Norwich Castle: Excavations and Historical Survey, 1987–98 Part II: *c.*1345 to Modern

by Elizabeth Shepherd Popescu

with major contributions from
Umberto Albarella, Mark Beech, Niall Donald, Alison Goodall, Julia Huddle, Alison Locker, Irena Lentowicz, Marta Moreno García, Quita Mould, Jacqui Mulville, Peter Murphy, Andy Shelley and Margot Tillyard

and contributions from
Sue Anderson, Susanne Atkin, David Buckley, Elizabeth Crowfoot, Julie Curl, John Davies, Blanche Ellis, Rowena Gale, Richenda Goffin, Stephen Heywood, Trevor Jennings, Richard Kemp, David King, J.M.Mills, Catherine Mortimer, Alan Peacey, Ian Riddler, Mark Robinson, John Shepherd, Maisie Taylor, Anthony Thwaite, Penelope Walton Rogers and David Whitmore

with
Steven Ashley, Justine Bayley, Neil Brown, Peter Collingwood, Geoff Egan, Andrea Kirkham, D.T.Moore, Sarah Paynter, Adrian Popescu, Thom Richardson, Jacqui Watson, Robert White and Robert C. Woosnam-Savage

illustrations by
Steven Ashley, David Dobson, Mark Hoyle, Hoste Spalding and Nick Arber

photographs by
Kirk Laws Chapman and David Wicks, with Terry Burchell, Graham Norrie, Gwil Owen and Elizabeth Shepherd Popescu

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Cover illustration
Reconstruction of the Norwich Castle area *c.*1792, demonstrating the effect of levelling and the creation of new roads across the Cattle Market. *Painted by Nick Arber*

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Contributors to Part II

Full acknowledgements for both monograph volumes appear in Part I. Where no name is given with the title of a section or sub-section, the author is Elizabeth Shepherd Popescu, who is also responsible for the introductory and linking text.

Umberto Albarella
Department of Archaeology, University of Sheffield

Sue Anderson
CFA Archaeology Ltd, East Lothian

Susanne Atkin
consultant on clay tobaccco pipes

Nick Arber
freelance illustrator

Steven Ashley
consultant on armorial devices and stone coffin and formerly illustrator, NAU

Justine Bayley
Ancient Monuments Laboratory, English Heritage

Mark Beech
formerly Dept of Ancient History and Archaeology, University of Birmingham

Neil Brown
British Museum

David Buckley
consultant on lavastone querns

Terry Burchell
freelance photographer

Peter Collingwood
consultant on textiles

Elizabeth Crowfoot
consultant on textiles

John Davies
Keeper of Archaeology, Norwich Castle Museum

David Dobson
Illustrator, NAU

Niall Donald
formerly Research Assistant, NAU

Geoff Egan
consultant on lead objects

Blanche Ellis
consultant on spurs

Rowena Gale
consultant on wood identification

Alison Goodall
consultant on copper alloy objects

Richenda Goffin
Finds and Post-Excavation Manager, Suffolk County Council Archaeological Service

Stephen Heywood
consultant on architectural stone

Mark Hoyle
formerly illustrator, NAU

Julia Huddle
Research Assistant, Finds, NAU

Trevor Jennings
consultant on bellfounding

Richard Kemp
formerly City of Lincoln Archaeology Unit

Andrea Kirkham
consultant on plaster

David King
consultant on window glass and cames

Kirk Laws Chapman
formerly NAU photographer

Irena Lentowicz
formerly Finds Officer, NAU

Alison Locker
consultant on fish bone

J.M. Mills
consultant on stone objects

D.T. Moore
consultant on honestone petrological analysis

Marta Moreno García
formerly Department of Archaeology, University of Cambridge

Catherine Mortimer
formerly Ancient Monuments Laboratory, English Heritage

Quita Mould
consultant on ironwork and leather

Jacqui Mulville
Lecturer in Bioarchaeology, University of Cardiff

Peter Murphy
Coastal Strategy Officer, English Heritage

Graham Norrie
freelance photographer

Gwil Owen
freelance photographer

Sarah Paynter
Ancient Monuments Laboratory

Alan Peacey
consultant on tobacco pipe kiln

Adrian Popescu
Senior Assistant Keeper, Dept of Coins and Medals, Fitzwilliam Museum, Cambridge

Thom Richardson
Keeper of Armour, Royal Armouries

Ian Riddler
consultant on bone-, antler- and ivory-working

Mark Robinson
University of Oxford

Andrew Rogerson
Senior Landscape Archaeologist, Norfolk Landscape Archaeology

Andy Shelley
formerly Project Manager, Norfolk Archaeological Unit

John Shepherd
consultant on vessel glass

Elizabeth Shepherd Popescu
Post-Excavation and Publications Manager, Oxford Archaeology East
formerly Senior Project Manager, NAU

Hoste Spalding
freelance illustrator and champion longbowman

Maisie Taylor
consultant on wood

Margot Tillyard
consultant documentary historian

Anthony Thwaite
consultant on stonewares

Penelope Walton Rogers
consultant on textile dyes

Jacqui Watson
Ancient Monuments Laboratory, English Heritage

Robert White
Lincoln City and County Museum Conservation Laboratory

David Whitmore
Project Manager, NAU

David Wicks
Photographer, Norfolk Landscape Archaeology

Robert C. Woosnam-Savage
Curator of European Edged Weapons, Royal Armouries

Personal Communication

In addition to the contributors listed above (and those indicated in the more detailed acknowledgements in Part I), the following people very kindly provided information used in Part II: J. Cotter (JS), Andy Crowson (formerly NAU), Julie Curl (NAU), Keith Dobney (UA), Don Duco (S.Atkin), Prof. Chris Dyer (University of Leicester), Helen Geake (formerly Identification and Recording Service, Norfolk Landscape Archaeology), S. Heywood (consultant on architectural stone), John Hurst, the late Sue Margeson (Keeper of Archaeology, Norwich Castle Museum), Thelma Morris (Norfolk Museums and Archaeology Service), S. Payne (Ancient Monuments Laboratory, English Heritage), P. Robinson, Roy Thomson (Leather Conservation Centre, Northampton).

Abbreviations

General

AML	Ancient Monuments Laboratory, English Heritage
BS	Environmental sample (bulk)
cat	Catalogue
D:	Diameter
EVE	Estimated vessel equivalent
Fig.	Figure
fth.	forthcoming
g	Gramme
G	Group (*e.g.* G1/47 = Area 1, Group 147)
GBS	Golden Ball Street site
HC	hand collected
kg	Kilogramme
L:	Length
NAU	Norfolk Archaeological Unit
n.d.	not dated
no.	Number
NISP	number of identified species
Qty	Quantity
SF	Small Find
SMR	County Sites and Monuments Record
SRS	Soil riddled sample
T:	Thickness
T	Watching brief (*e.g.* T100/2 = Watching Brief 100, Group 2)
taq	*terminus ante quem*
tpq	*terminus post quem*
W:	Width
Wt	Weight
XRF	X-ray fluorescence

Documentary

ASC	Anglo-Saxon Chronicle (see Swanton in Bibliography B)
Cal. Chart.	Calendar of Charter Rolls
Cal. Close	Calendar of Close Rolls
Cal. Lib.	Calendar of Liberate Rolls
Cal. Fine	Calendar of Fine Rolls
Cal. Inq. Misc	Calendar of Miscellaneous Inquisitions
Cal. Mem.	Calendar of Memorandum Rolls
Cal. Pat.	Calendar of Patent Rolls
EDP	Eastern Daily Press
EEN	Eastern Evening News
HA	*Historia Anglorum* (see Greenway in Bibliography B)
NRO	Norfolk Record Office
OV	Orderic Vitalis (see Chibnall in Bibliography B)
PRO	Public Record Office
VCH	Victoria County History

Numismatic items

References cited:

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BMC	H.A. Grueber, C.F. Keary, 1893, *A Catalogue of English Coins in the British Museum*. Anglo-Saxon Series, vol. II (London)
North	J.J. North, 1980, *English Hammered Coinage, Volume I*
Williamson	G.C. Williamson, 1891, *Trade Tokens Issued in the Seventeenth Century in England, Wales and Ireland, by Corporations, Merchants, Tradesmen, ETC,* 3 volumes (London)
Mitchiner	M. Mitchiner, 1988, *Jetons, Medalets and Tokens: the Medieval Period and Nuremburg*, Volume 1 (Seaby: London)

Plant Macrofossils (see also Appendix 7)

Abbreviations and symbols in the tables are as follows:

bri	basal rachis internodes
ca	caryopses
cn	culm nodes
co	cotyledons
cp	capsule segments
fb	floret base
flo	floret
fr	fragments
gt	glume tips (silica skeletons)
inf	inflorescence
inf. ax.	inflorescence axis
inv	involucre
le. fr.	legume fragments (Fabaceae fruits)
lvs	leaves/fragments
lk	lemma keel fragments
oo	oospores
pi	pinnules
pu/pr.fr.	plumule/primary roots fragments
rn	rachis nodes
s	seeds
sh	shoots
si. fr.	siliqua fragments (Brassicaceae)
si. sk.	silica skeletons
st	stem fragments
*	germinated cereal grains
x	fragmentary seeds or other material not readily quantifiable

Ceramic Building Material

CBM	ceramic building material
EB	Early bricks
EBA	Early Brick type A
EBB	Early Brick type B
LB	Late Brick
RT	roof tile, relating to Roof Tile Fabric Series

Pottery

DWE	Dutch White Earthenware
DUTR	Dutch-type Red Earthenware
EMSSW	Early Medieval Sparse Shelly ware
EMSW	Early Medieval Sandwich ware
EMW	Early Medieval ware
GRE	Glazed Red Earthenware
GTGW	Grimston Glazed ware
GRCW	Grimston Coarse ware
GRIL	Late Grimston ware
IGBW	Iron-glazed Black ware
King's Lynn	
NS	King's Lynn Norfolk Street ware
LEPM	Local Early Post-Medieval ware
LMT	Late Medieval/Transitional ware
LMU	Local Medieval Unglazed ware
MCW	Medieval coarse ware
NEOT	St Neots-type ware
TGE	Tin-glazed Earthenware
THETG	Grimston Thetford-type ware
TTW	Thetford-type ware
UPG	Unprovenanced Glazed ware
YTW	Yarmouth-type ware

8. Castle Decline and City Encroachment (*c.*1345 to mid/late 16th century)

> 'because the men living & residing in divers places inhabited about the ditches of our castle ... which are of the fee of the said castle ... are exempt from the jurisdiction of the Bailiffs of the said City, very many felons & evil doers indicted or accused of felonies & trespasses in the same city fly to the said fee & there are harboured by those residing under the jurisdiction of our Sheriff of Norfolk and his bailiffs ... so that justice cannot be done by the Bailiffs'
> Second Charter of Edward III, 19 August 1345; Hudson and Tingey 1906, 23–24
>
> [Norwich castle is] 'consumed and spoiled in the houses and habitations, as well as in the walls, timber, lead, as also in other things, so that no man can dwell in it for the safeguard of the castle, nor reside for any other occasion'
> Edmond de Thorpe, Sheriff of Norfolk and Suffolk, 1371;
> quoted by Beecheno 1888, 10

I. ARCHAEOLOGICAL, HISTORICAL AND DOCUMENTARY BACKGROUND

Norwich After *c.*1345

(Fig.8.1)

The Black Death (bubonic plague) reached Norwich in 1349, with further outbreaks in 1361–2 and 1369, causing widespread depopulation and the loss of several churches. On the eve of the Black Death, Norwich may have housed *c.*25,000 (Rutledge 1988, 27) and, despite the losses of approximately a third of the population (Green and Young 1981, 17), the figure may have lain at *c.*20,000 by 1377, when the Norwich Poll Tax was paid by 3,952 people.

Two charters made in the early 15th century (1404 and 1417) were to establish what was to prove 'a lasting basis for the city's constitution which, by the end of the century, was much as it was to remain until 1835: the city was a county by itself with a mayor, two sheriffs, twenty-four aldermen … and sixty common councillors' (Campbell 1975, 15). These changes signalled an increase in municipal works (including the construction of the Cow Tower, Market Cross, Guildhall and city water mills) combined with the continuing acquisition of 'municipal control over waste spaces in the city and, from 1345, over most of the Castle Fee' (Campbell 1975, 15). Elements of the city economy, such as market stalls, staithes and mills were brought under similar control. The textile trade continued to form a significant element of the Norwich economy, particularly worsted. Increased prosperity led in turn to new buildings and a concomitant demand for building materials: the castle's ramparts were extensively quarried for sand and gravel.

Date	*Event*
1345	Norwich castle baileys sold to the city bailiffs
1349	Black Death reaches Norwich
1381	Norwich castle seized during the Peasant's Revolt
1384	Shirehouse struck by lightening
1398–99	Construction of the Cow Tower next to the River Wensum
1407–12	New Guildhall constructed
1430–40s	Riots in Norwich led to brief siezure of the city by the King
15th century	Many of Norwich's churches rebuilt
1505	Mayor's Court issues a decree forbidding the dumping of refuse into the castle ditches and meadow
1507	Norwich damaged by fire
1530–40s	The Reformation leads to the demolition of monastic precincts within the city. Many churches lost or out of use
1535	Mayor's Court again forbids the pasturing of animals within the castle ditches and meadow
1541	The Sanctuary Plan provides the first map of Norwich
1549	Kett's Rebellion. Norwich looted by an army of 20,000 rebels. Ten pieces of city ordnance were set up in the castle ditches, although the castle was later taken by the rebels. The ringleaders were executed at the castle
1558	Cuningham's map of Norwich

Table 8.1 Key events – *c.*1345 to c.1558

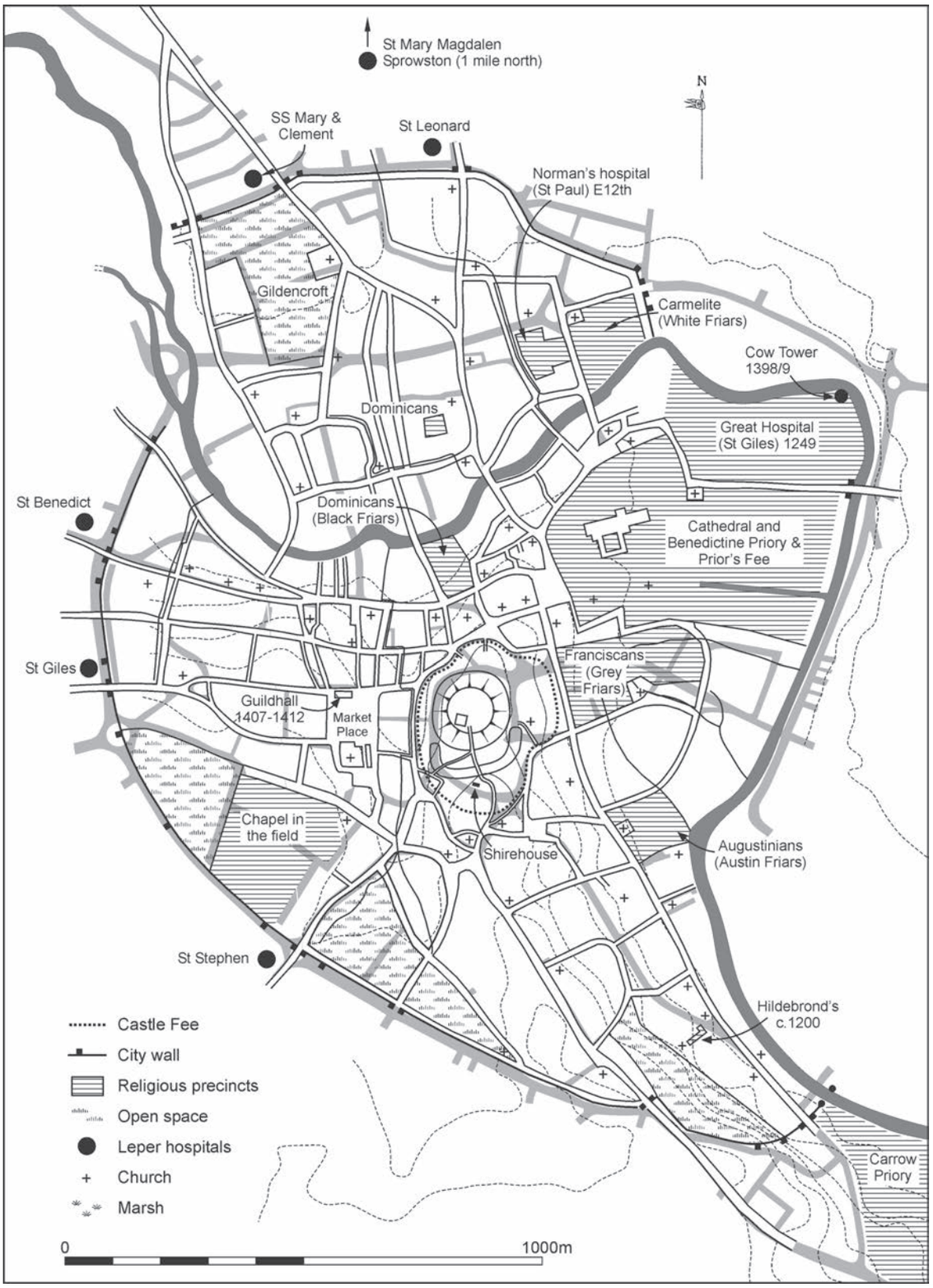

Figure 8.1 Map of late medieval Norwich. Scale 1:12500

Construction of the city walls had been completed by 1344, reducing still further the castle's defensive significance (Fig.8.1). Internal troubles within the city occurred in 1437 (when it was briefly seized by the King) and there was a riot in 1443 directed against the prior (Campbell 1975, 16). Despite economic decline during the early 16th century, there was still wealth in the city and new construction continued. The Market Cross, for example, was replaced in 1501–03.

Two fires devastated the city in 1507, destroying properties within most of the parishes that met at the castle (Carter *et al* 1985, fig.52). The fires were followed by

measures enacted in 1509 to ensure that buildings were henceforth roofed in tile rather than thatched (Carter *et al* 1985, 78). Many of the clay and timber buildings destroyed were replaced in flint and brick, although others were abandoned and areas of the city were left as gardens and orchards. During the later medieval period, many of the city's earlier flimsy houses were increased from one to two stories (Campbell 1975, 17), although the city's poorer classes continued to occupy smaller dwellings or 'cottages'. While stylised, the first map of Norwich (the Sanctuary Plan of 1541) shows around 70 houses, most of which have a chimney. The castle lies in a blank space (Plate 8.1.A), although many areas of the map are left empty as they were not significant to the map's purpose of highlighting landmarks and places of sanctuary. By 1558, Cuningham's perspective view (Plate 8.1.B) shows the castle enclosed by housing, much of the baileys still lying undeveloped. Parts of the circuit wall around the top of the mound, as well as buildings upon it, are evident. The castle's ramparts and mound appear heavily disturbed by quarrying.

The 1345 Handover and the Castle Fee

by Elizabeth Shepherd Popescu and Margot Tillyard

The background to the 1345 handover of the castle baileys to the city has been given in Chapter 7.I. Although in fact the motives behind the exchange were political and economic, the reasons given in documentary sources were rather different. Perhaps emboldened by the completion of the city walls, Norwich's citizens made a direct petition to Edward III who was in the city on 27 December 1344 (Hudson and Tingey 1906, xlii). On 16 June 1345, an Inquisition was formed with the objective of establishing whether the king would suffer if he acceded to the request. Two enquiries showed that the king had nothing to lose and found in favour of the citizens. On 19 August 1345, the Second Charter of Edward III transferred the fee to the city, with the exception of the castle, motte and shirehouse. The Charter states that 'because the men living & residing in divers places inhabited about the ditches of our castle ... which are of the fee of the said castle ... are exempt from the jurisdiction of the Bailiffs of the said City, very many felons & evil doers indicted or accused of felonies & trespasses in the same city fly to the said fee & there are harboured by those residing under the jurisdiction of our Sheriff of Norfolk and his bailiffs ... so that justice cannot be done by the Bailiffs' (Hudson and Tingey 1906, 23–24). The fee-farm rent was increased to provide the king with compensation for the loss of profit. From henceforward the city chamberlain would be responsible for collecting the taxes, rents and 'aids' due from those who lived around the edges of the Castle Fee. As has been outlined in Chapter 7.I, there had been dwellings there at least from the middle of the 13th century and probably long before. Several encroachments onto the area of the Fee had been converted into leases during the first half of the 14th century.

After 1345, parts of the Fee were leased out to be built upon. 'London Lane, which in old evidences is called Castle ditch, being part of the second vallum, was probably the part of the fee first built upon' (Woodward 1847, 39). Woodward continues 'The way called *the back of the Inns* is a portion of the same vallum; in the west side of which, houses have been standing from an early period' (1847, 40). (See Chapter 12 for further discussion of Woodward's interpretation of the displacement of the ditches.)

Browne described the handover as including the Shirehouse 'and the site of the Castle, as far as the outward bank of the ditch, which boundary is still preserved by large stone posts' (Browne 1785, 5). Evidence for the presence and position of these four large stone posts is provided by three sources dating to the 18th century (see Chapter 10.I and Fig.8.2). An undated plan (possibly of *c.*1780, Plate 10.35) shows the pillars ranged around the motte ditch and described as lying within the county. These posts may have been of some antiquity and were perhaps erected in *c.*1345 (Shepherd Popescu *et al*, in press).

Rebellions

by Margot Tillyard

Defence of the residual parts of the castle was not effective enough to prevent its being taken by force during the Peasant's Revolt of 1381. The immediate cause of the insurrection was the imposition of the third severe poll tax in four years, but it brought to the surface many pre-existing local conflicts. In east Norfolk those involved were mainly textile workers, led by a Felmingham dyer called Geoffrey Litster and backed by members of the local gentry. After gathering on Mousehold Heath, the rebels forced their way into Norwich and marched in triumph to the castle. Litster feasted in the Great Hall and was hailed 'king of the commons'. Armed with a huge bribe consisting of 'protection money' extorted from Norwich citizens, an embassy was despatched to the king to request pardon and a charter. The emissaries were intercepted by the Bishop of Norwich, Hugh Despenser, who had been in his manor of Burleigh. The Bishop then turned for Norwich, attracting reinforcements on the way, and entered and pacified the city. He pursued Litster to North Walsham, where he defeated his army, tried and shrove him on the spot and had him executed (Dobson 1983, *passim*; McKisack 1959, 417–8). A year later there was a fresh conspiracy to recapture Norwich and kill Despenser, but this was betrayed and the ringleaders executed at the castle.

By the time of the rebellion of 1549 the castle had not even a symbolic strategic importance. The surviving towers were in a state of decay and it was only the ditches which were seen as any protection. In June that year the sheriff complained about rubbish being deposited in them. It was only a few days later that a major rebellion broke out, motivated by anger at enclosures. A tanner from Wymondham, Robert Kett, and his brother, a butcher, gathered a force of twenty thousand who camped on Mousehold Heath where Kett made his headquarters under an oak tree. For two months they terrorised and laid waste the surrounding countryside. Ten pieces of ordnance belonging to the city were set up in the castle ditches, but their range being short they were moved nearer to the river. In spite of this the rebels succeeded in entering the city, looting, burning and taking hostages, among them the mayor who was taken during the parlay on Mousehold Heath. No attempt appears to have been

made to prevent their occupation of the castle and they kept some of their prisoners in part of it.

Eventually royal forces under Lord Warwick subdued the rebels at the second attempt on 27 August. They camped, not in the Castle Meadow or elsewhere at the castle, but in the market place. It was there that three hundred of the rebels were hanged. The ringleaders were tried at the castle and hanged there except for the two Kett brothers. They were taken to the Tower of London and after their trials were brought back to Norwich. One was suspended in chains from the battlements of the Keep[1] until he died and the other from the tower of Wymondham Abbey church.

The Castle After *c.*1345

by Margot Tillyard
(Fig.8.1; Plate 8.1)

Although after 1345 the emphasis in terms of the use of the site now turns firmly towards the city, it should not be forgotten that the Keep and other buildings on the mound remained in use. The sheriff was still a tax gatherer and a justice, the constable was still responsible for prisoners and the buildings had to be kept in repair. The position of Norwich gaoler was coverted into a life grant in 1381 (Pugh 1968, 151), while in 1383 the sheriff apparently claimed fees which the keeper of the castle and gaol considered rightfully his: the crown intervened although the outcome is not recorded (Pugh 1986, 173).

Cuningham in 1558 was the first to depict the castle in any detail (Plate 8.1.B). At this time the two towers at the north end of the bridge were still standing, there was an isolated tower to the west of the Keep and three on the north edge of the mound. Part of what might be the perimeter wall is indicated and on the west part of the mound behind the Keep is what seems to be an unfortified building lying from north-to-south, possibly the Great Hall (*cf.* Plate 10.2.A). What may be a building on the bridge and another beyond it (the barbican gate ?) are also shown.

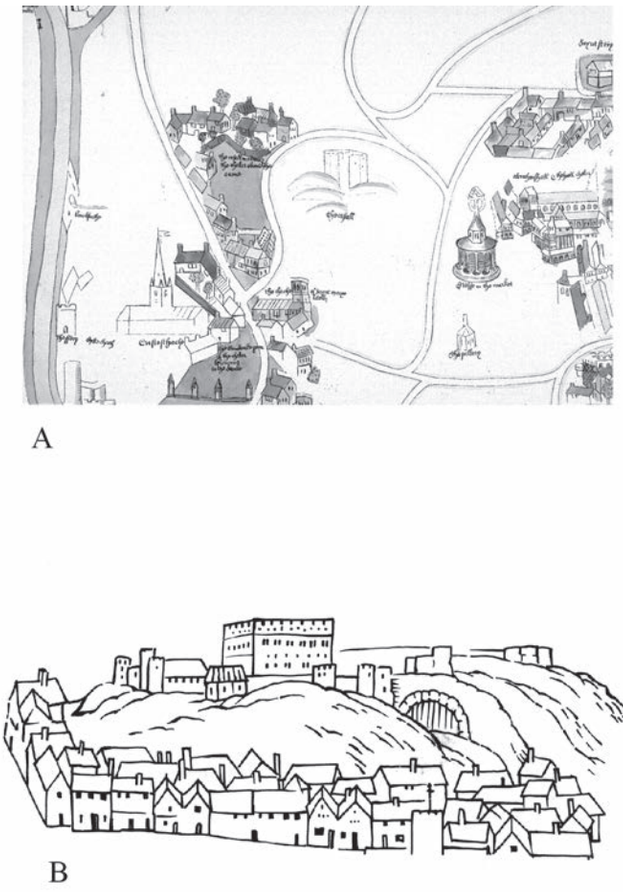

Plate 8.1 Sixteenth-century views of Norwich Castle: A. Sanctuary Plan (1541), B. Cuningham (1558; redrawn by David Dobson)

Buildings

Small sums were spent on maintenance of the castle in the latter part of the 14th century but nothing major was done. By 1371 the sheriff (Edmond de Thorpe, Sheriff of Norfolk and Suffolk) was complaining to the king that residence in the castle was impossible because it was 'consumed and spoiled in the houses and habitations, as well as in the walls, timber, lead, as also in other things, so that no man can dwell in it for the safeguard of the castle, nor reside for any other occasion' (Kirkpatrick 1845, 256; Beecheno 1888, 10). Time and weather were not solely to blame for this: 'the stones, timber and lead... have been broken down, carried and conveyed away' (Kirkpatrick 1845, 257). Theft from royal castles was not uncommon at this period (Pounds 1990, 265).

In 1390, repairs to the castle, bridge, buildings and towers cost so much that an enquiry followed. The commissioners reported that the 24 marks for the work of masons, plumbers and carpenters was justified. The repairs account of the sheriff applying to the period 1395–6 includes £13 6s 8d for materials including timber, boards, hooks, hinges, nails, lime and sand for work on the Tower (*i.e.* the Keep) of the castle in or on the north part towards the east (*in parte Aquilonis versus orientem*) and on the walls of the said Castle as well as of a certain house called a *Writhouse* there (*necnon muroribus euisdem Castri quam cuiusdam domus voc. Writhouse ibm.*) with carriage of said lime and sand from the various places where they were bought and also carriage of water for these works to the Castle and wages £12 2s 5d (National Archives E364/31).

Similar sums were spent on the castle and its buildings in the 15th century. In 1409/10 £20 was allowed for the worst defects, but £29 17s 3d had in the event to be spent on ironwork for window bars and hooks and hinges for various doors and windows in the Keep and other buildings and the provision of a conduit (? at the Shirehouse) together with wages of carpenters, plumbers and thatchers (National Archives E364/44C). In 1454 minor repairs to the buildings of the upper bailey, to the roof of the Shirehall and a conduit there, accounted for £5 (National Archives E364/89 13d).

By the 16th century all the towers were in a state of decay. In June 1549, just before Kett's rebellion broke out, the sheriff (Sir John Godsalve) threatened to repair one of them so that he could spy on those dumping muck into the ditches, which threatened the security of the castle (Kirkpatrick 1845, 317).

Ditches and Baileys

Much of the area of the southern bailey was still occupied by the barbican ditch. To Alexander Nevill (writing in the late 16th century) its configuration was still clearly visible: 'The second (ditch) was constructed in front of the gate and bridge in such a way that it curved round in the shape of a semi-circle or horn towards the inner ditch, with which its ends nearly but not quite connected. Now, however, the citizens have piled into it the sweepings of the city and the filth carried from their houses'.

Woodward noted that 'prior to the Fee of the Castle coming into the jurisdiction of the city the ditches were kept with great care; but afterwards they were much neglected, and were the receptacles of the rubbish and filth of the city' (Woodward 1847, 37). Unauthorised tipping of rubbish of all kinds certainly went on throughout this period. For instance at the New Leet of the Castle in 1374–5 Adam of Hindringham was amerced for 'muck in the highway and carts by day and night, the way deeply and foully encumbered' (Hudson 1892, 68). In 1390–91 Alice, widow of Thomas of Norton was presented for allowing her servant to 'dump muck near the Shirehous' and Thomas Alderman for 'much muck from his houses near the Shirehous' (*cf* Property 47). At the same court it was alleged that Thomas Hardegray, 'bocher', caused a dead horse to be dumped 'in a lane near the Shirhous' (NRO 5b/11).

The city authorities strove to keep the castle ditches clear. In 1475 Edmund Reade was ordered to remove by Michelmas sixty cartloads of muck 'by him injuriously heaped up' and the rest by All Saints day. In 1489–90 they collected 44s by agreement from certain people who had 'caused all the muck and filth of their houses to be carried and cast into the ditch of the castle, until it was forbidden by the Constable'. They bribed the constable with 40s not to make trouble over the matter and paid 'didalmen' 28s 6d to carry away the muck in a dung cart and deposit it in a lane 'opposite the messuage of John Carleton'. The anger of Sir John Godsalve in 1549 has been noted above.

A decree had been issued in 1505 prohibiting dumping 'upon the castle dike or meadow' with a fine of 4d for each offence. The fine had to be raised to 2s in 1534, but it was a losing battle. William Clark admitted at the Mayor's Court in 1549 that he had 'leyd ... a ded horse under the castle ditch ... wherefor' he was 'commanded to make a pitte and berye the same ther or to carye it away' (NRO Court Book 5, 549).

In 1451 it was certified at the Mayor's Court that John Quasshe 'hath kept and yet kepeth seventy-four shepe and thirty lambez gresyng upon the Castill diche contrary to an ordinance' (NRO CB5, 95). In 1535 a decree was issued by the Mayor's Court forbidding the pasturing of 'any mare, sheep or lamb' on the castle ditches or meadow on pain of a fine of 40d for every mare and 12d for every sheep or lamb found there, half the fine to go to the Community and half to the informant. There was a large pound or pinfold for the detention of animals caught being grazed contrary to the decree, placed at the bottom of Timberhill according to Beecheno. The use of its surviving materials is recorded after it had been damaged by Kett's men in 1549 (Neville 1582, 193). Other areas of open ground used for grazing within the walled city lay at Gildencroft, around the church of St Margaret *in Combusto*, at the Prior's Fee (which provided summer pasture next to the river), St Giles' parish, the Newgate/Surrey Street area and the Butter Hills (Ayers 1994a, 73; see Fig.8.1).

Despite development around its fringes, the north-east bailey remained substantially undeveloped until the mid 19th century and no features of late medieval date were recorded during excavations there (Site 416N; Ayers 1985, 22). Harrod described portions of the ditch still visible in gardens in the 19th century (Harrod 1857, 139). References to the Castle Meadow are made from 1351–2, when the area may have continued to be used as pasture (Beecheno suggested that the name Pelloures meadow by which it became known was a reference to such use, although this has been disputed; Ayers 1985, 6). Harrod suggested that the name 'Castle Meadow indicates a piece of pasture land in nearly primitive condition' (Harrod 1857, 141). There are indications that the city sought to control development of the meadow and 'in 1396, the city granted divers parcels of the Castle-meadow by the castle ditches to be built upon' (Beecheno MS 1908, 124). Encroachment into the bailey had apparently taken place earlier, however. In 1349–50, a messuage 'sometime of Rodelund de Barbour' probably lay on former Fee land (Ayers 1985, 6). Similar encroachments are known at this time, implying that the development following the 1396 grant would not have been the first.

The north-east bailey continued to be referred to as a meadow and is shown as such on the Sanctuary map of 1541 (Plate 8.1.A). It was not, however, in use as common land: 'no person shall keep or put to feed any mare, sheep, or lamb, upon the Castle dike or meadow' (Kirkpatrick 1847, 101). It is uncertain when the area began to be used as a market, although by the early 18th century the meadow was the venue for 'a market at Good-Friday, and Witsun and Trinity Fair-days for the black cattle … which are yearly brought from Scotland and the north part of England' (Kirkpatrick 1847, 104). The live-stock market continued to be held here until 1960.

Both the licensed and unlicensed erection of booths for the sale of food and drink took place within the baileys. The booths were pitched between the Shirehouse and the castle gate (Kirkpatrick 1845, 313–4; Beecheno MS 1908, 27), the ground being let out during assizes or sessions as is documented in the Corporation Accounts (Harrod 1857, 137). The licensee was usually the gaoler and the sum paid to the Chamberlain varied: 3s 6d in 1456–7, 2s 4d in 1488–9, 4s in 1541. Other examples occurred in 1484 when Edmund Cully paid for leave to place booths next to the Shirehouse at the time of the sessions and again in 1490 when Bryan Dorount paid a similar fee (*ibid.*). In 1541, Robert Brown 'jaylour of the castyll' paid for the privilege that 'non other persons but he shall set any vytallying-bothes within the compass of the castyll-dyche, at any time of assyse and sessyons, for this year …. ageynst the sherehous and castyll-gate' (Woodward 1847, 37).

The Shirehouse

Outside the barbican ditch was the only area excepted from the handover of 1345 — the Shirehouse and its yard. References to it in the property deeds of this period are numerous and these confirm its position to the west of the approach to the castle from the direction of St John Timberhill church. It was approached by a lane which

followed roughly the line of present day Orford Street. The sheriff was responsible for keeping it in repair.

A fire in 1384 occasioned an inquiry, which established that the cause was not arson as had been supposed, but a lightning strike. Fifteen 'teyles', two 'balkes' and two 'cells' were destroyed, masonry, woodwork and thatch were damaged and the building stood unroofed and ruinous. Henry of Stowe of Norwich (who, as property deeds have established, lived opposite to the east, at Property 45; Fig.8.2) was availing himself of the remains which he was using for a stable, a hay-barn and a timber store. It was estimated that the wages of masons, including their stone and lime would amount to 30s, wages of carpenters with their timber to £10 and rethatching would cost a further £10 (Cal. Inq. misc).

The cost of repairs in 1391–2 amounted to £20, when the items used included sand, lime, stone, timber, reed and nails, hinges and keys (National Archives E101/525/27). In 1436 another £15 10s 4d had to be spent. A contract with 'John Wright' resulted in a new door (*hostium*), though as this item included also lathe and lathe nails, perhaps there was also a porch. Windows or shutters were provided and timbers repaired in the roof, which was then rethatched with reed (National Archives E364/72 and E101/575/34). In 1453–4 repairs to the Shirehouse roof cost 63s 6d and the materials used included 300 bundles of reed and three cartloads ('carats') of rushes 'per le Coppyng' (National Archives E101/575/36).

'The king's hall in the castle of Norwich called the Shirehouse' was repaired again in 1466–7. Three labourers working for fourteen days and using stone, sand and lime cost 14s, the roof was patched with reed at a cost of 10s and another door and its ironwork supplied. Four pence was paid for a load of plaster (*luti*) (National Archives E101/575/38; Harrod 1857, 153). By 1568, the Shirehouse had become too small and the court eventually moved to a new building on the mound in 1579 (see Morgan 1996 and Chapter 10.I). The old one was then sold off.

The City After *c.*1345

Streets and Lanes

by Elizabeth Shepherd Popescu and Margot Tillyard

(Figs 8.1 and 8.62)

The streets and lanes surrounding the castle, the documented origin of many of which is detailed in Chapter 7.I, continued in use with a few additions and altered names.

1. Berstrete

This road continued to be named with variations of Berstrete throughout the period.

2. Durnedale/Old Swynemarket Hill (Timberhill)

The use of the name Durnedale for the stretch of road now known as Timberhill continued until 1766. Other names for the road, spanning the medieval and post-medieval periods are Old Swynemarket Hill (from 1299 to 1454) and later Timbermarket or Timberhill (from 1507 to 1789) (Sandred and Lindström 1989, 147).

3. Sporiere Row/Sadelgate (White Lion Lane/Street)

References to Sadelgate and its variant spellings appear to have largely ceased during the early part of the 14th century. Most references between c.1320 and 1626 are to Sporiere Row and its variations (Sandred and Lindström 1989, 153). The name is a Middle English derivative of the Old English **spora** ('spur').

4. Swynemarket (Orford Hill)

Norwich's swinemarket retained its name throughout the 14th and 15th centuries, being known as Sygars Hill in the 16th and the Hog Market from the mid 17th to early 18th century (Sandred and Lindström 1989, 122).

5. Cockey Lane (Back of the Inns/Castle Street)

References to the stretch of the lane along the upper part of the Great Cockey continued throughout the 14th century. It was referrred to, for example, as communis venella vocat Cokeye [[the] common lane called Cokeye] in 1346 (Sandred and Lindström 1989, 98). The stretch now known as Back of the Inns/Castle Street continued to be referred to with variations of (the lane called) Cokeye from the mid 14th century well into the 17th century (op. cit., 84).

6. Cutlerrowe (London Street)

By the middle of the 14th century, the former hosiers giving their name to this road had been largely replaced by the cutlers (Sandred and Lindström 1989, 116). References to Cutlerrowe continued into the 17th century, with other parts of the lane being used by goldsmiths and latteners.[2] References were made to Goldsmithrowe in 1372, 1401 and 1408.

7. Road between Cutlerrowe and Cunesford (Blue Boar Lane/Bank Plain)

See comments in Chapter 7.I.

8. Conesford (King Street)

Various forms of the name Conesford/Superior Conesford to refer to this street continued between the mid 14th and late 16th centuries (see Sandred and Lindström 1989, 114).

9. Road between Conesford (King Street) and the castle approach (Beaumont's Hill/Common Pump Street)

This road is simply documented as the 'King's Way' prior to the 17th century. A route in this position was referenced from the late 13th century.

10. Southern castle approach (Golden Ball Street)

See comments in Chapter 7.I.

11. Cockerel Lane (Stepping Lane)

This road was named with variations of Cockerelle Lane, a Norwich surname, throughout the period (Sandred and Lindström 1989, 143). In addition to the routes described above, a number of lanes and paths led into the castle ditches (Fig.7.37).

1. In vico Curia (Orford Street)

In 1457-8, this road was referred to as Pyeslane after Thomas Pye Corayour ('currier': one who dressed and coloured leather; Sandred and Lindström 1989, 124).

2. Un-named route (Angel Street)
A minor route may have existed to the north of the barbican ditch, leading between it and the motte ditch towards the barbican well.

3. Le Casteldyk Lane (York Alley)
In 1285 a road from Sadelgate (now White Lion Street) to the Shirehouseyard existed, presumably skirting to the south of the barbican ditch and leading into the south bailey (?along the line of present-day York Alley). This lane was mentioned in 1568 when it was called a 'common

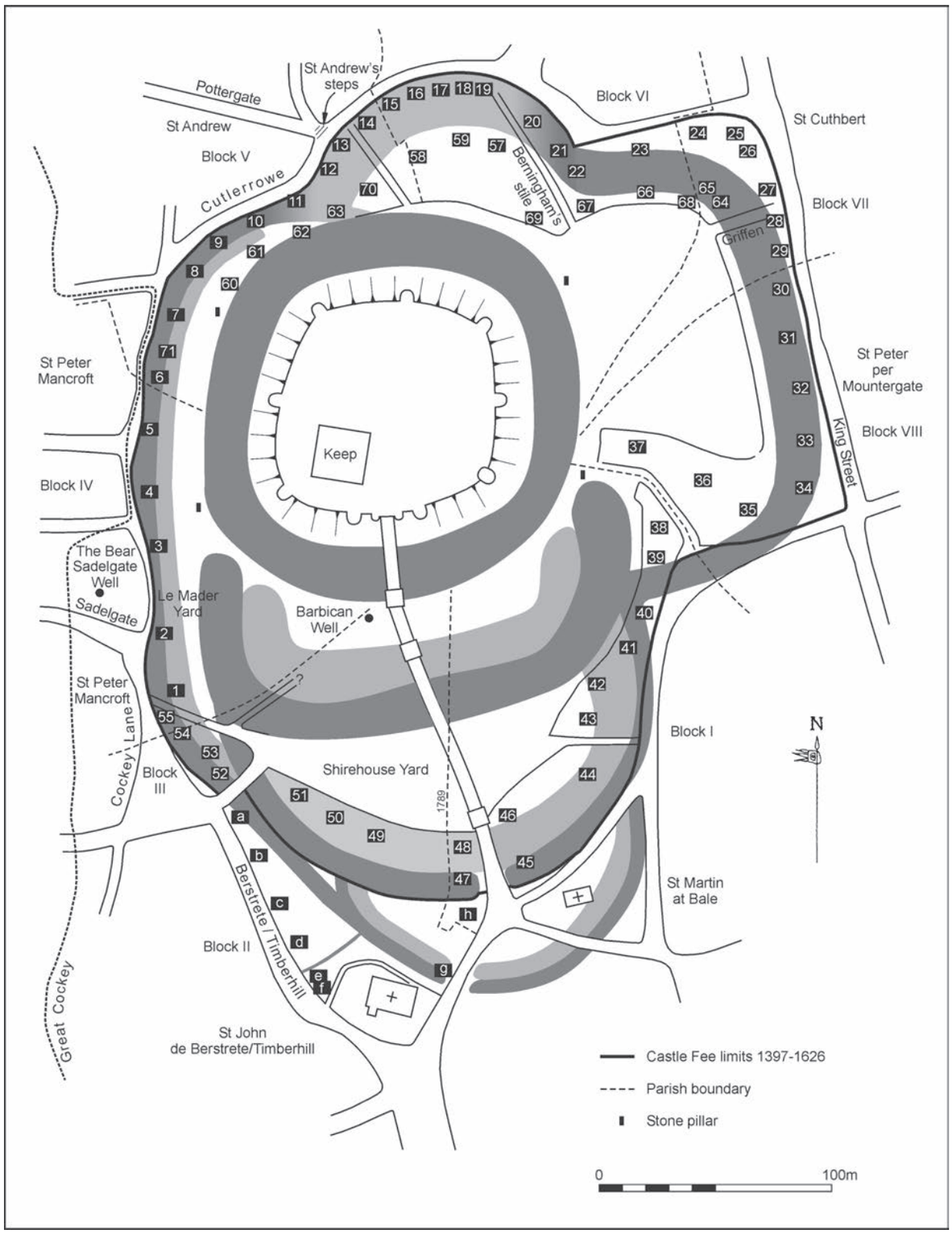

Figure 8.2 Documented properties around Norwich castle from 1397–1626: Properties have been numbered according to the first Castle Fee rent list (Plots 1–55), with additional numbers given in the order in which the grants made appear in the Norwich the Domesday Book (NRO Case 17). Scale 1:2500

way leading from the parish of St Peter Mancroft to the Shirehouse'. It was also probably referred to as a property boundary for a messuage (in Red Lion Street) when it was described as 'the way between the said messuage and the ditch foveam of the castle' (presumably a reference to the barbican ditch). In 1539 John Homerston (then owner of the property; Property 1) had to pay the City Chamberlain 'for paving the little lane that led into the castle ditch between his place and the tenement of Richard Benjamin' (now York Buildings). In 1569 and for a few years thereafter, it was known as le Castledyck lane (Sandred and Lindström 1989, 154).

Woodward (1847, 41) suggested that the passage from White Lion Street was so narrow as to be liable to blockage by household rubbish. A new right of way in 1673 (which may have run through Castle Inn Yard) was described as follows: 'where never was any, by which ancient ways are disused to the prejudice of the Lyon Lane.' These ancient ways presumably led into the south bailey towards the Shirehouse.

4. Path into Barbican
The boundary between the parishes of St Peter Mancroft and St John de Berstrete (Timberhill) sub-divided Hog Hill (Orford Hill) before running through the present Bell Hotel and running north-eastwards to the foot of the castle bridge. A route in this position was still in use in 1629 when a small piece of land to the south-west was leased by the Corporation to the owners of the Bell Hotel. Cleer's map of 1696, while schematic, does indicate a route in roughly this position, running through what appear to be piles of quarry waste (Plate 10.1).

5. Turpis Vicus (Opie Street)
This lane (part of the former Gropecuntelane) led from Cutlerrowe into the north-east bailey, with references to the Turpis Vicus in the 14th to 15th centuries (Sandred and Lindström 1989, 122).

6. Berningham's Stile (King's Arms Lane)
This lane which ran from the eastern end of Cutlerrowe into the Castle Meadow began to be referenced from the mid 14th century. The name may relate to a surname (Sandred and Lindström 1989, 113).

The Great Cockey
(Figs 8.1 and 8.62)
During the reign of Edward IV (1461–1483), Alderman John Drolle decided 'to make *de novo* one new Cockey from the North end … of the … old Cockey unto a certain great Cockey near Smethy Rowe [Little London Street]' (Hudson 1889, 44). Its new line ran along Royal Arcade, at right angles to its natural course, to what is now Back of the Inns and Castle Street, turning a corner into London Street before rejoining its former line at Little London Street (in accordance with Beecheno's 1908 map; *cf.* Campbell 1975, maps 2 and 3). This diversion may have been intended to release the flow of water from its by now culverted state, either as a practical matter as the area became increasingly developed and/or perhaps to service the artisan activity which was ranged along the western side of the castle (see Chapter 9.I and 9.VI). Discussion of the possibility that the stream's diversion was made earlier appears in Chapter 7.I and 7.V

Tenement Development and the Castle Fee
by Margot Tillyard
(Figs 8.2 and 9.1)

Introduction
From 1345 the City was free to lease or sell off unusable land on the perimeter of the Fee, a process already begun by the sheriff and completed by 1397, the date of the earliest surviving rent list. To compensate the king for loss of income from Castle Fee properties and from Shirehouse court fees, the citizens had to pay an additional fee-farm rent of £2 14s 4d, 26s 10d of which came from the properties (Kirkpatrick 1845, 306). The Estreat Roll or Tax Demand for 1357 was made up as follows: 'Farm of places about the Castle Ditch 54s 4d, from Robert Benediste and heirs for a certain place in Norwich 3s 4d, from William Bateman rents of three places in Norwich 12d, from John Athol for a piece of void land 12d' (Hudson and Tingey 1910, 42). The last three items represent leases granted following encroachments on the king's land in 1305 and 1344 and 1345. The amount owed to the king remained unchanged, but by 1485 the amount raised by the City Chamberlain had increased to £29 (Beecheno 1888, 22). The sum rose and fell at various times (*cf* the property information for Block I below and in Part IV).

Some of the first plots to go after 1345 (or before) were on the south side of London Street, all of which were probably occupied by 1370 (Beecheno MS 1908, 31). Further plots were leased between these and the castle ditch, until all the wide space north of the motte ditch was utilised. More of the Castle Meadow was released. Soon after 1397 Thomas Ingham, mercer, was listed as owing rent 'for a piece of land ... part of Castle Meadow, and is included in his garden next to the castle ditch'. The amount owed is not recorded but judging by other rentals there were several large plots, including a garden abutting on Castle Meadow to the south and a 'common lane leading to the castle' (the later King's Arms' Lane) on the west. Another piece of 'land on the Castle Meadow' measured 21¾yds on the south and 20¾yds on the west (Norwich Domesday Book, 42).

A common offence complained of at Leet Courts was blocking the public way. Alice, widow of Thomas Norton who may have lived in Property 48/49 of Block I (Robert of Norton held it in 1361) was accused in 1391 of allowing her servant to dump muck next to the Shirehouse. John of the Fermerye persistently obstructed the way near the Greyfriars' house on King Street, immediately to the east of Castle Meadow. John Pilly who held the corner site where *Le Rouen* public house now is, made a purpresture in the king's road next to 'le Shirehous' in 1374 for which he was fined 12d. At the same court John of Earlham was convicted of 'making a great purpresture ... viz with big stones at his corner' and fined 2s.

Unauthorised encroachment was not allowed. It was perhaps the outer slope of the ditch in St Peter Mancroft or St Andrew's which was the subject of concern in 1403 when the sheriff was commissioned 'to enquire into a report that divers citizens of Norwich have encroached on divers pastures and meadows belonging to the King's Castle of Norwich and made gardens out of them and cellars underground' (Beecheno MS 1908, 243; from Cal. Pat. Rolls, 5 March 1403).

Block no.	*Parish*	*Castle Fee Properties*	*City Properties*	*Beecheno Map (MS 1908)*
Block I	St Martin at Bale (-in-Balliva; united with St Michael at Thorn in 1562)	38–46		F and G
Block II	St Martin at Bale (-in-Balliva) and St John de Berstrete (Timberhill)	47–51	(a)–(h)	J
Block III	St John de Berstrete (Timberhill) and St Peter Mancroft	52–55		K
Block IV	St Peter Mancroft	1–5		L
Block V	St Andrew	6–14, 60–63, 70–71		A
Block VI	St Michael at Plea	15–23, 57–59, 66–69		B and C
Block VII	St Cuthbert	24–29, 64, 65		D
Block VIII	St Peter Parmentergate	30–37		E

Table 8.2 Documented Properties from Castle Fee Rent Lists (1397–1626)

Properties in the Castle Fee and in the City's Jurisdiction
(Fig.8.2)

This volume continues the account begun in Chapter 7 of the development of properties in the parishes of St Martin-in-Balliva (at Bale), St John de Berstrete (Timberhill), St Peter Mancroft, St Andrew, St Michael at Plea, St Cuthbert and St Peter Parmentergate which met at the castle (see Table 8.2 and Fig.8.2). As has been noted, the tenancies were subject to a fixed annual charge known later as the Castle Fee rents and, after the city bought the outer baileys from the Crown in 1345, these rents were collected by the City Chamberlains. Eight rent lists are found in their accounts, the first dated 1397 (in a copy in the Norwich Domesday book) and the last 1626, and they have been substantiated by the use of property deeds, wills, leases and court records (fully detailed in Part IV).

As mentioned above, Beecheno believed that all the land along what is now London Street after it bends to follow the line of the ditch was built on or occupied by 1370. The sale of numerous 'buildings, houses and shops' began in 1310 and others follow from about 1380: from these and the rent lists a plan can be made and a history of each property drawn up. As has already been stressed, it is a record of *ownership* and, in most cases the owner's domicile is unknown. Multiple holdings and multiple occupancy were common and became more so. Ownership of one or more properties was very common as can be seen from the Norwich Survey plans of late 13th and early 14th century Norwich (NRO MC 146).

Records of property transactions for the areas which had been part of the Castle Fee are found with those of the rest of the city in the court rolls of this period. The rolls for 1341–77 are missing though some notes from them survive which were made by Kirkpatrick. From the beginning of the 15th century numbers of enrolments fall off, nevertheless there were enough, together with Castle Fee rent lists, to have enabled Beecheno to deduce the history of the ownership of every property which had once been in the Fee.

Figure 8.2 shows approximate positions of all the properties (see further explanatory comments in Chapter 7.I). The information is summarised below in a series of eight blocks (Blocks I–VIII), relating to parishes meeting at the castle (Table 8.2). Of these blocks, only the first two are detailed fully here since they relate directly to the archaeological excavations. The pertinent details of Blocks III–VI are summarised below, with further information given in Part IV. Cross-references to these data are made throughout the two monographs, drawing on the information in relation to wider issues such as social economics, crafts and occupations and the particular inferences relating to named individuals.

Block I: St Martin-in-Balliva (at Bale)

As with the properties formerly of the Castle Fee which were in St Peter Parmentergate, no trace now remains of those in St Martin at Bale (Properties 38–46; Fig.8.2). All were swept away and the land raised and incorporated into an enlarged Cattle Market in 1862 (see Chapter 11). To the east of the block was Pump Street, known in the medieval period as the Common or King's Way from Conesford to the Castle of Norwich, that is to the main entrance into the south bailey near the church of St John Berstrete, on Timberhill. However by the time of the earliest surviving documentary records other ways into the 'Ditches' so-called had been created including the lane to the north of this block (later Holkham Lane) and the one to the south which led to the Shirehouse (Shirehouse gap, later Pig Lane). Smaller ways between the lanes also existed (see above).

What types of buildings were erected by tenants and sub-tenants remains unknown. The earliest property deeds mention several cottages and many gardens, some of which persisted for centuries. The length of the northern block of six properties (Properties 38–43) totalled about 1,000ft and remnants of them were later recorded at the Castle Mall site (Area 9).

Property 38

The first property in the Castle Fee rent list lay at the northern end of the block of six had a roughly triangular shape, and was bounded by a lane which ran later into the Castle Ditches on the north-east and by the ditch to the west where it measured nearly 100ft. The rent was 2¼d. This was paid by Peter Partryk in 1397. The lease had previously been held by Thomas Ladde, who also held Properties 37, 39 and 42. Peter Partryk was a mason who had been brought before the New Leet (Court) of the Castle in 1374–5 for raising the hue (making an affray). In this respect he conforms to the reputation for quarrelsome behaviour enjoyed by his profession (Harvey 1975, 128). [Harvey quotes the case of John Partryk, a bricklayer murdered by two masons in York in 1491. In Norwich another Partryk, Thomas, was prosecuted for battery in 1406.] Both he and his wife were amerced (fined) at the Leet Court for 'raising the hue' in 1374. Another person who 'raised the hue' was Alice, wife of the tailor of the Shirehousgappe. In 1394 Partryk devised this messuage with its adjacent curtilege to Thomas of Ocle (Roll 15, m 16). The next known tenant was Hugh Goldbeter, before Katharine the widow of John Redying paid the rent in 1457. Thomas Gardyner paid it in 1485 and 1493, for the tenement which had recently been Katherine

Dunnyng's. She was the widow of William Dunnyng, mercer, and left several properties in St Peter Mancroft and St John Berstrete but makes no mention of this one in her will of 1485 (Roll 20, m 11). The 16th-century leaseholders were John Welles, two members of the Penteneye family and William Parson. The rent for whatever reason had been reduced to 2d.

Property 39
This is the next property to the south, and subject to the Castle Fee rent of 1d, which when paid by Thomas Toftes, skinner, in 1397, was for a cottage which had formerly been Thomas Ladde's. Thomas Ladde had also held the leases of Properties 37 and 42 and of a garden on the site of the present *Le Rouen* public house. In 1394 Thomas Mulkeberton is found on an abuttal (Roll 15, m. 16). Subsequent rent-payers were John Belaugh, the former sergeant, John Lakenham, Alice Cottyng (1485), John Kyng, reder (1493), Henry Brigges, William Head, capper (1535), John Porrenger and William Richardson (1584).

Property 40
The adjacent property to the south was also subject to a Castle Fee of 1d and with the exception of one abuttal showing Adam of Colton as the tenant its early history is limited to the names of those paying it. In 1397 Agnes Gnateshale was charged 1d for the tenement formerly of John Gnateshale. He was twice a Norwich MP (Hudson and Tingey 1906, 265,7), and responsible for providing a fully armed man for the St Peter Mancroft View of Arms; that is to say that he was typical of those who found it profitable it invest in property on the edge of the Castle Fee. In the mid 15th century the holder of the lease was John Belaugh, sergeant (a court officer) who held all of the middle part of the block at that time, that is Properties 39–42. Then came Richard Stone, Robert Grene, miller (1485), Robert Belle (1493), John Hunt, tailor, Thomas Ashley (1535), Francis Sewall, George Burwell (1584) and finally Thomas Burrell, all paying the rent of 1d.

Property 41
The earliest information about this property is found in Kirkpatrick's copies of the deeds from a lost Norwich Court Roll. In 1348 William, son of Adam atte Hethe of Rakheithe sold four cottages to John Emelot and William of Creyk which were sold by John's executors to William of Ocle, messager, in 1356. John Emelot was a City Official; he had the lease of the Stonhous at the gates of the Priory of Holy Trinity for thirty years (Hudson and Tingey 1910, 365). Abuttals give William Messager in 1379 and Robert Bilhaghe in 1382. In 1395 the widow of Robert Sylvester of Bilhaghe sold the tenement with buildings and an adjacent curtilege to Thomas of Redham, the notary (Roll 15, m 21d). The property was liable for 1d Castle Fee rent. Several early holders appear to have had a connection with the legal profession. In 1397 the rent was paid by the 'Sergeant of the Priory' for his tenement formerly of William Ocle, messager, in 1457 by John Belaugh, recently sergeant (there were two men of the same name: this may be the son), in 1485 Matilda Atwood who had been preceded by Henry Coket and in 1493 by John Kechyn. John Ringolf had been named on an abuttal when Roger Cook paid the rents of the mid 16th century; he was no doubt a sub-tenant. Roger Cook was followed by George Beamond, then by Mistress Potter and George Burwell in 1584 and 1607.

Property 42
This next tenement to the south paid 1d Castle Fee rent. It seems to have been in several parts, some of which remained gardens for very many years, and it has not been possible to relate them the each other. Abuttals from the property to the north give 'curtilege of Sybil, widow of Alexander Mariot' in 1348, William Asger and Adam of Illyngton in 1356 and Thomas Cole, formerly Alexander Mariot in 1359 (Kirkpatrick). Thomas Ladde had been the Castle Fee tenant. In 1379 the executors of Alice Ladde devised three cottages under one roof to Henry Cole, spurrier in 1379 and he left these to his son John when he died in 1382. He left his daughter Pleasance two tenements with one house (Roll 14, m 13). They may all have been part of this property. Pleasance and her husband Thomas atte Lounde, mercer, sold what may have been the whole as 'a tenement with a house once Thomas Ladde' in 1429 (Roll 18, m 13).

The Castle Fee rent of 1397 had been paid by Thomas Morton; the 1457 payee was John Belaugh the sergeant. There were certainly two gardens here, the one to the north also including buildings, both of which had once been Thomas Ladde's and both acquired by John Kerych, carpenter (Roll 19D, 2d, 3d). Robert Smith paid the Castle Fee rent in 1535 for the tenement formerly William Drake's. He was a cordwainer. His heiress, Beatrice and her husband James Atkinson, 'reder', with Margaret Smith, co-heiress, disposed of the 'two tenements with buildings and gardens lying together' in 1546 to Thomas Marsham (Roll 21,m 127).

After this, the only reliable record so far established for this property is found in the Castle Fee rent lists. The widow Clerk paid it in 1584.

Property 43
The most southerly of the properties in this block, Property 43 was larger and more valuable, paying Castle Fee rent of 5d. It was bounded on the west by the 'common way near the Castle Ditch', usually called simply the 'Castle Ditch', on the east by the King's Way and to the south by a lane which ran from that towards the Shirehouse. This was known as 'the common way near the Shirehouse' (14th century), Shirehouslane (15th century) and Shirehousgappe in the 16th century. By the early 18th century it had become Sherrod's Gap and up to the absorption of the whole area into the Cattle Market, Pig Lane. The tenement may have measured *c*. 130ft from west to east and perhaps 60ft from north to south and from 1493 was divided into two, paying 3d and 2d Castle Fee rent. From 1535 there was an additional rent of 1d which may indicate redevelopment or a further grant of Castle Fee land.

Due to the complexity of the record, the documentary information is set out as a chronological list in Table 8.3, mainly without abuttals, though all the properties faced either the ditches or the street on the east and sometimes both (those post-dating 1600 are given in Chapters 10.1 and 11.1).

Properties 44–46
Three more properties (Properties 44–46) lay to the south of the Shirehouse Gap. On the north-west corner of this block was eventually situated the *Golden Ball* public house (the block was all demolished in 1862; see Chapter 11.I).

Property 44
The northern section of this block was described as a messuage with buildings in 1386 and as a garden two years later. In 1397, the date of the first Castle Fee rent list, it was owned by John of Middleton 'gaoler, lorimer' of the castle and paid 14s ½d. Much of it remained unbuilt on throughout the period.

Property 45
This property seems to have been the first to be sub-divided. In 1390 the south-west corner on which was a cottage with a solar was acquired by Geoffrey of Bixton and William Blakeamoor. They owned the lime-kilns near the south gate of the city and Blakeamoor owned another property on the north edge of Castle Meadow. East of this cottage was another by 1382 which may have been included in the conveyance of 1388 when the description reads 'tenement with buildings, shop, garden, *etc*'. The previous year Henry of Stowe, the draper, had persuaded the City Bailiffs that this 'edified tenement' for which he had been paying them 15s per annum was only worth 10s. The new leaseholder, duly paying the 10s in 1397 was John Lombe, le paumer.

For some time prior to 1464 this tenement was held by Robert Everard, the freemason responsible for the cathedral spire. A number of freemasons held property on the edges of the Castle Fee at various times. For instance Richard Ilward paid 3s 4d in 1493 for a portion of land in St Peter Parmentergate abutting on the southern ditch of the Castle Meadow. A shared well is mentioned when a carpenter acquired property in Property 45 in 1502.

As the three original tenements comprising this block (*i.e.* Properties 44–46) were further subdivided and built on, the ground rents were renegotiated. At one time, taken together, the rents amounted to 2s 4d, later, to as much as 11s 4d. They were reduced in 1532 'for that the Feez been brent' and again in 1543, so that by 1545 only 4s was paid. By then what had been seven separate tenements were combined into one. When Henry Albon, barber, acquired the lease of them all in 1544, they were described as follows: messuage with buildings and garden (1), tenement with walls, gardens, rents (2) and two tenements and two gardens, with another garden (3) all lying together (Roll 21, 116d).

Property 46
Adam of Ely, lorimer, sold this, described as a messuage with buildings in 1361–2. Later, for many years it was owned by Thomas Alderman, parson of St Botolf, who probably lived in part of it. He seems to have been a lawless character. He was prosecuted twice at the New Leet of the Castle Fee in 1390, once for dumping quantities of muck from his houses there next to the Shirehouse, and again for entering the house of a neighbour, Richard Oxburgh the tailor and removing lengths of cloth, a bed, tables, wooden vessels and other items (NRO 5b/11). He left Property 45 to be sold when he died in 1394 and it was bought by John of Middleton (see above) who paid Castle Fee rent of 1½d for it

in 1397. Edmund Culling, the gaoler lived here in the late 15th century. The only measurement so far found for any part of this block appears in a deed of 1533. With the messuage and buildings changing hands went part of a garden 18¾ yards long and 7¾ yards wide.

Block II: St Martin-in-Balliva (at Bale) and St John de Berstrete (Timberhill)

The whole of the north-eastern section of Block II (Properties 47–51) seems to have remained as gardens throughout the period. City properties to the south (Properties a–h) housed shops and other buildings from an early date. Properties abutted onto:

'the common place called Shirhousyerd' (1347, 1363)
'the common place near the Shirhous' (1361)
'a place called Castellond' (1389)
'the castle ditch' (1384, 1401, 1535, 1554)
'land called Castellond' (1391)
'way between said garden and Shirhous' (1435, 1533, 1558)
'penes' (near) 'le Sherehous' (1457, Beecheno)
'road near Shirhous' (1568)

Associated with some of the gardens were stone walls:

'garden within stone walls' (1533, 1558)	Property 50
'a wall along the north (?) side of the garden'(1388)	Property c
'a new stone wall' (on the north side) (1555)	Property c
'garden ... and stone wall, part 'Segors'' (1568)	Property 51

Late 14th-century references to shops:

'a messuage, with shops on the south part' (1389)	Property a
'messuage with shop, garden, etc' (1389)	Property b
'tenement with three 'solds' built on it' (1391)	Property g

Other features:

'a back gate to ... Castellond' (1389)	Property b
'a chamber with right of way' (to the street) (1406)	Property d
'a camera or mansion for the parish priest' (n.d.)	Property f
a garden still to be found fronting Timberhill in 1569.	Property b

Prices:

£40 was paid for a tenement called 'Segors' in 1389.	Property b
£100 was paid in 1542 for messuage in Timberhill partly abutting on the churchyard.	Property e
£53 6s 8d was paid in 1570 for messuage next to the above and abutting on the churchyard on two sides.	Property f

Date	*Owner*	*Castle Fee rent*	*Source*
1359 s	John of Stoke to Thomas Cole a tenement once of Adam of Horsford		Kirkpatrick
1382	(abuttal) tenement of Geoffrey of Sweynesthorp		
1386 x	testament of Thomas Cole leaves his daughter (inter alia) land on Castle ditch		Roll 14m29
1397	Thomas Lorymer, now said Thomas's daughter	5d	Castle fee rent
1404 xs	John Riedham to William Magesone, reder, a tenement (the western part)		Roll 16m18d
1457	John Kerych for tenement and garden, and another garden which John Belaugh holds	5d	Castle fee rent
1471	(abuttal) tenement once William Sweynesthorp and ten recently William Maggeson, reder		
1472 x	Thomas Pye, coriour to Robert Herman, yoman, tenement with buildings and garden once William Maggeson		Roll 19E3d
1472 xs	Robert Herman yoman to Robert Curle of Heigham, barker, Q in the same (the western part)		Roll 19E3d
1485	Richard Fawde for his tenement recently Thomas Bewfeld, and Thomas Bewfeld for his garden	3d and 2d	Castle fee rent
1493	Robert Hoo for his tenement recently Richard Fawde and Thomas Bewfeld for his garden	3d and 2d	Castle fee rent
1501 xs	Robert Curle, tanner to William Parker, corrour, tenement with buildings and adjacent garden (western part)		Roll 20m60
1504	will of Thomas Bewfeld, among other bequests he left his wife his 'place' where he lived in St. Michael-at-Plea 'with the garden in St. Martin of Balyff'		NCC will 491 Popy
1532 xos	William Brannche yoman to Thomas Brown, yoman messuage with buildings and two adjacent gardens		Roll 21m74
1535	William Downam for a tenement late Henry Grygges, William Waller for a garden once Thomas Bewfeld and Robert Kynge for a tenement once John Leverich, formerly John Belaugh	3d, 2d and 1d respectively	Castle fee rent
1545	Henry Shipdham for tenement once William Downam (other charges missing)	3d	Castle fee rent
1546	(abuttal) tenement of Henry Shipdham		
1546 xos	Thomas Brown and wife to Henry Albon, junior, barber messuage with buildings and adjacent gardens, formerly William Braunche		Roll 21m126d
1551 xos	Henry Albon, junior, barber to Robert Talbot, clerk, messuage with buildings and two gardens		Roll 23m22
1556 xos	Henry Baly, yoman to Anna Mower of W…, widow messuage with buildings and two adjacent gardens and another garden acquired from Robert Talbot		Roll 24m23
1561 xos	Edward Smyth of Weston, yoman and wife, the widow of William Mower to Thomas Tesmond, grocer, messuage with buildings and two gardens, and another garden		Roll 25m16
1584	Robert Hall, taylor, for a tenement once Henry Grigge, Robert Hall for a garden late Thomas Tesmond and Robert Hall for a tenement once Robert Kyng recently Thomas Tesmond	3d, 2d and 1d respectively	Castle fee rent

x = abuts on Castle Dykes to west
o = abuts on road to east
s = abuts on Shirehousegappe to south

Table 8.3 Ownership of Property 43, St Martin at Bale (in-Balliva), 1359–1584

Property 47 (St Martin-in-Balliva)
In 1391 Thomas Hardegray, butcher, was amerced at the Leet Court for causing a dead horse to be dumped in a lane near the Shirehouse. He may have lived in part of Property 47, Block I, as a member of his family had acquired it thirty years before. When he died in 1400, Thomas Spark left this property a 'tenement with buildings' in the south east corner of Property 48, to his wife. She and her second husband John 'of the Chamber', sold it the same year to John Querdling, a bladesmith. It was subject to a Castle Fee rent of 2d, paid in 1397 by a chaplain, Richard Wortham.

Property 48 (St Martin-in-Balliva)
In 1363 Thomas Spark (alias Norwich) sold this property to Katherine Pilly when it was described as a 'tenement next to a common place called Shirhousyerd'. When she died she left it — 'the garden' — to her son John. In 1397 John Harleston paid Castle Fee rent of 1d *per gardino quond*. *Thomas Ladde ex opposit dom. Com.* [for the garden formerly of Thomas Ladde opposite the Shirehouse].

Property 49
Facing north towards the castle were three gardens. This one was left in 1392 by William of Colton to his wife who kept it for forty years. But is was a Richard Colton whose capital messuage was on the edge of the Castle Fee north of York Place, who paid the Castle Fee rent of ½d for it in 1397.

Property 50
The next property to the west remained like the last as a garden. It was probably sold to John Baxter in 1361 (Kirkpatrick) when the northern abuttal was 'common place near the Shirehous' and was probably identical with the tenement bought by William Segore in 1391, abutting on 'land called the Castellond' to the north. William Segore paid 2d Castle Fee rent for it in 1397. In 1568 when acquired by the owner of the Castle Hotel, it was a garden, part 'Segors' and included a stone wall and was surrounded on all sides by gardens except the north, along which ran the 'road next to the Sherehous'.

Property 51 and (a)
The last garden facing north onto the Shirehouseyard was usually associated with the messuage on the corner of the lane into the bailey and Timberhill. Agnes of Bonington sold William Spark a messuage with shops on the south part and a parcel of land in the Castle Fee bounded by the Shirehouseyard, the ditch of the castle (the lane) and the road (Timberhill) (Kirkpatrick). In 1384 Thomas Veyse who married William Spark's daughter sold the northern part , the 'piece of land in fee of the castle' to John Churcheman and two years later on his death left a 'tenement with buildings' which seems to have been the southern part to be sold. The garden was subject to a Castle Fee rent of 12d in 1397. In 1401 the whole was acquired by a 'reder'. In 1535 John Bulwer 'tailour' sold it to Richard Bulward 'bladsmith' (abuttals: ditch of the castle, common lane and road) and in 1554 it was sold by Thomas Rochester after whom the little lane was called for many years.

Property (b)
The second messuage up Timberhill was sold by Agnes Veyse's executors in 1390 to William Segor for £40. This was described then as 'a messuage with a shop, and a garden with access through a back gate to the place called Castellond'. It backed onto part of the garden of John Churcheman (see above). It was known as *Segor's Inn*, a name which persisted for 200 years. In 1569 William Rochester a cordwaner bought the 'tenement once called Segorys Inne'. The garden and the tenement to the north were by then held by the parishioners of St John Berstrete. Blomefield states that they were left this 'part of a tenement called Segores Inn, with a Yard and Outhouses ... with Liberty of a Well' and subject to 1½d landgable in 1586.

Property (c)
Probably originally part of the last tenement this was sold by Agnes Veyse in 1388 to Thomas Hardelee. It was a garden with a wall along its north side and a cottage. Thomas Hardelee already held the next tenement to the south and it seems likely that together they formed a property which changed hands in 1555 and was described as 'messuage with buildings and garden once Robert Estane, with a new stone wall and foundation and right to a gutter six inches wide on the land of Edmund Culling the length of the wall'. Edmund Culling's garden formed part of the rear abuttal of the messuage and the stone wall measured 24 yards in length. (It is not suggested that the wall was the same as the wall of 1388 which seems to have been at right angles to the road.)

Property (d)
There is a small group of 16th-century deeds for the next tenement up the hill. It was described as 'messuage with buildings and garden' and seems at this date not to have had as long a garden as Property (c). It paid ½d landgable. Abuttal evidence leads to the conclusion that it corresponded to a 'messuage with buildings and garden' which was bequeathed in a will of 1406. William of Wymondham left it to his daughter with the reversion of a chamber with a right of way on the south part of his messuage next to the messuage of William of Sutton.

Property (e)
The next three properties (Properties e, f and g) abutted in part or wholly on the churchyard. They were on land which once formed part of it (see Fig.8.2) and paid a rent to the Infirmerer of Holy Trinity to whom the church was impropriated. Too few surviving deeds and in some cases imprecise abuttals make either a convincing sequence of owners or an estimate of the extent of the messuages problematic. The brasier, William of Sutton, acquired this messuage with buildings and gardens in 1402. On the east it abutted in part on the cemetery and in part on another tenement. To the north was an orchard or garden. In 1495 what seems to be the same property had three eastern abuttals, one the cemetery, the second the rear of a messuage which faced what became Golden Ball Lane and the third a messuage facing Timberhill. These are repeated in a deed of 1542 when a baker, who had bought it from another baker the same year, sold the messuage with buildings and gardens to a notary for £100. It was subject to landgable of ½d.

Property (f)
This property abutted the cemetery and the road. In 1388 the other two abuttals were a tenement held by the owner of Property (e), so Property (f) may have been a part of it. It appears to be the property released in 1494 which had the road to the west, two former owners of Property (e) to the north and the cemetery south and east. This could suggest that the land to the east have been taken back into use for the cemetery during the 15th century (a number of late burials were recorded here at the Castle Mall site, although these appear to date to the 14th century; see Chapter 7).

A previous owner had been Robert Estan, perhaps the same as the Robert Eston who gave the Priory of Holy Trinity 2s per annum from the messuage abutting south and east on the churchyard for a camera or mansion for the parish chaplain (DCN 40/1, 275). A glover held it from the Priory in 1294 (Roll 2 m 43). A chaplain paid rent of 2s for five months in 1484 (Cattermole 1985, 26). Ten years later the property was released to William Swetman, clerk (Roll 20 m 40d). In 1504 the Priory released forever 20d of the original rent to William Phelippe, a baker, who at that time held it and Property (e) (DCN 40/1, 275).

A chamber in the west angle of the cemetery brought the Infirmerer 4s in 1530 (Cattermole 1985, 26). For some time after the Dissolution the church wardens let it out as three tenements (Blomefield 1806, II, 128). Finally in 1570 the messuage with houses, buildings, garden and orchard was sold for £53 6s 8d (Roll 26 m 9).

Property (g)
North of St John's churchyard and facing east onto the lane leading into the bailey was a large tenement which was sold in 1391 as 'a messuage and other tenements, with a garden and an adjacent curtilage with buildings'. At the south east corner was a smaller tenement consisting of three shops and a piece of vacant land. About 1480 a carpenter sold another tenement facing the road and bordering the cemetery which measured from south to north along the road 77ft (23.46m) and was 43ft (13.10m) deep at the south end and 44ft (13.41m) deep at the north end. It was held in fee from the Priory of St Faith's on a perpetual lease paying 3s 6d per annum. There were further deeds for this property of 1511 and 1549. The shops are not mentioned again and in 1549 it was described as a garden.

Property (h)
There are two 14th-century deeds for a tenement in two parts which was to the north of Property (g). The northern part 'a tenement with one house' was acquired by Henry Cole, the spurrier, in 1379. To its north was a vacant piece of land, to the west the then owner of Property (e) and probably Property (f), while to the south was a tenement of William Spyndellere. In 1382 Henry Cole died and left his 'tenement with the tenement of William Spyndelere on one side' to his wife.

Block III: St John Timberhill and St Peter Mancroft

Four properties existed within this block (Properties 52–55, Part IV), the boundary between the parishes of

St John de Berstrete (Timberhill) and St Peter Mancroft running through the northernmost. The south-western corner of the block was later to become the site of the '*Blew Bell Inn*' (see Chapter 10 and Part IV). A notable owner of Property 54/55 was Robert Fuller, the 'brasier', who acquired it in 1391.

Block IV: St Peter Mancroft

There are five properties of this parish (Properties 1–5, Part IV) at the beginning of the first Castle Fee rent list of 1397 (excluding Property 55 included with those of the parish of St John Berstrete in Block III). The first of these (Property 1) faced west and south onto the lane which led into the south bailey, and the second (Property 2) faced partly along this lane towards the market and partly along the Cockey lane. This lane was narrow and wound northwards following the course of the culverted stream. The next three properties (Properties 3–5) lay between this minor thoroughfare and the castle ditch which lay close behind them. They probably remained as gardens for the next two centuries. The owners, where known, belong to no particular occupational group.

Block V: St Andrew's Parish

There were nine properties along what had become known as Cutlerrowe, a name which persisted throughout this period: Properties 6–14 (Part IV; see also Property 71). Additional grants of land on the Fee behind these have been given separate numbers — Properties 60–63 and 70. Four of the original indentures survive from 1421. They were contiguous, all in St Andrew's parish and all abutted south on the castle ditch. Taking them from west to east, the first was widely trapezoidal with a south boundary of 13¼ yards, the next two were coffin shaped tapering towards the south and 13 yards from south to north, the last rectangular, 13 yards from north to south and 9½ yards wide. A slightly later rental lists three more plots to the west of these, perhaps those leased in 1424 which had a 'way' between them and the Castle Ditch. Beecheno considered this to have been a narrow footpath.

Leaving aside clerics, of whom there are very few, seventeen different trades are mentioned in the records consulted. In the period up to 1425 there were five cutlers and a lattener who, with three goldsmiths, make metalworkers the most numerous category. There were six leatherworkers including two sheath-makers, two bag-makers, a bookbinder and a hatter. Apart from these there were two fletchers, two mercers, a turnour and a chandler. After 1425 there were four goldsmiths, but the only other metalworkers mentioned are a blacksmith and a locksmith. The leather trades are represented by three shoemakers, a skinner and a hatter. There were two tailors, a worsted weaver and a mercer, and the list is completed by a barber, a merchant and a grocer. In many cases trades are not given, and it is often far from certain that the owner lived in the property. However it seems safe to say that there was a preponderance of metalworkers and leatherworkers in this area.

Cutlerrowe formed part of the route between the market-place and the Cathedral. In a deed of 1378 it is called a *strata*, which usually implies paving. Two fletchers were acquiring a 'tenement with shops annexed and three other adjacent shops, recently built by the seller, and an adjacent garden'. The southern abuttal is given as 'the common *stratam* next to the ditch of Norwich Castle'. There had been shops on the north side of the street at the corners of the lanes there since the beginning of the century so perhaps the area at the top of either St Andrew's steps or the present Swan Lane was for some reason paved by this early date.

Block VI: St Michael at Plea

Eight of the Castle Fee properties in this parish (Properties 15–22) occupy the edge of the 'bulge' in the northern part of the bailey, followed by the present London Street and the northern part of Bank Plain. The first five seem to have been built up earlier and more densely than the remainder, probably because they were on the street between the market and the cathedral priory. Further east, along both sides of a lane leading into Castle Meadow and along the meadow's northern edge there were some quite large gardens. Almost on the parish boundary was a small property owned by the cathedral priory (Property 23). Again, additional grants behind those on the street frontage have been given separate numbers (Properties 57–59 and 66–69).

Early owners include five metalworkers including an armourer and a bladesmith, five textile and five leatherworkers, a spicer and two chandlers, a graver or image-maker and a chaplain. After the middle of the 15th century metalworkers and leatherworkers are largely absent, leaving one bladesmith and two goldsmiths. Clothing and textiles account for eight others, and there were six dealers in grocery, drapery and ironmongery. There was one clerk, one freemason and several barber-surgeons.

Block VII: St Cuthbert

At the end of the 15th century this parish was added to St Mary the Less, finally becoming part of St George Tombland in 1542. Many of the properties here were being divided into smaller units in the latter part of the 14th century. Where measurements are given in a property deed this appears to be the case. One example dated 1378 is unfortunately unplaced, though it could only concern one of Properties 26–29. A bookbinder sold the northern half of this property to his northern neighbour (who may have been a Taverner). It abutted on the road to the east and another building of his (the seller's) in part and in part on 'the meadow of the Lord' (*unam pratum Dominis*) on the west. The plot, which had buildings on it, measured 33ft on the north, 18ft on the east and 15ft on the west (Roll 14.3).

On the other hand, and particularly in the 16th century, those paying the Castle Fee rents were building up bigger holdings. The identity of the tenants and their occupations becomes more obscure. Trades noted from the 13th and 14th centuries are: saddler, two glaziers, tailor, swordsmith, mason, smith, chaplain, parchmentmaker, two merchants, bookbinder, barber (-surgeon). From the 15th century are a stainer, two cordwainers, an upholder (furniture dealer), barber (-surgeon), two chaplains, reeder (thatcher), two tailors, carpenter, clerk/scrivener, merchant, saddler, two masons. From the 16th and 17th centuries come a tailor, tiler, baker, clerk, yeoman and gentleman.

Block VIII: St Peter Parmentergate

As noted in Chapter 7.I and Part IV, this was a large block of eight properties (Properties 30-37), spanning

Name	*Occupation*	*Date*	*Property*
John Aubrey	draper	1457	19
John Barne	chandler	d.1523	2
John Basingham	goldsmith	d.1563	13, 14
John Belton	goldsmith	d.1517	15
John Bristomer	bladsmith	d.1497	16, 17
John Clarke	goldsmith	d.1465	9
Thomas Clarke	spurrier	d.1531	10
James Fisher	barber-surgeon	d.1603	13
William Gilbert	grocer	1545	13, 14
Stephen Leman	barber-surgeon	d.1522	20
William Nobbs	bowyer	d.1502	7
Simon Newton	goldsmith	d.1557	2
Felix Puttock	goldsmith	d.1555	7
John Roper	bowyer	d.1465	6
Robert Rose	goldsmith	1421	8, 9
Thomas Sparkhall	innkeeper	1685	2
Richard Yemmes	skinner	1457	10

Table 8.4 Castle Fee property owners-occupiers (mid 15th to 17th century)

the southern half of the Castle Meadow, several of which were acquired by Augustine Steward (the city magnate and Lord Mayor) in the 16th century. Of note amongst the 14th-century owners of Property 30 was John of Toftes, after whose family Toftes (or Stepping) Lane was named. The number of other female tenants of this same property in the 15th and 16th centuries is perhaps worthy of note: the Lady Agnes Hakon (1457), Isobel Atkyns (before 1485) and the widow Ellward (before 1606).

Occupations of owners during from 1345 to the late 16th century identified in Part IV include a chaplain, others working as clerks (including two scriveners) and in administration (including the city bailiff and a possible rent collector). Several were occupied in the building trades, including two masons, a wellmaker, painter, reeder (thatcher), a plumber (?and glazier), a wright, a carver and joiner, and a sawyer. Those associated with textiles included a sherman and weaver/draper, while the leather trade was attested by a spurrier and two skinners. There were, and remained, many taverns and inns in the area. By the late 16th century Property 36 was the *Jesus Inn*, later the *Holy Lamb*, and Property 37 housed a beerbrewer on a site which was to become the Duke, afterwards the *Shirehall* public house (see Chapters 10–11).

Buildings and Other Topographical Features in Blocks III–VI

Details of what the twenty-three sites under review in Blocks III–VI and others at their rear were used for are very scanty considering the number of them and the length of time spanned. In general the plots were built on. Those known to be empty at any time are noted in the list below. Details can be found in the main account for each property (given in Part IV), which expand the information to include all of the 71 Castle Fee tenements. There are a number of early records of small groups of shops, which as Elizabeth Rutledge has pointed out, probably mean cottages built for rent. Two of them have solars, or first floor rooms, which makes this interpretation the more likely. A craftsman would have his workshop on the ground floor and his living quarters above. The rent-lists themselves contain no references to shops, though, confusingly, there is one 'cottage' — in St Martin at Bale.

Six gateways are mentioned to the west and north of the Castle Fee in Properties 1–23 (later analysis of Properties 24–37 is not included here). It is remarkable how many of these ways persisted, some into the 19th century as passages, some up to the present in the form of streets, *e.g.* Opie Street and perhaps Bank Plain; Davey Place might be the resurgence of an unsuccessful 'new way' of 1693. The following listing cites property numbers (Fig. 8.2) and reference dates.

Empty tenements: 3 (1538), 9 (1493), 14 (1305), 15 1545), 19 (1344), 20 (1397)
Shops: 1 (1392), 8 (1392), 16 (1382), 18 (1395)
Gateways: 2 (1424), 8, 9 (*c.*1424, *c.*1460, see notes for these properties), 14 (*c.*1540, see notes)
Walls: 1 (1569), 10 (1480), 23 (1565), 66 (1564), 67 (1561, 1564), 68 (1437)
Fence: 10 (1480)
Markers: 1 (1569), 2 (1424), 68 (1437)
Wells: 9 (1397), 10 (1480)
Latrines: 9 (1397), 14 (1567), ?23 (1565), 67 (1564)
Windows: 10 (1480)
Chimney: 10 (1584)
Gardens: 3, 4, 5 (probably 1397), 3 (1462), 4 (1546), 5 (1555), 9 (1493)
Stables: 3 (1690), 9 (1563), 61 (1556), 67 (1564)
Sites formerly edified: 7 (1527), 9 (1524), 14 (1567)
Rebuilding: 1 (1699), 9 (1524), 15 (1580), 23 (1565)
Rents: 7 (1392), 8 (1425), 9 (1397), 71 (1377, 1397)
Selling prices: 1 (1571), 7 (1401, 1507, 1546), 8 (1425), 8, 9 (1570), 14 (1573), 23 (1463), 69 (1620)

Walls, markers, wells and latrines are usually only found in a rare record of division. In the same way a new chimney is only heard of because it encroached on the street. Building and rebuilding must have been a continuous process as properties fell into disrepair, vacant lots were filled in or tenements built into yards, but very little was recorded. A few formerly built-on sites dwindled into gardens. Some gardens turned into stables with their yards. Such glimpses have all been noted here. Further research would without doubt reveal more.

Occupations, Craft and Industry Within the Castle Fee

(Figs 8.2 and 9.2)

There can be no complete picture of the trades pursued on the edge of the Castle Fee because there is no certainty that the property owners, even where their trade is given, actually lived in them (see below). It is clear from the Castle Fee rent lists that as time went on holdings tended to become larger. The 71 properties in the seven parishes considered in Part IV and summarised above were owned by 51 different people in 1397 and by 22 in 1626, which makes it the more difficult to suggest how any particular site was being used. Very occasionally the phrase 'the tenement in which he lives ' (*in quo manet*) is found in the rent lists: sometimes an owner left a will in which no other property is mentioned. These cases form a short list of owner-occupiers shown in Table 8.4.

The people presented at the Leet Court (which met at the Shirehouse) probably lived in the Castle Fee and their occupations are another indicator of the kinds of activi-

ties pursued in the area. Among those named at the leet of 1374–5 were:

a parcheminer and a bookbynder
a glover, a pelter and a tapyser (or tapestry weaver)
a carpenter, a spindeler and two coupers
a latoner and a brasier
a sowsterer (or saucerer) and a cook's wife
a barber
a reeder and a mason

Of note amongst the documentary evidence for this period, and indeed earlier, are the large number of bell-founders surrounding the castle (Fig.9.1). In 1316 Alan le Belleyetere, son of Richard Poche was working in St Martin at Bale (Norwich Enrolled Deeds Roll 7, m 15d; see also reconstruction diagram 112 in NRO MC 146/52 684 x5). Within the Fee was Robert Fuller at Property 54, St Peter Mancroft in 1391. Robert Fuller was also known as Robert Braysier by 1381 (Cattermole 1990, 146) and his workshops clustered in St Stephen's parish remained in use by his successors until the 16th century (Cattermole 1987). Two properties of other brasiers lay on the fringes of the Castle Meadow: Richard Brasier (1438, Property 23) and William le Belleyetere (<1397, Property 24). Thirteenth-century bell-founders Godfrey le Belleyetere (probably working *c*.1220) and his son Ralph le Belleyetere (working *c*.1260) had worked in adjacent properties also within the Castle Meadow (Properties 30 and 31; see Chapter 7.I and Part IV). Further details of activities conducted around the Castle Fee from *c*.1345 to the late 16th century are given in Chapter 8.V, 'Crafts and Occupations', supplemented by broadly contemporary data (late 14th to early 16th century) from the barbican well (Chapter 9).

Churches and Cemeteries
(Figs 8.1 and 8.2)
Although a number of Norwich churches were lost at the time of the Black Death in the mid 14th century, most survived to witness renewed interest in church refurbishment in the late 14th century. Many churches were provided with new aisles or chantries at this time 'paving the way for massive rebuilding campaigns of certain churches in the 15th century' (Ayers 1994a, 77). Monastic complexes continued to dominate the city until the Reformation of the 1530s and 1540s, when their demolition released large areas of land. Many churches were lost or declined at this time, including St Martin-in-Balliva. Alterations to the parishes surrounding the castle continued into this period. St Cuthbert was joined to St Mary the Less in 1492 and demolished in 1530–35 (Sandred and Lindström 1989, 38).

St John de Berstrete/Timberhill
Evidence for the mid 14th- to 16th-century church, drawn from the Obedientiary Rolls of Norwich Cathedral priory is given by Cattermole (1985, 26–27). Here it is noted that the rolls of 1345–1347 record an income of £6, declining to 40s by the early 15th century. Documents describe payments related to rituals at the church: 'the wasting of wax at the time of the Purification … for candles for processions, marriages, for the paschal candle … for rushes at the same church at Easter and pentecost' (*ibid.*, quoting from the 1441 roll). The payments continued to decline, with occasional fluctuations, until they reached 6s 8d at the beginning of the 16th century.

Numerous repairs to the church are documented, including replacement of the thatch (Cattermole 1985, 27). More significant work may be indicated by the addition of a new window, the repainting of a retable (a frame enclosing decorative panels above an altar) and for the high altar in 1346. Further alterations are documented in 1399 and 1468, when a new east window was added (*ibid.*). In 1441, a gift was made towards the construction of a new aisle, with additional funding provided by a church ale (the sale of such beverages contributing to the church funds).

The surviving church, with an aisled nave and chancel with side chapels is of transitional Decorated (14th century) and Perpendicular style (15th–16th century). Its plain vaulted south porch has a parvis (a room above; Cautley 1949, 226), A chandelier of probable German origin dating to *c*.1500 survives in the south chapel. This has a small figure of the Virgin at the centre and the arms 'bristle with branches, leaves and grapes' while the church was also supplied with a Norwich-made Chalice of 1565–6 and Paten of 1566–7 (Pevsner 1988, 244). The church had a square tower with five bells (Messent 1932, 161). Blomefield described the Lady Chapel on the north side of the chancel, at that time the vestry, as founded in 1494 by John le Grice, gentleman, who was buried at the centre of the chapel in 1500 (Blomefield 1806, II, 127). In the south chapel (dedicated to St Mary), numerous others were buried including Robert Hales in 1436 who gave 40s towards its repair (*ibid.*). Those buried within the church included Henry Skye (1385); John, son of William, Sporle (1438); Walter Geffrey, Alderman (1475) and Thomas Alicok (1493). In 1479, John Erpyngham, gyrdler, 'gave a Legacy to the Light burning before our Lord's Sepulchre in Easter Time' (*ibid.*).

Due to the absence of a parish chaplain, 'the church was served directly from the priory' (*ibid.*). Blomefield listed the parish priests, chaplains and perpetual curates as: Sir Roger, parish priest (1303); William Singer (1382); Sir John Pallyng, chaplain (1455); Sir Robert Swetman (1494), Sir Robert Fritton (1555); Thomas Pidock, perpetual curate (1563) (Blomefield 1806, II, 128). Some of the incumbents may have been housed there. 'A dwelling house for the parochial chaplain, mentioned in 1484, was rented to him at 2s for 5 months, and a rent of 4s from a chamber in the west angle of the cemetery is mentioned in 1530' (Cattermole 1985, 26). Registers for the church exist from 1559.

Links with the prison (following the sale of St Martin-in-Balliva in 1562, see below) include an entry for 1566 recording the death of a felon buried here who had been 'prest to Deathe'. The man in question was Richard Ingham who, as a result of refusing to speak in court, was tied down with as much weight as he could bear placed upon him. Scraps of bread and stale water were fed to him on alternate days until his death (Green 1966, not paginated).

The church continued to be referred to in relation to Bergstrete/Bearstrete/Ber(e)strete throughout the 14th and 15th centuries, well into the 17th century (Sandred and Lindström 1989, 42). The first reference to it in connection with the Timbermarket appears in 1350, when it was described as *(in parochia) Sancti Johannis de Berstrete iuxta le Tymbermarket*.

St Martin-in-Balliva
Those who died at the castle, including those who were executed there, continued to be buried in the churchyard of St Martin-in-Balliva until 1562. Documented burials include Nicolas de Monte, benefactor (1386); Petronel Saluse (1445); John Attleburgh, chaplain (1459); John Arnald, gentleman (1465); William Byshop (1474); Henry Cole (1477); and Isabel, wife of William Birde, graver, who was buried in the church by Thomas Gurneys, her late husband (1502) (Blomefield 1806, II, 122).

At the Dissolution, the church came to the Crown and 'in 1549, the Rectory, and Advowson of the Vicarage, was granted to Ralf Sadler and Laurence Wynyngton; and the same Year, Hen. Albon and Robert Spull sold a bell, but were compelled to bring it again, and it continued in Use 'till 1562, and then it was sold to the Queen, and the Scite hath been in private Hands ever since' (Blomefield 1806, II, 121). When the church was sold to the Queen, the two bells and lead valued at £70 were retrieved before demolition. At this time, the church was deconsecrated and the parish united with that of St Michael at Thorn (Sandred and Lindström 1989, 45). The church, labelled as 'St Martin's on the Hill' appears in Daye's 1558 view of Norwich (Beecheno MS 1908, 17).

II. ARCHAEOLOGICAL SEQUENCE

Period 5.1 Late Medieval/Transitional (*c.*1345 to mid 15th century)

Summary
(Fig.8.3)
The period following the 1345 acquisition of the baileys by the city saw extensive quarrying across the south bailey and a total of 207 pits of this date was recorded across the site. Quarrying was particularly intense to the east of the castle approach and may have been commercial in character. An adjacent area of pits indicates that peat-burning was taking place. To the west of the road, the smaller quantity of quarrying may indicate the extraction of sand and gravel for the construction of buildings and boundary walls. During the same period, the upper part of the barbican well superstructure was robbed and the well itself was utilised for waste disposal (see Chapter 9), access to the well from the south-west perhaps being made via a new route inserted through the rampart. The barbican ditch continued to be infilled although, given the large number of documentary references to refuse disposal into it, the quantity of material surviving from this date was surprisingly limited. Final infilling of the ?Castle Fee boundary ditch occurred in the late 14–15th centuries.

Evidence for metalworking in the southern part of the site (in the parish of St John, Timberhill) included non-ferrous metalworking (including bell-founding) and the deposition of copper alloy waste into pits. Metalworking was particularly prevalent above the infilled ?Castle Fee ditch and in the eastern part of St John's cemetery. Domestic refuse pits relating to adjacent tenements were recorded both along the Timberhill frontage and across the northern part of the cemetery, the boundary of which had moved southwards.

