.* 27 (London, HMSO)

Fowler, G., 1934 'Fenland waterways past and present. South level district Part II', *Proc. Cambridge Antiq. Soc.* 34, 2–33

Fowler, G., 1947 'Cratendune: a problem of the Dark Ages', *Proc. Cambridge Antiq. Soc.* 41, 70–73

French, C.A.I., 1992 'Excavation at Holme Site 2, Cambridgeshire', *Fenland Res.* 7, 60–61

Gaimster, D., 1994 'The archaeology of post-medieval society, *c.*1450–1750: material culture studies in Britain since the war', in Vyner, B. (ed), *Building on the Past*, (London, Royal Archaeological Institute), 281–311

Gaimster D. and Nenk, B., 1997 'English households in transition *c.*1450–1550: the ceramic evidence', in Gaimster, D. and Stamper, P. (eds), *The Age of Transition: the Archaeology of English Culture 1400–1600*, Oxbow Monograph 98 (Oxford), 171–95

Gilchrist, R. and Mytum, H. (eds), 1989 *The Archaeology of Rural Monasteries*, Brit. Archaeol. Rep. British Ser. 203

Gomersall, H.M., 2000 'Departed glory: the archaeology of the Leeds tanning industry 1780–1914', *Industrial Archaeol. Rev.* 22, 133–44

Gooch, W., 1811 *General View of the Agriculture of the County of Cambridge*, (London, Richard Phillips)

Good, G.L., Jones, R.H. and Ponsford, M.W. (eds), 1991 *Waterfront Archaeology: proceedings of the third international conference on waterfront archaeology held at Bristol 23–26 September 1988*, Counc. Brit. Archaeol. Res. Rep. 74

Goodall, I.H., 1993 'Structural Ironwork', in Margeson, S. (ed), *Norwich Households: Medieval and Post-Medieval Finds from Norwich Survey Excavations 1971–78*, E. Anglian Archaeol. 58, 143–48

Goodall, I.H. and Carter, A., 1977 'Iron objects', in Clarke and Carter 1977, 291–98

Grant, G. and Doyle, K., 2004 *Land rear of 1–8 Annesdale (Riverside Boatyard), Ely, Cambridgeshire*, Archaeological Solutions Report 1597

Green, C., 1999 *John Dwight's Fulham Pottery, Excavations 1971–79,* English Heritage Archaeol. Rep. 6 (London)

Greig, J.R.A., 1991 'The British Isles', in van Zeist, W., Wasylikowa, K. and Behre, K. (eds), *Progress in Old World Palaeoethnobotany*, (Rotterdam, Balkema), 299–334

Hall, A., 2002 'A late 16th century pit group from Pembroke College, Cambridge', *Proc. Cambridge Antiq. Soc.* 91, 89–101

Hall, D., 1996 *The Fenland Project, number 10: Cambridgeshire Survey, Isle of Ely and Wisbech*, E. Anglian Archaeol. 79

Hall, D., 2001 'The pottery from Forehill, Ely, Cambridgeshire', *Medieval Ceramics* 25, 2–21

Hall, D forthcoming 'Pottery report', in Cope-Faulkner, P. *Excavations at Raynam House, King's Lynn*

Hall, D. and Coles, J., 1994 *Fenland Survey. An essay in landscape and persistence*, English Heritage Archaeol. Rep. 1 (London)

Hall, R.A. and Hunter-Mann, K., 2001 *Medieval Urbanism in Coppergate: Refining a Townscape*, Archaeol. York 10/6

Hampson, E.M. and Atkinson, T.D., 1953 'City of Ely', in Pugh, R.B. (ed), *The Victoria County History of Cambridgeshire IV* (Oxford, Oxford University Press), 28–89

Harcourt, R.A., 1974 'The dog in prehistoric and early historic Britain', *J. Archaeol. Sci.* 1, 151–75

Hawkes, J. and Fasham, P.J., 1997 *Excavations on Reading Waterfront sites, 1979–1988*, Wessex Archaeology Report 5

Hayes, R.H., 1986 'Excavations at Spaunton Manor, North Yorkshire', *Ryedale Hist.* 13, 4–25

Henderson, C.G., 1991 'The development of Exeter Quay 1564–1701', in Good *et al.* 1991, 124–36

Healey, R.H., 1969 'Bourne Ware', *Lincolnshire Hist. Archaeol.* 4, 108–09

Healey, R.H., 1975 *Medieval and Sub-Medieval Pottery in Lincolnshire* (unpubl. M.Phil. thesis Univ. Nottingham)

Healey, H., Malim, T. and Watson, K., 1998 'A medieval kiln at Colne, Cambridgeshire', *Proc. Cambridge Antiq. Soc.* 87, 49–58