The Decline of the Barbican

The Barbican Courtyard
by Elizabeth Shepherd Popescu and Andy Shelley

Infilling of the barbican well
The upper part of the well within the former barbican (Period 3.1, Chapter 6) was apparently robbed or demolished during the late 14th to mid 15th centuries. The well itself began to be infilled with building waste and refuse in the late 14th century (G5/23, Period 5.1, although earlier fills may have been present at its base). Filling continued into the 15th and early 16th century (G5/24, Period 5.2) and the artefacts and ecofacts recovered formed the major assemblage from the site. All of the fills and the material retrieved from them are described in Chapter 9. Final demolition occurred in the post-medieval period (see Chapter 10), with the ground above the well continuing to subside in modern times (see Chapter 11).

Open Area 21: robbing around the well shaft
(Figs 8.4–8.6)
Probable robbing was recorded to the west and south of the barbican well, although it may also have occurred on the remaining sides. The robber cut mirrored the shape of the well shaft, extending 0.65m to its east and 0.70m to its west. The well masonry survived to an upper level of *c.*26.67m OD, with the uppermost part of the robber cut surviving to 26.50m OD. It is unclear why the masonry of the shaft was not removed to the full depth of the robber pit and it remains possible that this activity was in fact associated with remedial works to the shaft. Such an hypothesis seems unlikely, however, given that the well was being infilled with substantial quantities of refuse during the second half of the 15th century (see Chapter 9). Another alternative is that there was some additional superstructure around the well which was the subject of dismantling. Access to the well must have been possible during the dumping of waste into it and it therefore seems probable that the robber pit must have been infilled by the time at which this occurred.

Robbing activity was recorded in most detail to the west (*50137*, G5/51) where it cut into Norman features and deposits (Period 3). The robber cut extended *c.*1.60m to the west of the wall of the well shaft, which it ran right up against, exposing the external face of the well shaft. The cut here was just over 1.5m deep (S.317; Fig.6.16) and had vertical sides. It contained a series of fills, containing clean sand, chalk, flints and mortar fragments (*50327*, *50326*, *50325*, *50324*, *50323*, *50322*, *50096* and *50095*). Other building materials included roof tile and lesser quantities of brick (Lentowicz, Chapter 8.III). The robber cut was also recorded outside the north-east angle of the well (*50078*, S.314, Fig.6.17) where it was 1.50–1.60m wide. Again it was dug hard up against the shaft wall and fills incorporated mortar and flint nodules (*50138 and 50099*). Immediately adjacent to the cut lay sand and mortar (*50130*), overlain by a patch of flint nodules, occasional brick rubble and worked stone (*50133*). A pebbly deposit (*50100*, not illustrated) lay to the east of the well, slightly overlaying its masonry and therefore post-dating the robbing action.

To the south, additional robbing took the form of a roughly semi-circular cut *c.*4m from the shaft

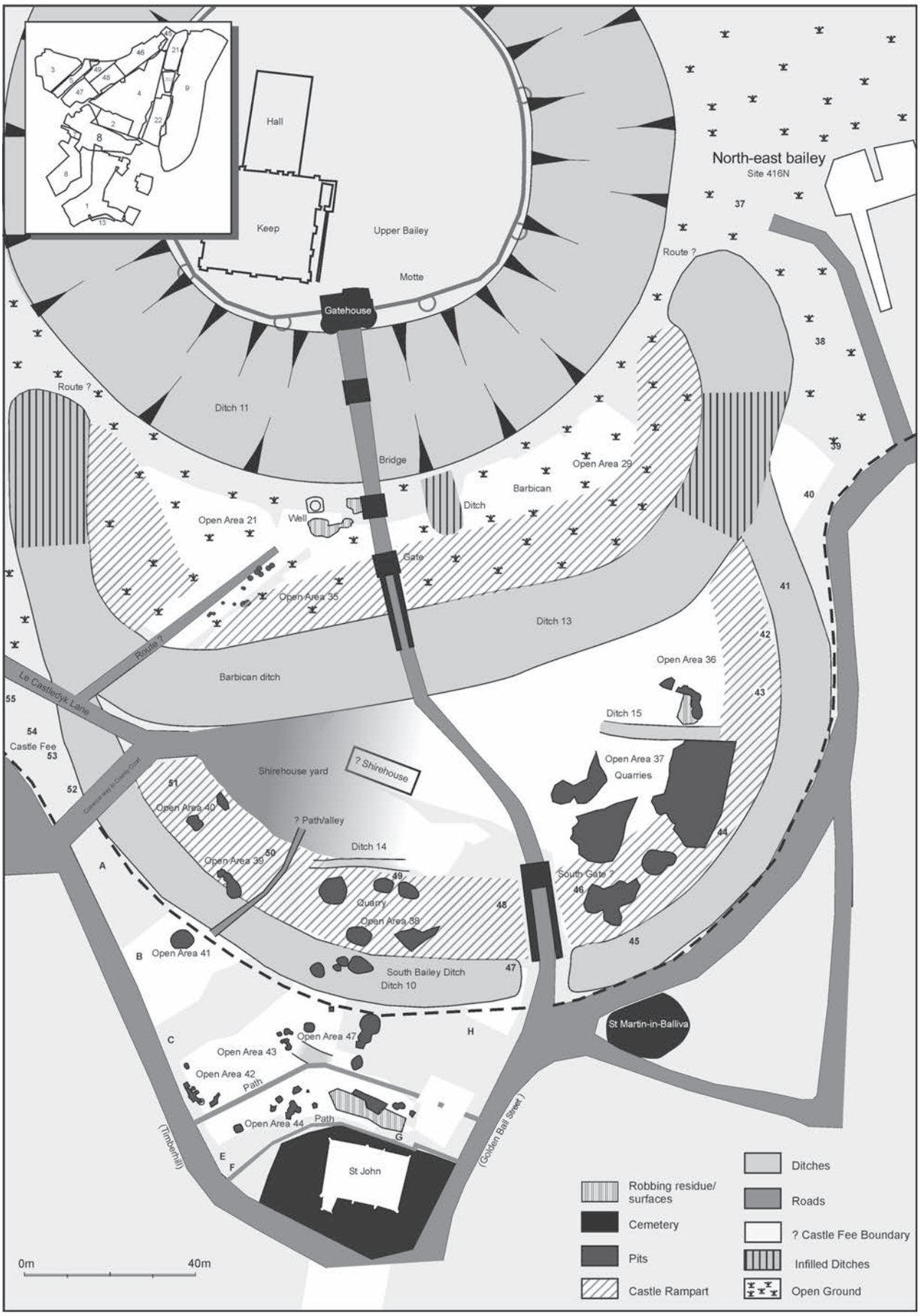

Figure 8.3 Period 5.1: Phase plan — *c.*1345 to 15th century. Scale 1:1250

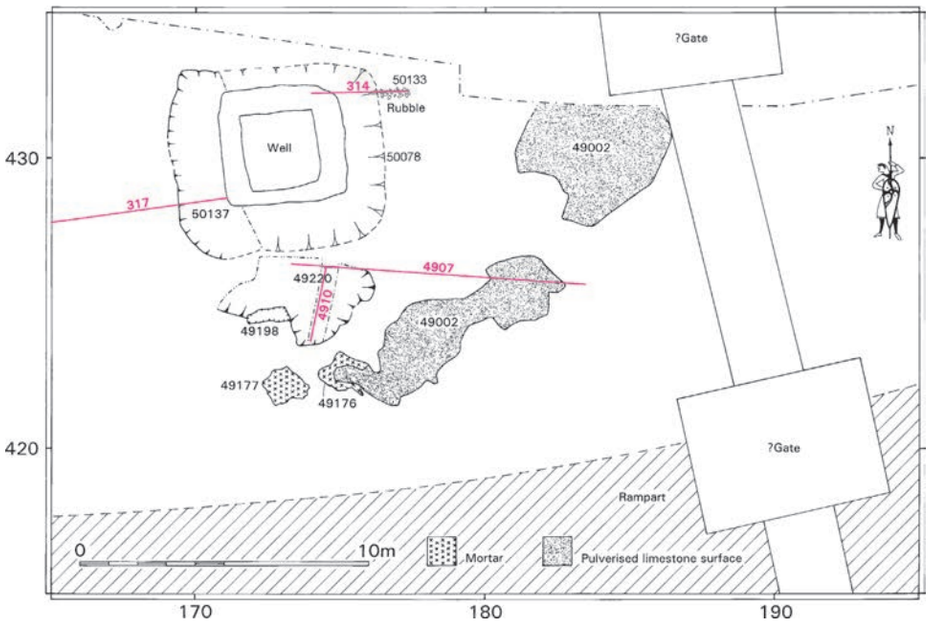

Figure 8.4 Period 5.1: Robbing around barbican well and surrounding activity, Open Area 21 (Areas 5 & 49). Scale 1:250

(*49220=49098*, *=49242=49418*, G5/39, S.4910 and 4907). This may have removed a feature integral to the well, such as a gate or room, the cut extending to the base of the fifth lift of the well. The angle of its sides varied, although it was flat-based. It had been infilled with mixed waste deposits, including mortar, crushed stone and flint, along with refuse type dumps (*49068*, *49207*, *49201* and *49066*). The upper part of this sequence contained a noticeable concentration of animal bone, as well as a range of brick and tile.

Small Finds
Fill *50096* contained a copper alloy pin (SF5635), needle (SF5636.01) and an iron nail (SF5692). Fill *50099* contained sawn bone (SF5833, Fig.8.58) and an iron ?strap guide (SF5721). Dump *50100* contained a residual type 2B horseshoe (SF5651). Fill *49201* contained a copper alloy stud (SF6803) and three nails (SF6770, 6874 and 6881). A lower fill (*49070*) contained a nail shank (SF6841).

Pottery
A total of 0.597kg of pottery was recovered. Fabrics included LMU, GTGW, LMT, TGE, RA stoneware and Langerwehe. Two regional medieval fine wares were also recorded; body sherds of Hedingham-type and Developed Stamford ware. Both are commonly recovered in 13th-century contexts and are probably residual. Other fabrics and forms span the late 14th to mid 15th century (see Appendix 6).

Open Area 21: pulverised limestone surfaces
(Fig.8.4)
Lying between the robbing activities described above and the base of the motte bridge was a series of crushed limestone surfaces (G5/38). To the south of the well was a layer of mortar and flints (*49176*), overlain by layers of pulverised limestone (*49002 and 49001*), containing occasional limestone fragments. Adjacent to these was a patch of mortar with occasional broken brick (*49177*). Three of the earlier large post-pits in the area (Period 4.1) had been filled with chalk or pulverised limestone fills suggesting either that the uprights were removed/infilled at the same time as the deposition of these surfaces across the area or indicating subsequent subsidence. No finds were recovered from these deposits and their date remains uncertain. They have been interpreted, however, as relating to the robbing of the upper part of the well shaft which may also have led to the deposition of stone waste within a ditch to the east (see below). The presence of mortar patches may indicate either constructional work or the residue of robbing for reuse.

Open Area 35: ?rampart revetment
(Fig.8.3)
A line of fourteen post-holes (some with post-pipes) ran from south-west to north-east through the postulated barbican rampart (not illustrated separately, *47968, 57087, 57044, 57080, 57022, 57085, 57081, 57023, 47890, 47930, 47613, 47681, 47694 and 47017*, G47/54, 47/12, 47/6, 47/10 and 47/7). Two associated layers sealed earlier surfaces (*47967 and 57083*). Although dating is somewhat uncertain, the posts may have been inserted to form a revetment to retain the rampart along the line of a path. This interpretation implies that a cutting was inserted through the rampart here, perhaps to facilitate easier access to the well during its use as a rubbish tip.

Small Finds
Pit *47694* contained an iron nail (SF7356).

Pottery
A total of 0.294kg of pottery was recovered. In addition to residual material, LMU, GTGW and LMT were recovered. See Appendix 6.

Plant Macrofossils
A sample taken from one of the post-pits was fully analysed (post-pit *47694*) and is detailed in Table 8.27 and Chapter 8.IV. It appears to contain a component of prime grain, perhaps including charred residues from hay.

insert

fold-out

insert

fold-out

insert

fold-out

insert

fold-out

Ditch 6, Phase 5: infilling
(Fig.8.7)
Overlying earlier fills within a ditch lying to the east of the southern end of the castle bridge (*46665*, Period 3.2, Chapter 6.II) were several layers of building waste. The building materials present in the fills may have come from adjacent constructional work or from demolition of (or alteration to) pre-existing structures. The levelling of the ditch may have taken place at the same time as the robbing of the well shaft to the west described above. The small amount of pottery, however, implies a curious gap between this infilling and earlier deposition into the ditch during the 12th century, suggesting that the ditch remained substantially open or survived as an overgrown dip in the ground. The quantities of pottery involved, however, are small and the pottery may have been introduced by later activity.

Fills recorded to the north (S.4614, G46/23, *46685*, *46684* and *46683*) contained mortar fragments and dust, as well as chalk, flint and fragments of Caen stone (some worked). To the south (S.4613, Fig.5.22) was a similar deposit (*46671*). No fills of this type were recorded in other sections across the ditch (S.4612 and 4616). Numerous later fills of the northern section of the ditch contained lesser quantities of similar building waste (G46/24; S.4614, *46682*, *46681*, *46680* and *46865*). Thicker deposits were apparent to the south (S.4613, *46670*, *46660*, *46659* and *46658*, S.4612, Fig.8.7), some of which may indicate the redeposition of rampart material.

Small Finds
A piece of sawn antler (SF6670) was recovered from fill *46636*.

Pottery
Four fresh sherds from an LMT flatware base were recovered from fill 46685, indicating a depositional date in the late 14th to 15th century.

Open Area 29: pits
(Fig.8.3)
Two pits were recorded within the eastern half of the former barbican. A small example (*46634*; G46/25), 0.65m deep, cut into the infilled earlier ditch (Ditch 6). A test trench excavated to the north-east of the site (T9; immediately to the north of Area 45) revealed a pit which contained frequent chalk and charcoal inclusions (*12040*; T9/30). This feature would also have lain within the former barbican area, immediately adjacent to the motte ditch.

Pottery
Pit *46634* contained residual TTW and very fresh sherds from two GTGW jugs. The base of a DUTR pipkin was recovered from pit *12040* (T9/30; 0.055kg), dating the fill to the mid 14th to 15th century.

The Barbican Ditch

by Elizabeth Shepherd Popescu and Niall Donald
(Figs 8.8–8.9)
There appears to have been little immediate impact in terms of infilling of the barbican ditch after 1345, the earthwork now having a wide, flattened base. Only small-scale infilling of the ditch during the late medieval transitional period was recorded to the west and east (Area 9 and watching brief T58).

Ditch 13, barbican, Phase 3: infilling
In the extreme western part of the ditch (T58) was a thick band of refuse (*12755b*, Fig.8.8), tipped into the ditch from the west. Although this remains undated, it must have been deposited between the construction of the barbican ditch (Period 4.2, Chapter 7.II) and the subsequent deposition of fills of mid 15–16th-century date described in Period 5.2.

Earlier fills to the east (Period 4.2, Chapter 7) were sealed by mixed silts with some refuse (11 fills in all, G9/37 (part)). In the south-facing sections (S.972/3 and 978, not illustrated) these included a silt layer with a notable concentration of shells (*91548*), perhaps suggesting a temporary ground level within the ditch. Subsequent fills included an organic layer (*91547*), distinctly different to other fills at this level. More silting and refuse deposition (*91546*, *91545* and *91544*). These fills were sealed by thick dumps (*91442* and *91443*; Fig.8.9), the former being extensive and recorded in several sections. Many of the same fills were recorded in the north-facing sections (*e.g.* S.975 and 981), with the addition of other fills including a thick pebbly layer (*91643*).

Small Finds
Layer *91547* included an iron nail (SF6368); dump *91643* contained an iron nail (SF6372) and a Coal Measures sandstone whetstone (SF6430).

Pottery
A total of 0.180kg of pottery was recovered, consisting of LMU and LMT. See Appendix 6.

Ditch 13, Phase 4: features
A large, sub-rectangular feature (*91553*) at least 4.00m long was recorded during the machining of fills of the barbican ditch (S.979; G9/5), also cutting into possible fills of the south bailey ditch (G9/46, see Chapter 6). It lay to the east of the eastern edge of the barbican ditch and its original depth may have been over 5m. Although lacking stratigraphic relationships with fills of the barbican ditch itself, it was cut from a level above fills described in Period 4.2 (G9/37, Chapter 7.II) and below those described in Period 6 (G9/41, Chapter 10.II). This may have been a large quarry pit, extracting the chalk through which it was cut and perhaps explaining its spatial position so low down the ditch. It may relate to the yard of Property 40 just to the east.

The Shirehouse and its Yard

The location of the Shirehouse to the west of the castle approach may explain the lack of quarrying and pitting within the block of land within which it probably lay: in contrast to the west, south and especially to the east there appear to have been large amounts of post-1345 activity. A ditch recorded running along the inner side of the postulated south bailey rampart may have been the documented ditch to the Shirehouseyard (perhaps within Properties 49 and 50, see below).

Ditch 14, Phase 5: disuse
(Fig.8.15)
Refuse was either deliberately used to infill the earlier ditch or had slumped into its top, perhaps at the same time or later than surrounding quarrying (Ditch 14, Period 4.2,

Chapter 7.II, G1/22). To the west two dumps of redeposited natural (*11161 and 11173*) were cut by a post-hole (*11157*). To the east a slot (*11309*) aligned east-to-west was sealed by further dumps of redeposited natural and mixed material including refuse (*10236, 11252, 11264 and 11312*). Above was a circular burnt patch (*11094 and 11151*) containing large fragments of charcoal and burnt animal bone suggests a localised fire. Above this was a further dump of redeposited natural (*11089*) along the northern edge of the underlying ditch.

Small Finds
Slot *11309* contained an iron awl or punch (SF5711, Fig.8.59) and intrusive clay pipe. Layer *11089* contained an iron horseshoe nail (SF5494).

Pottery
A total of 0.374kg of pottery was recovered, including Middle Saxon material amongst the residual content. Contemporary material consisted of LMU (including a coarse variant) and GTGW and imported Andenne ware. A sherd of LMT dates this activity to the mid 14th to 15th century. See Appendix 6.

City Encroachment

Castle Fee Properties in Block I (east of castle approach)

by Elizabeth Shepherd Popescu and Niall Donald
(Fig.8.2)

?Ditch 15, Phases 1 and 2: ?property boundary/route
(Fig.8.10)
Running east-to-west between pitting to the north (Property 43; G9/104) and quarrying to the south (Properties 44–46) was a ditch which may have acted as a property boundary marker (G9/92). This was excavated in several places along its length and was traced for over 15m. It had a surviving depth of 1.5m, suggesting that it may originally have been *c.*2.5m deep once truncation due to the Cattle Market is taken into account. The eastern and western extents of the ditch are unknown. To the east, it may have continued as far as the line of the lane/road leading to the castle (with a slight rise in ground slope), while to the west its relationship to the south bailey rampart could not be determined. The feature is interpreted as late medieval/transitional in origin, serving perhaps to demarcate properties at this period. Different activities do appear to have taken place either side of it, with quarrying restricted to the south. Upper fills (Period 5.2) date to the 15th century and a *taq* is provided by a 16th-century pit which cut into the ditch fills.

This steep-sided ditch was first detected during trial work (Trial Hole 3), where it was recorded to a depth of 1.30m. The subsequent excavation led to further recording (*90687=92701*), a slot being excavated through it. Subsequent machining meant that the ditch was recorded again at a lower level. What was apparently part of the same feature was recorded immediately to the east (*90972*), the base here being irregular and the sides concave. Fills to the west (*92631*) suggest the continuation of the ditch in this direction.

Two sections drawn across its fills both suggest that more than one feature may have been represented. They indicate the probable disturbance of earlier features; a near complete Thetford-type ware pot was recovered from early fills. Backfilling varied between the recorded observations, although may of the recorded fills were unusually gravelly. At the base of the feature was a compacted layer with frequent small and medium pebbles.

Three shallow post settings (*90450, 90453 and 90447*) ran in an east-to-west line for 2.40m along the northern edge of Ditch 15 (G9/92) and may have formed a fence associated with its use (*i.e.* separating Open Areas 36 and 37; G9/108). The only find was a single small chip of unidentifiable pottery.

Pottery
A single TTW body sherd was recovered. The near complete pot is now missing.

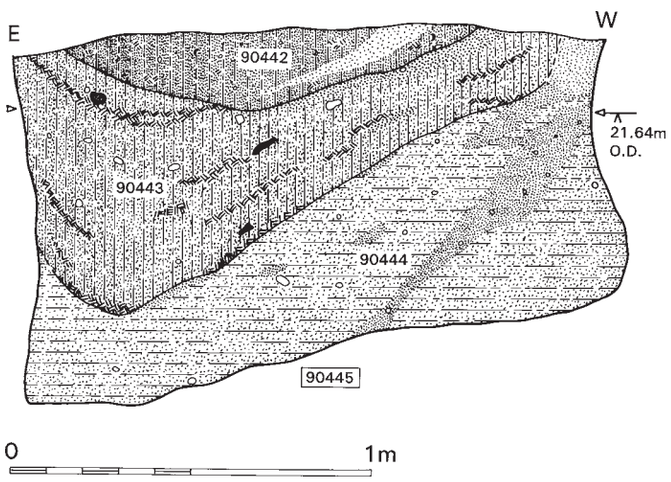

Figure 8.12 Period 5.1: North-facing section across pit *90445*, Open Area 36 (Area 9, S.923) (Castle Fee Property 43). Scale 1:20

Open Area 36 (Property 43): pits
(Fig.8.10–8.12, Plate 8.2)
To the north of the ?boundary ditch/route and fence line was an area of concentrated pitting (G1/104, part) producing evidence for the disposal of both domestic and craft/industrial waste, the latter from a heat-intensive activity which the environmental evidence indicates may have been associated with malt-drying. All of the pits had been used for refuse disposal and there was no direct evidence for burning *in situ* despite the widespread presence of burnt matter such as ash and charcoal. The pits ranged in size from small to large. A later phase of pitting, recutting earlier examples, extended into the late 15–16th centuries and is described in Period 5.2.

Sealing pre-Conquest pits and cut by late medieval pits was a layer of silt/sand (*90486*, G9/103) which may in fact have been the remnants of an early surface within the south bailey. To the north-west was a large pit (*90481*), excavated in a slot adjacent to an air raid shelter. The pit was augered to a depth of 2.20m and its infill sequence (S.922, Fig.8.11, Plate 8.2) shows dark loam (*90554*) with large lenses of orange sand above and below (*90481* and *90555*). Above these was a series of thin fills, overlain by a dark purple ash deposit (*90552*, *90551*, *90550* and *90549*). The pit was later recut (see Period 5.2).

Just to the south-east was a sub-oval shaped pit (*90445*, S.923, Fig.8.12), the eroded base of which indicated that it had stood open to the elements. It was 1.00m

Plate 8.2 South-east facing section across late 14th to 15th century pit *90481* (S.922), Open Area 36, Property 43 (Area 9, Period 5.1), one of a number in the vicinity providing evidence for peat-burning

deep. The basal fill was the result of erosion of the sides and consisted of mid brown silty sand (*90444*). This was overlain by thin layers of very dark brown, charcoal-rich material (*90443*), followed by black sandy loam again containing an abundance of charcoal (*90442*).

Cutting into this pit to the south-west was a sub-square or sub-rectangular pit (*90490*), with an augered depth of 1.66m. Just to the west was a small pit (*90436=90440*) 0.25m deep. It was lined with clay and infilled with humic ash and a subsequent mixture of burnt materials.

Immediately to the west was a larger, irregularly shaped pit (*90524*), 1.08m deep. Infilling appears to have taken place gradually and a sequence of silts were separated from each other by bands of charcoal. To the south was another large pit (*90539*) of uncertain shape due to truncation. This was not bottomed at a depth of 1.10m. Infills again included tips of charcoal, burnt soil and ash. Cutting into this pit to the west was a sub-rectangular pit (*90538*), 1.46m deep. To the east was a heavily truncated pit (*90563*) 0.40m deep.

Small Finds

The large assemblage of 50 objects from these pits is summarised by feature in Table 8.5 on CD. Notable finds include two copper alloy belt mounts from different pits, both in the form of a Lombardic letter B (SF6410 and SF6209, Fig.8.37; Goodall, Chapter 8.III), a copper alloy thimble (SF5969, Fig.8.59; Goodall, Chapter 8.III), an iron lock plate (SF6030, Fig.8.55; Mould Chapter 7.III), a 14th-century copper alloy buckle (SF6059, Fig.8.36; Goodall, Chapter 8.III), a copper alloy vessel rim fragment (SF6062, Fig.8.53; Goodall, Chapter 8.III) and the flange of a glass bowl or lid of 15th- to 16th-century date (SF6039, Fig.8.53; Shepherd, Chapter 8.III).

Pottery

(Fig.8.41 on CD)

A total of 5.826kg of pottery consisted of residual material (including a possible Middle Saxon sherd), GTGW, LMU, LMT and Langerwehe stonewares. The largest assemblage came from pit *90539* (1.528kg, Fig.8.41 on CD, see Appendix 6). Infill dates are of the late 14th to (early) 15th century. The assemblage is fully detailed in Appendix 6.

Plant Macrofossils

by Peter Murphy

These pits are united by the very similar and unusual contents of the samples taken from their fills. Small amounts of mineral-replaced macrofossils, mainly of food plants (*Bubus fruticosus* (bramble), *Sambucus nigra* (elder), *Ficus carica* (fig) and a cereal grain) were noted. These may relate to some deposition of sewage in the features, but most deposits sampled were of burnt material. Silica ash of plant origin [(*90422*), 1028 (*90446*) and 1013 (*90420*)] formed a major or predominant component of the flot. 'Silica skeletons' of plant macrofossils included scraps of monocotyledonous stem/leaf, *Cyperaceae* (?sedge) nutlets and nodes possibly of *Equisetum* (horsetail) were noted. All other plant macrofossils present were charred, representing a very wide range of plants, including some taxa not normally preserved in this form. The excellent preservation of delicate structures implied slow charring in very oxygen deficient conditions. Pit *90524* contained cheliped fragments of edible crab (Plate 13.1). The samples were fully analysed and are described further in Table 8.25 on CD and Chapter 8.IV. Mollusca is detailed in Table 8.26 on CD.

Open Area 37 (Properties 44–46): quarrying

(Fig.8.13, Plate 8.3)

A substantial area to the east of Golden Ball Street (measuring over 40m east-west by over 50m north-south) had been subjected to intensive quarrying (Properties 44–46). Five main areas of quarrying activity have been defined, consisting of nearly eighty individual pits ranging considerably in size. Quarrying in this part of the site was

Plate 8.3 Mid to late 14th-century pits and quarries (Quarry Area 2) at Properties 44–46 (Area 9, S.951 etc, Period 5.1)

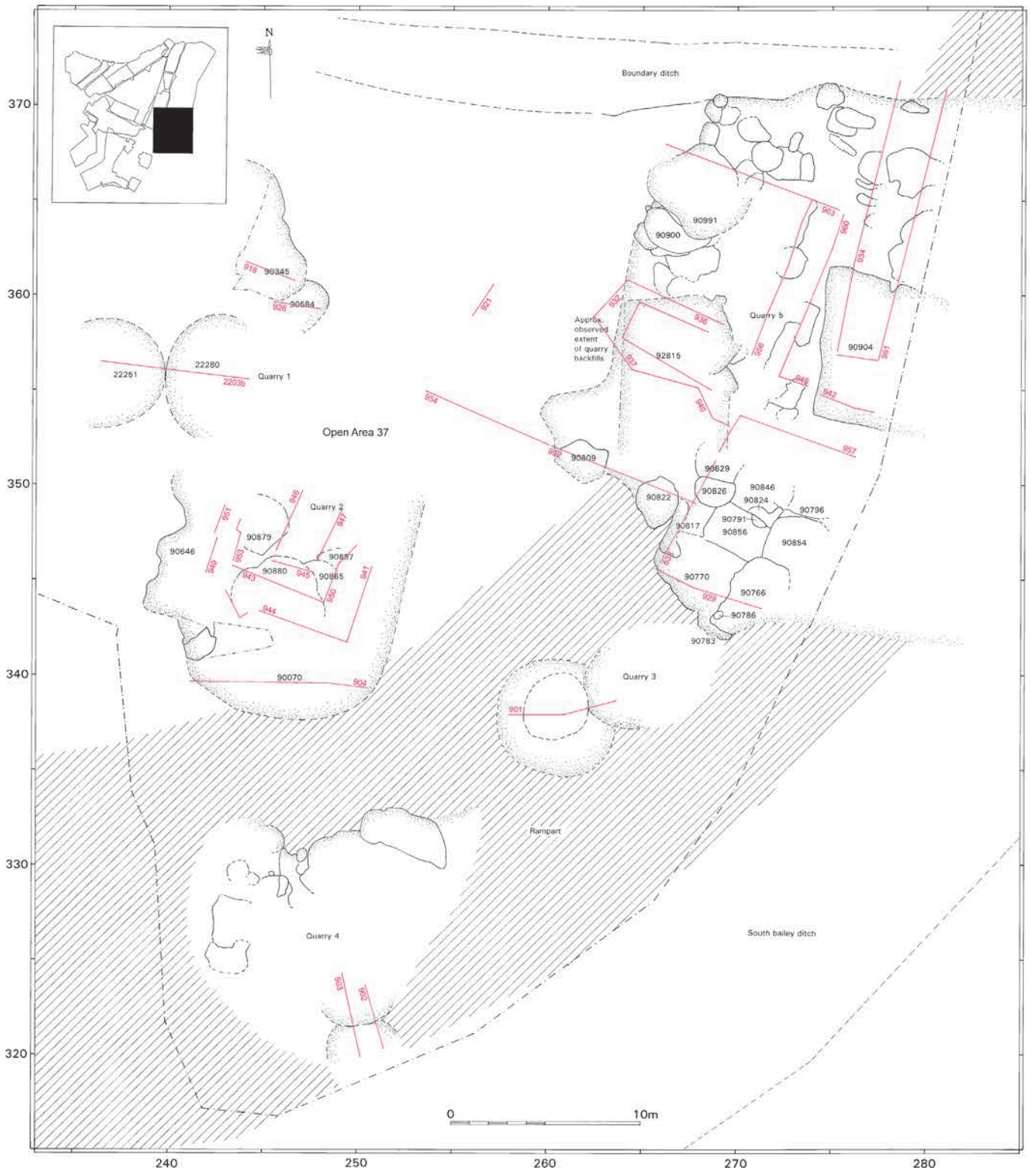

Figure 8.13 Period 5.1: Quarries to the east of the castle approach, Open Area 37 (Area 9) (Castle Fee Properties 44–46). Scale 1:300

probably originally even more extensive. A very high proportion of the ceramics recovered from these quarries appears to be residual, reflecting the considerable disturbance of earlier features and deposits.

Quarry Area 1

Lying just over 10m from the eastern edge of the postulated castle approach road were several large pits which may have formed a broadly contemporary or closely consecutive action. In contrast to many of the quarries further east, these quarries were not cut by 15–16th-century pits, the only *taq* being provided by an 1862 Cattle Market post. These quarries lay well within the former south bailey defences and at some distance from the inner side of the associated rampart, suggesting that quarrying here went directly into natural deposits.

All four were flat-based with surviving depths of *c.*1.2m in Area 9 and *c.*2.5m in Area 22 (where the sections were recorded in machine steps). The two pits to the west (*22280 and 22251,* G22/158, S.2203) were infilled with mixed redeposited natural and organic matter including cess. The approximate extent of the pits is shown in plan, both eventually being filled with the same sequence of makeup/levelling dumps.

Just to the north-west were two more intercutting pits (G9/65) which may have lain in the same quarry as the Area 22 pits. The earliest (*90584,* S.926) had been heavily truncated. To the north was a very large pit of irregular plan (*90345*, S.918), measuring at least 6 x 4m. These pits contained numerous infills, most consisting of redeposited natural.

Small Finds
Finds from pits *90584* and *90345* include an iron nail (SF6106) and an iron padlock key bit (SF6105.1, Fig.8.55) and strip (SF6105).

Pottery
A small amount of pottery (68g) was recovered from the two quarries in Area 22 (G22/158). A late 12th- to 14th-century date is indicated by the forms of the LMU, GTGW and LMT recovered. See Appendix 6.

Quarry Area 2

Immediately to the south of Quarry Area 1 was an intercutting sequence of what were recorded as eight quarry pits, although the actual number represented is unclear due to their intercutting nature and the fact that some were identified only by their fills (G9/55, part). The whole quarry area covered over 12m north-to-south and 13m east-to-west with the depth at around 3.30–4.00m. The southern limit would have clipped the projected line of the postulated south bailey rampart, although the bulk of the quarrying lay well within the former south bailey.

To the south, the upper metre of fill of a large quarry (*90070,* S.900 and 904) was hand excavated. The remainder was augered but was not bottomed due to the presence of a stony layer. Quarry fills were recorded in plan just to the north.

Five inter-cutting pits were recorded just to the north, recorded in machine-cut stepped sections (S.951 *etc*, Plate 8.3). None were bottomed, although augering suggests a maximum depth of 3.30–4.00m. The recorded sequence is complex and it is uncertain exactly how many features may have been present (*90879, 90880, 90865, 90646 and 90887*). Furthest to the west was the largest of the pits (*90646*), which was filled with redeposited natural, banded with darker, charcoal-flecked layers.

Small Finds
Finds include nails (SF5852, SF6606 and SF6238), an iron nail shank (SF6049) and window glass (SF5953).

Pottery
The majority of the pottery recovered from these quarry pits is residual (1.146kg in total). Contemporary fabrics included LMU, GTGW, DUTR, Siegburg stoneware and Langerwehe stoneware. Infill dates range from (12th to) 14th century, mid 14th century, mid to late 14th century, and mid 14th to 15th century. See Appendix 6.

Quarry Area 3

Another area of intercutting quarries was recorded just to the south-east of Quarry Area 2 (S.901; G9/55 part). The section shows one very large early pit, cut into by two slightly smaller ones with two more subsequent smaller pits. The whole sequence was then sealed by dumps which may have included incidental cuts. The approximate location of the quarry pits is shown in Fig.8.13. They were recorded to a depth of 1.30m but clearly continued much deeper. The reason they were intercutting is unclear; the second 'phase' of quarrying apparently cut entirely into fills of the earliest pit (*i.e.* extracting redeposited natural which had presumably already been sorted).

Quarry Area 4

To the south of Quarry Areas 2 and 3 was the southernmost observation of quarrying (Fig.8.13). Most of the information recorded here was of fills/layers which may have filled unexcavated quarries. The clearest evidence for comes from S.902 and 903, (G9/49) which show two intercutting ?quarries infilled with redeposited natural. The whole of this area of quarrying covered at least 12m north-to-south by 12m east-to-west. The depth of the cuts is unknown, but they lay within the limits of the proposed south bailey rampart. Further north and perhaps forming part of the same general area of quarrying, was a series of partially excavated or unexcavated deposits which are interpreted as probable quarry fills (G9/120). A *taq* for these pits is provided by overlying pits (G9/121, Period 5.2) which have 15–16th-century ceramic dates.

Pottery
A total of 0.667kg of pottery was recovered. Residual pottery makes up a high proportion. Contemporary fabrics consist of LMT, DUTR and oxidised GTGW. A 15th- to 16th-century date is suggested. See Appendix 6.

Quarry Area 5

The largest area of intercutting quarries was recorded to the east of the site (Fig.8.13). Here was a mixture of irregular shaped pits of varying size and extremely large, vertical-sided rectangular pits. The southernmost of the pits (G9/61) were stratigraphically isolated, but probably part of the same general process. The depth of quarrying varies but is about 2.5m; all of the pits seem to have bottomed out at a similar level of *c.*21.10–21.30m OD. Machining had resulted in the removal of up to a metre of deposits. The overall dimensions of Quarry Area 5 are *c.*30m north-to-south by a minimum of 15m east-to-west. Most of the quarry would have cut into remnants of the rampart. Overlying pits described in Period 5.2 suggest that the bulk of the quarrying ceased during the 15th century.

At the base of a sequence of pits to the south (G9/61) was a large, irregular pit (*90770*), probably over 3m deep (taking machining into account). It was largely filled with redeposited clay, sand and gravel (S.933 to the west and S.929 to the east). Cutting into this pit to the north was a sequence of smaller pits (*90856, 90829, 90796, 90846, 90844, 90824, 90831, 90791, 90854, 90766, 90826, 90817 and 90822;* S.929, 933, 931, 952 and 957) with an isolated pit to the west (*90809*, S.939). One had a post-hole at its base (*90766*, post-hole *90786*). Some may have originally been up to 3m deep and most were infilled with sand, clay and gravel, which was presumably the residue from sorted quarry waste. Many had been used for refuse disposal as a secondary function and some included organic waste. Erosional deposits at the bases indicates that some were left open prior to backfilling.

A multitude of intercutting pits and observations of fills of unexcavated/machined quarries lay to the north (G9/81). Of note here are two extremely large rectan-

Group	*Contemporary ceramics (kg)*	*Residual ceramics (kg)*	***Total***
9/61	1.207	2.030	**3.237**
9/81	0.412	5.765	**6.177**
9/90	-	1.651	**1.651**
Total	**1.619**	**9.446**	**11.065**
% total	15%	85%	

Table 8.6 Residual pottery from Quarry Area 5 (excluding G9/87)

gular pits which are different to surrounding quarries in that they appear indicative of much more regulated quarrying. The features included here were largely machine excavated and many of the observations were made in section only. Only two features are described in detail; these are both very large, possibly originally rectangular quarry pits, varying in morphology to many of the surrounding features of apparently similar function.

To the east was a very large rectangular pit (*90904*), running into the limit of excavation. It survived to its full north-to-south length of 7.80m and a truncated width of 4.30m. It was not fully excavated but was augered to a depth of 20.15m OD, possibly having been cut from *c.*22.62m OD, giving a minimum depth of *c.*2.50m. It had roughly vertical sides. It was recorded in a number of sections (S.942, 961 and 934), revealing a wide variety of fills, indicating complex deposition from a variety of sources. The general nature of the fills suggests that most were the result of waste from sorting following the extraction of natural deposits. The minimum level of extraction achieved by this pit was 7.80m x 4.30m x 2.50m (83.85m³). Descriptions of surrounding natural deposits are of Norwich crag, mostly bands of sand and gravel with some clay at a deeper level. This pit (and many of the others discussed here) lay within the confines of the postulated extent of the south bailey rampart, suggesting that they may actually have been cut from a much higher level, substantially extracting rampart dumps rather than undisturbed natural deposits.

Another very large pit lay to the west (*92815*). This, however, was recorded substantially in machine cut sections and a composite pre-excavation plan. Again, this appears to have been linear/rectangular in plan, the northern end having been truncated by the construction of a later cellar. The southern end was not recorded. It was at least 4.2m long north-to-south by 3.03m wide, with a minimum depth of 1.30m. The fills were generally of redeposited natural sand, clay and gravel.

A total of nineteen other pits are included here, also the result of quarrying activity. Some of these are clearly defined in terms of size and shape, as well as fill type. Others are large pits with generally greyer, more homogeneous fills. Of those included, none was excavated to its base. The average minimum depth of these pits was probably comparable to pit *90904* (*i.e. c.*2.50m). It appears that these pits were smaller in plan. Of note within their fills is the widespread occurrence of chalk inclusions, which are not frequent within fills of surrounding quarries. The source of this material is unclear, since none of the quarries were of sufficient depth to reach the underlying natural chalk strata (at a depth of *c.*16.30–15.50m from Boreholes 20 and 23; Fig.3.2) in this part of the site. The reasons for the variety and scale of quarry pits is unclear, each pit appearing to have been backfilled before the next was dug.

A series of heavily intercutting pits lay within the same general area (G9/87), including some fairly large examples (*e.g. 90991*). This was obviously another area of intensive pitting, comprising large quarry pits interspersed with smaller pits and ?layers (the latter possibly fills of unexcavated features). Fills were generally of redeposited natural with some refuse (ash and charcoal). Pit *90900* yielded a notable environmental sample (see below).

Further north, adjacent to the boundary ditch (Ditch 15), was an area of apparently smaller pits (G9/90) although this effect may largely result from the fact that the upper parts of larger pits had been machined away. Eighteen pits were recorded here, with some cutting into fills of earlier quarries. The elongated shape of some suggests that they may not have been quarries.

Small Finds

Pit *90854* contained a copper alloy waisted plate with two perforations (SF6244). Finds from pit *90766* included nails (SF6123 and 6164) and a copper alloy pin (SF6239) with a flattish, spiral-wound head. Pit *90817* contained a copper alloy plate, possibly from a strap-end (SF6116). Finds from pit *90904* included an iron nail (SF6308). Finds from quarries assigned to G9/81 consisted of a Late Saxon bone comb (SF6151) and 'eared' horseshoe nail (SF6333) from pit *91045*), nails (SF6364, 6349) and pin or needle stem (SF6476) from pit *91057*), iron strip (SF6216) from pit *91057* and nail SF6240 from pit *90918*), fragment of lava quern (SF6329 from pit *91057*) and copper alloy buckle pin (SF7467). One pit (*90906*) contained a copper alloy stud (SF6196) and iron horseshoe nail (SF6299). Finds from G9/90 pits included an iron nail (SF6414) and a formless fragment (SF6154).

Pottery

A total of 14.227kg of pottery was recovered. An indication of the proportion of residual ceramics included is given in the following table, the reasons for its presence being discussed in Chapter 8.V:

Contemporary fabrics consist of later medieval and transitional imports such as Langerwehe stoneware, DUTR and Raeren-Aachen stoneware. This is supplemented by locally produced LMT and GTGW, as well as LMU. A general late 15th- to 16th-century date is suggested. See Appendix 6.

Pit *90568* (0.397kg) contained the profile of a single, virtually complete Rhenish stoneware drinking mug, produced at Langerwehe or Raeren-Aachen. During the late 15th century similar products were manufactured at both production centres and definite identification is difficult (Jennings 1981, 112). This vessel appears to date this pit fill to the late 15th–16th century, although is probably more likely to be early to mid 15th century (Anthony Thwaite, pers. comm.).

Plant Macrofossils

by Peter Murphy

One quarry (*90900*, G9/87) in Quarry Area 5 had an organic/fire waste fill and provided a good sample. This was made up of two components; i) very poorly preserved barley grains (some sprouted), probably the residue from malt drying residues ii) well-preserved weed seeds, particularly of *Chrysanthemum segetum* (corn marigold), evidently charred in different conditions and probably representing crop-processing waste.

Zooarchaeological Remains

Pit *90766* contained the partial skeleton of a domestic fowl (Albarella *et al*, Chapter 8.IV and Part III).

Castle Fee Properties in Block II (west of castle approach)

(Fig.8.2)

Spanning the tenement block from the castle approach to the east (Golden Ball Lane) and the lane to the west (Sygars Hill, later Orford Hill) were four properties (Properties 48–51) facing northwards onto the Shirehouseyard/Castellond during the mid 14th to mid

insert

fold-out

insert

fold-out

16th centuries. Another property (Property 47) lay just to the south of Property 48, fronting onto the lane leading into the castle ditches. The approximate position of these is shown on Fig.8.3. The properties remained gardens throughout this period and are described below from east to west, although there is no archaeological evidence for divisions between them at this date. Several quarries were dug into ditch fills rather than into natural deposits; perhaps reflecting the large quantity of redeposited natural evident in earlier fills of the south bailey ditch.

Open Area 38 (?Property 49): quarrying
(Figs 8.14–8.15)
To the south of the infilled ditch described above (Ditch 14), three large quarry pits ran in a roughly east-to-west line above the south bailey rampart (G1/23). One was subsequently cut into by mid to late 15th-century pits (Period 5.2). To the west was a large pit (or series of them *11602=14214*), cut to extract sand and gravels from the rampart and underlying natural deposits. The pit was also recorded in sections to the south and east (S.170, 121, 122 and 132, *14214*) and must have been at least 2–3m deep, with a diameter of 7m. To the east were the fragmentary remains of another large pit (S.135/129, *14244*) which was *c.*5m across and of considerable depth. The third pit (*14230*) lay just to the east. The level from which all of these quarries were cut remains uncertain.

Another area of probable quarries lay just to the south. The earliest pits (G1/36) either cut into the rampart or into fills of the south bailey ditch (many of which were of redeposited natural). The ceramic date for these pits is late 14–15th-century. The earliest group consisted of at least four large pits (*e.g. 14162* and *14098*). The interpretation and inter-relationship of these features is problematic, this area having been heavily disturbed by quarrying. These pits pre-dated further dumps which appeared to act as levelling for both the ditch and quarries. Three more pits and a post-hole (*e.g. 14139*, G1/37) cut into ditch/quarry fills at an unknown date, the pits perhaps again acting as small quarries. A masonry lined cess pit (*14103*) was also inserted.

To the east, the northern edges of two large pits were recorded (G1/25) which again contained late 14–15th-century ceramics, both having been eventually used for refuse disposal (*11793* and *11794*). The latter was clearly substantial and was augered to a depth of 2.44m, perhaps forming another quarry to the north of the south bailey ditch.

Small Finds
Finds from pit *14098* included an iron horseshoe nail (SF6775). Sawn horn was retrieved from pit *11794*.

Pottery
Pottery recovered from these pits consisted of LMU, LMT and GTGW. See Appendix 6.

Open Areas 39 and 40 (Properties 50–51/a–b): quarrying
(Fig.8.3)
Three large pits (G8/23, not illustrated separately) lay on the northern edge of the south bailey rampart (Open Area 39). The largest measured at least 5 x 4m in plan and had been infilled with a sequence of redeposited sands and gravels, presumably the sorting residue from the quarrying process. Lenses of burnt gravel were also noted. Two successive pits followed, again containing high proportions of quarry waste.

A possible quarry (in Open Area 40) about 4m long and 2m wide (*80100*, G8/24, not illustrated) lay above the south bailey rampart and dumps above the earlier road (Period 3, Chapter 6). The pit contained puddingstone blocks similar to those recovered from earlier deposits in this part of the site which may have come from a castle-related postern gate (see further details in Chapter 6). Its fills indicated that it may have been left open for some time. Just to the south was an undated quarry pit (G8/29, *80059*) which was augered to a depth of 2.7m and measured 3 x 2m. Infills included frequent lenses of mortar.

Pottery
Only 0.220kg of residual pottery was recovered from quarry pit *80100.*.

City Properties in Block II (west of castle approach)
(Fig.8.2)
Pits, quarries and other features lying outside the south bailey ditch link to a number of documented city properties. Many of those lying in the southern part of the site encroached above the former cemetery (Cemetery 4) and to relate to Properties (e), (f) and (g). The presence of metalworking (specifically bell-founding) may indicate an association with William le Brasier at Property (e), although geographically lying within Property (g). Further discussion on this issue is given in Chapter 8.V.

Open Area 41 (?Property b): pit
(Fig.8.3)
A large pit (*80464*, G8/27) may have lain within the garden of Property (b). It cut into the southern edge of the early Norman ?Castle Fee ditch (Period 2, Chapter 5) and was over a metre deep. A shallow pit recorded in an adjacent watching brief (*12280*, T118/6; not illustrated) had been infilled with refuse and building debris and was 0.60m deep.

Small Finds
Finds from pit *80464* were iron nails and shanks (SF5983 and 6024).

Pottery
A total of 0.152kg of pottery was recovered, consisting of late 14th- to 15th-century fabrics and forms (LMU, DUTR and Langerwehe stoneware). See Appendix 6.

Open Area 42 (?Property d): pits
(Fig.8.16, Plate 8.4)
An isolated flint- and brick-lined keyhole shaped cess pit (*10304*, Plate 8.4, G1/148) lay to the north of other features. Its circular construction cut was irregular to the south where the lining had collapsed or been removed. The lining consisted of flint cobbles with less than 10% brick and was bonded with sandy mortar containing small pebbles and charcoal flecks. The flints were laid in rough courses, with the occasional substitution of brick/tile fragments. The fill contained plaster, flat roof tile (Type RT103) and EBB (the dominant type of brick during the 14th century). The feature was apparently infilled during the late 14th to 15th centuries. This infilling consisted of a mixture of cess and other domestic waste. It contained frequent pebbles, chalk and brick and was excavated to a depth of 1.44m. The upper fill had been disturbed

and finds were only taken from lower deposits. These provided a good ceramic assemblage.

Just to the south was a series of intercutting features including several cess pits. The earliest features to the north were an assortment of pits and posts (G1/146), all of which had been heavily truncated (*10529, 10257, 10394, 10350*). The remnants of a possible foundation (*10220*) cut into a small patch of burning and may indicate the presence of a wall alongside the road to the west.

An adjacent sequence eight intercutting posts (*10442 etc.*, G1/147) lay close to an overlying cess pit (G1/155 Period 5.2) to which they may have related, perhaps forming part of a superstructure. The posts exhibited a range of shapes and sizes, some having been heavily truncated. The repeated replacement of the posts may indicate that this was the corner of a building or structure for which no other evidence survived. Overlying both the pits and posts described above were the fragmentary remnants of possible hearths (*10154, 10132,* G1/149), associated with a post-pit (*10560*).

Cutting into earlier features and deposits was another cess pit (*10246 and 10247,* G1/151). It was lined with medium to large flint nodules, bonded with coarse cream/white sandy mortar. The flints were rough hewn and random uncoursed. Only the uppermost fill was excavated and consisted of a sandy deposit with frequent flints.

To the south was a post-hole (*10402,* G1/150) and a layer (*10419 =?=10554*, G1/157) which ran in a strip from north-east to south-west, possibly within a shallow cut. This may have been a trampled path leading to one of the cess pits (*10246*, described above). A subsequent gully (*10351*) contained a possible post-setting. The slot was 0.57m deep and its fill included lumps of coal. This may have been the surviving remnant of one of the buildings fronting the adjacent road.

Small Finds

Finds from cess pit *10304* were six copper alloy pins (SF5435) with wire-rounded heads, as well as other incomplete shanks, a glass bead possibly used to decorate wire-work jewellery (SF5242), an iron key bit with non-ferrous metal plating (SF5076), a complete small annular iron buckle with non-ferrous metal plating (SF5273) and fragments of iron pin stem. Also included was the possible base of a limestone figurine (SF5080).

Pit *10529* contained a residual Late Saxon copper alloy hooked tag (SF5164, Fig.4.70). Pit *10220* contained nails (some with wood attached), an iron clench bolt (SF5137). Finds from the intercutting posts (G1/147) included a nail (SF5181), iron fragments and a padlock bolt (SF5431).

?Hearth *10132* contained iron nails (x 2) and shanks (x 2) (SF5077). Post-hole *10402* contained an iron staple (SF5118), while gully *10351* contained a nail (SF5253) and a scale tang knife (SF5253.01).

Pottery

An assemblage of 1.945kg of pottery was recovered. An extremely good late medieval/transitional assemblage was recovered from cess pit *10304* (G1/148; 1.540kg). No residual material was found, nor any pottery which could be dated to earlier than the mid 14th century. LMT was the most common fabric and was represented by a jar rim from a pancheon which was sooted internally, as well as by body sherds from at least two globular jugs decorated with iron oxide painted decoration and two flat ware bases, one flat and one sagging. A single wedge handle or foot with scored lines was also recorded, probably from a cauldron. These vessels reflect both the medieval and Dutch influences on local pottery. The globular jugs with iron oxide decoration reflect LMT origins in the GTGW industry, while the wedge/foot handle reveals a Dutch influence. DUTR is represented by a complete profile from a cauldron (*cf.* Jennings 1981, fig. 56, no. 948). Finer, table wares were represented by a small chip of Tudor Green-type ware, probably from a drinking vessel. A body sherd from a large Langerwehe stoneware vessel, probably a large jug, was also recovered.

The other pits contained residual material alongside LMU, Andenne ware and LMT. See Appendix 6.

Plant Macrofossils

by Peter Murphy

The single sample from fills of pit *10304* contained cinder, charcoal, occasional charred grains of *Hordeum* (barley) and nutshell fragments of *Corylus avellana* (hazel), mineral concretions, uncharred, partly mineral-replaced macrofossils of *Ficus carica* (fig) and *Rubus* sp. (bramble/raspberry), mineral replaced arthropods, burnt and unburnt fish bones and bone fragments and avian eggshell. This was evidently partly composed of sewage, but preservation of macrofossils was not good enough to merit full analysis.

Open Area 43 (Property d): pits

(Fig.8.17)

An area of pitting had been cut into (12th) 13th-century fills of the ?Castle Fee ditch (Ditch 3, Period 4.1) with this area perhaps remaining lower than the surrounding ground level (G1/101). These features had apparently been used for the disposal of non-ferrous metalworking waste. The pits were all generally fairly small, some apparently having weathered before use. Depending on the location of the boundary between properties fronting Berstrete to the west and Golden Ball Street to the east, these pits may have lain at the rear of properties on either side. By the mid 16th century a wall at the rear of Property (d) (which may have been traced in the excavation — G1/106) could suggest that the boundary lay to the east of the pits, placing them within Property (d).

To the north-west were two intercutting pits, the earliest of which (*10880*) was 1.47m deep. Its had apparently been left open for some time before being used for the disposal of domestic and industrial waste, including cinders and copper alloy spillage. Cutting into this was a smaller pit (*10821*), 0.29m deep, its fills containing demolition/building debris. An adjacent pit (*10909*) contained compacted with lenses of burnt soil, above which was a dump of broken pottery, additional sherds from the same vessels coming from an overlying fill. The upper, fill again contained evidence for burning, either *in situ* or dumped from nearby. Just clipping this pit to the east was a small pit (*10908*) with a charcoal-rich fill. Another cluster of pits lay to the south. One (*10986*) contained a sequence of clay fills, some burnt and containing cinders, indicating that the feature had been successively relined. To the west was a slot (*10706*) and post-hole (*10687*), overlain by further pits and post-holes (*10494, 10669 and 10550 and 10547*), up to a metre in depth.

This group of features, cutting into fills of the ?Fee ditch, suggests that metalworking was taking place either here or in the immediate vicinity. It is notable that most of the pits had apparently weathered before final infilling.

Small Finds

Finds from pit *10880* included a copper alloy lacetag (SF6758) and iron objects including a small ferrule probably used in archery practice (SF5415.01), nails (SF5415, 5298, 5338 and 6757), a lead rod/bar/ingot (SF5292) and a whetstone of Norwegian ragstone (SF5324). Pit *10821* contained three iron nail shanks (SF5386). Pit *10494* contained copper alloy strips (SF5416 and5379), nails (including a horseshoe nail, SF5152), an iron hinge fitting (SF5226), iron strip (SF5420). An upper fill of pit *10550* contained two copper alloy strips (SF5207).

Pottery

A total of 1.385kg of pottery was recovered from pits assigned, although both the fabrics and quantities of pottery recovered from individual pits varied (see Appendix 6). Contemporary fabrics included LMU, GTGW, non-local Red Glazed ware and LMT. Infill dates range from 13th- to late 14th-century.

Plant Macrofossils
Pit *10909* (fill *10874*; BS 87) produced a large assemblage of charred material, including hulled barley. This was fully analysed and is described further in Table 8.27 and Chapter 8. IV.

Open Area 44 (Property e/f): pits
(Fig.8.18–8.19)
In the same area as a group of late 13-14th century pits described in Period 4.2 (Chapter 7; G1/74) was a single

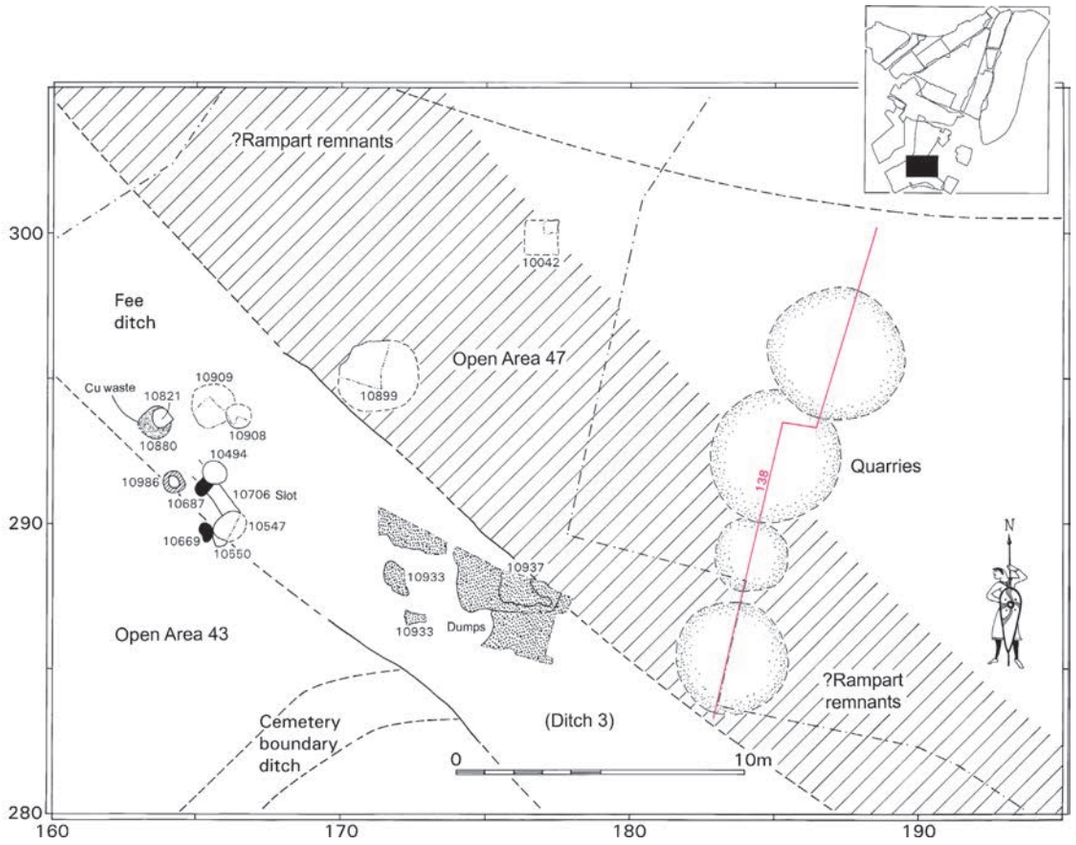

Figure 8.17 Period 5.1: Pits and quarries above Castle Fee ditch and bank, Open Areas 43 & 47 (Area 10) (City Property d). Scale 1:250

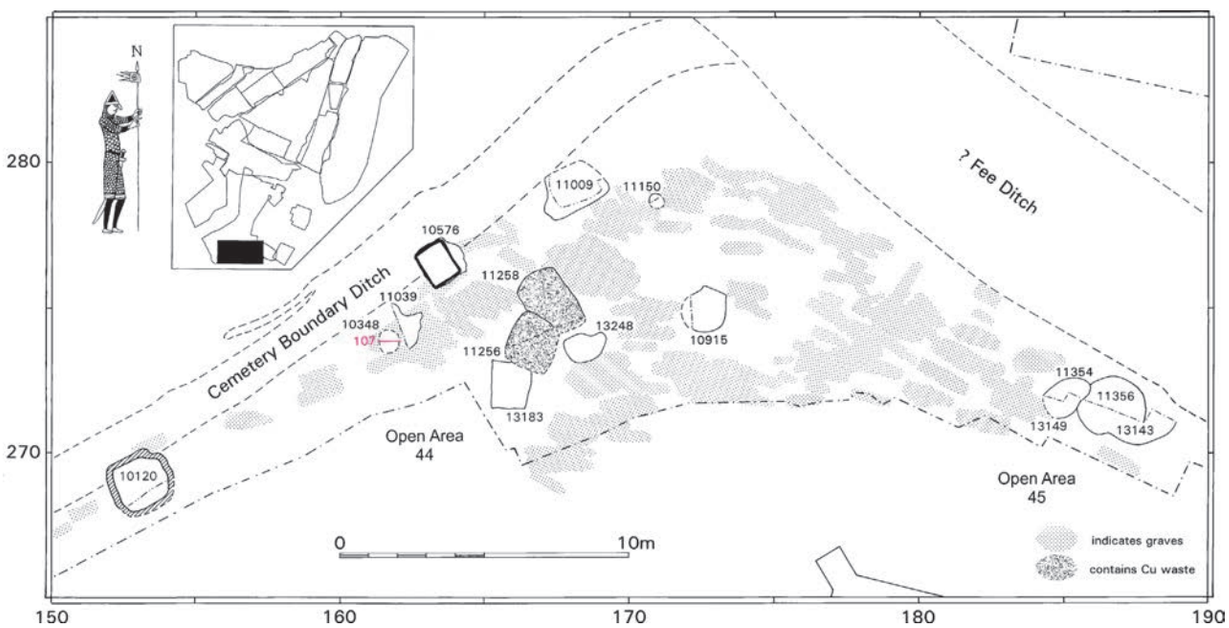

Figure 8.18 Period 5.1: Pits above Cemetery 4 (St John de Berstrete/Timberhill), Open Areas 44 & 45 (Areas 1 & 13) (City Property e/f). Scale 1:250

pit of late 14–15th-century date (G1/75). Finds suggest the disposal of domestic waste including a relatively large group of ceramics. This sub-square pit (*10120*) was 0.60m deep and appeared to have been lined with compacted sand/clay which survived along its north-western edge and base. A step had been cut into the northern side of the pit. The lower pit fill contained redeposited human bone (fragments of an extra adult male, adult female, child and sub-adult, part of the latter being found in an overlying fill).

In the former northern angle of the cemetery of St John de Berstrete (Cemetery 4) was a series of pits (G1/76) running along the southern edge of the boundary ditch and slightly cutting into its fills. The pits suggest the disposal of both domestic waste and copper alloy debris, suggesting that non-ferrous metalworking was taking place nearby. The pits provide a fairly good ceramic assemblage. Many of the pits pre-dated the insertion of walls across the area.

The westernmost feature was heavily truncated (*11039*) and lay adjacent to a roughly circular, steep-sided pit with a funnel-shaped profile (*10348*, S.107; Fig.8.19). This was not bottomed at a depth of a metre and the earliest recorded fills indicate silting/weathering interspersed with redeposited natural sand/gravel (*10331*, *10343* and *10345*), all of which appeared to have been deposited from the west. Above these fills was the skull and upper torso of a young male (sk.*10264*) which may have been dumped into the pit, implying that it was open during or soon after the active life of the cemetery. The skeleton was sealed by refuse (*10248*, *10342*, *10311* and *10344*) which appeared to have been deposited into the pit from the west.

Just to the east, also on the southern edge of the cemetery boundary ditch was a square/rectangular pit (*10576*) again cutting through graves and not bottomed at a depth of 1.32m. The presence of carbonised wood and nails suggests that it may have been wood-lined. Fills included ash and charcoal and it appears that the pit may have been left open to weather during the infill process. The upper, rubbly fills may indicate later disturbance.

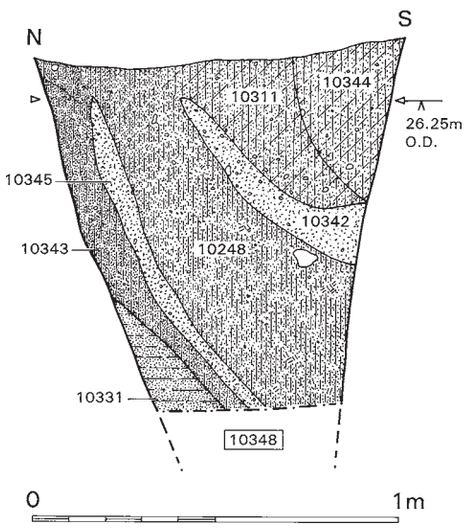

Figure 8.19 Period 5.1: West-facing section across pit *10348*, Open Area 44 (Area 1, S.107) (City Property e/f). Scale 1:20

To the south was a sequence of intercutting pits, the majority of which were truncated by later walls. One (*13183*) was roughly rectangular and cut into earlier features. It was augered to a depth of 1.60m and may have served as a cess pit, its organic fill containing wood fragments. Just to the east was a roughly circular pit (*13248*), 0.38m deep with organic fills, possibly having been used for refuse/cess disposal.

Cutting this pit to the north were two other pits, the earliest of which was fairly large (*11258*) and not bottomed at 1.15m. Infills included large amounts of copper alloy waste. To the west was a square ?pit (*11256*), filled with compact black clay banded with sand and containing markedly burnt layers including charcoal and copper alloy waste.

Isolated to the north-east but also cut by later walls was a small circular pit (*11150*), adjacent to a large isolated pit (*11009*, G1/129), which could have related to a later 16th-century malting kiln (G1/130, Period 6, Chapter 10) but which had a ceramic date of late 14–15th-century. Its position, which coincides directly with the southern edge of the later oven, suggests that it may have been a precursor to the later feature. The fill contained frequent oyster shell and charcoal.

Towards the centre of the excavated part of the cemetery area was an isolated pit (G1/111) cut by post-medieval walls. This circular pit (*10915*) was excavated to a depth of 0.65m and contained building debris (mortar, charcoal and chalk). It had later been truncated by a large 17th-century pit.

Small Finds

Pit *10120* contained copper alloy wire (SF5399), iron nails and a clench bolt rove (SF5074 and 5383) and a token of geometric type (SF5048). Finds from pit *10576* included a copper alloy pin (SF5225) and strip (SF5453), an intrusive Charles II farthing of 1673 (SF5227), nails and shanks (SF5200, 5315, 5345, 5444 and 5479), a residual type 1 horseshoe (SF5200.01) and medieval window glass (SF5314 and 5475). Pit *13183* contained a nail, an iron knife with a long narrow blade and a centrally placed tang (SF5750), a copper alloy pin (SF5876) and fragments of worsted textile, one of which was of a weave type out of general use by the end of the 14th century (SF6078; Fig.8.39). A copper alloy buckle (SF5476, Fig.8.36) was retrieved from pit *11258*. Pit *11009* contained iron and lead strips (SF5441 and 5458) and nails.

Pottery

by Irena Lentowicz
(Fig.8.42)

An assemblage of 2.793kg of pottery was recovered from these pits. Fabrics include LMU, LMT, GTGW, Hedingham-type ware and DUTR and non-local Medieval Glazed ware, most pits having late 14th- to 15th-century infill dates (see Appendix 6).

A particularly fine assemblage came from pit *10576* (G1/76, part; 1.555kg; Fig.8.42) which included a small proportion of residual Late Saxon and early medieval pottery but was dominated by a number of LMU vessels. These included rims from jars (types J2c — three rims (Fig.8.42, no.2), and J2j — two rims, Fig.8.42, nos. 4 and 5) and cooking pots (types J2b (Fig.8.42, no.1), J2c, J2j and *cv 1/11* (Fig.8.42, no.3) — two examples of each type), as well as bases from both jars and cooking pots. In addition a large bowl rim was also recorded (type Bj; Fig.8.42, no.6). A Blue-grey ware ladle was also recovered (Fig.8.42, no. 8). Glazed wares included a single GTGW jug, represented by the body sherds, thumbed jug base and multi-ridged strap handle (Fig.8.42, no.7). A body sherd from a non-local Glazed ware jug was also recorded, along with six LMT body sherds. The pit fills appear to date to the late 14th to 15th century on the basis of the multi-ridged handle and the presence of LMT.

A single large bowl with a curved profile was recovered from pit *13248* (0.141kg; type H2, Fig.8.42, no.10); this bowl was sooted on the external surface and the inner surface displayed signs of knife marks. Also recovered was an LMU jar rim (type J2i; Fig.8.42, no.9). These pits are dated to a general late 14th- to 15th-century range, based on

the presence of LMT but lack of any more closely datable diagnostic material.

Plant Macrofossils
by Peter Murphy
The sample from pit *10120* consisted of charcoal with relatively abundant but mostly poorly preserved charred grains of *Hordeum* with some *Avena* (oat) and *Hordeum* (barley) rachis fragments, uncharred *Sambucus nigra* (elder) seeds and some fish bones also present. A sample from pit *11039* (fill 10248, 26) contained only charcoal, poorly preserved charred cereals (including *Hordeum* and *Avena*), occasional charred weed seeds and uncharred *Sambucus nigra*. Pits *13183* and *13248* produced useful environmental samples. In both cases charred plant remains formed only a very minor component. Most plant macrofossils present were preserved in an uncharred form, partly by phosphatic mineral-replacement. These samples have been fully analysed and are described further in Table 8.27 and Chapter 8.IV.

Ditch 3, ?Castle Fee boundary, Phase 9 (boundary between Properties d and g/h): final backfills
(Fig.5.6 and 8.17)
A series of late 14–15th-century fills of the ?Castle Fee ditch (*10933, 10934, 10935, 10936, 10937, 10940 and 10984*, G1/59 and 1/95) were recorded in section and plan above the ditch. The uppermost fills all sloped to the west and may have formed part of a levelling process, some containing rubble. Many were undated, although they pre-dated the construction of walls and cellars across the area in the 16–17th centuries. They overlay 13th-century deposits (G1/58) and are likely to have begun to accumulate in the 14th century. These fills had an upper level of 27.60m OD (S.140) to 28.00m OD (the latter in the far eastern corner, eventually cut into by a brick-built cellar, G1/92). These levels suggest that the deposits were accumulating during the deposition of graveyard deposits and contemporary metalworking (which continued into Period 5.2).

Elsewhere, thick dumps of redeposited natural infilled the ditch to its surviving top, where it was cut by later features (S.144–145, *14048, 14057, 14056, 14046, 14047, 14045, 14050, 14045, 14050, 14051, 14052, 14061, 14066, 14065, 14064, 14063, 14062, 14028, 14001, 14000 and 11999*). To the south (S.141 and 140, Fig.5.6) was a similar dump (*11972*).

Small Finds
Finds were only recovered from one dump at the top of the sequence (*10940*) and included a limestone spindle whorl (SF5352).

Pottery
(Fig.8.43 on CD)
A total of 0.460kg of pottery was recovered. The only unglazed ware present was LMU, represented by a worn jar rim (type J2e), a strap handle from a jug and a sagging base. Glazed and fine wares are represented by local products and continental imports (GTGW, Non-local Glazed ware, Pingsdorf-type ware and LMT). A Langerwehe stoneware drinking vessel was present (Fig.8.43 on CD, no.1). A date of late 14th- to 15th-century is suggested. See Appendix 6.

Open Area 45 (?Property e/g): pits
(Fig.8.18–8.20)
Two pits (possibly three, G1/63) cut into earlier surfaces (G1/62, Period 1.3, Chapter 4) and a grave (Cemetery 4). As recorded, these features were sealed by deposits which were cut by more graves, although a reassessment of the dating suggests that this is incorrect. It now appears that they must have been cut from a higher level. Finds from the pits suggest that they were used for the disposal of domestic refuse.

The earliest pit (*11356=13143*) was not bottomed but was augered to a depth of *c.*3.64m, the steep-sided profile being recorded in S.169 (Fig.8.20). This may have been two pits recorded as one. The pit cut into a grave (grave *13036*) and was recorded as cut by others. The excavated fills included an erosional deposit (*11381*), followed by a thick deposit of silty clay (*11380*), sealed by a sequence of redeposited sands (*11379*, *11378*, *11377* and *11357*). Cutting this pit was a smaller pit (*11354=13149*), *c.*0.50m deep.

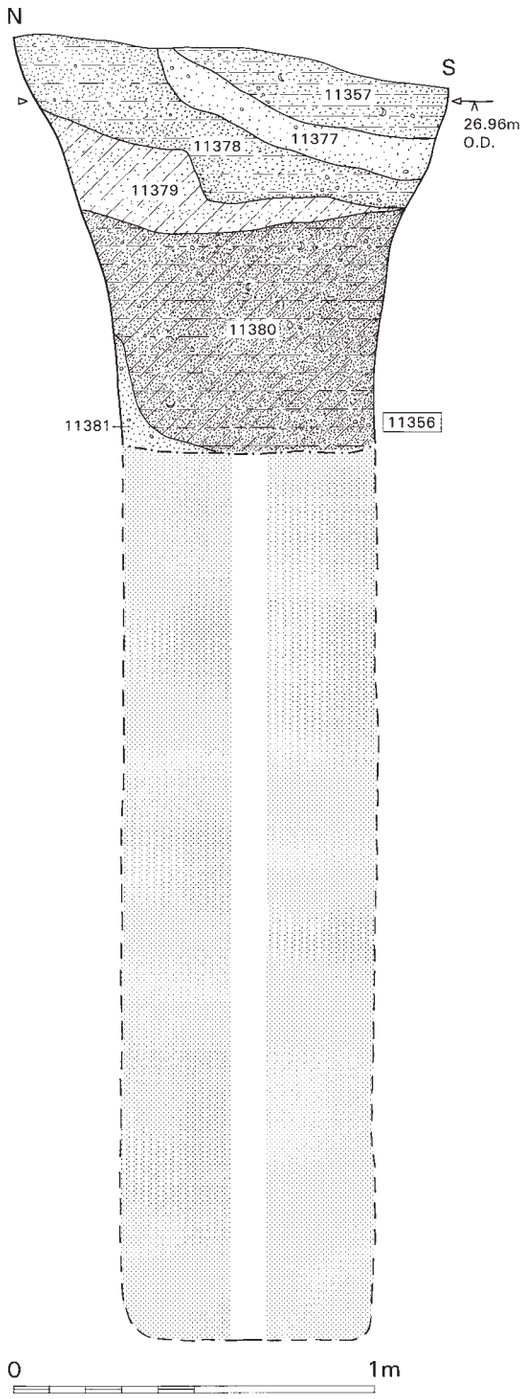

Figure 8.20 Period 5.1: West-facing section across pit *11356*, Open Area 45 (Area 1, S.169) (City Property e/f). Scale 1:20

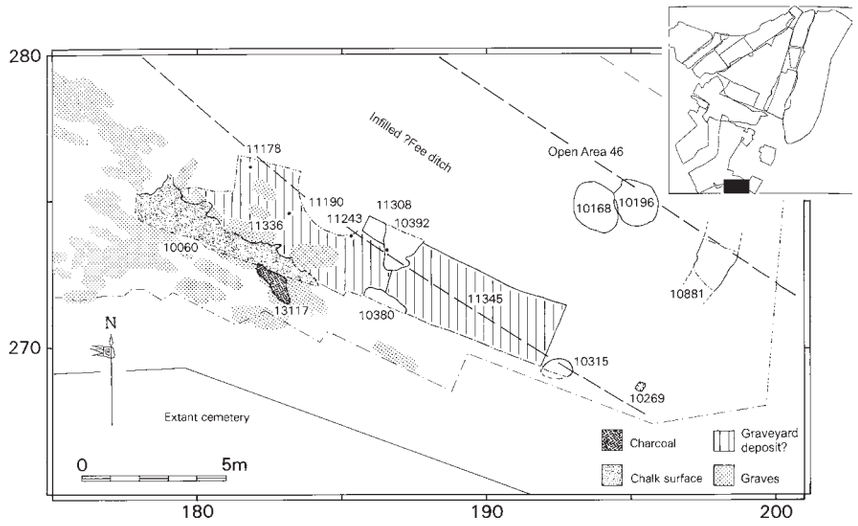

Figure 8.21 Period 5.1: Deposits and features above Cemetery 4 (St John de Berstrete/Timberhill) and ?Castle Fee ditch, Open Area 46 (Area 1) (City Property e/g). Scale 1:250

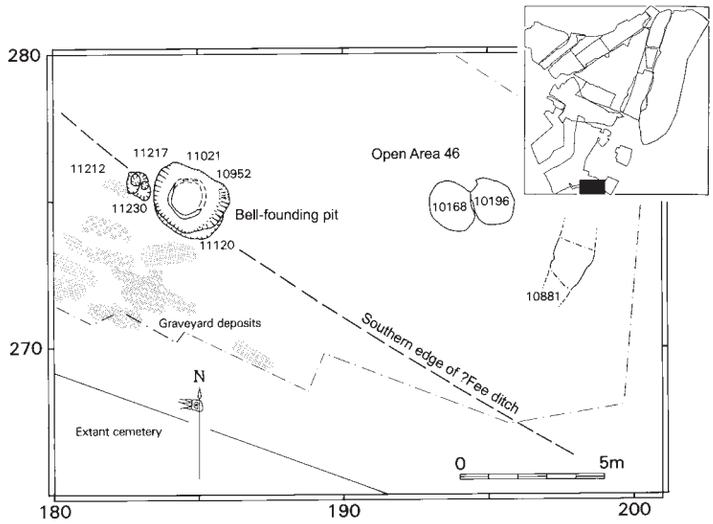

Figure 8.22 Period 5.1: Bell-founding and surrounding pits, Open Area 46 (Area 1) (City Property e/g). Scale 1:250

Small Finds
Pit *11356=13143* contained a nail (SF5644). The same pit later recorded in Area 13 contained a copper alloy plate fragment, possibly a mount (SF5761), nail (SF5748) and slag. Pit *11354=13149* contained a nail.

Pottery
A total of 0.231kg of pottery was recovered. Contemporary fabrics consisted of LMU, GTGW and LMT. A late 14th- to 15th-century date is suggested. See Appendix 6.

Open Area 46, Phase 1 (?Property e/g): non-ferrous metalworking
(Fig.8.21–24)
There are considerable difficulties with the recorded stratigraphic sequence in this area of the site, which are fully explored in the project archive. Graves relating to the cemetery of St John de Berstete/Timberhill (Cemetery 4) were recorded in various stratigraphic positions and some, recorded as cutting into the late medieval layers described below, have been radiocarbon dated to the Late Saxon period (Bayliss *et al*, Chapter 4.V). These were specifically targeted for dating to establish whether they were in fact much later burials within the earlier cemetery. A number of deposits were interpreted as fills of the Castle Fee ditch, although new evidence from the Golden Ball Street site indicates a revision of the line of the ditch to a more northerly position. A number of compacted surfaces occurred at various levels and stratigraphic positions and their inter-relationship with the cemetery sequence remains anomalous. The earliest clearly predated the cemetery (Period 1.3), while the latest lay nearly a metre higher and related to late medieval metalworking in the vicinity: the site record in relation to these deposits is self-contradictory. Clearly, a complex depositional sequence had occurred which, unfortunately, cannot now be reconstructed.

Overlying the pits described above (G1/63) was a mixed layer (*11345*, G1/64) comprising a combination of graveyard deposit and what were believed on site to be late fills of the ?Castle Fee ditch (with an upper level of 27.12m OD; Fig.8.21). Excavation of a spit through

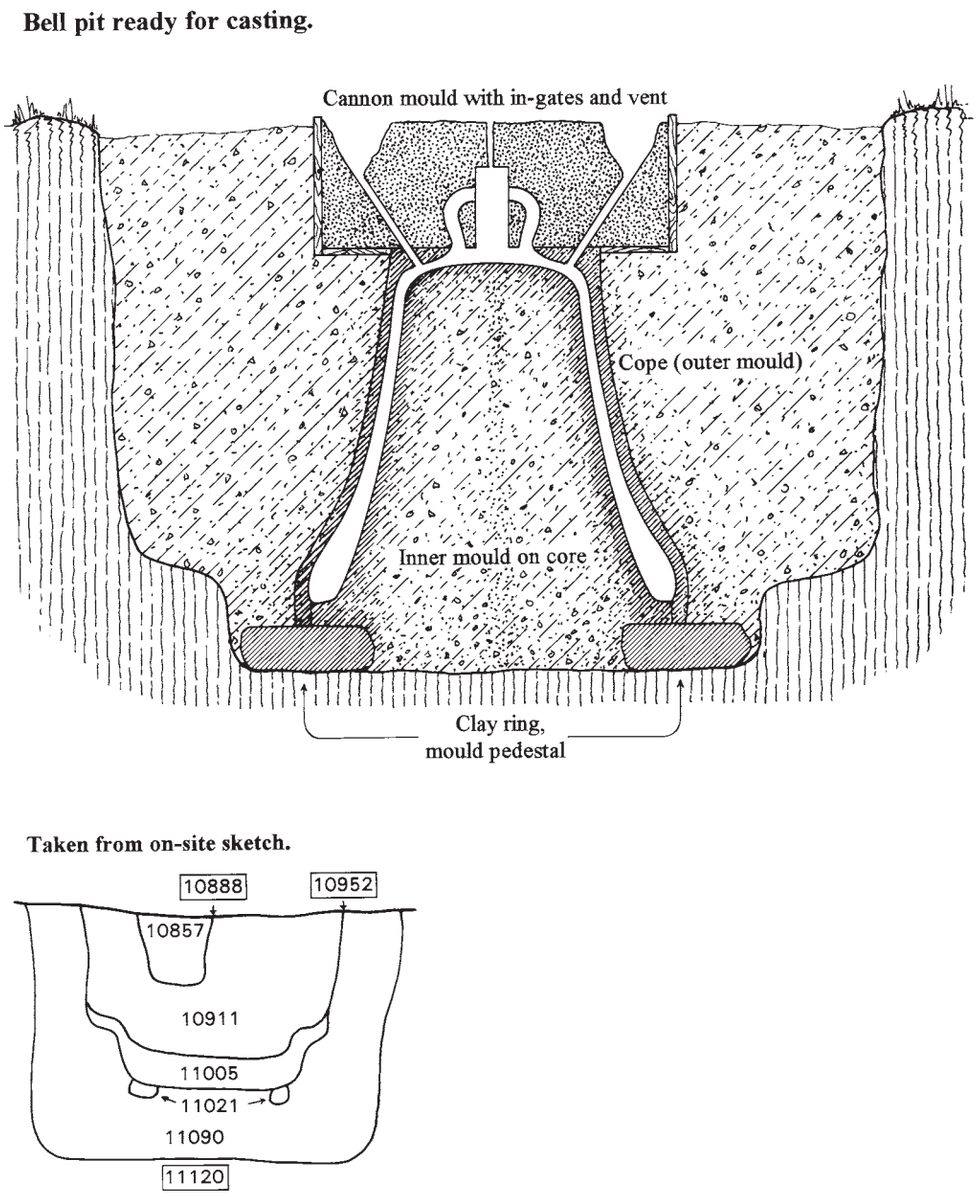

Figure 8.23 Period 5.1: Schematic section across bell-founding pit, Open Area 46 (Area 1) (City Property e/g). Not to scale

similar fills (*11148*, G1/66, not illustrated) revealed three graves. Its surface would have lain at *c.*27.18m OD and it was cut by a bell-founding pit and, purportedly, by further graves. Adjacent to these deposits was a layer of compacted chalk (*10060*, G1/78) which was recorded as sealing four graves and lay at just over 27.10m OD. This level is not, however, significantly different from the earlier chalk spreads (G1/62, Period 1.3, Chapter 4) although, as recorded, the two were stratigraphically separated by graves (which should have been visible if they were cut through the chalk layer). Other chalk surfaces (G1/72 below) lay at a much higher level (*c.*27.80m OD) and it is difficult to understand the relationship of the chalk layer in question to surrounding activity. No finds were recovered and this deposit may in fact have been much earlier. Just to the south, at a similar level and also recorded as overlying graves, was a patch of charcoal (*13117*) which may have been contemporary with the chalk. The recorded sequence would seem to imply the truncation of graves prior to deposition of these layers.

A line of four small stakes (G1/69) ran along the southern edge of the bell pit (G1/67), pre-dating a cemetery deposit (G1/70). These may have formed a fence line.

Small Finds

Spit *11148* contained an iron buckle which may have been used to secure a sword (SF5495, Fig.8.36) and a nail (SF5499).

Pottery

A total of 0.290kg of pottery was recovered, consisting of residual fabrics, as well as LMU, GTGW, Pingsdorf-type ware and LMT. A late 14th- to 15th-century date is indicated. See Appendix 6.

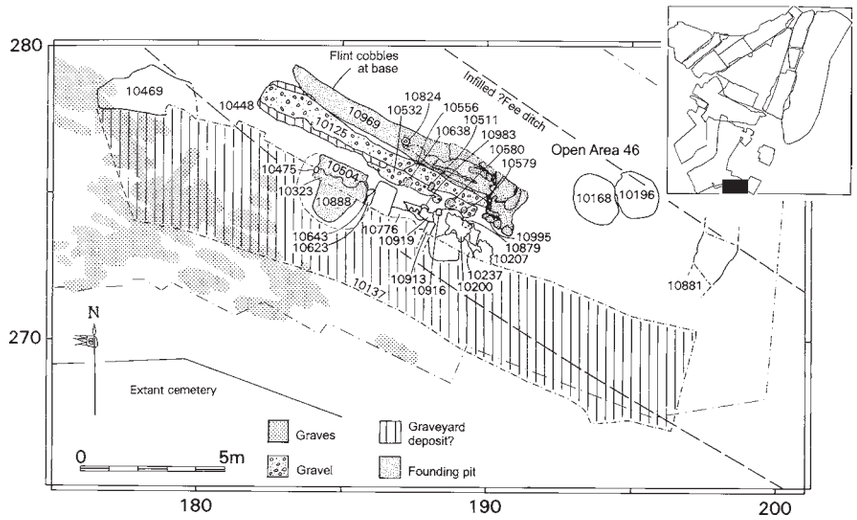

Figure 8.24 Period 5.1: Metalworking activity, Open Area 46 (Area 1) (City Property e/g). Scale 1:250

Open Area 46, Phase 2 (?Property e/g): bell-founding
(Figs 8.22–8.23, Plates 8.5 and 8.6)

Cutting into earlier deposits (G1/64-1/66 above) was a pit used for bell-founding (*11120*, G1/67, Fig.8.22). It lay in the eastern part of the St John de Berstrete/Timberhill cemetery and had been cut partially into late fills of the ?Fee ditch. It was apparently dug in two stages (Fig.8.23). The initial cut was a large, roughly circular pit (*11120*) with a flatter side to the north and with dimensions of *c.*2.5m north-west/south-east and 2m north-south. Its original depth is unclear as a result of truncation by machining, although a section drawing of the upper part of the pit (S.146) shows the cut surviving to an upper level of 27.55m OD. Its base was recorded at 26.35m OD, suggesting a minimum original depth of 1.20m. This initial cut was infilled with gravelly sand/loam/clay (*11090*).

A second, flat-based cut with stepped sides was then dug (*10952*), the earlier pit having been infilled to a depth of about 0.25m. At the base of this second cut was a clay ring with a high organic (?dung) content (*11021*). The northern part of the ring had apparently been damaged in antiquity. Its reconstructed diameter was 1.30–1.50m and the clay was *c.*0.10m high and 0.10m wide.

A sequence of three backfills was recorded above, composed mainly of founding debris. The lowest of these fills was mixed with sand/loam/clay (*11005*), above which was a burnt patch of mixed loam and ?cow dung (*11026*). Similar burnt matter was distributed throughout other fills. The latest and most substantial fill contained frequent flecks of metal (*10911*). Analysis of the mould

Plate 8.5 Late 14th- to early 15th-century bell-founding pit *11120*, (?Property e) (Period 5.1), showing earlier chalk surfaces and graves (Cemetery 4, St John de Berstrete/Timberhill)

fragments from this feature (by Trevor Jennings; see below) suggests that at least two bells were struck, although the absence of furnacing suggests that the founding area extended beyond the edges of the excavated area. Much of the debris came from a second, overlying pit (G1/68 described below).

An oval post-pit (*11230*, G1/65) lay immediately to the west of the bell pit and was 0.25m deep. It had apparently contained two posts and its initial fill was a sand bedding. The larger post may have been braced by a smaller post to the east. These posts may have been related to the use of the bell pit, perhaps supporting lifting-gear for the removal of the bell from the pit.

Small Finds
Cut *11120* contained a copper alloy brooch or buckle pin of 14th-century type (SF1019, Fig.8.36), lead came (SF5425), iron nails and shanks (SF5504, SF5498, SF5426, SF5464 and SF1018). Finds from pit *10952* were a human rib bone, copper alloy objects (metalworking debris SF5339, strip SF5329, metalworking debris SF5459 and sheet SF5491) and an iron nail shank (SF5502).

Pottery
A total of 0.499kg of pottery was recovered (see Appendix 6). The contemporary pottery recovered from pit *11120* (0.426kg) was dominated by LMU represented by rims from cooking pots (type J2b — 3 examples) and a bowl (type B1j). A more unusual cooking pot rim was also recorded (type cv 1/13). Other fabrics were represented in much smaller quantity and were all table wares including GTGW body sherds, the base of a Stamford ware jug (Fabric B) and two sherds of non-local Medieval Glazed wares. The assemblage dates to the 13–14th century, although a date in the latter part of this range appears likely on the basis of the brooch pin noted above.

Pottery from the post-pit *11230* (0.073kg) was largely residual, with contemporary fabrics represented by LMU and GTGW.

Non-ferrous Metalworking Waste
Twelve pieces of copper alloy waste were selected for analysis from pits *10911* and *11005* (G1/67) and 10857 (G1/68 — see below). Although the figures are difficult to interpret, the XRF analyses of these samples seem to show a variety of different alloy types. Most of the pieces analysed from the early bell pit (fills *10911* and *11005*) are bronzes or leaded bronzes. The full results are given in Chapter 8.III.

Bell Mould Fragments
The majority of the recovered bell mould fragments actually came from an overlying pit (see G1/68 below) and are described in Chapter 8.III. The 'mould' material from fills *11021* and *11026* could not be convincingly reconstructed as a bell mould. In fact, most of it was very lightly fired, if at all, and showed no evidence for having been connected with high-temperature metalworking. None of it was heavily reduced-fired.

Plant Macrofossils and Charcoal
A sample flot was composed largely of charcoal (including from probable ericaceous stems) with occasional charred *Hordeum* grains, slag and uncharred seeds of *Sambucus nigra* and *Hycoscyamus niger* (henbane). The sample was extracted for charcoal identification and is detailed in Chapter 8.IV.

Open Area 46, Phase 3 (?Property e/g): deposits and metalworking
(Fig.8.24)

A widespread deposit of mid brown clay, sand and gravelly loam (*10137*, G1/70) across the south-eastern part of Areas 1 and 13 was excavated as a spit across the cemetery area. It probably accumulated over a considerable period both during and after the active life of the cemetery. It survived to an upper level of 27.36m OD and sealed (as recorded) five graves. Some burials were probably inserted during its deposition, giving them a maximum depth of *c*.0.70m in this part of the site. A linear strip of the same deposit just to the north (*10448*) had survived truncation by later walls and foundations and its upper level lay considerably higher at 27.90m OD. It was of the same character to the deposits it overlay, which must have included late fills of the ?Castle Fee ditch.

Small and Bulk Finds
Deposit *10137* contained a bone stylus (SF5066), copper alloy pin (SF5085), glass (SF5096), an Edwardian silver penny dated to 1272–1277 (SF5082) and human bone. Other finds from the two deposits included a copper alloy plate (SF5161), sheet (SF5224) and pin (SF5263); iron nails (SF5079, 5101, 5162, 5167 and 5223), three iron spur fittings of mid 13th- to early 14th-century type (SF5097.2,

Plate 8.6 Detail of bell-founding pit *11120*, showing clay ring *11021* at base (Area 1)

Fig.8.60), two small fragments of iron sheet (SF5097.1 and 5134) and the tip of a wide blade (SF5167.1).

Pottery
Just over a kilogram of pottery (1.069kg) was recovered from the two dumps. The residual element of the assemblage was quite high (just over 20%). Although LMU still accounts for a large proportion of the material, other fabrics (GTGW, micaceous non-local Glazed ware and DUTR) are present. A mid to late 14th-century date is suggested. See Appendix 6.

Metalworking pit

Dug into both the earlier bell-founding pit and the extensive deposit described above was another metalworking pit (G1/68) from which much bell mould was retrieved (Fig.8.24). This strange, bell-shaped feature (*10888*) lay directly above the earlier bell-founding pit and was apparently also associated with metalworking (some of the mould perhaps redeposited from earlier activities). Its fill consisted of mixed ashy charcoal with signs of burning *in situ* and it contained frequent small fragments of copper alloy. The frequent finds included a large amount of fired clay (including bell-mould). The mixed nature of the waste suggests that the pit was used both for the disposal of industrial and domestic waste. Part of what may in fact have been the same feature was recorded at a much higher level (G1/71 below), where surfaces and deposits to the north of the pit are also described.

Small Finds
This pit contained part of a carding comb (SF5395, Fig.8.59 and 5428.2), a copper alloy strip (SF5449), copper alloy pin (SF5448), copper alloy sheet (SF5404), nails (SF5373 and 5450) and a triangular panel of leather (SF5278; Fig.8.39), leather fragment (SF5363) and intrusive welted shoe fragment of probable 17th-century date (SF5427).

Pottery
Only a very small quantity of pottery was recovered (0.011kg). LMU body sherds were present, along with a single small sherd from a Siegburg stoneware vessel. This latter sherd dates the fill to the mid to late 14th century.

Bell Mould Fragments
by Trevor Jennings (bell moulds) and Catherine Mortimer (XRF analysis)
The false bell technique is clearly illustrated by the surviving mould pieces, most of which came from pit *10888*. One fragment provides a fine example of layer moulding and the use of finishers and luting which have been carefully applied. Mould pedestal remains also indicate a knowledgeable technique for several different qualities of loam were applied, each becoming harder towards the upper surface and finely graded in gravel size. At least two bells were cast according to the mould fragments, although the absence of furnacing indicates that the founding site extending outside the excavated area. The mould fragments are described fully in Chapter 8.III.

About 1.5kg of mould fragments (from fill *10857*) were examined by XRF; other material from the context is fired clay, but could not be clearly identified as being concerned with non-ferrous metalworking. Included amongst the mould material, there are a few pieces with copper alloy attached, as well as pieces of copper alloy waste. Copper alloy attached to one mould fragment was found to be a heavily-leaded bronze containing antimony. This composition suggests that the mould is unlikely to have been used for casting bells. Further discussion of this contradictory evidence is given in Chapter 8.III.

Plant Macrofossils and Charcoal
The sample flot contained cinder, coal, slag and charcoal, the latter being of similar composition to that from the underlying pit. Fragments of a coal-like substance were present and the charcoal indicates a wide range of woody fuels (see Chapter 8.IV).

?Metal-working trench and associated deposits

Further metal-working may have taken place at the same time as the use of the founding activities described above. Three very small circular pits lay in a line to the north of the founding pits and apparently indicate small-scale copper alloy working (G1/71). Two of these (*10579, 10580 and 10638)* were *c.*0.20m deep. The primary fill of the latter contained 35% copper alloy fragments. At the centre of the pit lay a compact circle of burnt clay (*c.*0.12m in diameter).

All three of the pits were overlain by a deposit of compacted gravel which extended over a wider area (*10532*). This had an upper level of 27.88m OD and may have served to level the area, perhaps forming a working surface. This was in turn overlain by a patch of copper alloy-stained sand (*10556*) which included some copper alloy fragments. To the south, just adjacent to the bell-founding pit were further surface remnants (*10243 and 10643*).

The northern parts of two pits were recorded above the earlier metalworking pit (G1/68) and may have formed part of the same feature at a higher level (*10504 and 10323*). The uppermost level of the earlier pit was 26.84m OD, while those described here lay at 27.67 and 27.71m OD respectively. The earliest of the two pits (*10504*) was filled with a deposit containing moderate fragments of copper alloy waste, possibly disturbed from the underlying pit. Above was a patch of mortar (*10475*), cutting into which was the second pit (*10323*), mirroring the earlier one and filled with fine yellow sand including lenses of charcoal and moderate fragments of copper alloy. Just to the east was a roughly rectangular pit (*10941*), flat-based and 0.31m deep. Its fill included burnt clay.