Herteig, A.E., (ed), 1985 *Conference on waterfront archaeology in North European towns No. 2, Bergen 1983* (Bergen, Historisk Museum Bergen)

Higham, M.C., 1989 'Some evidence for 12th- and 13th-century linen and woollen textile processing', *Medieval Archaeol.* 33, 38–52

Hinds, S., 1994 *A recording brief at Ship Lane, Ely*, Cambridgeshire County Council Archaeological Field Unit Report A32

Hinton, D.A., 1999 ''Closing' and the Later Middle Ages', *Medieval Archaeol.* 43, 172–82

Hollindrake, C. and Hollindrake, N., 1993 'The Abbey enclosure ditch and a Late-Saxon canal: rescue excavations at Glastonbury, 1984–1988', *Somerset Archaeol. Nat. Hist. Soc.* 136, 73–94

Holton-Krayenbuhl A.P.B., 1984a 'The archaeological excavations', in Holton-Krayenbuhl 1984b, 25–36

Holton-Krayenbuhl A.P.B., (ed), 1984b *The Three Blackbirds. A medieval house in Ely Cambridgeshire*, (Ely, Ely Preservation Trust)

Holton-Krayenbuhl, A.P.B., 1997 'The infirmary complex at Ely', *Archaeol. J.* 154, 118–72

Huggins, P.J., 1972 'Excavations at Waltham Abbey, 1970–2', *Essex Archaeol. Hist.* 4, 30–127

Hughes, T. McK. and Hughes, M.C., 1909 *Cambridgeshire*, (Cambridge, Cambridge University Press)

Hutchinson, G., 1994 *Medieval ships and shipping*, (London, Leicester University Press)

James, E.M., 1987 'A fresh study of the South Gate at King's Lynn, in the light of recent restoration work', *Norfolk Archaeol.* 40, 55–72

Jenkins, H.J.K., 1988 'Fenland lighters: research and preservation involving a traditional type', *Northamptonshire Past Present* 7, 349–51

Jenkins, H. J. K., 1991a *Along the Nene*: *Peterborough waterway traffic through the centuries*, (Cambridgeshire Books)

Jenkins, H.J.K., 1991b 'A surviving Fenland lighter', *Mar. Mirror* 77, 418–20

Jenkins, H.J.K., 1993a 'Fenland lighters and their heyday *c.*1700–1850', *Mar. Mirror* 79, 155–69

Jenkins, H.J.K., 1993b 'Medieval barge traffic and the building of Peterborough Cathedral', *Northamptonshire Past Present* 8, 255–56

Jenkins, H.J.K., 1993c 'Medieval Fenland stone barges: a fragment of evidence', *Mar. Mirror* 79, 458–60

Jennings, S., 1981 *Eighteen centuries of pottery from Norwich*, E. Anglian Archaeol. 13

Jessop, O., 1996 'A new artefact typology for the study of medieval arrowheads', *Medieval Archaeol.* 40, 192–205

Johnson, M., 1993 *Housing culture. Traditional architecture in an English landscape*, (London, UCL Press)

Jones, A.E., 1993 'Archaeological excavations at the White Hart, Ely 1991–92', *Proc. Cambridge Antiq. Soc.* 82, 113–37

Jones, A.E., 2000 *St Mary's Street, St Neots, Cambridgeshire, archaeological investigations 1994–5*, E. Anglian Archaeol. Occasional Paper 7

Jones, C., Eyre-Morgan, G., Palmer, S. and Palmer, N., 1997 'Excavations in the outer enclosure of Boteler's Castle, Oversley, Alcester, 1992–93', *Birmingham Warwickshire Archaeol. Soc. Trans. 101*, 1–98

Jones, G., 1984 'Interpretation of archaeological plant remains: ethnographic models from Greece', in van Zeist, W. and Casparie, W.A. (eds), *Plants and Ancient Man*, (Rotterdam, Balkema), 43–61

Keene, D.J., 1976 'Suburban Growth', in Barley, M.W. (ed), *The Plans and Topography of Medieval Towns in England and Wales*, Counc. Brit. Archaeol. Res. Rep. 14, 71–82

Kemp, S.N. & J.P.C. Hunter. 1992 *Archaeological Investigations at Canonry House Garden, Ely*, Cambridge Archaeological Unit Report 65

Kilmurry, K., 1980 *The Pottery Industry of Stamford type, Lincs c. AD 850–1250*, Brit. Archaeol. Rep. British Ser. 84

Knight, H., 1999 'Excavations at Colham Mill Road, West Drayton', *Trans. London Middlesex Archaeol. Soc.* 49, 99–106

Langdon, J. 1993 'Inland water transport in Medieval England', *J. Hist. Geogr.* 19, 1–11

Le Patourel, J.H.E., 1968 'Documentary evidence and the medieval pottery industry', *Medieval Archaeol.* 12, 101–26

Leah, M., 1994 *The Late Saxon and Medieval Pottery Industry of Grimston, Norfolk: Excavations 1962–92*, E. Anglian Archaeol. 64

Leedham-Green, E. and Rodd, R. (eds), 1994–96 *Index of the Probate Records of the Consistitory Court of Ely 1449–1858*, (London, British Records Society)

Lentowicz, I., 1999 'The pottery', 46–65 in Andrews, P., 'Part II. Excavations at St Nicholas Street 1990, Site 1134', in Andrews, P. and Penn, K., *Excavations in Thetford, North of the River, 1989–90*, E. Anglian Archaeol. 87, 12–65

Lethbridge, T.C., 1952 'Jewelled Saxon pendant from the Isle of Ely', *Proc. Cambridge Antiq. Soc.* 46, 1–3

Lethbridge, T.C. and Fowler, G., 1933 'Excavations in the bed of the old Cam at Quanea (Rollers Lode)', *Proc. Cambridge Antiq. Soc.* 33, 129–32

Lucas, G., 1998 'A Medieval fishery on Whittlesea Mere, Cambridgeshire', *Medieval Archaeol.* 42, 19–44

Lucas, R., 1993 'Ely bricks and roof-tiles and their distribution in Norfolk and elsewhere in the 16th to 18th centuries', *Proc. Cambridge Antiq. Soc.* 82, 157–62

MacGregor, A., 1985 *Bone, Antler, Ivory and Horn. The technology of skeletal materials since the Roman period*, (London, Croom Helm)

Marsden, P., 1972 'Baynard's Castle', *London Archaeol.* 1, 315–16

Marshall, W., 1878 'On an ancient canoe found embedded in fen peat, near Magdalene Bend, on the river Ouse, in the County of Norfolk', *Proc. Cambridge Antiq. Soc.* 4, 196–206

Martin, C.J.M. and Martin, P.F. de C., 1996 'Vernacular pottery manufacture in a 19th century Scottish burgh: a kiln deposit from Cupar, Fife', *Tayside Fife Archaeol. J.* 2, 27–41

Mayes, P., 1968 'A 17th century kiln site at Potterspury, Northamptonshire', *Post-Medieval Archaeol.* 2, 1968, 55–82

McCarthy, M.R. and Brooks, C.M., 1988 *Medieval pottery in Britain, AD 900–1600*, (London, Leicester University Press)

McKendrick, N., 1983 'Josiah Wedgwood and the commercialization of the potteries', in McKendrick, N., Brewer, J. and Plumb, H.J. (eds), *The Birth of a Consumer Society*, (London, Hutchinson), 100–45

Mills, B., 1989 'Integrating functional analysis of vessels and sherds through models of ceramic assemblage formation', *World Archaeol.* 21, 133–47

Milne, G., 1987 'Waterfront archaeology in British towns', in Schofield, J. and Leech, R. (eds), *Urban Archaeology in Britain*, Counc. Brit. Archaeol. Res. Rep. 61, 192–200

Milne, G., 2001 'Joining the medieval fleet', *Brit. Archaeol.* 61, 14–19

Milne, G., 2002 'Great sites: London's medieval waterfront', *Brit. Archaeol.* 68, 20–23

Milne, G., 2003 *Port of Medieval London*, (Stroud, Tempus)

Milne, G. and Hobley, B. (eds), 1981 *Waterfront archaeology in Britain and northern Europe: a review of current research in waterfront archaeology*, Counc. Brit. Archaeol. Res. Rep. 41

Milne, G. and Milne, C., 1978 'Excavations on the Thames waterfront at Trig Lane, London, 1974–6', *Medieval Archaeol.* 22, 84–104

Milne, G. and Milne, C., 1979 'The making of the London waterfront', *Current Archaeol.* 6, 198–204

Milne, G. and Milne, C. 1981 'Medieval buildings at Trig Lane', *London Archaeol.* 4, 31–37

Milne, G. and Milne, C., 1982 *Medieval waterfront development at Trig Lane, London: an account of the excavations at Trig Lane, London, 1974–6 and related research*, London Middlesex Archaeol. Soc. Special Paper 5

Moorhouse, S., 1981 'The medieval pottery industry and its markets', in Crossley, D.W. (ed), *Medieval Industry*, Counc. Brit. Archaeol. Res. Rep. 40, 96–125