Lying just above the western edge of the pit described above were the fragmentary remains of two small walls, forming a right-angled junction. The eastern wall (*10913*) comprised a foundation cut aligned north-east-to-south-west, then a flint and brick wall of random uncoursed construction and with the flint apparently having been rough hewn. This wall was faced to the east. Very little of the northern wall (*10919*) survived. It was apparently built virtually free-standing and only the lower course of flint, brick and tile survived. Possibly forming part of the same structure were four posts, lying to the north of the walls (*10511, 10879, 10916 and 10983*). These elements may have formed a minor structure relating to surrounding metalworking. Overlying the possible structure were patches of burnt clay working surfaces and copper alloy waste (*10207=10776, 10237, 10685, 10692, 10694, 10722, 10729, 10733, 10737 and 10756*). To the south of the structure, above an earlier pit, was a patch of chalk (*10200*), possibly the remnant of a much more widespread deposit.

Just to the north of the deposits described above was a gravel surface (G1/85, *10125*) which probably equates with the similar deposit described above. It consisted of highly compacted rammed, rounded flint pebbles (2–10cm). Its top lay at 27.96m OD and formed a metalled surface running north-west/south-east between the copper alloy working pits to the south (G1/67 and G1/68) and a trench possibly also related to metalworking (G1/72) to the north.

Small Finds
Deposit *10556* contained a nail (SF5195). Finds from other deposits included a copper alloy pin (SF5189) as well as an iron horse bit (SF5290 from *10685*, Fig.8.60). Finds from layer *10125* included a nail (SF5259).

Pottery
A total of 0.542kg of pottery was recovered, of which 0.120kg came from the layers and features (G1/71) and 0.442kg came from gravel layer *10125*. Contemporary fabrics consisted of LMU, GTGW, LMT and Langerwehe stoneware. A date of late 14th- to 15th-century is indicated. See Appendix 6.

?Metalworking Trench
(Fig.8.24)
A trench to the north of the gravel surface ran for a distance of over 9m from north-west to south-east, with a possibly associated 'pit' at its eastern end (G1/72). The trench (*10969*) had an irregular base and petered out to the north-east. It was *c.*0.75m wide, surviving to only c.10cm deep. Although is possible that the trench and pit were completely unrelated, fills extended between the two features. The trench was deeper at its north-western end with a stepped profile for much of its length. Three of the lowest fills of the trench were of flint cobbles, noted to be burnt towards the east (*i.e.* towards both the pit and the highest concentration of metalworking debris fills). If burnt *in situ* this would suggest that the trench was open to its full depth at the time of use. Fills containing copper alloy waste, charcoal and ash were concentrated towards the east, spreading out from the pit to fill the trench. The origin of this material is uncertain: either it remained *in situ*, implying that both trench and pit related to metalworking, or these fills were redeposited from nearby. Cutting into the trench was a small, square pit (*10824*), 0.12m deep. This was filled entirely with copper alloy impregnated waste. This feature was very similar to and perhaps contemporary with other examples just to the south (G1/72).

The trench was originally interpreted associated with robbing activity, although its morphology makes this unlikely. It does not appear to have been connected with a furnace associated with adjacent metalworking, although it may have been the remnants of a founding trench with an integral pit. Four pieces of copper alloy spillage from fills of the trench and surrounding deposits were analysed and comprised two leaded bronzes and two quaternary alloys (Mortimer, Chapter 8, III). Further discussion is given in Chapter 8.V.

Small Finds
Trench *10969* contained copper alloy spillage.

Pottery
An extremely small quantity of pottery (0.040kg) was recovered, most of which was residual. Contemporary fabrics consist of LMU, non-local Medieval Red Glazed ware and LMT. A late 14th- to 15th-century date is indicated. See Appendix 6.

Open Area 46 (?Property e/g): pits
(Fig.8.21)
Three pits lay to the east of the metalworking activities (G1/77), overlying the infilled ?Castle Fee ditch. The earliest (*10196*) was sub-circular and 0.70m deep. It had been filled with a mixed dump of demolition debris. Cutting this pit to the west was another roughly circular pit (*10168*). This was shallow (0.25m deep) and fills included a mixture of refuse and building material. Just to the south-east was a linear feature (*10881*), truncated by a later cellar. This was 0.62m deep and was very irregular, the sides and base having been lined with compacted clay. It may have been used for drainage or as a boundary marker and sloped down towards the south-west.

Small Finds
Pit *10196* contained a copper alloy pin (SF5245), a drop hinge (SF5106, Fig.8.55), the corresponding hinge pivot being found in an adjacent pit (SF5090 below), a small knife blade, possibly from a pair of shears (SF5245) and a silver halfpenny of Henry VI, 1422–1427 (SF1007). Pit *10169* contained a nail (SF5244), copper alloy wire x 18 (SF1008), iron arrowhead with a triangular blade of late 14th- to 15th-century type (SF5257, Fig.8.60) and a hinge pivot (SF5090, Fig.8.55). Feature *10881* contained eighteen fragments of copper alloy wire (SF1014) and a nail (SF5286).

Pottery
A small assemblage (0.373kg) of pottery was recovered from the fills of the three features, comprising LMU, GTGW, LMT, Langerwehe stoneware and miscellaneous late medieval ware, as well as residual material. The presence of LMT and Langerwehe stonewares date these pits to the late 14th to 15th century. See Appendix 6.

Open Area 47 (Properties g/h): pits
(Fig.8.17)
To the east of the possible property boundary between properties facing Berstrete and those facing Golden Ball Street were two pits (G1/97) which may have lain at the rear of properties. One (*10899*) lay just to the north of the former ?Castle Fee ditch and was irregular in plan, not being bottomed at a depth of 1.31m. Finds were notable for the inclusion of partial animal skeletons and objects which may have had a military use (see below). To the north-east, the corner of a small square pit survived (*10042*), although it had been heavily truncated. Its refuse type fills included a layer of oyster shells.

Four large pits (G1/96) were recorded in a machine-dug section only (S.138) in the area between the former ?Castle Fee and south bailey ditches. These pits are undated, although their size could suggest that they were quarry pits, extracting materials from a rampart between the two ditches for which no evidence survived. These were the only features of such large size in this part of the site. The largest was 4.5m north-to-south and 2.26m deep.

Small Finds
Metal finds from G1/97 pits were; a fragment of plate armour (SF5184, Fig.8.60), a broken ring terminal (SF5300), a fragment of ring or small annular buckle (SF5438), a small conical ferrule designed for archery practice (SF5422.03), a small broken knife (SF5422.02) and an annular buckle/ring with non-ferrous metal coating (SF5422).

Pottery
Almost half a kilo of pottery was recovered from the two pits (0.426kg). Contemporary fabrics included LMU; unglazed coarse wares were supplemented by non-local Medieval Shelly ware, while glazed wares were represented by fresh GTGW sherds. However, the assemblage was dominated by LMT. Other fabrics present included Langerwehe stoneware. A late 14th- to 15th-century date is suggested. See Appendix 6.

Zooarchaeological Remains
Two partial cat skeletons were recovered from pit *10899* (Albarella *et al*, Chapter 8.IV and Part III).

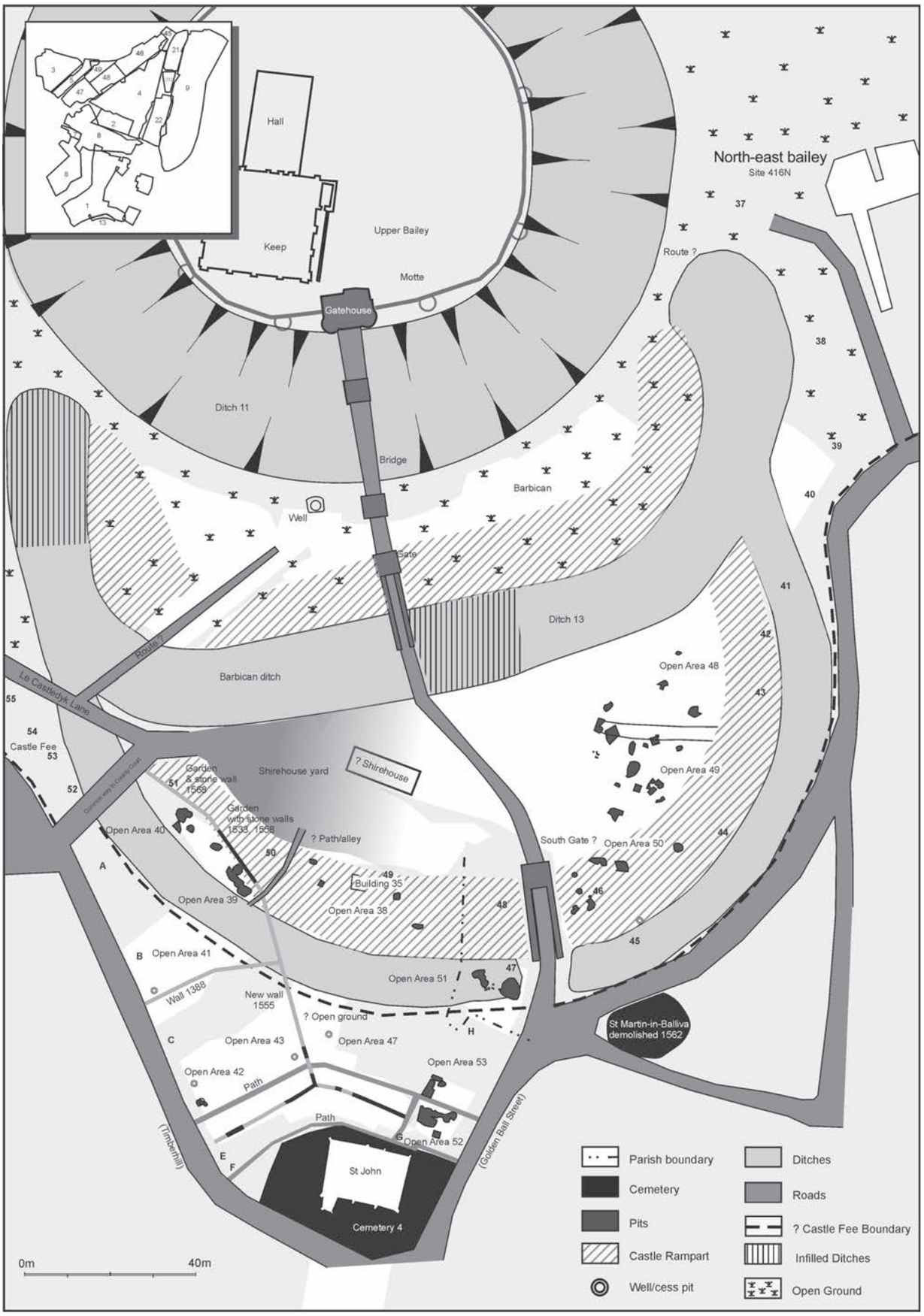

Figure 8.25 Period 5.2: Phase plan — mid/late 15th to mid/late 16th century. Scale 1:1250

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fold-out

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fold-out

Period 5.2: Late Medieval/Transitional (mid/late 15th to mid/late 16th century)

Summary
(Fig.8.25)
At this time, the well shaft at the base of the castle bridge was infilled with substantial deposits of waste, many of which derived from craft/industrial activities (Chapter 9). Elsewhere on the site, late 14th- to 15th-century quarry pits (Period 5.1) were consistently cut by smaller pits of probable 15th-century date across the Old Swynemarket (Timberhill) and Golden Ball Lane blocks, perhaps indicating that this initial period of quarrying was related to the construction of cottages/buildings which occurred after c.1345. A total of 109 pits was recorded at Castle Mall, with a further 21 at Golden Ball Street. The 16th century (or perhaps even the 15th) saw the construction of numerous walls, most of the excavated examples in the southern and western part of the site apparently serving as garden or property boundaries. Pits attributable to the 15th–16th century were located at the Golden Ball Street site, many overlying the south bailey ditch. The latter had already been substantially infilled to the west, although the terminus near the castle approach (recorded at Golden Ball Street) appears to have remained open to a considerable depth prior to infilling during the late 15th to 16th century.

The Decline of the Barbican

The Barbican Well
Infilling of the barbican well continued into the 15th century and early 16th centuries (G5/24, Period 5.2). The artefacts and ecofacts recovered formed the major assemblage from the site and both the archaeological sequence and the material retrieved from it are described in Chapter 9.

Ditch 13: Barbican, Phase 5: infilling
by Elizabeth Shepherd Popescu and Andy Shelley
(Figs.8.9, 8.26 and 8.27)
Refuse dumped into the barbican ditch during the late medieval period was recorded in a watching brief to the west of the site (*12758*, S.180, 179 and 184, T58/21, Fig.8.9). The initial deposit was of flint, red brick and mortar in a 0.20m thick band, tipping into the ditch from the western edge and effectively separating the refuse deposits from earlier, cleaner fills. This was followed by a thick dump of very dark grey/black homogeneous loam with frequent brick fragments and a high proportion of animal bone (5%). Similar fills were recorded in an adjacent section (*12766 and 12767*, S.183).

In the central part of the ditch (*40928*, Area 4, G2/29), fills were recorded in both the east- and west-facing sections, spreading across its base and up the southern edge. In the west facing sections (S.428 and 429, Fig.8.26) the main fill was of reddish brown loam (*40770*). In the east-facing sections (S.436, 438, 439 and 441, Fig.8.27) fills were of grey brown sandy loam or orange sand and silt (*e.g. 40481*), suggesting erosional processes rather than refuse deposition. A total of twenty-three fills were recorded in all, ranging in thickness between 0.40 and 0.60m.

No fills of this date were apparent in the sections across the ditch recorded in Area 9.

Small Finds
A nail and shanks were retrieved from fill *12758* (SF7246).

Pottery
A total of 0.767kg of pottery was recovered, most of which came from fill *12758* (0.703kg). All of the sherds were large and fresh and the assemblage appears undisturbed. It consists of LMU and LMT representing utilitarian kitchen wares. Fine table wares are represented by a Tudor Green-type ware jug. Other table wares were represented by the more common Rhenish stonewares, including a Langerwehe stoneware mug rim and handle and a jug spout and a Raeren-Aachen jug base. These vessels date the fill to the mid 15th to 16th century.

Only 0.064kg of pottery was recovered from the fill of the ditch recorded in Area 4, contemporary warres comprising LMT and Rhenish stonewares. See Appendix 6.

City Encroachment

Castle Fee Properties in Block I (east of castle approach)
by Elizabeth Shepherd Popescu and Niall Donald
(Fig.8.2)
Documentary evidence indicates that, as the three original tenements comprising the south-western block (Properties 44–46, Fig.8.2) were further subdivided and built on, the ground rents were renegotiated. By the mid 16th century, what had been seven separate tenements had been combined into one. In 1544, they were described as a messuage with buildings and garden; a tenement with walls, gardens, rents; and two tenements and two gardens, with another garden all lying together. Also included here is evidence for Properties 38–43.

Ditch 15, boundary marker, Phase 3: infilling
(Fig.8.28)
The earlier boundary ditch (*92701=90687=90972,* G9/92, Period 5.1) was infilled with a sequence of deposits which may have begun as early as Period 5.1. Fills varied along the recorded length of the feature. Some fills were clearly of domestic refuse and included cess. In Trial Hole 3 (S.48), the sequence included a layer of cobbles, perhaps serving to consolidate earlier fills or acting as a surface.

Small Finds
Finds included a lead strip (SF261), lead sheet (SF243), copper alloy strip (SF242), copper alloy pins (SF244 and 1084), copper alloy dress pin (SF6128, Fig.8.36), a copper alloy ornamental plaque (SF7464, Fig.8.54), an iron nail (SF555) and an iron strip (SF6484).

Pottery
A total of 2.406kg og pottery was recovered, most of which is residual. Contemporary fabrics consist of LMU, GTGW and LMT, giving a general late 14th- to 15th-century date. Fills of ditch section *90687* (0.386kg) also included Raeren-Aachen stoneware which dates these fills to the mid to late 15th to 16th century.

Open Areas 36 and 48 (Properties 42 and 43): pits
(Fig.8.11 and 8.28)
The area of pitting to the north of Ditch 15 (Open Area 36, Property 43) apparently continued in use for similar activities into the later 15th and 16th centuries. Other pits to the north (Open Area 48, Property 42) may also have belonged to the same or an adjacent property (no sub-divisions are apparent on the basis of the excavated evidence).

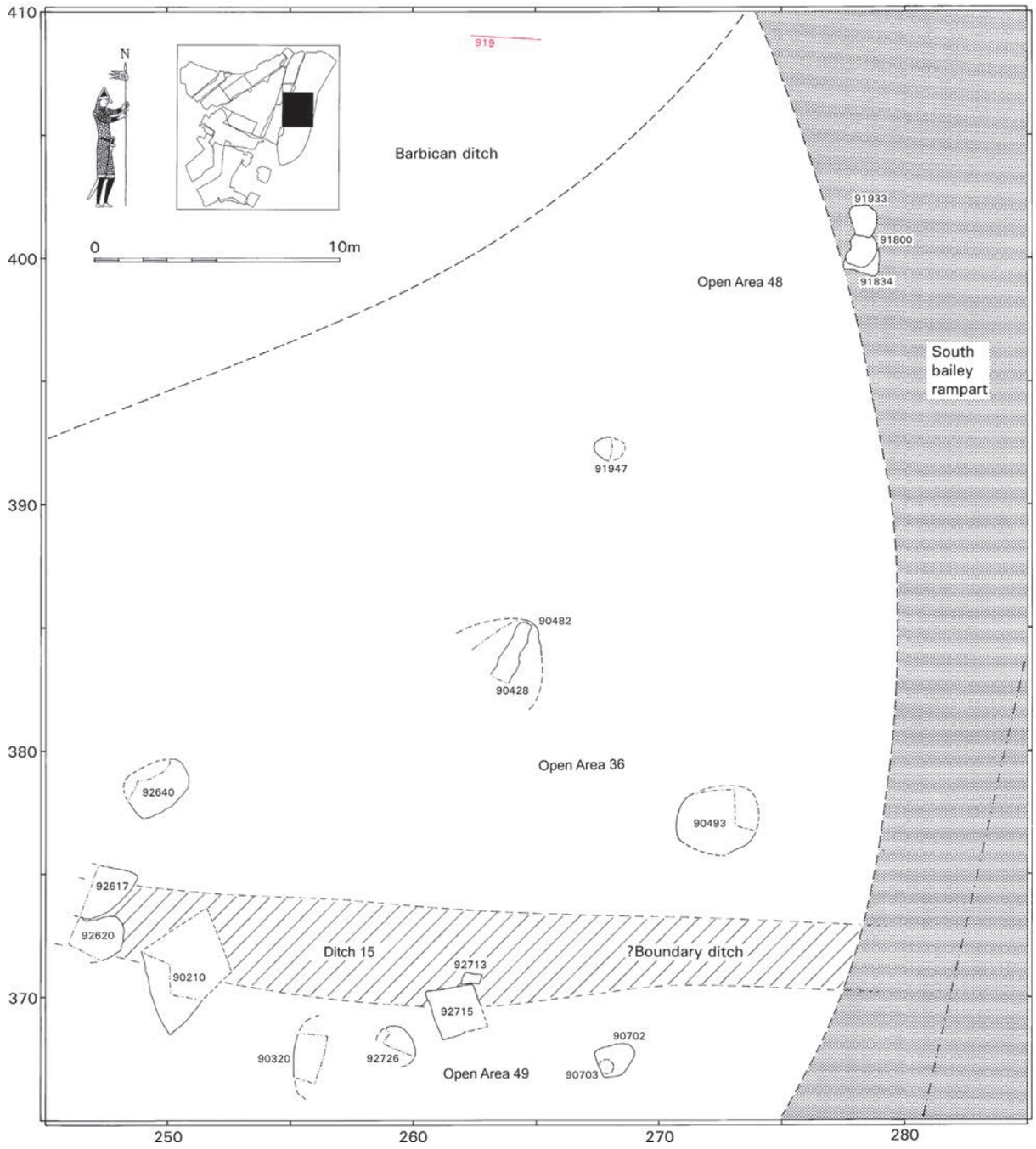


Figure 8.28 Period 5.2: Pitting to the east of the castle approach, Open Areas 36 & 48 (Castle Fee Properties 42 and 43). Scale 1:250

Two pits to the north (*91834 and 91933,* G9/118 (part)) pre-dated the construction of buildings in the area. One was 1.00m deep and the other *c.*2.50m. To the south-west lay an isolated pit (*91947*, G9/112), with a depth of 0.47m. Its fills contained a high organic content, as well as charcoal, burnt clay and shell.

To the south was a further phase of pitting (G9/104, pits *90482 and 90493*). The former was apparently a ?recut of pit *90481* and the latter a ?recut of pit *90539* (Period 5.1), the infill date of both probably extending into the 16th century. The pits indicate the continued disposal of domestic waste in the area. Pit *90482* (Fig.8.11) contained quantities of ash and heat-affected deposits (*90561* and *90457*), interleaved with sandier material (*90553*). Cutting into infilled pit *90482* was a linear feature (*90428*, G9/105), again with ashy fills. This was a rectilinear feature with a surviving length of 2.50m and a width of 0.80–0.85m, lying on a north-east to south-west alignment. It had vertical sides and varied in depth from 0.54 to 0.73m, sloping down towards the south. Basal fills (S.919 and 922 — Fig.8.11) included ash and charcoal, many other fills containing burnt clay (*90420*, *90405* and *90548*). Pit *90493=90448* was 2.70m deep and had been used for the gradual disposal of

waste, including ash and organic matter (similar to peat). Alternating clay fills may indicate a sanitation process. A further pit (*92640*, G9/99, part) lay to the west.

Small Finds

Pit *91834* contained painted medieval window glass (SF6548, Fig.8.56). Finds from pit *91947* include copper alloy objects (dress-making pin SF6394 and sheets, joined with a rivet SF6497), nails (SF6465 and 6496), iron strap (SF7502), painted medieval window glass (SF6550, Fig.8.56) and a silver Long Cross Penny (1272–1483) (SF7601). Finds from pit *90482* included copper alloy sheet (SF6397 and 6002) and a nail (SF5988).

Fills of pit *90493* contained copper alloy pins (SF6051 and 6010), copper alloy vessel fragment (SF7462, Fig.8.53), copper alloy and leather buckle (SF7461, Fig.8.36), two distinctive copper alloy candlesticks (SF1082 and SF1074, Fig.8.40), iron horse bit link (SF5973.01, Fig.8.60), ox shoe (SF5974, Fig.8.60), clench bolt rove (SF5980) and a whetstone (SF6392) of Norwegian ragstone.

Finds from feature *90428* included domestic waste including nails, a tenter hook (SF6193.1) and scrap of knitting (SF6283). Pit *92640* contained a purple phylite whetstone (SF238) and a double pierced piece of pottery, with an attempted third hole (SF520).

Pottery

by Irena Lentowicz

(Fig.8.44 on CD)

A total of 4.858kg of pottery was recovered, the majority coming from pit *90482* (2.063kg) although much of this was residual. Contemporary fabrics include GTGW, LMT, DUTR and Raeren-Aachen stoneware. The GTGW includes a jar rim (type cv 9/14). LMT was noted as fresh and was represented by rims from a jug (type *cv 9/15;* Fig.8.44, no. 2 and a jar (Fig.8.44, no. 1), and a jar as well as body sherds from a pancheon. The Raeren-Aachen body sherd dates this fill to the mid to late 15th to 16th century.

The pottery from pit *90493* (0.755kg) contains a residual element (including LMU). Other fabrics consist of GTGW, LMT and DUTR. The LMT was fresh and a number of cross-context joins were noted. Forms include a pancheon (Fig.8.44, no. 3). This pit was dated ceramically to the late 14th–15th century.

Contemporary ceramics from the remaining pits consist of LMT, DUTR, Raeren-Aachen stoneware and Langerwehe stoneware. Infilling during the mid to late 15th century is suggested. See Appendix 6.

Plant Macrofossils and Fish Bone

by Peter Murphy and Alison Locker

The sample from pit *91947* included large amounts of coke with some charred remains of bracken, reeds and barley grains. This probably represents domestic hearth debris: the use of fossil fuel had resulted in high combustion temperatures, hence the destruction of any moist plant material present. The fill of feature *90428* produced a similar sample to those from surrounding pits (G9/104) with silica ash of plant origin forming a major component (see further details in Table 8.25 and Chapter 8.IV). Mollusca are detailed in Table 8.26. Fish bone from the pits (G9/104) and the linear feature (G9/105) is indicated in Part III, Table 97.

Open Areas 49 and 50 (Properties 44–46): pits

(Fig.8.29)

An extensive area of late medieval pitting cut into (in many cases) fills or the postulated extent of fills, of underlying quarries (Period 5.1). There was apparently a trend in the 15th–16th centuries towards smaller pits, some with specific functions but most apparently used for the disposal of domestic waste. Many pre-dated masonry tenement structures, although some masonry wells and cess pits were clearly established by the 16th century elsewhere on the site (*e.g.* Areas 1 and 8). The pits can be loosely associated with Properties 44 and 46, some of them overlying the earlier boundary marker/routeway (Ditch 15). They extended westwards from the anticipated limit of properties at this period (see Chapter 8.V). The following description of excavated pits runs from north-to-south.

Pits associated with Property 44 (Open Area 49)

Five pits had been dug into the infilled boundary ditch (Ditch 15; pits *92617a and 92620* G9/99, *90210,* G9/91, *92713 and 92715,* G9/94). One pit contained a partially articulated pig skeleton. These pits lay between former Quarry Areas 1 and 5 and it is conceivable that some may have been contemporary with the quarrying.

More refuse pits containing notable quantities of refuse including ash, charcoal and other burnt matter lay just to the south of the ditch (*92726 and 90320*, G9/91; G9/82, *90702*, with post-hole *90703*). Another sequence of pits (G9/87, part) lay to the south-west (*90821, 90899, 90997, 90843, 90974, 90678, 90671, 90705, 90741, 90704, 90678, 90658, 90790 and 90821*). These were either filled with redeposited natural or refuse type fills (again including ash, charcoal and coal).

Just to the west were four more pits (G9/73; *90261, 90307, 90168 and 90356*). At the base of pit 90261 was a charcoal layer, perhaps a burnt lining. The pit was eventually filled with refuse including oyster and mussel shells, large quantities of charcoal and lime lenses. Upper fills were noted to contain articulated bone which may relate to half an articulated pig skeleton lying just to the south (sk.90171).

Just to the east were five more pits (G9/82) all used for refuse disposal (*90712, 90710, 91012, 90715 and 90961)*. The deepest was 1.80m deep. The lower fills of pit 90961 produced over 4kg of pottery, much of which may have been disturbed from earlier pits. A series of chalky dumps may have been deposited in preparation for occupation of the area or for general levelling (G9/84), overlying quarry backfills. Cutting into them was a short length of slot (*90743*).

Further to the south-west was another area of intercutting pits up to 2m in depth (G9/59; *90954, 90952 and 90955*), lying between former Quarry Areas 1 and 2. Their ceramic date is late 14th century although their spatial position suggests that they probably cut into quarry fills.

To the south-east was an isolated deep pit (*90714*, G9/62) cutting into fills of an underlying Quarry Area 3. The feature had ended life as a refuse pit, although the presence of two posts at its base may suggest an alternative primary function. The pit may have been nearly 3m in depth. Refuse deposition appears to have taken place gradually, finds indicating domestic waste.

Pits associated with Property 46 (Open Area 50)

To the west was another sequence of intercutting pits (G9/56), lying between earlier areas of quarrying. To the east was an area of four pits (*90048, 90050, 90044 and 90046*), the deepest being 0.85m deep. Four other pits lay just to the west (*90052, 90032, 90034 and 90017*). Pit 90032 survived to 0.60m deep and was lined with wood, held together with nails. At the base of the pit was a patch of clay (which may have been used as a hearth), overlain by deposits of charcoaled bone and wood. The pattern of deposition within it may indicate refuse deposition, alternating with natural deposits used to seal earlier fills.

The southernmost of the pits in this part of the site were seven pits of varying size and shape (G9/121, *90163, 90155, 90156, 90131, 90159=90121, 90157*, *90008*).), although generally quite small. One pit was clay and chalk lined (*90159=90121,* S.905 – Fig.8.30) and another was clay lined, the lining having been burnt *in situ* (*90155*). It is possible that a craft/industrial activity was taking place here (horn cores were present).

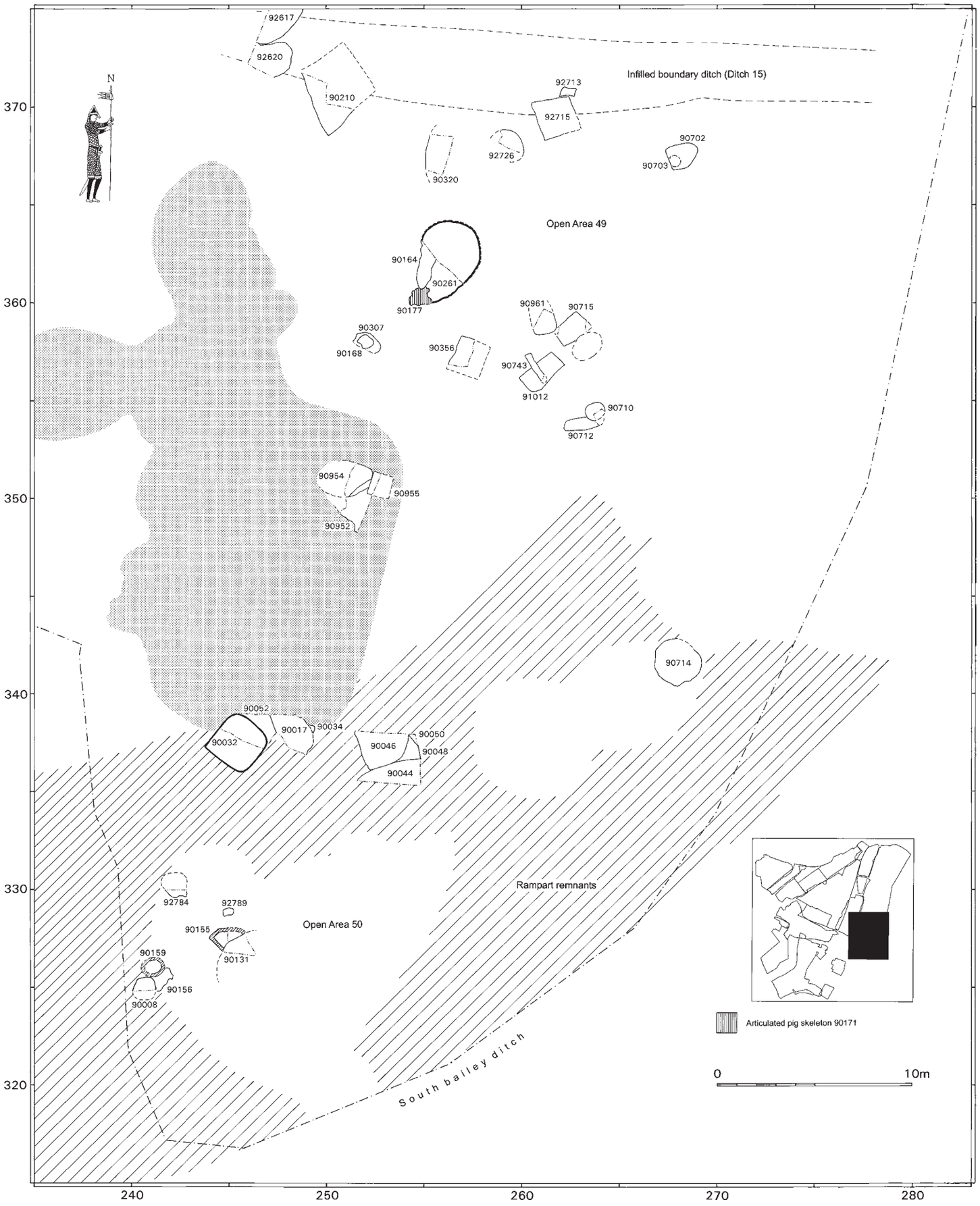


Figure 8.29 Period 5.2: Pits above quarries to the east of the castle approach, Open Areas 49 & 50 (Castle Fee Properties 44–46). Scale 1:250

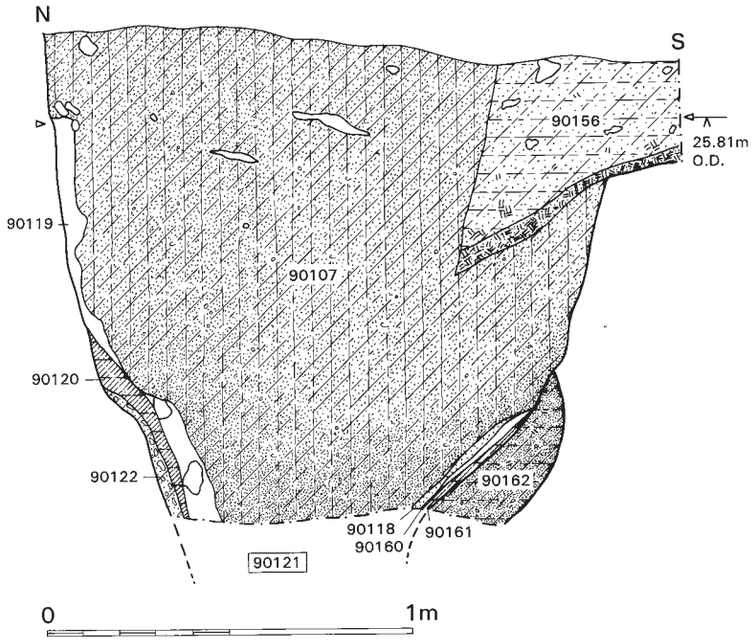


Figure 8.30 Period 5.2: West-facing section across pit *90121=90159*, Open Area 50, Castle Fee Property 46. Scale 1:20

Small Finds

Finds from pit *90210* included two glass beaker fragments of 14th–15th- and 15th–16th-century type (SF6171.01 and 0.2, Fig.8.53), window glass (SF7563), a copper alloy dress pin (SF6516) and a nail (SF6101). Pit *90320* contained cinder and smithing slag as well as two nails (SF6026 and 5961).

Pit *92620* contained a bone implement (SF231) and a copper alloy dress-making pin (SF232). Pit *92726* contained a vitrified tile (SF565), copper alloy dress-making pin (SF247), riveted iron sheet (SF593), nail (SF262) and a possible ceramic kiln debris (SF574). Sawn antler (SF7432) was retrieved from pit *92713*.

Finds from pit *92715* included a complete scale tang knife with inlaid maker's mark (SF250, Fig.8.54), medieval window glass (SF566), copper alloy wire (SF248), a dress-making pin (SF251) and iron industrial debris (SF567). Two iron objects were recovered from pit *92696=92697=92698* (a horseshoe nail SF245 and and nail SF563).

The assemblage of eighteen Small Finds from pit *90702* is summarised in Table 8.7 on CD. Illustrated finds consist of a copper alloy vessel patch (SF6038, Fig.8.53; Goodall, Chapter 8.III), two iron jack plates (SF6057.01, Fig.8.60, Mould, Chapter 8.III) and a knife with a maker's mark (SF6031.03, Fig.8.54; Mould, Chapter 8.III).

Pit *90710* contained daub, plaster, tile and a nail (SF6223). Finds from pit *91012* included fired clay and brick, as well as a copper alloy pin (SF6060) and nail (SF6229).

The ten Small Finds from pit *90715* is summarised in Table 8.8 on CD. Illustrated items consist of a copper alloy dress pin (SF6065, Fig.8.36; Goodall, Chapter 8.III) and a copper alloy purse hinge (SF6072, Fig.8.38; Goodall, Chapter 8.III).

Finds from pit *90961* included three nails (SF6155, 6162 and 6289) and a copper alloy object (SF6156). Finds from pit *90261* included pottery, animal bone, hearth bottom, brick/tile, daub and fired clay. Iron objects were a tang with mineral preserved coating from a handle (SF5895), nails (SF5931 and 6249) and a ?pierced plate (SF6099). Finds from pit *90307* were brick fired clay, plaster and mortar and a copper alloy pin (SF1068). A spur fitting with a non-ferrous metal coating (SF6150, Fig.8.60) and possible strap guide were also recovered (SF6135), as well as an s-shaped chain link with non-ferrous metal coating (SF6135.1). Pit *90168* contained a tanged chisel (SF6100, Fig.8.59).

Pit *90954* contained two nails (SF6228 and 6122), with another retrieved from pit 90952 (SF6306). Finds from pit *90955* included another nail (SF6303). Pit *90714* contained a copper alloy pin (SF6092) and an iron nailed binding/horseshoe (SF6091). Pit *90157* contained the branch of a horseshoe (SF5913.1). Finds from pit *90032* included brick and roof tile, lava quern (SF5804), nail (SF6019) and sawn antler (SF5834). Finds from pit *90159=90121* included a bone stylus (SF5909, Fig.8.38), a copper alloy strip (SF6022) and iron nail (SF6021). Pit *90155* contained nails (SF6096). Pit *90131* contained a copper alloy casket fitting (SF5894, Fig.8.54) and an annular iron buckle with non-ferrous metal coating (SF6425).

Pottery

by Irena Lentowicz

(Figs 8.45–8.46)

These pits produced assemblages with fine vessels, a total of 18.287kg of pottery being recovered (fully detailed by feature in Appendix 6). Small quantities of medieval pottery, mainly LMU and GTGW, were recovered from some pits and it is difficult to determine when LMU in particular becomes a residual element in late medieval/transitional assemblages, but for the most part it is seen as contemporary until the end of the 15 or 16th century. Some pits contained high proportions of residual pottery. Contemporary pottery consists of LMT, DUTR, Raeren-Aachen stoneware and Langerwehe stoneware. Infill dates of the late 14th–15th century, 15th century, late 15th–mid 16th century and mid 16th century are indicated (see Appendix 6).

Selected vessels from various pits have been illustrated. A large assemblage was recovered from pit *90961* (G9/82, part; 2.449kg; Fig.8.45) and much of the assemblage was residual earlier material (62%). This pit included a single sherd of LMU, but contemporary material was restricted to LMT with two Siegburg stoneware body sherds. LMT was represented by rims from two pancheons (Fig.8.45, nos 1 and 2), a globular jar (type A1; 7a, no. 3) and a jar with a bifid rim (type A4; Fig.8.45, no. 4) as well as two 'mugs' (Fig.8.45, no. 5) and four bases.

Pit *90710* (G9/82, part; 0.108kg) contained only contemporary pottery. This included sherds from an LMT cooking pot or pipkin (type *cf 9/15*; Fig.8.45, no. 6), and DUTR and Langerwehe stoneware vessels. This pit is dated as late 14th- to 15th-century.

Pit *90702* (G9/82 part; 0.975kg; Fig.8.45) was dominated by residual pottery, but contemporary material was well represented by body sherds of GTGW-type Glazed ware, as well as LMT, DUTR and Siegburg and Langerwehe stonewares. Only two vessel were represented by a rim, an LMT jar rim (type *cf 9/15*) and a Langerwehe drinking vessel rim (Fig.8.45, no. 7).

The majority of the pottery from pit *90715* (G9/82, part; 2.715kg; Fig.8.45), was dominated by Late Saxon/early medieval wares. LMT was the most common contemporary fabric and was noted as fresh. It was represented by handles from a pipkin and a double, horseshoe handled jar (type B2), as well as by two bases and decorated body sherds. One of the bases came from a jug (Fig.8.45, no. 8) and was noted as scaled inside. Other fabrics present included four sherds of Cologne-Frechen stoneware and a possibly intrusive fragment of West Norfolk Bichrome ware, probably from a pipkin. However, if this pit was dated as mid–late 16th-century, this latter sherd could just be contemporary,

although it does tend to occur in late 16th-century contexts in Norwich. One of the body sherds bears the traces of a medallion and can be dated to not earlier than the mid 16th century.

Almost 1.5kg of pottery (1.499kg) was recovered from pits G9/56 (Fig.8.46). The largest assemblage came from pit *90032* (0.675kg); this included a small quantity of residual pottery as well as contemporary fabrics. Although an oxidised GTGW-type Glazed ware sagging base, probably from a globular jug (Fig.8.46, no. 2), was present, no other medieval wares were recorded. LMT was represented by rims from a globular jar (type A1; Fig.8.46, no. 1) and a bowl, as well as by two bases and a body sherd decorated with iron oxide painted decoration. The late medieval nature of the assemblage is attested by the latter sherd reflecting the medieval tradition incorporated into production of later industry, as does the sagging GTGW Glazed ware base. In addition, a foot from a DUTR pipkin was also recovered along with a small chip from a Tudor Green-type drinking vessel. A virtually complete, frilled Siegburg stoneware drinking vessel base was also present (Fig.8.46, no. 3), along with a Langerwehe body sherd. A mid to late 15th-century date is suggested.

Within pit *90017* (0.493kg), no residual material was recorded and the assemblage was made up of sherds from two vessels, an LMT pancheon (with complete profile; Fig.8.46, no. 4) and two sherds from a single Langerwehe stoneware drinking vessel. This pit has been dated as late 14th- to mid 15th-century.

Animal Bone
by Umberto Albarella, Mark Beech and Jacqui Mulville
Pits *90261* and *92715* contained a partial pig skeleton and a partial dog skeleton respectively (Albarella *et al* Chapter 8.IV and Part III). Although only six bones were recorded from pit *90261*, half of a pig carcass (sk.90171) was probably associated. These bones were not collected due to poor preservation. A turkey bone came from mid to late 16th-century pit *90715*.

Properties 42–46: masonry lined wells and cess pits
Six wells or cess pits lay across the area of the site detailed above, although most are probably post-medieval in origin and are therefore discussed in Period 6 (Chapter 10). Two features may have been late medieval/transitional in origin (G9/123, part). These are a brick and stone lined cess pit (*92404*) and a ?well (*90132*). The lining was well-constructed with flint nodules and brick bonded with soft cream mortar. Post-medieval fills of the well indicate its later re-use for other purposes (Chapter 10.II).

Pottery
Pottery from cess pit *92404* was all medieval and was dominated by LMU, as well as GTGW. See Appendix 6.

Castle Fee Properties in Block II (west of castle approach)
(Fig.8.2)

Ditch 10, Phase 9 (?Property 47): refuse
by Elizabeth Shepherd Popescu and David Whitmore
Activity apparently within Property 47 recorded at the Golden Ball Street site included the final infilling of the south bailey ditch (Ditch 10). Overlying earlier fills (Period 4.2) was a sequence of mixed fills attributable to this period, apparently tipped into the ditch from the south (*546, 548, 547 and 464*, GBS Group 49). These included reddish or greyish brown clay sand silts, occasionally with a cess-like appearance.

Small Finds
Fill *464* contained iron nail fragments (SF83).

Pottery
A total of 0.458kg pottery was recovered, contemporary fabrics consisting of (LMU), Raeren stoneware and GTGW coarseware. Ditch fill *546* contained part of a Raeren stoneware jug with a frilled footring, which had been subsequently used to contain mortar: this vessel dates from the late 15th to the first half of the 16th century. See Appendix 6.

Ditch 10, Phase 10 (?Property 47): cleaning and refuse
by Elizabeth Shepherd Popescu and David Whitmore
Another possible cleaning episode or period of stabilisation (*503*, GBS Group 48) was not as clear as those which had preceded it (in Periods 3 and 4). The base of the suggested cleaning line lay 2.85m above the original base of the ditch, at a depth of 23.50m OD. By this stage, the ditch had a wide (9.05m) uniformly concave profile. A machine dug section longitudinal to its butt end clearly demonstrated that deposits had been tipped westwards into the ditch, utilising its most accessible point adjacent to the lane.

The initial fill after the putative cleaning episode was clean sand (*560*) that probably resulted from slumping or inwash into the base of the ditch. The overlying thin dirty layer (*554*) may represent standing water or puddling at the base of the cut. Two subsequent sandy fills (*501 and 502*) on the northern edge of the ditch may in fact have been the product of a much earlier phase of deposition, leached out from the ditch side as a result of weathering.

Over these layers a substantial dump of silty sand refuse (*499*) had been tipped. The profile of this deposit gave the appearance of having later been cut, perhaps during further ditch clearance. Thin layers of dumped refuse covered the base of this putative cleaning including a substantial layer of peat ash (*506*). Further layers of sandy silt probably represent the final backfilling of the ditch (*497, 505, 512, 523 and 498*), prior to deliberate levelling above. Dumps of dirty redeposited natural sand and clay (*462 and 463*) may indicate upcast from pit digging immediately to the south of the ditch.

Small Finds
Fill *436* contained an iron artefact (SF77) and a copper alloy strip (SF116). Fill *462* contained an iron artefact (SF90). Fill *505* contained lead spillage (SF51), iron ?nail shank (SF91) and a fragment of residual silver coin (attributable to a Plantaganet king, cut farthing, short cross, illegible, 1180–1247, SF102). Fill *506* contained lead sheet (SF52), lead sheet (SF54), an oval copper alloy buckle frame (SF254) and a copper alloy strip (SF256). Fill *501* contained lead spillage (SF55). Iron nails came from fills *560* and *523* (SF88 and SF89).

Pottery
A total of 2.306kg of pottery was recovered, although the vast majority of the pottery recovered from the infilling of this recut was clearly residual. The best indicator of the date is the first appearance of LMT, most notably the single sherd (14g) in the thin band of clay sand (*554*) close to the base of the cleaned out ditch. Large fragments of LMT were also retrieved from peat ash dump (*506*) and the substantial backfilled deposit (*505*) above. Contemporary fabrics consist of LMT, GTGW (including GRIL and GRCW) and MCW. Overall the pottery suggests a late 15th- or 16th-century date for this phase of backfilling. See Appendix 6.

Ditch 10, Phase 11 (?Property 47): levelling
by Elizabeth Shepherd Popescu and David Whitmore
(Fig.8.31)
The final phase of infilling of the south bailey ditch was represented by a series of levelling deposits, possibly involving the landscaping of the area to the north of the ditch (GBS Group 54). This levelling consisted of horizontal dumps of silty sand or clay silt sand (*341, 342, 343, 437, 478, 482, 494, 495, 498 and 514*). The uppermost deposits may have been laid down as make-up for a subsequent gravel yard surface that was constructed over the top of the backfilled ditch.

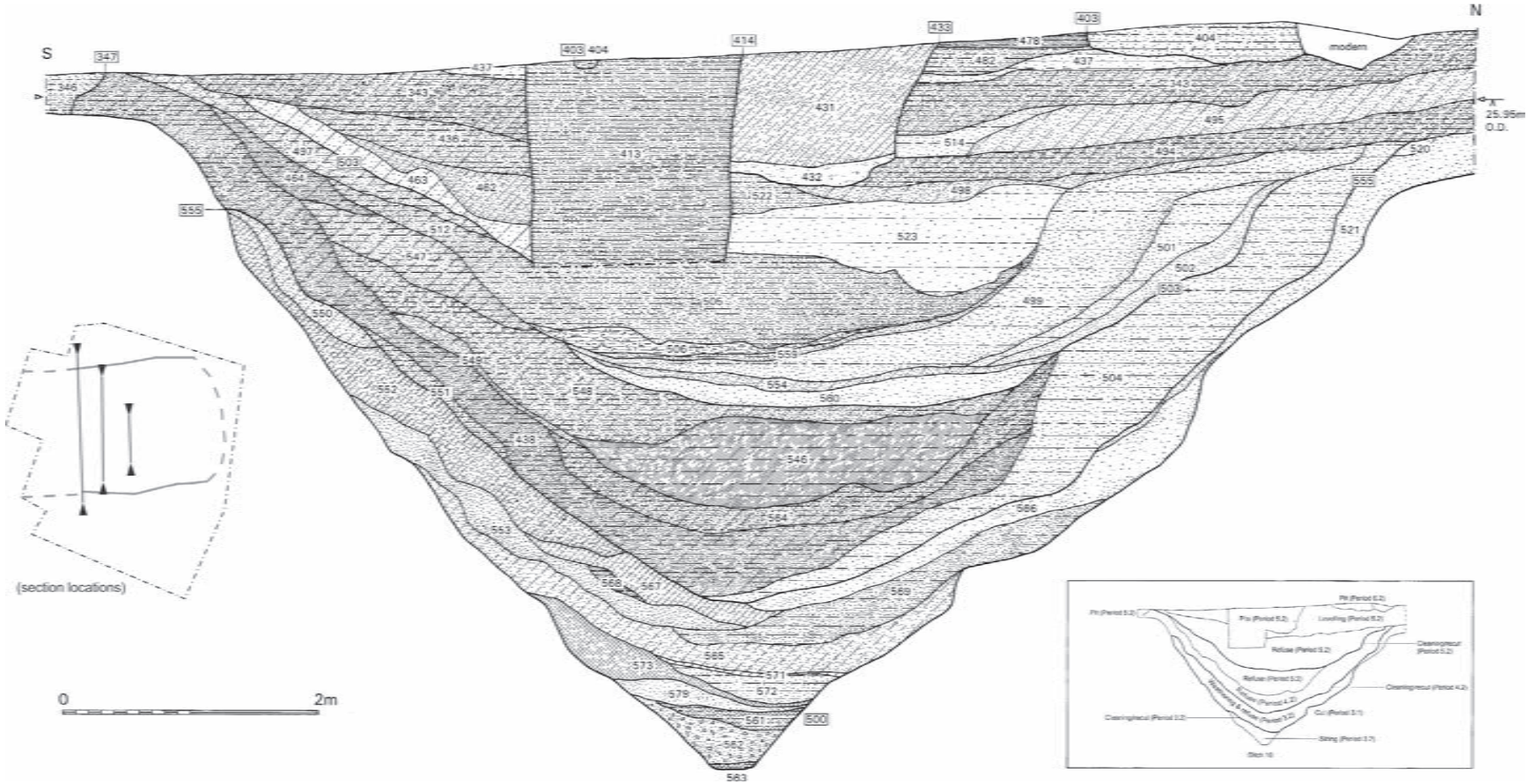


Figure 8.31 Periods 3–5: Composite east-facing section across Ditch 10 (south bailey) (Golden Ball Street, Area 1) (?Castle Fee Property 47). Scale 1:50

Small Finds
Fill *341* contained iron nail fragment (SF136). Fill *343* contained iron nail fragments x 6 (SF79), copper alloy rivetted shell mount (SF98, Fig.8.37), iron artefact (SF137), copper alloy staple (SF155), illegible silver penny of 14–15th-century date (SF173), copper alloy rivetted strip (SF179), illegible copper alloy Nuremberg jetton of 'Rose/orb' type, 16th–early 17th-century (SF198). Fill *437* contained an iron artefact (SF75) and iron nail fragment (SF128). Fill *478* contained iron artefact (SF145). Fill *482* contained a copper alloy staple (SF94). Fill *494* contained ferrous metalworking debris (SF76), iron nail (SF193), copper alloy ?metalworking debris (SF203) and an oval buckle frame (SF230).

Pottery
A total of 2.363kg of pottery was recovered. Contemporary fabrics comprise GRE, (LMU), GTGW, GRCW, GRIL, MCW and LMT (see Appendix 6). A large GRE Pipkin handle from fill 343 suggests a 16th- to 18th-century date for this levelling, although a date in the earlier part of this range appears likely, given the date and quantity of 15–16th-century material recovered from subsequent features. As with the underlying ditch fills, the majority of the pottery from the levelling layers was residual. Layer 343 proved to contain the greatest variation in pottery fabrics and was probably the product of landscaping and redeposition of occupation debris rich soils from nearby.

Open Area 51 (?Property 47): pits
by Elizabeth Shepherd Popescu and David Whitmore
(Figs 8.31)
Pitting into the infilled south bailey ditch appears to have occurred fairly rapidly. Two clusters of pits of late 15th to 16th century date were cut into the uppermost ditch fills, in a line which reflects the documented property boundary. To the west were a number of intercutting pits (GBS Group 45, *577, 347, 433 and 414*). The latter two cut through the upper stepped section of the south bailey ditch (Fig.8.31). Unbottomed pit *414* had been infilled with a refuse-type deposit containing a notable quantity of butchered animal bone. Its vertical sides suggest either that it had been revetted or was infilled rapidly. Both pits were sealed by a subsequent gravel yard surface constructed over the south bailey ditch between two now demolished buildings.

Further east, a group of three intercutting pits lay immediately south of the infilled ditch. The earliest and most notable was a circular example (*477*, GBS Group 56) which contained elements of a collapsed clay lining and a rich humic backfill. Possible stake-hole impressions within the clay may have represented a wicker lining. The pit was not bottomed at a depth of 1.20m. Two other pits followed (*490 and 474*, GBS Group 55).

An large irregular shaped pit (*411/530*; GBS Group 44) measuring at least 4.75m by 5.05m was cut through the earlier pits as well as the butt end of the south bailey ditch. It was probably sealed by the later gravel yard surface. Only the upper 1.20m of this pit was excavated by hand, with the remainder being removed by machine as part of the excavation of the ditch itself. The pit base was encountered at a depth of approximately 3.50m. This pit had clearly been used for the disposal of refuse, its primary fills having a high humic content. Upper fills comprised alternate layers of clay silt sands and burnt ash or charcoal and coal. This alternating sequence of fills may indicate that the burnt deposits were being placed into the pit whilst still hot and then rapidly covered with a more homogenous dumps of topsoil. The size of the pit may indicate that it may have remained open for a considerable period of time.

Ten post-holes were revealed after the machine stripping of the later gravel yard surface laid over the infilled south bailey ditch. All were cut into the ditch or pit fills and their roughly north-west to south-east alignment may reflect the known property boundary. One deep rectangular example (*399*) contained a fragment of human upper jawbone used as packing material.

Small Finds
Pit *414* contained a copper alloy English jetton dating to *c*.1280–1350 (SF194); copper alloy double-looped buckle frame (SF218). Pit *473* contained copper alloy object (SF257), while pit *477* contained iron ?nail shank (SF165).

Pit *411=530* contained: lead sheet (SF50); medieval window glass (SF39); copper alloy vessel rim (SF177); copper alloy pin and wire (SF184); copper alloy wire loop fastener (SF187); copper alloy lacetag (SF192); copper alloy ring (SF96); copper alloy buckle or suspension ring (SF234); copper alloy wire loop fastener (SF100); copper alloy sheet (SF242); perforated copper alloy sheet (SF244); copper alloy wire of varying gauges (SF95); copper alloy wire loop fastener (SF233). Ironwork from the pit comprised a chisel (SF133), a collar ferrule (SF170) from another implement, a broken horseshoe (SF253), fragments of knife (SF109 and possibly SF169), a strap fragment (SF144) and a small quantity of timber nails. An iron nail fragment (SF141) came from post-hole *399*.

Pottery
by Richenda Goffin
(Fig.8.50)
A total of 8.0004kg of pottery was recovered, of which a significant proportion (2.340kg) came from pit *477*. The most substantial vessel recovered from this pit consisted of 45 fragments of a highly decorated green glazed rounded jug (Fig.8.50, no.1) made of a sandy reduced fabric similar to GTGW, with has an olive-coloured lead glaze covering the upper part of the vessel, with some streaks present towards the bottom. The vessel has a slightly sagging unthumbed base, which has a diameter of 140mm. The decoration of the upper part of the jug is restricted to zoned patterns of curvilinear scrolling. The method of achieving this decoration appears not to have been through free-hand incised work, but by the application of one or more stamps, impressed with varying degrees of pressure. The top of the rim is very abraded, and is characterised by a slight collar. No fragments of any handle were recovered. In view of the fact that the vessel is highly decorated, it is likely that the jug is of 13th–14th-century date. However, no parallels for this type of decoration on GTGW can be found, and it is possible that it is non-local or even imported. The jug is accompanied by three body sherds of second vessel, which has an orange pink inner surface and pale grey outer surface, with watery lead glaze, identified as Yarmouth-type Glazed ware of 13th–15th-century date.

Pit *490* contained some clearly residual material comprising TTW, EMSW, Stamford ware and EMW, along with fragments of LMU. In addition 5 fragments of GTGW, and the complete upper part of a GTGW face jug with applied spout were present (Fig.8.50, no.2). Such highly decorated products of the Grimston kilns date to the 14th and 15th centuries (Clarke and Carter 1977, 206).

Pottery from the remaining pits is detailed in Appendix 6. Contemporary fabrics consist of GTGW, GRE, LMT, Langerwehe stoneware, Raeren stoneware, German stoneware and Siegberg stoneware, indicating infilling during the late 15th to 16th and 16th centuries.

Open Area 38 (?Property 49): garden with pits and skinning waste
(Fig.8.32, Plate 8.11)
Two pits lay within the suggested confines of Property 49 (G1/24, part). One contained a significant concentration of sheep/goat metapodials and horn cores from skinning activities, while the other also contained horn cores (see Albarella *et al* below). Both pits also contained a range of domestic waste. To the north-west was a sub-oval pit (*11048*), 0.52m deep, filled with a single deposit of mid brown loam with moderate small to large flints. The second pit (*11064*) lay to the south-east and was rectangular in plan, not being bottomed at a depth of 1.65m. Its lowest fill was of light grey clay loam with frequent charcoal and a large number of horncores. Above this

was a darker layer with frequent pebbles and burnt flint, as well as abundant large shells (oysters and whelks) and horn. A thin layer of charcoal was then sealed by another fill containing frequent pebbles. Although this pit has a ceramic date of mid to late 14th-century, it cut into fills of an earlier quarry (pit *11602*, Period 5.1) and has therefore been interpreted as a secondary activity in the period following the events of 1345. The presence of hornworking waste from both pits does tend to suggest that they were in use contemporaneously.

Two small domestic refuse pits above earlier quarries were recorded in what may also relate to Property 49 (G1/26). One (*11721*) was rectangular and was augered to a depth of 0.63m. The other (*11358*) was square with rounded corners and of unknown depth. Both were filled with dark loam deposits containing shell.

Small Finds

Pit *11048* contained a copper alloy strap-end (SF5372; Fig.8.37). Small Finds from pit *11064* are summarised in the following table.

Pit *11721* contained an iron ward plate from a lock (SF5587.1) and two pieces of nailed binding (SF5553). Pit *11358* contained a copper alloy pin (SF5497), vessel and window glass (SF5596 and 5537) and a nailed iron strap, possibly from a horseshoe (SF5594).

Fill	*SF*	*Description*	*Figure*
11058	SF5397	copper alloy ?suspension ring	Fig.8.54
	SF5357	composite knife with two silver inlaid hearts	Fig.8.54
	SF5470	iron blade with a maker's mark	
11063	SF7609	sawn horn	
	SF5388	iron knife blade fragment	
	SF5358	iron horse harness buckle	Fig.8.60

Table 8.9 Small Finds from pit *11064*, Open Area 38 (?Property 49)

Pottery

by Irena Lentowicz

(Fig.8.47)

A total of 1.557kg of pottery was recovered from these pits. Over a kilogram of pottery (1.186kg) was recovered from two of the pits, although their character is different. The largest assemblage came from pit *11048* (0.973kg; Fig.8.47). The fills contained a few sherds of residual Late Saxon and early medieval pottery, although no medieval material was recovered and the assemblage is made up of typically later medieval/transitional fabrics. LMT is more common, represented by rims from two jars (type A1; Fig. 8.47, nos 1 and 2), a storage jar with horseshoe handles (type B2; Fig.8.47, no. 3) and a skillet with a carinated profile (type E2; Fig. 8.47, no.4) as well as grooved body sherds probably from a globular jug. DUTR was represented by the rim, handle and body sherds from a single skillet. A small Siegburg stoneware body sherd was also recorded, along with sherds of an unidentified fabric. This pit appears to date to the early to mid 15th century.

Pit *11064* (0.213kg; Fig.8.47) also contained a residual element, but included medieval pottery represented by a single sherd of LMU and a rim from a Hedingham-type ware jug (type cv 1/20). Later medieval/transitional fabrics were restricted to LMT, which was represented by a rim and handle from a pipkin and a flat ware base, and a decorated body sherd from a Siegburg stoneware drinking vessel (Fig.8.47, no.5). These forms were recovered from the same context, although the pipkin was noted as fresh and the base and used and worn. The absence of

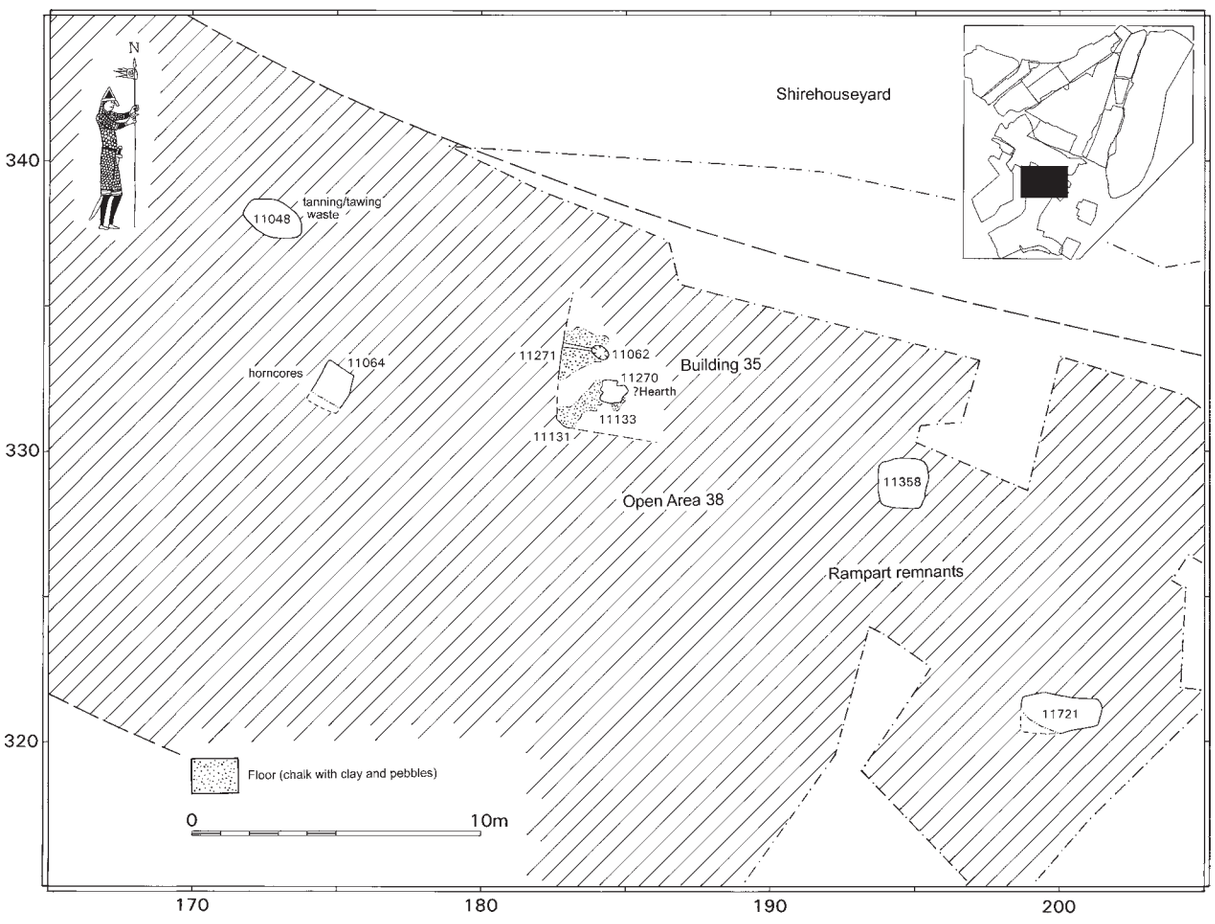


Figure 8.32 Period 5.2: Tanning/tawing waste pits above south bailey rampart, Open Area 38 (Area 1) (?Castle Fee Property 49). Scale 1:250

other later medieval/transitional fabrics and the presence of medieval wares (albeit in small quantity) would indicate that a mid to late 14th-century date is more appropriate for this pit group.

A total of 0.244kg of pottery was recovered from the other two pits, although they were not similar in nature. Medieval fabrics consist of LMU, GTGW and non-local Red-Glazed ware. Late medieval/transitional pottery consists of LMT and Langerwehe stoneware. See Appendix 6.

Animal Bone
by Umberto Albarella, Mark Beech and Jacqui Mulville
(Plate 8.11)
Pit *11048* contained a collection of 21 horncores, 109 metapodi and 60 phalanges (all belonging to sheep). All of the horncores had been chopped off the skull, 22% of the metapodi bore cut marks, presumably from skinning, whereas no butchery marks could be found on any phalanges. Cut marks on both metacarpi and metatarsi were all located very close to the proximal end. This deposit can be interpreted as the result of primary butchery activity, that is when body parts which carry little or no meat are discarded. Both the absence of other anatomical elements and the well-documented importance of leatherworking in Norwich indicate that this may have been tanning or tawing waste (see further details in Chapter 8.IV and Albarella *et al.* Part III). Pit *11064* also contained chopped horncores (28 NISP) of sheep and goat.

Building 35 (?Property 49)
(Fig.8.32)
Between the two sets of pits described above was the remnants of a small building, only the south-western corner of which survived (G1/27). Dating is uncertain; this may have been a 15th- to 16th-century 'workshop' associated with the adjacent skinning activities, or may have been later (*i.e.* post-medieval) in origin. The roughly square corner of a cut about 0.20m deep (*11270 and 11271*) was dug for the insertion of a floor, which survived in patches of made chalk and clay with frequent pebbles, perhaps rammed to form a compact surface (*11066, 11131 and 11133*). Above this was a roughly circular hearth (*11153*) overlain by the remnants of trample/abandonment processes (*11132*). A post-hole (*11062*) lay to the north-west of the hearth and a narrow slot ran from it westwards to the edge of the structure, perhaps indicating the presence of a partition.

Ceramic Building Material
Building materials recovered comprised medieval peg tile (type RT200) and fired clay/daub.

Pottery
Pottery (8g) comprised a single sherd of residual St Neots-type ware and a sherd of non-local Medieval Glazed ware.

Garden wall (Property 50)
(Figs.8.33–8.34, Plates 8.7–8.8)
Property 50 is described as a garden with stone walls by the mid 16th century. A 20m length of wall (*80034*, G8/22) lay above the remains of the south bailey rampart and coincidentally followed the same north-west to south-east line as the underlying pre-Conquest hollow (see Period 1.1, Chapter 4.II). The foundation trench (*80054*) extended to north of the wall itself, the latter having been constructed against the southern edge of the construction cut. The lowest fill of the foundation trench may indicate trample or weathering accumulated during wall construction. Above it was a layer of hardcore in the form of flint nodules. The wall itself survived to a height of 1.10m and was 0.70m wide. It was of flint and sandy pale yellow/cream mortar with the facing flints being slightly larger (to 0.25m), smaller flints forming the core of the wall (to 0.10m, S.805; Plates 8.7 and 8.8). The wall was not regularly coursed, although it contained some short strings. Its central section leaned towards the south-west and was slightly out of line with the rest of the wall, probably due to slumping. The construction cut to the north of the wall was subsequently backfilled with clean gravel and sand containing mortar, coal and charcoal with very occasional fragments of red brick towards the top. A single brick retained for identification proved to be type EBA, attributable to the late 13th to 14th century, indicating that a construction date earlier in the medieval period is possible. Given that the wall lay within the south bailey, a date in the second half of the 14th century would appear to be the earliest possible origin.

Plate 8.7 Mid 16th-century garden/terrace wall *80034*, Open Area 50 (Period 5.2)

Plate 8.8 Detail of mid 16th-century garden/terrace wall *80034* (Period 5.2)

Small Finds
Finds from the construction cut included ?medieval window glass (SF5773) and iron nails (SF5782, 5882, 6471, 6157 and 6436).

Pottery
A small quantity of pottery came from fills of construction cut 80054. The only contemporary pottery is LMU and GTGW. See Appendix 6.

Open Areas 39 and 40 (Properties 50–51/ a–b): pits (Fig.8.33)

Overlying earlier quarries (Period 5.1), a number of pits of 15th- to 16th-century date were recorded in the northern part of what may have been Properties 49–51 or (a) and (b), depending on the position of the boundary between them (G8/29, part and G8/25). Their intercutting nature suggests a focus of activity.

To the south-east was a group of pits lying immediately adjacent to the terrace/garden wall (Open Area 40). These may have lain in the rear garden of Property (a) and/or (b), assuming that the earlier boundary with properties fronting onto Castellond had moved northwards (see Chapter 8.V). One (G8/29, *80149*) was filled with domestic refuse of 15th century date. Just to the south-east of it were five more fairly large pits (G8/26) suggesting a combination of quarrying and refuse disposal. These were recorded in the south-facing section of a machine trench (S.819 and 820, *80385, 80214, 80215, 80386=80388 and 80440*) and were generally a metre or more in depth. Complex infill sequences included dumps of demolition material (ash, chalk, charcoal and mortar), along with refuse including food waste (shell, fish and animal bone). It is possible that these large pits, forming a line running to the south of the wall were dug for the purpose of extracting sand and gravel. They may have been used as refuse pits as a secondary function.

Another cluster of pits lay to the north-west (Open Area 40). The southernmost of these, running into the limit of excavation, was an irregular pit (*80019*, S.808) with a flat base (0.50m deep). To the north lay the lower of two pits (*80055*, S.806) *c.*2m deep, with a clay lining at its base. Just to the east was a second pit (*80170*) which was at least 2m deep and may have functioned as a cess pit. One of its fills comprised flint nodules which may have been residue from the construction of the adjacent wall. Other pits in the sequence (*80038, 80045, 80040, 80162, 80166 and 80170*) were up to 0.60m deep. To the south-east of the intercutting cluster of pits was an

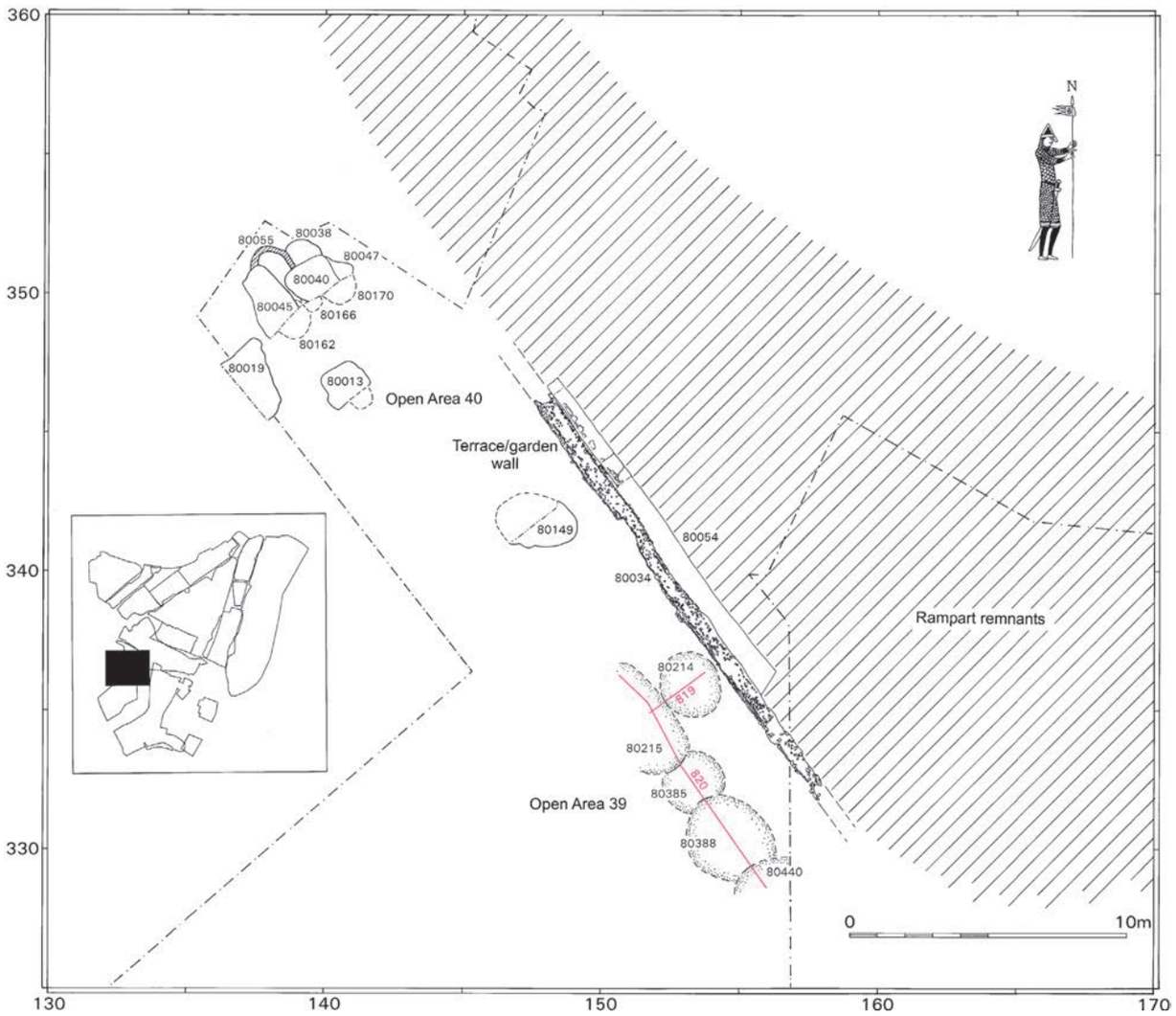


Figure 8.33 Period 5.2: Retaining wall *80504* and adjacent pits, Open Areas 39 & 40 (Area 8) (Castle Fee Property 50). Scale 1:250

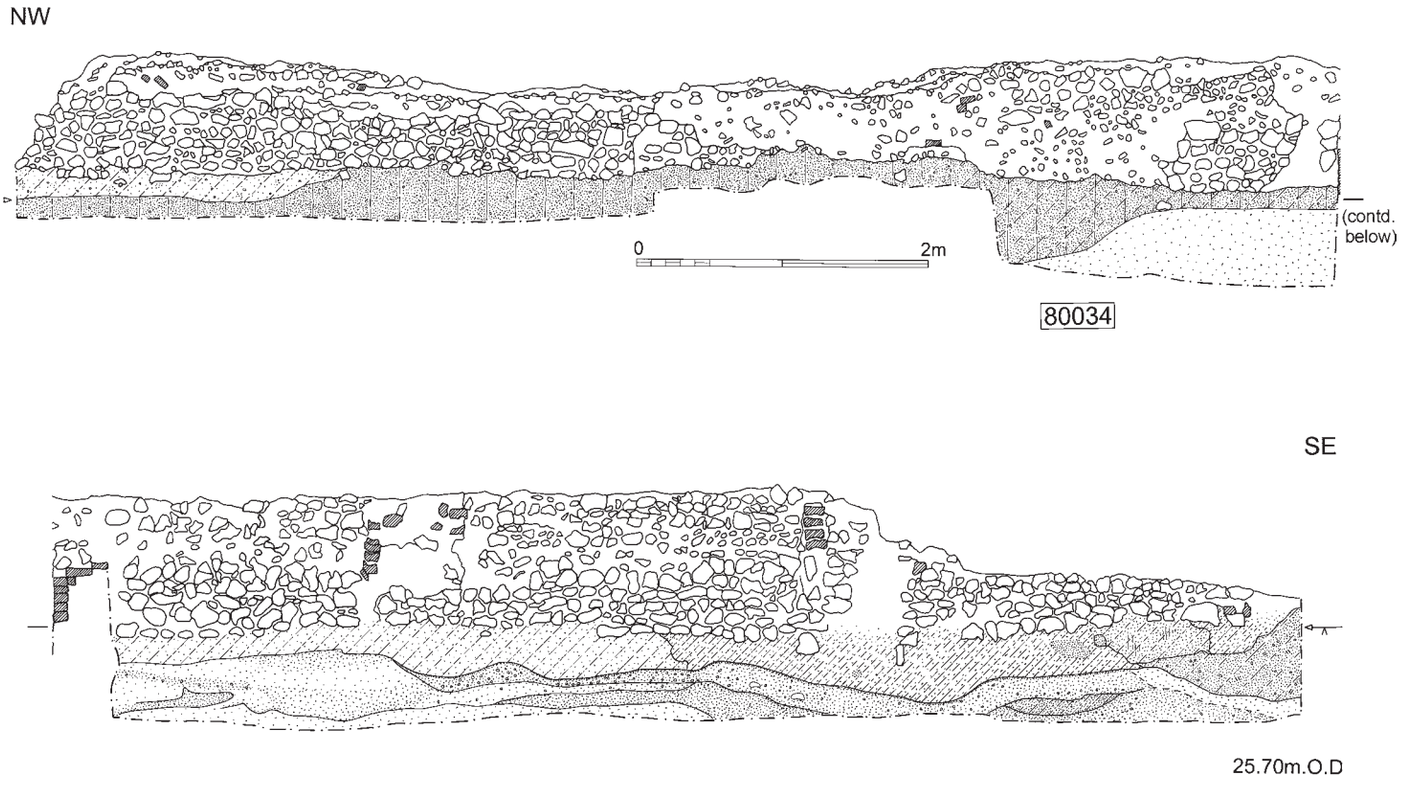


Figure 8.34 South-west-facing elevation of retaining wall *80504* (Area 8, S.805) (Castle Fee Property 50). Scale 1:50

isolated refuse pit (G8/29, *80013*, S.804) dug into an earlier quarry. This was 0.70m deep, with a possible post on its southern edge. Several of these pits detailed above contained sequences of redeposited natural sands, interspersed with dark silt deposits and may indicate acts of sanitation. Many fills contained oystershell and charcoal.

Small Finds

Pit *80019* contained nails (SF5823 and 6445) and an oxshoe (SF6445.01). Pit *80045* contained three beads, one of stone (SF5866, Fig.8.36) and two of bone (SF5688 and SF6259, Fig.8.36). It also contained a copper alloy lacetag (SF6310.01), four pins (SF6310.02), many fragments of copper alloy sheet, some folded (SF6310.02), nailed binding (SF5806), an iron stem (SF5875) and four nails (SF5875.01) and an iron buckle (SF6378). Pit *80013* contained nails (SF5813 and 5827).

Pit *80149* contained a copper alloy pin (SF6006) and a bone handle for a tanged tool (SF5800, Fig.8.54). Pit *80214* contained copper alloy wire (SF5975), an intrusive copper alloy hooked tag of 17th-century type (SF5812, Fig.10.23), iron hinge strap (SF5805), the branch of a horseshoe of later medieval type (SF5805.01) and a nail (SF5965). Pit *80215* contained medieval/post-medieval window glass (SF5959, Fig.8.56), iron knife blade fragments with the remains of mineralpreserved textile on one face (SF7226), iron nailed binding (SF5886), nail 7578) and lead came (SF5869 and 5872). Pit *80386=80388* contained nails (SF6290).

Pottery

A total of 2.327kg of pottery was recovered and is detailed by pit assemblage in Appendix 6. Contemporary fabrics consist of LMT, GTGW, DUTR, EPM and Rhenish stonewares from Langerwehe and Raeren-Aachen. Infill dates are generally mid 15th-century.

City Properties in Block II
(Fig.8.2)

Open Area 41 (Property b): well

Perhaps lying at the western end of this property was an undated flint and brick-lined well (G8/32, Fig.8.3) which may have originated in the late medieval or post-medieval period. It appears to have been documented in 1586 and is described further in Period 6.2.

Wall (Property c)
(Fig.8.35)

This may have been the property combined with the tenement to the south (*i.e.* Property d) which changed hands in 1555 (see Chapter 8.I). Although a wall along the northern side of the garden may have been present as early as the late 14th century, by the mid 16th century the property contained buildings and a garden, with 'a new stone wall and foundation and right to a gutter six inches wide on the land of Edmund Culling the length of the wall'. Edmund Culling's garden formed part of the rear abuttal of the messuage, suggesting that the new length of wall lay to the east. The stone wall measured 24 yards (21.94m) in length. A flint wall (G1/106) lay in approximately the anticipated position, depending on the width/location of the tenements fronting Oldswynemarket Hill (Timberhill) (see below and Chapter 8.V).

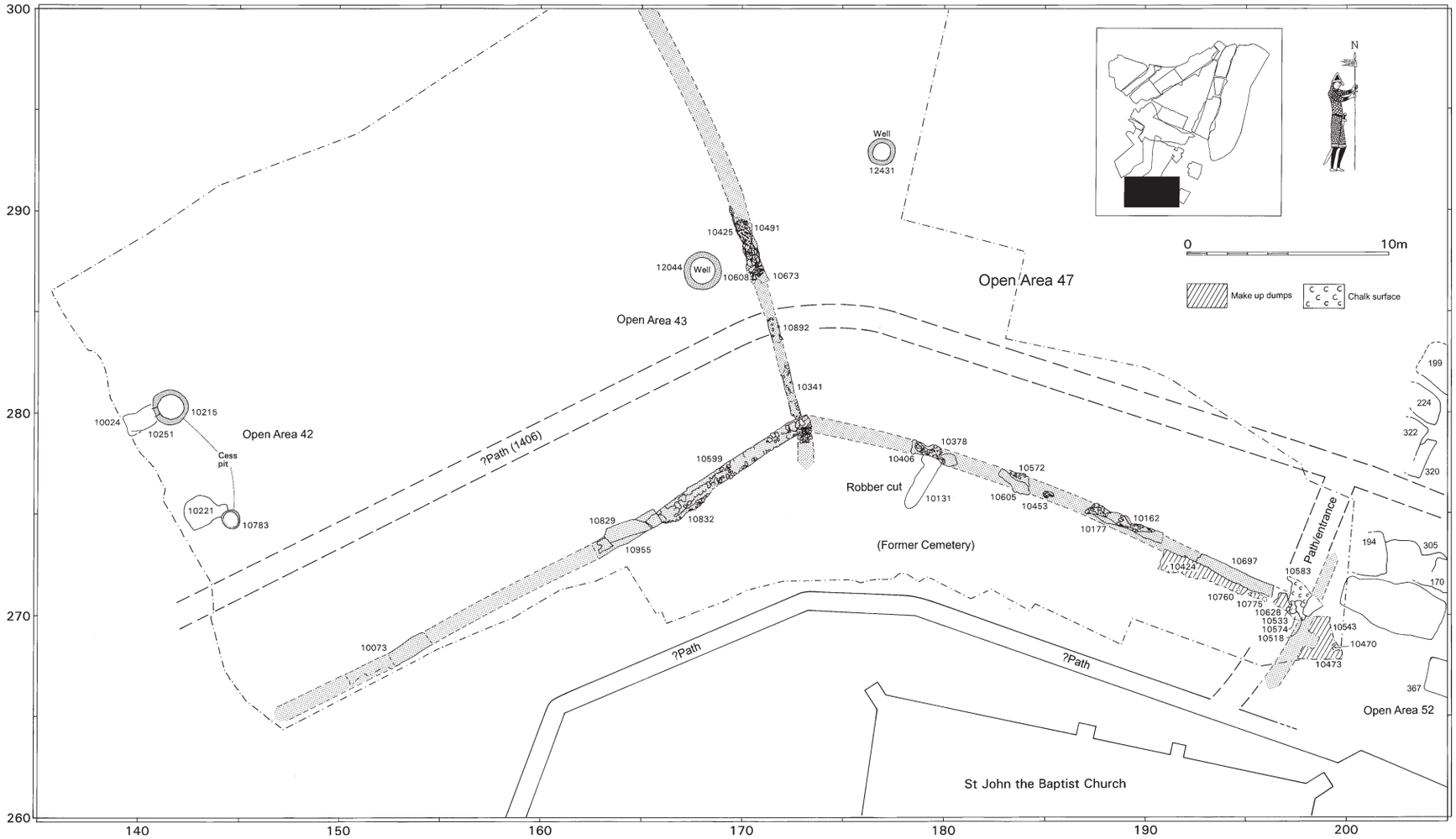


Figure 8.35 Period 5.2: Walls and pits, Open Areas 42, 43 & 47 (Area 1) (City Properties c–g). Scale 1:300

Plate 8.9 Late medieval or early post-medieval cess pit *10216* with lining *10215*, Open Area 42, (Property c/d) (Area 1, Period 5.2)

Open Areas 42 and 43 (Property c/d): cess pits and well
(Fig.8.35)
Three pits on the Old Swynemarket Hill (Timberhill) frontage date to this period. Furthest to the north was a large, circular pit (G1/155, Plate 8.9) which was infilled in the mid 17th century (see Period 6.1, Chapter 10), implying that the substantial feature was constructed and in use earlier. This cess pit (or possibly a reused well) was not bottomed at a depth of 1.00m. Within the construction cut (*10216*) was a lining of flint (40%) and chalk (60%), the largest fragments being 0.12m (*10215*). It was bonded with cream/white mortar and was random uncoursed. A hole had been cut into the south-western side to provide an overflow into a pit (*10251/10024*), consisting of a rectangular cut, 0.20m deep into the lining, the upper part of which was subsequently blocked with flint and chalk to form a void. The run-off pit continued into the western limit of excavation and may have run into a roadside drain.

Just to the south was another large, circular cess pit (*10221*, G1/152) not bottomed at a depth of 1.34m. A small cess pit (G1/153) cut into it. A roughly circular construction cut (*10294*) was of unknown depth. Its lining was of flint and brick (*10783*, 40–60%), the brick measuring 0.15 x 0.11 x 0.04m and the flint of medium to large unfinished nodules. It was random uncoursed and bonded with chalky sand mortar. The northern part of the pit had been disturbed, perhaps collapsed as an outlet/overflow lay on the northern edge. The lowest recorded fill was a pebbly backfill with brick fragments, while the upper fill was similar in character to garden soil, again containing frequent brick.

A flint and brick-lined well lying at the rear of Property (d) (*12044*, G1/104, Open Area 43) may have been constructed during the late medieval/transitional period, although uncertainties over is dating mean that it is detailed further in Period 6.1 (Chapter 10.II).

Small Finds
Pit *10221* contained domestic items including sawn bone (SF5237) and ironwork: a small broken knife (SF5075), broken spur fitting with non-ferrous metal-coating (SF5078.1) and a woodworking chisel (SF5231) Pit *10294* contained an iron nail (SF5295) and an iron awl or punch (SF5250, Fig.8.59).

Pottery
by Irena Lentowicz
(Fig.8.48 on CD)
A total of 1.025kg of pottery was recovered and is detailed in Appendix 6. A mid to late 15th-century date is suggested for the infilling of pit *10221*.

Garden wall (between Properties c–e and g–h)
(Fig.8.35)
At the rear of the documented tenements fronting Old Swynemarket Hill (Timberhill) to the west and the castle approach (Golden Ball Street) to the east was a flint wall above a flint foundation. It would have lain at the rear of Properties (c) to (e), forming the documented rear wall of gardens. By implication it would also have formed the rear wall of Properties (g) and (h). The wall was recorded over a length of *c.*9m (G1/106). To the south, it joined the junction of other walls which are detailed below. Although the date of constructional materials and artefacts could indicate a late 14th-century origin, the location of late 14th- to 15th- or 16th-century pits beneath the line of the apparently contemporary walls to the south has been taken to indicate construction during the 15th or 16th century.

The main part of the wall was recorded in two observations. To the north was a construction cut (*10693*), 0.37m deep and *c.*0.60m wide. The foundation consisted of large flint fragments (*10673*, 0.30 x 0.20 x 0.20m), perhaps a drystone construction as there were few traces of mortar. The foundation had been trench-built, the wall itself (*10425=10595*) being of flint (0.30 x 0.15 x 0.18m). Again there was little evidence for bonding, with only one course surviving. Just to the south were two other short lengths of the same wall (*10892 and 10341*). The foundation trench here (*10510=10902*) was 0.30m deep, with the foundation having been built against the western side of the cut. The foundation (*10341*) was of flint and 10% brick, the flint an average of 0.80 x 0.20m. It was bonded with pale yellow sandy mortar and was random uncoursed, the flints being rough hewn. It survived to a height of 0.26m, the overlying wall having been robbed or demolished.

Ceramic Building Material
Foundation *10673* contained EB3 (late 13th to 14th) and EB6 bricks, the latter one of the dominant types by the end of the 14th century.

Small Finds
Foundation *10673* included a possible fragment of Rhenish lava quern reused as rubble (SF5157).

Pottery
A total of 0.184kg of pottery was recovered from deposits associated with the wall. Medieval wares were present (LMU, GTGW and non-local Red Glazed ware), alongside LMT and earlier residual material. A late 14th-century date is indicated, although some of the pottery was abraded. See Appendix 6.

Walls and associated deposits (Properties e–g)
(Fig.8.35)
Running along the former northern edge of the cemetery of St John (Cemetery 4) were fragments of walls which may be attributable to the (15th to)16th century. Some may have formed boundaries, with others perhaps relating to adjacent tenements. The walls arced round to reflect the former position of the cemetery boundary ditch (Ditch 2) and the southern edge of the ?Castle Fee ditch (Ditch 3). The walls cut into earlier (Period 4, Chapter 7 and Period 5.1) pits suggesting a change in land use. The cemetery had apparently shrunk further to the south by this date, leaving a narrow strip of land about 10m wide between these walls and the northern edge of the graveyard (perhaps with an alley already running between the two in the position of later Church Alley).

Wall (Properties e and f)
The wall lying furthest to the west was aligned south-west/north-east (G1/107) and was recorded over a distance of 25m (Fig.8.35). Its line reflects that of the earlier cemetery boundary ditch (Ditch 2, G1/46, Period 1.4), which had run *c.*1m to the north. To the east, the wall ended at the point at which the boundary ditch had met the ?Castle Fee ditch (Ditch 3, G1/53, Period 2.1), reflected by the south-eastward turn in the walls located here. The wall cut across pits of late 14th- to 15th(16th)-century date (Period 5.1). The wall appears to have run between Properties (e) and (f). The Property (e) abuttals mentioned in the late 15th century are duplicated in a deed of 1542 which notes the presence of a messuage with buildings and gardens (Chapter 8.I). Documentary evidence for Property (f) indicates the presence of houses, buildings, gardens and an orchard during the 16th century. Further discussion of its relationship to surrounding properties is given in Chapter 8.V.

The wall is illustrated in Plate 8.10. A possible return southwards is suggested at its eastern end (where it was abutted by another wall); indicating the rear wall of the properties. At one place, a section of the wall had slumped due to the presence of an underlying ditch (Ditch 1, G1/40, Period 1, Chapter 4.II). To the south-west, part of the foundation trench (*10073*), surviving to only 0.25m deep, was infilled with sand and ballast, followed by a strongly bonded layer of mortar and flint. During construction of the wall, the upper fills of an underlying late 14th- to 15th-century pit (*10120*, Period 5.1) had been removed and replaced by foundation deposits. Above the bonded foundation was mixed rubble, followed by further flint foundation (with occasional brick), bonded with light grey mortar. The foundation had apparently been trench-built and survived to 0.55m deep. None of the superstructure of this part of the wall survived. Another observation further to the north-east (*10929=11254*) revealed a flat-based trench, 1.20m deep. This part of the foundation was of layered earth and flint; many of the flints having been reused. The wall itself (*10599=10955 =10829=10832*) was of flint nodules in off-white mortar with only the lower course surviving.

Plate 8.10 ?Sixteenth-century flint wall 10599 (Period 5.2) forming the boundary between Properties e and f, showing later cross-wall *10035* (Period 6.3), Area 1

Ceramic Building Material
by Irena Lentowicz, with Richard Kemp
Building materials recovered in association with the wall included medieval roof tile (RT100/RT103), glazed floor tile (FT127) and bricks including medieval and later types (EB2, EB10, LB1 and LB5). Type LB1 bricks were introduced in the late 16th century, although they may indicate repair work rather than the construction date.

Small Finds
Finds from trench *10929=11254* included a nail (SF5102).

Pottery
Only 0.042kg of pottery was recovered from contexts relating to this wall, including a small, probably residual sherd of Developed Stamford ware. Contemporary material included an LMU jar rim of unusual form (cv 1/4): with an external 'bifid' rim. 'Bifid' rims with internal protrusions are not common and are usually associated with LMT (see Jennings 1981, fig.25, no.426). LMT sherds were also present. See Appendix 6.

Walls and surfaces (Property e/g)
East of the major wall junction to the north of the former cemetery was another stretch of wall (G1/80), aligned north-west to south-east. This was rebuilt during the post-medieval period (G1/84, Period 6, Chapter 10). Pre-dating its construction was a series ground preparation deposits (G1/79), comprising makeup dumps and patches of chalk surface (Fig.8.35). These ran between a gap in the surrounding walls and may have formed a path through an entrance leading either to the church and cemetery or into a tenement plot (perhaps adjoining another route to the north of the cemetery). These deposits overlay former metalworking activity (Period 5.1) suggesting a later 15th to 16th century date.

The initial phase of dumps was most extensive in the easternmost part of the site (*10474, 10518, 10533, 10628, 10647, 10760, 10767, 10775, 10784, 10840, 10869 and 10943*). They were generally of mixed deposits of sand/loam/gravel containing mortar, surviving beneath and to the south of later walls with an upper level of just over 28.00m OD. Small deposits recorded to the north-west may have formed part of a similar process (*10376, 10453 and 10346*). At the top of the dumping sequence were three patches of compacted chalk (*10583, 10596 and 10574*), lying in the gap between two walls and perhaps forming a pathway.

On the eastern side of a second wall, forming the eastern side of the possible gate and either pre-dating or contemporary with it, were more makeup dumps with an upper level of 28.21m OD (G1/81). The earliest layer

contained frequent pebbles (*10473*), above which was patch of chalk (*10470*). Pitting recorded immediately adjacent to these deposits at the Golden Ball Street site is detailed below.

The long stretch of north-west to south-east wall (G1/80) had been badly disturbed by later robbing and subsequent rebuilding and only fills of the flint and brick foundation trench survived. Ceramics provide a date of 16th century. The wall ran over a distance of *c.*20m, with the possible gate at its eastern end. It was recorded in four separate observations, described below from north-west to south-east.

Furthest to the west was a shallow foundation cut (*10406*), 0.07–0.30m deep (Fig.8.35). The foundation within it was of unworked flint nodules (*10378*), bonded with yellow charcoal flecked clay, laminated with charcoal and soil. This contained brick fragments, shell (cockles, mussels and whelks) and pottery.

To the south-east a layer of compacted clay (*10607*) probably forming a bedding for the overlying foundation (*10605*). Again, the foundation cut was very shallow and irregular (0.07m deep) and was filled with brick fragments, perhaps forming a packing at the base of the overlying construction cut. The feature was cut to the north by another possible rectangular construction cut, probably part of the same feature (*10572*), 0.11m deep. Stones had been pushed into the base of the cut. This may have formed the very base of a foundation, the wall itself having been robbed/truncated during subsequent activity.

To the south-east was the longest surviving stretch of the first phase of the wall. The foundation trench (*10177*) survived to a depth of 0.10m and had a flat, slightly undulating base, 0.64m wide. The wall foundation itself (*10162*) was very fragmentary and survived to a height of 0.10m to 0.15m. It was constructed of flint and occasional brick, the flint being medium to large and rough hewn, random uncoursed with only one course surviving. It was bonded with pale yellow sandy mortar.

Further to the south-east, possibly ending at its southernmost recorded point, was the last piece of surviving wall (*10697*). Again, this only survived to a depth of 0.07m and had a concave base. The wall had been entirely robbed at this point and the construction trench was filled with rubble.

A linear cut had been inserted at right angles to the wall (*10131*, G1/90), which may have been a robber cut. It was 0.34m deep and the same width (0.70m) as the surrounding walls, perhaps forming a property sub-division. Its fill comprised domestic refuse.

To the south-east was part of a north-east to south-west running wall (*10543*), apparently contemporary with the southern end of the wall (G1/80). This cut into earlier chalk surfaces (described above) and was roughly rectangular, 0.23m deep and filled with a dump of chalk and sand. This wall was also later rebuilt (Period 6.1).