Moorhouse, S., 1991 'Ceramics in the medieval garden', in Bown, A.E., (ed), *Garden archaeology: papers presented to a conference at Knuston Hall, Northamptonshire, April 1988*, Counc. Brit. Archaeol. Res. Rep. 78, 100–17

Mortimer, R., 2000 'Village development and ceramic sequence: the Middle to Late Saxon village at Lordship Lane, Cottenham, Cambridgeshire', *Proc. Cambridge Antiq. Soc.* 89, 5–53

Mortimer, R., Regan, R. and Lucy, S., 2005 *The Saxon and Medieval settlement at West Fen Road, Ely: the Ashwell Site,* E. Anglian Archaeol. 110

Moseley, C.W.R.D., 1990 'A surviving Fenland lighter', *Mar. Mirror* 76, 279–81

Murphy, P., 1985 'The plant remains,' in Atkin, M., 'Excavations on Alms Lane', in Atkin, M., Carter, A. and Evans, D.H. (eds), *Excavations in Norwich 1971–1978: Part II*, E. Anglian Archaeol. 26, 228–34

Musty, J.W.G., 1974 'Medieval pottery kilns', in Everson, V.I., Hodges, H. and Hunt, J.G. (eds), *Medieval pottery from excavations: studies presented to Gerald Clough Dunning*, (London, John Baker), 41–66

Musty, J.W.G., Algar, D.J and Ewence, P.F., 1969 'The medieval pottery kilns at Laverstock, Salisbury, Wiltshire', *Archaeologia* 102, 83–150

Mynard, D.C., 1979 'Stone weights from the rivers Great Ouse, Ouzel, Nene and Tove', *Records Buckinghamshire* 21, 11–28

Niblett, R., 1993 'Excavations at the Abbey Mill, St Albans', *Hertfordshire Archaeol.* 11, 54–80

Oakeshott, E., 1991 *Records of the Medieval Sword, (*Woodbridge, Boydell)

Oakeshott, E., 1994 *The sword in the Age of Chivalry*, (Woodbridge, Boydell)

Oakey, N., 1995 *An archaeological evaluation at Lisle Lane, Ely*, Cambridgeshire County Council Archaeological Field Unit Report A72

Oosthuizen, S., 1993 'Isleham: a medieval inland port', *Landscape Hist.* 15, 29–35

Oosthuizen, S., 2000 'The Cambridgeshire Lodes', in Kirby, T. and Oosthuizen, S. (eds), *An Atlas of Cambridgeshire and Huntingdonshire History* (Sudbury, Lavenham Press), 32

Orton, C., 1982 'The excavation of a late medieval/transitional pottery kiln at Cheam, Surrey', *Surrey Archaeol. Coll.* 73, 49–92

Ottaway, P., 1992 *Anglo-Scandinavian Ironwork from Coppergate*, Archaeol. York 17/6

Ottaway, P. and Rogers, N., 2002 *Craft, Industry and Everyday Life: finds from Medieval York*, Archaeol. York 17/15

Owen, D.M., (ed), 1984 *The making of King's Lynn: a documentary survey*, (London, Oxford University Press)

Owen, D.M., 1993 *The medieval development of the town of Ely*, (Ely, Ely Historical Society)

Page, F.M., 1967 'Industries', in Salzman, L.F. (ed), *The Victoria County History of Cambridgeshire* II, (Oxford, Oxford University Press), 357–76

Panlin, W.A., 1963 'The merchant's houses and warehouses of King's Lynn', *Medieval Archaeol.* 6–7, 173–81

Payne, A., 1987 'Medieval Heraldry', in Alexander, J. and Binski, P. (eds), *Age of Chivalry: Art in Plantagenet England 1200–1400*, (London, Weidenfeld and Nicholson), 55–59

Pearce, J., 1992 *Post-Medieval Pottery in London, 1500–1700, Vol. 1, Border Wares*, (London, HMSO)

Pearce, J., 1998 'A rare Delftware Hebrew plate and associated assemblage from an excavation in Mitre Street, City of London', *Post-Medieval Archaeol.* 32, 95–112

Pinter-Bellows, S., 2000 'Animal Bone', in Jones, A.E., *St Mary's Street, St Neots, Cambridgeshire, archaeological investigations 1994–5*, E. Anglian Archaeol. Occasional Paper 7, 13–20

Reaney, P.H., 1943 *The Place-Names of Cambridgeshire and the Isle of Ely*, English Place-Name Soc. 19

Regan, R., 1998 *An evaluation of the archaeological potential at the Old Eastern Electricity Depot, Ely*, Cambridge Archaeological Unit Report 266

Regan, R., 2001 *Excavations south of The Lady Chapel, Ely Cathedral, Cambridgeshire*, Cambridge Archaeological Unit Report 419

Reynolds A.J., 1999 *Later Anglo-Saxon England: Life and Landscape*, (Stroud, Tempus)

Reynolds, T., 1994a *A Medieval waterfront at the Maltings, Ely*, Cambridgeshire County Council Archaeological Field Unit Report 96

Reynolds, T., 1994b 'A Medieval waterfront at the Maltings, Ely', *Fenland Res.* 9, 67–70

Rigold, S.E., 1977 'Small change in the light of medieval site-finds', in Mayhew, N.J. (ed), *Edwardian Monetary Affairs (1279–1344)*, Brit. Archaeol. Rep. British Ser. 36, 59–80

Rigold, S.E., 1978 'The St Nicholas or 'Boy Bishop' tokens', *Proc. Suffolk Inst. Archaeol. Hist.* 34, 87–101

Robinson, B. and Duhig, C., 1990 *Anglo-Saxon Burials at 'Three Kings', Haddenham 1990*, Cambridgeshire County Council Archaeological Field Unit Report 53

Robinson, M., 1982 'Environment, archaeology and alluvium on the river gravels of the South Midlands', in Needham, S. and Macklin, M.G. (eds), *Alluvial Archaeology in Britain*, Oxbow Monograph 27, 197–208

Robinson, P., 2000 'Some copper alloy objects from the West Country depicting the arms of the Commonwealth', *Post-Medieval Archaeol.* 33, 285–87

Rogerson, A., 1976 'Excavations on Fullers Hill, Great Yarmouth', *E. Anglian Archaeol.* 2, 131–245

Rogerson, A. and Ashley, S.J., 1985 'A medieval pottery production site at Blackborough End, Middleton', *Norfolk Archaeol.* 39, 181–89

Rogerson, A. and Dallas, C., 1984 *Excavations in Thetford 1948–59 and 1973–80*, E. Anglian Archaeol. 22

Roseff, R., 2000 'Soil Studies', in Jones, A.E., *St Mary's Street, St Neots, Cambridgeshire, archaeological investigations 1994–5*, E. Anglian Archaeol. Occasional Paper 7, 11–12

Rowell, T.A., 1986 'Sedge (*Cladium mariscus*) in Cambridgeshire: its use and production since the 17th century', *Agr. Hist. Rev.* 34, 140–48

Salzman, L.F., 1967 'Medieval Cambridgeshire', in Salzman, L.F. (ed), *The Victoria County History of Cambridgeshire* II, (Oxford, Oxford University Press), 58–111

Schofield, J., 1994 'Medieval and later towns', in Vyner, B. (ed), *Building on the Past, Papers celebrating 150 years of the Royal Archaeological Institute*, (London, Royal Archaeological Institute), 195–214

Schofield, J., 1997 'Urban housing in England', in Gaimster, D. and Stamper, P. (eds), *The Age of Transition. The archaeology of English culture 1400–1600*, Soc. Medieval Archaeol. Monograph 15/Oxbow Monograph 98, 127–44

Schofield, J and Vince, A., 1994 *Medieval towns*, (London, Leicester University Press)

Schneider, J., 1999 'Medieval malting kilns in Dunstable', *Manshead J.* 39, 20–32

Serjeantson, D., 1989 'Animal remains and the tanning trade', in Serjeantson, D. and Waldron, T. (eds), *Diet and crafts in towns. The evidence of animal remains from the Roman to the Post-Medieval periods*, Brit. Archaeol. Rep. British Ser. 199, 129–46

Shaw, M., 1996 'The excavation of a late 15th to 17th century tanning complex at The Green, Northampton', *Post-Medieval Archaeol.* 30, 63–127

Sherlock, D., 1980 *Medieval floor tiles in Suffolk churches*, (Market Lavenham, Suffolk Historic Churches Trust)

Smith, K.M., 1990 *Traditional fuels of the Outer Hebrides: the modern charred seed assemblages*, unpublished MSc dissertation, University of Sheffield

Spoerry, P.S., forthcoming, *Medieval Ely Wares*, E. Anglian Archaeol.