Ceramic Building Materials
by Irena Lentowicz, with Richard Kemp
The ground preparation deposits (G1/79) contained roof tile (types RT103 and RT104) and a range of brick types (EB7, EB8 and LB5). Although mortar and roof tile type RT103 fragments were recovered from the deposits directly associated with the wall (G1/80), the small assemblage is dominated by medieval bricks (types EB2 and EB8), as well as late 16th-century type LB1. The type LB3 brick, which dates to the late 17th to early 18th century, may indicate a later repair/patching.

Small Finds
Finds from layer 10473 included a 14th-century copper alloy strap end (SF5240, Fig.8.37) and a copper alloy buckle of 14th-century type (SF5218, Fig.8.36). Finds from surfaces G1/79 include a harbick (SF5206), hinge pivot (SF5206.1) and a nailed binding (SF5206.2). Fills of construction cut 10406 contained an iron tube and nails (both SF5344). Cut 10131 contained medieval window glass (SF5071) and six nails (SF5129 and 5070).

Pottery
A total of 0.694kg of pottery was recovered. Contemporary fabrics consist of GTGW, LMT, DUTR, Raeren-Aachen stoneware and Langerwehe stoneware. Amongst the residual material was a Middle Saxon Ipswich ware sherd. The presence of the stoneware dates the activity to the late 15th to 16th century. See Appendix 6.

Open Areas 52 and 53 (?Property g): pits
by Elizabeth Shepherd Popescu and David Whitmore
(Fig.8.37)
Although this large property had previously housed shops in its south-eastern corner (Chapter 8.I), by the mid 16th century it had become a garden. Numerous 16th-century pits were recorded in Area 2 at the Golden Ball Street site and probably lay within this garden. Two distinct pit clusters were observed. The first (Open Area 53) consisted of six relatively shallow sub-rectangular examples (Group 23, *115 (*not planned), *157, 199, 224, 320 and 322*) located adjacent to the infilled cellar of No.14 Golden Ball Street. These had been filled with organic refuse. A second linear grouping of five shallow intercut, circular or oval pits (*156, 184, 197, 225 and 253*, Open Area 52) had clay silt fills. The sub-rectangular examples may represent small quarries cut into the northern edge of the remnants of the Castle Fee rampart. The line of the pits reflects the position of contemporary walls recorded in Area 1 at the Castle Mall site.

Immediately to the south of the line of pits was a large isolated pit (*170*, GBS Group 13, Fig.8.37), cut through the edge of the ?Castle Fee ditch (Ditch 3) and completely truncating the Late Saxon cemetery boundary ditch (Ditch 2). The substantial sub-rectangular pit (over 5m in length and 2.60m wide) was not bottomed at 1.20m. The pit had been backfilled with dark brown (*172*) or greyish brown (*202*) silty sands. These deposits were divided by a thin band of light yellow gravelly sand (*201*) tipping into the pit from the west side. The partially infilled pit had been later used for the dumping of a layer of charcoal (*171*) that had been subsequently sealed by the dumping of sand (*168* and *169*) and a final deposit of greyish brown silty sand (*167*). This later sequence of deposits was initially interpreted as the fills of a 'working hollow' (*254*, GBS Group 12) but probably represents a further episode of levelling and dumping.

Two other pits were cut directly into the top of the backfilled ?Castle Fee ditch. The westernmost had been heavily truncated (*430*), while the other was a square pit (*367*) measuring 0.50m deep. Set into its centre were three post-holes, two (*488 and 487*) being located towards the east and west corners of the pit. These were both larger and deeper than the third post-hole (*485*) which lay between the other two. The base of the pit was covered by a silty sand (*481*), sealed by a highly organic layer (*480*) that may represent the remnants of a collapsed wooden floor originally supported by the posts. The pit had been finally backfilled with a homogeneous layer. A likely interpretation for this feature is that it was a latrine pit.

Period	*Small Finds (no. objects)*		*Pottery (no. sherds)*		*CBM (kg)*	
	Rest of Site	*Well fills*	*Rest of Site*	*Well fills*	*Rest of Site*	*Well fills*
Period 5.1	518	8	5,019	27	18.814	0.280
Period 5.2	473	4,835	3,453	1,747	25.463	30.185
Total	**991**	**4,843**	**8,472**	**1,774**	**44.277**	**30.465**
Combined Total		**5,834**		**10,246**		**74.742**

Table 8.10 Selected Period 5 finds by sub-period at Castle Mall, comparing the barbican well assemblage with the remainder of the site

A flint-lined well (*10012=12431*, G1/99) recorded at the western end of Property (g) within Castle Mall Area 1 may have originated in the late medieval transitional period. It was infilled in the mid 17th century and is detailed in Chapter 10.II (Period 6.1).

Small Finds
Pit *115* contained copper alloy artefact (SF4); lead spillage (SF59); lead sheet (SF69); iron strap (SF119) and intrusive modern window glass (SF224). Pit *117* contained copper alloy vessel leg, ?ewer (SF210); intrusive modern window glass (SF225). Pit *157* contained copper alloy strip (SF14). Pit *156* contained three fragments of medieval window glass (SF40); intrusive ?post-medieval window glass (SF42); iron knife blade (SF121); iron fragments x8 (SF123); iron fragments x2 (SF122). Pit *184* contained iron strap (SF157). Pit *199* contained iron artefact (SF151); copper alloy shield-shaped strap end (SF205, Fig.8.36). Pit *305* contained lead spillage (SF61); iron nail (SF185); iron nail (SF250). Pit *225* contained iron ?nails (SF223 and SF212). Pit *230* contained iron ?nail (SF237). A total of 16 timber nails was found. Charcoal and mortar present in the corrosion products of objects from contexts *114*, *162* and *155* suggest they are associated with demolition debris.

Pit *170* (fill *172*) contained iron horseshoe (SF153); iron nail (SF154); possible dagger chape (SF183). Fill *202* contained two-pronged copper alloy object (SF97); an illegible copper alloy penny of 14–15th-century date (SF174); copper alloy object or metalworking debris (SF213); copper alloy diamond-shaped ?mount (SF222) and an iron carpenter's drill bit (SF235). Fill *171* contained two notable fragments of medieval glass (both SF226) and an iron strap/sheet (SF236). Fill *168* contained two broken knife blades (SF156), while fill *167* contained a wide strap/blade (SF167).

Pottery
by Richenda Goffin
(Fig.8.49)
A total of 3.389kg of pottery was recovered. Although some residual Late Saxon and medieval wares were present within pit fills, pottery of 16th-century date was identified. Pit *115* contained a small (0.368kg) but well-dated group, comprising base fragments from a large Raeren jug (Fig.8.49, no.2), a fragment of a second Raeren/Aachen jug, two LMT jars (Fig.8.49, nos 3 and 4) and a LMT bowl with thumbing around the rim (Fig.8.49, no.1), and three fragments of a tin-glazed vessel with a pink/buff fabric (Fig.8.49, no.5). The decoration on the exterior consists of broad and narrow dark blue slightly curved bands, similar to the outline of the banded medallion on vessels with the YHS monogram, which were exported from the South Netherlands. The fine buff pink fabric also suggests that it is a South Netherlands maiolica, dated *c*.1480–1575. The fragments are likely to have originated from a flower vase or jug. Although provisionally identified as being produced in this part of the Netherlands, recent analytical work involving neutron activation analysis has indicated that some ring-handled vases previously attributed to the South Netherlands were actually made in Italy, as well as handleless vases (Hughes and Gaimster 1999, 66–67; Hurst 1999, 91–106). A larger assemblage with similar pottery dating to the first half of the 16th century was identified in Cellar H, Pottergate, Norwich (Evans and Carter 1985, 35). Here a group of LMT including two bowls with thumbed rims and a range of jars and jugs was accompanied by the ring-handle of a South Netherlands maiolica vase, with several Raeren jugs, including a *dreihenkelgesichtskrug* or three-handled face jug (Evans and Carter 1985, 38).

Pottery from the other pits is detailed in Appendix 6. Amongst the contemporary fabric is an abraded LMT sherd of Wattisfield type (S Anderson, pers comm). Other contemporary fabrics consist of GTGW, LEPM, LMT, Raeren-Aachen and Langewehe stonewares, Dutch-type and Dutch redwares along with GRE, or perhaps more likely, a Dutch redware. Although the pottery recovered from many of these pit fills contains a high proportion of residual material, the type of redwares and stonewares, together with the small quantity of imported tin-glazed ware, suggests a date in the late 15th to first half of the 16th century for many of them. See Appendix 6.

Flint wall (Properties h and 47)
by Elizabeth Shepherd Popescu and David Whitmore
A 2.28m long stretch of flint wall (*272;* GBS Group 29) had been utilised as part of the cellar of the now demolished 17th- or 18th-century building to the north of No. 18 Golden Ball Street. This wall was probably a remnant of an earlier more extensive east-to-west aligned flint wall. It appeared to function as a retaining wall for the soil immediately to the south.

III. FINDS

Introduction

A total assemblage of 5,455 Small Finds was retrieved from Period 5 deposits at Castle Mall (52% of the total site assemblage: Table 8.10) and a further 141 from Golden Ball Street (Table 8.11). Of the Castle Mall group 4,864 (89%) were recovered from fills of the barbican well and are detailed in Chapter 9.III. Many other diagnostic late medieval objects were found intrusively in earlier deposits or residually in later deposits and are included here. Further items were unstratified, those illustrated being described further below.

Period	*Small Finds (no. objects)*	*Pottery (no. sherds)*	*CBM (kg)*
Period 5.1	0	0	0
Period 5.2	141	1179	12.736
Total	**141**	**1,179**	**12.736**

Table 8.11 Selected Period 5 finds by sub-period at Golden Ball Street

Dress Accessories and Personal Possessions

Dress Fittings

Copper alloy ring
by Alison Goodall
(Fig.8.36)
The initials '**IS**' or '**SI**' cut into the bezel of a signet ring (SF1087) are probably those of the owner. The general form of the ring is comparable with examples of signet rings in Salisbury Museum (Cherry 1991b, 40–43, fig. 12) which are generally dated to the 15th century; this seems to be a likely date for the present example.

SF1087 **Finger ring**. ?Gilded finger ring with shallow rectangular bezel, decorated with initials 'IS' within a double-line grooved border. The initials have an engraved border filled in with oblique lines and are separated by an eight-point star.
90000, unstratified

Beads
by Julia Huddle
(Fig.8.36)

Eight beads came from late medieval/transitional deposits, five of which were from fills of the barbican well (see Chapter 9.III). In addition, a red/brown glass bead with a 1mm hole (SF5242, not illustrated; cess pit *10096*, Period 5.1, G1/148) probably came from wire-work jewellery. Two bone beads (SF5866 and 6259) are both from fills of the same cess pit and are likely to have come from Rosaries since bead necklaces were not in fashion at this time.

SF5866 Globular **bone bead**. Diameter of hole: 2mm
80044, fill of cess pit 80045, Period 5.2, G8/25
SF6259 Globular **bone bead**. Diameter of hole: 2mm
80044, fill of cess pit 80045, Period 5.2, G8/25

Copper alloy dress and head-dress pins
by Alison Goodall
(Fig.8.36)
A total of 114 copper alloy pins came from late medieval levels, of which 65 were recovered from fills of the barbican well (Chapter 9.III). This total sub-divides further into dress or head-dress pins (40 from the well, 8 from the rest of the site) and pins which may have been used in sewing (25 from the well, 41 from the rest of the site), the latter group being discussed separately below. Another dress pin of late medieval/post-medieval type was found unstratified.

The late medieval pins are generally small and have heads made from coiled wire. They may have had many uses and are seen, for instance, in contemporary Flemish paintings of women securing the fine lawn materials used as veils or neck inserts (*e.g.* Rogier van der Weyden's *Portrait of an unknown lady*, 15th century). Some examples (*e.g.* SF6128) are larger than normal and may have been used as dress pins. A large dress pin (SF6065) is paralleled at the Free Grammar School, Whitefriars, Coventry, where a similar example identified possibly as a hair pin dates to the mid 16th century (Woodfield 1981, 94, fig.5.40).

SF6065 **Pin**. Large dress pin, with circular-section solid shaft, and head separately made from two pieces of flat-section strip spirally curled outwards. Most of shaft and point missing.
90716, fill of pit 90716, Period 5.2, G9/82

SF6128 **Pin** with spiral-wound sub-conical head, long fine shaft bent in two places. L: *c.*58mm
90657, fill of ditch 90687, Period 5.2, G9/92

Copper alloy buckles
by Alison Goodall
(Fig.8.36)
The eight copper alloy buckles from late medieval levels are of medieval and early post-medieval types. One gilded example (SF5797) with its double-pronged extension to the frame, may perhaps be compared with a buckle from a post-medieval context at Wharram Percy which has a triangular pointed extension and, like the Norwich example, has traced surface decoration (Goodall 1989, 46, fig. 31.7). The buckle may also be compared with Fingerlin 1971, no. 229, dated to the 15th century. An engraved brooch or buckle pin (SF1019) recovered from fills of a bell-founding pit is of 14th-century type. An early post-medieval double-looped buckle (SF7461) was also found.

A rectangular buckle (SF6059) is paralleled on many sites including London, where it was found in a context dated to the second half of the 14th century (Egan and Pritchard 1991, 97, fig. 62.447) and Chelmsford (Goodall 1985, 43, fig. 46.10). Another (SF5476) is also a common medieval buckle which would originally have had a roller on the front bar to facilitate tightening the strap (*cf.* Egan and Pritchard 1991, no. 298). An ornamental buckle with a gilded surface (SF5784) is probably late medieval in date and can be compared with an unstratified example from Exeter (Goodall 1984, 339, fig. 191.97). The gilding and other ornamentation are typical of artefacts from high status sites.

A number of the Castle Mall buckles were poorly made or roughly finished. These include rectangular examples (SF5044.02 and SF5218), the latter of which may date to the 14th century (*cf.* Margeson 1993, fig.14, no.145) and a crudely cast, possibly unfinished, double-looped example (SF7562) of early post-medieval type.

SF1019 **Buckle/brooch** pin from an annular buckle with broken loop, decorated with transverse moulded ridges with engraved grooves near the loop. The tip has a cut-out underside.
11090, fill of bell pit 11120, Period 5.1, G1/67
SF5044.02 Buckle. Incomplete large rectangular double-looped buckle frame, of circular section and with cut-off corners, decorated with short engraved lines. Crude design. Loop of pin, made of wrapped-around strip, survives on pin-bar.
10000b, unstratified
SF5218 **Buckle**. Rectangular buckle frame, with slightly narrowed pin-bar and bevelled edges and bevelled edges to other three sides. All surfaces are covered in file marks and poorly finished. L: 33mm.
10473, external dump, Period 5.2, G1/81
SF5476 **Buckle** frame and plate. The small frame has an offset pin-bar with a slight constriction for the iron pin, a stub of which remains. The pin-rest, also offset, has moulded half-round knobs at each end, and iron staining, and would have had a separate roller. The rectangular plate has one rivet hole at the open end, and is broken at the folded hinged end.
11257, fill of pit 11258, Period 5.1, G1/76
SF5784 **Buckle**. Gilded oval buckle frame, with offset narrowed pin-bar. triple moulding at pin-rest and another on each side of the frame; between the mouldings the frame has a double row of punched dots. The pin has transverse moulding near an open loop. H: 34mm, L: 25mm.
80000, unstratified
SF5797 **Buckle**. Buckle of gilded copper alloy and iron. The frame is made from thick copper alloy sheet; it has a separate iron pin bar and a front bar around which a copper alloy cylinder revolves. A fragment of the iron pin survives and there is

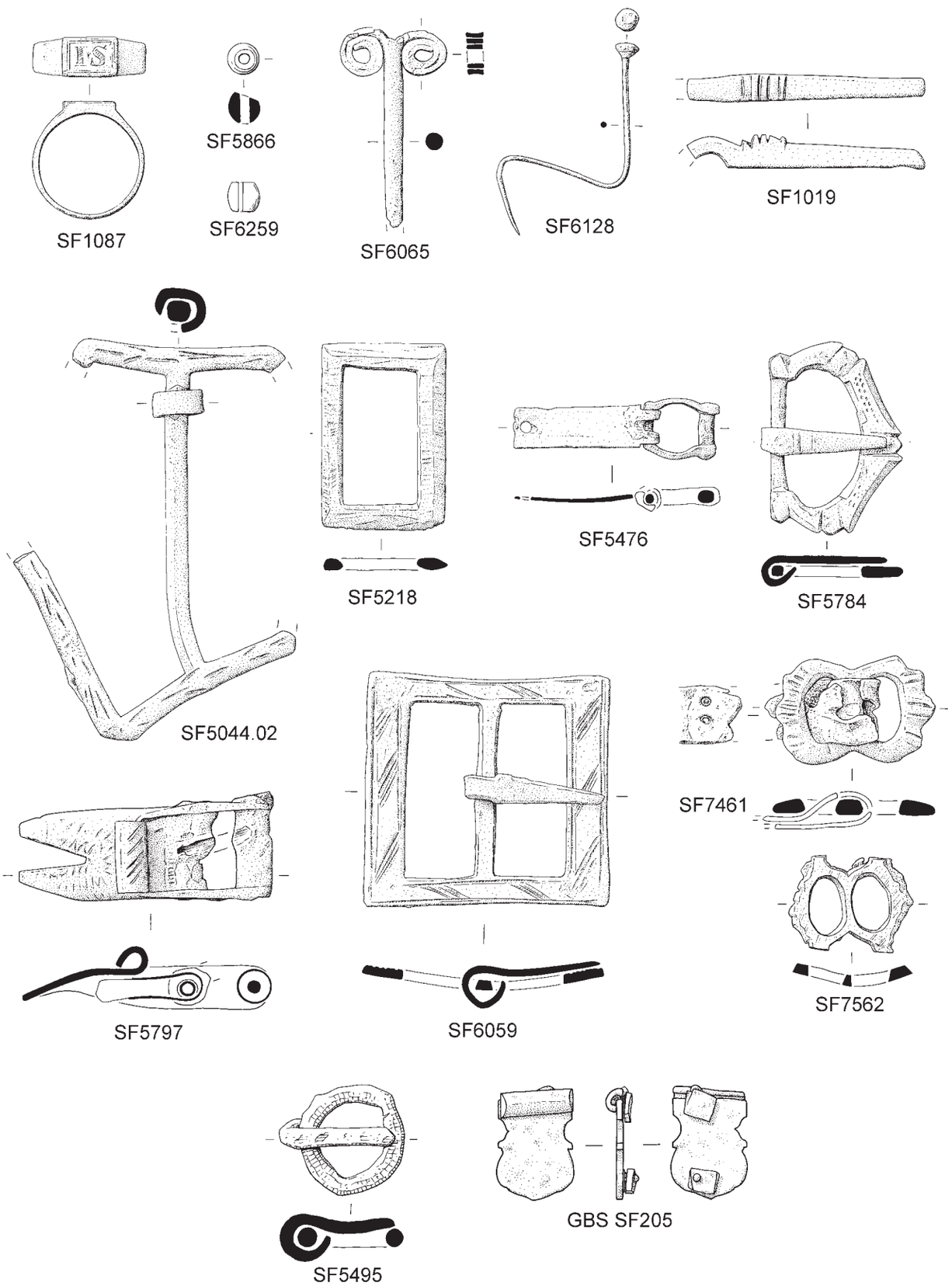


Figure 8.36 Copper alloy ring (SF1087); bone beads (SF5866 & 6259); copper alloy pins (SF6065 & 6128); copper alloy brooch/buckle pin (SF1019); copper alloy buckles (SF5044.02, 5218, 5476, 5784, 5797, 6059, 7461 & 7562); iron buckle (SF5495); copper alloy belt clasp (GBS SF205). Scale 1:1; ironwork at 1:2

a buckle plate also of iron. The part of the frame opposite that roller has been cut to form a forked 'tail' decorated with rocked tracer zigzags and part has been rolled back to make a raised cylinder which has a decoration of diagonal incisions.
90019, fill of trench 90020, Period 7.1, G9/58

SF6059 **Buckle**. Rectangular double-looped buckle frame with engraved decoration of single-line borders with groups of two or three oblique lines within. Narrowed central bar, and pin with narrow narrowed open loop. L: 43mm.
90585, fill of pit 90538, Period 5.1, G9/104

SF7461 **Buckle**. Double-looped buckle frame with remains of copper alloy pin. Oval loops with three transversely grooved lobes on each outer edge. Remains of leather strap wrapped around pin-bar. L: 28mm
90507, fill of pit 90493, Period 5.2, G9/104

SF7562 **Buckle**. Double-looped buckle, very poorly cast, with oval loops. Angular projections at top and bottom of each loop, and scalloped outer edges. Many file marks visible on top face. Possibly an unfinished casting. L: 22mm.
40000, unstratified

Copper alloy belt clasp
by Alison Goodall
(Fig.8.36)

A shield-shaped belt clasp from the Golden Ball Street site (GBS SF205), similar to SF5636 from Castle Mall (Period 4.2, Chapter 7.III), would have formed one part of a fastening; the other part would have resembled SF6012 (also Chapter 7.III; see also Egan and Pritchard 1991, 116–120 and 156–8).

GBS SF205 **Belt clasp**. Shield-shaped clasp with plain bar mount attached to it. Two rives secured by square roves.
198, 15th–16th-century pits, Period 5.2, G23

Iron buckles
by Quita Mould
(Fig.8.36)

Three large annular buckles were found, each with a non-ferrous metal coating. Two (SF5495 and 7393, latter not illustrated) were sufficiently large to have been used on belts or girdles around the waist, possibly to hold a sword (*cf.* the copper alloy scabbard buckle SF7091 found in the barbican well, Chapter 9.III, Fig.9.47; see Egan and Pritchard 1991, 64–5 for a discussion of usage). Seven small annular buckles were found in pit fills dating to the late medieval/transitional period. Similar items were found in quantity in fills of the barbican well and are discussed in Chapter 9.III.

SF5495 **Buckle.** Annular buckle frame with non-ferrous metal coating and pin wrapped around the frame. D: 42mm
11148, possible fill of Castle Fee ditch/graveyard deposit, Period 5.1, G1/66

Copper alloy strap-ends
by Alison Goodall
(Fig.8.37)

Of the late medieval strap-ends from the site (other than those from the barbican well), one (SF5372) is a simple form, made from a folded sheet (*cf.* Egan and Pritchard 1991, 126–9, cat. 583, fig. 83). The other (SF5240) is a type dated to the 14th century which has a pair of plates soldered onto a cast forked spacer which incorporates an acorn-shaped knop (*cf.* Egan and Pritchard 1991, 143–45, fig. 94). The traced zigzag lines are a typical decorative motif although examples are known with more complex animal designs, such as one from Goltho (I.H. Goodall 1975, 91, fig. 43.3), while the majority are undecorated. A similar example was recovered from the barbican well (Chapter 9.III).

Two probable strap-ends were found in unstratified or modern contexts at the Golden Ball Street site, but should probably be dated to the late medieval/transitional period. A damaged strap-end (GBS SF104, not illustrated) has a hint of decoration along the upper edge; it appears to be part of a row of repoussé cabling which might link it to a class of belt fittings dating from the late 15th to early 16th century (Goodall 1981, fig.61.4–9). Another (GBS SF209, not illustrated) is incomplete and may be a strap-end or a book clasp while a fragment of strip with possible repoussé edges (GBS SF159, not illustrated) may also be from a strap-end.

SF5240 **Strap-end**. Composite strap-end with front and back plates soldered to forked spacer plate. Front plate has a Y-shaped motif within a border, all of rocked tracer engraving; the space between the arms of the Y is filled with an almost circular opening and a deep groove running in from the incurved open end. The back plate has a corresponding circular hole but no groove. Either side of the circular holes is a single copper alloy rivet passing through both front and back plates. The spacer plate has a cast acorn-shaped terminal. L: 66mm.
10473, external dump, Period 5.2, G1/81

SF5372 **Strap-end** made from rectangular sheet folded widthways, with two rivets at open end. L: 29mm.
11030, fill of pit 11048, Period 5.2, G1/24

Copper alloy belt mounts
by Alison Goodall and Elizabeth Shepherd Popescu
(Fig.8.37)

Two repoussé mounts in the shape of Lombardic letter 'B's were recovered (SF6410 and 6209). It is not now possible to say whether the mounts were still attached to their leather or textile base when discarded or whether they had already become detached. These may have been a cheap copy of mounts made in precious metals (Spencer 1985, 449–51). Similar examples have come from elsewhere in Norwich (Margeson 1993, 40 and fig.41, no.274; undated) and London (Egan and Pritchard 1991, 203, fig. 127, nos 1095–1097; from deposits dated *c.*1400–1450). The Castle Mall examples were recovered from adjacent pits in one of the properties to the east of the castle approach (Property 43, see Fig.8.10).

SF6209 **Mount**. Incomplete repoussé sheet belt mount in the shape of a Lombardic letter B, with separate rivet fixed in the centre of the straight side.
90471, fill of pit 90481, Period 5.1, G9/104

SF6410 **Mount**. Repoussé belt-mount in the form of a Lombardic letter B, with separate rivet in the straight side.
90419, fill of pit 90436, Period 5.1, G9/104

Copper alloy mounts
by Alison Goodall
(Fig.8.37)

Mounts of various forms, of which several were found at the Golden Ball Street site supplementing the group from the barbican well (Chapter 9.III), were used to decorate and reinforce the straps of belts, book bindings and harness. A sexfoil mount (GBS SF92, not illustrated) and a scallop shell (GBS SF98) are likely to have come from costume. Both forms are paralleled among the finds from London (Egan and Pritchard 1991, 186–192 and 200 nos

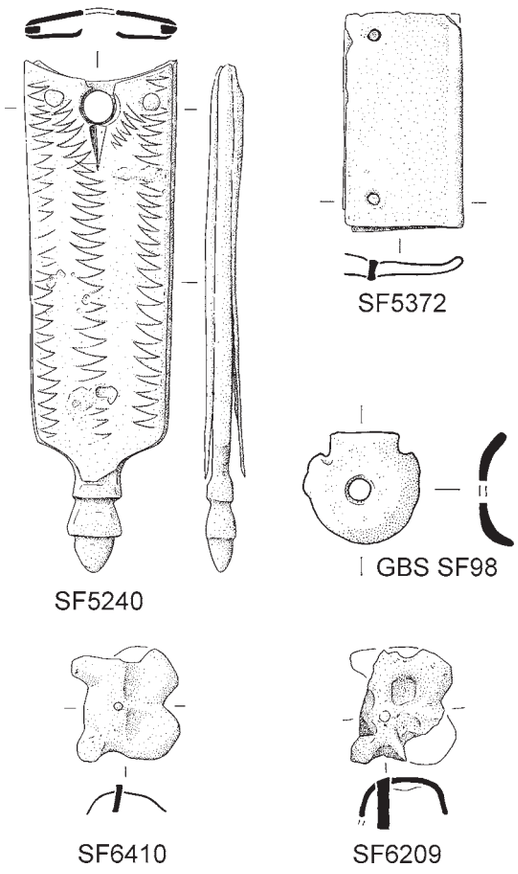


Figure 8.37 Copper alloy strap-ends (SF5240 & 5372); copper alloy belt mounts (SF6209 & 6410; GBS SF98). Scale 1:1

1082–3); sexfoils in particular were common from the 14th century into the late medieval period. Rectangular mounts like SF262 (not illustrated) probably date from the late 14th to early 15th century (*ibid*., 226–7); they often have a large perforation in the centre which is thought unlikely to have served as an eyelet. The plates were sometimes used to connect lengths of strap and may sometimes have served as fastenings on book covers. GBS SF179 is a bar mount from a strap and GBS SF24 is probably a lozenge-shaped mount (neither illustrated).

GBS SF98 Mount. Scallop-shaped repoussé mount with central rivet hole. Possible incised markings round the upper edge.
343, final fills of South Bailey Ditch, Period 5.2, G54

Wire eyelets and lace ends
by Alison Goodall
Four eyelets made from twisted wire and several other fragments were found in the large pit cut through the terminus of the southern bailey ditch at the Golden Ball Street site, together with three fragments of Type 2 lace ends. Another three similar lace ends, one containing organic material, were found in the upper fills of the south bailey ditch. Both lace ends and eyelet could relate to the 16th-century fashion for fastening the fronts of garments by lacing, although they could have been used in other ways too.

Personal Possessions

Bone stylii
by Julia Huddle
(Fig.8.38)
Four bone stylii were recovered from the Castle Mall site; one is unstratified (SF5039, not illustrated), one is from a mid 15th-century graveyard deposit (SF5066, not illustrated) and the other two are from 15–16th-century contexts (SF5909 and SF6899; the latter being from the well, see Chapter 9.III). Apart from SF5909, the head-end of which is broken, all have spherical heads above a collar. All retain at least part of their iron points inserted into the hole at the tapered ends, excluding one with an incomplete shaft (SF5066).

There has been some discussion as to the function of these items. David Brown expresses doubt that stylii could ever have been made of bone, ivory or wood since, he suggests, it would have been necessary to heat the tops to erase the writing on the wax. He argues that these objects could have been used as parchment prickers, used to prick holes in the margins for marking out lines on parchment leaves (Brown 1990a, 733–5). MacGregor points out that a projecting spatulate-like tongue (rather than the spherical heads seen on most of these items) could have served as an eraser which would have been an essential element for a stylus (MacGregor 1985, 124).

Conversely, however, Nigel Ramsey comments that it is common for manuscripts to be marked out by a knife leaving longitudinal slits rather than round holes (Ramsey 1987, 382–3). He also notes that stylii have been recovered with medieval writing sets. A collection of late 14th- to early 15th-century objects from Lubeck included twenty-two wax tablet books and a wooden stylus. Two corner pieces of wax tablet books were found at Battle Abbey, in deposits which also included seventeen objects similar to the Castle Mall stylii (Hare 1985, 149–151).

SF5909 Stylus. Bone stylus, head ?broken off, collar in the form of two concentric rings; inserted iron point, tip missing. Small irregular depression at top of the shaft, which presumably originally had a head. L: 64mm.
90107, fill of pit 90159, Period 5.2, G9/121

Iron purse frame
by Quita Mould
(Fig.8.38)
An iron purse frame (SF347) was found residually in post-medieval dumping into the barbican ditch. It is comparable with an example from the fire deposits of 1507 at Pottergate, Norwich — believed to be of a type that may have been imported during the second half of the 15th century (Margeson 1993, 43–4, no. 295, fig.25, pl.x).

SF347 Purse frame. Purse frame with heavy horizontal main frame with non-ferrous metal coating and central swivel with decorative finial, minerally preserved leather within the corrosion may come from the original purse. L: *c.*100mm.
92758, fill of barbican ditch 91295, Period 6.2, G9/41

Copper alloy purse frames
by Alison Goodall
(Fig.8.38)
A copper alloy purse frame (SF1107) of Ward Perkins Type b5 (Ward Perkins 1940, 169), probably dating to the first half of the 16th century, was recovered from a

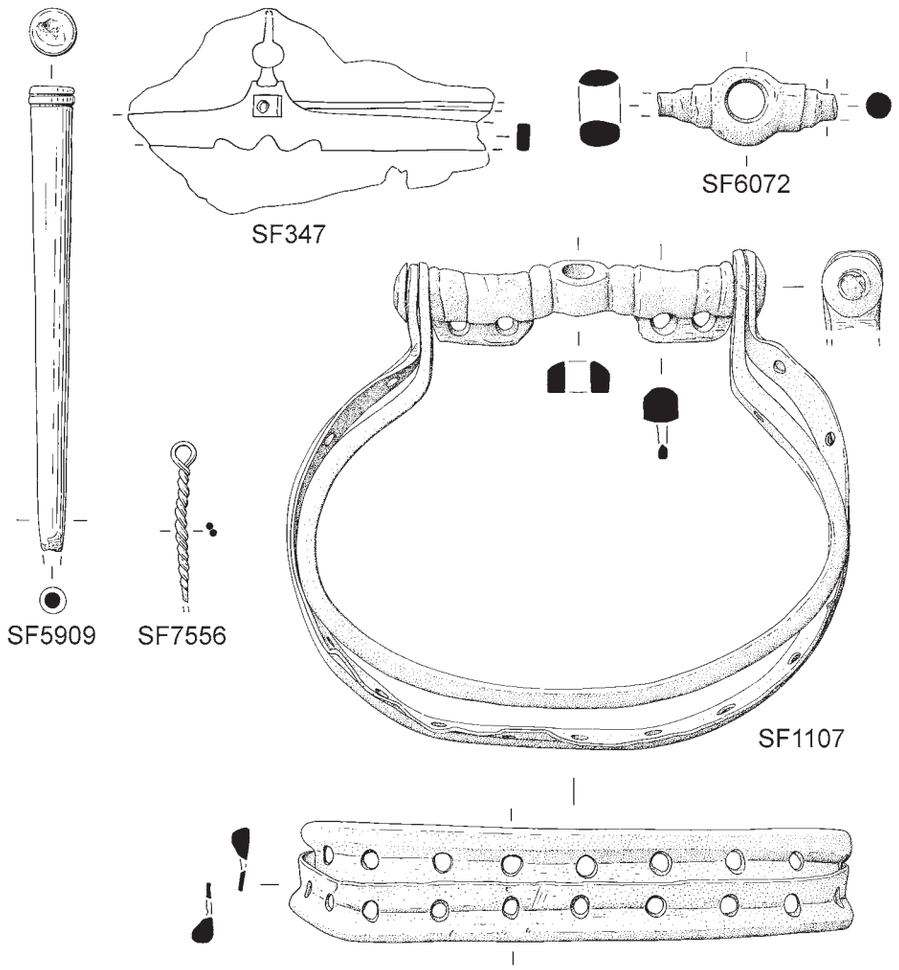


Figure 8.38 Bone stylus (SF5909); iron purse frame (SF347); copper alloy purse frames (SF1107 & 6072); copper alloy nail cleaner/toothpick (SF7556). Scale 1:1, ironwork at 1:2

pit dated to the late 16th century where it was probably residual. A purse of similar form, but with an ornamental cresting running along the top of the bar, is shown hanging from the belt of one of the wise men in Rogier van der Weyden's *Bladelin Triptych*, which was painted in the middle years of the 15th century. Another purse frame of similar form and size, complete with its swivel loop, was excavated at Netherton, Hants from a 14th-century context (Goodall 1990, 429, fig. 9.14,129). Although the Netherton purse is probably intrusive in its early context, the evidence of the van der Weyden painting points to these purses having an earlier origin than is usually suggested. A purse hinge (SF6072) was recovered from a late medieval/transitional pit.

SF1107 **Purse frame**. Purse-bar and frame with central suspension loops missing. Bar has moulded decoration and small integral plates, each with two perforations for attachment of the textile part of the purse. From the bar are suspended two frames, each of p-shaped section and each with sixteen attachment perforations.
45090, fill of pit 45242, Period 6.1, G45/5

SF6072 **Purse**. Central part of purse bar, with ring loop flanked by the stubs of moulded arms.
90716, fill of pit 90716, Period 5.2, G9/82

Copper alloy nail cleaner/tooth pick
by Alison Goodall
(Fig.8.38)
A small object made from twisted wire (SF7556) can not be identified with certainty; similar objects are variously described as lace-tags (Bayley *et al* 1985, 47, fig. 30.74–5) or ear-scoops/toothpicks (Egan and Pritchard 1991, 379–80, fig. 251.1766 and 1768) or needles. Norwich parallels (Margeson 1993, 64, nos 400 and 401) also date to 1400–1600 (400) and 1450–1500 (401). Two other examples (SF7116.02) came from fills of the well (Chapter 9.III).

SF7556 **Toilet article**. Toilet implement or lace-tag, neatly made from a single strand of wire, bent double and twisted leaving a loop. The tip is missing. L: 22.5mm.
10000b, unstratified

Textiles
by Elisabeth Crowfoot
(Fig.8.39)
Other than items retrieved from the well shaft (Chapter 9.III), few textiles were found in late medieval transitional deposits (Table 8.12). A few tabby weave fragments (some 2/2 twill and 2 unidentified) came from a pit fill

SF no.	*Context*	*Measurements*	*Fibres*	*Spinning*	*Twist*	*Weave*	*Thread Count*	*Colour*	*Comments*
SF6078	13210, fill of pit 13248, Period 5.1, G1/76	(a) 20 x 13, 10 x 6, 7 x 9, 7 x 9	animal coat	S/Z	l/l	tabby	13/10, 9/10	brown, no dye	even spin and weave, unfulled, worsted appearance
		(b) 8 x 5, 8 x 6	wool	S/S	l/l	2/2 twill	12/12 (6/6.5mm)	lighter, ?red (trace madder)	?worsted
		(c) 13 x 7.5, 6 x 8.5	wool	Z/Z	m/m	twill	c.32/20 (8 on 2.5/10 on 5)	red, madder/ bedstraw	larger piece, thread ?coarser, deteriorated
SF6283	90420, flue 90428, Period 5.2, G9/105	fragments, best c.18 x 18	wool, no pigment	S	m-l	knitting, stocking stitch	8st. 14 rows (variable)	dark brown (no dye detected)	small scraps (see above, 1033)

Table 8.12 Textile from Period 5 contexts (other than barbican well)

(SF6078). These, along with other scraps recovered from the well and later deposits, illustrate the other important commercial weave of the district, worsted, a twill made with yarns of combed wool, spun on the spindle (rock), not the wheel. This textile is said to take its name from the village of Worstead in Norfolk. It has a hard shiny surface, regarded as dust repellent, particularly suited to bed-curtains and other household furnishings.

Another textile craft for which Norwich was later well-known was knitting (Crowfoot 1993, 49–50). This is only represented at the Castle Mall site by two groups of undecorated wool stocking stitch, solid fragments probably from medium-grade hose, or possibly a knitted jerkin. Their clear surface and absence of shaping makes it unlikely that they come from caps, normally heavily fulled to render them waterproof. Several fragments of this knitting came from a possible flue (SF6283, not illustrated; the other group came from a post-medieval context, see Chapter 10.III).

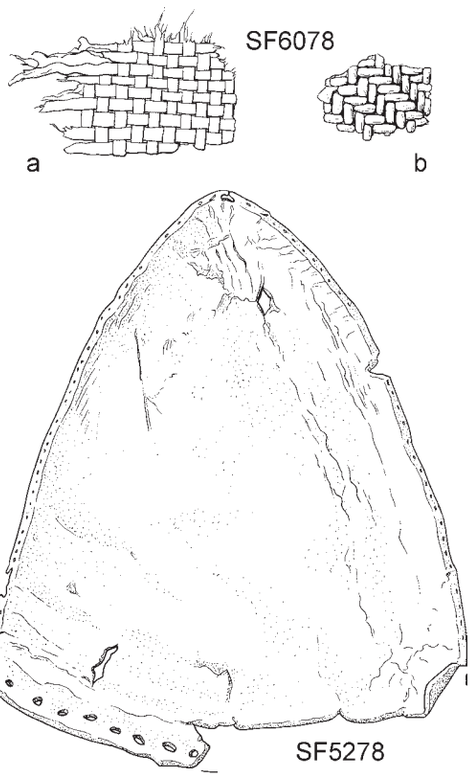


Figure 8.39 Textile (SF6078) A = tabby, B = diagonal twill; leather panel (SF5278). Textile at Scale 2:1; leather at Scale 1:2

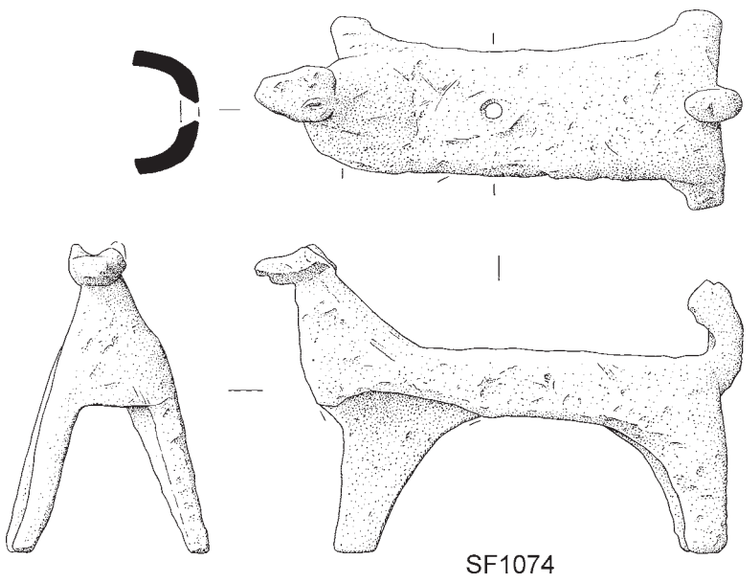
Leather
by Quita Mould
(Fig.8.39)
A triangular shaped panel (SF5278) of heavily worn leather was found in the fill of a metalworking pit. A small quantity of bottom unit fragments (SF5427, not illustrated) from a shoe of welted construction apparently of 17th-century or later date were found in the same context indicating that the fill had suffered from contamination.

SF5278 **Leather.** Triangular panel with remains of an unmoulded grain/flesh seam sl 7mm along the shorter edge, the other two edges meeting at a point have fine grain/flesh seams sl 3mm. Leather heavily worn ?calfskin. Length 159mm, width 134mm
10857, fill of pit 10888, Period 5.1, G1/68

Furnishings and Household Equipment

Lighting

Copper alloy candlesticks
by Alison Goodall
(Fig.8.40)
Fragments of two distinctive candlesticks (SF1074 and 1082) were retrieved from pits in the same property (Property 43, Period 5.2). One (SF1074) is in the form of a crudely made animal with a perforation in its back to take a candle socket: it is similar to one from France dated to the 14th century (Ward Perkins 1940, pl XXXIX). Another animal candlestick was excavated in Bath and is said to be Romano-British (Michaelis 1978, frontispiece). The dating of the Norwich example is uncertain, although the context would suggest a late medieval or early post-medieval date. The other fragment is from a twin socketed candlestick with a central pricket; this piece would have fitted over the pricket, as on the 'Flanders' candlesticks



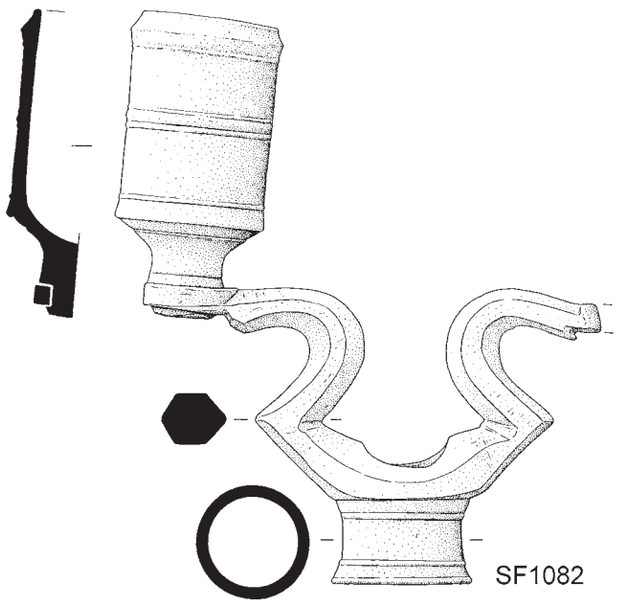


Figure 8.40 Copper alloy candlesticks (SF1074 & 1082). Scale 1:1

of the late medieval period. These candlesticks clearly demonstrate that both socketed and pricket types were in use at the same time, and it is thought that the preference for one type over another was determined by the local quality of the wax or tallow (*ibid*., figs 11 and 55). A branched fitting from a candlestick similar to SF1082 was excavated at Sewer Lane, Hull from a context dating to the 15th century (Armstrong 1977, 67, fig. 28.105).

SF1074 **Candlestick**. Candlestick base in the form of an animal, with small stylised head and tail, and 'U'-section hollow body and legs, one of which has broken off. Made of cast copper alloy, with a perforation in the broad back for attaching a candlesocket.
90422, fill of pit 90493, Period 5.2, G9/104

SF1082 **Candlestick**. Part of a double-branched candlestick. Waisted collar, two branches in the shape of back-to-back 'C' s, and a single socket only; stem and base missing. The socket is made separately from collar and branches, and is attached by a small stub on the base. Both socket and collar are decorated with groups of linear grooves. The stem may have extended upwards to form a pricket between two sockets. L:80mm
90510, fill of pit 90493, Period 5.2, G9/104

Pottery
by Irena Lentowicz
(Figs 8.41–50)

Introduction and quantification
A total of 10,259 sherds of pottery weighing 114.871kg was allocated to this period, accounting for 12.0% of the total ceramic assemblage. An additional 16.377kg of pottery came from the Golden Ball Street site and is not included in the analysis below, although significant

Fabric	*Quantity*	*Weight (kg)*	*% Quantity*	*% Weight*
Roman	*19*	*0.163*	*0.2*	*0.1*
Middle Saxon	*5*	*0.035*	*<0.1*	*<0.1*
Late Saxon	*5259*	*37.362*	*51.3*	*32.6*
Early Medieval	*673*	*3.652*	*6.5*	*3.2*
Total residual	**5,956**	**41.212**	**58.1**	**36.0**
LMU	1371	8.561	13.4	7.47
Grimston Coarse ware	4	0.159	<0.1	0.1
Non-local Med Unglazed ware	10	0.081	0.1	<0.1
Grimston Glazed ware	536	9.826	5.2	8.6
Developed Stamford ware	4	0.019	<0.1	<0.1
Hedingham-type ware	6	0.038	<0.1	<0.1
Non-local Med Glazed ware	47	0.800	0.4	0.7
Andenne ware	19	0.063	0.2	<0.1
Aardenburg-type ware	4	0.025	<0.1	<0.1
French Red Painted ware	1	0.012	<0.1	<0.1
Misc. Medieval wares	1	0.001	<0.1	<0.1
LMT	1545	35.987	15.1	31.4
Dutch-type Red EW	83	2.451	0.8	2.1
Tudor Green ware	16	0.075	0.1	<0.1
Dutch Red Earthenware	35	1.050	0.3	0.9
Low Countries EW	169	3.621	1.6	3.1
Siegburg Stoneware	67	1.429	0.6	1.2
Langerwehe Stoneware	244	6.968	2.4	6.1
Raeren-Aachen Stoneware	42	1.023	0.4	0.9
Misc. Late Medieval wares	3	0.026	<0.1	<0.1
Local EPM	11	0.334	0.1	0.3
Total contemporary	**4,218**	**72.549**		
Intrusive	73	0.930	0.7	0.8
Intrusive Post Medieval	*62*	*0.883*	*0.6*	*0.7*
Intrusive Modern	*11*	*0.047*	*0.1*	*<0.1*
Unidentified	12	0.180	0.1	0.1
Total intrusive/unidentified	**85**	**1.110**		
Total	**10,259**	**114.871**		

Table 8.13 Total quantity and weight of Period 5 pottery by fabric

vessels are detailed by Goffin in the discussion section. A significant proportion of the Castle Mall assemblage (34.5%; 1,774 sherds weighing 39.654kg) came from the backfill of the barbican well and is discussed in detail in the next chapter. However, the general comments below and the section on fabrics and forms below incorporate all Period 5 material.

Ceramically this period was defined by the introduction of late medieval/transitional wares in increased quantity as well as the continued presence of medieval fabrics in the assemblage. Residual pottery accounted for *c*.36% of the assemblage (5,956 sherds weighing 41.212kg), and a small quantity of intrusive later material was also recorded (0.8%; 73 sherds, weighing 0.930kg). While some of the medieval fabrics were probably also residual by the late 14th century, it was difficult to distinguish what proportion of the 2,003 sherds (19.585kg) was in fact residual and what proportion long-lived and contemporary.

The increased dominance of late medieval/transitional wares characterised this period and the 2,202 sherds (52.612kg) represented 45.9% of the period assemblage. The fabrics introduced during the latter part of the previous period were present in increased quantity. Utilitarian kitchen wares LMT, DUTR and Dutch Red Earthenwares were supplemented by small quantities of English fine ware such as Tudor Green-type ware. Table wares were, however, dominated by imports of Rhenish stonewares. Siegburg stoneware continued to be imported, but products from the Langerwehe industry were more common and vessels from Raeren-Aachen made their first appearance.

Fabrics and forms

As mentioned above, some of the medieval fabrics recovered from contexts assigned to this period would undoubtedly be residual by the mid 15th century. The medieval fabrics accounted for *c*.17.1% of the period assemblage, mostly made up of GTGW and LMU. Vessels from these local kilns continued to be produced into the later 14th and 15th centuries and it was difficult to ascertain what proportion of the wares were in

fact residual. LMU would have continued to be used as a kitchen ware alongside LMT and DUTR. Vessels represented by rims tended to be jars and cooking pots with incipient (type J2i) or developed 'hammer-head' rims (type J2j), although simpler everted rims (such as types J2b and J2c) were also recorded. Bowls were more commonly recovered from this period than previously, and appeared to be larger with curved profiles perhaps indicating a development into larger bowls or pancheons characteristic of later, 15th-century forms.

Medieval glazed wares

Grimston-type Glazed ware, though recovered from earlier medieval contexts, only a made up a significant proportion of the assemblage during this period; only *c.*10.5% of Grimston wares came from Period 4 contexts, while the 9.823kg recovered from Period 5 represented *c.*66% of the total weight of the fabric recovered from the site. Where possible, rims were assigned to typologies and recent works undertaken on the Grimston industry are referenced below (Little 1994 and Grimston, Vong Lane: Lentowicz and Percival 1994).

Of forms represented by rims, the jug was the most common individual vessel, with forty-one of the total of fifty rims recorded. This was also the only form recorded before Period 5.2. Twenty-six jugs came from Period 5 contexts, of which seven were from Period 5.1. Six of these were assigned to a type, and jugs with flat-topped rims, curving from the neck (Little type GGL – four rims) were the more common type. Single examples were also recorded of a straight-sided upright rim curving from the neck (Little type GGA) and flat-topped rim with a groove (Grimston Vong Lane type J2). Nineteen rims came from Period 5.2 contexts (of which four could not be assigned to a type), and as well as Little types GGA (two examples) and GGL (three examples) referred to above, two rims with straight-sided expanded flat (Little type GGD) were recorded. In addition, two jugs with straight-sided slightly flaring rims (Little type GD) were also recorded; these usually come from unglazed jugs but all the Castle Mall examples are glazed with the standard glossy green glaze.

In Period 5.2 the range of vessels represented by rims expanded to include bowls (four rims) and a possible ?lid. However, this was better demonstrated by other diagnostic sherds such as bases and handles. Bases were more numerous than handles, and those from jugs most common (thirty-eight examples from thumbed jugs, as well as seven splayed bases and seven non-diagnostic bases). Flat ware bases, glazed on the interior, were introduced in Period 4.2, continued to be represented in Period 5.1 and expanded in number during Period 5.2, to also include sagging and splayed as well as flat bases. Other forms represented by bases included bowls and jars recorded in later contexts. A base with a bunghole spout from a cistern was also recorded.

Again, handles predominantly came from jugs, either attached to vessel wall fragments or diagnostically parts of strap, oval or round, ribbed handles. A skillet handle was recorded from Period 5.1.

These more unusual vessels, such as skillets, bunghole cisterns and the bowl base and rim, show the local Grimston industry endeavouring to increase its product range to cope with a changed demand. Unfortunately the industry did not adjust accordingly, or did not fulfil the required demands as effectively as its rival, and by the late 15th century the industry was in decline.

Late medieval and transitional ware

The demand for new forms was met by industries producing a range of pottery recovered from the late 14th to late 16th century. These were dominated by Late Medieval and Transitional ware (LMT), the common name given to the large group of hard-fired, slightly sandy, compact fabric with quartz, red mineral and mica inclusions recovered in some quantity on many sites in Norfolk. No kiln sites have been identified in the immediate vicinity of Norwich, though production of this pottery must be local and the Waveney valley has long been considered the most likely source of many of the LMT vessels reaching Norwich. Recent fieldwork and the subsequent re-evaluation of LMT collections supports this theory (Anderson *et al* 1996).

LMT was found as an intrusive element in small quantities in earlier periods, although some of the material recovered from Period 4 may be contemporary as the fabric was introduced into the Norwich assemblage in the early to mid 14th century. However, it was only in Period 5 that LMT commanded the larger proportion of the assemblage. Just over half of all the LMT recovered came from this period (*c.*50.5%), with an additional 36.6% from Period 6 contexts (Chapter 10.III), although only the material from Period 6.1 could be considered as contemporary (366 sherds, weighing 6.969kg, 9.8% of all LMT recovered).

The range of vessels produced in LMT represents a combination of medieval elements with influence from the continent and changes in cooking and eating habits. The majority of the forms recovered were kitchen wares, but jugs and table wares were also produced. The single most common vessel form recorded was the multi-functional jar (112 rims). Where possible these have been allocated to a type based on vessel and/or rim profile, although this was not possible with fifty-seven of the rims. Of the remaining fifty-five rims, the majority came from jars with globular profiles (type A1 – thirty-seven rims), while the other profile types were represented by six rims apiece. These were jars with distinct necks (type A2), straight-sided jars (type A3) and jars with *bifid* rims (type A4).

Other jar types were developed to include handled jars, either with one or two-handles (fifty rims). Most distinctive were globular jars with two horseshoe shaped handles (type B2 – thirty-five rims), while one-handled jars were less common (type B1 – ten rims); five rims showed scars of attachment only and could not be allocated to a specific type.

Although two cooking pot rims were recorded, the development of LMT shows changes in cooking habits and influence of Dutch vessels, with the introduction of specific cooking forms such as the pipkin, the cauldron and skillet. The skillet in particular was a late medieval/transitional form and thirty-eight rims were recorded. The majority of these came from skillets with a carinated profile (type E2 – twenty-nine rims), while rounded profiles were less common (type E1 – five rims). Pipkins too were common with thirty-three rims recorded; eleven were not assigned to a type and the remainder divided almost equally between pipkins with globular profiles (type C1 – twelve rims) and those with angular profiles

(type C2 – ten rims). Pipkins with globular profiles were further sub-divided into vessels with everted rims (type C1a – eight rims) and those with lid-seated rims (type C1b – four rims). Cauldrons were not so common, and only two examples were recorded both with rounded profiles (type D1). Another late medieval/transitional form associated with changes in cooking practice was the dripping pan. Only three rims were recovered, one with an upright profile (type F1) and two with sloping sides (type F2).

Bowls were also a common form with forty-six rims recorded. Twenty-one rims were not allocated to a type, but bowls with curved/carinated profiles (type H2 – eleven rims) appeared to be more common than straight-sided bowls (type H1 – eight rims) or bowls with upright rims (type H3 – six rims). The large bowl, or pancheon (by definition requiring two hands to lift) was another late medieval/transitional development, and thirty-two rims were recorded. These came from vessels with sloping sides, and were sub-divided according to rim profile with either sloping rims (type I1a – twelve rims) or flanged rims (type I1b – one rim). The remaining nineteen rims were not classified. Three rims from small handled bowls were also recorded; the function of these is unclear but they are a common element in post-medieval assemblages.

While bowls and pancheons could also serve a variety of functions as either food preparation or serving vessels, jugs and dishes acted as table wares. A total of fifty-four jug rims were recorded, and again these were allocated to a type based on profile and rim type. Over half of the total number of rims were recorded by type only (*i.e.* profile was not discernible, type K1); most were plain, upright rims (type K1a – twenty-seven rims) although collared rims were also present (type K1c – six examples). Globular jugs with collared rims were also common (type K3c – seventeen rims) while similar jugs with upright rims were also recorded, these were not so prolific (type K3a – two rims). A similarly small number of jugs with an S-curved profile (type K2 – two rims) were also recorded, one with an upright rim (type K2a) and one with a collared rim (type K2c). Only nine dish rims were recorded, and five of these come from a single vessel. Other table wares included a small number of drinking vessel or mug rims (five rims); these were never a large component of red earthenware industries as the market was dominated by Rhenish stonewares.

Other forms recorded were of a household nature and included a cistern (one rim; also represented by a number of spouts and bases), a straight-sided chamber pot (eight rims, but from one vessel) as well as a vessel recorded as a pedestal lamp but more likely to be an early candlestick.

A small number of intrusive rims were recovered from Periods 1 to 3, as well as a two-handled jar (type B2) from Period 4. Nineteen rims were recorded Period 5.1 contexts; these included rims from jars with globular profiles (type A1), as well as two jar rims which could not be assigned to a profile type; other forms included two bowls with curved profile (type H2) and three pancheons with a sloping rim (type Ia), as well as three rims from skillets with rounded profiles (type E1). Rims from two globular jugs with collared rims (type K3b) and splashed glaze were also recorded. The skillet and pancheon rims, as well as the globular profile of the jugs all indicated the influence of contact with the continent as these imitate Dutch vessels and also reflect a change in cooking and serving habits.

By Period 5.2 the number of rims recovered has increased (143 rims were recorded). Jars were again very common, with thirty-five examples recorded, and while jars with globular profiles were present (type A1 – 20 rims) the range expanded to include jars with necks (type A2 – four rims) and with *bifid* rims (type A4 – four rims); nine rims were not allocated to a type. A cooking pot was also recorded, which probably indicated the continuation of medieval tradition. Bowls were also common with seventeen rims recorded. Jugs were also common (twenty-three rims), mostly with upright rims and globular profiles. However, typical late medieval/transitional vessels were more dominant. A total of thirty-four skillet rims were recorded and seven pipkin rims. Handled jars were also present, either with two horseshoe shaped handles (type B2 – five rims) or with one handle (type B1 – one rim with a handle, along with two other examples with scars).

Low Countries/Dutch Red Earthenwares

Other late medieval/transitional kitchen and domestic wares were represented by products from the continent, or by vessels imitating them produced by local potters. Dutch (or Low Countries) Red Earthenwares were a large group of undecorated glazed earthenwares with a wide date range and manufactured in many centres in the Low Countries from the 13th century (Baart 1994, 19). They were imported into Norwich in the late medieval and early post-medieval periods and the forms were extensively copied by local LMT potters. The earliest imports were probably occasional parts of cargoes mainly carrying wool and grain, or for personal use by Dutch traders. Later they began to be imported for Dutch immigrants and then manufactured locally to supply the demand; these are recorded as Dutch-type Red Earthenwares (DUTR). It is difficult to determine macroscopically the exact provenance of many of these vessels, especially as many of the forms were copied by local potters although there are some characteristic forms and manufacturing techniques which can clarify fabric. The most frequent DUTR forms are one- or two-handled cauldrons, carinated bowls, bowls, shallow dishes, frying pans and skillets, with distinctive attributes such as pinched handles, tripod bases, pinched feet, ring-base or collared vessels. The distinction here was made on a combination of form and glaze: Dutch or Low Countries Earthenware appear to have a smoother, thicker, honey-coloured glaze, while those products assigned as DUTR have a patchier LMT-type glaze.

A total of 204 sherds of Low Countries/Dutch Red Earthenware weighing 4.671kg was recorded and first appeared in the ceramic record in Period 4.2 represented by the bases from a pipkin and a flatware vessel. The fabric made up a proportion of the Period 5 assemblage with 4.513kg recovered (3.9% of the period assemblage), accounting for 96.6% of all the ware from the site. It was less common in Period 5.1 (0.647kg) than in the following sub-period; the only form represented were the rim of a cauldron and profiles from two further cauldrons, or two-handled cooking pots. (A total of twenty rims were recorded but ten of these came from a single vessel and a further nine from another.) These vessels were not a

common product of the industry but do appear to have been the most popular import into England.

Most of this ware came from Period 5.2 (3.866kg) and the range of forms recorded increased. Bowls were very common (sixteen rims recorded), as well as jars (three rims), jugs (three rims) a handled bowl and a skillet represented by four rims and a base, as well as by a solid handle from a skillet. The jug rims were unusual, as these were a common product in the 13th century but by the late 14th and 15th centuries were less common as the demand for these vessels was being met by Rhenish stonewares.

Locally produced DUTR was more common than its Dutch counterpart, with a total of 233 sherds weighing 7.753kg recovered from the site. However, only 2.451kg came from contexts allocated to Period 5 (2.1% of the period assemblage, and 31.6% of all DUTR recovered). Almost a quarter of the entire assemblage (22.6%) came from contexts which were archived at assessment, and a small quantity was recovered as an intrusive element in earlier contexts. A single sherd came from Period 4.1, just over a third of the total assemblage from Period 5 contexts and a further 3.338kg (43.0%) from Period 6. However, as with LMT, it is only the material recovered from Period 6.1 which can be considered contemporary, 0.949kg.

Cauldrons and pipkins were the most common vessel forms recovered, although it is possible that some of the cauldrons came from one-handled jars rather than two-handled examples. A total of twenty-five cauldron rims were recorded, and though it was attempted to classify these by profile and rim type time this was not done consistently. Rounded profiles (type D1 – seven rims) appeared to be more commonly noted than angular profiles (type D2 – two rims), but the majority (sixteen rims) were not allocated to a type at all. A further nine cauldron bases were also recorded. A total of eighteen pipkin rims was recorded, the majority from Period 6 contexts. Again these vessels were also represented by other diagnostic sherds such as bases (seventeen examples) and handles. Other cooking vessels included three skillet rims and one base; other forms represented by rims included bowls, jars, dishes and handled bowls.

Cauldrons were very common in Period 5.1 (seventeen rims); one profile of a vessel with a rounded profile and handle coming off the rim (type D1b) was recorded. The remaining sixteen rims were not assigned to a type. Other late medieval/transitional cooking vessels were better represented by bases. Feet from pipkin and/or cauldron bases were supplemented by a skillet base. Other vessel forms from this sub-period included three bowl rims and four dish rims, as well as an applied wedged foot. Though this is usually seen as a diagnostic Low Countries vessel, this particular example appeared to come from a Dutch-type vessel.

The range of vessels in Period 5.2 was less varied. Three cauldron rims were recorded, as well as rims from three skillets. Two of these had rounded profiles (type E1) and one angular (type E2). The rim from an unidentified vessel form was also recorded.

Tudor green-type wares

The remaining late medieval/transitional wares recovered from the site were tablewares. The only English ware present was Tudor Green-type ware, and only a small quantity of this was recovered 0.223kg from the entire excavation. The fabric first appeared in Period 4.1 (only one sherd weighing 8g), while only 75g was recovered from Period 5 with a further 97g from Period 6. Two forms were represented by a splayed base with lip from Period 5.1 and the rim of a drinking vessel/mug from Period 6.2.

Early post-medieval ware

A small quantity of Early Post-medieval ware (EPM) was also recorded; these were mostly body sherds of red earthenware with a metallic sheen and a clear lead glaze.

Imports

Most of the drinking and pouring vessels were provided by Rhenish stonewares and products from Siegburg, Langerwehe and Raeren-Aachen were all recovered from this period. Imports from the first large stoneware production centre at Siegburg appeared in Norwich in the early 14th century (Jennings 1981, 109), and indeed a small quantity of the fabric was recovered from Period 4.2 contexts. Only a small quantity of the ware was recovered in total (1.472kg), and just over 97% of all Siegburg stoneware came from Period 5 contexts.

Long-necked jugs, small jugs and loop-handled cup were the most common forms produced. The majority of the Castle Mall assemblage was made up of body sherds. All the rims recorded came from Period 5.2 contexts and were upright rims from jugs/drinking vessels (fifteen rims). A number of frilled bases were also recorded, as well as a tentative lid.

Langerwehe stonewares were much more prolific than Siegburg products, and made the first major impact in terms of number of vessels. These products were common in later 14th- and 15th-century contexts in Norwich. Again, of the total assemblage recovered (7.969kg) the majority came from Period 5 contexts (6.968kg; 87.4% of the total fabric weight), with the bulk of the material coming from Period 5.2 (6.337kg) and only 0.631kg from the Period 5.1.

The most common imported forms were again jugs and two-handled cups, but rims recovered from Castle Mall came exclusively from jugs. Again a number of frilled bases were also recorded which may have come from two-handled cups, but the majority appeared to have been from jugs or one-handled drinking vessels. No diagnostic handles from two-handled cups were recorded. Five frilled bases were recorded from Period 5.1, with most rims and bases came from Period 5.2. These included a jug with an upright rim (type J1/Hurst type I – one rim), jugs with upright rim and cordon just below rim (type J2/Hurst type III – two rims), jugs with a cordon at the neck and body junction (type J3/Hurst type IV – four rims) and a jug with an upright rim and rilled neck (type J4 – two rims). An additional twenty-one jug rims (twelve forming a profile of a jug) were not allocated to a type, and a further four rims were recorded as drinking vessels. A mug rim was also recorded (Jennings 1981, fig. 45, no. 741). Again, twenty-four frilled bases were recorded, as well as one flat base and a spout. Three frilled rims were also recorded from Period 6 contexts.

Manufacture began at Raeren-Aachen industries in the 15th century and Norwich examples appear in late 15th to early 16th century contexts. The fabric appears

Fabric	*Quantity*	*Weight*	*% Qty*	*% Wt*
Roman	*7*	*0.080*	*0.1*	*0.2*
Middle Saxon	*3*	*0.021*	*<0.1*	*<0.1*
Late Saxon	*2852*	*18.071*	*57.1*	*48.4*
Early Medieval	*497*	*2.416*	*9.8*	*6.4*
Total residual	**3,359**	**20.588**	**66.5**	**55.2**
LMU	1019	5.528	20.2	14.8
Other Med. Unglazed wares	7	0.058	0.1	0.1
Grimston Glazed ware	197	2.308	3.9	6.2
Other Medieval Glazed wares	53	0.596	1.0	1.6
LMT	241	5.123	4.7	13.7
Dutch-type Red EW	40	1.360	0.8	3.6
Tudor Green ware	3	0.050	<0.1	0.1
Low Countries/Dutch Red EW	22	0.647	0.4	1.7
Siegburg Stoneware	2	0.005	<0.1	<0.1
Langerwehe Stoneware	28	0.631	0.5	1.7
Raeren-Aachen Stoneware	5	0.045	0.1	0.1
Misc. Late Medieval wares	6	0.053	0.1	0.1
Local EPM	1	0.004	<0.1	<0.1
Total contemporary	**1,624**	**16.408**		
Intrusive	*22*	*0.152*	*0.4*	*0.4*
Intrusive Post Medieval	*16*	*0.120*	*0.3*	*0.3*
Intrusive Modern	*6*	*0.032*	*0.1*	*0.1*
Unidentified	10	0.156	0.2	0.4

Table 8.14 Total quantity and weight of pottery by fabric in Period 5.1

in small quantities as an intrusive element in Periods 1.3 and 2.2, but makes its first impression in Period 5 where the 1.023kg recovered represented 35.1% of the total quantity recovered, with 0.801kg (27.5%) from Period 6. (Again over a quarter of the fabric came from contexts archived at assessment).

The most common vessels imported were small globular drinking vessels with wide necks, strap handles and frilled bases. Fourteen rims were recorded, most as upright jug rims although some were noted as drinking vessels, including a mug profile and a mug rim from Period 6.3 (Jennings 1981, fig. 47, no. 778). Forms from Period 5 included a single jug rim from Period 5.1, seven frilled bases from Period 5.2 along with rims from three jugs (Jennings 1981, fig. 46, nos 753 and 756) and two mugs. The Period 6 material included frilled bases, two jug rims and a mug rim.

Stratigraphic distribution

Assemblages are detailed by group in Chapter 8.II and Appendix 6, where details of illustrated items can also be found.

Period 5.1

(Figs 8.41–43)

A total of 5046 sherds of pottery weighing 37.302kg was recovered from this sub-period, 32.6% of the Period 5 assemblage. Residual earlier pottery accounted for over half of the material (55.2%), while medieval pottery, of which LMU and GTGW were the major components, made up 22.7%. Late medieval/transitional wares account for 21%, of which LMT was the most common fabric, supplemented by smaller proportions of kitchen wares DUTR and Dutch Red Earthenwares and tables wares of Rhenish stonewares and English Tudor Green.

Period 5.2

(Fig.8.44–52)

Just over two-thirds of the pottery allocated to Period 5 came from this sub-period (67.4%) – 5200 sherds weighing 77.217kg. Much of this (51.2%, 1747 sherds weighing 39.556kg) came from this fills of a single feature, the backfilling of the well shaft (discussed in Chapter 9.III).

This sub-period was characterised by the increased quantity and dominance of late medieval/ transitional wares, which make up 57.6% of the sub-period assemblage compared with only 21.2% of the Period 5.1 material. Medieval fabrics, though still present, account for only 14.3% and though again some was probably contemporary, the majority was probably residual. The exception is GTGW which made up a greater proportion of the assemblage. The range of late medieval/transitional fabrics was similar and no new fabrics were introduced, however, as mentioned above the quantity increased.

Again, residual earlier material accounted for a proportion of the assemblage. Of the medieval fabrics recovered, LMU in particular appears to be more residual, although as mentioned above, Grimston Glazed ware was still a contemporary element. LMT was much more of a presence in many of the assemblages, and supplemented by DUTR and Low Countries/Dutch Earthenwares, while table wares were represented by Rhenish stonewares from Langerwehe and the introduction of Raeren-Aachen products, with a small quantity of English Tudor Green-type ware.

Fabric	*Quantity*	*Weight*	*% Qty*	*% Wt*
Roman	*12*	*0.083*	*0.2*	*0.1*
Middle Saxon	*2*	*0.014*	*<0.1*	*<0.1*
Late Saxon	*2375*	*19.215*	*45.7*	*24.9*
Early Medieval	*176*	*1.314*	*3.4*	*1.7*
Total residual	**2,565**	**20.626**	**49.3**	**26.7**
LMU	350	3.033	6.7	3.9
Medieval Unglazed wares	7	0.182	0.1	0.2
Grimston Glazed ware	339	7.618	6.5	9.8
Medieval Glazed wares	30	0.359	0.6	0.5
Misc. Medieval wares	1	0.001	<0.1	<0.1
LMT	1304	20.864	25.0	39.9
Dutch-type Red EW	43	1.091	0.8	1.4
Tudor Green ware	13	0.025	0.2	<0.1
Dutch Red Earthenware	203	4.565	3.8	5.9
Siegburg Stoneware	65	1.424	1.2	1.8
Langerwehe Stoneware	216	6.337	4.1	8.2
Raeren-Aachen Stoneware	37	0.978	0.7	1.3
Misc. Late Medieval wares	3	0.082	<0.1	0.1
Local EPM	10	0.330	0.2	0.4
Total contemporary	**2,621**	**46.889**		
Intrusive	*38*	*0.468*	*0.7*	*0.6*
Intrusive Post Medieval	*48*	*0.798*	*0.9*	*1.0*
Intrusive Modern	*3*	*0.009*	*<0.1*	*<0.1*
Unidentified	2	0.024	<0.1	<0.1

Table 8.15 Total quantity and weight of pottery by fabric in Period 5.2

Discussion and conclusions
by Richenda Goffin

The pottery from Period 5 was recovered from features attributable to c.1345 to the mid to late 16th century, spanning the late medieval period and the beginnings of the post-medieval period. The ceramic assemblage is substantial and forms 12.0% of the ceramics from the site as a whole (10246 fragments, weighing 114.519kg). A large proportion of the Period 5.1 assemblage is residual (55% by weight), a figure which decreases in Period 5.2 to 26.7%.

The ceramics recovered from Period 5.1 are primarily medieval in date, whilst those from Period 5.2 date to the transitional early post-medieval period. A total of 37.302kg of pottery was recovered from Period 5.1, with 77.217kg assigned to features from Period 5.2. The latter assemblage includes the large and important ceramic assemblage from the backfilling of the castle well shaft (39.56kg), detailed in Chapter 9. Pottery from this period is dominated by groups from the infilling of extensive quarry pitting and the gradual infilling of the barbican ditch, as well as domestic and craft-related pits relating to documented properties. The extensive disturbance of earlier features, particularly the quarries, accounts for the high proportion of residual material found (see further discussion in Chapter 8.V).

The ceramics assigned to this period include a range of long-lived fabrics which continued to be made into the late medieval period, as well as new local fabrics and imported wares primarily from the Low Countries and the Rhineland. In addition, a small quantity of the regional imports such as the Surrey whiteware of 'Tudor Green' type was also reaching the site.

Local medieval unglazed wares still form a considerable component of the Period 5.1 assemblage (14.8% by weight). Although some of this pottery was no doubt residual by Period 5, there is evidence from other sites that LMU continued to be used into the 15th century (Jennings 1985, 38–39 and 188). In addition some of the Grimston wares recovered from the Castle Mall site represent late variants and are likely to be contemporary rather than residual elements. An example of this is the Grimston glazed jug with multi-ridged strap handle from quarry pit *90070* (Open Area 37, Castle Fee Properties 44–46).

The most significant change in the production of utilitarian wares however is marked by the arrival of LMT ware, which mainly superseded LMU in the 15th century. Nearly a third of the Period 5.1 assemblage by weight is made up of this locally-made micaceous redware. Locally-made Dutch-type Red Earthenware and Dutch redwares also form a significant element of the Period 5.1 assemblage (5.2% by weight). At Dragon Hall such redwares only occur in any quantity in Period 6 deposits dating from the early 15th century through to the middle of the 16th century (twenty-nine sherds) (Anderson 2005).

At Castle Mall, the Period 5.1 assemblage is also characterised by the arrival of stonewares from the Rhineland, comprising small quantities of Siegburg and Langerwehe. Although present in small amounts in the preceding period, there is still surprisingly little Siegburg

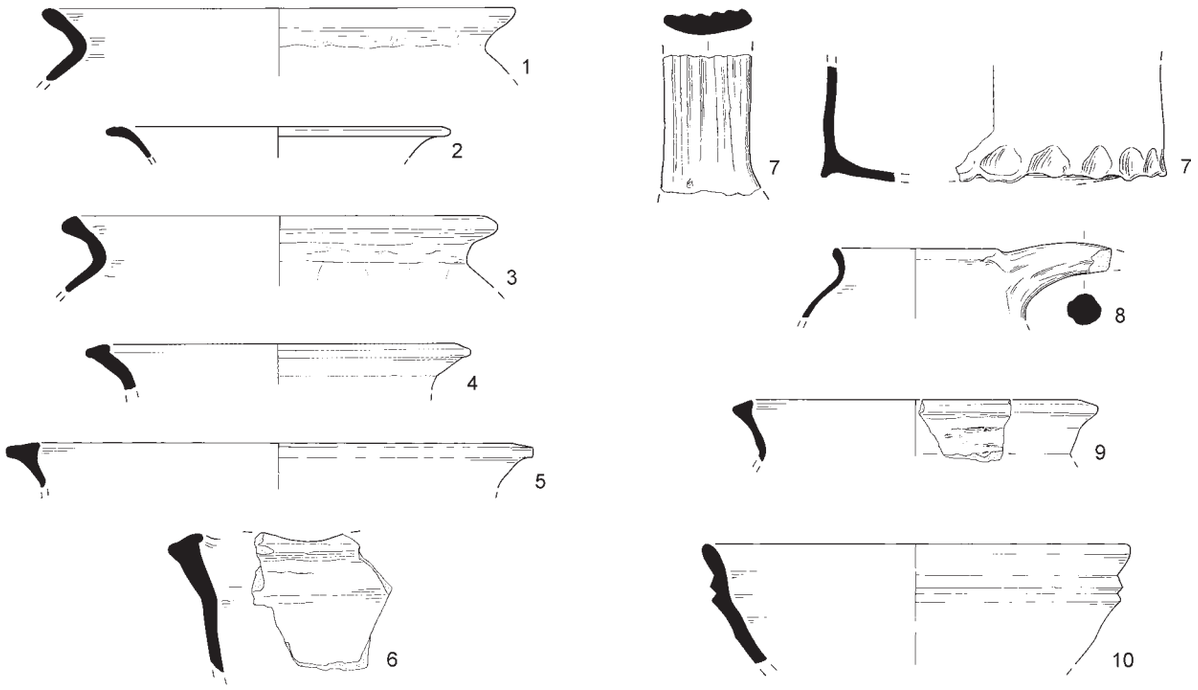


Figure 8.42 Pottery from pits encroaching on St John de Berstrete/Timberhill cemetery boundary ditch, Open Area 44 (G1/76, part) (City Property e/f). Scale 1:4

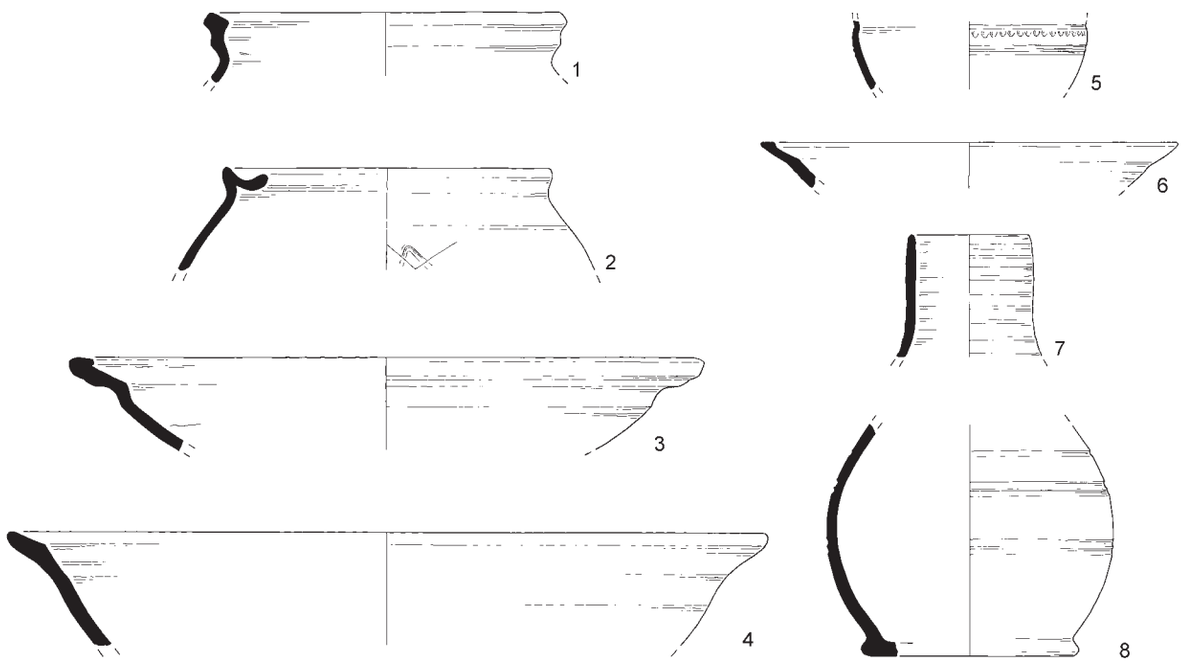


Figure 8.45 Pottery from pits, Open Area 49 (G9/82, part) (Castle Fee Property 44). Scale 1:4

recovered in Period 5.1. Only one sherd was present in a metalworking pit (*10888*, Open Area 46, Property g) and another fragment came from quarry pit *90879* (Open Area 37, Castle Fee Properties 44–46). Langerwehe stoneware by comparison is more frequent, comprising twenty-eight fragments from Period 5.1. At Greyfriars nine fragments of Siegburg were identified from Period 3 (13th to mid 16th century), with a further six sherds found in Period 4 deposits (late 16th to mid 19th century) (Lentowicz in Emery, 2007). Langerwehe stoneware is present in greater quantities at Greyfriars, and comprised forty-nine fragments in Period 3 and thirty-eight in Period 4. A similar pattern occurred at the nearby Dragon Hall excavations, although the quantities are small, probably due to the lack of pottery overall of this late medieval date. Here only one fragment of Siegburg stoneware is present in Period

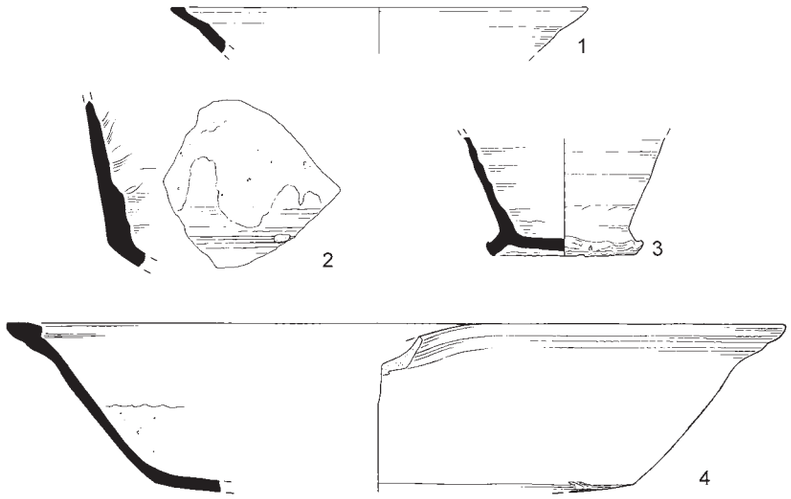


Figure 8.46 Pottery from pits, Open Area 50 (G9/56, part) (Castle Fee Property 46). Scale 1:4

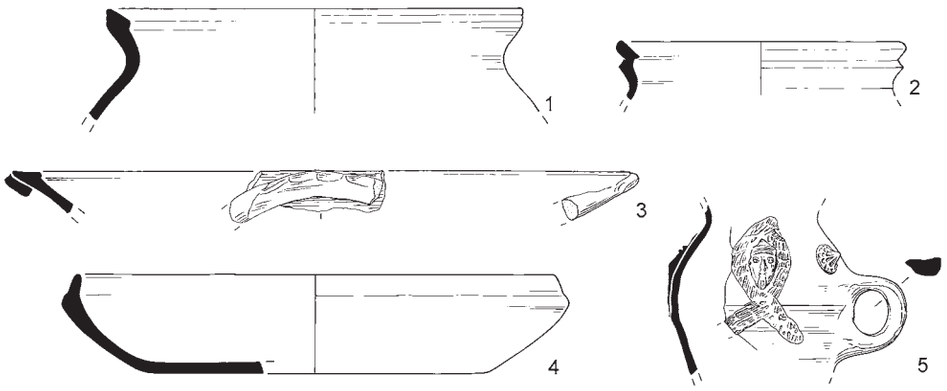


Figure 8.47 Pottery from pits containing animal butchery and domestic refuse, Open Area 38 (G1/24) (?Castle Fee Property 49). Scale 1:4

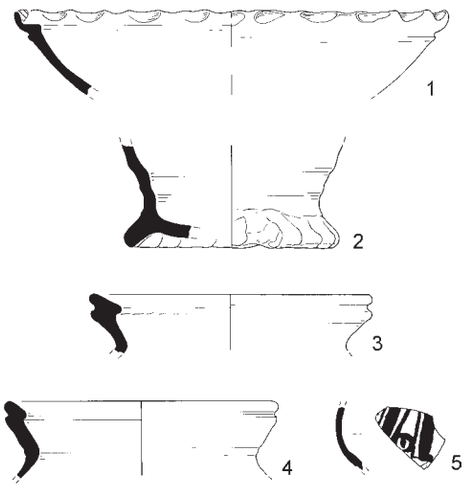


Figure 8.49 Pottery from pit *477*, Open Area 51, (Castle Fee Property 47) (GBS Group 56). Scale 1:4

7 deposits (mid 16th to late 17th century), and five fragments of Langerwehe in Period 6 (early 15th to mid 16th century), Period 7 and Period 8 (late 17th to mid 19th century) (Anderson 2005). No stratigraphic groups were assigned to the mid 14th to early 15th century (Period 5) at Site 26460N in King Street and no stonewares were recorded from Period 6, early 15th to mid 16th century (Goffin in Shelley and Brennand, forthcoming). It is difficult to explain the comparative paucity of stonewares of 14th- to 15th-century date at Castle Mall. Five fragments of Raeren stoneware of late 15th- to 16th-century date were found in Period 5.1 deposits, most of which were associated with the robbing activity surrounding the barbican well (Open Area 21, G5/51).

Much of the pottery attributed Period 5.2 came from the fills of pits which cut into pitting from the preceding phases: these features were probably dug during the construction of dwellings during the 14th century and later. The percentage of residual pottery is less than in Period 5.1, although curiously, the quantity of Grimston glazed ware sherds is higher. It is likely that some of the Grimston was contemporary and was being used alongside vessels made from LMT. One later product of the

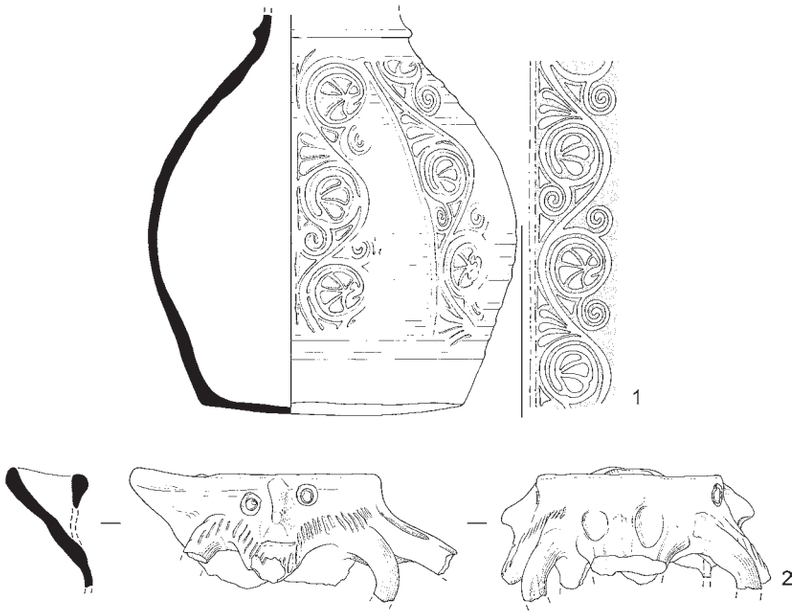


Figure 8.50 Pottery from pit *115*, Open Area 53, (City Property g) (GBS Group 23). Scale 1:4

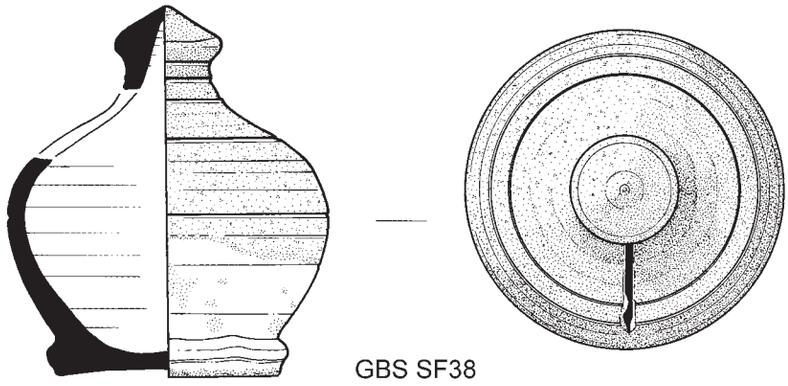


Figure 8.51 Residual money box from pit *146* (Period 6.1), Open Area 53 (City Property g) (GBS Group 9). Scale 1:4

Grimston industry is the face-jug which was found in one of the fills of pit *490* (Open Area 51, Castle Fee ?Property 47) at Golden Ball Street (Fig.8.50, no.2), dating to the 14th to 15th century or even later (Clarke and Carter 1977, 206). A further possible late Grimston product was recovered from pit *477* within the same property (Fig.8.50, no.1). This jug has an unusual scrolling decoration in zones, for which as yet no parallels have been found.[3]

Local medieval unglazed wares are still also in use in Period 5.2, although their presence is greatly reduced, forming 3.9% by weight of the sub-period assemblage. It is possible that some of the makers of this type of pottery were attempting to maintain their share of the market by copying LMT forms. A LMU jar present in a deposit associated with a wall running between City Properties (e) and (f) along the northern edge of the cemetery of St John has the appearance of a 'bifid' rim, a characteristic feature of LMT jars and pipkins.

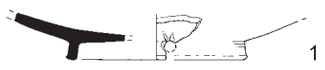


Figure 8.52 Residual pottery from cellar Structure 56 (Period 6.3), (City Property g) (GBS Group 3). Scale 1:4

Late medieval and transitional wares make up nearly 40% by weight of the Period 5.2 assemblage. As detailed by Lentowicz above, a wide range of forms are present. Such redwares are supplemented by Dutch redwares in the form of kitchenwares such as skillets, pipkins and bowls, and also local copies of Dutch wares.

This part of the Castle Mall assemblage follows a similar pattern as many other sites in Norwich. The utilitarian wares which are mainly local are supplemented by large quantities of Rhenish stoneware jugs and drinking vessels, with small quantities of other imported wares and fabrics from other parts of the country. In this case Siegburg, Langerwehe and Raeren stoneware make up 11.3% by weight of the Period 5.2 assemblage, with no Cologne/Frechen sherds being identified.

Perhaps the most unusual vessel is the Siegburg drinking jug with looped handle recovered from pit *11064*, a feature apparently used for the disposal of waste from hornworking and related activities (Open Area 38, ?Castle Fee Property 49). This vessel has an applied decoration and prunts (Fig 8.47, no.5). The base and upper part of the vessel is missing, but the jug has a globular body with a looped handle attached to the widest part. The vessel is covered with a matt red-brown ash glaze both internally and externally. It is decorated with an applied prunt and a moulded applied decoration in the form of an elongated human head encircled with a shallow applied band of clay which has been roughly incised. It is likely that the fragments are part of a funnel-necked jug. Such vessels with small shoulder loop handles and prunts can be dated to the second half of the 15th and into the first half of the 16th century (Hurst *et al* 1986, 180). Although found on the Continent, jugs with relief-moulded faces between the prunts are rare in Britain. A much larger jug made out of proto-stoneware with applied prunts was present at St James' Works, Whitefriars in Norwich (Jennings 1981, 110–111, fig.735).

Langerwehe stoneware is however, far more frequent at the Castle Mall, forming 8% of the Period 5.2 assemblage. Many vessels were identified from the barbican well, with nearly 4kg of Langerwehe recovered from the upper backfills. At Greyfriars, 126 fragments of Siegburg, Langerwehe and Raeren were recovered from Period 4 deposits dating from *c*.1538 to *c*.1800. At Dragon Hall nearby, the Period 6 assemblage (early 15th- to mid 16th-century) contained only twelve fragments of Langerwehe and Raeren.

Further pit groups of 16th-century date were present at Golden Ball Street, including one deposit which is likely to date to the first half of this century. In addition to several LMT vessels and Raeren stonewares, part of a decorated tin-glazed vase or jug was present in pit *115* (Fig.8.49, no.5), associated with Open Area 53 (City Property g). It is likely that this vessel is a product of the South Netherlands (see further discussion of the assemblage in Chapter 8.II and Appendix 6).

After 1345, the castle baileys and the barbican were accessible to the inhabitants of Norwich for a wide range of activities, including the disposal of large quantities of both domestic and craft waste. The tenements within and around the Castle Fee continued to develop and some fine ceramic assemblages were recovered in association with them. Ceramically, Period 5 at Castle Mall is characterised by the introduction of late medieval/transitional wares to supplement local medieval products. Although there is a standardization within shape and size of vessels, the variety of forms increases to include vessels with more specialized functions such as skillets and candlesticks. The range of table wares also increases and much of the demand is met by imported wares, although most pottery is still made on a local basis. Medieval fabrics continued to be used, with LMU still accounting for a sizeable proportion of the kitchen ware assemblage. Although cooking pots and jars were still most common, a large number of bowls were also recovered and reflect the increased popularity of open ware vessels during this period. Meanwhile, the Grimston Glazed ware industry was endeavouring to increase its product range to cope with a change in the market and the increased demand for new forms copying continental imports, locally produced in the Waveney Valley.

Late medieval/transitional pottery is dominated by LMT which combined medieval elements with continental influence and produced a range of vessels indicating a change in cooking and eating habits — cooking pots were replaced by cauldrons and skillets, while jugs became increasingly globular and bowls larger and shallower. The majority of LMT was made up of kitchen wares, though jugs and serving wares are also known. Examples of the vessels the LMT copies were based on are also recovered with both Dutch and Dutch-type Red Earthenware present, again mostly represented by kitchen wares. Table wares were recovered in smaller quantity and most of the drinking vessels recorded were Rhenish stonewares.

Illustration Catalogue

Period 5.1

Fig.8.41 (on CD) Pottery from pits, Open Area 36 (Property 43) (G9/104, part)
no.1 Dutch Red Earthenware, cauldron with angular profile and protruding handles (type D2b), Pit 90445, fill 90434
no.2 Tudor green-type ware, splayed base, Pit 90445, fill 90434
no.3 Langerwehe/Raeren-Aachen stoneware, drinking vessel base, Pit 90445, fill 90442
no.4 LMT, skillet with rounded profile (type E1), Pit 90538, fill 90585
no.5 LMT, jug with globular profile and collared rim (type K3b), Pit 90538, fill 90585
no.6 LMT, jug with globular profile and collared rim (type K3b), Pit 90538, fill 90546
no.7 Grimston Glazed ware, jug with flat topped, grooved rim (Pott Row type J2), Pit 90539, fill 90567
no.8 Grimston Glazed ware, jug with rim flattened and pulled down (Little type GGG), Pit 90539, fill 90567
no.9 LMU, bowl rim, Pit 90539, fill 90567

Fig.8.42 Pottery from pits encroaching on St John's cemetery boundary ditch, Open Area 44 (Property (e)/(f)) (G1/76, part)
no.1 LMU, cooking pot with everted rim (type J2b), pit 10576, fill 10565
no.2 LMU, jar with everted rim coming to a point (type J2c), pit 10576, fill 10565
no.3 LMU, jar with everted rim expanded to wedge shape (type cf11), pit 10576, fill 10565
no.4 LMU, jar with 'hammer-head' rim (type J2j), pit 10576, fill 10565
no.5 LMU, large jar with 'hammer-head' rim (type J3j), pit 10576, fill 10565
no.6 LMU, bowl with 'hammer-head rim' (type Bj), pit 10576, fill 10565
no.7 Grimston Glazed ware, thumbed jug base and handle, pit 10576, fill 10565
no.8 Blue-grey ware, ladle rim and handle, pit 10576, fill 10565
no.9 LMU, cooking pot rim with incipient 'hammer-head' rim (type J2i), pit 13428, fill 13210
no.10 LMT, bowl with curved profile (type H2), pit 13428, 13210

Fig.8.43 (on CD) Pottery from levelling above ?Castle Fee Ditch, Ditch 3 (G1/95)
no.1 Langerwehe stoneware, drinking vessel profile, fill 10940

Period 5.2

Fig.8.44 (on CD) Pottery from pits, Open Area 36 (Property 43) (G9/104, part)
no.1 LMT, jar (type c9/15), pit 90482, fill 90390
no.2 LMT, jug rim and handle, pit 90482, fill 90390
no.3 LMT, pancheon with uneven rim, pit 90493,fill 90424

Fig.8.45 Pottery from pits, Open Area 49 (Property 44) (G9/82, part)
no.1 LMT, jar with globular profile (type A1), pit 90961, fill 90923
no.2 LMT, jar with bifid rim (type A4) and incised, wavy line decoration, pit 90961, fill 90923
no.3 LMT, pancheon rim, pit 90961, fill 90923
no.4 LMT, pancheon rim, pit 90961, fill 90923
no.5 LMT, body sherd from a ?mug decorated with grooved lines and indented impressions around the body, pit 90961, fill 90973
no.6 LMT, bowl rim, pit 90710, fill 90709
no.7 Langerwehe stoneware, drinking vessel rim, pit 90702, fill 90702
no.8 LMT, jug base with grooved decoration, pit 90715, fill 90716

Fig.8.46 Pottery from pits, Open Area 50 (Property 46) (G9/56, part)
no.1 LMT, jar with globular profile (type A1), pit 90032, fill 90031
no.2 Grimston Glazed ware, sagging base from open, flatware vessel, pit 90032, fill 90031
no.3 Siegburg stoneware, jug/drinking vessel base, pit 90032, fill 90031
no.4 LMT, pancheon profile, pit 90016, fill 90016

Fig.8.47 Pottery from pits containing animal butchery and domestic refuse, Open Area 38 (?Property 49) (G1/24)
no.1 LMT, globular jar with everted rim (type A1), pit 11048, fill 11030
no.2 LMT, globular jar with everted rim (type A1), pit 11048, fill 11030
no.3 LMT, storage jar with horseshoe-shaped handles (type B2), pit 11048, 11030
no.4 LMT, skillet with carinated profile (type C2), pit 11048, fill 11030
no.5 Siegburg stoneware, body sherd and handle from drinking vessel with applied decoration, pit 11064, fill 11063

Fig.8.48 (on CD) Pottery from pit 10050 on the Oldswynemarket Hill/Timberhill frontage, Open Area 42 (Property (c)/(d)) (G1/152)
no.1 LMT, globular pipkin with lid-seated rim (type C1b), fill 10050
no.2 LMT, globular jar rim (type A1), fill 10050
no.3 DUTR, foot from pipkin base, fill 10050

Golden Ball Street

Period 5.2

Fig.8.49 Pottery from pit 115, Open Area 53, Property (g) (GBS Group 23)
no.1 LMT bowl with thumbed rim, fill 114
no.2 Raeren jug base, fill 114
no.3 LMT jar/pipkin, fill 114
no.4 LMT jar/pipkin, fill 114
no.5 ?South Netherlands Tin-Glazed ware vase, fill 114

Fig.8.50 Pottery from pit 477, Open Area 51, Property 47 (GBS Group 56)
no.1 ?Grimston rounded jug, fill 473
no.2 Grimston face jug, fill 473

Period 6 (residual)

Fig.8.51 Residual money box from pit 146 (Period 6.1), Open Area 53, Property (g) (GBS Group 9)
no.1 Money box (SF38)

Fig.8.52 Pottery from cellar Structure 56, Property (g) (GBS Group 3) (Period 6.3)
no.1 Biscuit ware dish/bowl, backfill 178

Glass Vessels

by John Shepherd

(Fig.8.53)

A total of 26 fragments of vessel glass came from late medieval deposits at Castle Mall, of which 10 derived from the barbican well (Chapter 9.III). A few intrusive pieces of post-medieval or modern glass were present.

Of note amongst the period assemblage is a small group of identifiable drinking vessels. A fragment of colourless glass with rigareed trails (SF6171.01) comes from a drinking vessel which may either have been a squat beaker form with a pushed-in base and rigareed base trail or, as Clark suggests (1986, 181), the bowl of a high-stemmed glass. Both would be Italian products. The trails on these vessels were not spirally wound but were individual, horizontally wound threads. Similar vessels come from 18 Shore Road, Hackney (in a context dated to the 14th or 15th century; Clark 1986 180–1), Little Britain, London (associated with 14th-century pottery), and Winchester Palace, Southwark (from a context dated to the late medieval period, Brehm and Shepherd forthcoming). SF6171.02 has simple plain applied trails but probably comes from a vessel of 15th- or 16th-century date.

A fragment from the flange of a bowl or lid (SF6039) is not easy to parallel. The flanges of vessels of the 15th to 17th centuries are usually hollow and tubular. An example which was probably originally green, but now black, came from a late 15th-century context in Exeter (Charleston 1984b, 265, no. G.32). The Venetian industries also included this feature in their repertoires well into the post-medieval period. This example from Castle Mall, however, has been flattened down and does not compare favourably with these others. It may be significant, however, that the metal of this piece, colourless glass with a distinct green tint, does compare with a small group of vessels which date from the late 15th century to the 17th century which probably originated in the Spanish glasshouses of this period (J.D. Shepherd, forthcoming a). The forms of these vessels have many features which appear to be derived from Islamic glass and pottery traditions. A published example of a bottle which belongs to this group from Exeter (Charleston 1984b, 271, no. G.94) has features in common with many fragments from a number of sites in the City of London.

The following catalogue of illustrated items shows individual fragments by SF no., annotated with an archive catalogue number for ease of identification where more than one fragment is present and to permit cross-referencing to the archive specialist report.

SF6039 **Vessel**. (cat.no.4) Fragment of natural green glass of a free-blown vessel. Part of the flange of a bowl or lid. Free-blown; good quality natural blue green glass.
90585, fill of pit 90538, Period 5.1, G9/104

SF6171.01 Vessel glass. (cat.no.1) Fragment from the side of a beaker. Free-blown; colourless glass with a green tint. Decorated with two ringareed trails.
90210, fill of pit 90210, Period 5.2, G9/91

SF6171.02 Vessel glass. (cat.no.3) Fragment from the rim of a beaker. Free-blown; natural green glass with a deep surface decomposition layer. Rim fire-rounded, body decorated with two thin trails, probably a spiral, of the same metal.
90210, fill of pit 90210, Period 5.2, G9/91

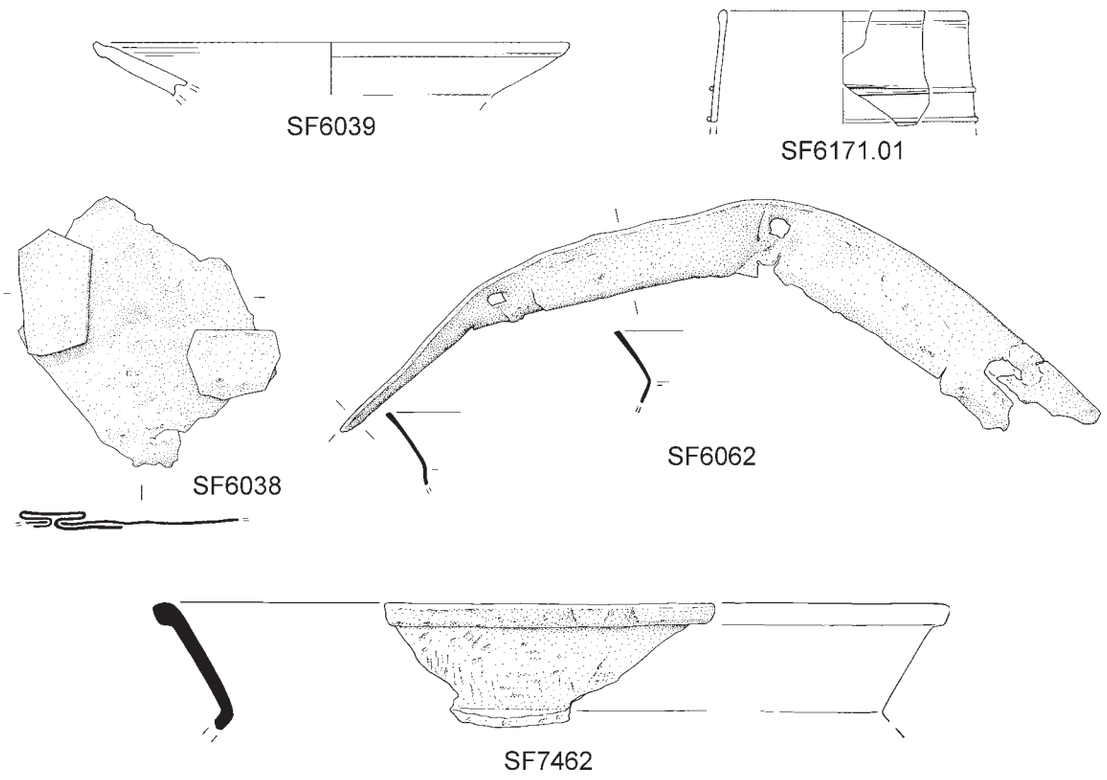


Figure 8.53 Glass vessels (SF6039, 6171.01 & 6171.02). Copper alloy vessels (SF6038, 6062 & 7462). Scale 1:2

Copper Alloy Vessels
by Alison Goodall
(Fig.8.53)
Fragments of twenty copper alloy vessels were recovered from Period 5 contexts, the majority (x 17) coming from the barbican well (Chapter 9.III). The other three items came from pit fills and include a cast cooking vessel (SF7462). A thin sheet of copper alloy with two holes (SF6038) has been repaired with two 'paper-clip' rivets, indicating the effort taken to extend the life of some copper alloy vessels. Part of a perforated rim from a hammered vessel was also found (SF6062). Fragments from cooking vessels are often found in domestic rubbish deposits. Larger pieces could have been melted down for re-use, although usable pots probably remained in service until they were too damaged or worn to be functional.

Three fragments from copper alloy vessels were found at the Golden Ball Street site (not illustrated). Cast skillets are represented by a foot (GBS SF210) and a fragment from a rim (GBS SF408). Included among some sheet fragments were pieces of one or two sheet-metal rivets, possibly used to repair damaged vessels. Further indeterminate pieces of copper alloy sheet from contexts dating to Period 5.2 may be from sheet metal vessels or patches, although some may be waste products from the manufacture of artefacts.

SF6038 **Rivet**. Thin piece of sheet, with two paper-clip rivets passing through it. Probably a vessel repair.
90683, fill of pit 90702, Period 5.2, G9/82

SF6062 **Vessel** rim from hammered sheet vessel, with three widely and evenly spaced perforations, perhaps for attachment of a handle.
90585, fill of pit 90538, Period 5.1, G9/104

SF7462 **Vessel**. Part of everted rim of cast copper alloy vessel, with thickened lip.
90507, fill of pit 90493, Period 5.2, G9/104

Iron Vessels
by Quita Mould
A fragment of sheet with a rolled rim (SF6032, not illustrated) found in a rubbish pit and three fragments of riveted sheet (SF593, not illustrated), both from Period 5.2, may derive from sheet vessels and represent later contamination.

Implements

Iron knives
by Quita Mould, Maisie Taylor (wood), Jacqui Watson and Sarah Paynter (minerally preserved organics)
(Fig.8.54)
Six whittle-tang knife blades, a tang broken from another example and four scale-tanged knives (SF250, 5357, 5366 and 5253.01, the latter two not illustrated) were found in late medieval/transitional deposits, other than fills of the barbican well (Chapter 9.III). In addition, a further seven broken blades without evidence for their hafting were also recovered. Scale tang knives were a mid 14th-century introduction, becoming increasingly popular in the later 14th and 15th centuries (Cowgill *et al* 1987, 26). Two blades had maker's marks of inlaid non-ferrous metal (SF250 and 6031.03) in the shape of a cross — a commonly used symbol (*ibid*, 20). Another blade fragment (SF5470, not illustrated) had the symbol of a 'P' on its side.

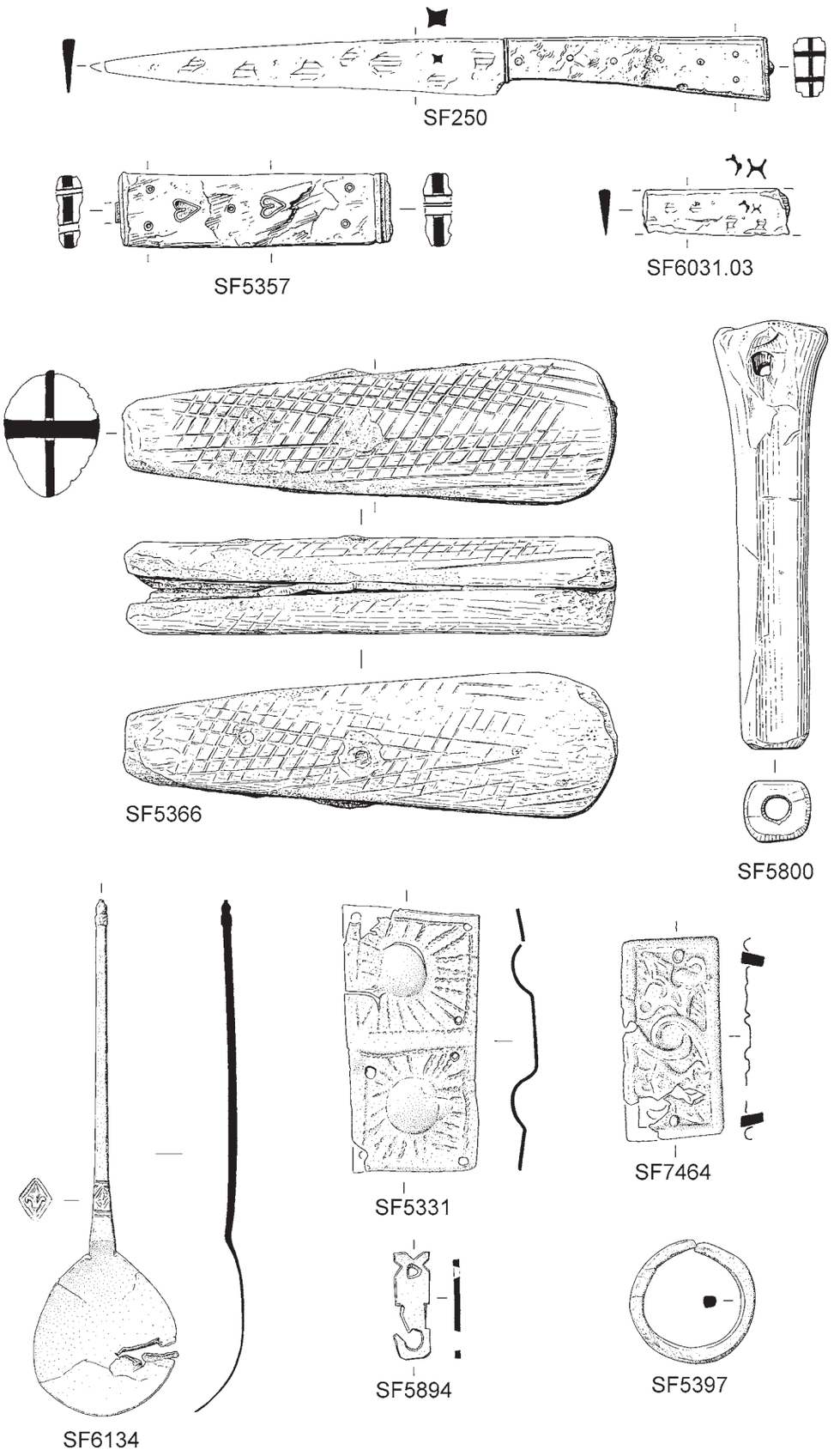


Figure 8.54 Iron knives (SF250, 5357 & 6031.03). Scale 1:2. Antler knife handle (SF5366); bone handle (SF5800). Scale 1:1. Copper alloy spoon (SF6134), Scale 1:2. Copper alloy mounts/plaques (SF5331 & 7464) and fastener (SF5894). Copper alloy ?suspension ring (SF5397). Scale 1:1

One handle decorated with hearts (SF5357) was of complex construction (see below) and had box-wood scales. The narrow-bladed knife (SF250) had a cleverly designed wooden handle, possibly made of ash, with two pieces on each side. The inner pieces are carved with the grain, presumably for strength, the outer pieces are carved across the grain, presumably for appearance. The grain effect would have been rather striking, possibly giving the illusion that the grain of the wood 'wrapped around' the handle.

SF250 **Narrow blade** with straight back and edge and small inlaid makers mark, scale tang handle with seven tubular rivets and a non-ferrous metal end cap. Wooden scales made of two pieces of wood on each side, all carved from ?ash (*Fraxinus excelsior*), and sandwiched together. SEM analysis (SEM B807) indicated that the surviving wooden scales have a very curly grain, although unfortunately species identification was not possible as the microscopic structure had not retained sufficient diagnostic features. Total L 210mm blade w 16mm
92716, fill of pit 92715, Period 5.2, G9/94

SF5357 **Scale tang handle** with five non ferrous metal rivets and pair of decorative hearts back to back, non-ferrous metal end cap and shoulder plate. Handle carved at an angle to the grain possibly to prevent the wood splitting around the inlay hearts. The scales of this knife are made from *Buxus* sp. (box) (SEM B809). X-radiography shows that there are five small tubular rivets through the handle, only three of which are visible. Analysis of the rivets showed that they are brass. The two heart-shaped, sheet metal rivets run through the thickness of the handle, which are also brass. Traces of lead were detected in one small area on the handle, near a rivet. This is possibly a spot of solder. It appears that the end plate of the knife has become detached, exposing the iron tang where it would have been fitted, and leaving green corrosion products. This plate was probably brass, as analysis identified predominantly copper and zinc in this area. There is also a thin layer of grey metal at the end of the handle, which analysis showed was tin. The two materials, silver-coloured tin and gold-coloured brass, would have had an attractive appearance side by side. The shoulder plate has also become detached from the handle, leaving traces of green corrosion. This plate was probably brass, as analysis identified predominantly copper and zinc. High concentrations of lead were detected next to the shoulder plate, which may indicate that the shoulder plate was made of sheet metal with a lead filling. L 88mm
11058, fill of pit 11064, Period 5.2, G1/24

SF6031.03 Knife blade fragment with straight back and edge with double makers mark of inlaid non-ferrous metal. L 46mm, W 15mm
90653, fill of pit 90702, Period 5.2, G9/82

Antler knife handle
by Julia Huddle
(Fig.8.54)
Of the seven knife or implement handles made of antler from the site, an unstratified knife handle is thought to date to between the late medieval period and early post-medieval periods. Although no direct parallel has been found, its scale-tang form indicates a mid 14th-century date at the earliest. Other examples of different design came from the barbican well (Chapter 9.III), with finer examples from post-medieval deposits (Chapter 10.III).

SF5366 **Knife**. Incomplete scale-tang knife and handle with antler scales decorated with roughly incised diagonal crossed lines forming a diamond pattern; two iron rivets; blade broken off. L: 78mm.
10000b, unstratified

Bone handle
by Julia Huddle
(Fig.8.54)
An implement handle for a tanged tool, probably a knife, was recovered (SF5800) although there is no iron staining either end. There are many small scratches and it has a slightly polished surface indicative of use rather than suggesting an unfinished item. The transverse hole at the end may be a suspension hole.

SF5800 **Worked bone** tubular object, with transverse hole at proximal end. The shaft is sawn through at the distal end, sawn surfaces are smoothed, possibly with a file. Possible implement handle with suspension hole. Right sheep/goat metatarsal, proximal end and part of mid-shaft. L: 62mm
80148, fill of pit 80149, Period 5.2, G8/29

Copper alloy spoon
by Alison Goodall
(Fig.8.54)
A spoon (SF6134) is simply made from sheet metal and it is difficult, therefore, to make comparisons with the finer quality silver spoons. However, the small acorn knop and the shape of the bowl are reminiscent of spoons dated to *c.*1500 (Snodin 1974, 18). A very similar hammered sheet spoon, with two 'fleur-de-lis-lozenge' stamps is illustrated in Emery 1976, fig. 86, and may be French.

SF6134 **Spoon**. Spoon made from cut and hammered sheet copper alloy, with oval bowl, rectangular section tapering handle and small acorn terminal. On the handle near the bowl is a stamped fleur-de-lis within a lozenge, between two pairs of transverse grooves. damaged bowl.
90000, unstratified

Iron shears
by Quita Mould
The fragmentary remains of two pairs of shears were found (SF6073.1/2 and 6423, neither illustrated). One (SF6073.1/2) has the remains of a notched edge, reminiscent of a group of late 14th-century shears from London (Cowgill *et al* 1987, fig.72, no 333–4 and fig.73, no. 336) and a narrow blade (W: 9mm) suggesting a domestic function.

Miscellaneous Fittings

Copper alloy ?book/casket fittings
by Alison Goodall
(Fig.8.54)
Ornamental plaques (such as SF5331 and SF7464) could have been used to decorate a variety of different objects such as belt loops, book bindings or caskets. The panels of SF5331 are similar to square-domed book-mounts (*e.g.* Margeson 1993, no. 456; Baart *et al* 1977, nos 759 and 760; A.R. Goodall 1982, 239, fig.44.41), and the plates may represent a stage in the manufacture of these. However, there is no guide line to indicate that the two panels were intended to be separated. A fastener (SF5894) resembles the small hooks used to secure modern boxes and caskets.

SF5331 **Mount**. Rectangular plate, with two square panels of decoration, each with radiating lines and a border, both of rocked-tracer engraving, and a domed centre. The panel has a rivet hole in each corner. One of which is now missing.
10571, external dump, Period 6.1, G1/82

SF7464 **Plaque**. Rectangular plaque with two separate attachment rivets, decorated with repoussé ornament comprising a pair

of trefoil leaves with intertwining stems, on an obliquely hatched ground with half-round border around. L: 32mm.
90657, fill of ditch 90687, Period 5.2, G9/92

SF5894 **Fastener**. Rectangular hooked-fastener made from copper alloy sheet, cut into a bi-lobed terminal with circular attachment hole at one end and sub-rectangular hook at the other, with slight waist in between. Possibly a casket fitting. L: 17mm.
90123, fill of pit 90131, Period 5.2, G9/121

Copper alloy rings
by Julia Huddle and Alison Goodall
(Fig.8.54)
A copper alloy ring (SF5397) recovered from a late medieval/transitional pit is comparable with rings of rectangular section often referred to as simple buckle or suspension rings from similarly dated contexts elsewhere (Margeson 1993, 82, fig. 47, nos 522–523). A further example occurred in the barbican well shaft (Chapter 9.III). A similar ring from Wharram Percy was fitted with a pin and had obviously been used as a crude buckle; it was from a late 15th- to early 16th-century context (A.R. Goodall 1979, 108, fig.55.1).

Two small irregular rings (GBS SF96 and SF234) from the Golden Ball Street site could have had a variety of functional uses (not illustrated).

SF5397 **Ring** with irregular sub-rectangular section, broken.
11058, fill of pit 11064, Period 5.2, G1/24

Iron ?upholstery nails
by Quita Mould
Two small spherical-headed nails (with a head diameter of 16mm) and two other dome-headed nails (each 23mm in length with a head diameter of 12mm) are likely to have been used on upholstery.

Unclassified

Stone ?figurine
The base of a possible ?limestone figurine (SF5080, not illustrated) came from a cess pit (pit *10304*, Period 5.1, G1/148). Late medieval and post-medieval figurine fragments, used for either religious or secular purposes, are more commonly made in pipeclay (*cf.* Margeson and Williams 1985, 44 and fig. 37; Margeson 1993, 219, fig. 168, no.1791).

Buildings

Structural Metalwork

Timber nails
by Quita Mould
The structural ironwork was dominated by timber nails. A total of 131 flat-headed nails and 151 nail shanks was recovered from Period 5.1 deposits, while a further 131 flat-headed nails and 97 nail shanks came from Period 5.2 (excluding the large group of 1,649 those from the barbican well which are discussed in Chapter 9.III). The nails were principally of 'medium size', being less than 100mm in length with small heads. A group of distinctly small nails were recovered (from pit *80045* at Property 50/51 or a/b, Period 5.2) measuring 12mm in length with heads 6mm across. Four clench bolts were also recovered.

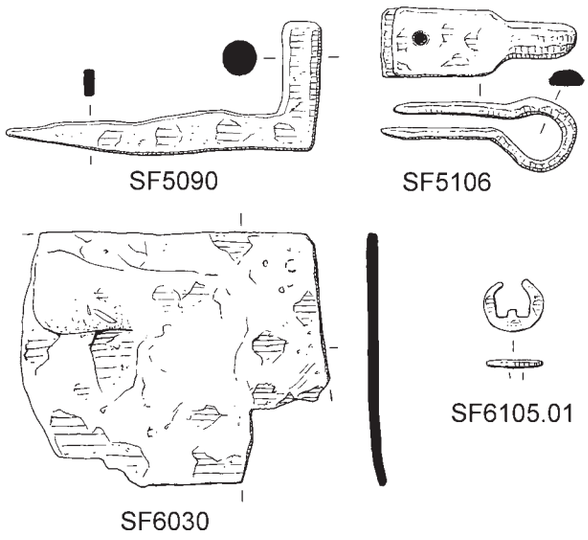


Figure 8.55 Iron hinge and hinge strap (SF5090 & 5106); iron lock plate (SF6030); iron padlock key (SF6105.01). Scale 1:2

Hinges and straps
by Quita Mould
(Fig.8.55)
Fragments of strap hinge (*e.g.* SF5805, not illustrated) comprising a pair of articulating ring-headed straps were used on items of furniture such as chest lids. Drop hinges (*e.g.* SF5106) which articulated with a separate hinge pivot were used to hang shutters, doors and gates. Thirty-five hinge pivots of varying size (largest length 120mm, smallest 40mm) were found at Castle Mall, 20 occurring in the upper backfills of the barbican well (see Chapter 9.III) and a further 6 (*e.g.* SF5090) in other late medieval/transitional deposits.

Many fragments (a total of 93) of nailed strap binding were found during the excavations deriving from such hinges or strapping on furniture, the heavier examples coming from doors, gates and structural timbers. Fourteen occurred in Period 5 deposits, excluding the barbican well.

SF5090 **Hinge pivot** with tapering rectangular-sectioned shank and round-sectioned, upstanding arm. L 85mm Arm ht: 38mm
10170, fill of pit 10168, Period 5.1,G1/77

SF5106 **Drop hinge strap** with U-shaped eye to fit over a hinge pivot. Minerally preserved wood present between the straps. L: 53mm, W: 18mm
10195, fill of pit 10196, Period 5.1, G1/77

Copper alloy staples
by Alison Goodall
Two staples cut form copper alloy sheet from the Golden Ball Street site (SF94 and SF155, neither illustrated) may have been used for clamping *e.g.* wood together. Both came from Period 5.2 fills of the south bailey ditch (?Property 47).

Locks and Keys

by Quita Mould

(Fig.8.55)

A padlock bolt (SF5431.02, not illustrated) and the circular bit broken from a padlock key (SF6105.01) were found in Period 5 deposits, along with a ward plate (SF5587, not illustrated), two pieces of lock plate from a mounted lock (SF6030 and 6031, latter not illustrated) and a broken key bit (SF5076, not illustrated). Locks and keys from the barbican well are discussed in Chapter 9.III.

SF6030 **Rectangular lock plate** with angular arrangement of staples to hold the mechanism. L: 80mm W: 70mm
90533, fill of pit 90524, Period 5.1, G9/104

SF6105.1 **Padlock key** circular bit. D: 16mm.
90278, fill of quarry pit 90345, Period 5.1, G9/65

Window Glass and Cames

by David King

(Fig.8.56)

A group of 46 fragments of window glass came from late medieval/transitional deposits at Castle Mall, with a further 64 fragments from fills of the barbican well (Chapter 9.III). A few pieces of post-medieval glass are intrusive. A selection of the contemporary glass is illustrated, including some of the painted pieces (SF6494, 6548 and 6550). Most of the glass came from pits in Areas 1 and 9, although pit *80215* in Area 8 (Property 50/51 or a/b) contained 23 fragments ranging from medieval to post-medieval in date (SF5959).

Three pieces of medieval lead came were recovered from late medieval/transitional deposits, with additional items from the barbican well shaft (Chapter 9.III). Types B/C and C were represented, all three pieces coming from pit *80215* noted above.

SF5959 **Window glass**. Clear glass, fragments include two with muff edges — medieval/post-medieval; four with grozed and diamond-cut edges — post-med; two with diamond-cut edges — post-med; one with two grozed edges — med/post-med; a further two fragments have diamond scratches on the surface — post-med. The remainder (14), are medieval/post-medieval.
80195, fill of pit 80215, Period 5.2, G8/26

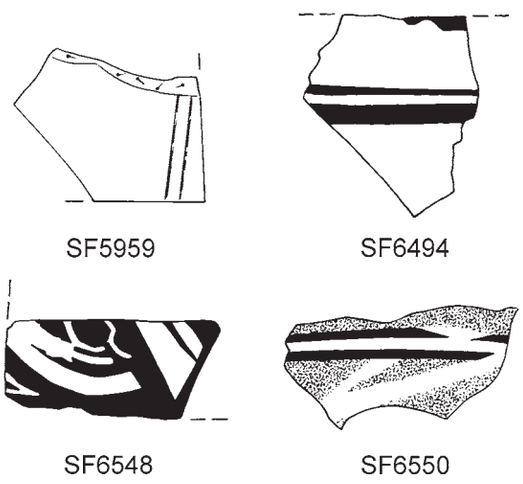


Figure 8.56 Window glass (SF5959, 6494, 6548 & 6550). Scale 1:1

SF6494 **Window glass**. Clear glass, painted with unidentified design, trace line and one grozed edge. Medieval.
91008, fill of pit 91009, Period 5.2, G9/99

SF6548 **Window glass**. Clear glass, one medieval piece painted with unidentified design, trace line, matt wash: flashed ruby and two grozed edges. The other fragments are medieval or post-medieval.
91932, fill of pit 91933, Period 5.2, G9/118

SF6550 **Window glass**. Painted opaque glass with trace line, matt wash: flashed ruby. Medieval.
91946, fill of pit 91947, Period 5.2, G9/112

Ceramic Building Materials

by Irena Lentowicz and Richard Kemp (identification)

A much larger assemblage of CBM was recovered from contexts assigned to this period than previous ones, 2095 fragments weighing 74.742kg (32.7% of the CBM assemblage). Residual CBM represented only a small proportion of the period assemblage and contemporary material provided a significant proportion with medieval types of roof tile and brick supplemented with transitional later CBM such as Drury's later post-Roman brick type LB2. Medieval brick was the most common type of building material recovered by both weight and number of fragments, while roof tile was also common and the first occurrence of floor tile in any quantity, although only nine fragments were recovered.

Period 5.1

A quarter of the Period 5 assemblage was recovered from contexts assigned to this sub-period, 579 fragments weighing 19.094kg, 25.5% of the period assemblage. There was very little incidence of intrusive or residual material with only one later brick fragment recovered along with a small quantity of fired clay fabrics. Miscellaneous fragments made up 10% of the sub-period assemblage and this was mainly mortar along with a small number of ceramic fragments. Roof tile was more numerous with 327 fragments weighing 6.456kg were recovered (33.8% of the sub-period assemblage). Although this gave an average fragment weight of nearly 20g, in fact this material was not as fragmentary as first appeared as just under a half of the total number of small fragments were in RT200. Standard sandy roof tile types RT2/3 and RT4 were the most common roof tile fabric recovered, although fabrics RT114 and RT105 were both well represented. Floor tile was introduced in three fabrics FT101, FT4 and FT125 with the first being most common. However, brick was the most common building material recovered by weight, accounting for 57.5% of the sub-period assemblage, 173 fragments weighing 10.980kg. A wide range of fabric types were recovered, with types EB8 and EB7 being most common individual fabrics. The first appearance of type LB2 brick occurred in this sub-period, but was intrusive in this context.

Ceramic building material from lower fills of the barbican well (G5/23; 0.280kg) is detailed in Chapter 9.III. A very similar range of material came from robber trenches associated with the dismantling of the barbican well superstructure (G5/39; 0.606kg). As well as brick

Fabric	*No. frags*	*Weight (kg)*	*% Weight*
Misc frags	136	2.351	3.1
Roman	1	0.005	<0.1
Fired clay	107	1.020	1.4
Fabric 200	249	0.328	0.4
Medieval roof tile	331	12.719	17.0
Medieval brick	1142	44.964	59.6
Medieval floor tile	9	1.695	2.3
Post medieval tile	3	0.160	0.2
Post medieval brick	177	12.110	16.2
Total	**2,155**	**75.352**	

Table 8.16 Total number of fragments and weight of CBM at Castle Mall by fabric in Period 5

Fabric	*No. frags*	*Weight (kg)*	*% Weight*
Misc frags	25	0.191	10.0
Fired clay	48	0.257	1.3
RT100/103/111 (RT2/RT3)	149	4.893	25.6
RT104 (RT4)	38	0.580	3.0
RT105	3	0.440	2.3
RT114	6	0.415	2.2
RT200	131	0.128	0.7
EBA	31	0.460	2.4
EBB	7	0.740	3.9
EB1	3	0.580	3.0
EB2	8	0.308	1.6
EB3	19	0.957	5.0
EB4	1	0.065	0.3
EB5	7	0.610	3.2
EB6	9	0.240	1.3
EB7	43	3.970	20.8
EB8	31	2.695	14.1
EB10	3	0.045	0.2
EB115	1	0.295	1.5
EB119	10	0.015	0.1
FT101	3	0.550	2.9
FT4	1	0.535	2.8
FT125	1	0.060	0.3
Later brick LB2	1	0.065	0.3
Total	**579**	**19.094**	

Table 8.17 Total number of fragments and weight of CBM at Castle Mall by fabric in Period 5.1

types EB5 and EB7, and roof tile types RT103, RT114 and RT200, this assemblage also included a floor tile fragment type FT125. The assemblage from another robber cut was similar in character but made up of different fabrics (G5/51; 0.315kg). Roof tile was more common and along with type RT103, glazed tiles in RT100 and RT114 were also recorded. Brick was less dominant and only one fragment of a type EB4 brick was recovered. An intrusive fragment of late brick was also present.

Most of the material recovered from contexts assigned to this sub-period came from pit groups associated with tenements, some 15.111kg making up 79.1% of the assemblage. The largest single group came from the metalworking pit *10888* (Open Area 46, Property e/g; G1/68; 6.038kg), where a range of brick, roof tile and floor tile was recovered. Roof tile fabrics RT100/103/111 were most common, although much of this came from a single, fragmented tile. Similarly much of fabric RT105 was also represented by a single tile. Other roof tiles included glazed fragments of type RT104. Brick types EB8, EB6 and EB115 made up most of the brick fabrics present, but also included small fragments of EB119. Three fragments of glazed floor tile type FT101 were also recovered. Remaining material included single fragments of daub Fabric 136 and roof tile RT200.

A smaller assemblage was recovered from bell-founding pit *10952* again at Property e/g (G1/67, 0.475kg). However, the character of this assemblage was very different and the group was dominated by brick fragments including types EB10, EB3, EB7 and EB5. Roof tiles were restricted to types RT100/103 and many of the fragments were noted as burnt and sooted. Other fabrics recovered included RT200 and daub Fabric 129, the latter was also noted as burnt.

A large assemblage was also recovered from a number of industrial and refuse pits in Area 9 (Property 43; G9/104, part; 6.992kg). These were similar to the bell-founding pit as they were dominated by bricks with only small quantities of other CBM types. Over 3kg of material was recovered from pit 90524 (3.172kg) and consisted almost entirely of brick fragments of types EB7 and EB8, with only a few fragments of roof tile type RT200. Another large assemblage came from pit *90538* (2.195kg) which was again dominated by early brick types EB7 and EB8, but also included types EB3, EB5 and EB2. A

Fabric	*No. frags*	*Weight (kg)*	*% Weight*
Misc frags	111	2.160	3.9
Fired clay	59	0.763	1.4
Roman	1	0.005	<0.1
RT100/103/111 (RT2/RT3)	120	5.485	9.8
RT104 (RT4)	3	0.295	0.5
RT105	6	0.321	0.6
RT114	4	0.270	0.5
RT117 (RT5)	1	0.015	<0.1
RT200 & RT123	119	0.205	0.4
EB	1	0.115	0.2
EBA	10	0.325	0.6
EB1/EB113	23	2.530	4.5
EB2	28	2.530	4.5
EB3	76	3.980	7.1
EB4	3	0.040	0.5
EB5	16	0.695	1.2
EBB	210	3.278	5.6
EB6	7	0.180	0.3
EB7/EB118	108	4.085	7.1
EB8	229	12.670	22.6
EB10	1	0.100	0.2
EB106	16	2.200	3.9
EB107	9	0.565	1.0
EB110	1	0.005	<0.1
EB115	2	0.050	0.1
EB119	228	0.326	0.6
EB151	1	0.110	0.2
FT4	3	0.385	0.7
FT140	1	0.165	0.3
LB1	34	0.395	0.7
LB2	9	1.835	3.3
LB3	70	1.905	3.4
LB4	45	0.850	1.5
LB5	18	7.060	12.7
Post medieval tile	3	0.160	0.3
Total	**1,576**	**56.058**	

Table 8.18 Total number of fragments and weight of CBM at Castle Mall by fabric in Period 5.2

large floor tile fragment type FT4, decorated with an applied yellow slip glaze was also present, along with some fragments of daub Fabric 136. Only brick fabrics were recovered from pits *90563* (0.130kg; types EB7 and EB5), *90490* (0.025kg; type EB8) and 90457 (0.165kg; type EB7). Roof tiles were present along with brick fragments in some pits, including pit *90436* (0.335kg) which included brick type EB7 and roof tile types RT100/103 as well as RT200 and mortar fragments. Pit *90445* (0.970kg) included large fragments of brick types EB1, EB3 and EB7, but also included a large number of amorphous type EBA fragments. Roof tile was represented by an RT114 fragment as well as RT200 fragments and a quantity of daub Fabrics 129 and 136.

Another large assemblage came from the encroachment in to the central part of St John's cemetery (Open Area 44, Property e/f; G1/76, part; 1.295kg). These pit assemblages were similar and included both brick and tile fragments. Pit *10576* (0.790kg) included brick types EB2 and EB3 along with roof tile types RT103 and glazed tile type RT111, as well as mortar fragments. Pit *11258* (0.390kg) contained a type EB8 brick fragment and RT103 roof tile fragments, one of which was glazed. A single large type EB2 brick fragment was recovered from pit *13183* (0.115kg).

Period 5.2
Almost three-quarters of the Period 5 assemblage came from this sub-period, 1576 fragments weighing 56.058kg (74.3%). By far the largest proportion of this was made up of early brick (969 fragments, 33.984kg) accounting for 60% of the sub-period assemblage. Late bricks made up a further 216% (176 fragments, 12.045kg) and though some of these were probably intrusive (in particular brick type LB3 which dates to the late 17th–early 18th century) a proportion were mid 16th-century examples. Of the early bricks, type EB8 was the single most important fabric. Roof tile accounted for only 11.8% of the sub-period material, 253 fragments weighing 6.591kg, while floor tile was less well represented with only five fragments weighing 0.555kg (1.0%). Miscellaneous material comprised mostly mortar with small quantities of plaster and slate also represented. The remaining CBM was made up of fired clay fabrics and post-medieval pan tile fragments.

By far the largest assemblage of this sub-period came from the upper backfill of the barbican well shaft (G5/24, 30.185kg). This group accounted for 54.2% of the sub-period assemblage and 12.9% of the entire CBM assemblage studied. A wide range of CBM was recovered and is detailed in Chapter 9.III.

A proportion of the sub-period assemblage was recovered from contexts associated with structures. This included a small, fragmentary assemblage from a structure above the rampart: Building 35 (?Property 49; G1/27; 0.040kg). Most of the twelve fragments recovered were roof tile type RT200 but also included single examples of fired clay Fabrics 129 and 136.

Other groups associated with ?16th-century structures were more substantial. A range of material was also recovered from ground preparation and surfaces in Area 1 (Property e/g; G1/79; 0.475kg) and included roof tile types RT103 and RT104 and a range of brick types such as types EB7, EB8 and LB5. Although mortar and roof tile type RT103 fragments were recovered from an overlying wall G1/80 (1.070kg), this group is dominated by bricks and included types EB2 and EB8, as well as late 16th-century type LB1. However, this group also included type LB3 which dates to the late 17th–early 18th century, perhaps indicating a later repair/patching. Other walls relating to tenements across the southern part of the site included wall *10608* (G1/106; 0.240kg) which included type EB3 and EB6 brick fragments. The assemblage from G1/107 was more varied and included a small quantity of roof tile type RT100/RT103 (which included a glazed example) and a floor tile type FT127 which was also glazed with a copper-black glaze. Bricks included type EB2 and EB10, as well as later brick types LB1 and LB5. A single type EBA brick fragment was recovered from retaining wall *80473* (Property 50; G8/22; 0.050kg).

The remainder of the sub-period assemblage came from pits. The character of the assemblages was very similar with brick fragments dominating but in various combinations of early bricks and roof tile fragments.

A minimum of 39 fragments (2.884kg) of ceramic building material, including fired clay, came from Period 5.2 deposits at the Golden Ball Street site. Much of it derived from pit fills (specifically from GBS Groups 23 and 56, Property g), with additional material from fills of the south bailey ditch (?Property 47; GBS Groups 48 and 49). The material included a range of brick and tile of both medieval and post-medieval character.

Discussion
By Period 5 the quantity of CBM recovered increases dramatically, though little is associated with actual buildings as the majority is recovered from pits. Roof tiles and bricks continue to be recorded and by Period 5.2 almost the entire range of CBM is recovered. Much of that sub-period assemblage came from the fills of the barbican well and this does indicate a wide range of building materials used in the area. Some material was recovered from actual structures and along with identifying use of specific brick types, these assemblages also indicate an element of re-use of earlier material. Further comments are made in Chapter 13.

Occupations, Industry and Crafts

Metalworking

Introduction
This period provided evidence for the most intensive metalworking activity at the site, particularly above the infilled ?Castle Fee ditch and in the eastern part of the cemetery of St John. A total of 42.911kg of metalworking waste was recovered from this period, accounting for 32% of the total site assemblage. Deposits assigned to Period 5.1 produced 15.894kg of debris (37% of the period assemblage), while those assigned to Period 5.2 accounted for 27.017kg (63%). Of the Period 5.2 assemblage, however, the majority (95%) came from fills of the barbican well (see Chapter 9.III), with only 1.382kg coming from other Period 5.2 deposits. Many of the numerous late medieval pits excavated across the southern part of the Castle Mall excavations produced evidence for the disposal of metalworking waste. Some examples had clearly been used for metalworking *in situ*, including a late 14th- to 15th-century bell-founding pit and its later replacement, both of which may have been used for other non-ferrous casting. Several small 'bowl furnaces' were recorded in the same area.

Metalworkers are the most frequently attested trade in this area of Norwich at this time (Tillyard, Chapter 8.I). William of Sutton, for example, was listed as a local metalworker in 1402, while Castle Fee rent lists for 1457–8 included two goldsmiths, a pewterer and a sword-finisher. Local metalworking continued into the 16th century. It has proved difficult to assign excavated features to particular documented plots with certainty, although it appears likely that some of the recorded remains link directly to the activities of documented owners and/or occupiers. Indications of possible associations with documented properties are made below.

Of the period assemblage of metalworking and associated remains, an important group came from fills of the barbican well shaft and is discussed in Chapter 9.III.

Chronological and spatial distribution of metalworking debris
by Irena Lentowicz, Elizabeth Shepherd Popescu and Justine Bayley (identification)

Period 5.1
Fills deposited into the eastern part of the barbican ditch (Ditch 13) included an iron-stained layer (G9/37) from which a hearth bottom was recovered. The final backfilling of the ?Fee ditch (Ditch 3) occurred in the late 14th–15th century, with pits then cutting into earlier fills. These features, which may have lain at the rear of properties fronting Oldswynemarket Hill/Timberhill to the west and Golden Ball Street to the east, had apparently used for the disposal of non-ferrous metalworking waste. One pit (*10880*, G1/101) at Property (d) contained cinder and copper alloy spillage. An adjacent cluster of pits included a circular example (*10986I*), which contained a sequence of clay fills (some burnt) containing cinders, indicating successive re-lining. To the west, two more circular pits (*10550* and *10547*) both contained metalworking debris, including cinder from pit *10547*. Smithing slag was recovered from pit *10899* (G1/97) lying just to the north of the former ?Fee ditch at Property (g/h).

Metalworking activity was also recorded within the northern part of St John's cemetery (Cemetery 4), where a series of pits ran along the southern edge of the boundary ditch. These pits were associated with Property (e/f) and contained both domestic waste and copper alloy debris suggesting non-ferrous metalworking activity was taking place nearby. a hearth bottom was recovered from a wood-lined pit *10576* (G1/76). Fuel ash slag with copper alloy was recorded from pit *13183*.

Context	Group	Period	Context type	SF no	Type	Alloy	Other
10911	1/67	5.1	bell pit		CA waste a	leaded bronze	
10911	1/67	5.1	bell pit		CA waste b	leaded bronze	
10911	1/67	5.1	bell pit		CA waste c	bronze	
10911	1/67	5.1	bell pit		CA waste d	leaded bronze	As, Sb
11005	1/67	5.1	bell pit	5360	CA waste a	bronze	
11005	1/67	5.1	bell pit	5360	CA waste b	copper alloy	
11005	1/67	5.1	bell pit	5360	CA waste c	bronze	
10857	1/68	5.1	bell/metalworking pit		CA waste a	quaternary	
10857	1/68	5.1	bell/metalworking pit		CA waste b	leaded bronze	
10857	1/68	5.1	bell/metalworking pit		CA waste c	quaternary	
10857	1/68	5.1	bell/metalworking pit	1016	CA waste d	copper alloy	
10857	1/68	5.1	bell/metalworking pit		CA waste e	quaternary	Sb? Ag? As
10637	1/71	5.1	layers related to metalworking		CA spill	quaternary	
10801	1/72	5.1	layers related to metalworking		CA spill	leaded bronze	
10801	1/72	5.1	layers related to metalworking		CA spill	leaded bronze	
10823	1/72	5.1	layers related to metalworking		CA spill	leaded bronze	
90646	9/55	5.1	quarries		CA spill	bronze	
90683	9/82	5.2	refuse pits/quarry backfill		CA spill	leaded bronze	
90716	9/82	5.2	refuse pits/quarry backfill		CA spill	leaded bronze	
90922	9/82	5.2	refuse pits/quarry backfill		CA spill	leaded copper	

CA = copper alloy, As = arsenic, Sb = antimony

Table 8.19 XRF analyses on non-ferrous material

Pit *11258* contained a large quantity of copper rich waste, cinder with copper alloy as well as iron objects. To the north-east, also cutting the boundary ditch, was an isolated pit (*11009*, G1/129) which produced cinder. Further east three pits included metalworking debris (G1/63). Smithing slag was recovered from pit *13143*, iron pan from pit *11354* and hearth bottom and lining from pit *11356*. Overlying these pits was a graveyard deposit (*11345*, G1/64) infilling the upper part of the underlying ?Fee ditch to the south, which also produced a hearth bottom.

A bell-founding pit at Property (e/f) cut into earlier graveyard deposits and fills of the ?Fee ditch (G1/67). Smithing slag was recovered from the initial roughly circular pit (*11120*). This was replaced by a second flat-based cut with stepped side (pit *10952*) which contained bell mould. Three backfills of the second cut were composed mainly of founding debris; the lowest was fill *11005* which contained bell mould, copper rich fuel ash slag and copper alloy spillage, while bell mould was also recovered from fill *11026*. Fill *10911* was the most substantial, including bell mould, copper rich fuel ash slag and copper alloy spillage. Analysis of the mould fragments (see Jennings below) suggests that at least two bells were struck, with the associated furnace lying beyond the excavated area. Most of the pieces of copper alloy analysed from contexts *10911* and *11005* (see Mortimer below; Table 8.19) were bronzes or leaded bronzes, which are not satisfactory for casting of bells (which are usually made with high-tin bronzes), though lightly leaded bronzes are not unknown. As well as bells, the objects made here may have included a range of domestic items such as cauldrons (see discussion below).

Most of the bell-mould assemblage came from a second pit which was dug directly into the earlier one (G1/68). Pit *10888* was, ironically, bell-shaped in plan. Its fills were mixed ashy charcoal, with signs of burning *in situ* and frequent small fragments of copper alloy. Mixed finds were also recovered and included pottery, copper alloy objects and leather as well as bell-mould and fired clay, indicating that latterly the pit was used for domestic as well as industrial waste. Debris identified by the specialist included bell mould, copper rich fuel ash slag and copper alloy spillage. Analysis of three of the samples from the metalworking pit (Mortimer, below) indicates quaternary alloys (containing copper, lead, tin and zinc), and two samples of leaded bronze (Table 8.19). Again, these were thought unlikely to have been used for bell casting.

Three small pits close to the bell pit were possibly used as rudimentary 'bowl furnaces', possibly in blade manufacture. The best surviving example (pit *10638*, G1/71) was a small circular pit with a concave base and burnt clay lining; its primary fill was made up of *c*.35% copper alloy fragments, identified as quaternary (see Mortimer below; Table 8.19). Also included was copper rich fuel ash slag and copper alloy spillage. Associated with these pits was a metalled path running between the founding pits to the south (G1/67 and 1/68) and a trench (G1/72) to the north. This trench (*10801*) contained copper alloy waste (identified as leaded bronze; see Mortimer below; Table 8.19), charcoal and ash. Cutting the fills of the eastern end of the trench was a small, square pit *10824*, filled entirely with copper alloy impregnated waste.

Cinder came from a path or worn area leading from a property to a cess pit (G1/157) at Property (d) on the Oldswynemarket Hill/Timberhill frontage.

To the east of the castle approach road (later Golden Ball Street), the area was subjected to intensive quarrying. Further north lay a group of pits within Property 43, including a flue-like feature, which were believed on site to have a direct relationship with metalworking due to the presence of layers of ash and a large number of metal finds. Analysis of the plant macrofossils indicates that this was not the case: the heat-intensive activity fuelled by peat burning may have been associated with malt-drying (Murphy, Chapter 8.IV). Metalworking waste was, however, present in pit *90490* (G9/104) which produced smithing slag and other metalworking debris.

Metalworking debris came from quarry pits in three of the five main extraction areas identified in this part of the site (Properties 44–46). In Quarry Area 1, quarry pit *22280* produced a hearth bottom (G22/158), while a larger quantity of material came from quarry pit

Context	Group	Period	Context type	Type	Fe	Cu	Zn	Pb	Sn	comments
11021	1/67	5.1	bell pit	fired clay						no non-ferrous detected
11026	1/67	5.1	bell pit	fired clay						no non-ferrous detected
10857	1/68	5.1	bell/metal-working pit	mould	xx	xxx		xxx	xxx	Sb detected

number of 'x's denotes strength of signal, tr = trace, ? = possible

Table 8.20 XRF analyses on crucible, mould and fired clay

90345 and included hearth bottom, attached hearth lining and smithing slag. Immediately south of Quarry Area 1, in Quarry Area 2, quarry pit *90879* (G9/55) included smithing slag, cinder and attached hearth lining as well as copper alloy spillage, identified as bronze (see Mortimer below; Table 8.19). In the largest area of intercutting quarries to the east, Quarry Area 5, a number of pits included smithing slag (pit *90817* (G9/61) and pit *90906* (G9/81)).

Period 5.2

Metalworking activity was less pronounced during this sub-period and much appears to be recovered as secondary rubbish disposal rather than primary waste. The deposition of metalworking debris was also recorded in Properties 50/91 or (a/b) (G8/26), where fuel ash slag was recovered from pit *80385* and smithing slag from pit *80214*. A small building was recorded in the corner of the garden of Property 49. While metalworking debris was represented by cinder and iron pan, the quantity of animal bone waste in the vicinity indicated that this structure may have been a workshop associated with skinning, tanning/tawing activities.

Metalworking debris was again recovered from the properties to the east of the southern approach road (later Golden Ball Street). The boundary ditch between Properties 43 and 44–46 was infilled and cinder and metalworking debris were recovered from a linear feature *90687* (G9/92). Six pits were cut into the infilled boundary ditch, lying between Quarry Areas 1 and 5. Metalworking debris was recovered from pit *90320* (G9/91) and included cinder and smithing slag. The fills of rubbish pit *90702* (G9/82) contained copper alloy spillage; three samples were identified as leaded bronze (two examples) or leaded copper (one example) (see Mortimer below; Table 8.19). Refuse pit *90705* (G9/87) contained hearth lining and smithing slag. To the south, two more pits yielded copper alloy spillage (G9/82, pits *90715* and *90961*).

Just to the south was a slot and series of dumps which were possibly part of a levelling process. Cutting into the dumps was slot *90742* (G9/84) which contained smithing slag. To the west more pits (G9/73, *90168* and *90261*) contained hearth bottoms. Further west another pit *90017* (G9/56) produced copper alloy spillage. The clay and chalk lining of pit *90159* (G9/121) had been burnt *in situ*. This may indicate a craft/industrial function and smithing slag was recovered from its fills.

XRF analysis

by Catherine Mortimer

Twelve pieces of copper alloy waste were selected for analysis from two pits in the eastern part of the cemetery of St John (pit *11120*, fills *10911* and *11005*, G1/67 and pit *10888*, fill *10857*, G1/68; both Period 5.1; Table 8.19). Although the figures are difficult to interpret, the XRF analyses of these samples seem to show a variety of different alloy types. Most of the pieces analysed from the first bell pit (fills *10911* and *11005*) are bronzes or leaded bronzes.

The detection of arsenic and antimony on one sample from the bell pit ('d' from context *10911*) might indicate the use of a high impurity copper alloy, such as those recently discussed by Blades (1995); this sample was also noted to be more heavily-leaded than other pieces from this assemblage. Three samples from context *10857* (G1/68; Table 8.19) are quaternary alloys (Cu-Pb-Sn-Zn) and the other two are a leaded bronze and an unidentified type of copper alloy (small amounts of both copper and lead were found in this example).

The late medieval non-ferrous metalworking waste therefore appears to have utilised a range of different alloy types, which could have been used for casting different types of artefacts. Bells, for example, are normally made up of high tin bronzes and cannot be made satisfactorily using heavy leaded bronze or quaternary alloys. It is known, however, that lightly leaded bronzes were used for bell-founding (up to 4.5% Pb; Tylecote 1986, 39), although the medieval sources such as Theophilus (Hawthorne and Smith 1963) do not specifically refer to lead being added. It is difficult to suggest what sort of lead levels might originally have been in the spillages as they are now heavily corroded, but experience in interpreting surface XRF spectra suggests that they are unlikely to be more than a few percent in most of the pieces from the bell pit. It is less likely that the high-impurity alloy would have been used to cast bells; most objects made of this type of alloy are domestic vessels such as cauldrons.

The range of alloys found (including those from G1/71 and G1/72) would seem to suggest that several classes of artefact were being cast. Although bells could have been cast using the lightly leaded bronze found in the bell pit, other large or small cast artefact types could also have been made. Similarly, the quaternary alloys and the high impurity alloy would also be suitable for large or small cast artefact types.

About 1.5kg of mould fragments from the upper bell-founding pit (fill *10857*) were examined; other material from the context is fired clay, but could not be clearly identified as being concerned with non-ferrous metalworking. Included amongst the mould material, there are a few pieces with copper alloy attached, as well as pieces of copper alloy waste (above). Copper alloy attached to one mould fragment was found to be a heavily-leaded bronze containing antimony. This composition suggests that the mould in question is unlikely to have been used for casting bells (although see Jennings below).

The 'mould' material examined from the earlier pit (fills *11021* and *11026*) could not be convincingly reconstructed into a bell mould. In fact, most of it was very lightly fired, if at all, and showed no evidence for having been connected with high-temperature metalworking. None of it was heavily reduced-fired.

Bell mould fragments

by Trevor Jennings

Material recovered from the two bell-casting pits was examined (pits *11120* and *10888*, G1/67 and 1/68, Period 5.1, Property e/g). Clearly, the area from which the bell mould fragments were recovered was one of high industrial activity at a time when Norwich was in the forefront of bell-founding processes. The false bell technique is clearly illustrated by the surviving mould pieces examined and in one instance depict a fine example of layer moulding and the use of finishers and luting which have been carefully applied. Mould pedestal remains also indicate a knowledgeable technique as several different qualities of loam were utilised, each becoming harder towards the upper surface and finely graded in gravel size. Some of the larger samples of loose fabrication undoubtedly formed part of the lining of the bell pit and were of a coarse gravel, sand and clay consistency, designed to withstand subsequent straining of the mould during the casting process.

The mould fragments illustrate that at least two bells were cast, although the absence of furnacing indicates that the founding site extending outside the excavated area. Whether gravity fed and direct induced metal or crucible hand-shanked methods were employed, there is usually ample evidence of firing, furnacing and, in most cases, robbing for future use. The size of the initial pit hardly justified a one or two bell cast (see Chapter 8.II and Plates 8.5 and 8.6). It was usual to cast smaller bells at a distance from the main furnaces as the metal could be hand-shanked without much loss of heat in the crucible.

Atmospheric oxygen would, however, enter during the passage from furnace to mould.

The excavated bell mould fragments were the remains of both the mould pedestal and the cope of the outer mould of the bell. Lack of curvature on the fragments makes it almost impossible to give an accurate assessment of the size of the small bells being produced, although diameters of in the range of *c*.0.42–0.50m are indicated by the surviving fragments of mould pedestal. The lack of oiled/waxed loam points to a mould prepared by the false bell technique, not that of *cire perdu*. Although no evidence of a central pivot hole was discovered on the pedestal floor to indicate that the mould had been strickled up within the pit itself, this would have undoubtedly been the case. Backfilling and core drying processes and materials could have destroyed any traces. Little calcified animal or avian bone was present, for moulding purposes.

A small sample of curvatured cope was perhaps the most significant find, giving a clear indication of the technique employed in the production of the outer mould. The cope was formed by building up the walls using a thin layering method with one coat of loam being applied over another. The outer layers were fabricated in a loam mixture of a finer consistency and were finished off in a paste-like material. This gave the mould greater stability and protection from wash under pressure and intense heat from the metal. The sample gave layer thicknesses from the outside of 0.75cm, 1.0cm and 2.01cm respectively. This was a refined material and had withstood casting temperatures well, with no evidence of metal intrusion or vitrification. The sample was too small to provide material for froth flotation testing, but the other materials of the pedestal (from the sample analysed) showed little organic material, seeds and recognisable humus capable of accurate identification, apart from two examples of oat. There was a significant lack of organic binder, although possible cow dung was recorded within the pit fill.

Ferrous and non-ferrous scrap and associated evidence
by Quita Mould (ferrous), Alison Goodall (copper alloy) and Elizabeth Shepherd Popescu (lead)

A very small group of material likely to have been associated with ironworking (bar iron, strip and formless fragments) were found in Period 5 deposits other than fills of the barbican well (Chapter 9.III). No concentrations were observed. Ironwork with radio-opaque specks present in the encrustation suggesting that it had been in proximity to some form of metalworking activity was noted in Area 9.

A relatively large group (x 92) of copper alloy sheet, strips, wire and other debris including casting waste was recovered from Period 5 deposits other than those in the well. Of these, 33 examples came from the bell pit sequence at Property (e/g) (G1/67 and 1/68), including slag, droplets and sheet offcuts. Eighteen pieces of round-sectioned wire came from pit *10169* at the same property (G1/77, Period 5.1), one of which was bent into two loops (SF1008, not illustrated). Another small concentration of sheet and wire came from Area 9 (G9/99 and 9/104). Also present in Period 5 deposits were a number of plate fragments, some of which may have come from complete artefacts such as mounts (x 4).

Again, the majority of the leadworking waste from late medieval deposits also came from the well shaft. A small group of objects from other features included a possible bar ingot, as well as strips, offcuts and spillage. Three fragments from deposits assigned to Period 5.2 came from Area 9 and included a large strip with a triangular section which had been folded several times (SF261, pit *92730*, G9/92, not illustrated). A piece of concave lead sheeting with a bevelled edge, perhaps serving as a rim, came from the same group and may have been part of a vessel (SF243, dump *92679*, G9/92, not illustrated).

Seven fragments of leadworking waste came from Period 5.2 deposits at the Golden Ball Street site. The sheet offcuts include a relatively large folded piece measuring 132 x 75 x 20mm (SF69, not illustrated, pit fill *114*, GBS G23) as well as a large example of lead spillage measuring 90 x 60 x 10mm (SF55, not illustrated, south bailey ditch fill *501*, GBS G48).

Iron metalworking tools
by Quita Mould
(Fig.8.57)

It is often difficult to assign a particular craft function to a tool that is recovered incomplete or damaged: a tanged chisel with a very narrow blade (SF6100) may have been used in engraving.

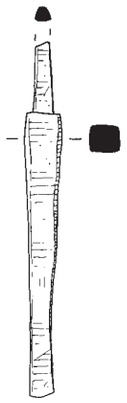


Figure 8.57 Iron tool (SF6100). Scale 1:2

SF6100 **Small tool** with centrally-placed rectangular-sectioned tang, tapering from a distinct shoulder to a narrow blade with broken edge. Possibly a graver. L 98mm max w 10mm
90168, fill of cess pit 90168, Period 5.2, G9/73

Discussion and conclusions
by Elizabeth Shepherd Popescu
(Fig.9.1)

Non-ferrous metalworking was dominant at the site during the late 14th to 15th century (Period 5.1), with documentary evidence attesting to the presence of a number of artisans working (and perhaps living) on individual properties throughout the late medieval period (those of the period late 14th century to *c*.1530 being plotted in Fig.9.1). Metalworking activity was focused in the eastern and southern parts of Area 1 around the bell-founding pit (the relevant property having a documented association with brasiers; see below and Chapters 8.I and 8.V; Fig.9.1), although a cluster of activity also occurred in Area 9.

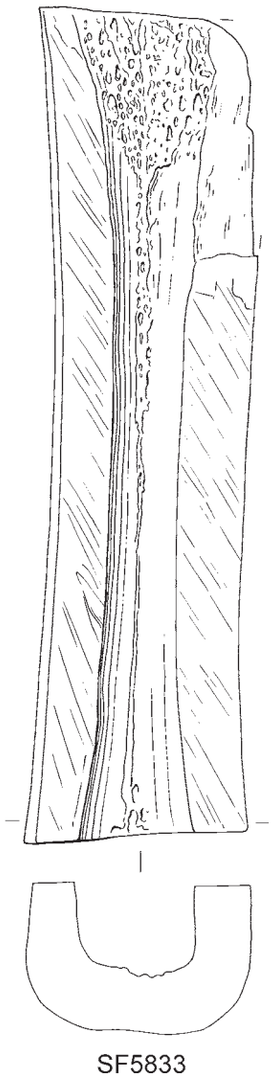


Figure 8.58 Boneworking waste (SF5833). Scale 1:2

An intramural expanse of open ground like the castle ditches would have been ideal for the use of industries such as bell-founding and a significant number of Norwich bell-founders had property in or adjacent to them during the 13th and 14th centuries (summarised in Chapter 8.V; see Cattermole 1987, 134). Further discussion of metalworking in the area and bell-founding in Norwich is given in Chapter 8.I and Chapter 13, while a plan of the documented bell-founders surrounding the castle is given in Fig.9.1 (see also Cattermole 1987). A number of archaeological observations in the immediate vicinity of the castle attest to founding activities. Fragments of fired clay recovered from within the north-east bailey were tentatively identified as possible bell-founding cope (Site 416N; Ayers 1985, 44). More conclusive evidence comes from excavations in Prince of Wales Road which uncovered a late 15th- to early 16th-century workshop and bell-founding pit associated with Norwich's Franciscan friary (Emery 2007). Further evidence for non-ferrous founding comes from a number of sites to the south and west of the castle, including evidence dating to the 16th or early 17th century on Ber Street (Shelley 1999).

Analysis of the copper alloy waste from the bell-founding pits at Property (e/g) (the former having a documented relationship to brasiers William and John de Sutton in 1402; see Chapter 8.V) demonstrates the use of a variety of alloys, although the heavily-leaded bronzes identified were unlikely to be used for casting bells. Other products, such as cauldrons, skillets and candlesticks were also cast in moulds and the production of a range of objects in the vicinity is probable. This situation has been noted at other sites both in Norwich (*e.g.* Greyfriars; Emery 2007) and further afield. Excavated workshops in a number of cities (including York) demonstrate the dominance of cauldrons and other domestic vessels within the urban foundries (Bayley and Richards 1993, 192). The Castle Mall example was apparently fuelled by a coal-like substance, with charcoal indicating a wide range of other woody fuels (see Gale, Chapter 8.IV).

In the latter part of the 15th and into the 16th century (Period 5.2) metalworking activity across most of the site was less pronounced and much of the relevant waste came from secondary rather than primary context. This is counterbalanced, however, by the assemblage of material from the barbican well shaft from the mid to late 15th century which is detailed in the following chapter.

Woodworking

Iron tools
by Quita Mould
(Fig.8.59)
Few woodworking tools were recognised within the site assemblage. A chisel (SF5231) was found in pit fill of 15th–16th-century date at Property (c/d), while a small axe was recovered from fills of the barbican well (Chapter 9.III). Two further tools were recovered from contexts of similar date: a complete carpenter's drill bit (77mm long) with rectangular sectioned shouldered head and long point (GBS SF235, not illustrated; pit *170*, Period 5.2, Open Area 52, Property g) and another chisel (GBS SF133, not illustrated; from pit *411=530*, Period 5.2, Open Area 51, ?Property 47) came from the Golden Ball Street site (two copper alloy staples found in the same property are noted by Goodall above). Property (g) is known to have been owned by a carpenter in *c*.1480 (see Fig.9.1).

SF5231 **Chisel** with broken rectangular-sectioned tang, straight shoulder and bevelled edge. L 205mm edge w 20mm
10050, fill of pit 10221, Period 5.2, G1/152

Textile Manufacture and Needlework

Copper alloy dress-making pins
by Alison Goodall
A group of 65 small pins, probably used in sewing, were found in late medieval deposits at Castle Mall, of which 25 came from fills of the well (Chapter 9.III). The majority of the remaining pins came from pits in Area 1 (x 18) and Area 9 (x 17). These include examples with spirally wound spherical or flattish heads, one having a white metal coating. Such drawn copper alloy wire pins were made in a similar way from the medieval period until the early 19th century, although the earlier examples tend to be thicker (Margeson 1993, 11).

At least eight pins were found from levels at the Golden Ball Street site assigned to Period 5.2 and there

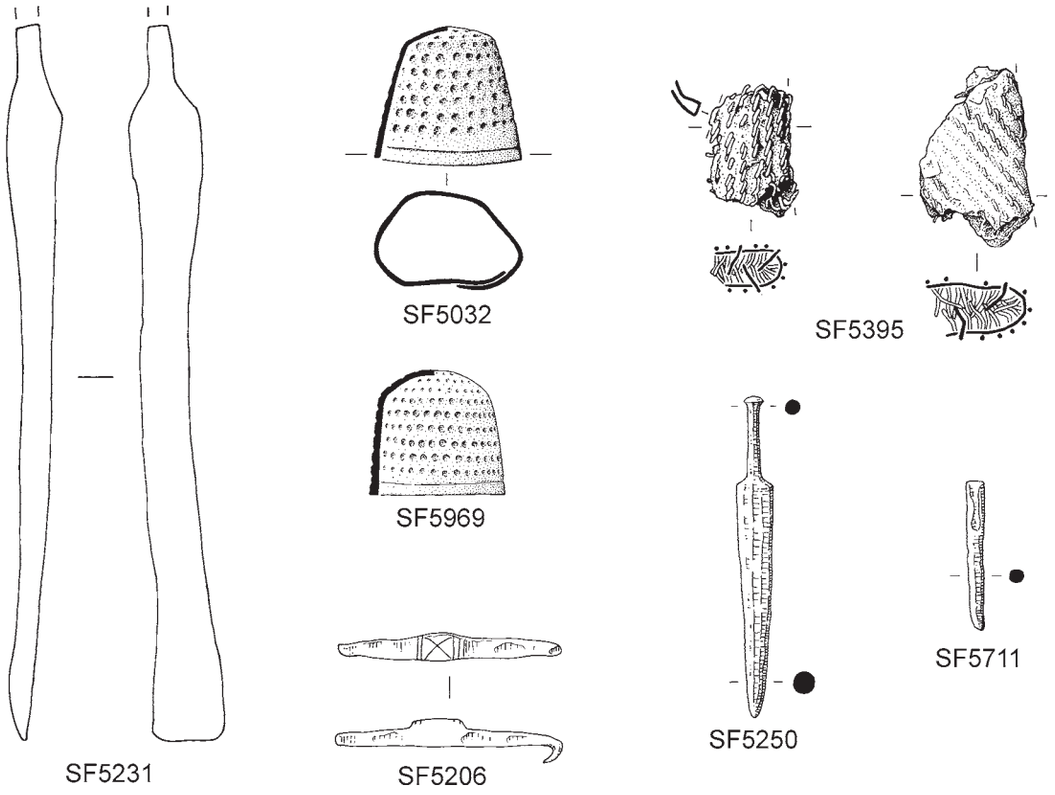


Figure 8.59 Iron chisel (SF5231); copper alloy thimbles (SF5032 & 5969); iron harbick (SF5206); wool carding comb fragments (SF5395); iron awls (SF5250 & 5711). Scale 1:1, ironwork at 1:2

were other fragments. Where the heads were present, they were all of coiled wire and the pins were generally of 28–32mm in length. One incomplete pin was larger and heavier, being at least 40mm long. All came from the large pit cut through the terminus of the south bailey ditch.

Copper alloy thimble
by Alison Goodall
(Fig.8.59)
A conical thimble (SF5969) recovered from a pit fill is of medieval/late medieval type and is similar to a number of others found at Norwich (*cf.* Margeson 1993, fig.139, no.1459). An example from Alms Lane came from a layer dated 1275–1400. Another example found in a post-medieval context (SF5032) is also squat in shape and may be late medieval or early post-medieval.

SF5032 **Thimble** made of wrapping and brazing a single piece of copper alloy sheet (a diagonal line can be seen running down one side). Straight rim with single-line border, and spiral of hand-made circular indentations covering both sides and top.
10003, fill of pit 10059, Period 6.2, G1/93

SF5969 **Thimble**. Large thimble with straight border with a single engraved line, and neat spiral of hand-made circular indentations, the rows more widely spaced on the top than on the sides. L: 20mm
90442, fill of pit 90445, Period 5.1, G9/104

Iron implements
by Quita Mould
(Fig.8.59)
Conglomerations of fine wire interlinking hooks and minerally preserved organic were found in a bell-founding pit of late 14th–15th-century date (SF5328.2, 5428.2 and 5395). They appear to be the fine wire teeth of a wool carding comb and its leather backing sheet which had originally been mounted onto a wooden 'bat' or paddle and used to remove the dirt and align the individual wool fibres ready for spinning. A secondary use polishing metal might be suggested by the fragments being discarded in a metalworking pit.

A single example of a harbick (SF5206) was recovered from the site. Harbicks were used in pairs to secure cloth to the cropping board whilst shearing the nap. A triangular backed iron example has been found previously in Oak Street, Norwich (Margeson 1993, fig. 133, 1435).

A tenterhook (SF6193.01, not illustrated) was found in a possible flue in Area 9, associated with 15th–16th-century pottery. Four others were found in the barbican well shaft (Chapter 9.III). Broken needle stems (SF5875 and 6979, not illustrated) were also found in pit fills.

SF5206 **Harbick** with straight arms with hooked terminals and central box moulding with incised decoration of saltire cross between vertical borders, white metal plated.
10628, external dump, Period 5.2, G1/79

SF5395 Five pieces of **interlocking hooks** with minerally preserved backing of leather present. Hook length c 6mm wire diam 1mm. Woolcarding comb.
10857, fill of pit 10888, Period 5.1, G1/68

Stone spindle whorl
by Julia Huddle
A symmetrical, bi-conical spindle whorl, possibly made of limestone, was recovered from an external dump in Area 1 (SF5352, not illustrated). A chalk example came from the barbican well (Chapter 9.III).

?Leatherworking

Iron awls
by Quita Mould, with Jacqui Watson and Sarah Paynter
(Fig.8.59)
Considerable evidence for leatherworking in this period came from fills of the barbican well (Chapter 9.III). Elsewhere on the site, two pointed tools, each originally with an organic handle, were found and may have been designed to make holes (SF5250 and 5711) or to act as a small punch. They may have functioned in leather-marking, woodworking or with soft metal. The use of a horn handle on SF5250 may indicate use as a hand-held tool rather than one to which force was applied with a hammer or mallet.

SF5250 **Awl** with pronounced shoulder tapering to a blunt tip, tang tapers to a small flat head at the other end. Minerally preserved horn present on the tang from the original handle. L 88mm max w 12mm
10199, fill of cess pit 10294, Period 5.2, G1/153

SF5711 **Awl** with slender round sectioned stem and simple open socket. L 41mm diam 5mm.
11237, fill of pit 11309, Period 5.1, G1/22

Antlerworking
by Julia Huddle
A total of four pieces of sawn antler waste (all of red deer antler) were recovered from contexts dated to this period, excluding those from the fills of and surrounding the barbican well (see Chapters 9.III and 10.III).

Hornworking
by Umberto Albarella, Mark Beech, Jacqui Mulville and Julia Huddle
(Fig.8.58, Plate 8.11)
The Castle Mall site provides important evidence for the late medieval hornworking industry. A total assemblage of 135 horncores (NISP) came from deposits assigned to Period 5, the majority of which came from fills of the barbican well (see below). Only three examples came from Period 5.1, the related activity apparently being concentrated during the second half of the 15th century.

Of particular interest amongst the faunal assemblage is the contents of two adjacent pits (pits *11048* and *11064*, Period 5.2, G1/24, ?Property 49) which contained a total of 46 sheep/goat horncores. Pit *11048* (fill *11030*) contained a collection of 21 horncores, 109 metapodia and 60 phalanges (all belonging to sheep) (Plate 8.11). The pit fill dates to the mid 15th century. *All* horncores had been chopped off the skull, 22% of the metapodia bore cut marks, presumably from skinning, whereas no butchery marks could be found on any phalanges. Cut marks on both metacarpi and metatarsi were all located very close to the proximal end. This deposit can be interpreted as the result of a primary butchery activity, that is when body parts which carry little or no meat are discarded. However, due to the total absence of any other sheep anatomical elements, the contemporary presence of foot bones *and* horncores and the historically well attested importance of leatherworking in the town, the current authors are more inclined to think that it represents tanning or tawing waste. Indeed it is known that in the past foot bones and horncores were left on the skin when this was brought to the tanner or the tawyer (Serjeantson 1989). The lower number of horncores compared to metapodia can be explained either by the fact that some skins were brought to the tannery with feet but no horncores, or that some skins derived from polled sheep. A better preservation of metapodia would also account for this discrepancy.

Deposits with a high concentration of foot bones or horncores have been found in several other sites, and have generally also been interpreted as tanning waste. For instance, sheep metapodia and phalanges interpreted as refuse of leatherworking have been found at Walmgate, York (O'Connor 1984), Hungate, Lincoln (Dobney *et al.* 1996) and St Peters Street, Northampton (Harman 1979). The last case had originally been interpreted as slaughtering waste, but Serjeantson (1989) suggests that it could be another case of tanning or tawing refuse. Association between horncore deposits and

Species	*Rest of Site*	*Well Fills*	***Total***
Sheep/goat	50	70	**108**
Cattle	1	26	**27**
Total	**51**	**96**	**135**

Table 8.21 Horncores from Period 5 deposits

Plate 8.11 Sheep horncores, metapodia and phalanges from possible tanning pit *11048*, Open Area 38, Property 49 (Area 1, Period 5.2)

leatherworking activities have also been suggested by Prummel (1978; quoted by Serjeantson 1989) for the site of Hertogenbosch, Netherlands. Castle Mall provides the only case known to the authors of the close association of foot bones and horncores. This is interesting because it represents the first archaeological confirmation of the historically known phenomenon of leaving the cranial and foot bones attached to the skin, and also because it suggests that different practices may have been carried out in different towns.

Similar evidence came from the barbican well (Moreno Garcia, Chapter 9.IV and Part III) and horn was clearly being removed for use as a raw material on the site. Although horn generally has a poor capacity to survive prolonged burial (MacGregor 1985, 95) SEM analysis by Watson and Paynter of two late medieval implements from the site has indicated the use of horn for handles (tool SF5250 below and see SF7139, Chapter 9.III).

Boneworking
by Julia Huddle
(Fig.8.58)
A sawn section of cattle-sized long-bone (SF5833) has further been sawn lengthways and may have been prepared for the manufacture of combs or handles. The shape of cattle long-bones is ideally suited for producing long thin strips of relatively thick bone, the grain being straight and even. Similar examples were recovered from post-medieval deposits and are discussed in Chapter 10.III.

SF5833 **Sawn-off waste**. Sawn bone, section of the mid-shaft of a cattle metatarsal, sawn lengthwise. Cattle metatarsal diaphysis.
50099, fill of robber trench 50078, Period 5.1, G5/51

Whetstones
by J.M. Mills and David Moore
Four whetstones (not illustrated) were recovered from late medieval/transitional deposits, with a further 20 coming from fills of the barbican well, a number of which are illustrated (Chapter 9.III). Of the group of four, one of purple phyllite appears to be residual (SF238, Chapter 4.III). Two of the others are of Norwegian ragstone (SF5324, context *10822*, fill of pit *10880*, Period 5.1, G1/101 and SF6392, from *90424*, fill of pit *90493*, Period 5.2, G9/104) and the third of Coal Measures Sandstone (SF6430, fill of ditch *91295*, Period 5.1, G9/37). One example (SF6430) may have been a utilised pebble. Norwegian Ragstone was imported, possibly as hewn stone rather than as finished hones (Ellis and Moore 1990, 280) from Eidisborg in the Telemark region of Norway. The sandstone hone is likely to derive from the Coal Measures of the Midlands or southern Yorkshire, these being the closest known sources to Norwich. Further details of whetstones in general are given in Chapter 13.

Querns
by David Buckley
Three querns were recovered from late medieval/transitional deposits other than fills of the well, which contained a further three examples (see Chapter 9.III).

Commercial Activity

Coins
by John Davies
A total of twelve coins came from Period 5 at the Castle Mall site, with an additional four of the period found unstratified. The group includes eight which were retrieved from fills of the barbican well and are detailed in Chapter 9.III.

The earliest are an Edward I–III silver groat (1272–1377) and English Long Cross silver penny (1272–1483). The 15th century is represented by a penny of Henry V (1413–2), a halfpenny of Henry VI (1422–7), a groat of Edward IV (1480–3) and a standard type 'G' penny of Henry VIII (1485–1503). There are two Tudor silver coins. One is a groat of Mary (1553–4) and the other is an incomplete halfgroat, possibly of Henry VII (1485–1503).

The three coins recovered from Period 5.2 deposits at the Golden Ball Street site comprised a residual late 12th- to 13th-century cut farthing (SF102; see Chapter 7.III) and two illegible pennies of 14th–15th-century date (uncatalogued), one copper alloy (SF174, pit *170*, GBS Group 13) and the other silver (SF173, fill of south bailey ditch, Group 54).

SF1007 **Henry VI silver halfpenny**, annulet issue
AD 1422–27
Obv: HEN------
Rev: illegible
Wt: 0.42g
10195, fill of pit 10196, Period 5.1, G1/77

SF5035 **Edward IV silver groat**, second reign
AD 1480–3
mintmark: heraldic cinquefoil
(London mint)
Wt: 2.93g
10000b, unstratified

SF5082 **Edward I–III silver penny**
AD 1272–1377
three illegible fragments
Wt: 0.32g
10137, external dump, Period 5.1, G1/70

SF5174 **Henry VII standard type 'G' copper alloy penny**
AD 1485–1500
Obv: illegible
Rev: illegible. 'H' in centre
North 1721.
Wt: 0.81g
10602, external dump, Period 6.1, G1/109

SF5777 **Tudor, possibly Henry VII fragment of halfgroat**
AD 1485–1503
Wt: 0.25g
40000, unstratified

SF6042 **Henry V silver penny**
AD 1413–22
Obv: illegible
Rev: CIVITAS LONDON
(London mint)
Class C. North 1396
Wt: 0.79g
90000, unstratified

SF6751 **Mary groat**
AD 1553–4
Obv: [MARIA D]G [ANG] FRAZ [HIB REGI]
Rev: [VE]RITAS TE[MPORIS FILIA]
Wt: 1.41g
48000, unstratified

SF7601 **English Long Cross silver penny**
AD 1272–1483
Border clipped away, with no legends remaining. Pierced through centre.
Wt: 0.39g
91946, fill of pit 91947, Period 5.2, Group 9/112

Jettons
by John Davies
A French jetton of 14th- to 15th-century date came from a pit, while seven other jettons came from fills of the barbican well (see Chapter 9.III). Two others came from late medieval/transitional deposits at the Golden Ball Street site. One was an illegible Nuremberg jetton (GBS SF198), while the other was an English jetton dating to *c*.1280–1350 (GBS SF194).

GBS SF194 English jetton
c.1280–1350
Obv: illegible design. Pellet border
Rev: Long Cross pattance. Border of crowns
Wt: 0.803g
413, fill of pit 414, Period 5.2, GBS Group 45

GBS SF198 Nuremberg jetton. 'Rose/orb' type
16th to early 17th century
illegible
Wt: 1.071g
343, fill of south bailey ditch, Period 5.2, GBS Group 54

SF5971 French jetton. Moor's Head type
14th to 15th century
Obv: AVE MARIA GRACIA PLEI(G)
Rev: +A-VE-M-AR(G)
Michener obv: 372, rev: 370
Wt:1.16g
90567, fill of pit 90539, Period 5.1, G9/104

Diversions

Horse Equipment

Iron spur fittings
by Quita Mould
(Fig.8.60)
A large body of evidence relating to spurs and spur fittings came from the well (Chapter 9.III). In addition, a group of square-bodied spur fittings (SF5097.2), from another mid 15th-century context, differed from the majority of spur fittings recovered in being riveted to the leathers rather than hooked. They can be paralleled by fittings found on a number of rowel spurs from London dating from the mid 13th–early 14th century (Ellis in Clark 1995, nos 322, 324–7, 329) and probably occurred residually

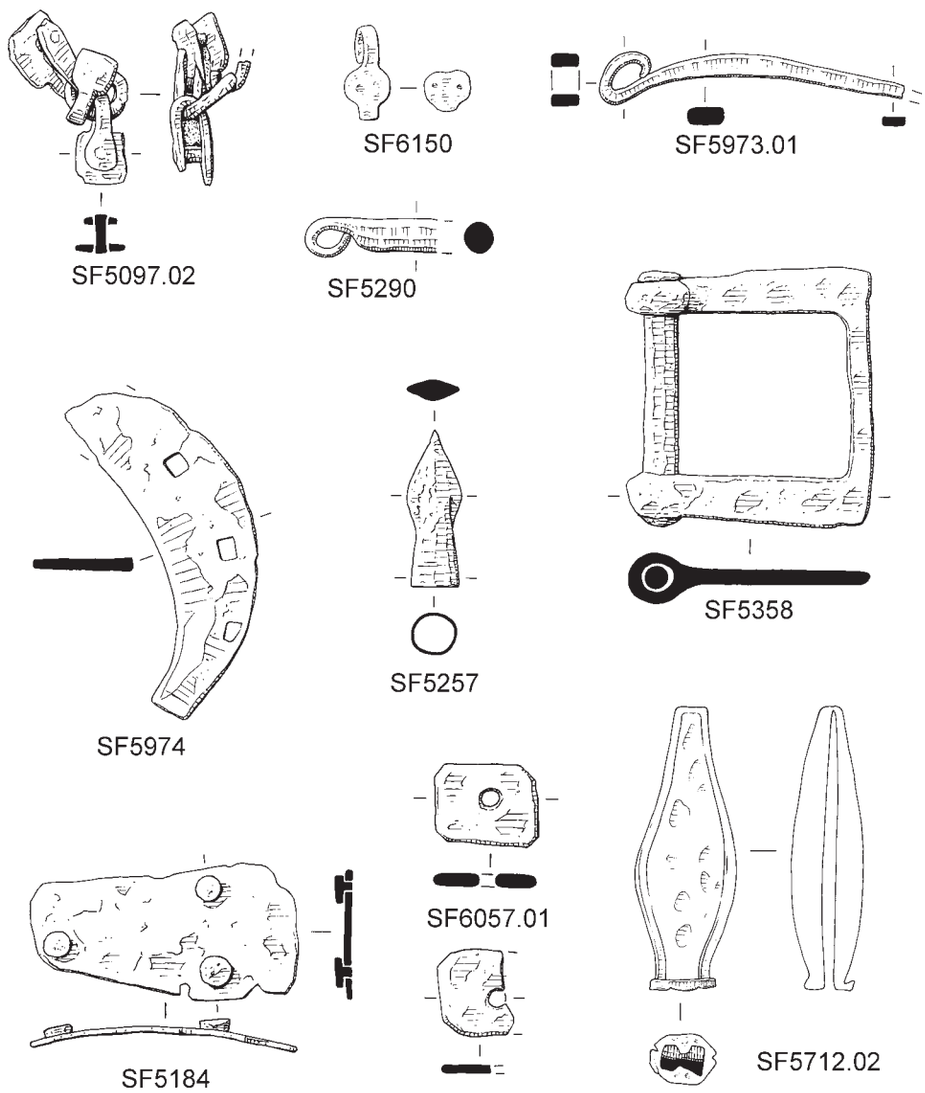


Figure 8.60 Iron spur fittings (SF5097.02 & 6150); iron horse bit links (SF5290 & 5973.01); iron harness buckle (SF5358); iron ox-shoe (SF5974); iron arrowhead (SF5257); iron plate armour (SF5184 & 6057.01); iron dagger grip (SF5712.02). Scale 1:2

in the context in which they were found. Two hooked spur fittings (SF5078.01, not illustrated and SF6150) were found in pit fills. Such fittings were found in some numbers in fills of the barbican well and are discussed fully in the next chapter.

SF5097.2 Spur fittings. Three spur fittings with riveted, square plates and looped arms, and remains of a fourth example, all articulating with a small, round-sectioned ring. Traces of white metal plating present. Ring D 18mm, fitting L 25mm W 17mm
10137, external dump, Period 5.1, G1/70

SF6150 Spur fitting with central disk and remains of two hooked arms with non-ferrous metal plating. Max L: 27mm. Also remains of a second example.
90289, fill of pit 90307, Period 5.2, G9/73

Iron horse-bits and harness
by Quita Mould
(Fig.8.60)
Two individual broken links from horse bits (SF5290 and 5973.01) and two harness buckles (SF5358 and 5982.01, latter not illustrated) were found in Period 5 deposits excluding fills of the barbican well. The large buckle with a solid roller (SF5358) is a long-lived type occurring throughout the medieval (Egan in Clark 1995, 57) and into the post-medieval period (Egan and Pritchard 1991, 95).

SF5290 Horse bit link with looped ring terminal and broken shank. L 35mm
10685, external dump, Period 5.1, G1/71

SF5973.01 Horse bit link with pierced ring terminal, broken L:94mm.
90424, fill of pit 90493, Period 5.2, G9/104

SF5358 Buckle. Harness buckle large frame with narrow pin bar and wide strap arms with pierced terminals to hold the solid roller.ht: 70mm.
11063, fill of pit 11064, Period 5.2, G1/24

Iron horseshoes and horseshoe nails
by Quita Mould
The remains of a maximum of fourteen horseshoes were found in Period 5 contexts, excluding the barbican well. A horseshoe of Clark's type 1 (SF5200.01, not illustrated) and type 2B (SF5651, not illustrated) occurred residually. The remainder of those sufficiently large to classify were of late medieval type, Clark's type 4 (1995, 88–91, 97). No certain examples of Clark's type 3 were recognised from the excavations but two 'eared' horseshoe nails which were used with them (*e.g.* SF6333, not illustrated) were found in Period 5 deposits. Three horseshoe nails with the shanks expanded to form a flat, rectangular-shaped head, of a type still in use today (SF6299, not illustrated) were also found. The spirally-clenched shank noted has been seen on nails from London of late medieval date and has been discussed by Clark (1995, 87).

Of the total of 91 horseshoe nails recovered from the site, 29 came from late medieval/transitional deposits, including 19 from the well shaft (Chapter 9.III). Over half of the site assemblage (x 62) were fiddlekey nails used on horseshoes with countersunk nailholes. Three 'eared' nails were found (two in Area 9 pits (G9/81), one unstratified in Area 46) which were used in a type 3 horseshoe, also with countersunk nail holes, of 13th- and 14th-century date (Clark 1995, 96). Ten cuboid-headed nails occurred exclusively in the upper backfill of the barbican well used on horseshoes of type 4 of later medieval date (like SF7034 above; Chapter 9). The remainder were nails with the shank expanded to form a flat, rectangular head of a type still in use today, some may be 'lost' head nails used in joinery from which broken, encrusted examples are difficult to distinguish: see timber nails above.

Iron oxshoes
by Quita Mould
(Fig.8.60)
Amongst the broken horseshoe branches, two possible oxshoes could be identified (SF5974 and 6445.01, latter not illustrated). The cloven hooves of oxen were shod when animals spent much time on hard surfaces when pulling carts.

SF5974 Oxshoe rectangular section with three square nail holes close to the exterior edge. L 90mm, w 32mm
90422, fill of pit 90493, Period 5.2, G9/104

Weapons and Armour

Iron dagger
by Quita Mould
(Fig.8.60)
A dagger grip (SF5712.2) was found in late 16th- to 17th-century refuse and demolition deposits overlying the 15th-century dismantling of the barbican well superstructure. It is similar in shape to the dagger grip illustrated on the brass of Sir Brian de Stapilton at Ingham, Norfolk, dated 1438 (Ward Perkins 1940, fig.9, 13). A glassy, vitrified residue was present on the surface like that found on several items from the upper backfill of the barbican well (see Chapter 9) and it is likely that it dates to that period of backfilling and occurs residually.

SF5712.02 Dagger. Dagger grip of six-sided section, flat end with central rectangular slot to take the tang, expanding into a swollen shoulder for the hand grip before tapering to the pointed terminal. Copper based plating found on both interior and exterior probably brazing, indication of 'comma-shaped' inlaid white metal decoration on the exterior. L: 88mm.
50083, makeup dump, Period 6.1, G5/52

Iron arrowheads
by Quita Mould
(Fig.8.60)
Three arrowheads were found in pits belonging to Period 5.1 and eight other arrowheads were recovered from 15th-century fills of the barbican well (Chapter 9.III). Two (SF5257 and 6508.01, latter not illustrated) were compact warheads of late 14th- to 15th-century date (type M1 and M2, Jessop 1996, 198 and fig.1). Another is a short conical ferrule (SF5422.03, not illustrated; Jessop type MP9) thought to have been designed for archery practice (Jessop 1996, 197 and fig.1). A fragment possibly broken from a second example was also noted (SF5415.01, not illustrated).

SF5257 Small, socketed **arrowhead** with leaf-shaped blade of lentoid section. L 40mm, blade w 15mm
10172, fill of pit 10168, Period 5.1, G1/77

Iron plate armour
by Quita Mould
(Fig.8.60)
Many fragments (minimum 51) of sheet with round-headed rivets or rivet holes were recovered, a small quantity (18 minimum) may be fragments of plate armour: many of these came from the barbican well (Chapter 9.III) or pit fills of similar date (*e.g*. SF5184). In addition, two small plates from a jack of plate, a padded protective jacket worn by the common soldiery during the 16th century were found (see discussion of pieces from Beeston Castle, Eaves in Ellis 1993, 161–164). The skirts and collars of some jacks of plate were filled with chain armour rather than plates. The occurrence of fragments of chain armour in the backfill of the well is discussed in Chapter 9.III.

SF5184 **Rectangular plate** with slightly curved profile and three round-headed rivets remaining. L 77mm w 38mm.
10524, fill of pit 10899, Period 5.1, G1/97

SF6057.1 **Two jack plates** with cropped corners and central hole. L 30mm w 23mm
90677, fill of pit 90702, Period 5.2, G9/82

IV. ZOOLOGICAL AND BOTANICAL EVIDENCE

Mammal and Bird Bone

by Umberto Albarella, Mark Beech and Jacqui Mulville
(Plate 8.11)

Assemblage Summary

A total assemblage of 1,165 mammal, bird and amphibian bones and teeth (NISP) was hand collected from late medieval/transitional deposits at the Castle Mall site, with an additional 171.5 bones from Site Riddled Samples (SRS) and 116 from Bulk Samples (BS). The large assemblage from the barbican well shaft, detailed separately, amounts to 14,607 mammal bones/bone fragments and 3,888 bird bone fragments (see Moreno Garcia, Chapter 9.IV and Part III), The range of taxa recorded from non-well shaft deposits at Castle Mall is indicated in Table 8.22. A further 218 bones and teeth (NISP) were identified at the Golden Ball Street site (see Curl, Part III). Full details of the complete mammal and avian bone assemblages from both sites are given in Part III.

Refuse Disposal

Most of the refuse attributable to this period came from pit fills, although ditch fills of 16th-century date were evident at the Golden Ball Street site. The few partial animal skeletons recovered are indicated in Table 8.23, although this does not include half a pig carcass which was located in Area 9. In addition, 15 partial dog skeletons and 16 partial cat skeletons were recovered from the barbican well. At least some of these animals appear to have been deposited into the well while still alive (see Chapter 9.IV).

Craft Waste

The most significant craft waste of the period came from fills of the barbican well and is detailed in Chapter 9.IV. Elsewhere on the site, a pit fill containing a significant group of sheep horncores, metapodia and phalanges (pit *11048*, Plate 8.11) at ?Property 49 provides evidence for the deposition of tanning/tawing waste and is summarised in Chapter 8.III, with further details given in Part III. This group of 21 horncores is remarkable for their general small, female-like, size (although they may represent early castrated wethers).

Taxa	*Hand collected*	*SRS*	*BS*	***Total***
Cattle (*Bos taurus)*	312.5	41	11.5	**365**
Sheep/goat (*Ovis/Capra)*	477**	41.5	43	**561.5**
sheep (Ovis aries)	*(193)*	*(4)*	*(5)*	***(202)***
goat (Capra hircus)	*(1)*	-	-	***(1)***
Pig (*Sus domesticus)*	121.5*	18	15	**154.5**
Equid (*Equus* sp.)	1.5	-	-	**1.5**
Dog (*Canis familiaris*)	10*	4	-	**14**
Cat (*Felis catus)*	35*	0.5	10.5*	**46**
Red deer (*Cervus elaphus)*	+	-	-	+
Fallow deer (*Dama dama*)	-	4.5	-	**4.5**
Hare (*Lepus* sp.)	3	-	-	**3**
Rabbit (*Oryctolagus cuniculus)*	22.5	7	12	**41.5**
Rat (*Rattus* sp.)	-	1	-	**1**
House/wood mouse (*Apodemus/Mus*)	-	-	1	**1**
Domestic fowl (*Gallus gallus*)	119*	38	19	**176**
Goose (*Anser anser*)	48*	11	1	**60**
Duck (*Anas* sp.)	9	2	1	**12**
Turkey (*Meleagris gallopavo*)	1	-	-	**1**
Little Grebe (*tachybaptus ruficollis*)	1	-	-	**1**
Swan (*Cygnus* sp.)	1	-	-	**1**
Pochard/Tufted duck (*Aythya ferina/fuligula*)	+	-	-	+
Coot (*Fulica atra*)	1	1	-	**2**
Grey partridge (*Perdix perdix*)	-	-	1	**1**
Crane? (*?Grus grus*)	+	-	-	+
Rook/Crow (*Corvus frugilegus/corone*)	1	-	-	**1**
Pigeon (*Columba* sp.)	-	1	-	**1**
Bird	1	-	-	**1**
Amphibian	-	-	1	**1**
Total	**1,165**	**171.5**	**116**	**1,452.5**

Sheep/Goat also includes the specimens identified to species. Cases where only 'non-countable' bones were present are denoted by a '+'. Pig metapodii and ruminant half distal metapodii have been divided by two, while carnivore and lagomorph metapodii have been divided by four. Due to the difficulty in distinguishing between upper and lower incisors in equids and upper and lower canines in carnivores, all have been recorded and then divided by two. All totals which include material from partial skeletons are denoted by '*': this material is described in further detail in Table 8.23. The figure denoted '**' includes a 'special' group of 169 sheep metapodia and phalanges.