Spufford, H.M., 1962 'The significance of the Cambridgeshire Hearth Tax', *Proc. Cambridge Antiq. Soc.* 55, 50–64

Stace, C., 1997 *New Flora of the British Isles*, 2nd edition (Cambridge, Cambridge University Press)

Steane, J. M., 1967 'Excavations at Lyveden', *J. Northampton Mus. Art Gall*. 2, 1–37

Stephenson, R. 2000 'Platform Wharf imported pottery: potter's inspiration or stock in trade?' *Medieval Ceramics* 22–23, 152–3

Summers, D., 1973 *The Great Ouse: the history of a river navigation*, (Newton Abbott, David and Charles)

Taylor, C., 1995 'Reach, a medieval fenland port in East Anglia', in Longcroft, A. and Joby, R. (eds), *East Anglian Studies: essays presented to J.C. Barringer*, (Norwich, Marwood Publishing), 267–75

Thomson, R., 1981 'Leather manufacture in the post-medieval period with special reference to Northamptonshire', *Post-Medieval Archaeol.* 15, 161–75

Thurley, C.A. and Thurley, D. (eds), 1976 *Index of the Probate Records of the Court of the Archdeacon of Ely 1513–1857* (London, British Records Society)

Time Team, 2001 *The island of the Eels*, Channel 4 Broadcast 17 May 2001

Tipper, J., 2003 *2 Ship Lane, Ely, Cambridgeshire. An archaeological evaluation*, Cambridge Archaeological Unit Report 540

Tribe, A., 1997 *The investigative conservation of the lead fishing weights from Holme Fen Cambridgeshire*, Ancient Monuments Laboratory Rep. 70/97

Turner-Rugg, A., 1995 'Medieval pottery from St Albans', *Medieval Ceramics* 19, 45–65

Tyler, K., 2000 *The Limehouse Porcelain Manufactory: Excavations at 108–116 Narrow Street, London, 1990*, MoLAS Monograph 6

Vancouver, C., 1794 *General view of the Agriculture in the County of Cambridge, with observations on the means of its improvements*, (London, W. Smith)

Walker, F.G., 1911 'Excavations at Magdalene College, Cambridge 1910', *Proc. Cambridge Antiq. Soc.* 15, 78–181

Weatherill, L., 1983 'The growth of the pottery industry in England 1660–1815', *Post-Medieval Archaeol.* 17, 15–46

Wilcox, R., 2002 'Excavation of a monastic grain processing complex at Castle Acre Priory, Norfolk, 1977–82', *Norfolk Archaeol.* 44, 15–58

Willan, T.S., 1936 *River navigation in England 1600–1750*, (Manchester, Manchester University Press)

Willan, T.S., 1976 *The inland trade*, (Manchester, Manchester University Press)

Williams, R., 1989 *Lime kilns and limeburning*, (Princes Risborough, Shire)

Wilson, J.K. and Faulkner, A.H. 1972 *Fenland barge traffic*, (Kettering, Robert Wilson)

Woodward, D., 1985 'Swords into ploughshares: recycling in pre-industrial England', *Econ. Hist. Rev.* 38, 175–91

Index

Notes: page numbers in italics refer to illustrations; locations are in Ely unless otherwise stated

East Anglian Archaeology

is a serial publication sponsored by ALGAO EE and English Heritage. It is the main vehicle for publishing final reports on archaeological excavations and surveys in the region. For information about titles in the series, visit **www.eareports.org.uk**. Reports can be obtained from:

Phil McMichael, Essex County Council Archaeology Section
Fairfield Court, Fairfield Road, Braintree, Essex CM7 3YQ

Reports available so far:

No.1, 1975 Suffolk: various papers
No.2, 1976 Norfolk: various papers
No.3, 1977 Suffolk: various papers
No.4, 1976 Norfolk: Late Saxon town of Thetford
No.5, 1977 Norfolk: various papers on Roman sites
No.6, 1977 Norfolk: Spong Hill Anglo-Saxon cemetery, Part I
No.7, 1978 Norfolk: Bergh Apton Anglo-Saxon cemetery
No.8, 1978 Norfolk: various papers
No.9, 1980 Norfolk: North Elmham Park
No.10, 1980 Norfolk: village sites in Launditch Hundred
No.11, 1981 Norfolk: Spong Hill, Part II: Catalogue of Cremations
No.12, 1981 The barrows of East Anglia
No.13, 1981 Norwich: Eighteen centuries of pottery from Norwich
No.14, 1982 Norfolk: various papers
No.15, 1982 Norwich: Excavations in Norwich 1971–1978; Part I
No.16, 1982 Norfolk: Beaker domestic sites in the Fen-edge and East Anglia
No.17, 1983 Norfolk: Waterfront excavations and Thetford-type Ware production, Norwich
No.18, 1983 Norfolk: The archaeology of Witton
No.19, 1983 Norfolk: Two post-medieval earthenware pottery groups from Fulmodeston
No.20, 1983 Norfolk: Burgh Castle: excavation by Charles Green, 1958–61
No.21, 1984 Norfolk: Spong Hill, Part III: Catalogue of Inhumations
No.22, 1984 Norfolk: Excavations in Thetford, 1948–59 and 1973–80
No.23, 1985 Norfolk: Excavations at Brancaster 1974 and 1977
No.24, 1985 Suffolk: West Stow, the Anglo-Saxon village
No.25, 1985 Essex: Excavations by Mr H.P.Cooper on the Roman site at Hill Farm, Gestingthorpe, Essex
No.26, 1985 Norwich: Excavations in Norwich 1971–78; Part II
No.27, 1985 Cambridgeshire: The Fenland Project No.1: Archaeology and Environment in the Lower Welland Valley
No.28, 1985 Norfolk: Excavations within the north-east bailey of Norwich Castle, 1978
No.29, 1986 Norfolk: Barrow excavations in Norfolk, 1950–82
No.30, 1986 Norfolk: Excavations at Thornham, Warham, Wighton and Caistor St Edmund, Norfolk
No.31, 1986 Norfolk: Settlement, religion and industry on the Fen-edge; three Romano-British sites in Norfolk
No.32, 1987 Norfolk: Three Norman Churches in Norfolk
No.33, 1987 Essex: Excavation of a Cropmark Enclosure Complex at Woodham Walter, Essex, 1976 and An Assessment of Excavated Enclosures in Essex
No.34, 1987 Norfolk: Spong Hill, Part IV: Catalogue of Cremations
No.35, 1987 Cambridgeshire: The Fenland Project No.2: Fenland Landscapes and Settlement, Peterborough–March
No.36, 1987 Norfolk: The Anglo-Saxon Cemetery at Morningthorpe
No.37, 1987 Norfolk: Excavations at St Martin-at-Palace Plain, Norwich, 1981
No.38, 1987 Suffolk: The Anglo-Saxon Cemetery at Westgarth Gardens, Bury St Edmunds
No.39, 1988 Norfolk: Spong Hill, Part VI: Occupation during the 7th–2nd millennia BC
No.40, 1988 Suffolk: Burgh: The Iron Age and Roman Enclosure
No.41, 1988 Essex: Excavations at Great Dunmow, Essex: a Romano-British small town in the Trinovantian Civitas
No.42, 1988 Essex: Archaeology and Environment in South Essex, Rescue Archaeology along the Gray's By-pass 1979–80
No.43, 1988 Essex: Excavation at the North Ring, Mucking, Essex: A Late Bronze Age Enclosure
No.44, 1988 Norfolk: Six Deserted Villages in Norfolk
No.45, 1988 Norfolk: The Fenland Project No. 3: Marshland and the Nar Valley, Norfolk
No.46, 1989 Norfolk: The Deserted Medieval Village of Thuxton
No.47, 1989 Suffolk: West Stow: Early Anglo-Saxon Animal Husbandry
No.48, 1989 Suffolk: West Stow, Suffolk: The Prehistoric and Romano-British Occupations
No.49, 1990 Norfolk: The Evolution of Settlement in Three Parishes in South-East Norfolk
No.50, 1993 Proceedings of the Flatlands and Wetlands Conference
No.51, 1991 Norfolk: The Ruined and Disused Churches of Norfolk
No.52, 1991 Norfolk: The Fenland Project No. 4, The Wissey Embayment and Fen Causeway
No.53, 1992 Norfolk: Excavations in Thetford, 1980–82, Fison Way
No.54, 1992 Norfolk: The Iron Age Forts of Norfolk
No.55, 1992 Lincolnshire: The Fenland Project No.5: Lincolnshire Survey, The South-West Fens
No.56, 1992 Cambridgeshire: The Fenland Project No.6: The South-Western Cambridgeshire Fens
No.57, 1993 Norfolk and Lincolnshire: Excavations at Redgate Hill Hunstanton; and Tattershall Thorpe
No.58, 1993 Norwich: Households: The Medieval and Post-Medieval Finds from Norwich Survey Excavations 1971–1978
No.59, 1993 Fenland: The South-West Fen Dyke Survey Project 1982–86
No.60, 1993 Norfolk: Caister-on-Sea: Excavations by Charles Green, 1951–55
No.61, 1993 Fenland: The Fenland Project No.7: Excavations in Peterborough and the Lower Welland Valley 1960–1969
No.62, 1993 Norfolk: Excavations in Thetford by B.K. Davison, between 1964 and 1970
No.63, 1993 Norfolk: Illington: A Study of a Breckland Parish and its Anglo-Saxon Cemetery
No.64, 1994 Norfolk: The Late Saxon and Medieval Pottery Industry of Grimston: Excavations 1962–92
No.65, 1993 Suffolk: Settlements on Hill-tops: Seven Prehistoric Sites in Suffolk
No.66, 1993 Lincolnshire: The Fenland Project No.8: Lincolnshire Survey, the Northern Fen-Edge
No.67, 1994 Norfolk: Spong Hill, Part V: Catalogue of Cremations
No.68, 1994 Norfolk: Excavations at Fishergate, Norwich 1985
No.69, 1994 Norfolk: Spong Hill, Part VIII: The Cremations
No.70, 1994 Fenland: The Fenland Project No.9: Flandrian Environmental Change in Fenland
No.71, 1995 Essex: The Archaeology of the Essex Coast Vol.I: The Hullbridge Survey Project
No.72, 1995 Norfolk: Excavations at Redcastle Furze, Thetford, 1988–9
No.73, 1995 Norfolk: Spong Hill, Part VII: Iron Age, Roman and Early Saxon Settlement
No.74, 1995 Norfolk: A Late Neolithic, Saxon and Medieval Site at Middle Harling
No.75, 1995 Essex: North Shoebury: Settlement and Economy in South-east Essex 1500–AD1500
No.76, 1996 Nene Valley: Orton Hall Farm: A Roman and Early Anglo-Saxon Farmstead
No.77, 1996 Norfolk: Barrow Excavations in Norfolk, 1984–88
No.78, 1996 Norfolk:The Fenland Project No.11: The Wissey Embayment: Evidence for pre-Iron Age Occupation
No.79, 1996 Cambridgeshire: The Fenland Project No.10: Cambridgeshire Survey, the Isle of Ely and Wisbech
No.80, 1997 Norfolk: Barton Bendish and Caldecote: fieldwork in south-west Norfolk
No.81, 1997 Norfolk: Castle Rising Castle
No.82, 1998 Essex: Archaeology and the Landscape in the Lower Blackwater Valley
No.83, 1998 Essex: Excavations south of Chignall Roman Villa 1977–81
No.84, 1998 Suffolk: A Corpus of Anglo-Saxon Material
No.85, 1998 Suffolk: Towards a Landscape History of Walsham le Willows
No.86, 1998 Essex: Excavations at the Orsett 'Cock' Enclosure
No.87, 1999 Norfolk: Excavations in Thetford, North of the River, 1989–90
No.88, 1999 Essex: Excavations at Ivy Chimneys, Witham 1978–83
No.89, 1999 Lincolnshire: Salterns: Excavations at Helpringham, Holbeach St Johns and Bicker Haven
No.90, 1999 Essex:The Archaeology of Ardleigh, Excavations 1955–80
No.91, 2000 Norfolk: Excavations on the Norwich Southern Bypass, 1989–91 Part I Bixley, Caistor St Edmund, Trowse
No.92, 2000 Norfolk: Excavations on the Norwich Southern Bypass, 1989–91 Part II Harford Farm Anglo-Saxon Cemetery