Table 8.22 Numbers of mammal, bird and amphibian bones and teeth in Period 5 at Castle Mall by collection category (NISP), excluding the assemblage from the barbican well

Period	*Area/Group*	*Context*	*Related feature*	*Collection method*	*Species*	*Notes*
5.1	1/97	10976	pit 10899	hand	cat	20 bones
5.1	1/97	10976	pit 10899	BS sieve	cat	4.5 bones
5.1	9/61	90765	pit 90766	hand	dom. fowl	10 bones
5.2	9/73	90171	pit 90261	hand	pig	6 bones
5.2	9/94	92716	pit 92715	hand	dog	5 bones

The number of bones and teeth given are the number of countable specimens from each skeleton

Table 8.23 Summary of partial animal skeletons found within Period 5 features (excluding barbican well)

Comparison with the Barbican Well Assemblage

Animal bones recovered from the upper fills of the well within the castle barbican date to the mid 15th to early 16th century and are therefore contemporary with the assemblage from Period 5.2 across the remainder of the site. The well assemblage was analysed by Marta Moreno García and is described and discussed in Chapter 9.IV and Part III. The results of analysis have been compared with those from the remaining assemblage.

The total weight of bird bones in the barbican well is substantially higher (4.3%: sieved and hand-collected) than the Period 5 assemblage (1.3%: hand collected; Part III, Fig.10). However, when the NISP count is considered the difference is not that evident. Bird bones represent 21% of the total number of mammal and bird fragments from the barbican well (this count includes both material hand-collected and from sieving) and between 15% and 30% (depending on which type of recovery is considered; Part III, Fig.14) from the rest of the site in Period 5. The relatively higher weight of bird bones from the barbican well is partly the result of the inclusion of material from sieving (where a larger number of bones are expected) and partly due to the higher number of bones from the larger goose. The abundance of goose bones in the well deposit can be attributed to the high numbers of carpometacarpi, which are probably the by-product of some industrial activity (see Moreno García).

The MNI percentage of the main domestic mammals from the barbican well has been compared to the rest of the site for Period 5. A larger number of pigs (30% versus 16%) and a smaller number of cattle (20% versus 39%) were found in the well. However, the counts were very similar when the frequency of taxa calculated through a 'diagnostic zone' system (hand-collected + sieved material) adopted by Moreno García was compared to our NISP (which is also a 'diagnostic zone' system). In general more similarities than differences emerge from the comparison between the well assemblage and that from the rest of the site. The minor differences can be attributed to factors such as differences in preservation, recovery or quantification methods which are of minor archaeological interest.

Wild species are poorly represented both in the barbican well and in the rest of the Castle Mall assemblage. A number of hare and rabbit bones were, however, recorded from the well. It is interesting to note that for the rest of the site, the largest number of lagomorph bones were also found in Period 5 (see Part III, Tables 3–6).

General Comments

It is notable that nine out of the sheep horncores from the group associated with tanning waste have clear thumb prints. This condition is commonly found in archaeological sites and has been associated with environmental stresses such as malnutrition or breeding in elderly animals, which may cause calcium resorption (Hatting 1983, Albarella 1995). Its occurrence in about 25% of the horncores from Period 5 suggests that the condition of these sheep may have been poor. Their rather small size may also be associated with a low plane of nutrition (see Davis 1996). A similar occurrence of depressions (23%) was found by Moreno García (Part III) in her study of the mid/late 15th to early 16th century fills of the barbican well and by Curl in her analysis of the material from Golden Ball Street (Part III).

Variations in animal size and age at death are apparent in a range of species during this period and are fully detailed in Part III. Evidence from Period 5 deposits at both Castle Mall and Golden Ball Street indicates that the shift towards culling of juvenile cattle may have occurred earlier in Norwich than in other parts of the country.

Fish Bone

by Alison Locker

In this period of some two centuries there was a large assemblage of fish bones of which 61% came from a single context, the barbican well. The fills of this large feature, most of which are dated to Period 5.2 are discussed separately in Chapter 9.IV. The summary shown below (Table 8.24) excludes the fish from the barbican well and is collated from a variety of features including pits and linear features some of which are discussed in the full report (Part III).

The bulk sieved material is 77.6 % of the assemblage, with site riddled at 12.6% and hand collected at 9.6%. This contrasts with the comparatively low proportion of fish from bulk sieving in the well despite the greater weight of whole earth samples sieved in the latter feature. These differences may reflect a greater density of fish in the non well samples and also a greater variety with 37 taxa from an assemblage of 1,811 identified bones compared with 28 in the larger sample by both weight and bone number from the well.

Using the bulk sieved sample minus the elasmobranchs herring are 35.3% by bones number and eel are 9.1%. Cod and large gadid together are 8.4%, whiting 6.5% and haddock 2% so the combined gadids, all important food fishes total around 17%. Sprat, a smaller

Taxa	*Hand collected*	*SRS*	*BS*	***Total***
Elasmobranch	1	0	9	**10**
Spurdog	0	1	0	**1**
Ray	0	0	6	**6**
Roker	0	2	6	**8**
Eel	1	2	163	**166**
Conger eel	0	2	0	**3**
Herring	3	13	617	**633**
Sprat	0	0	139	**139**
Pilchard	0	0	1	**1**
Salmonid	0	1	1	**2**
Smelt	0	0	5	**5**
Pike	0	3	1	**4**
Roach	0	0	1	**1**
Cyprinid	0	1	39	**40**
Cod	61	74	86	**221**
Large Gadid	55	51	66	**172**
Small Gadid	5	0	5	**10**
Haddock	1	22	36	**59**
Whiting	34	12	117	**163**
Pollack	0	3	0	**3**
Saithe	0	2	0	**2**
Ling	8	1	0	**9**
S. Scorpion/Bullrout	0	0	2	**2**
Perch	0	0	3	**3**
Bass	0	0	1	**1**
Pandora	0	1	0	**1**
Ballan Wrasse	0	0	1	**1**
Catfish	0	1	0	**1**
Dragonet	0	0	1	**1**
Mackerel	0	2	16	**18**
Scombrid	0	0	1	**1**
Turbot	2	0	0	**2**
Plaice	2	7	10	**19**
Plaice/Flounder	1	19	65	**85**
Halibut	0	1	3	**4**
Sole	1	4	6	**11**
Flatfish	0	3	0	**3**
Total	**175**	**229**	**1,407**	**1,811**

Only material identified to species and/or family level is indicated. Indeterminate fragments including fins and rays were not quantitifed, though all potentially identifiable material was recorded.

Table 8.24 Numbers of identified fish bones from Period 5 (excluding the barbican well) by collection category (see Part 3, Tables 81–83)

close relative of the herring was 7.7%, but at 13cm long at adult size would have contributed little in the way of food. The smaller flatfishes, excluding halibut and turbot and are mostly plaice and flounder, comprised 4.1%.

Considering herring and the gadids in terms of quantities of food as represented by 'portion' herring is 26%, cod 56%, haddock 10% and whiting 7%. This indicates that cod and haddock were much more important than suggested by bone numbers. Haddock shows a small increase from the low levels of Periods 1 and 2, conversely whiting is slightly lower by 'portion' and herring greatly reduced.

The measured cod bones from the entire period (including the barbican well) showed a smaller size range than preceding periods at 50–85cm, though the sample size of 9 is small. These smaller fish could represent the catch of a more localised inshore fishery in the North Sea, slender evidence but they are significantly smaller than the maximum size of preceding period of 120cm total length.

Sea bream, bass and other marine species present in low numbers were evidently a sign of variety in the fish eaten rather making a significant contribution in terms of quantity are they are all relatively small fish. Mackerel are 0.8%, present throughout the deposits but in always in low numbers. Pilchard (an adult sardine) was identified from a single opercular, a close relative of the herring with very similar bones, this species may be under represented have been included with herring. However the normal distribution of pilchard, favouring warmer water temperatures than the herring though their occurrence overlaps, led to the main fisheries being based on the southwest coast.

Salmonid vertebrae were also present in small numbers as in other phases and N.J. Williams (1988, 170) describes barrels of salmon, an expensive delicacy, sent to Norwich every year in the latter part of the 16th century. The prominence of salmon in the documentary record for many parts of the country coupled with the known poor survival of the bones compared to other bony fish suggests they are under represented at Castle Mall and many other sites.

Plant Macrofossils and Arthropods

by Peter Murphy and Mark Robinson

Fills of the barbican well (G5/23 and 5/24) attributed to Period 5 are discussed separately in Chapter 9.IV. All other data for this site period came from pit groups.

Industrial/Refuse Pits

Samples from the fills of a group of industrial/refuse pits of late 14th–15th-century date at Property 43 (G9/104) with an associated linear feature of mid 15th-century date (G9/105) were analysed. Though a functional or chronological relationship is not definitely established from artefactual evidence, macrofossil assemblages from the two groups show similarities and are appropriately considered together. The unusually good state of preservation of charred macrofossils initially drew attention to samples from this group during assessment, and this was reinforced by the need to establish a function for associated activities.

Plant macrofossils, molluscs and other material from the samples are listed in Tables 8.25 and 8.26 on CD. The macrofossil assemblages from the pit fills (pits *90445, 90538*, *90436 and 90457*, *90539, 90490 and 90481,* Period 5.1; *90493*, Period 5.2) are very similar in composition, probably all derived from a common event or activity. The fill of the linear feature (*90428,* BS 1013, fill *90420*, G9/105, Period 5.2) also contained a comparable assemblage of macrofossils.

Small amounts of mineral-replaced macrofossils, mainly of food plants (*Rubus fruticosus*, (ramble), *Sambucus nigra* (elder), *Ficus carica* (fig) and a cereal grain) were noted. These may relate to some deposition of sewage in the features, but most deposits sampled were of burnt material. Silica ash of plant origin was present in most samples, and in BS1018 (*90442*, pit *90445*), 1028 (*90466*, pit *90457*) and 1013 (*90420*, linear feature *90428*) formed a major or predominant component of the flot. 'Silica skeletons' of plant macrofossils included scraps of monocotyledonous stem/leaf, Cyperaceae (?sedge) nutlets and nodes possibly of *Equisetum* (horsetail) were noted. All other plant macrofossils present were charred, representing a very wide range of plants, including some taxa not normally preserved in this form. The excellent preservation of delicate structures implied slow charring in very oxygen-deficient conditions.

Cereals Grains and chaff make up a relatively minor component of these samples. The most frequent cereals are *Hordeum* (barley) and oats (*Avena sativa*), with some *Triticum aestivum* (wheat) and *Secale cereale* (rye). Most of the barley grains and some of the oats had sprouted before charring.

Other crops These included occasional pulse seeds, including *Vicia sativa* (cultivated vetch) and capsule fragments of *Linum* sp. (flax/linseed).

Terrestrial herbs This group included segetal weeds, commonly associated with cereal crops, and grassland plants. Small grass caryopses (Poaceae) were abundant and frequent and other grassland plants included *Chrysanthemum cf leucanthemum* (ox-eye daisy), *Plantago lanceolata* (ribwort plantain), *Prunella vulgaris* (self-heal) and *Ranunculus* sp. (buttercups).

Trees/shrubs Scraps of hazel nut shell were present.

Heathland plants These comprised leaf fragments of *Erica cf cinerea* (bell heather) and *Pteridium aquilinum* (bracken) with and *Erica* floret and heather stem fragments.

Wetland/aquatic plants *Carex* spp. (sedges) predominated, but other wetland plants including *Eleocharis* spp. (spike-rush), *Cladium mariscus* (great fen-sedge) and culm nodes of *Phragmites* (reed) were also common. Calcified oospores of *Characeae* (stoneworts), discoloured by the effects of burning, were noted, with charred fruits/seeds of some other aquatics.

The samples also included abundant mollusc shells, representing a range of habitats. Freshwater species predominated, and most of these were discoloured to black or grey, and showed varying degrees of deformation and loss of surfaces due to burning. Many of the marine mollusc shells (whelk, cockle, mussel, oyster) and crab remains were also burnt. These are largely edible species, representing food waste, though one shell of the flat winkle (*Littorina littoralis*) was present. Land snails were relatively uncommon, but included both burnt and unburnt specimens from both open and shaded habitats.

These are therefore some of the most diverse charred/burnt assemblages from the entire site, incorporating material from a wide range of sources. Interpretation is obviously problematic, but they are thought to represent mainly fuel debris. Components included: wood/charcoal (with some attached shells of woodland snails); crop processing waste including many weed seeds; grassland vegetation (?waste hay); heather and bracken; reeds, sedges and other wetland plant material (with associated freshwater molluscs); and miscellaneous food waste. It is possible that the wetland/aquatic plants and freshwater molluscs could relate to the burning of base-rich *Phragmites* or *Cladium* peat. Such a heterogeneous type of fuel, combined with the state of preservation of the macrofossils, does not suggest that temperatures generated would have been high, nor that oxygen supply was good. On these grounds, the biological evidence does not support the possibility that these layers related to metalworking. This is in very marked contrast to some other assemblages representing fuel residues from Area 9. For example, a Period 5 pit fill, *91946* (BS1408; Group 9/112: not quantitatively analysed) was composed almost entirely of cinder, coke and coal; charred plant material was comparatively rare, consisting of occasional *Hordeum* grains, *Phragmites* culm nodes and *Pteridium* pinnules and stems. Combustion in generally well-oxygenated conditions and higher temperatures seemed to be indicated.

The consistent presence of sprouted barley grains, and some oats, may be coincidental, but it is possible that these grains indicate that the main activity in this area was malt-drying.

Cess Pits

Samples from fills of two latrine pits at Property (e/f), encroaching into the northern part of the cemetery of St John, were analysed (Table 8.27 on CD; pits *13183 and 13248*; G1/76, Period 5.1; *13184* (BS 737) and *13210* (BS 741)). In both cases charred plant remains formed only a very minor component. Most plant macrofossils present were preserved in an uncharred form, partly by phosphatic mineral-replacement. Pit *13248* (fill *13210*) included a wide range of food plant remains, including fig (*Ficus carica*), strawberry (*Fragaria vesca*), flax/linseed (*Linum usitatissimum* — seed fragments only), apple (*Malus sylvestris*), cherry (*Prunus avium*), sloe (*Prunus spinosa*), plum/bullace (*Prunus domestica* s.l.), bramble (*Rubus fruticosus*), raspberry (*Rubus idaeus*), elderberry (*Sambucus nigra*), the herb savory (*Satureia hortensis*) and grape (*Vitis vinifera*). Other probable dietary residues were testa fragments of segetal weeds (*Agrostemma githago, Anthemis cotula, Brassica* sp., *Centaurea* sp., *Chrysanthemum segetum, Cirsium/Carduus* sp., *Fallopia convolvulus, Rumex* sp., *Spergula arvensis*). These probably were originally contaminants of milled wholemeal grain foods. Cereal periderm fragments were not noted: presumably conditions were unsuitable for preservation. Concretions, mineral-replaced monocotyledonous stems, beetles, fly puparia, fish bones and some bone fragments were also noted. The sample appeared to be composed largely of sewage and kitchen/table waste.

Pit *13183* (fill *13184*) included a somewhat different assemblage. Dietary residues were less common. The sample included a range of seeds/fruits from weed, grassland and wetland species (Table 8.27 on CD). The deposit may have included waste flooring materials or litter, composed of hay and perhaps straw.

Arthropods from these features were identified by Dr M. Robinson, who comments as follows. The undecayed insect remains comprised a mixture of indoor species, such as *Tipnus unicolor* and *Mycetea hirta*, and background species such as *Polydrusus* sp, which feeds on the leaves of trees. One species of particular interest is *Xestobium rufovillosum*, the death watch beetle. It can cause serious damage to hardwood structural timbers. Mineral-replaced insect remains from this feature were few and no sewage fly puparia were identified.

Other Pits

A sample from a post-pit within the castle barbican was analysed (Table 8.27 on CD; pit *47694*; G47/10, Period 5.1; *47693* (BS 1785) and was dominated by charred plant material. Charred cereal grains (mainly oats, barley and rye) were common. A few had germinated before charring, but insufficient to suggest that malt was represented. Cereal chaff was rare. Seeds of cultivated vetch (*Vicia sativa*) were noted, with fragments of large Fabaceae cotyledons, and hazel nutshell fragments. There was a wide range of terrestrial herbs — segetals and grassland plants. Wetland taxa were common.

In view of the rarity of chaff, the sample appears to have included a component of prime grain. The seeds/fruits of segetals could represent either original crop contaminants or a later admixture of processing waste used as fuel for crop drying. The seeds/fruits of wetland taxa *might* represent residues from peat fuel (as above, G9/104), though *Phragmites* remains were rare and *Cladium* absent. It is perhaps more probable that charred residues from hay are represented.

A sample from a pit lying above the infilled ?Castle Fee boundary ditch in Area 1 at Property (d) (pit *10909*, fill *10874*; BS 87) produced a large assemblage of charred material (Table 8.27 on CD; G1/101, Period 5.1). Charred hulled barley grains predominated, including asymmetrical grains from lateral spikelets, thus establishing the presence of six-row hulled barley (*Hordeum vulgare*). Other cereals and weed seeds occurred in small numbers, representing contaminants of the batch of barley. The barley grains were well-preserved, and showed no obvious signs of germination prior to charring.

Charcoal

by Rowena Gale

Two charcoal samples from fuel residues associated with possible bell-founding and metalworking pits at Property (e/g) were analysed (pits *11120* and *10888*, Period 5.1). Most samples contained a substantial quantity of charcoal but, in some, a large proportion was made up of small slivers that were not suitable for identification. Fragments measuring >2mm in the radial transverse plane were selected for identification (see Appendix 4 for further details of methodology). The results are summarised in Table 8.28.

Oak, ash, maple and poplar/willow were common to most contexts; a high proportion of the oak and ash included heartwood. Oak and ash, in particular, are long-lasting fuel woods with high calorific values; ash has the advantage that it burns well when green. Other woods identified included hazel and hawthorn type, but these occurred sporadically , suggesting that they were used less frequently.

Most metalworking processes require a combination of high temperatures and a reduced atmosphere: these can only be achieved by the use of charcoal. Charcoal production was a lengthy and costly process, although it may have been used in bell-founding and other metalworking. Fragments of a coal-like substance were present in contexts *11005* and *10857*, together with a wide range of woody species including heather. Heather flares up quickly to produce a fierce heat, but this rapidly dies down. It has a traditional use as fuel (Edlin 1949), although its twiggy morphology renders it unsuitable to charcoal production. Although ericaceous stems were identified from only one of the fills examined, seed capsules, leaves and stems were commonly found in contexts across the site (Murphy, this volume). The range of materials identified from the metalworking pits suggests that wood and other types of fuel may have been mixed with charcoal or used for some part of the processing.

The consistent use of heartwood rather than narrow roundwood suggests that wood was cut or gathered from mature trees rather than coppiced species in managed woodland. Heathland may have included pockets of mixed deciduous woodland, perhaps including oak, ash, maple, hazel and hawthorn. Alder, willow/poplar and elm were more likely to have been growing on damper soils associated with meadows, rivers or streams.

Feature	*Fill*	*Sample No.*	*Acer sp., maple*	*Alnus sp., alder*	*Corylus sp., hazel*	*Ericaceae**	*Fraxinus sp., ash*	*Pomoideae**	*Quercus sp., oak*	*Salicaceae**	*Ulmus sp., elm*
11120	11005	121	12	-	1	10	16	-	31	1	5
10888	10857	85	1	1	-	-	37	1	30	-	5

Those marked * include genera which are anatomically similar: Ericaceae includes *Calluna vulgaris* and *Erica* sp., heathers and ling; Pomoideae, subfamily of the Rosaceae, which includes *Crataegus* spp., hawthorns; *Malus* sp., apple; *Pyrus* sp., pear, *Sorbus* spp., rowan, whitebeam and wild service; Saliceae which includes *Salix* sp., willow and *Populus* sp., poplar.

Table 8.28 Charcoal from pits *11120* and *10888*

V. DISCUSSION

Introduction

Norwich Castle's fortunes changed dramatically during this period, although by this date the term 'castle' had effectively ceased to be applicable to it in military terms: 'if the castle was of little military significance in the 15th century, it was of none in the 16th. And yet in its outward form — its gatehouse, towers and crenellations — the castle lived on' (Pounds 1990, 297). From this chapter onwards, the term castle at Norwich loosely refers to the motte and buildings on it, the Shirehouse (until the late 16th century) and remnants of the defences. Although as has been outlined in Chapter 8.I monies were occasionally spent on maintenance of the Keep, other buildings and the bridge during the latter part of the 14th century and into the 15th century, by the 16th century many of the former defences were in a state of decay. The Shirehouse survived in use within the south bailey until 1579 when it was re-sited on top of the castle mound. The use of the castle baileys as a rubbish dump was a continual irritant, both to the authorities and those living in the immediate vicinity.

A key element of this analytical programme has been to address the social and economic development of the Norwich Castle area from the mid 14th century until the eventual transition to the early post-medieval period. This study, which has considered the altered local topography engendered by the city's acquisition of the baileys, is set within a rich historical and documentary framework laid out in Chapters 8.I, 9.I and Part IV. The two centuries covered by this period (*c*.1345 to mid to late 16th century) saw the continuing development of properties in the area within and surrounding the Castle Fee, and the beginnings of their formalisation. In some cases surviving boundaries and routeways can now be traced back to their origin within the archaeological and/or the documentary sequence. Although the outer part of Castle Fee had lost its former royal status, it remained an administrative entity under Borough control throughout the period, with both rents and the activities of its Sub-Leet being well documented. Evidence for craft and industry in the vicinity of the Fee is plentiful, permitting linkage between the archaeological evidence and documented trades as well as, on occasion, named individuals.

Prior to the excavations at Castle Mall and Golden Ball Street, understanding of the decline of the castle area was restricted to documentary and antiquarian evidence for the development of tenements (effectively Beecheno's unpublished work of 1908). A few pits, wells and other features of the period had been recorded at various small sites surrounding the Castle Fee. At No.18 Davey Place (Site 218N), for example, refuse pits of probable 16th-century origin were cut into an earlier ditch (the probable Norman Castle Fee boundary marker detailed in Chapter 5) along the western side of the castle precinct. Limited interventions into other castle ditches had led to small-scale examination of late medieval fills: those within the south bailey ditch were noted at Site 60N (Green 1964) and those of the barbican ditch at Site 150N (Atkin 2002a).

The Decline of the Castle Defences

Quarrying and Robbing

(Figs 8.2, 8.3, 8.13, 8.15, 8.17 and 8.61; Plates 8.1 and 8.3)

Open-cast quarrying for sand, gravel and marl was common in Norwich over a long period. Norwich Survey excavations along Pottergate, for example, revealed evidence for small-scale quarrying of aggregate for road and building construction in the period *c*.1100–1450 (Atkin, Carter and Evans 1985, Site 149N, figs 2 and 6). Similar activity of varying date was recorded at many other Norwich Survey sites (such as Bishopgate (Sites 154N and 156N), St Benedict's Street (Site 153N), Shirehall Car Park (Site 150N) and Magdalen Street (Site 148N; Atkin and Evans 2002, 157–184) and more recently at several others (including Greyfriars, Site 845N; Emery 2007). Extensive quarrying elsewhere in the city was related to the recovery of iron pan for use in ironworking (see 'Metalworking', Chapter 8.III). As well as sand and gravel, flint and lime were locally available and were quarried both within and outside the city. The Ber Street escarpment in particular was exploited for the latter materials, many of the former quarries surviving as open space to this day (Ayers 1990, 222). Bucks' sketch of the early 18th century gives a clear indication of the effects of quarrying to the east of the castle by the post-medieval period (Plate 10.2.B), while recent excavations between Horns Lane and Thorn Lane confirm the presence of quarries here at this date (Shelley 1999, 14).

Despite the evident scale of the aggregate trade, there is little specific documentary evidence to indicate its presence. Norwich's enrolled deeds for the period 1285–1311 suggest that those working in the building trades were not operating within particular zones of the city (Kelly *et al* 1983, 29). The number of masons appears to have remained low until the mid 15th century, at which time a notable increase relates to the reconstruction of churches and other masonry structures. The use of sand and lime for repair work at Norwich Castle is documented in the late 14th century (Chapter 8.I) and is known to have come from 'various sources'; one of these may have been its own ramparts. Quarries were often opened close to a construction site. At Nottingham Castle in 1357, for example, stone used for repairs came from 'the quarry beside the castle' (Salzman 1967, 119). Quarrying has received relatively little academic study, despite the fact that 'quarries were an important aspect of many local economies, providing full or part time employment, and materials either for building or more specialized uses' (Crossley 1994, 211). In Norwich, the lack of local building stone led to the common construction of buildings in timber or flint with a chalk and rubble wall core (see 'Building Materials' below). As in earlier times, much building stone was imported, although chalk quarrying was probably linked to flint extraction. An extensive system of mines, possibly active between the 16th and 19th centuries, extends beneath areas of the modern city (Ayers 1994a, fig.82) and 'ston mynes' — probably extracting sand and gravel — are shown in a 16th-century map of Mousehold Heath (Ayers 1990, 222). After excavation, the sand and gravel extracted would have required at least rudimentary grading and cleaning. During modern sand and gravel extraction,

the materials are screened for size, larger fragments often being crushed to reduce them. These processes are followed by washing which requires the local provision of an adequate clean water supply, sand being subsequently dewatered to reduce its moisture content (Saga 1967, 99).

The Castle Mall excavations reveal that the period immediately following the 1345 transfer to the city saw extensive quarrying across the south bailey, particularly concentrated along its rampart (Period 5.1; Fig.8.3). Even when not in an urban setting castles were opportunistically exploited. Similarly extensive quarrying of probable mid 17th- to early 19th-century date was recorded, for example, within the baileys at Stafford Castle for the extraction of sand, gravel or marl (Darlington 2001, 94 and fig.43). At Norwich, to the west of the lane leading towards the mound, small-scale activity may have been related to the extraction of aggregate for the construction of buildings and boundary walls, the earliest documented example of the latter being constructed between Properties (b) and (c) in 1388. To the east of the lane, some of the quarries were so large as to suggest a commercial character. In both blocks of ground, the late 14th- to mid 15th-century quarry pits had been cut into by smaller pits of probable mid/late 15th- to 16th-century date (Period 5.2).

Quarrying to the east of the lane extended over an area of 40m east-to-west by over 50m north-to-south relating broadly to Properties 44-46 in Block I (Figs 8.2 and 8.3). The interpretation presented in Chapter 8.II (Open Area 37) is of necessity rather simplistic and implies that quarrying in this part of the site had finished by the time that it was given over to smaller scale pitting. It has not proved possible to demonstrate just how many of the quarries may have been in use at one time, although the intercutting nature of the features indicates that extraction may have extended over a considerable period. Although a number of very large individual quarries were present, some of the smaller examples may in fact have been refuse pits rather than having a direct association with quarrying. It is difficult to calculate precisely how much sand and gravel may have been extracted, particularly as a substantial number of the quarries must have been cut into the castle rampart which was subsequently removed by Cattle Market truncation. The groups of quarries positioned within the bailey, rather than above the rampart, were up to 4m deep. Assuming that the rampart stood to at least 2m high, a depth of *c.*4.5m can been estimated for those positioned above it (these survived to *c.*2.5m deep): the largest area of quarrying to the north-east (Quarry Area 5, Fig.8.13) measuring *c.*30 x 15m would have extracted at least *c.*1,800m³.

Dating of the quarries is problematic due to the relatively limited amount of excavation by hand and the large quantities of residual pottery recovered (*e.g.* 85% of the pottery from Quarry Area 5 was residual). In broad terms, ceramics recovered from quarries to the north-west (Quarry Areas 1 and 2) indicate that this activity can be attributed to the mid to late 14th century. Some of the remaining quarries (Quarry Areas 4 and 5) appear to be slightly later, continuing well into the 15th century. They were overlain, however, by rubbish pits containing well-dated artefactual assemblages (Open Areas 49 and 50, Period 5.2). Although some of these later pits have ceramic dates of late 14th- to 15th-century, most are of 15th- to 16th-century date with some more closely dated to the mid or late 15th to mid 16th century. It is possible that the bulk of the quarrying activity took place in the period *c.*1345 to perhaps the first quarter of the 15th century. The quarries were evidently later used at least in part for the disposal of refuse including sewage, food and crop-processing waste.

Although no physical evidence for property boundaries between the areas of quarrying was located, the variations in date may indicate that those within Property 46 were excavated first, with those above the rampart following slightly later (Properties 44 and 45). This is rather unexpected, given that the apparently later quarries were the ones sited directly above the rampart.

The archaeological evidence resonates with the documentary record for Property 45, while much of Property 44 (which contained the majority of the quarrying) remained undeveloped throughout the period. Property 45, most of which lay outside the excavation area, was held by Geoffrey of Bixton and William Blakeamoor in the late 14th century, the latter being one of the suppliers of lime for the construction of the city's Cow Tower in 1398/9. They owned lime kilns elsewhere in the city, one of them on the northern edge of the Castle Meadow at Property 24, St Cuthbert (others are given in Ayers 1990, 220). The quarries recorded at Castle Mall do not appear to have been of sufficient size to have reached natural chalk (which would have required a depth in excess of 6m), although their full extent was not exposed during the excavation and those further to the east (close to the edge of the south bailey ditch) may have gone deeper. The original base of the ditch must have lain close to the top of the chalk. It is possible that the two lime suppliers were also dealing in sand and gravel, although traces of lime were found in later pits (this, however, could also link to tanning processes). Property 44 continued its association with — and possibly exploitation by — the building trades: by the mid 15th century, it was in the ownership of the freemason responsible for the cathedral spire, which was rebuilt between 1463 and the 1480s (Woodman 1996, 192). Numerous other masons or freemasons held properties in the Fee including one at Property 38 in 1397 and others around the Castle Meadow (including Property 36 (1493), Property 37 (1457), Property 29 (1386 and 1468) and Property 23/67 in the mid 16th century (see Part 8.I and Part IV).

Given the position of the south bailey bank and ditch, the latter appearing not to have been completely infilled until the 16th century, ascertaining the location of the documented buildings (the first of which occurs in the 1360s) within Properties 44-46 is problematic. Some may have been positioned in the gap of *c.*10m between the western edge of the recorded quarrying and the lane (now Golden Ball Street). Alternatively, in their earliest form, the tenements here may have lain further north than their antecedents would suggest, or this stretch of the south bailey ditch may already have been infilled (see comments on 'Street Pattern' below). Access to Property 44, which by the late 14th century also contained buildings, a shop and a garden, may have been via a cutting through the rampart, the position of which may be indicated by Ditch 15 (Fig.8.3). It would appear logical that the buildings here were placed in the flat part of the south bailey (although a location on the street frontage might be anticipated for the shop).

To the west of the lane smaller clusters of quarries lay

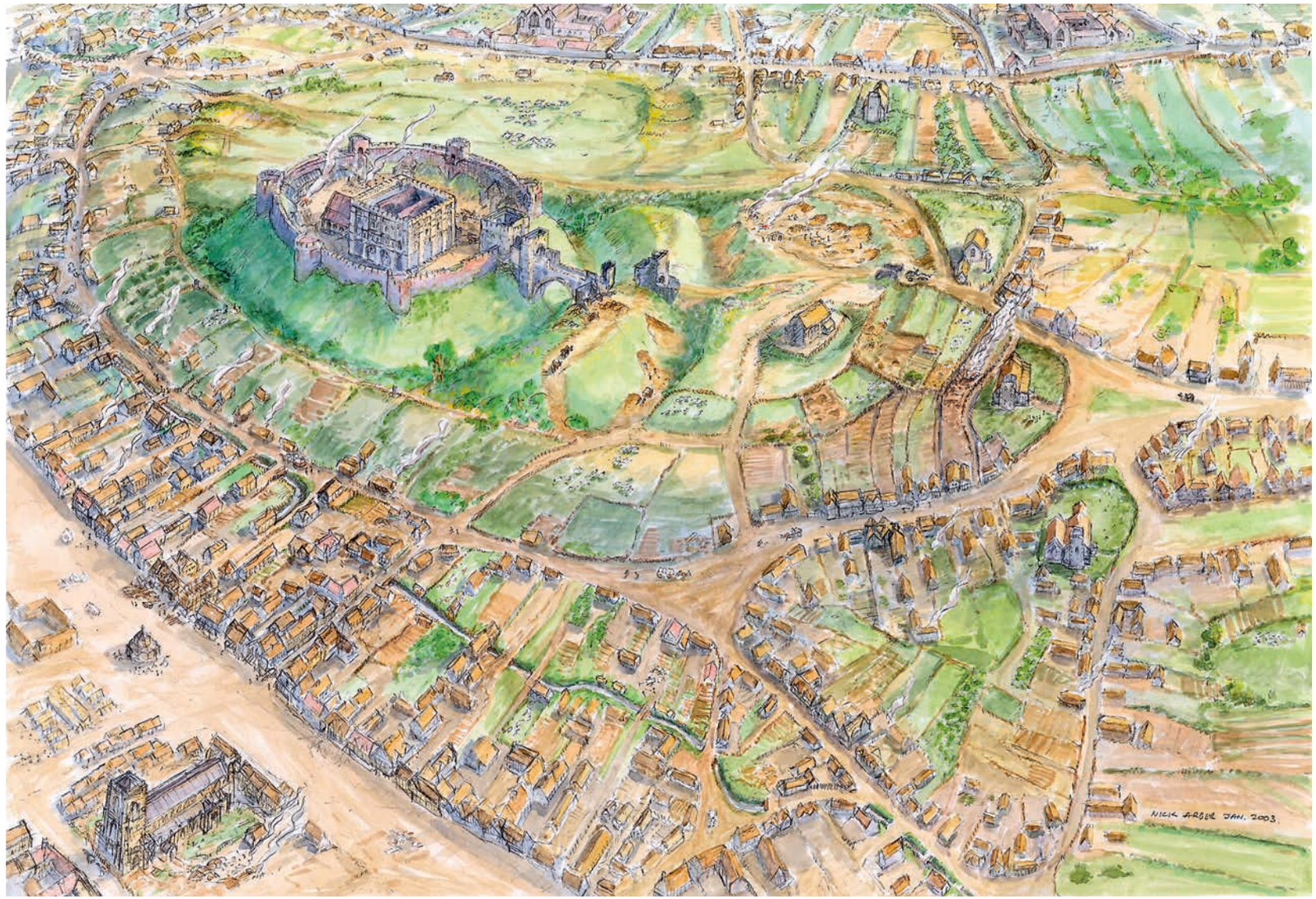


Figure 8.61 Reconstruction of the late medieval castle and surrounding city, showing the impact of quarrying within the eastern half of the south bailey.

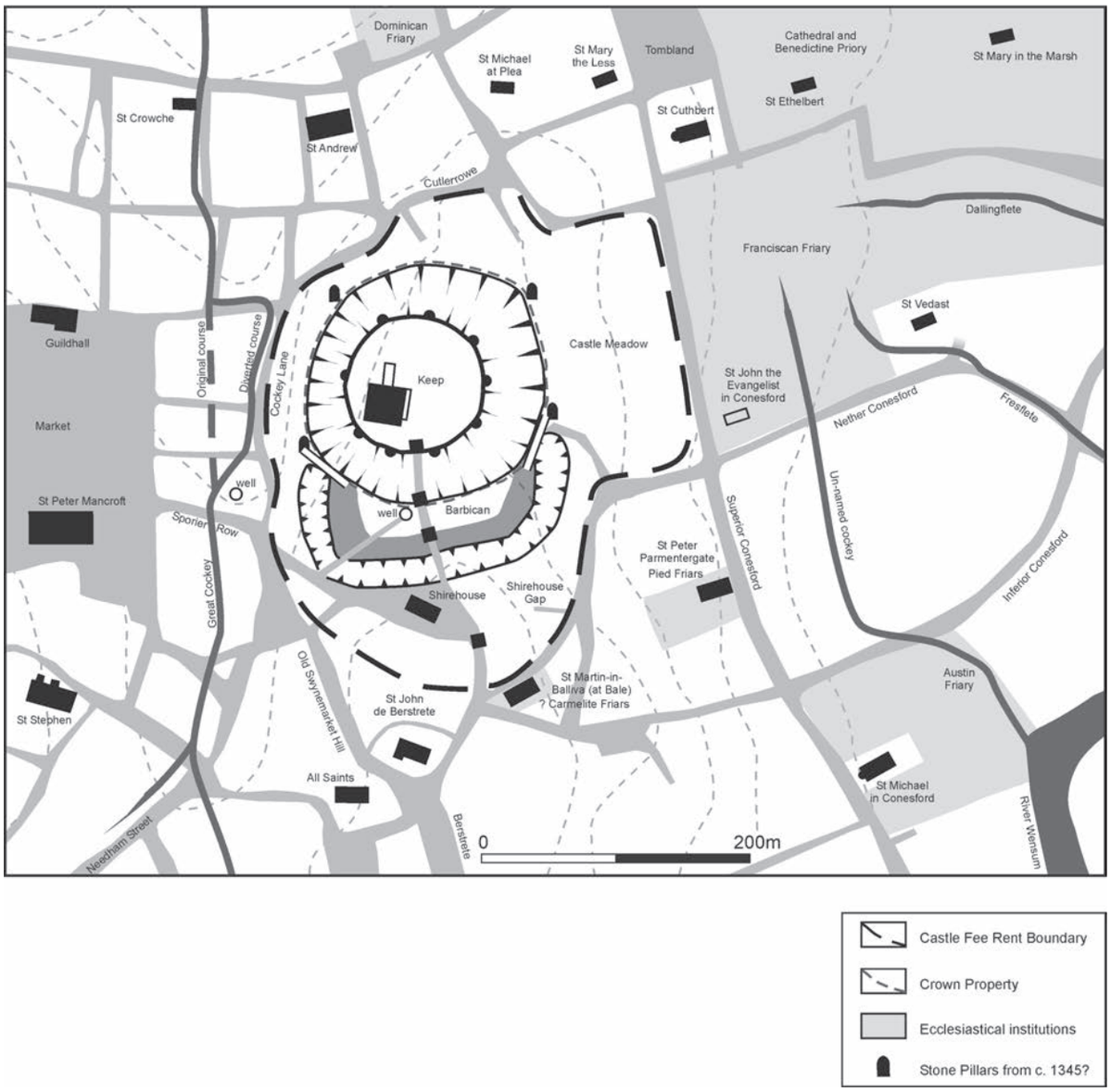


Figure 8.62 Late medieval settlement and street pattern in the castle area. Scale 1:5000

within four gardens (Properties 48–51; Fig.8.3) facing northwards onto the Shirehouseyard. Several of these were cut into fills of the south bailey ditch, perhaps extracting the loose spoil of the redeposited rampart. Although the commencement of this activity is not closely dated it may have occurred in the second half of the 14th century. No documentary evidence for quarrying in relation to these properties has been found. The quarries were again cut into by smaller pits, the construction of walls across the area being documented in the mid 16th century (see 'Boundary Markers' below). Pitting above the quarries in Property 48 spans the mid/late 14th to early/mid 15th century. Most of the pits within Properties 50/51 date to the late 14th to 15th centuries, with two examples (or possibly the same feature) at the top of the sequence which may date to the mid to late 16th century.

The lack of local freestone made Norwich Castle's masonry elements an obvious target for robbing, although this may not only have been for the flint and Caen stone they contained. Old mortar could be reused (as happened at Pevensey Castle in 1288) either by reburning, as with plaster, or by pounding and mixing with new (Salzman 1967, 149). The superstructure of the well within Norwich's barbican was apparently robbed during the 15th century and layers of pulverised limestone and mortar were found around it. Other masonry structures, such as the outlying castle gates, would also have been targets for such activity. One of the gates set within the barbican was eventually undermined by post-medieval quarrying and, although substantial elements of its rubble core were recovered, most of the dressings had already been removed (see Chapter 10).

The City

Street Pattern

(Figs 8.1, 8.3, 8.25, 8.61 and 8.62)

The major street pattern around the former castle had been set in the previous period (see Chapter 7), although re-naming took place at this time (see Chapter 8.I and Fig.8.62). Sadelgate, for example, was effectively renamed Sporier (Spurrier) Row in the mid 14th century. To the south-east, infilling of the Castle Fee boundary ditch may have led to a northwards revision of the route leading from the northern end of Ber Street to Nether Conesford (Rose Lane) at its junction with Conesford (King Street). A lane to the south of St Martin-in-Balliva appears to have been disused before 1289 (Tillyard, Chapter 7.I) and may equate with the relevant stretch abandoned during road migration. Closure at such an early date might imply that the eastern arm of the ditch was infilled prior to the western arm (archaeologically recorded at Castle Mall and Golden Ball Street), which does not appear to have been levelled until the late 14th to 15th century. The revised more northerly course of the route is indicated as running along the southern edge of the south bailey ditch at this time in Fig.8.62, as evidence from the Golden Ball Street site demonstrates that, here at least, it remained a substantial earthwork until infilling in the 16th century. The route indicated is somewhat to the south of the course demonstrated by Hochstetter in 1789 (and indeed its modern line) which appear to run at least partially along the line of the infilled ditch. This may indicate the use of a 'line of least resistance', although the course of the ditch along this stretch is not definitively proved archaeologically (lying outside the excavated area). Alternatively, the eastern arm of the south bailey ditch may have been infilled substantially earlier than the western arm, possibly as a result of easier access for refuse deposition from city properties. This stretch of road appears to have remained un-named in the documentary record until the 17th century (when it became Beaumont's Hill/Common Pump Street), prior to this simply being documented with the ubiquitous 'King's Way'.

New paths and lanes leading into the former baileys developed after 1345. Such minor routes ran through the western part of the barbican rampart, providing access for refuse deposition into the barbican well from properties to the west. One such path may be represented archaeologically by a line of posts, perhaps serving to retain the rampart. Later quarrying appears to respect the same line which may have remained in use as a route into the 17th century. The line is also reflected in the parish boundary between St Peter Mancroft and St John Timberhill in the early 18th century. Kirkpatrick described a route (amended in 1632) as 'ascending and descending into the ditches' — probably in the present day location of Orford Hill — although this gives a vivid indication of the undulating nature of the ground.

Similar routes (including Opie Street and Berningham's Stile) may have developed to lead into the Castle Meadow at this time. Although an origin in the period prior to 1345 is possible (see Chapter 7), use of such routes would undoubtedly have increased.

In the eastern part of the former south bailey (Block I, between Properties 43 and 44; Fig.8.2), another route was first documented as the 'common way at le Shirhous' in 1360 (Beecheno MS 1908, maps F and G) and it continued in use (as Shirehouse Gap and later Pig Lane) until it was swept away by the Cattle Market alterations in 1862. The presence of cobbles within a fenced ditch (Ditch 15), which tallies precisely with the documented route, may indicate that this was infact an eroded pathway, although its depth and later pitting across its course argue against this interpretation and it may rather have been a boundary marker. Its eastern end was located at the inner side of the postulated rampart, through which it may have run. It appears to have been infilled during the late 15th to 16th century, when it was cut into by pits. No other archaeological evidence for the route was found.

Pathways also developed within the western part of the former south bailey defences (Block II; Figs. 8.2, 8.23 and 8.25). These include a right of way, documented in 1406, running between Properties (d) and (e). This was eventually to develop into Grout's Thoroughfare, its position reflecting the line of the pre-existing cemetery boundary ditch (although not respecting it exactly). Further east, running between two groups of features associated with metalworking was a metalled path, which may link to the same pathway leading towards the lane on the eastern side of St John the Baptist's church (Golden Ball Street). Immediately to the north of the church, another pathway may have existed and was eventually also to be named Grout's Thoroughfare/Church Alley. Its existence at an early date is indicated by a gateway and path (Period 5.2) leading behind a property on the lane frontage (City Property g).

The Great Cockey

(Figs 8.1 and 8.62)

It has been suggested in Chapter 8.I that the documented diversion of the Great Cockey stream in the late 15th century may relate to the concentrated artisan activity that was now taking place in the area, providing both a source of water and cleansing. In modern Cambridge, water is diverted to clean roadside gutters along Trumpington Street during the summer months (pers. obs. 2003).

Tenement Development

Documents, maps and archaeology

(Figs 8.2, 8.25, 8.61 and 9.1; Plates 7.1, 8.1, 10.1 and 10.3)

A new understanding of many of the tenements surrounding the castle has been facilitated by the combination of documentary and excavated evidence at Castle Mall and Golden Ball Street. Archaeological data relating to tenement Blocks I and II (Castle Fee Properties 38–51 and City Properties (a–h) provides insights into city life in the vicinity during the period *c.*1345–*c.*1550, further testimony being drawn from new research into developments in other property blocks within the Castle Fee (see Chapter 8.I and Part IV). Reconciliation of the archaeological and documented development of tenements is, however, somewhat problematic as the historical record does not reflect the nuances of tenement sub-division, changing boundaries and irregularities in property shape and size over time. Few measurements are available, those that are having been plotted against the boundaries suggested by the archaeology. From the mid 16th century,

cartographic evidence provides a crucial additional source. The Sanctuary Plan of 1541, although schematic, indicates the hilly area and open space surrounding the castle (Plate 8.1.A). Buildings to the north-east fringe the Castle Meadow. Cuningham's view of 1558 demonstrates gradual city encroachment (Plate 8.1.B). Later maps, including Cleer (1696; Plate 10.1), Corbridge (1727) and Hochstetter (1789; Plate 10.3) all confirm that the central part of Block II remained substantially open ground, as did the north-eastern end of Block I. Even at the time of the 1880s Ordnance Survey map, numerous small yards survived (Plate 11.6).

In some areas, specifically the southern part of Block I, the various sources of evidence tally relatively well. Further north, however, the divisions between properties are more difficult to define due to the paucity of boundary markers. A garden wall corresponds to a property known to have had such a wall by 1533 (Property 50; Fig.8.25 and 8.33–8.34; Plates 8.7–8.8). Its position indicates that it served to retain the remnants of the south bailey rampart which had been heavily quarried (see below). The previous line of the Castle Fee boundary probably ran along the south bailey ditch and the position of the wall may indicate a northwards shift of the boundary, leaving smaller areas of ground to the north. The wall survived within later buildings to be plotted on the late 19th century OS map. The rear wall of City Property (c), documented in 1555, may correspond to the continuation of a wall recorded slightly further south (Fig.8.35), its recorded length (24 yards, 21.94m) fitting neatly between the end of the excavated wall and the southern edge of the south bailey ditch (Fig.8.25). A wall in this position would tally with the alignment of the rear of properties depicted in Cleer's late 17th-century map, infilling of the central part of the block being a later (*i.e.*18th-century) development.

Whether the wall at the rear of City Property (c) continued north-westwards to link up with the wall forming the boundary between Properties 50 and (b) remains open to question (Fig.8.25). Had it continued, it would have run directly across the south bailey ditch; although this had been substantially infilled prior to 1345, the length of ditch recorded in Area 1 does not appear to have been finally levelled and consolidated until the post-medieval period (Period 6.2). In Area 8, closer to the Timberhill frontage, the upper part of the ditch and subsequent quarries had been truncated, presumably by the creation of terraces in the 16th century. Gardens running down into abandoned castle ditches are known elsewhere (*cf.* Oxford; Hassall 1976, 254).

The frenzied quarrying activity in Block II (Properties 44–46) has been detailed above. Some of the later pitting recorded here lay above the infilled quarries and/or remnants of the south bailey rampart, although most was concentrated further west on the flatter ground within the former bailey. This suggests that the tenement boundaries here stretched further back from the road than might be supposed from a reading of Hochstetter (Plate 10.3) and Beecheno's maps (MS 1908, maps f and g; Plate 7.1). The city's expansion into the eastern part of the south bailey, stretching to the southern edge of the barbican ditch, would not have suffered the same physical constraints as the western part (which were dictated by the position of the Shirehouse and its yard).

Boundary markers

(Fig.8.25 and 8.61; Plates 8.7, 8.8 and 8.10)

Boundary walls between gardens within Block I are first documented in the late 14th century, with further references in the mid 16th century (Chapter 8.I). Most of the excavated examples appear to represent survivals of these walls, some of which were retained into the post-medieval period while others were apparently rebuilt along the same line. One of the garden walls discussed above seems to have served a dual function as a terrace wall, retaining the remnants of the south bailey rampart and associated quarry waste to its north (Plates 8.7 and 8.8). Pits recorded to the north-east of the wall (Property 49) were cut from a level of just over 28.00m OD, while those to its south (*e.g.* in Properties a and b) survived to just over 25.00m OD. The effect of the terracing is shown in a schematic drawing (Fig.6.50). The base of the south bailey rampart lay at around 26.20–26.60m OD, suggesting truncation to the south of the wall of at least a metre below the base of the rampart. Although further truncation took place during the construction of post-medieval and modern cellars, the considerable depth of some late medieval/transitional pits to the south of the wall (up to 2.60m) does suggest that some ground reduction had already taken place here before the pits were dug, probably at the time that the walls were inserted to make two level areas on either side of the wall.

Within Block II was a boundary ditch (Ditch 15) with a fence running along one side ran east-to-west, its position coinciding almost exactly with a documented route leading into the former bailey (see 'Street Pattern' above).

Buildings and building materials

(Fig.8.61; Plates 8.7–8.10)

Excavated Norwich sites tend to suggest that the 'gradual use of drier and more permanent foundations ... began in the later 14th century' (Atkin and Evans 2002, 240). After the fires in 1507, which destroyed much of the city, the desire for improved protection against conflagration may have been one of the factors in the rebuilding of many buildings in flint, flint-and-brick rubble and plain brick (Atkin 1985a, 251). Many early examples may, however, simply have been footings for timber-framed superstructures: 'the change to flint and brick foundations is not as significant as it might at first appear, for the new walls merely formed a ground-floor shell for what were primarily timber-framed buildings with jettied upper stories' (Atkin and Evans 2002, 240). Although brick was widely used in Norwich during the 14th century (as in the arcading of the city walls and the facings of the Cow Tower), the city is not known for its use of brick architecture. Between *c.*1400 and the early 17th century, its principal use was as rubble within flint walls (Atkins and Evans 2002, 240). It was only after about 1630 that the proportion of brick used in walls increased.

The evidence given in Chapter 8.I and Part IV attests both to the presence of those working in the building trades and to some of the changes in building that took place around the Castle Fee at this time. Documents indicate that many structures were present along the fringes of the Castle Fee during this period, including garden walls, shops and cottages. The buildings left virtually no trace in the archaeological record (a single fragmentary example being recorded), although many may have lain

outside the area investigated. The remainder may have been swept away by later truncation or may have been too ephemeral to have left any traces, other than their associated cess and rubbish pits and wells. The excavated building lay within a garden (Building 35, Property 49; Fig.8.32) and was of timber construction with a sunken rammed floor and a small hearth. Similar small buildings, with surface-laid clay or beaten earth floors, were excavated at Alms Lane where they had housed a range of functions (*e.g.* brewing and metalworking), between *c.*1275 and *c.*1400 (Site 302N; Atkin 1985a, 148ff and fig.4). The Castle Mall example may have functioned as a temporary shelter or workshop associated with surrounding skinning, tanning/tawing and hornworking activities, although its dating is equivocal.

A number of Tudor timber-framed buildings survived along the eastern side of Golden Ball Street until their demolition in a road widening scheme in the 1930s (see Chapter 11.I). Others on the western side survived later.

Stone boundary walls are documented within Block II between 1388 and 1558, some of which were located at Castle Mall (see above and Plates 8.7, 8.8 and 8.10): by the late 17th century new walls were constructed in brick (noted in Part IV). Over 30% of the total site assemblage of ceramic building materials came from Period 5 and was dominated by medieval (14th- to 15th-century) and 16th-century brick, with lesser quantities of roof tile (Lentowicz and Kemp, Chapter 8.III). Very few floor tiles were recovered, while plaster (some painted) and slate were also noted. The first walls recorded during the Castle Mall excavation were constructed of flint, with brick occasionally used as rubble. Building materials from the walls in the western part of the site suggest that they may be attributable to the 14th to 15th century, while those to the south may be slightly later, although the situation here is confused by later repair and rebuilding during which later brick types appear to have been introduced.

Contemporary structural ironwork consists almost entirely of timber nails, hinges and a large quantity of straps, although a wider range came from the barbican well (Mould, Chapters 8.III and 9.III). Many of the hinges and straps probably served on doors, gates and other structural woodwork. Window glass includes painted fragments, one of which indicates the presence of material from a particular late 14th-century family house (see King, Chapter 9.III). Hay or straw recovered from cess pits in Property (e/f) (Open Area 44) above the northern part of St John's cemetery may indicate its use as flooring materials or litter (Murphy, Chapter 8.IV). Of note amongst the arthropod assemblages from these same pits was the presence of indoor species (such as *Tipnus unicolor* and *Mycetea hirta*) along with the death watch beetle (*Xestobium rufovillosum*) which can inflict major damage to structural timbers (Robinson, Chapter 8.IV).

Wells and water supply

At least some of the 22 domestic wells recorded at Castle Mall are probably attributable to the late medieval/transitional period, although they proved difficult to date and in numerous cases the functional difference between well or cess pit could not be established. Many were lined with flint or flint and chalk, while others included varying quantities of brick. Infill dates, where available, generally fall within the 17th century.

A common feature of the city was the sharing of a well between two or more properties, these often being constructed on the line of a boundary wall. Documented examples occurred in 1397 at Properties 8 and 9, in St Andrew's parish (Part IV) and Property 45 in 1502. At Castle Mall, the proximity of excavated wells to boundary walls, which in some cases they cut into, confirms this archaeologically (*e.g.* Figs 8.35 and 10.18). Other documented wells of the period within Castle Fee properties include one in 1480 (Property 10, St Andrew) and another in 1586 at City Property (b). The Property (b) well appears to have been located during the excavation (Open Area 41; Fig.8.25). Four wells of probable post-medieval date (see Chapter 10.II, Period 6.2) were recorded in Properties 45 and 46.

Wells and water supply are discussed in more detailed in Chapter 14, with further constructional details in Chapter 10.VI.

Public houses and inns

(Fig.8.2)

A public house called the *Bear* lay opposite Property 3, St Peter Mancroft before the mid 16th century, while another hostelry known as *Segor's Inn* lay within the Timberhill block (City Property b). Beerbrewers are mentioned within the Castle Fee in 1396 (Properties 16 and 17) and 1535 (Property 8, St Andrew, Part IV). It was not until the 17th century, however, that the numerous hostelries surrounding the former castle baileys became well documented. Malt-drying possibly related to brewing was evidently taking place on the Castle Mall site (Property 43) during the late 14th to 15th centuries (see below and Murphy, Chapters 8.IV and 13; 'Plant Remains').

Pitting and refuse disposal

(Figs.8.3 and 8.25; Plates 8.2–8.4 and 8.9)

Pitting

Although much of the waste from the city was dumped into the castle ditches, still more would probably have been removed to provide manure for the surrounding fields. At Alms Lane, a clear decrease in the number of pits during the later medieval and post-medieval periods was accounted for by pressure for space within the city and changes in general hygiene habits probably as a result of outbreaks of plague (Atkin 1985a, 255). An increase in the number of what appear to have been purpose-built

Period	*Indeterminate*	*Latrine*	*Industrial*	*Quarry*	*Refuse*	*Fire*	*Storage*	*Well*	***Total***
5.1	134	2	4	49	15	0	0	3	**207**
5.2	69	7	0	0	30	0	0	3	**109**
Total	**203**	**9**	**4**	**49**	**45**	**0**	**0**	**6**	**316**

Table 8.29 Period 5 pit types at Castle Mall

Lining type	*Period 5.1*	*Period 5.2*	***Total***
timber	1	2	**3**
cobble	0	0	**0**
wattle	0	0	**0**
clay	3	3	**6**
masonry/brick	2	4	**6**
Total	**6**	**9**	**15**

Table 8.30 Period 5 pit linings at Castle Mall

cess pits is, however, evident at the Castle Mall site. These would have been for temporary storage of waste; 'the practice of disposing of one's rubbish off the tenement was widespread in medieval and later Norwich' (Atkin 1985a, 255). At Castle Mall, such pitting perhaps continued due to the availability of open land.

As has already been discussed, a high proportion (15% of the period total) of the mid 14th- to mid 15th-century pits were quarries. Of a total of 316 excavated pits (Table 8.29), only 5% were lined (Table 8.30), the wells/cess pits utilising flint and occasionally brick.

Pitting within Castle Fee properties

Within the Castle Fee to the east of the castle approach (divided from the area of quarrying described in Properties 44–46 by a ditch; see below) was a series of large late 14th- to 15th-century pits within Property 43 containing significant artefactual assemblages (Open Area 36; Period 5.1; Fig.8.10; Plate 8.2). The pits notably contained fuel waste, including peat-burning apparently relating to a low heat process (see 'Leather and Related Trades' below), as well as evidence for malt-drying (see Chapter 8.IV, 'Plant Remains'). Further pitting, again exhibiting heat-affected fills, continued in the same area during the mid to late 15th and 16th centuries. Ownership of this property in the period 1359–1584 (Table 8.3) includes a reeder, a currier, a barker (skinner), a tanner and a barber.

A few smaller pits to the north may be associated with Properties 42 and 43. The ceramic assemblage was notably dominated by kitchen wares, including a skillet, cauldrons, a pancheon and a colander or sprinkler jug. One pit of mid to late 15th-century date contained rakings from a domestic hearth.

Cutting into the infilled boundary ditch (Ditch 15) and extending southwards were more pits (Figs 8.28 and 8.29). Those above the infilled quarries in Properties 44–46 dated to the mid 15th to 16th centuries and notably contained dumps of chalk and lenses of lime, possibly disturbed from the underlying quarries. Properties 45 and 46 were both owned by the castle gaoler/lorimer at different dates. As with the pits in adjacent properties, many fills contained burnt matter (some *in situ*), alongside objects associated with a wide range of activities and partial animal carcasses. The ceramic assemblages were notable for the fine wares they contained, over 30kg of pottery being recovered in total. As previously, a high level of residual Late Saxon pottery was present, although medieval pottery was virtually absent in many pits (see further discussion in Chapter 13). Although the three original tenements were much sub-divided during the mid 15th to early 16th centuries, probably accounting for the numerous pits, by 1544 they had been combined into one.

Overlying the final backfilling of the south bailey ditch terminus recorded at the Golden Ball Street site (probably Property 47; see ditch fills below) was a group of pits, the ceramic dates of which indicate infilling during the late 15th to 16th centuries. This date can be refined in consideration of the date of underlying ditch fills and the contents of individual pits. Although the ditch fills cover the same broad date range, closer dating of some vessels may allow the range for both activities to be restricted to the late 15th century to *c*.1550. An adjacent flint wall perhaps indicates the boundary between Properties 47 and (h) at this date, or may be a reinstatement of the late 13th-century sub-division of City Property (h), albeit on a slightly different alignment. Given that this line reflects the known parish boundary between St John, Timberhill and St Martin at Bale (-in-Balliva), an association with Property 47 seems more probable. No details of ownership were traced at this date.

Pitting within city properties

A group of cess pits, refuse pits and hearths lay along the Durnedale/Old Swynemarket Hill (Timberhill) frontage and may have related to one or more of the documented properties (City Property c/d), either within buildings or in associated yards (Open Areas 42–43; Figs 8.3, 8.16, 8.25 and 8.35; Plate 8.4). They produced good ceramic assemblages of the mid 14th to 15th century. At the eastern end of what may have been the same tenement was a cluster of small pits of probable late 14th-century date associated with the disposal of waste from non-ferrous metalworking. One contained a large assemblage of charred barley, including the six-row hulled variety (Murphy, Chapter 8.IV). Documentary evidence is limited, although by the early 15th century a right of way (later to become Grout's Thoroughfare) is known to have run between this property and the adjacent one (City Property e). New cess pits were inserted in the mid to late 15th century, along with a well adjacent to the tenement's rear wall.

South of the right of way the northern part of the cemetery of St John de Berstrete was extensively pitted in the late 14th to 15th centuries (Period 5.1), confirming the documented movement of the cemetery boundary southwards (Fig.8.18). Several pits cut into the former cemetery boundary ditch and some contained human bone disturbed from underlying burials, including partially articulated skeletons (implying disturbance only a few years after the burials had been made; see note on possible re-use of this part of the cemetery in Chapter 8.I). This property was the one acquired by William of Sutton (brasier) in 1402. The abuttal evidence is imprecise (see Chapter 8.I), although it appears that in the late 14th century it may have been held with City Property (f) just to the south. Given the location of evidence for mid/late 14th- to 15th-century metalworking (including bell- founding; see below) to the east, it is possible that Property (e) may have extended further west than previously supposed. In *c.*1480, dimensions were given for a property facing onto the lane leading to the castle (Golden Ball Street) and, when plotted, coincide almost exactly with a small gully lying to the east of the metalworking activity (Fig.8.22). This may define a property boundary between the two and the line was reflected in the position of a later wall (Period 5.2). This would effectively mean that at this period, Property (e) formed a long narrow

tenement along the northern side of the cemetery, probably separated from it by a path/alley. Property (f) may then have formed a sub-division of the south-western part of the same tenement, although it lay outside the excavated area.

Other pitting within the proposed confines of Property (e) included domestic refuse and cess pits (one containing a Henry VI coin of 1422–1427). Waste associated with metalworking was concentrated within pits nearer to the bell-founding area (at the centre of the block of land enclosed by the two roads; now Timberhill and Golden Ball Street).

Flint and brick walls were inserted across the area during the 16th century, cutting into the earlier pits. One lay roughly equidistant between the path to the north (Grout's Thoroughfare) and the probable path to the north of the cemetery (migrated Grout's Thoroughfare/Church Alley), effectively separating Properties (e) and (f) (Plate 8.10). The eastern limit of the tenements, defined by another wall, appears either to have shifted westwards to lie mid way between the two flanking roads or to have been sub-divided.

To the east, Property (g) was a large tenement in the late 14th century, housing three shops, a garden and undeveloped land. As noted above, a measurement is given for a tenement adjacent to the cemetery sold by a carpenter in 1480. No features attributable to the mid 14th to 15th century were located at the Golden Ball Street site (the southern trench of which mirrored the late 15th-century plot), although numerous 16th-century pits were present, some of which may have been small quarries while others were latrine pits. A gap between two groupings of pits may indicate the presence of a path (see below).

Use of castle-related features

The barbican well

Use of the barbican well as a rubbish tip, particularly during the second half of the 15th century, indicates the deposition of waste from a variety of sources, much apparently derived from the craft/industrial activities that were sited around the fringes of the Castle Fee. See Chapter 9 for further details.

The barbican ditch

Despite the documented accounts (Chapter 8.I) and massive dumping of waste into the barbican well, archaeological evidence for refuse disposal into the barbican ditch from the mid 14th to mid 16th century is surprisingly limited and may indicate the success of repeated ditch clearance, or the preferential use of the barbican well at this time. During such ditch clearance, it is possible that waste from the barbican ditch was utilised elsewhere in the city; subtantial material of the period, for example, was deposited at the Duke's Palace in a programme of land reclamation (David Adams pers. comm. 2004). It appears that in London, measures were being taken to identify suitable places for deposition as early as 1378 (Harbottle and Ellison 1981, 93) and such may have been the case at Norwich from 1345 (see Chapter 9).

Few recorded barbican ditch fills at Norwich date to the time immediately after 1345, those that were lying in the eastern and western parts of the ditch (watching brief T58 and Area 9; Period 5.1). Fills recorded to the east (Area 9) were small-scale and lay at the contemporary base of the ditch which remained open to a depth of several metres. A slightly later dump of mid 15th- to 16th-century material recorded to the west (T58, Period 5.2) contained a significant proportion of rubble and animal bone which substantially infilled this stretch of the ditch. Early infilling of the western part of the ditch may relate to the developing routeways leading towards the castle mound and, specifically, to the barbican well. These may have engendered the development of causeways, although the irregularity of some of the paths leading into the ditches is well documented. A fairly thin sequence of ditch fills recorded in the central part of the ditch (Area 4, Period 5.2) appeared to demonstrate the effects of erosion and silting rather than refuse disposal. At Site 150N to the north-east, a succession of fills of the barbican ditch was interpreted as post-dating 1345, with a notable increase in the amount of ash and refuse in the 15th and 16th centuries (Atkin 2002a, 72). The bulk of the refuse appeared to have been dumped here in the 16th century, continuing until *c*.1640.

In the castle ditch at Newcastle, there appears to have been a similar hiatus in refuse dumping between *c*.1425 and *c*.1475, during which time silt accumulated within the ditch. After this date, 'tipping not only speeded up but was all from outside the castle. The nature of the layers altered, and there was a vast increase in both the types and quantity of objects found' (Harbottle and Ellison 1981, 88). Around 4m of deposits accumulated here from the late 15th to late 16th century, as at Norwich deriving from the townsfolk rather than the remnant elements of the castle. It was suggested that, prior to *c*.1500, the Newcastle ditch was not approved as a dumping place by the town's authorities, although later in the 16th century documentary sources indicate that the deposition of 'the castle moat midden' was increasingly controlled (Harbottle and Ellison 1981, 93). At Castle Mall the limited depth of deposition and the small quantity of finds recovered from fills of the period *c*.1345 to *c*.1558 contrasts sharply with the massive refuse dumps that were to follow until the early 18th century (Chapter 10).

The south bailey ditch

The central part of the western arm of the south bailey ditch (Castle Mall Areas 1 and 8) had been substantially infilled during the mid 13th to 14th centuries (Period 4.2, Chapter 7.II) and both its rampart and fills began to be quarried and pitted in the period *c*.1345 to mid 15th century (Period 5.1). The ditch would still have formed a considerable dip in the ground, however, with its infilled base lying *c*.1–3m below the contemporary ground surface. A clearer picture emerges at the terminus of the ditch recorded at the Golden Ball Street site which had not been affected by quarrying. Here the ditch had clearly remained substantially open (to a depth of *c*.3.5m) and appears only to have been infilled in the late 15th to 16th century (Period 5.2). Refuse fills (including cess and possible peat ash) were sub-divided by a period of apparent stabilisation, before deliberate infilling was followed almost immediately by 16th-century pitting (see above). The fills appeared to have been tipped into the ditch from the direction of the lane running towards the castle, although their late date in comparison with other excavated fills of the ditch is perhaps surprising (given that this was the most easily accessible part of the

ditch for use as a rubbish tip). Both the ditch and pit fills yielded some interesting ceramic groups (Goffin, Chapter 8.II and III).

The stretch of the ditch recorded at Golden Ball Street would, on initial appearances, seem to equate with documented Property 47 which lay in the parish of St Martin-in-Balliva (at Bale). The existence of such a property (forming a sub-division of Property 48) was documented from the early 14th century (see Chapter 7.I and Fig.7.2), although the presence of the south bailey ditch indicates that it was not usable land at this time, a situation confirmed by indications that it was undeveloped. By the beginning of the 15th century, however, the presence of buildings within the tenement is apparent. It is possible that, prior to the infilling of the ditch in the 16th century, both Properties 47 and 48 lay constricted above the former rampart to the north of the ditch, to the south of the Shirehouseyard. This area was not explored archaeologically.

The ?Castle Fee ditch

A series of fills dating to the late 14th–15th centuries (Period 5.1) levelled the upper part of the ?Castle Fee ditch at Castle Mall, immediately prior to the use of the area for bell founding and other metalworking. This was followed by the insertion of boundary walls across the area during the 16th century (Period 5.2), the line of which ultimately reflected the course of the former earthwork.

Daily Life

(Figs 8.2 and 9.1)

This period sees a dramatic increase in the quantity of artefactual and ecofactual evidence, accounting for over half the entire site assemblage of Small Finds. Considerable variations with the assemblage were evident, ranging from high status to poorly made objects and including local, regional and continental imports of materials and finished objects. The most evocative group came from fills of the barbican well (Chapter 9), much of which relates to the artisans working on the fringes of the Castle Fee. Elsewhere on the site, smaller groups of material were recovered. Continental imports of objects and materials demonstrate contacts with Scandinavia, Germany, France, Italy, Spain and the Low Countries and, more unusually, the tropics. Commercial activity is attested indirectly by the presence of purse frames, as well as an unexpectedly small number of coins.

Weapons and armour — other than the large group from the barbican well — are represented by a dagger, arrowheads, plate armour and buckles possibly used for sword attachment (Mould; Chapter 8.III). These attest to the castle's continued military associations, being a focus of activity during the rebellions of 1381 and 1549 (Chapter 8.I). Two of the castle's gaolers, who also worked as its lorimers, owned property in Block I in the late 14th and 15th centuries (Fig.9.1). Although peat-burning was evidently taking place in the vicinity, there is little to indicate a direct association of the excavated features with metalworking (see below). Horse equipment was well represented across the site and includes spurs/spur fittings and leathers, harness fittings, horseshoes and horseshoe nails. Documentary evidence attests to the presence of stables within Castle Fee properties from the late 14th century onwards.

A wide range of dress fittings and personal possessions was retrieved, of note amongst which were two belt-mounts in the form of a Lombardic letter 'B', from adjacent late 14th- to 15th-century pits in Property 43 (SF6209 and 6410; Fig.8.37; Goodall, Chapter 8.III). A garden relating to the property was owned by John Belaugh before 1457 and a tenement and garden by Thomas Bewfield before 1485 (see Chapter 8.I, Table 8.3), one of whom *may* have been the owner of the belt. Across the site household items are again numerous, demonstrating the nature of furnishings, fittings, implements and vessels which provide a useful supplement to those already published for Norwich. Alongside the usual range of utilitarian objects, some notable decorative items included two distinctive copper alloy candlesticks from the same pit associated with peat-burning, again at Property 43 (SF1074 and 1082, Fig.8.40; Goodall, Chapter 8.III).

Although it was possible to correlate many ceramic assemblages to documented properties, analysis shows little difference between individual tenements. Some fine assemblages were recovered (Lentowicz and Goffin, Chapters 8.II and 8.III; Appendix 6). The high level of residual pottery recovered from quarrying in the eastern part of the site (Properties 44–46) relates to the disturbance and redeposition of material from pits and other features, at least some of which may have been associated with a focus for Late Saxon ceramic manufacture (see Chapters 4 and 13). A small but notable group of glass drinking vessels was present, including one of possible Spanish origin (Shepherd, Chapter 8.III).

The large assemblage of knives and knife handles (x 133, many of which came from the barbican well) includes some high status decorative examples, many of complex construction (Chapters 8.III and 9.III). The range of functions included examples for use at table, in the kitchen and/or for butchery and for craft. Maker's marks were common and duplications indicate the products from particular workshops. Handles/scales in a range of materials were present including bone, antler, horn, ivory and wood, as well as possibly mother-of-pearl.

Food consumption is most evident in the large assemblage of animal, fish and bird bone summarised in Chapters 8.IV and 9.IV and fully detailed in Part III. This includes partial skeletons and craft waste alongside the usual dumps of domestic waste. The main domestic species continued to dominate the assemblage, with a low proportion of wild species. A shift towards culling of juvenile animals was noted, suggesting that this trend may have occurred in Norwich earlier than elsewhere. Supplementary evidence for kitchen and table waste comes from plant remains from dietary residues found in cess pits, which attest to the consumption of fruit and grains (Murphy, Chapter 8.IV). A few querns were also found.

Crafts and Occupations

(Figs 8.2 and 9.1; Plates 8.5, 8.6 and 8.11)

Documentary evidence for property ownership within the Castle Fee during the period *c.*1397–*c.*1558 (Chapter 8.I and Part IV; Fig.8.2) indicates 63 different occupations, of which only a few are attributable to the period *c.*1345 to *c.*1397. Although this is a record of ownership rather than occupation, it appears likely that many of the attested trades were actually carried out within or adja-

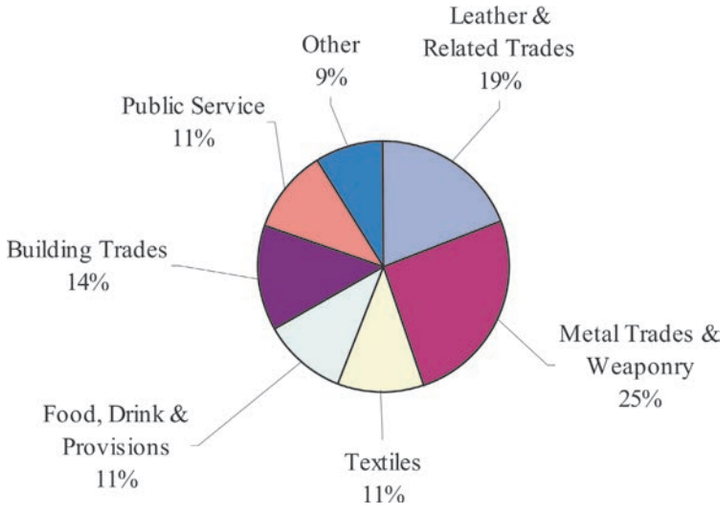


Figure 8.63 Documented Castle Fee owners' trades (*c*.1397–*c*.1558) in the parishes studied, by no. of individuals (excludes unspecific 'merchants')

cent to the relevant property: a large proportion of the documented trades were represented archaeologically at Castle Mall, either by associated refuse deposition or *in situ* working.

A breakdown by trade group is given in Fig.8.63 (those of the period late 14th century to *c*.1530 are plotted in Fig.9.1). The metal and weaponry trades clearly predominate, a total of 43 individuals having occupations named as armourer, blacksmith, locksmith, bladesmith, goldsmith, cutler, bowyer, fletcher, lorimer, latoner or pewterer. Two other lorimers owned properties to the east of the lane leading towards the castle (Propeties 45 and 46, Block II). Two sword-smiths were present in St Cuthbert's parish (Properties 25 7 28). Additional evidence from properties outside the Fee notably includes two brasiers in the Timberhill block (Block I, ?Property e). The next largest group is the leather and related trades, including skinners/pelters, spurriers, pouch and sheath makers, makers of clothing (shoes and hats) and a bookbinder. Of note within both the south bailey and Castle Meadow properties are a number of curriers, who dressed and coloured leather — the stainer may have been similarly occupied. Textile-related crafts are also well represented, including weavers, an embroider/vestment maker, tailors, mercers and drapers (specific materials noted include wool, worsted cloth and silk). A similar proportion consists of those associated with food and provisions (including brewing, butchery, a miller, a baker, a fishmonger and numerous grocers). The building trades have already been discussed (see 'Quarrying and Robbing' above) and of note are the glasswrights and painters within the Castle Meadow. Others include masons, reeder/thatchers, lime-burners, gravers, carpenters and turners. A dealer in furniture (upholder) was also present. A few other occupations, including ecclesiastics and clerks/scriveners, are less well represented.

Metal trades and weaponry

Prior to the Castle Mall excavations, archaeological evidence relating to metalworking in the vicinity of the castle was limited. Amongst the owners of Castle Fee properties at this time, 25% were engaged in metal-related trades (Fig.8.63). A 15th-century non-ferrous metalworking hearth had been recorded to the west of the castle at a depth of *c*.10ft (3m) at 9 Davey Place (Site 54N). Two 13th-century founding pits were found at World's End Lane (Site 156N; Atkin and Evans 2002, 42–44) while an early 16th-century example was subsequently discovered at the Franciscan Friary (Site 845N; Emery 2007). Bell mould fragments came from the north-east bailey (Ayers 1985, 44), along Ber Street (Shelley 1999, 14) and Bacon's House (Site 172N). Possible 16th-century waste from bell-founding came from Red Lion Street/Orford Place (Site 94N).

Bell-founding in the castle area has been studied in by Cattermole (1987; 1990) and a discussion of the processes involved is given by Wilthew in Atkin and Evans (2002, 42–44). The documentary evidence for brasiers working within and just outside the Fee has been noted in Chapter 8.I and the practice is documented at the site from the 1260s (see Chapter 7.I). Two brasiers — William and John of Sutton — who were working outside the Fee, probably at Property (e) in St John's Berstrete (Timberhill) in the early 15th century, have been noted above (see 'Pitting within City Properties' above and further discussion in Chapters 8.I and 8.V). It appears that the bell-founding pit and associated evidence recorded at Castle Mall may relate to these individuals (see below). New evidence for metalworking within the parish of St John includes non-ferrous metalworking (including bell-founding) and the deposition of copper alloy waste in late 14th- to 15th-century pits. Scrap materials (including leadworking waste) came from the southern part of the site and were also noted at Golden Ball Street. Metalworking was apparently particularly intensive in the eastern part of the cemetery of St John with successive phases of such activity taking place. Bell mould fragments were also recovered from fills of the barbican well.

A bell-founding pit and overlying pit also associated with metalworking had been cut into fills of the Fee boundary ditch and probably dated to the mid/late 14th to mid 15th century. Analysis of the mould fragments (Jennings, Chapter 8.III) suggests that at least two bells were struck. XRF analysis of samples from the first pit

(Mortimer, Chapter 8.III) indicates a variety of alloy types including bronzes and leaded bronzes. Samples from the second included copper alloy residue attached to a mould fragment — this proved to be a heavily-leaded bronze containing antimony, the composition indicating that this piece of mould was unlikely to have been used for casting bells. Analysis of charcoal from fills of the pits (Gale, Chapter 8.IV) indicates that wood and other fuels such as heather may have been mixed with charcoal. Finds recovered from the fills suggest that a combination of industrial and domestic waste had been dumped into the pits. Further discussion on founding activity is given in Chapter 8.III and a possible connection with brasiers has been outlined above and detailed elsewhere in this volume.

A trench apparently associated with metalworking found immediately adjacent to the founding pit appears similar in character to examples excavated at Winchester, although in these instances they were integral with bell-founding pits (*cf*. the example of *c*.1100 excavated at Castle Rising (Morley and Gurney 1997, 28–31) and the 13th-century example illustrated in Biddle 1990, fig.20).

A small group of ironworking waste came from late medieval/transitional deposits other than the barbican well fills, with some suggestion of such activity being carried out in Area 9. Both ferrous and non-ferrous waste was found in the fills of quarries and later pits, in an area that had a known association with the castle gaoler/lorimer. A small tool recovered from a cess pit in the same area may have been used for engraving. Ironworking waste and tools retrieved from the barbican well included blacksmithing scrap as well as incomplete objects suggesting an association with a workshop repairing and refitting military items (see Chapter 9.III). A large group of whetstones was recovered, of which the majority came from the barbican well: again, they are discussed further in Chapter 9.

Leather and related trades

Leather and allied trades account for 19% of the identified trades of property owners noted at the site (Fig.8.63). An important assemblage of evidence for animal bone related craft waste was recovered from the barbican well (Moreno García, Chapter 9.IV and Part III). Another assemblage of particular interest was found in a mid 15th-century pit in the south bailey (Property 49, Open Area 38, Period 5.2; Fig.8.32) which produced a large group of sheet/goat bones and horncores (Plate 8.11). This is detailed by Albarella *et al*, Chapter 8.III and Part III and appears to provide the first known archaeological instance to confirm the historically attested phenomenon of leaving the cranial and foot bones attached to the skin. An association with skinning, tanning/tawing and hornworking is indicated. Hornworking waste was evident in a number of other pits within the former south bailey, as well as within the barbican well. The finished products may have included handles and by-products such as glue. After removal of the hair, the hide was soaked over a long period in an infusion of oak bark/urine, followed by oiling. During tawing, it was treated with oil or alum to produce lighter leather. Pelts to be used as furs would be pared, oiled, stretched and suppled, perhaps also sheared (Miller and Hatcher 1995, 57). Tanning, skinning and tawing are usually considered to be riverside trades, although throughout the medieval period into the 15th century they were probably also active alongside the city's streams as at Barkeres (*i.e.* tanners') Fleet (Ayers 1994a, 67). Hornworking may also have occurred next to streams.

Evidence for the use of cattle, sheep, horse and pig skins has been found in all periods at Castle Mall and this is consistent with the historical evidence for a flourishing leather industry and market in Norwich. Although leatherworking was widespread across the medieval city, preservation of the end products is rare. Twelfth- to thirteenth-century shoe fragments were recovered at St Martin at Palace Plain in 1981 (Ayers 1987c, 108–109). Important evidence for leatherworking at Castle Mall was recovered from fills of the barbican well, which produced a large assemblage of waste leather (Mould, Chapter 9.III) probably relating to the production of spur leathers which is also attested by the presence of metal mounts for leather and a large quantity of spurs and their fittings. Two leatherworking knives were also recovered from the well, while two iron awls recovered from elsewhere on the site may have been used in leather-marking or similar activities.

A series of large intercutting pits in the yard of Property 43 contained fuel residues from a low heat process (Murphy, Chapter 8.IV), but the occupations of documented owners offer no immediately obvious related craft. The recorded owners included a reeder/thatcher (1404), a currier (leather dresser and colourer) (<1472), a barker/tanner (1472) another tanner and a second currier (both 1501) (see Chapter 8.I, Table 8.3). Discussion with Quita Mould suggests a possible association with a leather-finishing process (such as drying in a warm airy place or relating in some way to colouring the leather), or perhaps the heating of oils for blending into the surface of the leather by curriers (Roy Thompson, pers. comm. 2003). Alternatively, it may relate to the requirement of low heat for a related craft such as dyeing, hornworking, tanning or glue making: the situation remains equivocal.

Limited evidence for antler- and boneworking was recovered from late medieval/transitional deposits, with additional evidence coming from fills of the well and deposits surrounding it (Huddle, Chapter 8.III and Chapter 10.III). This appears to related to comb and/or handle manufacture.

Textiles

The textile accounted for 11% of Castle Fee ownerships of the period. Fragments of worsted cloth, knitting and silk items attest to Norwich's thriving textile industry (the bulk coming from fills of the barbican well and described by Crowfoot in Chapter 9.III). By the mid 16th century the city was famous for its worsted, particularly knitted stockings which were exported to Europe (Margeson 1993, 234). Other textile processing in the vicinity is attested by the presence of a wool carding comb, harbick and tenterhooks (five of which came from late medieval/transitional deposits, including the barbican well). Needles, thimbles, shears and scissors were also recovered, along with chalk and limestone spindle-whorls.

Food, drink and animal grazing

Food, drink and provisioning accounts for a further 11% of the documented Castle Fee property owner's trades. Many court cases relating to the Castle Fee and surrounding area involved the unlicensed grazing

of animals in the baileys. One of the most interesting findings of the analysis of the animal bones from the Castle Mall site was the evidence of on-site breeding (Albarella *et al*, Part III), indicating the pasturing and raising of animals here. The main evidence is the presence of neonatal bones of the main domestic animals: cattle, sheep, pig, horse and domestic fowl. Cattle and sheep neonatal bones are more common in early periods, whereas pig newborns were more commonly found in late medieval/transitional and post-medieval deposits. While many animals may have been brought to graze at the castle on a daily basis (penned elsewhere at night) some were apparently bred and presumably kept on site. Pigs, for example, need little space and could have been raised in backyards fed on household scraps. Grazing on common land of course continues to this day: in Norfolk, the largest piece of common land with associated grazing rights is in the village of Brisley (Breckland). This provides a broad analogue for the situation at Norwich Castle. Houses come with grazing rights attached, or such rights can be leased. Many villagers have small-holdings to which the animals are taken at night. Other livestock is left for longer periods, either fenced in or left to roam freely (Andy Crowson, pers. comm.). Further discussion on the issue of food provision and on-site breeding at Norwich Castle is given in Chapter 13 and Part III.

Evidence for butchery drawn from animal remains is fully detailed in Part III. Additional evidence comes from the presence of butchery knives within the barbican well (Chapter 9.III). A butcher is documented within the Fee in the late 14th century, while butchery and associated trades continued to dominate activity in the Berstrete area (see Chapter 7.V).

Samples taken from a series of pits in the eastern part of the south bailey (Property 43) provide some of the most diverse charred/burnt assemblages from the entire site, incorporating material from a wide range of sources (Murphy, Chapter 8.IV and above). Although interpretation of these interesting assemblages is problematic, they may represent a combination of fuel debris (specifically peat) and malt-drying. Small scale brewing in a domestic setting is familiar on many Norwich sites.

Building trades

Buildings and raw materials have already been discussed, related trades accounting for 14% of the Castle Fee owner's trades of the period. As well as the documented builders and building suppliers already noted, carpentry is represented at both the Castle Mall and Golden Ball Street sites by the presence of a few woodworking tools (chisels, a drill bit and an axe; Mould, Chapter 8.III).

Environment

(Fig.8.61)

Despite the increasing development of buildings along road frontages, much of the inner parts of the castle baileys remained open ground, while numerous gardens and orchards lay between the developed areas. At the rear of Property (b), adjacent to the recorded garden wall (documented in 1568), Plates 8.7 and 8.8 show a large quantity of dark matter in the foreground, probably the accumulation of garden soil in this area after 1345, when the presence of gardens here was documented (Chapter 8.I and Part IV). Evidence for the presence of tree cover in some parts of the site comes from arthropods in cess pits along the Timberhill frontage which contained *Polydrusus* sp, a species which feeds on their leaves (Robinson, Chapter 8.IV).

Parishes, Churches and Cemeteries

(Figs 8.1, 8.61 and 8.62)

St John de Berstrete (Timberhill)

The cemetery of St John had clearly contracted southwards by this period, with tenements laid out in the relevant area and paths developing to link the flanking roads. Documentary evidence indicates that many alterations were made to the superstructure of the church itself (Chapter 8.I). The boundary between the parishes of St Peter Mancroft and St John's appears to be indicated by a routeway of probable late medieval origin (see 'Street Pattern' above).

St Martin-in-Balliva (St Martin at Bale)

In broad terms, the southern part of the parish boundary as mapped in outline for *c*.1300 (Kelly *et al* 1983, fig.3) may reflect the line of the outermost castle ditch, a disused lane and/or the line of the pre-Conquest earthwork. Having maintained its earlier association with the castle prison, at the Dissolution the church was transferred to the crown and — after what may have been more than five centuries of religious service — was eventually demolished in 1562. The parish became united with St Michael at Thorn, the original part of which lay south of St John's.

Conclusions

This period, encompassing the two centuries after the acquisition of the baileys by the city, witnessed the gradual encroachment of urban development around the fringes of the site and the denudation of the castle earthworks. To the south, adjacent to the church of St John, this development was of relatively standard character with numerous refuse and cess pits and the development of fixed boundaries. The inner parts of the baileys remained open space, as did the inner part of Block I, housing a range of noxious activities including metalworking, malt-drying, tanning/tawing, skinning and peat-burning.

The recent research has permitted linkage between these activities and named individuals and has attempted to set these activities within their wider context both within the Fee and within the city. Of particular note is the staggering amount of material that was dumped into the barbican well, particularly during the second half of the 15th century. This material forms the subject of the following chapter.

Endnotes

1. From this period onwards, the term 'keep' is used in preference to the earlier 'donjon', it being the name used for the castle's great tower by antiquarians, historians and others until recent times.
2. Workers of an alloy of copper, zinc, lead and tin (Sandred and Lindström 1989, 116).
3. Thanks are extended to Adrian Popescu for his patience in reconstructing the vessel for illustration.

9. The Barbican Well Assemblage (late 14th to early 16th century)

'Ding dong bell,
Pussy's in the well'

English Nursery Rhyme, before the late 16th century

'The pinion fether as it hath the firste place in the winge, so it hath the fyrst place in good fetheringe'

Roger Ascham, *Toxophilus,* 1545; Wright 1904, 90

I. ARCHAEOLOGICAL, HISTORICAL AND DOCUMENTARY BACKGROUND

The Norwich Context

Fifteenth-century Norfolk was still suffering from the effects of depopulation after the ravages of the Black Death, which lasted until the end of the century (Virgoe 1989, 12). At the same time, England appears to have been subjected to climatic change which made it colder and wetter as an eye-witness account indicates: 'mother, for God's sake take care that you make sure you take no cold on the way to Norwich, for it is the most perilous March that ever was seen by any man living' (letter of John Paston III to Margaret Paston, 8 March 1477; Virgoe 1989, 252). Despite the effects of depopulation, poor weather and heavy taxation for war, there was still money to spare for major rebuilding campaigns of the city churches and civic pride was an increasing factor in the building or rebuilding of municipal buildings (see Chapter 8.I). Like many towns and cities of the period, Norwich had a complex system of craft guilds and the market was controlled by the city bailiffs (Priestley 1987, 10). Similarly, 15th-century London was dominated by six great companies: the mercers, grocers, drapers, fishmongers, goldsmiths and skinners, from whom local officials such as mayors and aldermen were drawn (Thomson 1992, 50). Two mayors of Norwich (one of them a draper) and several aldermen owned property within Norwich Castle Fee (see Tillyard, Part IV).

The city's economy remained rooted in textile production and large quantities of both wool and cloth were exported. Norwich's extensive market, which included arterial streets and lesser markets, continued to develop as one of the main market centres for East Anglia with produce deriving locally, regionally and internationally. Subsidiary markets included the Maddermarket and the

Date	*Event*
1337–1451	Hundred Years War
1437	Norwich briefly seized by King due to internal troubles
1439	Norwich suffers conflicts with ecclesiastics
1443	Riots against the prior, Norwich seized by the King who held it until 1447
1455–1487	Wars of the Roses
1461	John Lynde, custodian of gaol of Norwich Castle
1464	Sir John Howard, constable. Sheriff in 1461, Howard was a favourite of Edward IV and a follower of the House of York. Later created Duke of Norfolk, he was killed at Bosworth with Richard III
1470	Letter of John Paston III to Margaret Paston, 12th October: 'I believe my brother, Sir John, shall have the constableship of Norwich Castle with £20 fee — all the lords are agreed to it' (Virgoe 1989, 200)
1485	Sir W. Willoughby, constable; Henry Wyott, keeper and gaoler
1485	Battle of Bosworth
1486–9	Henry Wyot, constable and keeper of gaol
1501–03	Market Cross replaced
1505	Mayor's Court forbids the pasturing of animals within the castle ditches and meadow
1507	Norwich suffers major fires
1511–12	Sir Thomas Boleyn, Governor of Castle: Sir Henry Wyot, master of the Jewel House
1515–16	Sir Thomas Boleyn, Governor of Castle

Although the well assemblage considered in this chapter spans the late 14th to early 16th centuries, the bulk of the infilling occurred during the mid/late 15th to early 16th centuries.

Table 9.1 Key events and individuals: mid 15th to early 16th century (from Campbell 1975; Kirkpatrick 1845, 325–326; Rye 1921, 22–23)

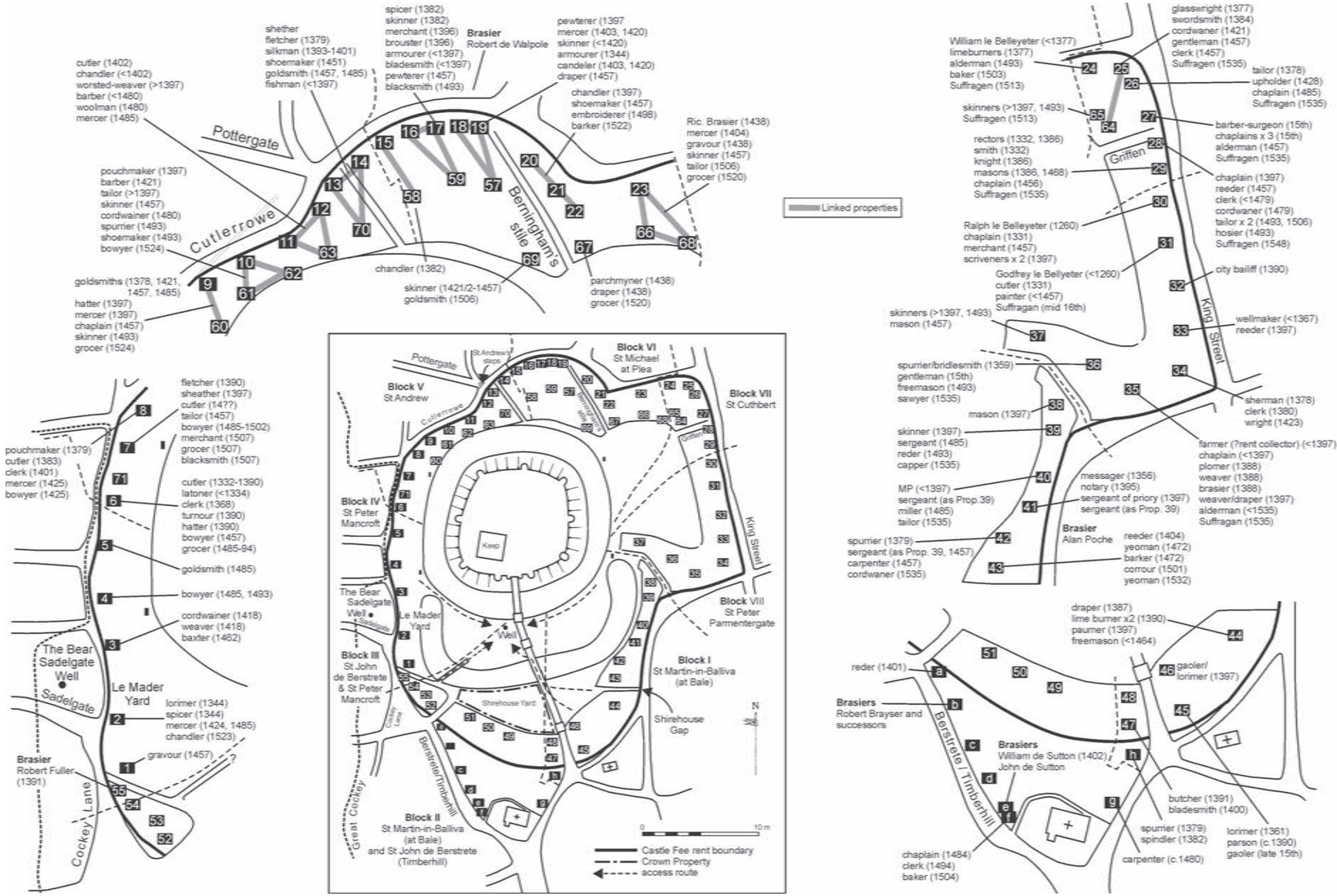


Figure 9.1 Documented trades around the Castle Fee from the late 14th century to c.1530. Note that some references are to the same individual at different properties.

Swynemarket (now Orford Hill, between the castle and the main market). The late 14th- to 15th-century market place included stalls for the sale of meat, fish, poultry, bread, barley and wheat, as well as wool and drapery (Sandred and Lindström 1989, fig.4). A wide range of leatherworkers, pelters and metalworkers operated around it. As well as those for staple produce, other markets and stalls spanning the medieval period included those of the apothocaries, spicers, girdlers (the guild owned a single stall along Needler's Row in the late 13th century), glovers, leekers ('leeks' being a term used for herbs in general), rope, baskets (skeps), soap (made from animal fat) and various kinds of bread (Sandred and Lindström 1989, 71–82). Scudders' Row accommodated leather-dressers and appears to have been a term specific to Norwich for those also known as whitawyers, who dressed white leather.

Access to the great market was congested and Sadelgate probably provided one of the main routes from both Berstrete and Needham Street, now St Stephen's Street (Priestley 1987, 10). Sadelgate (modern White Lion Street) was first documented in 1246 and references to Sadelgate and its variant spellings appear to have largely ceased during the early part of the 14th century. Most references between *c.*1320 and 1626 are to Sporiere Row and its variations: it was also known as 'Le Lorimers Rowe' in 1322 and 'Bridlesmiths Rowe' in 1364 (Sandred and Lindström 1989, 153). Sporiere is a Middle English derivative of the Old English **spora** ('spur'). The road was, however, named 'Sadler's Row' by the time of King's map of Norwich in 1766 (Plate 10.3.A). Trades concentrated in the Sadelgate area during the period 1285–1341 (see Part I, Chapter 7.I) had included metalworking, lorimers, swordmakers, armourers, girdlers, saddlers, sheathers and bursars (bag- or purse-makers). One saddler/harness maker was still operating in the area as late as 1843.