No.93, 2001 Norfolk: Excavations on the Snettisham Bypass, 1989
No.94, 2001 Lincolnshire: Excavations at Billingborough, 1975–8
No.95, 2001 Suffolk: Snape Anglo-Saxon Cemetery: Excavations and Surveys
No.96, 2001 Norfolk: Two Medieval Churches in Norfolk
No.97, 2001 Cambridgeshire: Monument 97, Orton Longueville
No.98, 2002 Essex: Excavations at Little Oakley, 1951–78
No.99, 2002 Norfolk: Excavations at Melford Meadows, Brettenham, 1994
No.100, 2002 Norwich: Excavations in Norwich 1971–78, Part III
No.101, 2002 Norfolk: Medieval Armorial Horse Furniture in Norfolk
No.102, 2002 Norfolk: Baconsthorpe Castle, Excavations and Finds, 1951–1972
No.103, 2003 Cambridgeshire: Excavations at the Wardy Hill Ringwork, Coveney, Ely
No.104, 2003 Norfolk: Earthworks of Norfolk
No.105 2003 Essex: Excavations at Great Holts Farm, 1992–4
No.106 2004 Suffolk: Romano-British Settlement at Hacheston
No.107 2004 Essex: Excavations at Stansted Airport, 1986–91
No.108, 2004 Norfolk: Excavations at Mill Lane, Thetford, 1995
No.109, 2005 Fenland: Archaeology and Environment of the Etton Landscape
No.110, 2005 Cambridgeshire: Saxon and Medieval Settlement at West Fen Road, Ely
No.111, 2005 Essex: Early Anglo-Saxon Cemetery and Later Saxon Settlement at Springfield Lyons
No.112, 2005 Norfolk: Dragon Hall, King Street, Norwich
No.113, 2006 Norfolk: Excavations at Kilverstone
No.114, 2006 Cambridgeshire:Waterfront Archaeology in Ely