The northern side of the market place was the goldsmiths row (*Aurifabria*) and the name continued along what is now London Street to the north of the castle during the late 13th to early 15th century (Sandred and Lindström 1989, 116). This road was also known until around 1362 as Hosiergate. By the mid 14th century, the hosiers appear to have been replaced by the cutlers (Cutlerrowe) and latoners (Latonrowe). The smiths were concentrated along what is now Little London Street, immediately to the north of the castle.

One of the determining factors in the positioning of the trades between the market and the castle was the water supply provided by the Great Cockey stream. The watercourse was 'made anew' during the latter part of the 15th century (see Chapter 8.I), an action which may have been intended to release the flow of water from its by then culverted state, possibly to service artisan activity.

Norwich is fortunate in having well-published late medieval and early post-medieval sites, in particular the artefactual assemblages that were preserved as a result of the fires of 1507 (Carter, Evans and Margeson 1985, 77–84; Margeson 1993). Supplementing the excavated evidence, a group of remarkable documents spanning *c.*1440 to 1504 — the Paston letters — provides vivid insights into Norfolk family life in the 15th century. Reference to these letters is made at appropriate points throughout the discussion section of this chapter. The family had close connections with Norwich and one member had ambitions to become constable of Norwich Castle in 1470 (Virgoe 1989, 200; see Table 9.1), although it appears that these were not fulfilled (Rye 1921, 23). Further comments on the fortunes of Norwich during the 15th century have been made in the previous chapter.

No references to the either the barbican well or its infilling have been found in the documentary and antiquarian record for Norwich castle and this section details with contemporary evidence for surrounding properties. There is nothing to indicate the licensing of the well for rubbish disposal and it may simply have become available to the populace after 1345. In 1673, however, the City Chamberlain was accused of permitting 'a defective way between the hills and the pitt in the dykes' (see Tillyard, Chapter 10.I) and it is possible that this is a folk-memory reference to use of the well as a rubbish tip which archaeological evidence indicates had been completely infilled by the late 16th to early 17th century (see Chapter 10.II, Period 6.1).

Documented Trades and Industries Around Norwich Castle *c.*1397–*c.*1530

by Margot Tillyard and Elizabeth Shepherd Popescu
(Fig.9.1)

Introduction

Although there can be no certainty that property owners with named trades or suggestive personal names (*e.g.* John Sylkman) actually lived in them, the material deposited within the barbican well confirms that virtually all of the documented trades, some of which are plotted in Fig.9.1, were being carried out in its immediate vicinity. Even the ecclesiastics and clerks/scriveners may be indirectly indicated by the presence of religious objects and writing equipment.

The following documentary evidence, drawn largely from the data given by Tillyard in Part IV, is presented using the major themes highlighted by the artefactual and ecofactual assemblage detailed in by various authors in Chapter 9.III–VI and by Moreno García and Locker in Part III. Details of the documentary sources used (including wills, inventories and property deeds) can be found in Part IV. A summary of the trades of owners of those properties considered is given in Table 9.2 and is based on the Castle Fee rent lists (from 1397) and other evidence post-dating 1345 where available. A cut-off point of *c.*1530 has been adopted for the purposes of this chapter. Many of the trades continued earlier occupations, some of which can be traced back around the site to the late 13th century (see Chapter 7.I).

Metalworking

A large proportion of the documented trades relate to metalworking, including individuals actively manufacturing objects and those occupied in secondary trades. Two armourers are documented within the Fee in the mid to late 14th century. These were at Property 19 (St Michael at Plea) in 1344, when John Athol, armourer obtained a licence to build on a plot. Giles Albert the Armourer bought Property 16 in 1382, already being in possession of the adjacent property (Property 17). A swordsmith, John of Aylesham is documented in St Cuthbert's in 1384 (Property 25; see Part IV), while goldsmiths and other

Occupation	*Total*
alderman	3
armourer	2
bailiff	1
baker/baxter	3
barber (-surgeon)	3
barker/tanner	2
beerbrewer/brouster	1
blacksmith	2
bladesmith/swordsmith	4
bookbinder/clerk	1
bowyer	5
brasier *	10
butcher	1
capper	1
carpenter	2
chandler/candeler	5
chaplain/parson/rector	13
clerk	6
cordwainer/shoemaker	8
courrier (colourer of leather)	1
cutler	5
draper	3
embroiderer	1
farmer/rent collector?	1
fishman	1
fletcher	2
freemason/mason	6
gaoler/lorimer	2
gentleman	2
glasswright	1
goldsmith	8
gravour	2
grocer	5
hatter	2
hosier	1
knight	1
latoner	1
lime-burner	3
lorimer	2
mercer	4
merchant	4
messager	1
miller	1
MP	1
notary	1
painter	1
parchmyner	1
paumer **	1
pewterer	2
plomer (plumber)	1
pouch/malemaker	2
reder/thatcher	5
saddler	1
sawyer	1
scrivener	2
sergeant	2
sheather	2
sherman	1
silkman	1
skinner	9
smith	1
spicer	2
spindler	1
spurrier/bridlesmith	4
stainer	1
tailor	7
turnour	1
upholder (furniture dealer)	1
weaver/worsted-weaver	4
wellmaker	1
woolman	1
worsted merchant	1
wright	1
yeoman	2
Total	**195**

* includes five brasiers outside the Fee
** *i.e*. palmer: someone who had been on a Crusade or, perhaps more likely in this context, on a pilgrimage

Table 9.2 Summary of trades of owners paying Castle Fee rent and those within the Timberhill block (mid 14th century/c.1397–c.1530); see Fig.9.1

metalworkers might also have associations with refurbishing swords (see below). Two bladesmiths and four cutlers (making knives, daggers *etc.)* were also present.

In the late 15th century, John Brystomer, a smith, may have lived in Properties 16, 17 and/or 59 (St Michael at Plea). In his will of 1493, along with £10 he left his son Walter 'my grete scythe, with the belhous [bellows], all my hamers, my grnston and my other toolls belonging to the Smythescraft' (NCC Will 70 Multon). Another blacksmith (John Tylles) sold part of Property 7 in 1507, while a locksmith was present within the Castle Meadow in 1361. Three lorimers (harness makers) are noted, one of whom also served as the gaoler (Property 46, St Martin-in-Balliva/at Bale).

Eight goldsmiths of the period have been noted during this study, although many more were working in the immediate area. Of note amongst those within the Castle Fee properties was Robert Rose (at Property 9, St Andrew) who was responsible for the maintenance of the Mayor's sword. At different times between 1406 and 1426 he made a 'harness' for it for which he needed 6¼ ounces of silver, repaired the bosses and regilded the pommel and the hilt, burnished the sword, provided a new belt with a buckle and pendant and decorated the

black scabbard with three silver bars (Hudson and Tingey 1910, 54, 56, 64, 66).

Two pewterers (William Tyllot in 1424 and John Blake in 1457) are named at adjacent Properties 59 and 16, St Michael at Plea. A third (William Warner) at Property 19 may have been the pewterer who gained his freedom in 1388. A single worker of latten (an alloy of copper, zinc, lead and tin) of the period is noted at Property 6, St Peter Mancroft. Two gravours (engravers) are named at Property 1 (1457) and at Property 23 (1438).

As has been discussed in the previous two chapters, the founding of bells and other items was concentrated around the castle during the 13th to 15th centuries. Five brasiers are named within the Castle Fee, with several others immediately outside it, the latter notably including Robert Brayser and his successors in workshops to the south-west of the castle (Fig.9.1; see Chapter 8.I and Part IV).

Fletching and Bow-Making

Although no fletchers of mid 15th- to early 16th-century date were recorded in the Castle Fee properties, two had been present in St Andrew's parish in the late 14th century (John of Martham at Property 7 and Robert Seward at Property 13). Two others are mentioned to the north of Cuttlerrowe in a deed of 1378, along a stretch of the road which may already have been paved (see Block V, Part IV). No poulterers, who would have provided feathers for fletching, are mentioned within the Fee at this period but they were operating immediately outside it both now and earlier (see Chapter 7.I). During the late 14th and 15th centuries, the poultry market lay along Overrowe in the northern part of the great market (Sandred and Lindström 1989, fig.4).

Five properties within the north-western part of the Fee have documented connections with bowyers in the mid 15th to early 16th century. At Property 6 in St Andrew's parish, John Roper, a bowyer appears to have actually lived in the property. In his will of 1465 he left the messuage to his wife, and to William Nobbs, his next door neighbour (Property 7) all the tools and stock in his shop, including sixty bow-staves. He also left Nobbs a cloak of motley (parti-coloured cloth) a prews (pine) Chyst, a brass pot, a posnett (a small cooking pot with feet and a handle) and a chafour with three feet, as well as a ewer and a pulley, both of latten (NCC Will 6 Cobbald).

Spurriers

Four spurriers are documented, while a saddler was also noted in the Castle Meadow. Specific references to spurriers in the immediate area include a 14th-century deed in which the northern part of 'a tenement with one house' was acquired by Henry Cole, spurrier, in 1379 (Property (h)). One of the owner occupiers was a spurrier named Thomas Clarke who died in 1531 (Property 10). He apparently took over the tenement in 1493 from William Chamberleyn (paying ¾d in Castle Fee rent).

Butchery and Leatherworking

During the medieval period, Norwich's butchers lived for the most part in the Berstrete sub-leet (modern Ber Street and what is now Timberhill). A single butcher owned Property 47 in 1391, while the skinners and tanners were concentrated around the northern side of the castle. Earlier butchery and leatherworking in the area included several tawyers who had been present in the early 14th century (see Chapter 7.I). Roger of Gryselham, shether, paid 6d in Castle Fee rent for Property 7 (St Andrew) in 1397. At Property 13 (St Andrew) Janyn Silkwoman paid rent for property once owned by Robert le Shether. A malemaker (a maker of bags and pouches) William of Dilham, is documented between 1397 and 1421 at Property 10 (St Andrew). Other leatherworkers included five shoemakers, including one at Property 61 in 1493, another at Property 13 in 1451 and a third at Properties 20 and 21 in 1457. Leatherworking relating to harness and spur fittings has been noted above. A parchment-maker was present at Property 67 (St Michael at Plea) and a bookbinder at Property 71 (St Andrew).

Clothing, Textiles, Silkworking and Embroidery

Trades of property owners within the Fee associated with textiles and clothing include two hatters, five shoemakers, three drapers, three tailors, a spindler, two weavers, four mercers, a worsted merchant and a woolman. Two silkworkers were also present, along with an embroiderer or vestment-maker. The well assemblage provides important evidence for the work of the Norwich silkwomen (Crowfoot, Chapter 9.III). In St Andrew's parish (Property 13), a messuage with buildings and a garden was purchased by John Sylkman of Essex (and others). His widow was named as Joan in 1401 and, when named as the former owner of the property in 1457, as Janyn Sylkwoman. This is rather confusing as Janyn Sylkman paid the Castle Fee rent for it in 1397. It is possible that he had first died and she was named from him, later taking over the business in her own right. Janyn and Joan seem synonymous. John may have been a silk weaver who had served his apprenticeship in Essex and met there his London-trained embroideress wife, after which they returned to Norwich. A John of Colneye, Silkman, gained his freedom in 1371.

Although there seems to have been at least two silk-*workers* in the Castle Fee at this time, there appears to be no documented evidence for an early silk-*weaver* in Norwich. There were many trades nearby, however, who could have used the skills of embroiders, tailors, vestmentmakers, purse-makers *etc.* Many goldsmiths would have been able to beat out gold and silver thread which would have called for silk thread when being couched onto the item in hand.

It has been suggested that the machinery for working silks only reached Europe *c.*1300 and the centre for the trade was London (Harvey 1975, 13, 171). The Norwich Archdeaconry Inventory of Church Goods of 1368 (Watkin 1947) gives numerous examples of silk vestments and altar furnishings, some of great splendour. Most of the silk was probably imported from Italy, brought in pieces and made up and embroidered locally.

Fine textile workmanship is demonstrated in a notable item in the will of John Belton of 1517 (also at Property 13): the gift of money to St Michael at Plea church for the remaking of a cope: 'I will have sought as muche White damaske as will clade the olde Cope, the Braunches takyn of and powdered uppon the newe Damaske withe Spangillis as it was before and a boute the Shulders with x or xii beltons werkmanly don and on the bake a Scochin of the goldesmythes armes upon it' (NCC Wills 123 Heyward).

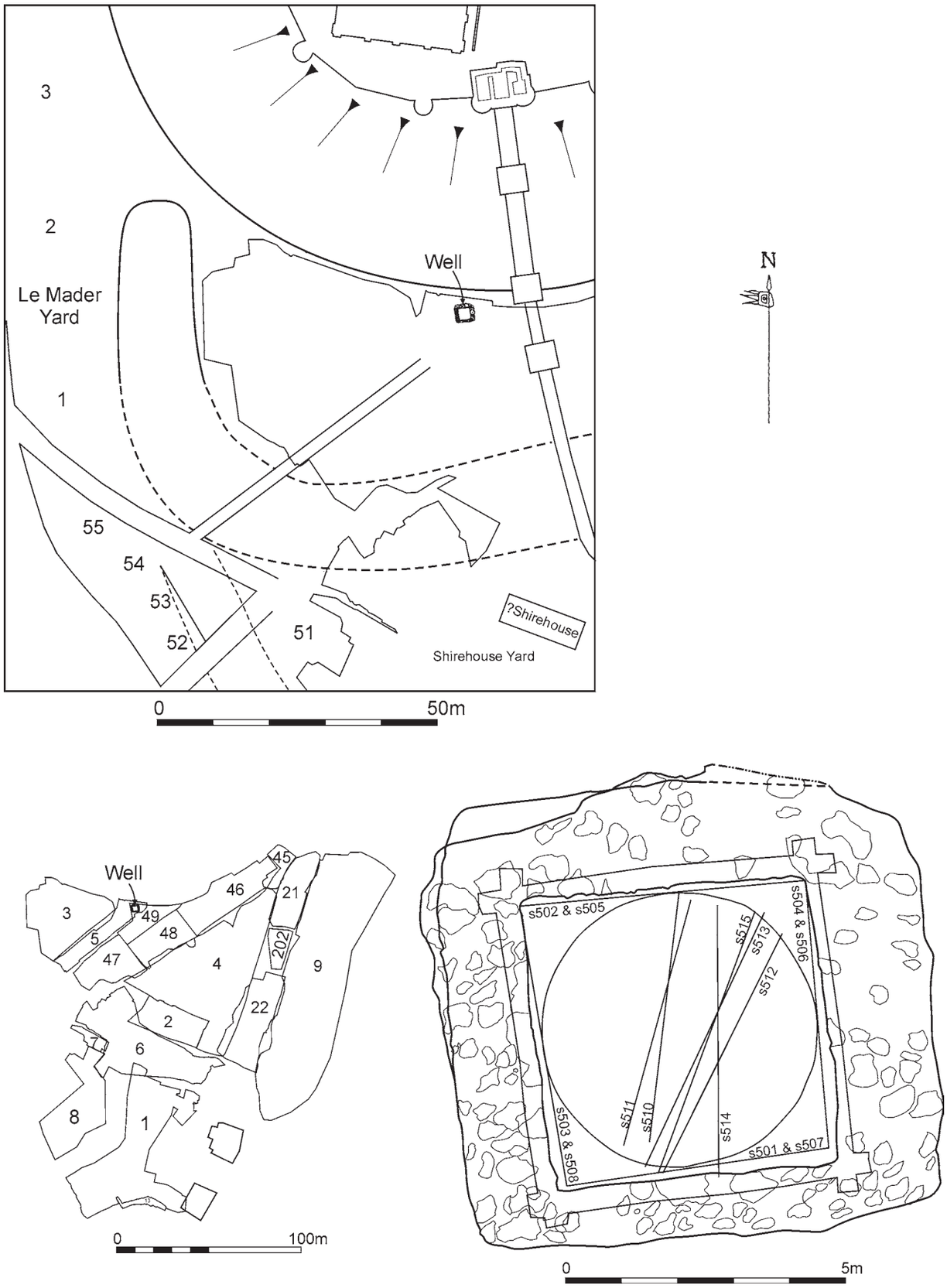


Figure 9.2 Barbican well location plan

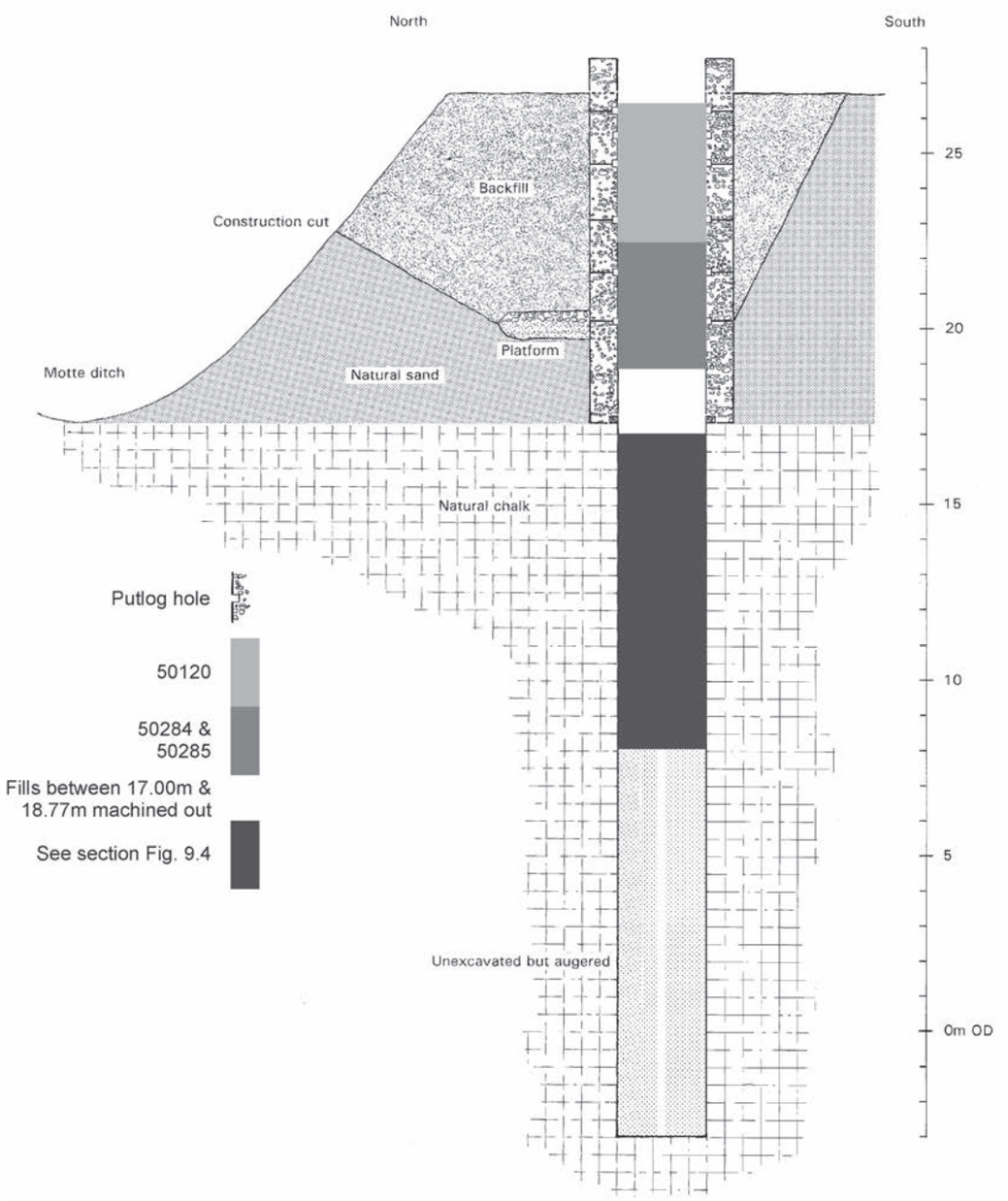


Figure 9.3 Schematic cross-section of well, showing position of excavated fills. Scale 1:200

Building Trades
Individuals associated with the building trades (lime-burners, masons, a carpenter and a thatcher) are fully detailed in Chapter 8.I and 8.V.

Food and Provisions
Castle Fee property owners working within the food trades include two bakers, a brewer, a fishman, five grocers and two spicers (for further details, see Chapter 8.I and Part IV). A mustardman owned the southernmost of the Castle Meadow properties in 1360 (Property 36; Beecheno MS 1908, map E). Four individuals are noted under the catch-all trade of merchant. The five chandlers/candelers may have dealt in candles and/or other merchandise.

II. ARCHAEOLOGICAL SEQUENCE

Summary
(Fig.9.1)

Around three hundred years after its construction (see Chapter 6.II), the well at the foot of the surviving castle bridge served as a convenient rubbish dump for the artisans working around the Castle Fee who accessed it via pathways leading into the former barbican. Its fills were archaeologically excavated to a depth of over 18m and were sampled by augering for a further 11m. The majority of the waste had accumulated between the mid/late 15th

and early 16th centuries and yielded a huge assemblage of finds, including significant faunal and avifaunal evidence. Many of the trades documented in the vicinity are represented archaeologically and a significant proportion of the various types of debris clearly came from local workshops. Some of Norwich's butchers may also have used it to dispose of their waste on a regular basis. Overall, this constitutes the single most important assemblage from the site with implications which reach far beyond the city of Norwich itself. Excavation of the well fills is illustrated in Plates 9.1–9.4.

Lower Fills (Period 5.1)

by Elizabeth Shepherd Popescu and Andy Shelley
(Figs 9.2–9.4, Plates 9.3 and 9.4)

Lower fills of the well (between -3.00m and 12.00m OD) were core sampled, the basal part (below 7.80m OD) not having been subsequently excavated. The earliest deposit (*50316*, G5/23, -3.00 to -2.00m OD) was *c.*1m thick and contained flints and limestone fragments, perhaps deriving from the original construction or later robbing of the well superstructure (see Chapter 8.II). The next metre of fill (*50315*, -2.00 to -1.00m OD) contained frequent chalk flecks, followed by dark brown loam with mottles of red-brown, grey and olive sand and ash (*50314*, -1.00 to 0.00m OD). The remaining fills in this early part of the depositional sequence (*50306-50313*, 0.00 to 8.00m OD) were of similar character. These early fills appear to have contained significantly less refuse than those that were to follow.

Small Finds
A total of eight Small Finds was recovered from lower fills of the well (Table 9.3).

Context	*SF no.*	*Description*	*Fig. no.*
50307	SF7000	Copper alloy jetton, French, Moor's Head type (14–15th century)	
	SF7393	Complete annular belt buckle, with non-ferrous metal coating	
	SF7302	Bone bead	Fig.9.5
50310	SF7306	Copper alloy lace tag	
	SF7303	Iron nail and shank	
	SF7301	Jet bead	Fig.9.5
50315	SF7273	Worked limestone (indeterminate)	

Table 9.3 Small Finds from Period 5.1 well fills

Pottery
by Irena Lentowicz
Most of the pottery from these lower fills (0.098kg) came from samples and is fragmented. The lowest fill (*50316)* contained four sherds of LMU (11th to 14th century), while the next contained three sherds of GTGW dating to the late 12th to 14th centuries. The only larger sherds came from an LMU ware base and a GTGW jug base (from fill *50311*). Other fabrics were represented by a small chip of LMT ware, DUTR, Langerwehe stoneware and Raeren/Aachen stoneware. One sherd of GTGW had been repaired with a ferrous rivet. The suggested depositional date for these fills is late 14th-century, although the presence of a lace-tag may indicate a 15th-century date.

Plant Macrofossils
These lower fills were largely de-watered when excavated and were dominantly minerogenic. Charred and uncharred plant macrofossils were present, but not in large amounts. The lowest fills seem to represent 'natural' deposition rather than dumping. All samples were fully analysed and are detailed in Tables 9.23–9.25 and in Chapter 9.IV.

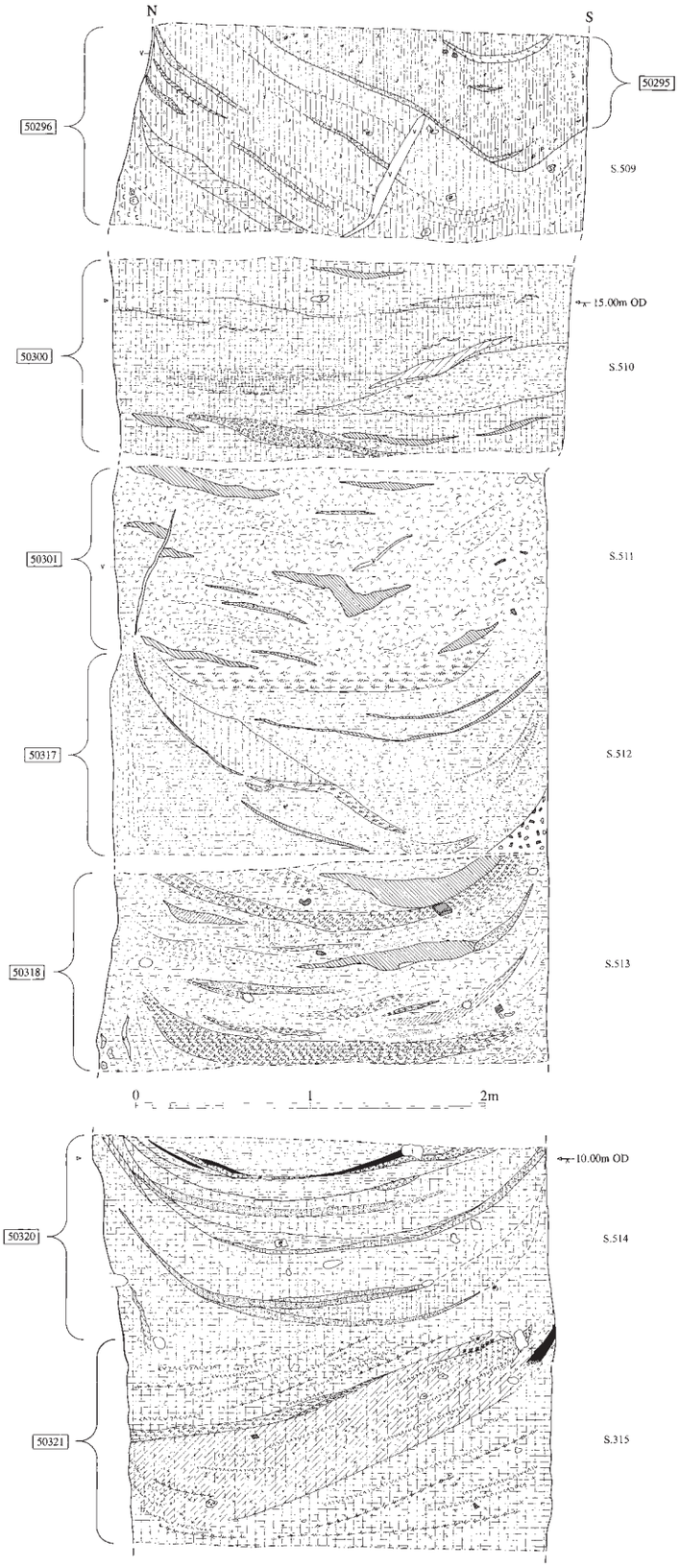


Figure 9.4 West-facing section across middle well fills (see Fig.9.3 for relative level). Scale 1:40

Plate 9.1 Barbican well during excavation of late medieval/transitional fills, following surrounding ground reduction

Plate 9.2 Upper part of barbican well interior during excavation

Plate 9.3 Lower part of barbican well interior during excavation

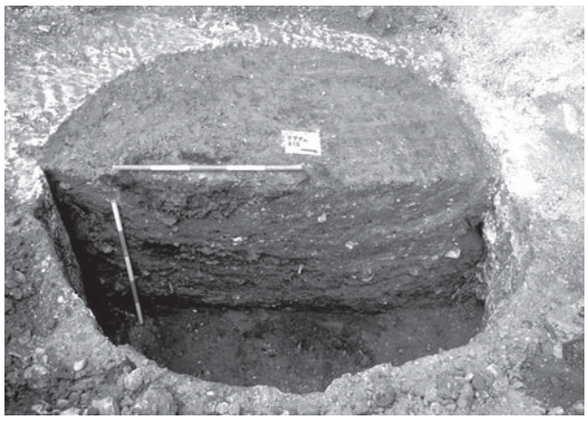


Plate 9.4 Detail of cross-section of composite context *50317* (S.512)

Plate 9.5 ?Scratch marks (claw marks?) from dog visible within chalk side of barbican well shaft

Upper Fills (Period 5.2)

by Elizabeth Shepherd Popescu and Andy Shelley
(Figs 9.3–9.4, Plates 9.1–9.2)

The well shaft had become the focus for the intensive deposition of refuse by the mid to late 15th century (G5/24). Infilling was recorded in most detail between 7.80 and 17.00m OD (Figs 9.3 and 9.4), deposits between these levels being recorded by half-sectioning to a depth of 1.20m. On completion of the section drawing, the remaining fill and the surrounding chalk was machine excavated to the base of the 1.20m section, the process then being repeated (Plates 9.3–9.4). A total of seven such spits were excavated and recorded. The sections were not drawn in a single plane across the feature and the detailed illustration of the fills (Fig.9.4) has taken this into account (*i.e.* reversing the site drawings where necessary) to produce a composite section.

The lowest spit (*50321 = borehole fill 50305*, S.315) consisted of an equal mix of layers of grey/brown ash/organic loam and light brown clay with frequent mortar lumps and ash lenses. The presence of mortar may relate to building alterations to or robbing of the shaft superstructure.

The next spit (*50320 = borehole fill 50304*, S.514) was recorded between 8.90 and 10.20m OD and consisted of similar layers to those below it, with frequent lenses of ash. Ten blocks of worked stone were recovered from these fills, along with occasional lumps of mortar. The skeleton of a dog was found at *c*.9.00m OD. This had the largest skull of the fifteen partial dog skeletons recovered from the well fills and showed fractures on the left and right frontal bones (Moreno García, Part III, Chapter 4). The presence of scratch/claw marks in the adjacent chalk wall of the well (Plate 9.5) appears to indicate that the animal was thrown into the well alive. The limestone blocks may have been dropped in an attempt to kill the dog, causing the fractures to the skull. Although this interpretation remains open to speculation, several cats had clearly been alive when they entered the well (see below).

The next spit (*50318 = borehole fill 50303*, S.513) was recorded between 10.50 to 11.80m OD. These fills included layers consisting wholly of leather scraps and off-cuts, as well as lenses of ash and cess. Frequent brick and flint were also included, as well as the partial skeletons of further cats and dogs. Subsequent fills (*50317= borehole fill 50302*, S.512) recorded between 11.85 to 13.00m OD consisted of layers of ashy loam (30%, 70%) with common brick fragments and leather off-cuts. The latter lay in thin lenses.

The fill between 12.80 and 14.05m OD (*50301*, S.511) consisted of further refuse type fills comprising mixed tips or lenses of compacted leather scraps and off-cuts, ash and friable mid to dark grey/ mid to dark reddish brown lenses of ash and silt. These contained frequent charcoal flecks, moderate chalk flecks, occasional oyster-shell and occasional small to medium pebbles.

A higher concentration of ash (80%) was present in the following spit than in earlier deposits (*50300*, S.510) and was observed between 14.10 and 15.25m OD. Lenses of compacted leather off-cuts were again apparent.

The next spit (*50296*, S.509) was recorded between 15.30 and 16.56m OD. Within it was a large deposit of compacted leather and copper alloy waste which was separately contexted (*50299*, SF6903) lying at 15.83m OD. Again, the spit consisted of many thin layers of ash and humic loam, interspersed with layers of chalk and brick fragments, as well as a large quantity of shell. Its overall constituents were of mid grey brown sand/silt (50%) and clay (50%), with moderate chalk flecks, moderate small pebbles and occasional charcoal flecks. Leather off-cuts were present in lesser quantity than earlier fills and metalworking waste was also apparent. These fills tipped steeply down from the northern edge of the well shaft.

Above these fills, within the same section, was another fill (*50295*) of very dark brown/black clay/silt (50%) and ash (50%) with frequent chalk lumps and flecks, frequent pebbles and charcoal flecks, frequent lumps and flecks of coal, occasional brick fragments and frequent lenses of light grey brown ash with occasional oyster shell. The finds within it appeared to be clustered into distinct groups, with scatters of fish bones and shell apparent. This confirms that the refuse deposits had remained undisturbed.

Fills lying above 17.10m OD were recorded in a different manner. The fill between 18.77 and 22.50m OD was machined out, with the surrounding ground level reduced to approximately 18.30m OD. The interior of

Context	*Context Details*	*No. Objects*	*% Total*	*Ceramic date*	*Later Objects or Early Examples?*
50120	machine excavated	1	<1%	(L14–)15th	
50285	machine excavated	243	5%	M15–E16th	
50284	machine excavated	1090	22.5%	ML15th	
50295	spit	671	13.75%	ML15th	16th-century bolster and arrowhead
50296	spit	1164	24%	ML15th	L16th-century spur
50299	leather and CA waste	4	<1%		
50300	spit	454	9%	ML15th	
50301	spit	323	6.5%	ML15th	16th–17th wirework fastener (x2) 16th–E17th-century vessel glass
50302	borehole = 50317	3	<1%	(L14–) 15th	
50303	borehole = 50318	0	0	(L14–) 15th	
50304	borehole = 50320	0	0	(L14–) 15th	
50305	borehole = 50321	2	<1%		
50317	spit = 50302	186	3.75%	ML15th	16th–17th-century wirework fastener (x2) late 16th-century textile
50318	spit = 50303	242	5%	ML15th	
50320	spit = 50304	212	4%	ML15th	16th–17th- century wirework fastener
50321	spit = 50305	217	4%	ML15th	
50224	putlog fill	1	<1%		
50226	putlog fill	1	<1%		
50227	putlog fill	9	<1%		
50229	putlog fill	1	<1%		
50231	putlog fill	2	<1%		
50234	putlog fill	3	<1%		
50237	putlog fill	1	<1%		
50239	putlog fill	4	<1%		
50241	putlog fill	2	<1%		
50243	putlog fill	2	<1%		
50251	putlog fill	2	<1%		
50253	putlog fill	1	<1%		
50289b	putlog fill	2	<1%		
Total		**4,843**			

Table 9.4 Small Finds from Period 5.2 well fills by context in stratigraphic sequence from the top down. Fills of putlog holes are indicated separately (CA = copper alloy)

the shaft was then scaffolded (Plate 9.2). The machined silty fill was removed from the site (*50284*) and riddled and metal-detected for finds. The riddling processed only about 20% of the material. No leather off-cuts were observed, although metalworking waste was still present. Another composite fill (*50285*) removed by machine contained frequent animal bone and moderate lumps of slag.

The surviving fills between levels 22.50 and 26.40m OD were minimally recorded and were again removed by machine (*50120*). In this instance, the fill was not reserved for later finds retrieval, but finds were hand-collected during its removal. It was of dark brown loam interspersed with two major layers of mortar. The first of these lay at the base of the sequence and was 0.20m thick. The second mortar layer was recorded between 24.12 and 24.47m OD.

In addition to the finds recovered from fills of the shaft, further artefacts and ecofacts came from fills of the two sets of putlog holes within the masonry part of the shaft (Fig.6.13). These had obviously filled up gradually, at the same time as the shaft itself, implying that the timbers had long since rotted or been removed. Several of the holes contained cat skeletons, indicating that live cats thrown into the well crawled into the holes before they became infilled. The lowest putlogs recorded (*50288 and 50289*, at *c.*17.80m OD) survived as voids, suggesting that the timber was still present within them when the main shaft was being infilled. The next putlogs (*50263 and 50281*, 18.80m OD) contained sand with occasional timber fragments and 70% organic matter. The next set of putlogs was at 19.37m OD. One (*50262*, fill *50232*) contained clay, sand loam and a cat skeleton, as well as wood fragments. The second hole (*50276*) contained loam and wood fragments. Other cats, some of which retained scraps of fur, were found in putlogs *50266* (fill *50236*), *50268* (fill *50238*), *50270* (fill *50240*) and *50271* (fill *50241*).

Small Finds

A summary of the Small Finds assemblage from fills of the well shaft by context is given in Table 9.4. It is also summarised by material in Table 9.5 and by object type in Table 9.6, where the assemblage is fully detailed (Chapter 9.III). Nearly five thousand individual objects were recovered from these fills including large quantities of each of the major material types: antler and bone objects (x 62), copper alloy (x 591),

vessel and window glass (x 74), iron objects (x 3968) and leather (x 59, including large blocks of off-cuts). Much of the material relates to manufacturing processes, such as the manufacture of spurs, arms and armour. Significant groups within the assemblage include belt-mounts (x 53), dress/spur buckles (x 755), knives (x 111) and a large quantity of iron spurs and spur fittings (x 113), along with waste from the manufacture of spur leathers. Important individual items were also recovered in a variety of materials.

Working up the stratigraphic sequence (as illustrated in Fig.9.4), a clear depositional pattern is evident. The proportion of finds recovered from the lowest fills recorded by spit (*50321, 50320, 50318 and 50317*) is relatively consistent, gradually increasing in the next two spits (*50301 and 50300*). The majority of the assemblage came from fill *50296* (at the top of the block of fills subjected to detailed excavation) and a subsequent deposit (*50284*), both of which contained a similar proportion of the group accounting for a total of 46.5% of the finds assigned to this sub-period. The deposit with the next highest quantity (*50295*; 13.75%) lay between these two finds-rich fills, effectively forming the upper part of *50296* (see Fig.9.4). This appears to indicate that the vast majority of excavated finds were deposited over a relatively short period. These three layers contained a significant concentration of small annular buckles (Mould, Chapter 9.III). Although evidence for spurs, their fittings and manufacture occurred throughout the fills, it was concentrated within these deposits.

Pottery

by Irena Lentowicz, with Anthony Thwaite (stonewares)
(Fig.9.19)

A total assemblage of 1,747 sherds (39.556kg) of pottery came from this sequence of fills and indicates that the bulk of the material was deposited in the mid to late 15th century, with lesser quantities of late 14th- and early 16th-century material present. Most contexts were originally assigned a mid/late 15th- to early 16th-century date, although these were subsequently revised in the light of more detailed analysis of the stonewares which demonstrated nothing amongst most context groups to suggest a date later than 1500: most may be attributable to the 1470s or earlier (John Hurst, pers. comm.). Any groups which fall outside this range are indicated below, where the assemblage is detailed by context. Further comments and quantification are given in Chapter 9.III.

Just over 2kg of pottery was recovered from the lowest spit *50321* and associated borehole *50305* (2.066kg). The assemblage included an LMU baluster jug and the bases of at least three GTGW vessels. LMT was represented by two jug rims and a cistern spout as well as by two bases. This was supplemented by Dutch Red Eartehnware, which was represented by a base. Rhenish stonewares made up the rest of the assemblage, represented by a Siegburg base and a Langerwehe jug/drinking vessel rim and frilled base (Fig.9.19, no. 1). This fill was dated to the later 14th to 15th century.

Above this was spit *50320* and borehole *50304*, which produced 4.578kg of pottery. A small residual element was present, and medieval fabrics and forms included and LMU jar rim with a developed 'hammer-head' rim (type J2j) and three bases. Grimston Glazed ware was again represented by three bases, but LMT was the most dominant fabric recovered. A number of rims were recorded, including examples from a jar, pancheon and skillet, as well as spouts from two cisterns and at least ten bases. Again, Dutch Red Earthenware was represented by a base. Rhenish stonewares were dominated by Langerwehe vessels, with a jug profile (Fig.9.19, no. 2) recorded along with three jug/drinking vessel rims and two frilled bases. Five Westerwald-type sherds appear intrusive.

A residual element was also recovered from the next spit *50318* and borehole *50303* (3.560kg), and again LMU provided a small assemblage including a cooking pot base. Kitchen wares were again dominated by LMT and imported Dutch Red Earthenware. LMT was represented by rims from a bowl as well as a jug rim; while a Dutch Red Earthenware bowl rim was also recorded. Flatware bases in both fabrics were more common. While Grimston Glazed ware was represented by sherds from two jug handles, tablewares were again dominated by Langerwehe stoneware including three jug/drinking vessel rims and three frilled bases; Siegburg stoneware was not recovered from this spit, although this is not significant as it reappears in later levels. Other fine wares included a small spout from a Tudor Green-type ware drinking vessel.

Residual Late Saxon pottery was still occurring in the assemblage recovered from the next spit *50317* and borehole *50302* (6.387kg), while medieval pottery was represented by an LMU jar rim (type J2b) and a GRCW base. Medieval glazed wares were represented mainly by Grimston Glazed ware sherds from a number of jugs; however some of these vessels and other sherds came from late medieval/transitional vessels including a flatware bowl rim. Utilitarian kitchen wares were again dominated by LMT, represented by rims from a similar range of forms including two bowls (Fig.9.19, no.3), a jar with horse-shoe handles, three skillets and two jug rims. A rim from a Dutch Red Earthenware bowl was again recorded, and DUTR makes its first appearance in the assemblage represented by a pipkin base. Rhenish stonewares were again represented by Siegburg jug/drinking vessel rims (six examples) and bases (two examples), as well as Langerwehe drinking vessel/jug rim and two bases.

The assemblage from the next spit *50301* (4.213kg) was similar, with a small residual element and medieval pottery represented by LMU and GTGW. However, medieval glazed wares were also represented by sherds from Developed Stamford ware (Fabric C) and imported Aardenburg-type ware vessels. This would appear to indicate that some of the material was redeposited rather than primary deposition. The range of contemporary wares was identical with LMT represented by rims from a bowl, two jars and three skillets, as well as two jugs. Dutch Red Earthenware was represented by a handled bowl and jug rims, and DUTR by a pipkin handle and base. Five Siegburg stoneware jug/drinking vessel rims were recorded, and three Langerwehe examples along with two frilled bases.

No residual earlier material was recovered from spit *50300* (4.240kg), and the LMU present was represented by a developed jar rim (type J2j) as well as a base. Grimston Glazed ware was again represented by bases from at least four jugs. LMT was represented by rims from familiar vessels such as a bowl and three skillets, as well as the introduction of a new form represented by the handle and body from a dripping pan (Fig.9.19, no. 4). While no DUTR was present, Dutch Red Earthenware included a skillet rim and base. Siegburg and Langerwehe stonewares were again represented by rims from jugs/drinking vessels (one of the former, and two of the latter). Other table wares were represented by a small quantity of Tudor Green-type ware. This context also included a sherd of GRE; this may have been intrusive.

The next spit *50296* included compact leather and copper alloy waste as well as a quantity of pottery (2.760kg). A residual element was recorded, and medieval fabrics included an LMU bowl with 'hammer-head' rim (type J2j), as well as sherds of imported Aardenburg-type ware and two Grimston Glazed ware jug rims and handles. Contemporary late medieval/transitional wares were again represented not only by the same range of fabrics but also the same vessel forms LMT by bowls (two rims), jars (two rims) and a skillet, Dutch Red Earthenware by a bowl and skillets (two rims; Figs 9.19–9.21, no.5), and Siegburg and Langerwehe stonewares by sherds from drinking vessels/jugs (Fig. 9.19, no. 6).

Above this spit was fill *50295* which was similar to *50296* and the finds appear to have been clustered, though a smaller assemblage of pottery was recovered (1.369kg). Medieval wares were represented only by LMU, including a small jar rim (type J1b), while contemporary wares were limited to LMT, Dutch Red Earthenware, Siegburg and Langerwehe stonewares. LMT was represented by a bowl rim and two jug rims and Langerwehe by a drinking vessel rim and two frilled bases.

Fills above this spit were recorded in a different manner, being machined out and riddled to retrieve the finds. The range of pottery from the next fill *50284* was similar (2.427kg). LMU was represented by rims from two bowls (types Bj and B2l), two small jars (types J1d and J1i) and a small cooking pot (type J1i). Sherds from a GTGW jug decorated with iron oxide painted decoration were also recorded, while of contemporary fabrics only LMT, Dutch Red Earthenware and Langerwehe stoneware were present. The range of LMT vessels was not wide ranging, and included a bowl rim, a jar rim and five jug rims, while Dutch Red Earthenware was represented by body sherds only and Langerwehe by four drinking vessel/jug rims (Fig.9.19, nos 7 and 8).

Context *50285* produced the largest individual assemblage (7.619kg), and no residual earlier pottery was recovered. Medieval wares were represented by a rim from an LMU jar (type J2j), as well as by GTGW jugs (four rims) including a small, slender S-shaped jug with a flat base and pulled rim (Fig. 9.19, no.9). A bowl rim and four other flatware bases were also recorded. LMT was most common and included the usual range of forms represented by rims. Three jar rims were recorded, two from globular jars (type A1, Fig.9.19, no. 10) one of which was decorated with applied thumbed strips around the neck and on the vessel body (Fig 9.19, no.11), and one from a necked vessel (type A2). Three skillet rims were noted, one with a carinated profile (type E2, Fig.9.19, no. 13) as well as a pancheon/bowl rim also with a carinated profile (type H2, Fig. 9.19, no. 12). Other kitchen wares included a jug rim and a fragment of a cistern spout (Fig.9.19, no. 14). Dutch Red Earthenware was represented by almost 1.5kg of sherds; unfortunately no forms were recorded. A DUTR pipkin base was also present. Rhenish stonewares were represented by a Siegburg base (Fig.9.19, no.14) and five Langerwehe base. This fill was characterised

by the first appearance of Raeren-Aachen stoneware body sherds which would date this fill to the late 15th to 16th century. A small quantity of intrusive material was also recorded — sherds of GRE and imported Martincamp flask and Cologne-Frechen stoneware.

Context *50120* produced only 0.337kg. This assemblage consisted of a small quantity of Non-local Medieval Glazed ware with LMT the only other fabric present. Forms recovered included a globular jar rim (type A1), two bases and a handle from a jug.

Plant Macrofossils and Invertebrates
by Peter Murphy
The plant remains from upper fills are very mixed assemblages representing several types of waste disposal (including charred and uncharred crop remains, heathland and wetland plants), but there was no evidence for sewage disposal. They were fully analysed and are detailed in Tables 9.23–9.25 and Chapter 9.IV, along with evidence for terrestrial arthropods.

Animal and Fish Bone
by Marta Moreno García and Alison Locker
A summary of the mammal bone recovered is given in Table 9.13 and by context in Table 9.14. A total of 14,607 specimens were identified, of which 5,537 were domestic mammals and 238 were wild species. Many others remained unidentified. The excellent preservation and recovery of the animal bone has allowed a detailed study of the relative occurrence of the main domestic taxa. Further details of the animal bone assemblage from the well are given in Chapter 9. IV, with the full report appearing in Part III, Chapter 4.

Nearly 3,000 fish bones (2,882) were retrieved and are summarised in Table 9.22. They suggest a clear predominance of herring, cod and related species. Further details appear in Chapter 9. IV and Part III, Chapter 5 and Table 98.

Human Bone
The remains of two infants came from consecutive fills *50320* and *50318* and are detailed by Anderson in Chapter 9.V.

III. FINDS

Introduction

A total of 4,843 objects was retrieved from fills of the barbican well (46% of the total site assemblage; Table 9.5), including a small proportion of residual and intrusive items. Only 8 Small Finds came from lower fills (G5/23, Period 5.1), the remainder coming from upper fills (G5/24, Period 5.2). Finds are detailed by object type in Table 9.6.

This assemblage represents the dumping of refuse on a very large scale. The recorded infilling began in the late 14th century, although earlier fills at the base remained unexplored. The assemblage demonstrates the presence of varying categories of waste deriving from surrounding households, craft/industrial activities (including butchery) and manufacturing activity. The ironwork, for example, represents a wide range of object types. Throughout the fills there is a consistent occurrence of structural and domestic ironwork typical of the refuse of an urban population. In addition, there is a large amount of iron-working debris and objects apparently deriving from the clearance of a specialist workshop or workshops. Further comments on the craft and other activities demonstrated by the well assemblage are given in Chapter 9.VI.

The ceramic assemblage indicates that infilling was concentrated in the mid to late 15th century: only the very uppermost fills in the sequence considered here contained late 15th- to 16th-century fabrics (see further comments in Chapter 9.VI). Brick types include examples traditionally believed to have reached Norwich

Material	*No. Objects*	*Comments*
antler	18	
bone	44	
chalk	1	
copper alloy	591	
glass (vessel)	10	
glass (window)	64	
iron	3,968	
ivory	1	further items identified via SEM
jet	2	
lavastone	6	
lead	26	
leather	59	includes blocks of leather, plus composite objects
limestone (architectural)	12	
mortar (painted)	4	
pewter	1	
stone	23	
silver	7	
textile	6	plus composite objects
Total	**4,843**	

Table 9.5 Small Finds from Period 5 well fills (by material)

in the 16th century, although known in other regional assemblages from the mid 15th century (Lentowicz below). The coin assemblage is dominated by 14th-century types, while jettons are of 14th- to 15th-century date (Davies below). Ironwork dates predominantly to the 14th and 15th centuries, with occasional residual items and objects of 16th- century date. Bolsters were a 16th-century introduction and both of the examples from the well came from consecutive fills (*50296* and *50295*), the latter also containing an arrowhead of 16th-century type (SF7155.04, Mould below), and the first of the diagnostically early 16th-century pottery suggesting that these particular objects are probably in their contemporary setting. A spur of apparent late 16th-century type also came from fill *50296* although may be an early example of its type (SF6979.10, Ellis below).

The copper alloy objects are generally medieval, but include examples from the 12th to 13th century and early post-medieval period (*i.e.* post-*c.*1500). The presence of a few classes of object attributable to the 16th to 17th century (including four wirework hooked fasteners (Goodall below) three vessel glass fragments (Shepherd below) and a fragment of late 16th-century textile (Crowfoot below)) cannot be taken to indicate a fully post-medieval date for this large assemblage of earlier material. These items may have been intrusive, may have migrated within well fills as a result of post-depositional processes (see Chapter 9.VI) and/or may be early examples of their type. The latter interpretation includes the wirework hooked fasteners: although these appear on other Norwich sites in 17th-century deposits, 16th-century examples are known in Amsterdam and other wirework products were in use in the city in the late 15th to early 16th centuries (Margeson 1993, 19). The limited number of lace-tags present supports the inter-

Object Type	*Total*	*Object Type*	*Total*	*Object Type*	*Total*
Architectural fragment	11	Harness mount	1	Ring-headed pin	1
Arrowhead	9	Hasp	3	Rivet	18
Axe	1	Hinge	3	Rod	1
Balance	1	Hinge pivot	18	Sawn antler	12
Bar (metal working)	66	Hook	6	Scale pan	1
Bead	5	Hooked stem	7	Scissors	1
Bell	2	Horse bit	1	Scrap	27
Belt	2	Horseshoe	20	Shears	2
Belt-/dress-/spur-buckle	755	Jetton	7	Sheet (including offcuts)	364
Belt-mount	53	Jews harp	1	Sheet (riveted)	6
Binding (u-shaped)	14	Key	10	Sickle	3
Bit link	4	Knife	111	Skimmer	1
Book fitting	2	Knife handle	2	Spadeshoe	1
Brooch pin	1	Knife sheath	3	Spindle whorl	1
Buckle	10	Lace-tag	12	Split pin	2
Buckle pin	7	Latch rest	1	Spur	24
Button	5	Lava	3	Spur arm	6
Came	3	Leather-working debris (11.234kg)*	34	Spur fitting	74
Candleholder	1	Link	4	Spur leather	7
Carved frame	1	Lock	3	Spur rowel	2
Casket-mount	1	Looped ring terminal	1	Spur-buckle	19
Chain	5	Mail armour (iron)	22	Staple	16
Chain link	13	Mail arnour (CA)	3	Stem	10
Clench bolt	1	Metal working debris	10	Strap	57
Coin	8	Mirror	1	Strap-end	14
Coin weight	1	Mortar (painted)	4	Strip	136
Cylinder	4	Mould (limestone)	2	Stud	57
Dagger handle	1	Mount	1	Stylus	1
Dagger blade	1	Nail	1650	Sword	2
Dagger hilt guard	1	Nailed binding	51	Tack	3
Disc	1	Needle	4	Tenter hook	3
Disc or weight	1	Pin	60	Textile (+ others attached to objects)	6
Door bolt	1	Pin/pen	34	Thimble	3
Fastener	8	Plaque	1	Toilet article	2
Ferrule	13	Plate	28	Tool	2
Fibre processing spike	3	Plate (riveted)	19	Vessel (glass, copper alloy & iron)	28
Finger ring	2	Punch	1	Wall hook	2
Fitting	13	Purse fragments	8	Whetstone	20
Formless fragment	622	Quern	3	Window glass	70
Gaming board	1	Rake tooth	1	Wire	19
Handle	4	Ring	6	Worked antler	1
				Total	**4,843**

* this figure relates to a number of blocks of leather waste, one of which was analysed and found to contain 1,050 individual pieces (see Mould, 'Leather-Working' below)

Table 9.6 Small Finds from well fills (by object type)

pretation of an earlier date for the majority of infilling, although the uppermost part of the well appears not have been infilled until the late 16th to 17th centuries (see Chapter 10). Craft activity (specifically the manufacture of antler handles) continued to take place in the vicinity of the well at this later period. A pistol grip ivory handle *may* have been as early as the mid 16th century (Riddler below).

In light of the above discussion, an overall date range of mid to late 15th- to early 16th-century is suggested for the majority of the fills discussed in this chapter. A few of the discarded items were apparently of considerable age when deposited. Further comments on the issues of dating, intrusion and residuality are given in Chapter 9.VI.

Dress Accessories and Personal Possessions

Dress Fittings

Copper alloy finger-rings
by Alison Goodall
(Fig.9.5)
A finger ring (SF6992) is simply made with the separate pieces held together by solder. A small piece of glass set within the bezel is in imitation of a gemstone. The form of the ring is generally similar to other rings of medieval date although is not paralleled exactly. A second ring is of much simpler form (SF7588).

SF6992 **Finger ring**. Incomplete finger-ring, with flat-sectioned very large hoop, and white-metal inlaid transverse lines on shoulders and forming collar around bezel. The bezel is set with a pyramid-shaped piece of glass.
50295, fill of well 50108, Period 5.2, G5/24

SF7588 **Finger ring**. Undecorated finger-ring of flat section.
50285, fill of well 50108, Period 5.2, G5/24

Beads
by Julia Huddle
(Fig.9.5)
Five beads were recovered from soil samples. In this late medieval context, the small examples may have been used as elaborate trimmings for dress (Egan and Pritchard 1991, 305). One coral example is tiny (only *c*.1.5mms in diameter) with a hole of around 0.5mms in diameter (SF7292). At Trigg Lane, London, a coral bead with a similar sized hole was noted to have been at about the limit of contemporary technology (Egan and Pritchard 1991; 310, fig.206, no.1551). Other beads from the well include a bi-conical example made of pewter alloy (SF7420, not illustrated), two spherical jet beads (SF7278 and 7301, neither illustrated) and one of bone (SF7302). The larger examples may have come from rosaries. Analysis of the pewter alloy bead using x-ray fluorescence at the AML detected lead-tin alloy with some copper.

SF7292 Tiny annular **red coral bead**. Diameter of hole = *c.* 0.5mm
50284, fill of well 50108, Period 5.2, G5/24

SF7302 Globular **bone bead**. Diameter of hole = 3mm.
50307, fill of well 50108, Period 5.1, G5/23

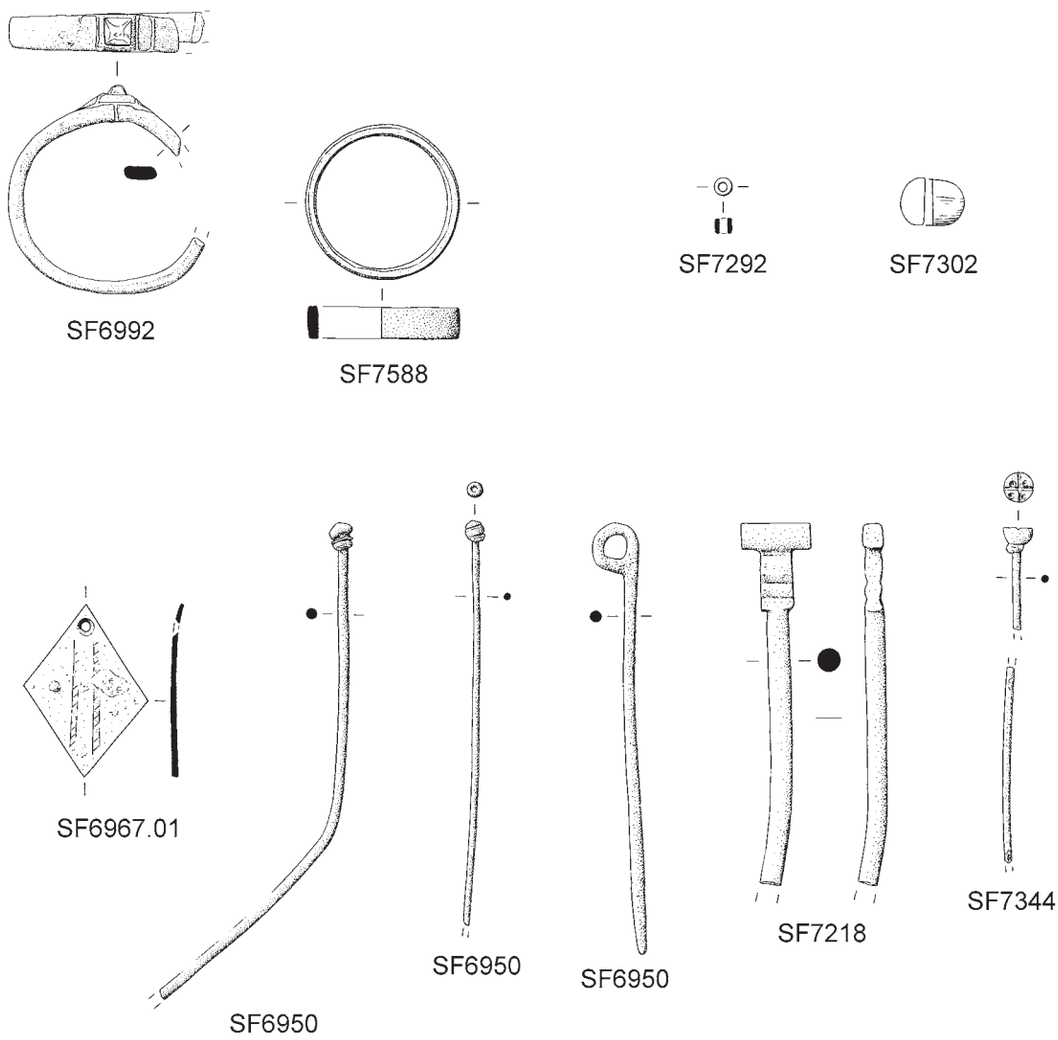


Figure 9.5 Copper alloy finger rings (SF6992 & 7588); coral bead (SF7292); bone bead (SF7302). Copper alloy ?pendant (SF6967.01). Copper alloy dress/head-dress pins (SF6950 (x 3), 7218, 7344). Scale 1:1

Copper alloy ?pendant
by Alison Goodall
(Fig.9.5)
The function of a lozenge-shaped plaque (SF6967.01) is uncertain, although the perforation in one corner suggests that it may have been worn as a pendant.

SF6967.01 Plate. Lozenge-shaped plate with small circular perforation in one corner and two parallel lines of engraving running down to the other corner.
50296, fill of well 50108, Period 5.2, G5/24

Copper alloy dress/head-dress pins
by Alison Goodall
(Fig.9.5)
The group of 39 dress/head-dress pins displays a range of sizes and forms. Long pins with decorative heads may have been worn as hair and dress ornaments in the 14th and 15th centuries. A number of different head forms found during that period are illustrated by the finds from London (Egan and Pritchard 1991, 297ff). Of note amongst the Castle Mall group is a crutch-headed pin (SF7218) similar to an unstratified find from Sherbourne Abbey (P. Robinson 1996, pers. comm.). Four pins from well fill *50301* include one with a solid globular head (SF6950.00), another with a curled over looped head (SF6950.01) and another with a spherical spiral-wound head (SF6950.02). A flat-topped pin with an engraved decoration (SF7344) is very similar pin to one found at Baynard Castle, London dated *c.*1350–1400 (Egan and Pritchard 1991, fig. 199, no. 1478).

SF6950.00 Dress pin, with a solid globular head and a spiral-wound collar beneath.
50301, fill of well 50108, Period 5.2, G5/24

SF6950.01 Dress pin, with a curled-over loop head.
50301, fill of well 50108, Period 5.2, G5/24

SF6950.02 Dress pin, with a spherical spiral-wound head.
50301, fill of well 50108, Period 5.2, G5/24

SF7218 Pin. Crutch-headed pin, with T-shaped top with two transverse grooves on the foot of the T, and a circular shaft below with point missing. L: 51mm+.
50284, fill of well 50108, Period 5.2, G5/24

SF7344 Pin. Five fragments of dress pins. One has a hemispherical head with a flat top and a collar beneath; on the flat top is an engraved cross, with a punched dot in each quadrant. The second has the remains of a perforated disc forming part of the head. There are three shaft fragments only.
50301, fill of well 50108, Period 5.2, G5/24

Copper alloy brooch pin
by Alison Goodall
(Fig.9.6)
Brooches are only represented in the well fills by a single brooch pin (SF6996).

SF6996 Brooch pin with engraved spiral line covering about half of shaft, up to closed loop. L: 35mm.
50296, fill of well 50108, Period 5.2, Group 5/24

Copper alloy dress/belt buckles and clasps
by Alison Goodall
(Fig.9.6)
A group of 13 copper alloy buckles or parts of buckles in a range of forms is supplemented by other types of clasp. All of the buckles and belt fittings recovered are consistent with a date range from the 13th/14th century to the late medieval period. None is significantly damaged and there is little that can be said about the circumstances of their loss or disposal prior to being deposited in the well; the objects were not being discarded because they were unfit for use.

Annular buckles with mouldings on the pins (such as SF6920, 6954, 7089 and 7093) probably date from the 13th and 14th centuries. The pin of SF7089 suggests a 14th-century date. Several plain annular buckle frames were also found, in a range of sizes. The largest (SF7217) is likely to have formed an annular buckle of similar date to those found with pins. Although in the past these have sometimes been described as annular brooches, they are now more properly thought of as buckles. An annular buckle found *in situ*, with remains of the leather strap, on the pelvis of an adult ?female burial seems to confirm this (Clay 1981, 133, fig. 48.24). This is supported by two of the smaller Castle Mall examples which had leather still attached (SF6928 and 7122). A small plain ring (SF7115) may have formed a buckle or suspension ring (*cf.* Fig.9.25, SF7030 and 7049).

A buckle with a decorated roller on the front bar (SF7014) is possibly from the 13th century. A clasp (SF7026) has a rotating flap on the front bar which would have locked into a corresponding fitting on the other end of a strap; this is probably of 13th- to 14th-century date. The remains of a tablet weave band with chevron pattern were found within it (Crowfoot, below). A gilded clasp (SF7215) contained a silk tablet band (Crowfoot, below), while a buckle plate (SF6951) contained a leather strap.

Other buckle types included an asymmetrical double looped buckle (SF7039) of a type not usually found in large numbers (*cf.* Egan and Pritchard 1991, fig. 65, no. 472, with other late medieval parallels cited). Some eleven almost identical buckles were however recently excavated in Hull at the Magistrate's Court site, many of them associated with male and ?male burials (Goodall in prep.). Here, the unusually small range of buckle types coupled with the monastic nature of the site make it tempting to suggest that the buckles formed part of a uniform or a monastic habit; however, there is insufficient evidence for confirmation of this at present. A rectangular buckle (SF7073) has 13th- and 14th-century parallels (*cf.* Egan and Pritchard 1991, nos 426 and 440). A larger rectangular buckle with a central bar was also found (SF7114).

Annular Buckles

SF6920 Buckle. Annular buckle with thick solid circular sectioned frame, and pin with moulding near open loop. Small indentation on underside of tip to rest on frame. H: 41.5mm.
50300, fill of well 50108, Period 5.2, G5/24

SF6928 Buckle. Circular buckle frame of round section, with slender pin with open loop. The pin has been cut from sheet. Fragment of leather strap adhering to frame. W: 22mm.
50296, fill of well 50108, Period 5.2, G5/24

SF6954 Pin from an annular **buckle**, rectangular in section with chamfered edges. Open loop, now broken, with double moulding near loop. L:45mm
50301, fill of well 50108, Period 5.2, G5/24

SF7089 Buckle. Plain annular buckle with oval section frame and rectangular section pin with closed loop, now worn through. Pin has grooved moulding near loop and recess on underside for frame. H: 44mm.
50320, fill of well 50108, Period 5.2, G5/24

SF7093 Buckle. Plain annular buckle with circular-section frame and cast pin with three moulded ridges near open loop. Tip of pin flattened and tilted up to rest on frame.
50321, fill of well 50108, Period 5.2, G5/24

SF7115 Frame. Plain annular frame, with flattish oval section; pin missing. Perhaps a brooch, buckle or suspension ring. D:

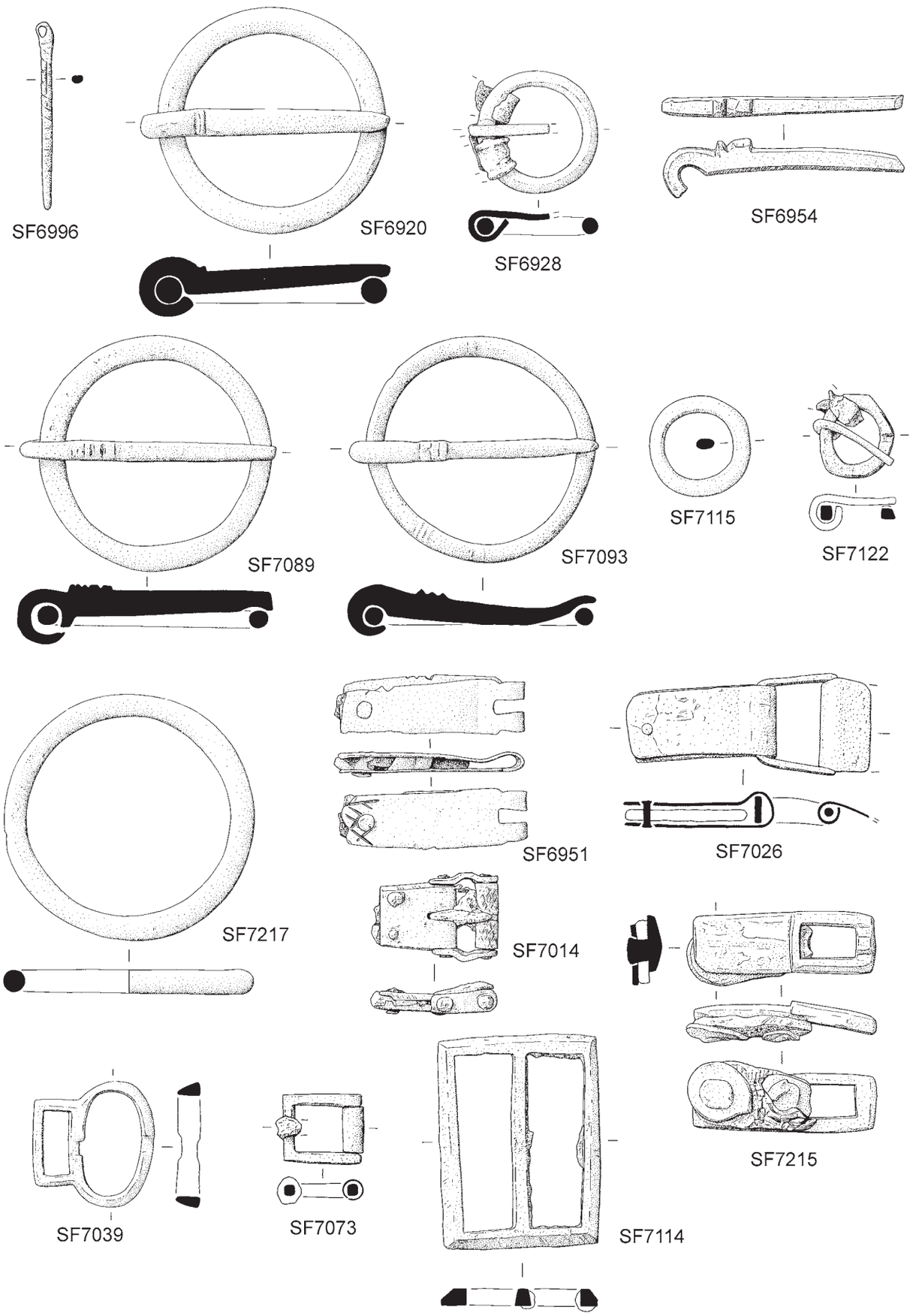


Figure 9.6 Copper alloy objects: brooch pin (SF6996); buckles (SF6920, 6928, 6954, 7089, 7093, 7115, 7122, 7217); buckle plates and clasps (SF6951, 7014, 7026, 7215); buckles (SF7039, 7073, 7114). Scale 1:1

18.5mm.
50321, fill of well 50108, Period 5.2, G5/24

SF7122 **Buckle**. Circular buckle frame of very uneven section, with grooved pin-rest and slender pin. The surviving fragment of leather adhering to it shows that it was used as a buckle rather than as an annular brooch. (*cf.* SF6928). H: 15mm.
50321, fill of well 50108, Period 5.2, G5/24

SF7217 **Buckle**. Large ring of slightly uneven circular section, probably the frame from an annular buckle. D.45-46mm.
50284, fill of well 50108, Period 5.2, G5/24

Strap-End Buckles and Clasps

SF6951 **Buckle plate** made from folded rectangular sheet, with cut-out pin slot and frame recess. A single rivet at the open end secures a fragment of leather strap; around the rivet are roughly incised crosses. L: 35mm.
50301, fill of well 50108, Period 5.2, G5/24

SF7014 **Buckle** of iron and copper alloy with traces of white-metal coating. The frame is made of two out-curved copper alloy bars with holes at either end, into which the iron pin-bar and roller-bar are inserted and held in place by ?copper alloy roves. The copper alloy roller has no visible seam, and is decorated with engraved coss-hatching. It has a grooved rest for the iron pin. The slightly tapering folded plate has bevelled edges and two iron rivets near the open end. L: 25mm
50317, fill of well 50108, Period 5.2, G5/24

SF7026 **Buckle or clasp**. Trapezoid frame made from stud with separate front bar inserted and a rotating cylinder and tab at the front. Strap and plate with single rivet, enclosing textile strap. The textile to which this buckle was attached is of tablet weave and is described further by Crowfoot (this chapter). L: 44mm.
50317, fill of well 50108, Period 5.2, G5/24

SF7215 **?Clasp**. Gilded rectangular frame with integral strap end attached to textile with two rivets with large roves. See Crowfoot (this chapter) for textile, which is a tablet band. L: 35mm.
50300, fill of well 50108, Period 5.2, G5/24

Other Buckle Types

SF7039 **Buckle**. Double-looped buckle frame with outer oval loop with pin constriction and grooved pin-rest, and small rectangular inner loop for attachment to the strap.
50284, fill of well 50108, Period 5.2, G5/24

SF7073 **Buckle**. Rectangular buckle frame with sheet roller on outer edge, and remains of iron pin.
50317, fill of well 50108, Period 5.2, G5/24

SF7114 **Buckle**. Rectangular buckle frame with central bar, bevelled edges and iron staining from missing pin. H: 39mm.
50321, fill of well 50108, Period 5.2, G5/24

Iron dress and shoe buckles
by Quita Mould
(Fig.9.7)

Small Annular Buckles

The ironwork assemblage was dominated by the occurrence of large numbers of small, annular buckles, both complete frames, many with the pin *in situ*, and fragments of broken frame (site total 456, of which 289 came from the well). A further 301 complete small annular buckle frames were recovered from Period 5 deposits, 62 of which had their buckle pins present, and a further 462 frame fragments. These buckles (*e.g.* SF6979.02), measuring between 10–15mm in diameter, derived principally from three backfills *50296, 50295* and *50284* (98% of the site total) which lay one above the other within the well (Fig.9.4) suggesting that they were disposed of over a relatively short period of time. A small number (SF7340 and 7360, neither illustrated) were found in fills of the putlog holes within the well shaft (putlogs *50273* and *50257*).

Many of the small buckles had a non-ferrous metal coating likely to be of tin as found on the analysed shoe buckles from London (Grew and de Neergaard 1988, 75). A number of the buckles retained parts of the narrow leather straps to which they had originally been attached (*e.g.* SF7231 strap width 6mm, not illustrated).

Such buckles have been found in small numbers previously from Norwich (Goodall 1993d, 33, fig.18, nos 206–217) and other late medieval and post-medieval excavations. They are thought to have been used to fasten shoes and hose. Mrs Russell-Smith (1956, 217–221 plate XVI) has convincingly argued that they fastened the hose to the `brygyrdyl' a leather strap worn in the manner of the modern suspender belt, but that they were superseded by the use of laces with `points' to hold up the hose after *c.*1356. In London these small buckles have also been found *in situ* on shoes and in the early 15th century they occurred as the standard shoe buckle (Egan and Pritchard 1991, 53). At Castle Mall these small annular buckles were found in association with a relatively large quantity of spur fittings and it is possible that they were also used to fasten spur leathers (see 'Spur Buckles' below). Similar buckles (*e.g.* SF7149) of slightly larger size (diam 17mm) may have come from shoes. No evidence for late 14th- and early 15th-century footwear was found during the excavations although leather was found in the same context as the buckles, and shoes of later date were recovered elsewhere (see Chapter 10.III). The fact that the well fills in which they were found contained a relatively large proportion of broken spurs (x 17) and spur fittings makes it tempting to see them as the debris from the workshop of a spurrier engaged in the possible repair and refitting of spurs and their leathers.

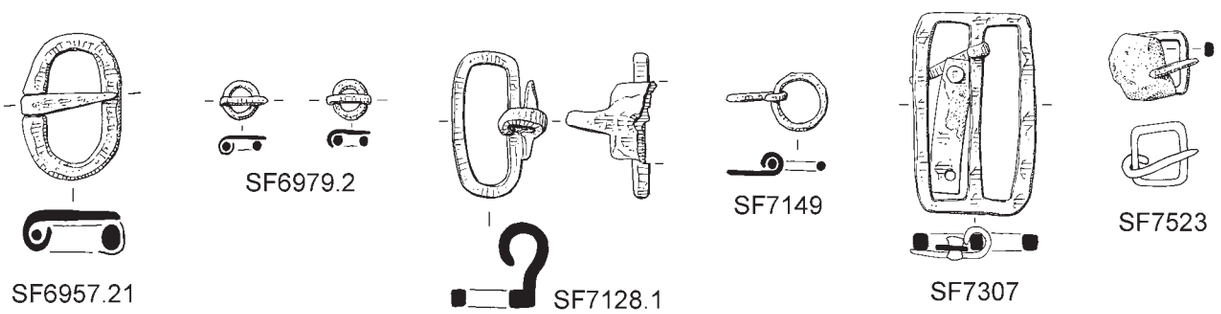


Figure 9.7 Iron dress and shoe buckles (SF6957.21, 6979.2, 7128.1, 7149, 7307, 7523). Scale 1:2

Other Buckle Forms

Other buckle forms represented included D-shaped and angular framed examples, along with broken buckle frames whose shape could not be distinguished (x 5), individual buckle plates (x 5) and buckle pins (x 7). An oval framed buckle was found (SF6957.21), along with a D-shaped buckle (SF7169, not illustrated) and a double-framed rectangular buckle and plate (SF7307). A non-ferrous metal coated oval buckle frame or link (SF7128.1) had a square-bodied hook spur attachment articulating with it: as it came from a large dump of material (*50321*) this association might have occurred during deposition rather than during use.

A small square buckle (SF7523) retained minerally preserved organic matter and is likely to come from an item of dress, probably a spur leather.

SF6957.21 **Buckle** with oval frame of oval section with straight pin wrapped around the frame. Minerally preserved leather present on the back. Ht 42mm
50300, fill of well 50108, Period 5.2, G5/24

SF6979.02 **Buckles**. Two small buckles with annular frames and pins wrapped around the frame. D 12mm
50296, fill of well 50108, Period 5.2, G5/24

SF7128.1 **Buckle and spur fitting**. Oval shaped frame with non-ferrous metal plating with remains of square plate with looped terminal adhering. Ht: 42mm.

SF7149 **Buckle** with annular frame with non-ferrous metal coating and rectangular-sectioned pin. D 17mm
50296, fill of well 50108, Period 5.2, G5/24

SF7307 **Buckle** with rectangular double-looped frame with fragment of pin and part of the preserved leather strap with rectangular buckle plate with two rivets. Ht 55mm w: 35mm
50285, fill of well 50108, Period 5.2, G5/24

SF7523 **Buckle** with square frame with pin wrapped around the frame, non-ferrous metal coating. Much minerally preserved organic present. L: 17mm
50300, fill of well 50108, Period 5.2, G5/24

Copper alloy hooked fasteners
by Alison Goodall
(Fig.9.8)

Double-hooked fasteners

While simple double-hooked fasteners (*e.g.* SF6999 and 7018) could have been used as garment fasteners, they may in fact be harbicks or shear-board hooks, used in the manufacture of cloth to secure the cloth to the shear-board when cropping the nap; several examples of iron harbicks were found in excavations at Winchester (I.H. Goodall 1990b, 239–40, fig. 51) and one of copper alloy from Exeter (A.R. Goodall 1984, 345, fig. 193.177). A further iron example came from Castle Mall (SF5206, see Chapter 8.III).

Two double-hooked fasteners of more complex form were also found in fills of the well. The first (SF6952) has a shield-shaped plate, while the other (SF7550) has a square plate. A similar example from Norwich dates to 1400-1660 (*cf.* Margeson 1993, fig.9, no. 81), while examples from Amsterdam come from 15th- to 16th-century deposits (Baart *et al* 1977, nos 157–160).

Four-hooked wirework fasteners

Wire fasteners with long hooked ends (like SF7005, 7019, 7284 and 7552), would have been used as garment fasteners (*cf.* Margeson 1993, fig.9, nos 88 and 89; Baart *et al* 1977, 164 and 169). Other Norwich examples tend to date to the 17th century, although 16th-century examples are known in Amsterdam and late 15th- and early 16th-century examples of other wirework objects are known in Norwich (Margeson 1993, 19). All of the examples from the well have four hooks, while the Norwich parallels cited above are double- or triple-hooked.

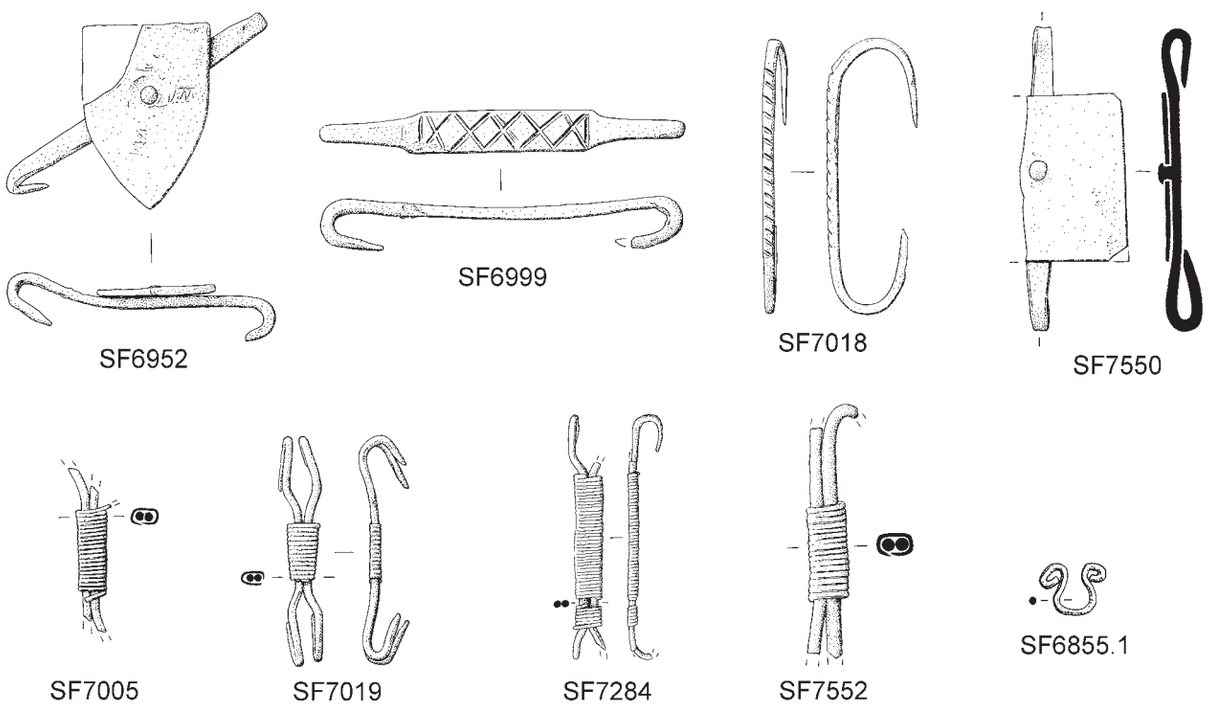


Figure 9.8 Copper alloy double-hooked fasteners (SF6952, 6999, 7018 & 7550). Copper alloy four-hooked fasteners (SF7005, 7019, 7284 & 7552); iron eye fastnener (SF6855.1). Scale 1:1

Double-Hooked Fasteners

SF6952 **Fastener**. Double-hooked fastener consisting of a bar with hook at each end, with incomplete shield-shaped plate decorated with rocked-tracer engraving, attached at an angle to the bar with a single rivet
50301, fill of well 50108, Period 5.2, G5/24s

SF6999 **Fastener or harbick**. Double-hooked fastener with traces of possible white-metal coating. narrow rectangular central plate decorated with engraved zig-zag lines forming a row of lozenges, tapering to a hook at either end. L: 50mm.
50296, fill of well 50108, Period 5.2, G5/24

SF7018 **Fastener or harbick**. Double-hooked fastener, made of a length of almost rectangular sectioned wire bent down into a pointed hook at each end and decorated in between with engraved diagonal lines, perhaps in imitation of twisted wires (*cf*.. Baart et al 1977, nos 157-159). L: 38mm.
50317, fill of well 50108, Period 5.2, G5/24

SF7550 **Fastener**. Double-hooked fastener consisting of a bar with hook at each end, with an incomplete square plate attached to the bar with a single rivet. L: 42mm.
50300, fill of well 50108, Period 5.2, G5/24

Four-Hooked Fasteners

SF7005 **Fastener**. Incomplete four-hooked fastener, made from two parallel double-hooked wires bound together with a coil of finer wire.
50317, fill of well 50108, Period 5.2, G5/24

SF7019 **Fastener**. Complete four-hooked fastener made from two double-hooked wires bound together with a coil of finer wire so that the hooks are parallel. L: 32mm.
50317, fill of well 50108, Period 5.2, G5/24

SF7284 **Fastener**. Incomplete four-hooked fastener, made from two parallel double-hooked wires bound together with a coil of finer wire Only one hooked end survives. L: 34mm.
50320, fill of well 50108, Period 5.2, G5/24

SF7552 **Fastener**. Incomplete four-hooked fastener, made from two parallel double-hooked wires bound together with a coil of finer wire.
50301, fill of well 50108, Period 5.2, G5/24

Copper alloy buttons

Five buttons or button covers, either convex or flat-topped were found (not illustrated). Two had integral shanks and one example had an illegible inscription within two concentric lines. Buttons are well-attested from the medieval period onwards (Egan and Pritchard 1991, 272).

Iron fasteners

by Quita Mould

(Fig.9.8)

Simple wire dress fasteners have a long history of use and are consequently difficult to date. This is equally true of the 'eyes' to which they were attached (*e.g.* SF68551.1). Three similar looped eye fittings were found in Anglo-Scandinavian deposits at 16–22 Coppergate, York (Ottaway 1992, fig.303, no 3825–3) while others were also used to fasten the buff leather coats used by soldiers during the Civil War.

6855.1 **Eye** with looped ring terminals for sewing to the garment, non-ferrous metal coated. L: 18mm
50285, fill of well 50108, Period 5.2, G5/24

Composite belts, copper alloy belt studs and mounts

by Alison Goodall and Elizabeth Shepherd Popescu

(Fig.9.9, Plate 9.6)

A group of 51 copper alloy mounts and studs came from the well, along with 17 studs. A range of forms of varying quality and decorative detail is represented, although most of the small studs and decorative mounts found came from costume. A significant proportion of the group came from late medieval belts/girdles and further comments on these items are given by Crowfoot elsewhere in this chapter. Textiles and leather were found in association with the mounts and selected items are also fully detailed by Crowfoot.

Plate 9.6 Fifteenth-century girdle and gilded mounts with displayed eagle motifs (SF7076)

The most significant item, forming part of an opulent dress item, was a pair of gilded displayed eagle mounts (SF7076, Plate 9.6) which would have been mounted on a madder-patterned silk girdle. This item is of probable 15th-century date. The displayed eagle was a common medieval heraldic device borne by a number of different families. Additionally, a two-headed eagle was adopted as the emblem of the Holy Roman Empire, but eagles were also used more generally, *e.g.* on seals (Cherry 1991a, 34 no.24) and tiles (Eames 1991, fig. 35.103). Egan and Pritchard (1991, 195 no.1048 and 238 no.1274) illustrate mounts and spangles from London bearing displayed eagle motifs and Fingerlin (1971, 140; 129, fig. 214, cat. no. 398) shows a number of late medieval clasps with eagle decoration. Eagles also decorate the late 14th-century ceiling of the Eagle Ward of the Great Hospital, Norwich, originally the chancel of St Helen's Church; it is traditionally supposed that the eagles were in honour of Anne of Bohemia, wife of Richard II, who visited Norwich for the opening of the chancel in 1383 (Wearing 1957, 113). Whether or not the eagles on the Castle Mall mounts are connected with this can not be determined.

Another square but undecorated mount (SF7585, not illustrated) and a rectangular mount with an unidentifiable design (SF7006, not illustrated) had both been mounted on silk tablet-woven bands.

Other ornamental belt mounts include trefoil (*e.g.* SF7043), quatrefoil (*e.g.* SF6997.01 and 7546), sexfoil (*e.g.* SF7584 and 7586) and multifoil examples (*e.g.* SF7551). Such types are well known in late medieval London (Egan and Pritchard 1991, 184–195) and may have been used for decorating and stiffening belts, as well as to embellish other items of textile or leather clothing. One quatrefoil mount (SF7016, not illustrated) has a rivet in each foil secured by square roves and is attached to a piece of ?woollen fabric.

Plainer convex/dome-headed mounts, a number of them gilded, were also found (*e.g.* SF6911 (not illustrated), 6995, 6997.00, 7012 x 2 and 7072), some with concentric repoussé decoration and others undecorated. Two similar studs (SF7293 and 7310, not illustrated) were recovered in association with woollen textile.

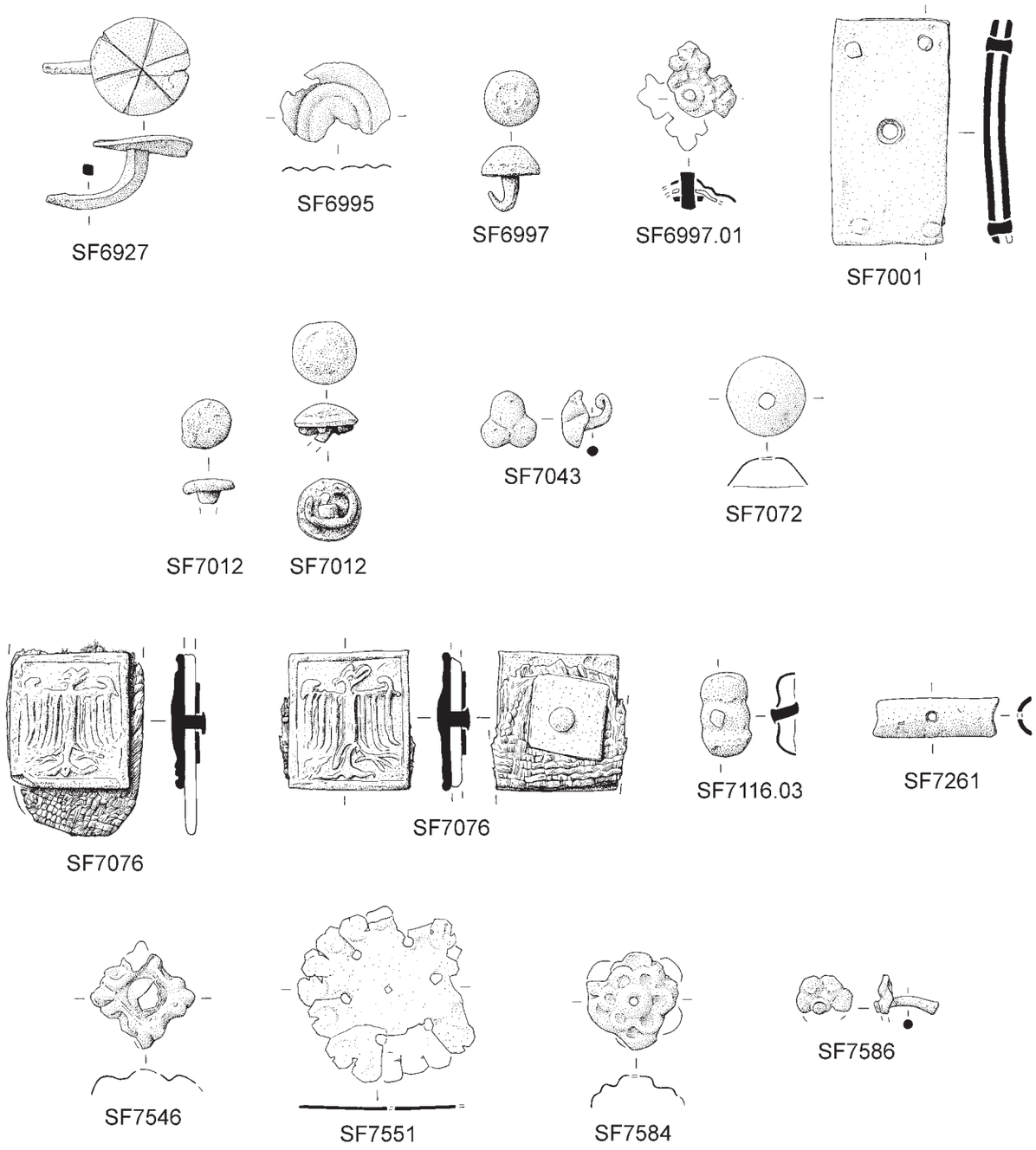


Figure 9.9 Copper alloy belt studs and mounts (SF6927, 6995, 6997 (x 2), 7001, 7012 (x 2), 7043, 7072, 7076, 7116.03, 7261, 7546, 7551, 7584 & 7586). Scale 1:1

Several lengths of leather strap with plain studs inserted at intervals along the middle and stitch holes along both long edges may have formed part of a belt, similar to SF6948. The latter was found in association with a cut piece of textile (wool with madder (alizarin) dye). Another narrow leather belt, 8–9mm wide (SF7427, not illustrated) retains seven gilded studs and traces of moss were identified in association with it.

Small bar-mounts (*e.g.* SF7116.03 and 7261) would have been used on belts or straps (*cf.* Egan and Pritchard 1991, fig.133), the latter possibly dating to the 14th century. Another flat-headed stud (SF6924, not illustrated) was attached to a piece of woollen textile, identified as English broadcloth (Crowfoot, this chapter).

Examples of rectangular plates with rivets at the corners and a larger central hole (like SF7001) have been found attached to belts, but similar plates were also used as fastenings on the closing straps of books, with the central perforation fitting over a pin on the other board of the book (*cf.* Egan and Pritchard 1991, figs 123 and 124, no 1060; dated early 15th-century). Two other plate fragments (SF6857, not illustrated) appeared to have been wrapped in leather or fur, possibly stable debris.

A more substantial mount (SF6927) may be a decorative nail rather than a dress fitting (*cf.* Egan and Pritchard 1991, 242–243, fig. 155, no.1301; dated 1330–1380).

Mounts and Studs

SF6927 **Stud** with flat circular head and long rectangular-sectioned shank. The top surface of the head is gilded and decorated with six regularly spaced radiating engraved lines.
50296, fill of well 50108, Period 5.2, G5/24

SF6995 Incomplete convex circular **belt-mount** with repoussé concentric mouldings, broken at central rivet hole.
50296, fill of well 50108, Period 5.2, G5/24

SF6997.00 **Belt-mount**, hollow domed flat-topped gilded mount with bent-over attachment shank
50296, fill of well 50108, Period 5.2, G5/24

SF6997.01 **Belt-mount**, quatrefoil, with repoussé central boss surrounded by pellets and trefoil lobes, with separate central rivet with circular rove.
50296, fill of well 50108, Period 5.2, G5/24

SF7001 **Mount**. Mount, made from two rectangular plates, with large central circular hole and a small rivet in each corner. L: 36mm.
50317, fill of well 50108, Period 5.2, G5/24

SF7006 **Mount**. Rectangular plaque with large rivets and square rove, remains of textile. ?Belt fitting. The plaque is decorated with cast relief ornament and possible gilding but the motif cannot be identified with certainty. Not illustrated.
50317, fill of well 50108, Period 5.2, G5/24

SF7012 **Mount**. Five circular convex belt-mounts, one with central repoussé boss and no visible means of attachment (*cf*.. 6911, where other examples are listed); one with central perforation; two gilded with attachment shanks (illustrated); and one perhaps with white-metal coating and attachment shank.
50317, fill of well 50108, Period 5.2, G5/24

SF7043 **Mount**. Gilded hollow trefoil belt-mount with bent-over integral central attachment shank. [*cf*..5229]
50284, fill of well 50108, Period 5.2, G5/24

SF7072 **Mount**. Hollow circular convex belt-mount with central rivet hole.
50317, fill of well 50108, Period 5.2, G5/24

SF7076 **Strap with mounts**. Two decorative strap plates of gilded copper alloy, mounted on the remnants of a woven textile strap. Each is secured with a single central rivet with a large rectangular rove on the underside to prevent the rivets from pulling through the fabric. The plates are decorated with a stylised displayed eagle within a raised border. The plates are 20 x 22mm., the width of the strap being approximately 22mm. The textile is silk, patterned with madder (Crowfoot, this volume).
50317, fill of well 50108, Period 5.2, G5/24

SF7116.03 **Stud**. Three possible studs, one with convex lobed head and short surviving shank, one with convex circular head and no shank and one with fragmentary circular head and broken central perforation. L: 14mm.
50321, fill of well 50108, Period 5.2, G5/24

SF7261 **Mount**. U-sectioned bar-mount with central rivet hole and incurved short edges, possibly from a clasp (*cf*..SF122, 5636). L: 19mm.
50295, fill of well 50108, Period 5.2, Group5/24

SF7546 **Mount**. Square belt-mount with repoussé trefoil at each corner and central circular boss within a sunken square. Part of the central boss, presumably the site of an attachment hole or rivet, is torn away. W: 13mm
50317, fill of well 50108, Period 5.2, G5/24

SF7551 **Mount**. Sub-circular mount made of very thin sheet, with deeply cut scalloped edge, each scallop having nicks cut into the edge. Six circular perforations, and one square attachment hole in the centre.
50301, fill of well 50108, Period 5.2, G5/24

SF7584 **Mount**. Incomplete sexfoil repoussé mount, with most of edge missing. Central rivet hole within a central circular boss, which is surrounded by six dished foils, then an outer ring of six similar foils set between.
50296, fill of well 50108, Period 5.2, G5/24

SF7586 **Mount**. Incomplete repoussé sexfoil mount, only four foils surviving, with separate central rivet.
50296, fill of well 50108, Period 5.2, G5/24

Leather Belt

SF6948 **Belt**. Fragment of leather strap with copper alloy fittings. Remains of two stud shanks with small washers and roves on reverse to secure them. Another fitting has a looped head passing through a sub-rectangular rove and may have been some form of closure or for suspension. Impression of another stud in the leather. Not illustrated.
50301, fill of well 50108, Period 5.2, G5/24

Iron mounts/studs
by Quita Mould
(Fig.9.10)

Mounts were used to decorate leather straps and belts, harness and upholstery. Most of the 39 mounts from the well derived from spur leathers (see below). The majority are round, dome-headed studs (28 examples; *e.g.* SF6914.4 x 2) principally with a central hole for the attachment of a separate rivet. One example was found with a rivet with a copper alloy washer or rove (SF6940.8). Two mounts with a decorative sexfoil head and an example with a quatrefoil head were noted (SF7136.5). Several retained the remains of leather to which they had been attached indicating that they had been used; there were suggestions, however, that others may have been manufactured in the vicinity (see 'Metalworking' below). Large flat-headed nails (*e.g.* SF6944.22) were probably used on upholstery.

Four additional dome-headed mounts, one with a possible decorative non-ferrous metal coating and two conical-headed mounts were recovered from fills of putlog holes within the well.

SF6940.8 **Studs**. Two round dome-headed studs with small copper alloy washer attached to the shank. Diam 11mm ht 5mm
50300, fill of well 50108, Period 5.2, G5/24

SF6914.4 **Studs**. Dome-headed stud with non-ferrous metal plating Diam 15mm. Sexfoil mount with central boss and non-ferrous metal coating, Diam 20mm
50296, fill of well 50108, Period 5.2, G5/24

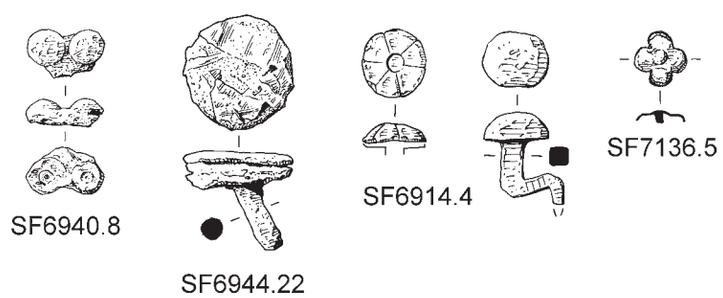


Figure 9.10 Iron studs and mounts (SF6940.8, 6914.4, 6944.22, 7136.5). Scale 1:2

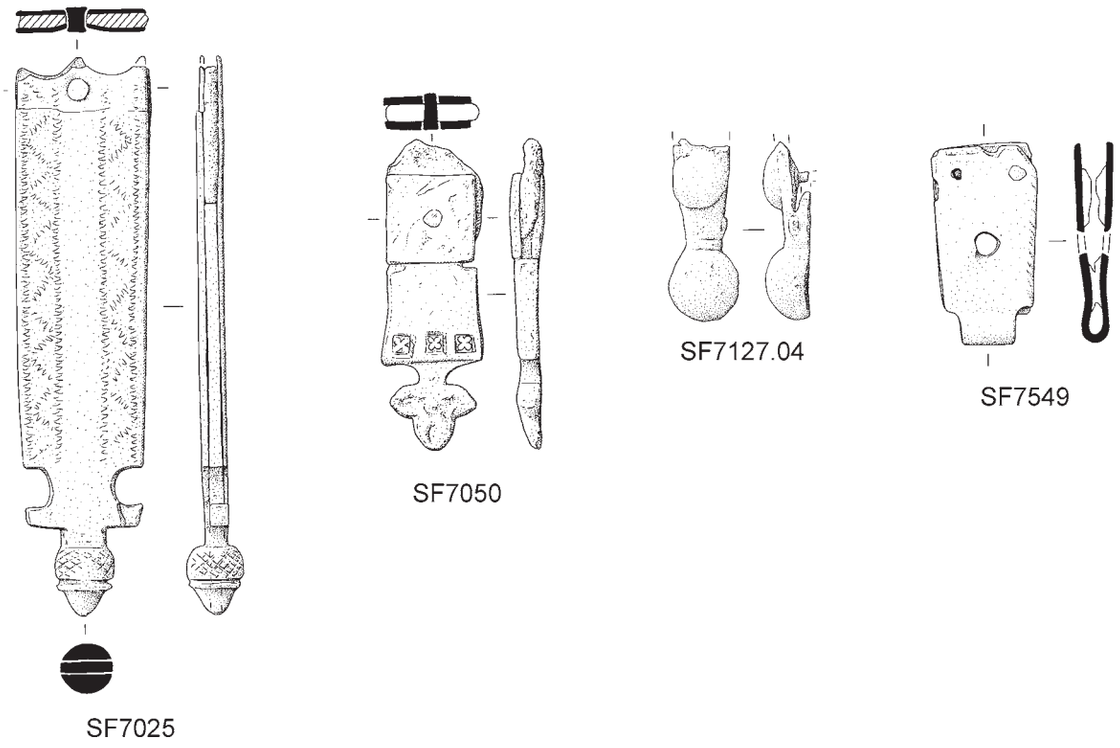


Figure 9.11 Copper alloy strap-ends (SF7025, 7050, 7127.04 & 7549). Scale 1:1

SF6944.22 Nail. Large, flat-headed nail with head covered in copper alloy sheet, probably for upholstery. Diam 30mm shank 20mm
50296, fill of well 50108, Period 5.2, G5/24

SF7136.5 Mount with quatrefoil head and central shank. L: 13mm
50284, fill of well 50108, Period 5.2, G5/24

Copper alloy strap-ends
by Alison Goodall
(Fig.9.11)

Eight copper alloy strap-ends came from the well, of which a selection are illustrated and catalogued here. Strap ends with forked spacers and decorative finials or knops, like SF7024 (not illustrated), date from the 14th century and SF7050, which is an unusual form of strap end, is probably also medieval. Strap-end SF7024 had the remains of a tablet weave band within it (Crowfoot, below). The strap ends are 14th-century types. Both SF7024 and SF7025 have decorated plates with lines of traced zigzags. SF7024 is the simpler form, being made from two plates attached to a spacer plate, all three layers being cut through to form the small terminal knop. SF7025, on the other hand, has a cast fork-shaped spacer which also forms the acorn knop: the sides of the plates and the spacer have been hollowed for ornament. A fragmentary gilded object (SF7127.04) is split at one end and may be a form of strap end. However, it also has similarities to the various forms of gilt binding strips found for example at Castle Acre (A.R. Goodall 1982a, 235–6) and Goltho Manor (A.R. Goodall 1987, 173–6), and may therefore be related to the strips and mounts discussed below (see also Chapter 6.III).

A folded strap-end or buckle plate (SF7549) is similar to examples from London (Egan and Pritchard 1991, 116–120, 154–155). If it was used with a folding strap clasp, a late 13th- to early 15th-century date is suggested; if used with a hinged loop, a late 14th- to early 15th-century origin is more likely.

SF7025 Strap-end. Strap-end with forked spacer between two shaped plates. Spacer has well-made acorn knop. Outer plate has two longitudinal panels of rocked-tracer decoration. There is a single rivet at the open end and the upper edge has double convex shaping. Part of leather strap survives between plates. L:77mm.
50317, fill of well 50108, Period 5.2, G5/24

SF7050 Strap-end. Unusual gilded strap-end cast in one piece. The body is composed of two square fields, divided by a notch mid-way on each side. The upper square is split, and contains a leather strap, secured by a single central rivet. The front is gilded, and there is a trefoil terminal modelled in relief. The base is decorated with three stamped quatrefoils in square fields.
50318, fill of well 50108, Period 5.2, G5/24

SF7127.04 Strap-end. Key-hole shaped gilded strap-end, with solid hemispherical terminal and broken split end with single rivet and circular boss.
50321, fill of well 50108, Period 5.2, G5/24

SF7549 Strap-end or buckle plate. Folded rectangular plate with cut-out recess for folding strap clasp or hinged loop. Both the front and back plates have a large circular central perforation and a white-metal coating; the front plate has serration along one long edge. L: 28mm
50300, fill of well 50108, Period 5.2, G5/24

Iron strap-ends and lace-tag
by Quita Mould
(Fig.9.12)

Amongst the five iron strap-ends the plain examples of simple folded strip (SF7264 and 6935.12) are likely to have been used on spur leathers or possibly shoe straps. A small number of similar examples have been found on shoe straps dating to the first half of the 15th century in

Figure 9.12 Iron strap-ends (SF6935.12, 6936,07, 6936.1, 7264 & 7439). Scale 1:2. Copper alloy lace-tag (SF7022).

London (Grew and de Neergaard 1988, 76 fig. 110). An example with a round terminal (SF6936.07) is reminiscent of a shield-shaped strap end (Egan and Pritchard 1991, 156–158) but is larger than the London examples cited. SF6936.1 has chip carved decoration. Another object (SF7439) is reminiscent of a large lace-tag or 'aiglette' and could have been used to decorate the end of a thong on horse harness, or upholstery, the draw string of a bag *etc.* (Egan and Pritchard 1991,285–6).

SF6935.12 Strap-end of folded sheet with single rivet and fragment of leather strap remaining. Straight terminal decorated with cross-hatched incised lines and white metal coating. L: 28mm w: 12mm
50296, fill of well 50108, Period 5.2, G5/24

SF6936.07 Strap-end with round terminal with decorative finial, the straight end has a single rivet, non-ferrous metal plating visible in radiograph. L: 52mm max w: 25mm.
50296, fill of well 50108, Period 5.2, G5/24

SF6936.1 Strap-end tapering strip with forked terminal with remains of leather present held by a central rivet. The terminal has faintly chip carved decoration reminiscent of animal headed ornament with a raised central panel below. Non-ferrous metal coating visible in radiograph. L: 60mm w: 13mm.
50296, fill of well 50108, Period 5.2, G5/24

SF7264 Strap-end of folded sheet with rivet hole at the open end which contains fragment of the leather strap within. L: 29mm w: 11mm
50295, fill of well 50108, Period 5.2, G5/24

SF7439 Rectangular-sectioned **aiglet** with single rivet tapering to a gently pointed tip with non-ferrous metal coating. L: 38mm w: 14mm.
50284, fill of well 50108, Period 5.2, G5/24

Copper alloy lace-tags
by Alison Goodall
(Fig.9.12)
A total of twelve lace-tags, including fragments, were recovered. Types 1–3 (Margeson 1993, 22–23) and indeterminate types are represented (see note in Chapter 8.III). Lace-tags would normally be expected to be more numerous if the well fills had continued to accumulate throughout the late medieval and early post-medieval periods. Lace-end SF7022 (probably type 3; Margeson 1993, 22–24) has been made from rolled sheet and this type of lace-tag is generally found to be slightly earlier than those made by folding the sheet. The earliest example in the sequence came from one of the lower fills (*50310*, G5/23), associated with pottery of late 14th-century date, although lace-tags came into use in the 15th century.

SF7022 Lace-tag. Large tapering lace-tag, The seam is overlapped at the top and bottom, but edge-to-edge in the middle.
50317, fill of well 50108, Period 5.2, G5/24

Personal Possessions

Iron purse frame
by Quita Mould
Four pieces broken from an iron purse frame (SF6913.07, 6935.21, 7287.06 and 7462, none illustrated) were found in fill *50295*.

Copper alloy mirror case
by Alison Goodall
(Fig.9.13)
A mirror case (SF6932) is incomplete and was therefore probably thrown away as useless. Mirrors and their cases have been studied by Bayley *et al.* (1984, 399–402). The type of punched or traced decoration on the Norwich example is quite usual, although a more common design is that illustrated by examples from London (Egan and Pritchard 1991, 361–2, fig. 241.1714–16) showing an open cross formed from four arcs of punched decoration, with a vertical line of punching running down the middle. The dating is 13th- to 14th-century. Another mirror case from Winchester still retains fragments of convex glass inserts; its context is dated tentatively to the early 14th century (Biddle 1990, 656, fig.178.2103).

SF6932 Mirror. Part of a shallow circular mirror case with unusual punched dot decoration of fourteen unevenly spaced radiating double lines apparently forming a lobed or petalled motif. On one side of the mirror case is a broken projecting loop; on the other is one complete loop and the stub of another, which together with a bar would originally have formed a hinge.
50296, fill of well 50108, Period 5.2, G5/24

Bone pens/pins
by Julia Huddle
(Fig.9.14)
The vast majority of the bone objects recovered from the well are bird bones which have been cut at one end, generally on one side, with one or more cuts at an oblique angle forming a `point'. A total of 39 of such bones came from the site as a whole, of which 34 were from fills of the well. One other is from a ?12th-century ditch fill (Ditch 12, G1/51, Period 3.2), while the remainder are unstrati-

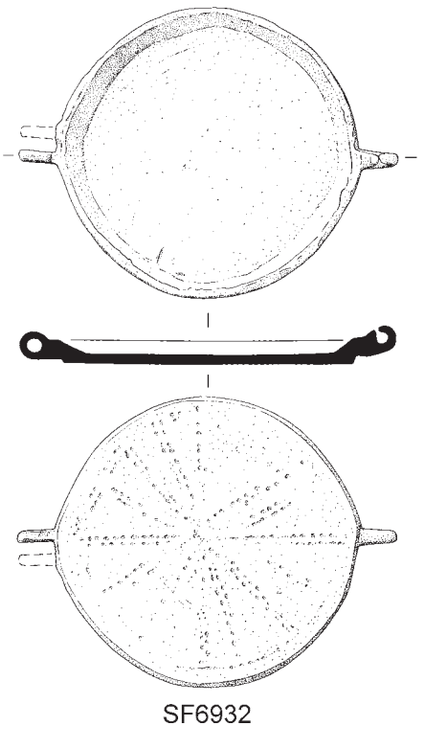


Figure 9.13 Copper alloy mirror case (SF6932). Scale 1:1

fied or come from modern features. Previous examples from Norwich come from a 13th- to 14th-century pit (Hurst 1965) and contexts ranging in date from the 14th to the 16th century (Margeson 1993, 68–9). Although the function of these items remains uncertain, the quantity recovered in the barbican well suggests that they were used nearby and then discarded either *en masse* or in small groups by the person(s) using them.

Two examples (SF6178, not illustrated and 7184) are cut all round the shaft forming the type of point found on a knitting needle or a knife-sharpened pencil. Thirty-six pieces are made from goose radii (*e.g.* SF7098, 7604 and 7098), the remaining three from chicken radii (*e.g.* SF7602). The vast majority have points formed at the distal end; only four have points at the proximal end and a few are incomplete. Four pieces have knife marks on or near the heads (articular ends). These knife marks may be a result of the deliberate selection of goose carpometecarpals (*cf.* Moreno García; Chapter 9.IV and Part III, Chapter 4).

Elsewhere these objects have been tentatively described as medieval pens: MacGregor (1985, 125–6), Biek (1965, 172–3) and Margeson (1993, 68–69). Examples from York (MacGregor 1985, 125) and Boston (Moorhouse 1972, 21–55) have contemporary ink stains on them although most authors note that the lack of split ends appears to render these objects useless as pens, since the split (found on quills and fountain pens) allows for capillarity and flexibility. None of the Castle Mall examples had split ends and none showed wear patterns indicative of use as pens, the tips generally being quite smooth and rounded.

Other interpretations summarised by MacGregor (1985, 125–126) include use as lining pens, scoops or measures for softened galls (used in the preparation of ink), pipettes for charging quill pens and holders for broken quills. It appears that the group from Castle Mall could not have functioned as pipettes, scoops or measures, since three examples are made from chicken radii (which are considerably smaller than goose radii) and two have closed points. The most likely function appears to be either for boring (Biek 1965, 172–3) or as a simple form of stylus for use with wax tablets (Ian Riddler, pers. comm.). Styli made of lathe-turned bone with rounded heads and iron points inserted in their ends are well known from medieval and early post-medieval contexts (see below).

SF7098 **Pin/pen**. Three goose radii, each with oblique cuts at distal ends forming pointed ends.
50320, fill of well 50108, Period 5.2, G5/24

SF7184 **Pin/pen**. Goose radius with oblique cuts at distal end forming a point, tip missing.
50285, fill of well 50108, Period 5.2, G5/24

SF7602 **Pin/pen**. Chicken radius with oblique cuts at distal end forming a point.
50296, fill of well 50108, Period 5.2, G5/24

SF7604 **Pin/pen**. Goose radius with oblique cuts at proximal end forming a point.
50320, fill of well 50108, Period 5.2, G5/24

Stylus
by Julia Huddle
(Fig.9.14)

A bone stylus with inserted iron point (SF6899) is of a type commonly recovered from similarly dated contexts. Three others found were elsewhere at the Castle Mall site (see Chapter 8.III).

SF6899 **Stylus**. Bone stylus with spherical head and simple collar. Inserted iron point.
50296, fill of well 50108, Period 5.2, G5/24

Copper alloy nail cleaner/tooth pick
by Alison Goodall

Two nail-cleaners/toothpicks or lace-tags (SF7116.02, not illustrated) made from two lengths of fine wire, each bent double and twisted leaving a loop came from fill *50321* (*cf.* Margeson 1993, fig. 32, nos 400, 401). The two twists are corroded or possibly linked together. See Chapter 8.III for an illustrated example (SF7556) and discussion.

Textiles
by Elisabeth Crowfoot and Penelope Walton Rogers, with Peter Collingwood
(Fig.9.15)

The most striking textile finds from the Castle Mall excavations come from the filling of the well, where they were probably discarded late in the 15th century. The high quality of some of the metal-ware perhaps suggests a connection with residents at the castle: book clasps, the remains of a box-cover and gilded plaques from a girdle of a style fashionable in the 14th and 15th centuries. Many of the other textiles are fragments of tablet-woven bands.

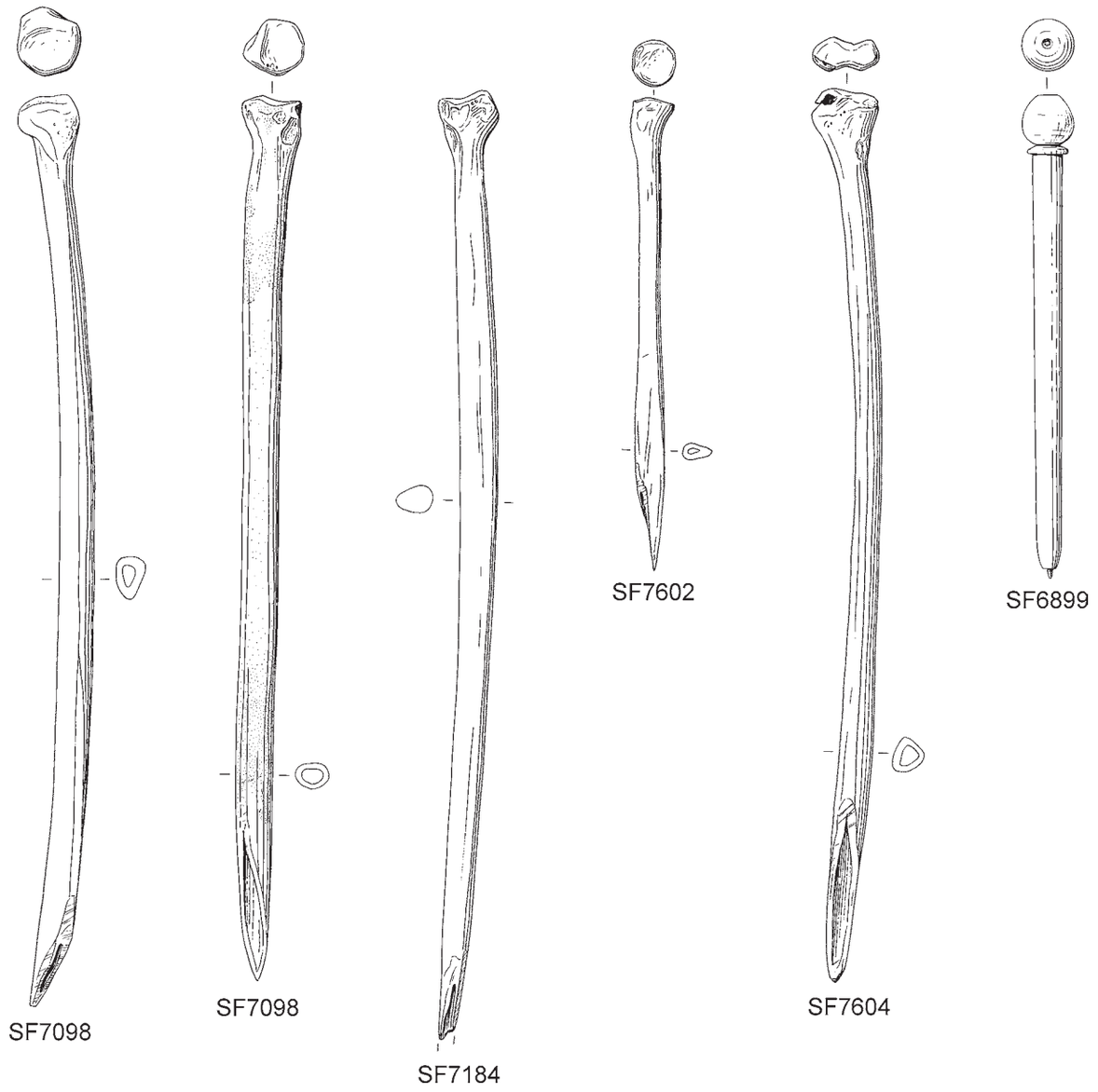


Figure 9.14 Bone pins/pens (SF7098 (x 2); 7184, 7602 & 7604); bone stylus (SF6899). Scale 1:1

Vegetable fibres

The presence of possible fine flax, now charred black, forming a knot of soft tabby folds (SF6986, Fig.9.15) and coarser fragments of undyed flax or hemp (SF7111, not illustrated) could suggest that some of the metal objects deposited into the well may have been deliberately wrapped. A jetton (SF7101) was found in association with folded worsted.

Animal fibres

Most of the recognisable woollen fragments are from garment fabrics of variable quality. They reflect the usual remains from domestic and minor commercial activities; worn areas and scraps from seams and hems, discarded during the thrifty re-making of garments, familiar from medieval and post-medieval town existence. A good proportion of these wool remains have mixed spinning, Z?warp and S?weft, with clear traces of the finishing processes, fulling and raising a nap, characteristic of the 'English broadcloth' (*e.g.* SF6924, not illustrated). This product was responsible for much of the late medieval trading wealth of England, shared by Norwich as a 'stable town' controlling the standards of the local wool trade. The appearance of this cloth has recently been confirmed by Dr Philippe Wolff's discovery of a letter in the archives of Toulouse, of April 1458, regarding the purchase of four lengths of this product, with samples of cut cloth still pinned to the document (Wolff 1983, 120–125). A few other wool scraps from the Norwich well illustrate the other important commercial weave of the district, worsted, a twill made with yarns of combed wool, spun on the spindle (rock), not the wheel, said to take its name from the village of Worstead in Norfolk. This has a hard shiny surface regarded as dust-repellent, particularly suited to bed-curtains and other household furnishings (*e.g.* SF7101).

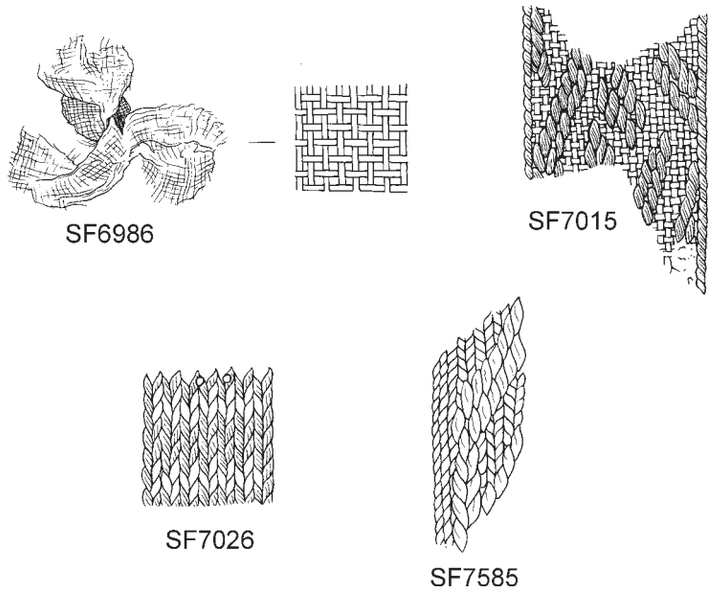


Figure 9.15 Textiles (SF6986, 7015, 7026 & 7585). SF6986 fragment at Scale 1:2, details at Scale 2:1

The remains on the box-cover (SF6934, Fig.9.28) suggest that it was perhaps covered with patterned cloth, two layers of wool, the one next to the metal a light brown Z-spun tabby weave; above this lie coarser red S-spun threads from a second textile, or possibly a pattern on the tabby ground.

Tablet-weaves and other silks

One piece of a narrow strap adhering to a probable stirrup-buckle is of particular interest, owing to its likeness to an example from Felixstowe already in the Castle Museum. This band was analysed and published by Mrs G. M. Crowfoot (1951, 202–204); the design and technique in the two items is so similar that it is tempting to think that they were produced by the same weaver. The Suffolk band was woven in shades of flax thread, ?undyed and light brown; the Castle Mall band (SF7026) has a very similar pattern of chevron stripes, but woven in undyed hemp thread, and dark brown naturally pigmented wool. The weave would have been made with 2-hole tablets, producing a very strong solid fabric that could certainly have been used for stirrup-straps instead of leather (see Egan and Pritchard 1991, 132).

The 2-hole technique is also used in the other tablet-woven bands from fills of the well, though these are all of silk, the fragments being preserved by the metal of girdle-mounts. Dr Peter Collingwood, to whom photographs of two of the bands were sent (SF7015 and 7585), describes their techniques:

SF7585 Apparently 2-strand warp twining, with warp floats made by letting tablets 'idle' in some sequence — *i.e.* selected tablets are pushed forward out of the pack and are not turned for a certain number of picks, then returned to the pack. When out, the threads they carry make floats on front and back. It would be easy to do this with tablets with holes in the centre of the sides, or at the corners, and giving the pack half-turns forward or backward. The tablets are alternately S and Z threaded.

SF7015 Apparently exactly the same design idea as SF7585, but based on a warp-face plain weave, not warp twining. This would be simple to work on tablets turned one-quarter forwards, one-quarter backwards.

The silk of all the fragments is now dark brown. No dye could be identified in SF7585, but in SF7015 the ground was originally undyed, probably the light gold of much good silk, and the long pattern floats red, dyed with madder (Walton-Rogers, below). The pattern remaining on SF7015 shows a geometric design with strong diagonal lines, perhaps from the swastika or fret patterns so familiar from earlier brocaded tablet-weaves (Fig.9.15).

It is likely that both these silk bands come from fashionable women's girdles. Metal studs are commonly found on leather belts (Egan and Pritchard 1991, 168ff; like the narrow fragment (SF7427) from the well decorated with seven round studs) but narrow tablet-woven bands of the 14th and 15th centuries are also among the London dress accessories (*op. cit.* 48, 49); one of these, of silk, has at intervals plain metal bar mounts. The writers describe girdles of the 15th century being woven to imitate 'expensive fabrics such as velvet, satin and satin damask', into which category the Castle Mall patterned silk bands might come. The length of girdles varied, but the end hanging from the buckle in the front of the waist could reach almost to the feet of the wearer (*op.cit.* figs. 10, 20, 139), the most ornate decorated with metal plaques for the whole length. The single square mount surviving from SF7585 is undecorated, but the two gilded mounts ornamented with displayed eagles (SF7076) would have made this a very opulent dress item, reminiscent of the 'girdle of green silk garnished with silver' bequeathed in 1456 by a London silkweaver to her apprentice (Dale 1932–4, 327).

One other silk item from the well is a recognisable feature from the decoration of fashionable men's and women's garments of the late 16th century. Threads from embroidery (SF7017, not illustrated) were also silk, again covered with silver-gilt strip; most of the metal has gone, except for blackened fragments preserved by silk couching stitches holding them down. One tiny fragment survives to suggest that this tangled mass probably came from a panel embroidered with flowers, a small leaf shape in very fine tabby.

Silkworking
Much has been written about the wool trade of Norwich, but the same attention does not seem to have been paid to the silkworkers. From Marian Dale's account of the *London silkwomen of the 15th century* their organisation and status is clear. Without being a recognised guild, the craft was governed by the same practice; girls were accepted by recognised silkwomen in London from all over the country, Yorkshire, Lincolnshire, Norfolk, Buckinghamshire and Bristol, boarded and trained as apprentices for seven years, after which they could return to their native town to work, 'not under special regulations of the craft, but under the local customs in force for other female workers' (Dale 1932–4, 325); they could be traders, but were skilled in 'throwing' (preparing) the silk, and weaving it into 'corses, ribbons, and laces, fringes, buttons and tassels, cauls for the hair, and other trappings' (*op. cit.* 331–332), minor decorative products with which the male workers (mercers) were not concerned. Here in the rubbish at Castle Mall we have evidence of some of the work of the Norwich silkwomen, which is detailed further in Chapter 9.I.

Microscopy of fibres
Samples from textiles and other fibrous materials were examined with a transmitted-light microscope fitted with a polarising analyser, at x 100 and x 400 magnification. By this means it was possible to identify non-textile fibres.

Matted lumps of feathers, moss and decayed leather all came from the well, which also yielded several clumps of raw animal fibre (SF6857 and 7553). SF6857 included three or four different sets of fibres, comprising white wool, possible brown wool, pigmented fibres from a short-haired animal, and a number of animal fibres in a matrix of organic matter, probably the remains of an animal pelt. The fibres in SF7553 on the other hand, were all of one type. They consisted of short, fine and medium-coarse fibres which seemed to be flattened and twisted in places. They had the ladder medullas which are typical of fur, but while some were uniserial, others were multiserial, a feature seen in mouse, rabbit and hare. The scales (all animal coat fibres have overlapping scales on the outer surface) had prominent margins and the patterns they formed were `irregular petal' and `irregular waved mosaic' with smooth near margins; pigment was sparse (for explanation of terms, see Wildman 1954 and Appleyard 1978). These fibres are clearly from the fur of a small mammal, mouse being the most likely candidate (Appleyard 1978, 18–19).

The woven and knitted goods (see Chapter 8.III) proved to be made from the typical range of medieval and post-medieval textile fibres, that is, wool, silk and flax or hemp. Wool was identified from scale patterns, which were generally `irregular mosaic' with smooth near margins. Most samples consisted of fine and medium fibres, although there were coarser-fibred wools in SF7545. No pigment granules were observed, indicating that all the wool came from white sheep.

Silk was represented by long, fine, smooth fibres with no visible internal structure and by the blue coloration which appeared as the polariser was rotated. In SF7006, many of the fibres lay in pairs, which suggests that they had not been fully degummed (the silk moth, *Bombyx mori*, exudes paired filaments in gum), but in all the other samples, the filaments were single and therefore fully degummed.

Finally, plant-stem fibres (often known as `bast') were observed in textiles SF6986 and 7026. SF6986 was carbonised, but could be identified from the smooth profile of the fibres and the regular joints, known as `dislocations'. In SF7026, a dark wool yarn had been combined with a paler plant-stem fibre yarn. In this instance, the stem fibres had not been fully processed and the fibres lay together in bundles, as they would have done in the plant, with some of the original parenchymal tissue still in position. This partial processing is usually applied to hemp rather than flax and can be seen in another late medieval tablet braid, from Hull (Walton 1987, cat.no.161).

Analysis of dyes
Samples from five wool and four silk textiles were tested for dye using standard procedures based on solvent extraction followed by absorption spectrophotometry and thin-layer chromatography (TLC) (Walton and Taylor 1991). Dye was detected in several wool and two silk textiles. A red madder-type dye was found in SF6948, SF7015 (pattern weft) and SF7076. In SF6948, the principal constituents proved to be alizarin and purpurin, detected by TLC, indicating that the dye source was almost certainly the roots of Dyers' Madder, *Rubia tinctorum* L., which was imported from the Netherlands in late medieval and post-medieval times. In the other madder-dyed textiles the dye was too weak to allow distinction between Dyers' Madder and other madder and bedstraw dyes. Tillyard (Part IV) notes that a garden in the parish of St Peter Mancroft next to the castle ditches (somewhere to the north of Property 2, Fig.8.2), was called 'le Mader yard' in 1357/8. Madder was also grown by the Priory garden near St Mary in the Marsh churchyard and there was another `Madiryerd' in the parishes of St Margaret and St Olave, both recorded in the same decade (Kirkpatrick 1889; *cf.* St John Maddermarket).

The blue colorant, indigotin, was also identified in SF6924. It is not possible to distinguish chemically between indigotin from woad and indigotin from indigo, although woad, a vat dye derived from the leaves of *Isatis tinctoria* L., is more likely in a 15th-century English textile, as imported indigo did not seriously rival it until the 16th century (Hurry 1930, 284–7).

Furnishings and Household Equipment

Furniture Fittings

Antler casket mount
by Julia Huddle
(Fig.9.16)
An antler strip (SF7441) may simply be a part of a box or casket mount, although the surface treatment on the face and its wedge-shaped profile suggest that the shaping may have had some functional purpose.

SF no.	*Context*	*Measurements*	*Fibres*	*Spinning*	*Twist*	*Weave*	*Thread count*	*Colour*	*Comments*
6857	50285		leather, hair, sheepskin	-	-	-	-	-	matted round thin fragment Ae plate. Probably stable debris.
6924	50301	circle, diam: 11	wool	Z/S	m-l/l	tabby	9/18–20	blue, indigotin	on Cu alloy studs, traces, held by nail; ?warp concealed, napped; underside clear
6934	50300	(a) 35 x 7	wool	Z/Z	m	?tabby	12–15/12 (6 .5mm)	light brown	on lock, against metal
		(b) 55 x 15	wool	S/-	l	?pattern on (a)	9/12	red-brown, madder	above (a); very coarse threads
6948		14 x 16.5, (diagonal)	wool; unpigmented	Z/S	m/l	tabby	8/7–8 on 5mm	red, madder (alizarin)	cut strip, with belt, (leather)
				5 ply	-	threads	coarse	brown	near ring, ?tying
6986	50301	*c.* 55 x 45, 40 x 36, 50 x 60	vegetable, probably flax	Z/Z	m/m-l	tabby	12/15, 13–14/15, 12–13/18–19	black (charred)	originally fine, soft, ends of ?veil, folds, knot (Fig.9.15)
7006	50317	*c.*14 x 13	silk, not completely degummed	S (slight) ground S (multiple)	reeled (pattern)	tablet-band tablet-braid, 2-hole, warp-face tabby	see 7015 7016	(pattern) red, faint, madder	Mount, rivetted plate, fragment behind
7015	50317	*c.*40 x 21–22 Ls.20,25,15	silk, degummed	S/S (slight) pattern multiple	fragments loose	ground, pattern floats (p.680)	wefts/7	ground, undyed; pattern madder	(Fig.9.15)
7016	50317	width *c.*20	deteriorated ? wool	Z/S	-	traces	ends *c.*12 on 4mm	no dye detected	traces, Cu alloy mount
7017	50317	-	silk core, wrapped metal, Ag gilt	S ply	-	embroidery	-	no dye detected -	mass confused threads, patches, ? leaves
						? tabby patch	4/4 on 1mm		
7024	50317	w.*c.* 1.5mm	wool	Z/sl. S	l/-	tablet-band	4 (5mm)/7 (10)	? undyed	broke ends, inside buckle
7026	50317	23 x 11.5	wool, hemp/wool (partially processed)	Z,S ply/?Z	l,l/-	tablet-4-hole (Y meeting) (see p.680)	12 cords/g	wool, natural dark brown; hemp undyed	inside strap buckle, chevron pattern, (Fig.9.15)
7076	50317	(c) 21–2 x 22	silk, degummed	S (slight)/S multiple	l.	(see 7015)	see 7015	pattern madder	on square mounts with displayed eagles, belt or girdle
7101	50285	25 x 20, 15 x14	wool	Z/Z	l/l	2/2 twill	16–18/16	dark brown (no pigment)	with jetton, folded; shiny worsted, edge cut
7111	50320	36 x 20, 15 x 20	flax/hemp	Z/Z	l/l	tabby	11/12, 13/13	undyed	loose weave, pulled diagonally

SF no.	*Context*	*Measurements*	*Fibres*	*Spinning*	*Twist*	*Weave*	*Thread count*	*Colour*	*Comments*
7215	50300	23 x 12	mineralised? silk	S	l/l	tablet-band, ?tabby + floats	-/6–7 on 5 mm	-	inside buckle shape, 2 layers, (cf.SF7015)
7293	50284	-	mineralised, ? wool	Z, S	m, m	threads	-	light brown	fibres, traces round stud
7310	50320	-	mineralised, ? wool	Z, S	l.	threads	-	-	round stud, and traces on pin
7427	50284	L.60, wid. 8–9 thickness 2–3	leather and ? threads, mineralised	S	-	threads?	-	medium brown	cut strip, 7 Ae studs, gilded
7545	50317	(traces)	wool	S/S	v.l./m	?twill	-		? textile, back of mounts, ? book covers
				S ply	t.	? sewing	-	? undyed	
7553	50301	-	feathers, ? leather horsehair ?mouse fur	-	-	-	-	brown (leather) black	belt in buckle; horsehair. Possibly stable debris.
7585	50296	L.28, width 2–22	silk,degummed	S (slight)/S	v.l./l.	tablet-band; 2-hole, alternate Z, S, float pattern; 2 4-hole edge?	2g/13.14 (on 21mm)	? undyed	on square mount, cut edges (Fig.9.15)

Table 9.7 Textiles from the well shaft

SF7441 **Artefact**. Incomplete wedge-shaped antler strip of plano-convex section, with two pierced iron stained circular holes. The front is highly polished and there is a slight thumb-nail depression on one side towards the thin end. The back is incised with criss-cross lines, presumably to form a key for glueing.
50300, fill of well 50108, Period 5.2, G5/24

Bone fittings
by Julia Huddle
(Fig.9.16)

Amongst the worked bone assemblage recovered from the barbican well are two finely carved items. One (SF6901) is a plaque, probably from a casket, dated on stylistic grounds to the 14th century and probably of English origin. The other (SF7095) is thought to be part of a reliquary or similar and dates to the 14th–15th century.

The probable casket mount (SF6901) is a carved plaque with castellated top and ogee-shaped arch at the underside. It is scored across the back with cross-hatching at each side and vertical lines in the centre, presumably to help hold it in place or at least keep it from slipping. Furthermore there are two rivet holes providing an additional means of fixing. Carvings, cut in low relief, adorning high status items such as caskets are more usually found in ivory which is superior both in terms of prestige and as a raw material, capable of being carved to a reasonable depth and with no marked surface texture (MacGregor 1985, 38 and 127). Ivory carvings displaying ogee-headed arches with crockets and finials include many 14th-century examples, most notably from France. The latter include, for example, an ivory casket of the early 14th century in the Musée de Louvre, Paris depicting the History of Saint Percival (Musée de Louvre 1998, 166, no. 102). English ivories although less common include the particularly splendid triptychs and two leaves of a ?polyptych of John de Grandison, dated to *c*.1330–40 (Alexander and Binski 1987, 465–467, nos 593–6).

SF7095 is probably the side panel of a carved bone `frame', perhaps used around a figural scene or on a reliquary, triptych or similar. The front panel must have fitted into the slot on the reverse of the rounded front edge. The `window-openings' suggest the likelihood of a reliquary. Eight bone objects displaying similar castellated architectural forms with window openings are known from elsewhere[1]. An example from London Wall (Guildhall Museum Catalogue 1908, 155, no 170) is described as a 'Reliquary (?), portion; bone, with battlemented top and pierced with architectural design'. It is dated to the 15th century and, like the Castle Mall piece, is the only other

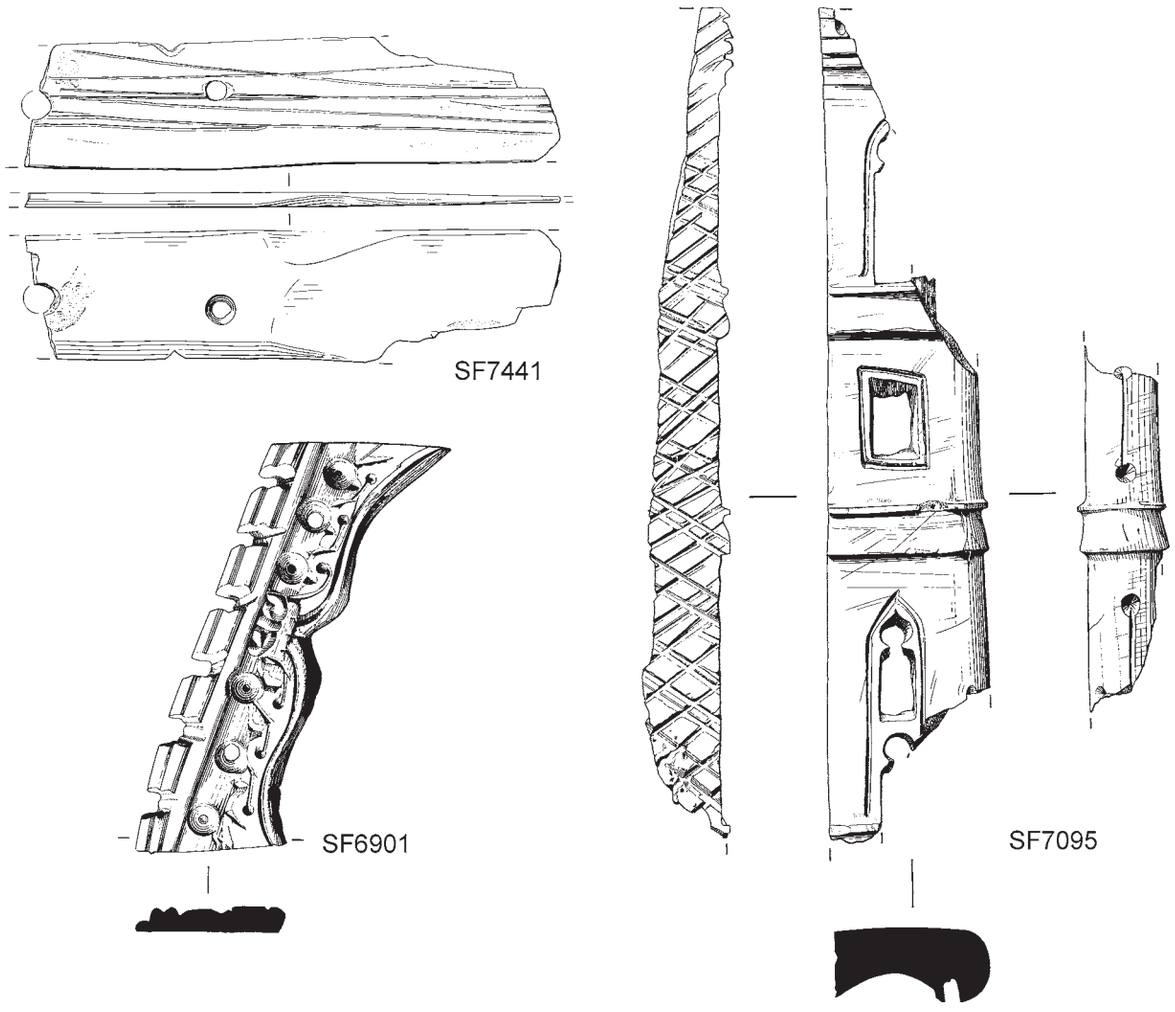


Figure 9.16 Antler casket mount (SF7441); bone plaque (SF6901); carved bone frame (SF7095). Scale 1:1

example carved from a flat plate, rather than a hollow bone. All the other examples described below are made of hollowed sections of long-bones.

Perhaps the finest example of the type, is from Dowgate, Upper Thames Street, London which is 'carved to form a three-storied tower, rectangular in section at the ground floor and below and half-round for the upper floors; crenellated at two levels and perforated with several windows; the back is keyed for adhesion': interestingly, as with the panel from Castle Mall, grooves had been cut into the sides, probably to take panels (MoL acc.no. 86.419/1). Two other examples are known from the Museum of London's collections. One other fine example unfortunately with no record of acquisition or source, is dated to the late medieval period (MoL acc. no. 79.233/5), and another from Fleet Street, London is dated to the 15th century (MoL acc.no. A379). Both of these examples have flattened backs and the former is scored to form a key for adhesion.

A 'roughout for object' from a 14th- to 16th-century deposit at Nicholas Street, Dublin has one arched 'window-opening' and a 'loop-hole' window on the front, mouldings below and above each window continue around the two sides (Walsh 1997, 142, fig. 68, no. 1). Another example from Hereford, Brewery site from period 4c (dated to the 15th and 16th centuries) is described as a castellated carving and is probably complete (Shoesmith 1985, fig. 24, no. 20). It has 'window-openings' on the front and sides with mouldings below the castellations and between the openings. A further example from Bedford (Baker *et al* 1979, 291, fig. 180, no. 1538) is from a medieval pit, and is described as a 'carved and polished part of a whistle or flute with remains of a small bronze rivet on top'. This incomplete example appears to be castellated, although only one castellation survives. On the front is one (probably of an original two), arched 'window-openings' and a 'loop-hole' window; with additional groups of drilled dots, five of which form an arch above the arched window. The decoration continues around the two sides.

Finally, a far less elaborate version of these crenellated bone objects comes from a mid 12th- to 13th-century context in Cambridge (Tebbutt *et al* 1971, 71, fig. 13, no. 13). It has mouldings to indicate separate stories and, rather than carved window openings, it has three incised dot-in-circles, one above the other to represent windows. Like all of the other examples given here, the back is flattened and like most of the others is scored to form a key for adhesion.

Apart from the Bedfordshire and London Wall examples, which are slightly smaller than the others, the scale of these carved items is very similar. The distance between the mouldings is almost identical, as is the size of the window-openings. All examples both hollow and flat carved plates have one undecorated flatter side and it is plausible that they may have been attached here to a frame or similar. It is perhaps also of interest to note that the Bedfordshire example has a 'small bronze rivet at the top', which may have been the method of attachment here rather than glue, as is suggested for the Castle Mall piece.

Given the similarities of these small, carved objects, it seems likely that they may have served a similar purpose. Apart from the example from Cambridge, the examples cited above are all dated to the 14th or 15th centuries, based on the architectural style represented. The Cambridge example, from a mid 12th- to 13th-century context, is less elaborate and may perhaps be seen as a precursor to the more decorative versions noted, including the one recovered from Castle Mall.

SF6901 **Plaque**. Bone plaque with two rivet holes, probably from a casket. The plaque is scored across the back with cross-hatching at each side, and vertical lines in the centre. The underside is an ogee-shaped arch with 3 crockets in the form of profile leaf scrolls on each side of the central double leaf, which has a band across the stem. Above the arch are 6 drilled circular depressions, the central one on each side pierced for rivets. The top edge is castellated with 7 castellations. 14th century, probably English L: 60mm. Description kindly given by Sue Margeson.
50284, fill of well 50108, Period 5.2, Group 5/24

SF7095 **Carved frame**. Incomplete carved frame. Bone architectural feature fragment from tryptych or reliquary or similar. The back edge is roughly engraved with cross-hatching to help hold it in place or at least keep it from slipping. The fragment has a rounded front edge, decorated with tiny drilled `dots' linked by vertical lines in the form of two `loop-hole' windows. There are three `window-openings' in the front between four mouldings. Two windows are arched (the bottom one has two single lights with ogee heads, one above the other); the top one has a single light with an ogee head and the central one is roughly square. There is a vertical slit in the reverse of the rounded front edge, into which must have been slotted the next panel. The rest of the back is left rough and was clearly not meant to be seen. Late 14th/15th century. Description kindly given by Sue Margeson.
50301, fill of well 50108, Period 5.2, Group 5/24

Copper alloy strips and mounts
by Alison Goodall
(Fig.9.17)

Typologically some of the earliest copper alloy finds from the well include a gilt binding strip (SF6852) which may be compared with fragments occurring in large quantities on castle and manor sites of the 12th and 13th centuries, such as Goltho and Castle Acre (A.R. Goodall 1987, 173–6, figs 154–5; A.R. Goodall 1982a, 235–6, figs 43–4). The strip fragment from Norwich is just a single example, which suggests that it was discarded as a broken fragment rather than as an entire object (see also another piece from Golden Ball Street; Chapter 6.III). The function of these gilded strips is still unknown. The sites quoted above demonstrate the range of forms of these bindings: common features are the D-shaped cross-section and the gilding on the upper surface, as well as a common range of decorative treatments. There are always pin-holes for attachment and sometimes the pins, often with domed or globular heads, survive. Also related to these strips are the gilded 'octopus' mounts, like those from Lydford (A.R. Goodall 1980, 164–5, fig. 16.1) and Aberdeen (Murray *et al.* 1982, 186, fig. 107.4). The many small fragments of wood and bone found with some of the strip fragments from Goltho may possibly represent a chest or casket to which the strips were attached.

A possible decorative mount was also found (SF7547). Further evidence for casket locks, keys and hasps is given separately below.

SF6852 **Mount**. Fragment of D-sectioned gilded casket-mount. Pierced circular boss with, on one side, a short bar and a broken u-shaped terminal; on the other, two slimmer curving bars.
50285, fill of well 50108, Period 5.2, G5/24

SF7547 **Sheet**. Part of an object made out of sheet copper alloy with three unevenly spaced rivet holes, one with a surviving iron rivet. One of the long edges has notches all along its length

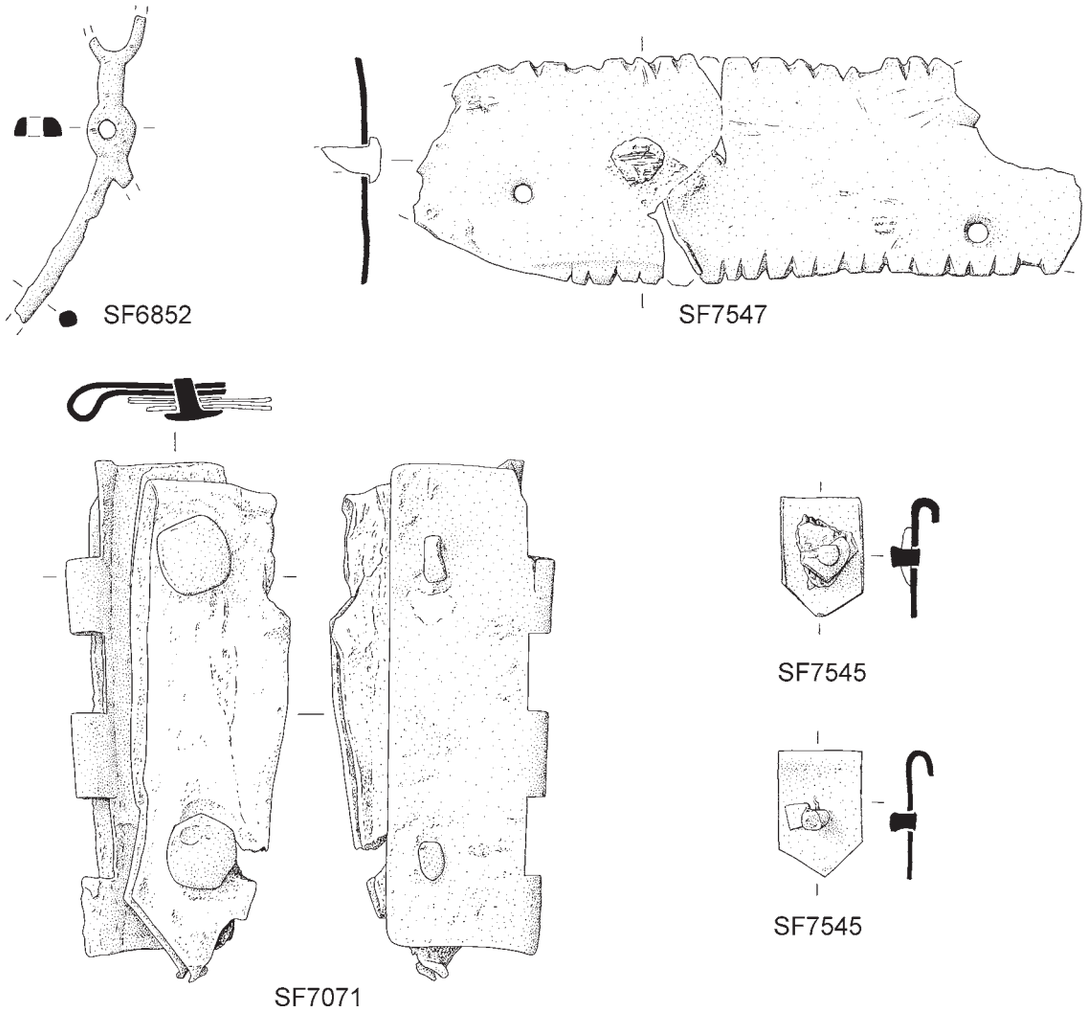


Figure 9.17 Copper alloy casket mounts (SF6852 & 7547); copper alloy hinge (SF7071); copper alloy ?book clasps (SF7545, x 2). Scale 1:1

and one-quarter smoothly curved. Perhaps part of a large decorative mount.
50300, fill of well 50108, Period 5.2, G5/24

Copper alloy hinge
by Alison Goodall
(Fig.9.17)
A gilded hinge (SF7071) is not very substantial and was attached to leather, some of which survives. It probably came from a casket or a book binding.

SF7071 **Hinge**. Rectangular hinge-plate made of thin sheet copper alloy, gilded on the front surface, with three folded loops for hinge-pin to pass through. The plate is attached to leather by two rivets with gilded flat circular heads on the reverse and bent-over shanks on the front. L: 65mm.
50317, fill of well 50108, Period 5.2, G5/24

Copper alloy clasps
(Fig.9.17)
A pair of copper alloy plates (SF7545) were attached to woollen twill fabric (Crowfoot, this chapter). Rectangular plates may have been used to decorate book closing straps (see SF7001; 'Belt Fittings' above). The clasps may have come from book bindings or from clothing.

SF7545 Two riveted **mounts** with square roves. The mounts are bent over at one end to form a hook, the other end is cut to a point. Remains of textile between rove and mount.
50317, fill of well 50108, Period 5.2, G5/24

Iron casket and book fittings
by Quita Mould
(Fig.9.18)
A broken hooked fitting (SF6935.13) may be a book clasp comparable with those on the late 16th-century binding on the *Commonplace Book* which belonged to Henry Appleyard of Dunston and is now in the Norwich Castle Museum (NCM 20.98), being described and illustrated by Margeson (1993, 74–5 and pl. XIII). A hooked plate (SF6957.39) could be a book fitting or fragment of a large spur buckle.

SF6935.13 Fitting. Right angled fitting with round riveted terminal. L: 38mm and second fragment with right angled bend possibly from the same object
50295, fill of well 50108, Period 5.2, G5/24

SF6957.39 Lobed plate of flat section with a hooked terminal, centrally pierced by a square-headed rivet attaching a rectangular-sectioned bar to the underside. Non-ferrous metal plating visible in radiograph. L: 31mm
50300, fill of well 50108, Period 5.2, G5/24

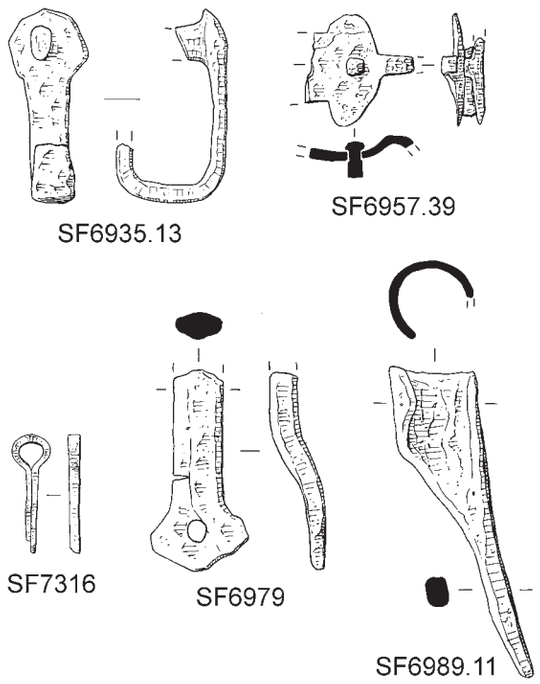


Figure 9.18 Iron casket and book fittings (SF6935.13 & 6957.39), iron split pin (SF7316), iron furniture handle (SF6979), iron candleholder (SF6989.11). Scale 1:2

Miscellaneous iron fittings
by Quita Mould
(Fig.9.18)
Small iron split pins were used as points of attachment including to secure furniture handles for example. Three examples were recovered from fills of the barbican well (*e.g.* SF7316). An iron furniture handle (SF6979) was also recovered.

SF7316 **Split pin** with bow head and straight arms with non-ferrous metal coating. L: 32mm. Head D: 11mm.
50226, fill of putlog hole 50256 within well 50208, Period 5.2, G5/24

SF6979 **Handle** with oval section and pierced lozenge-shaped terminal L: 54mm
50296, fill of well 50108, Period 5.2, G5/24

Lighting
by Quita Mould
(Fig.9.18)
A simple candleholder comprising a socket with a spike to be driven into wood was found.

SF6989.11 **Candleholder** with open socket with long pointed rectangular-sectioned tine. L: 90mm socket diam 23mm
50301, fill of well 50108, Period 5.2, G5/24

Pottery
by Irena Lentowicz and Anthony Thwaite (stonewares)
(Fig.9.19)

Introduction
A total of 1,774 sherds of pottery, weighing 39.654kg was recovered from the well. The majority of this material came from contexts allocated to Period 5.2 (G5/24), with only 27 sherds weighing 0.098kg from the lower fills in Period 5.1 (G5/23).

Stratigraphic distribution
Full details of each context assemblage and illustrated items are given in Chapter 9.II.

The majority of the pottery recovered from the lower backfills (G5/23) came from samples and most of the material was very fragmentary with an average sherd size of just *c*.3.5g. The fabrics present indicate a date of the late 14th century for deposition of these fills.

A total assemblage of 1,747 sherds (39.556kg) of pottery came from the upper sequence of fills (just over 4% of the total site assemblage; G5/24) and indicates that the bulk of the material was deposited in the mid to late 15th century, with lesser quantities of late 14th- and early 16th-century material present. Most contexts were originally assigned a mid/late 15th- to early 16th-century date, although these were subsequently revised in the light of more detailed analysis of the stonewares which demonstrated nothing amongst most context groups to suggest a date later than 1500: most may be attributable to the 1470s or earlier (John Hurst, pers. comm.).

Discussion and conclusions
by Richenda Goffin
The pottery recovered from the series of spits forming the upper infilling of the barbican well demonstrates some chronological differences consistent with the sequence of disposal of the rubbish material. The lowest fills from which pottery was recovered contained ceramics which date to the late 14th to 15th century. These groups consist of a mixture of long-lived fabrics such as Grimston wares of late medieval date and LMU, which may still be in use during this period, local and imported redwares, and Siegburg and Langerwehe jugs and drinking vessels. Surrey whiteware of Tudor Green type is also present in small quantities, and where identifiable is represented by drinking cups. This fabric was reaching Norwich by the late 15th century (Carter *et al* 1985, 81).

The largest group of ceramics which weighed over 7kg was recovered from context *50285*, towards the top of the stratigraphic sequence of fills. In addition to the range of fabric types present in the lower fills, this context also contained fragments of Raeren stoneware dating from the late 15th to the early decades of the 16th century.

A comparison of the well assemblage with the pre-1507 fire groups excavated at 31–51 Pottergate provides some interesting observations (Carter *et al* 1985, 79–82). Broadly the groups from Pottergate comprise a range of

Fabric	*Quantity*	*Weight*
LMU	6	0.026
Grimston Glazed ware	1	0.011
Grimston Glazed Oxidised	3	0.015
LMT	8	0.032
DREW	1	0.001
Langerwehe Stoneware	8	0.013
Total	**27**	**0.098**

Table 9.8 Total quantity and weight of pottery by fabric from lower well backfills (Period 5.1)

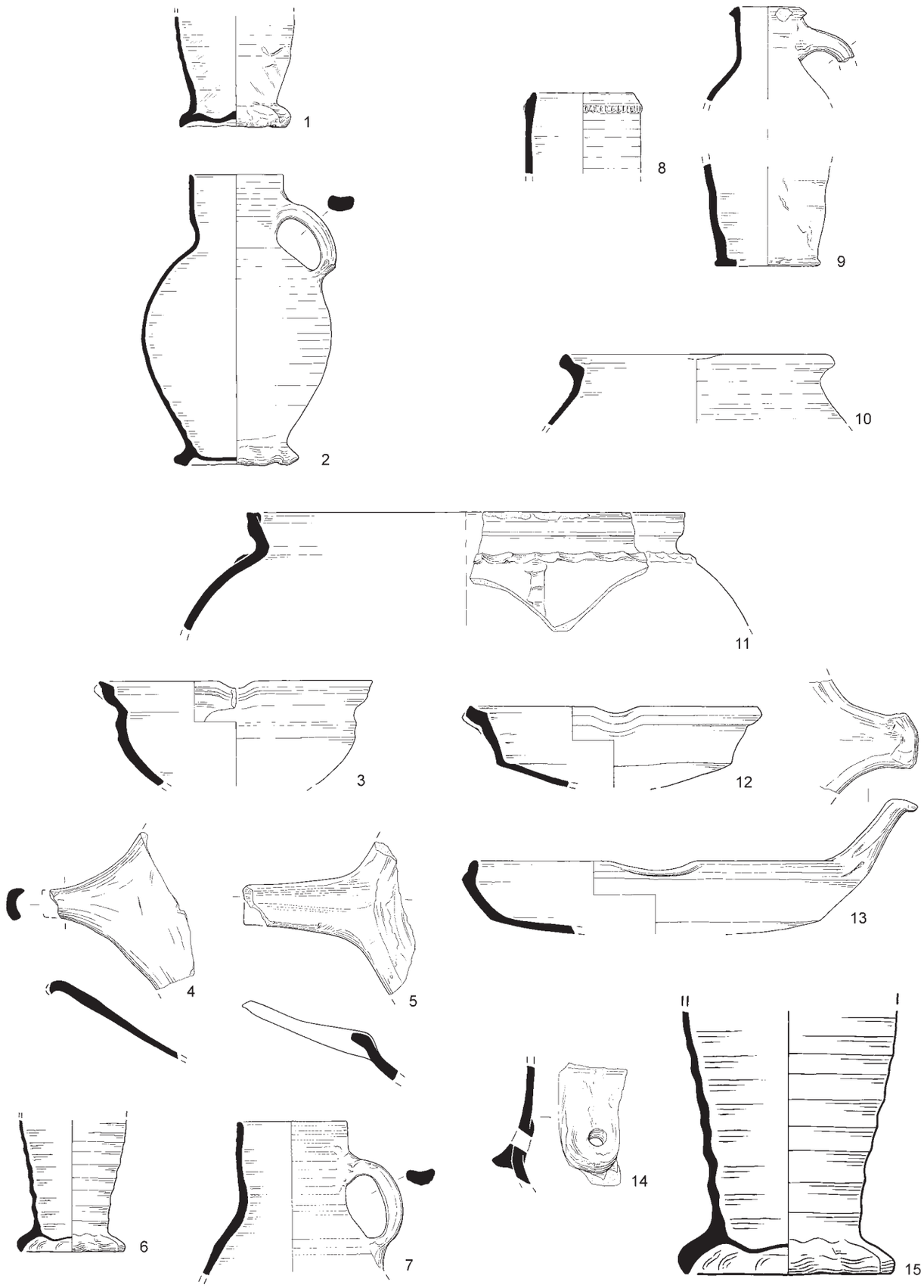


Figure 9.19 Pottery from well fills. Scale 1:4

Fabric	*Quantity*	*Weight*	*% Qty*	*% Wt*
Thetford-type ware	27	0.380	1.5	0.9
LMU	185	1.929	10.6	4.9
Grimston Coarse ware	4	0.159	0.2	0.4
Grimston Glazed ware	267	6.226	15.3	15.7
Developed Stamford ware	2	0.006	0.1	<0.1
Non-local Med Glazed ware	2	0.144	0.1	0.4
Aardenburg-type ware	3	0.024	0.2	0.1
LMT	812	20.035	46.5	50.6
Tudor Green ware	9	0.014	0.5	<0.1
DREW	7	0.213	0.4	0.5
Low Countries/Dutch Red EW	160	3.474	9.1	8.8
Siegburg Stoneware	59	1.355	3.4	3.4
Langerwehe Stoneware	115	3.932	6.9	9.9
Raeren/Aachen Stoneware	71	1.418	4.1	3.6
Local EPM	4	0.119	0.2	0.3
Intrusive	20	0.128	1.1	0.3
Total	**1,747**	**39.556**		

Table 9.9 Total quantity and weight of pottery by fabric from upper well backfills in Period 5.2

storage vessels, (including cisterns), drinking vessels, and some bowls and dishes and a few jugs. Few cooking vessels such as pipkins, and cauldrons are represented, although there is an example of a LMT frying pan, and two Low Countries 'grapen' are present (Carter *et al* 1985, 80). The low number present in the ceramic record is doubtless due to the fact that such vessels were made in metal rather than pottery.

The barbican well assemblage at Castle Mall comprises a larger quantity of skillets and pipkins, and in addition a dripping dish (Fig.9.19, no.4). LMT jars with 'horseshoe' handles are present on both sites, but a jar with applied thumbed strips (Fig 9.19, no.11) present in fill *50285* at Castle Mall has no counterpart in the fire groups at Pottergate. It is possible that such decoration may be typical of the earlier part of the LMT industry, since the decoration is essentially a remnant of an earlier, medieval tradition. In addition there are several cisterns, indicative of the practice of home brewing, which are also present at Pottergate. Jugs are not only made in Rhenish stonewares but are also present in GRIL, a feature also noted at Pottergate (Carter *et al* 1985, 80). Finally the presence of small quantities of Surrey whiteware in the form of drinking vessels has already been mentioned; this fabric is notably absent in the Pottergate fire groups. Siegburg stoneware is present in some quantity in the well assemblage, reflecting the earlier date of deposition of most of the fills by comparison with Pottergate. The presence of Raeren stoneware in the second to highest deposit at the Castle Mall, together with small quantities of Martincamp stoneware and fragments of GRE confirm a late 15th- to early 16th-century date for the latest fills.

Illustration Catalogue

Period 5.2
Fig.9.19 Fills of barbican well (G5/24)
no.1 Siegburg stoneware, frilled base from jug, fill 50321
no.2 Langerwehe stoneware, jug profile, fill 50320
no.3 LMT, bowl, fill 50317
no.4 LMT, dripping pan handle, fill 50300
no.5 Dutch Red EW, skillet handle and rim, fill 50296
no.6 Siegburg stoneware, jug/drinking vessel, fill 50296
no.7 Langerwehe stoneware, jug rim and handle, fill 50284
no.8 Langerwehe stoneware, jug/drinking vessel rim, fill 50284
no.9 Grimston Glazed ware, jug rim and base, fill 50285
no.10 LMT, globular jar (type A1), fill 50285
no.11 LMT, globular jar with applied thumbed decoration (type A1), fill 50285
no.12 LMT, bowl with carinated profile (type H2), fill 12050
no.13 LMT, skillet with carinated profile (type E2), fill 12050
no.14 LMT, cistern spout, fill 50285
no.15 Siegburg stoneware, jug/drinking vessel base, fill 50285

Glass Vessels

by John Shepherd
(Fig.9.20)

Of the 11 fragments of vessel glass from fills of the well, the three illustrated examples (SF7277, 6984 and 7285) derive from tall beakers with pushed-in pedestal bases which can be regarded as type fossils of the end of the 16th and beginning of the 17th centuries (Charleston 1981, 88). Both plain and optic-blown examples are present here. They have been found on many sites in England including glassmaking sites such as Rosedale and Hutton (Charleston 1972, fig. 61, nos 23–6; fig. 64, nos 64–82; fig. 65, nos 83–4 and 87–92), Woodchester (Daniels 1950, pl.VII, nos 48–53) and many Wealden sites (Kenyon 1967 *passim*).

SF6984 **Beaker**. Fragment from the base of a beaker. Mould-blown and re-inflated. Indeterminate optic decoration; natural green glass. Pushed-in pedestal base. 16th or early 17th century.
50301, fill of well 50108, Period 5.2, G5/24

SF7277 **Beaker**. Fragment from the base of a beaker. Free-blown; natural green glass with deep surface decomposition. Pushed in pedestal base. 15th or 16th century.
50317, fill of well 50108, Period 5.2, G5/24

SF7285 **Beaker**. Fragment from the rim of a beaker. Mould-blown and reinflated; natural green glass. Rim fire-rounded and sloping slightly inwards. body decorated with low relief spiral ribs. 16th or early 17th century.
50302, fill of well 50108, Period 5.2, G5/24

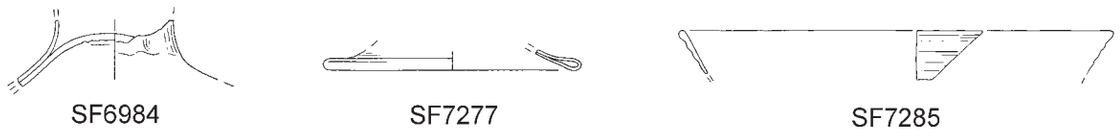


Figure 9.20 Vessel glass (SF6984, 7277 & 7285). Scale 1:2

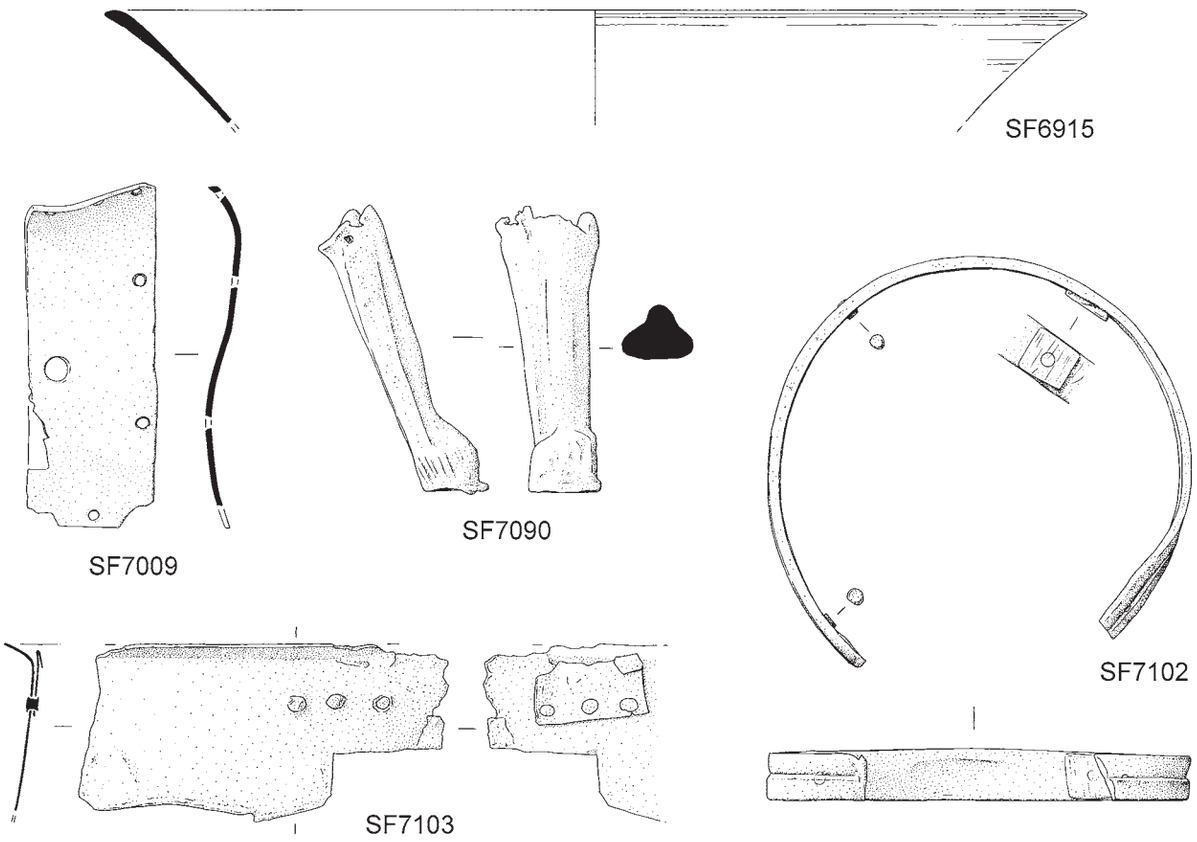


Figure 9.21 Copper alloy vessels (SF6915, 7009, 7090, 7102 & 7103). Scale 1:2

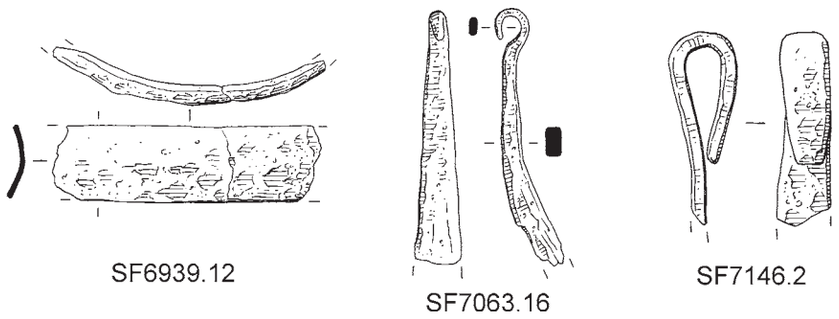


Figure 9.22 Iron bindings from wooden vessels (SF6939.12, 7063.16 & 7146.2). Scale 1:2

Copper Alloy Vessels

by Alison Goodall

(Fig.9.21)

Other objects indicative of domestic rubbish are broken fragments from copper alloy vessels. SF6883 (not illustrated) is a fragment from the flaring rim of a cast cooking pot; it shows evidence of soot blackening on the exterior surface. SF7031 (not illustrated), also from a cast vessel, is a rather porous casting with many air bubbles in it. SF7038 (not illustrated) is a rim fragment from a vessel made from hammered sheet metal. The rim fragment (SF6915) and the foot (SF7090) come from cooking pots or skillets which would have had rounded bodies and three legs. A sheet fragment (SF7009) may have served as a handle escutcheon or vessel repair patch, similar to that remaining *in situ* on vessel SF7103. An annular collar or rim binding (SF7102) was also found.

SF6915 **Vessel**. Rim fragment from cast cooking pot. Soot blackening on exterior face.
50296, fill of well 50108, Period 5.2, G5/24

SF7009 **Sheet**. Rectangular sheet with small pierced holes around three edges. In the centre of the fourth long side is a larger circular hole, perhaps for the attachment of a handle (*cf.* SF7012). Perhaps a handle escutcheon or vessel repair patch.
50317, fill of well 50108, Period 5.2, G5/24

SF7090 **Vessel**. Leg from vessel, very poorly cast, especially at the top attachment edge. Central longitudinal rib and roughly modelled foot. Probably from a skillet or ewer. L: 85mm.
50320, fill of well 50108, Period 5.2, G5/24

SF7102 **Vessel**. Incomplete annular collar or binding ring from a vessel, with central longitudinal groove. Within the groove, equally spaced around the ring, are three surviving rivets and one rivet hole. One of the surviving rivets secures a small square plate on the inside of the ring; the file marks which cover the inside of the ring are also visible on this plate.
50320, fill of well 50108, Period 5.2, G5/24

SF7103 **Vessel**. Fragment of body and everted rim from a hammered straight, slightly sloping-sided sheet vessel, possibly a bowl. Close to the rim on the inside of the vessel is a rectangular patch attached with three rivets. The top edge of the patch is broken and partly folded over. The patch is very thin and perhaps unsuitable for use as a handle escutcheon; it is attached at a point where the rim has begun to break, and may be the remains of a repair patch.
50320, fill of well 50108, Period 5.2, G5/24

Wooden Vessels

by Quita Mould

(Fig.9.22)

Strap bindings from wooden stave built vessels (*e.g.* SF6939.12) were found, along with fragmentary bucket handles (SF7146.2 and 7063.16). Fragments of sheet may also have come from vessels; three sheet tubes could be simple sockets for wooden handles or possibly the nozzle from bellows (see 'Metalworking' below).

SF6939.12 **Strap**. Gently curving strap binding from bucket, barrel *etc.* L: 72mm w: 21mm
50301, fill of well 50108, Period 5.2, G5/24

SF7063.16 **Curved handle** with small looped ring terminal. L: 74mm w: 14mm
50318, fill of well 50108, Period 5.2, G5/24

SF7146.2 **Strip handle** with looped ring terminal L55mm w: 15mm
50296, fill of well 50108, Period 5.2, G5/24

Implements

Knives

(Figs 9.23–9.24)

A substantial collection of knives and knife handles (x 132) was recovered from the well, encompassing a range of uses (at table, in the kitchen/for butchery, craft knives). The group include several prestigious examples and three decorative leather knife/dagger scabbards were also found (see Mould below).

Iron knives

by Quita Mould, with Maisie Taylor (wood), Jacqui Watson and Sarah Paynter (minerally preserved organics)

(Fig.9.23)

The relatively large group of iron knife blades includes the remains of 46 whittle-tanged knives, 20 scale-tanged knives and 52 blade fragments. The whittle-tanged knives have pointed tangs for insertion into an organic handle of wood, bone, antler or ivory (see further details of knife handles below); from the 14th century onward scale-tanged knives with strap handles riveted to a pair of organic handle plates became increasingly popular. Those knives with their handles present are described in subsequent text.

Many of the knives appear to be general purpose tools, but blades likely to have been used for specific functions were identified. A long-bladed knife (SF6957.13) is a boning knife, while the heavy handles (SF6990 and 7035.20) also suggest a use in butchery. Two possible leather cutting knives (SF7145.13 and 7154) are discussed elsewhere. Small tanged knives with pointed blades (SF6978.13 and 7158.09) may be penknives. The blade fragment with an angled back (SF7062.03) may also be from a penknife, though such angled blades are commonly found in pre-Conquest contexts and this fragment may be residual as other blade fragments belonging to the earliest occupation were found in the well backfill (for example, pivoting blade SF6938.19 discussed in Chapter 4.III). A group of table knives with decorated handles of late 14th- to 15th-century date (*e.g.* SF6906, 7139, 7162/3, 7434 and 7531) were prestigious items.

Maker's marks inlaid with non-ferrous metal occurred on 12 knife blades. Such marks were used by bladesmiths throughout Europe during the later medieval and early post-medieval period (Cowgill *et al* 1987,17-24) and it appears that certain symbols were commonly used. Three blades from the upper backfill of well had the same double mark (SF7064/5, 7145.7 and 7519) and so may come from the same workshop. The individual marks can be paralleled on knives from London (Cowgill *et al* 1987, fig. 6, 49,86,120 *etc.* and fig. 8, 43 and 81) as can other symbols found on Castle Mall blades (*ibid.*; the linear mark fig. 8 no. 138; fleur de lys fig. 7 no. 149, 153; and the key fig. 6 no. 160 is comparable to the lozenge-bowed key symbol on SF7063.14).

SF6863.09 **Scale tang knife**. Wooden scales identified as possibly *Salix* sp. (willow) or *Populus* sp. (poplar) (SEM B810). No non-ferrous metals were detected. Not illustrated.
50285, fill of barbican well, Period 5.2, G5/24

SF6938.19 **Pivoting blade** fragment with V-shaped tooth between two notches and rivet hole directly above. L: 41mm w: 20mm.
50284, fill of barbican well, Period 5.2, G5/24

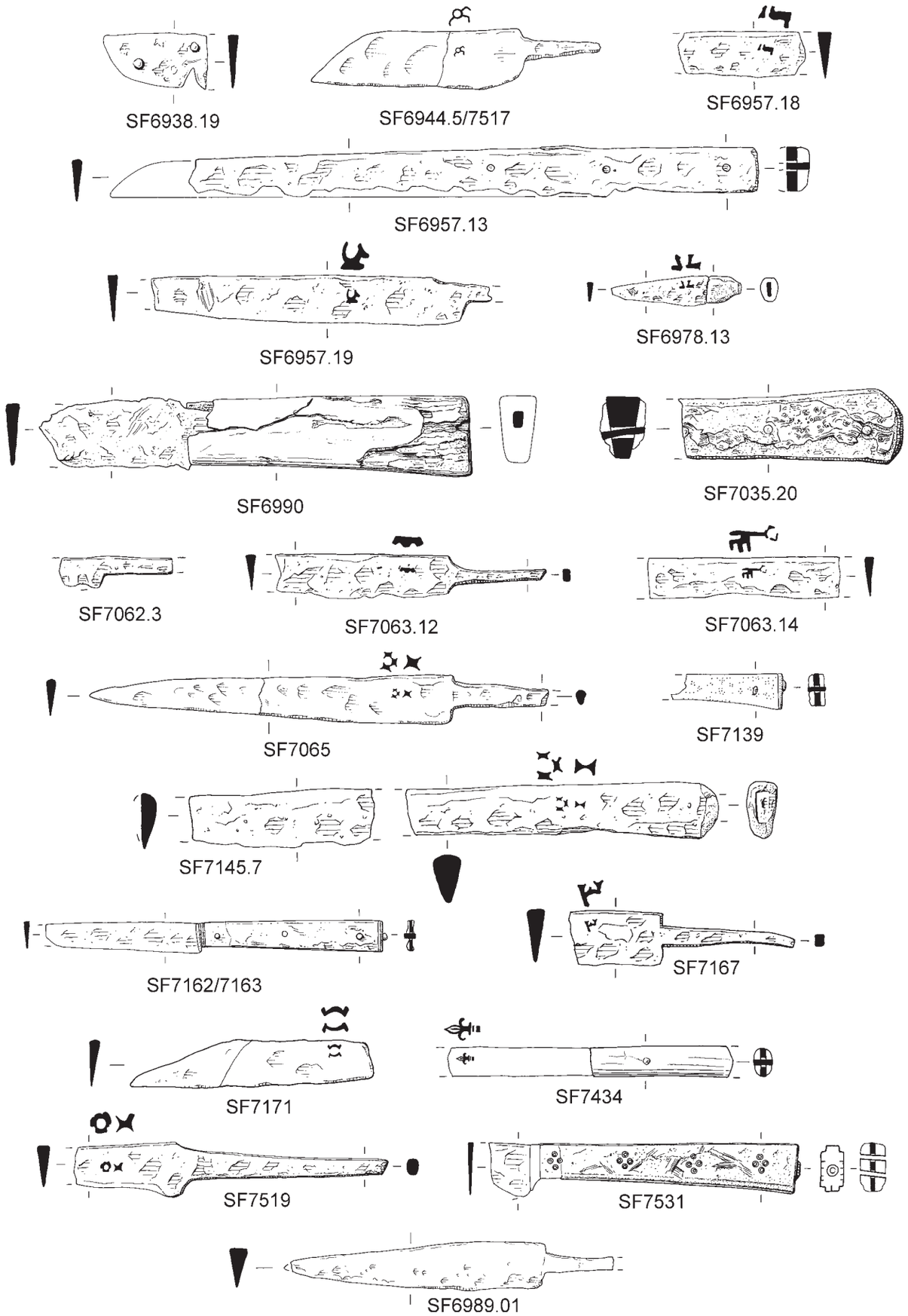


Figure 9.23 Iron knives: (SF6938.19, 6944.5/7517, 6957.13, 6957.18, 6957.19, 6978.13, 6990, 7035.20, 7062.3, 7063.12, 7063.14, 7065, 7139, 7145.7, 7162/7163, 7167, 7171, 7434, 7519 & 7531); pivoting knife (SF6989.01). Scale 1:2

SF6944.15/7517 Knife with straight back and edge meeting at a pointed tip, centrally-placed tang, maker's mark. L: 135mm w: 23mm
50296, fill of well 50108, Period 5.2, G5/24

SF6957.13 Long, narrow **knife** with straight back and edge and scale tang with three rivet holes. L: 206mm w: 16mm
50300, fill of well 50108, Period 5.2, G5/24

SF6957.18 Blade fragment with straight back and edge, inlaid maker's mark. L47mm
50300, fill of well 50108, Period 5.2, G5/24

SF6957.19 Long **knife blade** with straight back and edge, straight shoulder and choil and centrally-placed tang, circular maker's mark. L: 125mm w: 20mm
50300, fill of well 50108, Period 5.2, G5/24

SF6978.13 Small **knife** with straight edge and back dropping to meet the edge at a pointed tip, centrally-placed tang with remains of the round sectioned wooden handle present, double maker's mark. L: 48mm w: 10mm This knife has the remains of a bone or antler handle and random fragments of wood on the blade.
50296, fill of well 50108, Period 5.2, G5/24

SF6990 Knife. Large broken knife with straight back and edge, tang set just below the back and fitting into a large ivory whittle-tang handle with tapering rectangular section. File marks visible on one side of the handle. L: 172mm, handle length: 100mm, w: 25mm.
50301, fill of well 50108, Period 5.2, G5/24

SF7035.20 Large thick **scale tang knife** with 3 copper alloy rivets, much wood from handle preserved, size and weight suggests a craft, possibly butchery. This knife has wooden scales (SEM B813) with a very knotty grain. It had previously been suggested that these scales were walnut or burr elm. Unfortunately the wood species could not be definitely identified, as the microscopic structure had not retained sufficient diagnostic features. There are three tubular rivets through the knife handle, with associated green corrosion products, which analysis showed are brass.
50317, fill of well 50108, Period 5.2, G5/24

SF7062.3 Blade fragment with angled back dropping to meet the edge at a pointed tip. L: 53mm w: 12mm
50318, fill of barbican well, Period 5.2, G5/24

SF7063.12 Knife with straight back and edge with straight shoulder centrally-placed tang. Simple linear marker's mark. L104mm w: 20mm
50318, fill of well 50108, Period 5.2, G5/24

SF7063.14 Blade with straight back and edge and makers mark in form of a key with a lozenge-shaped bow. L: 71mm w: 20mm
50318, fill of well 50108, Period 5.2, G5/24

SF7064/5 Knife with narrow blade with straight back and edge meeting at a long pointed tip, centrally-placed tang straight shoulder and choil, double maker's mark L: 170mm w: 20mm
50318, fill of well 50108, Period 5.2, G5/24

SF7139 Horn scale tang knife handle with copper alloy end cap, well preserved horn scales decorated with non-ferrous metal pins. L: 40mm (comparable with Cowgill *et al* 1987, 95, fig. 65 no. 138, plate 4e with a bone scale tang handle and tin rivets).
50284, fill of well 50108, Period 5.2, G5/24

SF7145.7 Long **blade** with straight back and edge, centrally-placed tang, double maker's mark. L:115mm w: 23mm
50296, fill of well 50108, Period 5.2, G5/24

SF7162/3 Scale tang table knife with narrow blade with straight back and edge, copper alloy stop ridge and end cap, much minerally preserved material from handle plates present. The knife may originally have had mother-of-pearl scales, but the organic remains are in a very poor condition. The blade of the knife is a ferrous alloy. Traces of green corrosion products indicate that a copper alloy shoulder plate, which analysis showed was probably brass, was once attached to the knife. The rivets through both the handle and blade are iron. Blue/green corrosion products indicate that a copper alloy end plate was once attached to the handle. Analysis showed that the plate was probably brass. Traces of mercury and tin were detected in some areas near the end and shoulder plates. Although mercury was used in the gilding and (rarer) silvering processes, neither gold nor silver were detected. L: 125mm w: 11mm.
50320, fill of well 50108, Period 5.2, G5/24

SF7167 Knife with straight back and edge with centrally-placed tang and straight shoulder, maker's mark. L87mm w: 22mm
50320, fill of well 50108, Period 5.2, G5/24

SF7171 Narrow **blade** with straight back and edge with maker's mark L: 78mm w: 15mm
50284, fill of well 50108, Period 5.2, G5/24

SF7434 Small **broken blade** with straight back and edge with fleur de lys markers mark and scale tang with 6 non-ferrous metal rivets L: 53mm w: 14mm. Maker's mark is comparable to examples from London (Cowgill *et al* 1987, 22 no. 149, 153). The elephant ivory scales on the knife tang are in an excellent condition, with the lines of Retzius clearly visible (Penniman 1952).
50285, fill of well 50108, Period 5.2, G5/24

SF7519 Knife with thick, straight back and worn edge and long centrally-placed tang, sloping shoulder and choil, double maker's mark. L: 114mm w: 20mm
50301, fill of well 50108, Period 5.2, G5/24

SF7531 Knife fragment with scale tang, organic scales decorated with 4 groups of 4 tubular non-ferrous metal rivets (only one rivet being functional in each group), non ferrous shoulder plate and end cap (7532). The scales of this knife are highly polished or have a resin surface. They are possibly made from elephant ivory, bone or antler, but not wood. Chopped stems are also preserved on top of the handle. The handle of the knife is iron and has a shallow groove running along each edge on one side. These grooves may have contained inlaid metal as there are traces of green corrosion products in one of them. Analysis detected copper and zinc, indicating brass. Alternatively these corrosion products may have originated from another brass fitting. The handle also contains groups of small tubular rivets, which analysis showed are impure copper. At the end of the handle, where an end plate was once attached, there are traces of green corrosion products. Copper and zinc were detected, indicating that the plate would have been brass. There are large amounts of ferrous concretion at the other end of the handle but traces of green corrosion are just visible and a shoulder plate is visible on the x-ray. Copper and zinc were detected which indicates that the shoulder plate is brass. L: 120mm
50296, fill of well 50108, Period 5.2, G5/24

SF7535 Scale tang knife. Wooden scales (SEM B814), made from *Buxus* sp. (Box), with a very knotty grain. The two fragments are very degraded. The handle has three rivets, which analysis shows to be tin-plated iron. Not illustrated.
50296, fill of well 50108, Period 5.2, G5/24

Knives with bolsters

by Quita Mould

Bolsters became popular in the 16th century. One knife from the upper backfill of the well (SF7155.6, not illustrated) has a thickened section toward the tang rather a `proto' bolster than a fully formed bolster, suggesting that it is an early example. Its distinctly thick back suggests a likely craft function. The glassy vitrified residue on the surface, charcoal within the encrustation and slag present adhering to the surface suggests that it was in close association to high temperatures processes probably amongst the debris from around a metalworking hearth. A second broken blade with a possible bolster (SF7142.05, not illustrated) was also noted.

SF7155.6 Knife with narrow, broken blade with straight back and edge thickening in section before the rectangular-sectioned, centrally-placed tang. L: 64mm blade w: 11mm. Not illustrated.
50295, fill of well 50108, Period 5.2, G5/24

Folding knife

by Quita Mould, Jacqui Watson and Sarah Paynter

(Fig.9.23)

Another blade (SF6989.01) appears to be a folding knife, probably a razor or penknife. Its handle appears to have been attached with thread, probably as a repair.

SF6989.01 Blade. Fragment of tapering narrow blade pivoting on a copper alloy rivet between a shouldered bolster. Remains of minerally preserved organic handle present and weld line between back and edge visible on the blade. This knife has wooden (SEM B811) scales, made from *Salix* sp. (Willow) or *Populus* sp. (poplar). At the blade end, the handle is bound with tightly wound plyed thread (SEM B812). At high magnification the thread appears to be made up of very fine fibres with no visible scale patterns or nodes. The size of the fibres suggests that they are vegetable fibres rather than animal hair. L: 53mm w: 11mm.
50301, fill of well 50108, G5.2, G5/24

Composite knives and knife guards
by Alison Goodall
(Fig.9.24)

One knife from the well (SF6953) has a copper alloy scale tang and shoulders and an end-cap with a pointed terminal. Wooden handle-scales were attached with four copper alloy rivets through the tang. The blade is of iron. The form of the pointed end suggests a date in the 14th century. Parallels from London are all late 14th-century (*cf.* Cowgill *et al.* 1987, nos 119–123). Knife handle plates (such as SF7532) come from knives with handles made from alternating plates of metal and organic material, such as wood, which were threaded onto the whittle tang. Similar handles are found on iron knives from sites dating to the 12th and 13th centuries (I.H.Goodall 1980, G75 and G76).

SF6953 **Knife handle**. Knife handle with tiny stub of broken-off blade. Short iron tangs survives, which is rivetted to copper alloy shoulder plates with a copper alloy rivet. The shoulder plates are made in one piece with a copper alloy scale-tang at right angles to the plane of the blade, cast in one piece with the tang, a copper alloy end-cap with pyramidal pointed terminal. Wooden scales are attached with four copper alloy rivets.
50301, fill of well 50108, Period 5.2, G5/24

SF7532 **Knife** guard from lower end of a knife handle, made from two slightly tapering subrectangular plates, with a rectangular-section iron tang passing through them. L: 17mm.
50296, fill of well 50108, Period 5.2, G5/24

SF7544 **Knife**. Tapered rectangular copper alloy handle-plate from a knife, with part of iron blade. L: 17mm.
50317, fill of well 50108, Period 5.2, G5/24

Knife handles
by Jacqui Watson and Sarah Paynter

Despite their current corroded appearance, many of the large group of knives recovered from the well originally had highly decorated handles of various materials including ivory and possibly mother-of-pearl, as well as horn and the more usual bone, antler and wood. Many of the scale-tang knives have non-ferrous metal components to attach the organic scales to the knife and as decorative elements on the handles.

The condition of the preserved organic material is highly variable. The elephant ivory scales on the knife tang SF7434 (described by Mould above) are in an excellent condition, with the lines of Retzius clearly visible (Penniman 1952) while the condition of the iron-preserved wood is completely different. At low magnification there are extensive remains which appear to be well preserved, but in some cases at high magnifications it can be seen that the wood structure has been reduced to replaced cells, with no trace of the middle lamella. In several instances none of the essential diagnostic features remain within the vessels, with the result that identification to species level has not been possible.

Some of the handles are made from wooden sections with many knots visible, which may have been a deliberate choice for decorative effect, or poor quality wood was used which was coloured (Cowgill *et al* 1987). Two of these knife handles (SF250 (see Chapter 8.III) and SF7035.20) had previously been identified as possibly being made from walnut or burr elm. Unfortunately neither of these examples could positively be identified, but the use of either of these woods for knife handles has not been recorded in the archaeological record.

As mentioned above, one of the knives has a distinct ivory handle, but another (SF7531) could also be made of this material or it may just be bone or antler. The whittle tang handle of knife SF6978.13 was possibly made of bone or antler.

The scale-tang knife SF7162/3 may originally have had mother-of-pearl scales, but the organic remains are in a very poor condition, having been reduced almost completely to iron corrosion. On examination under the SEM, these corrosion products had the same structure as mother-of-pearl scales on a similar type of knife from Camber Castle, Sussex which comes from a 16th- to 17th-century context. Mother-of-pearl is made from the nacreous lining of shells, in particular pearl oysters of genus Pinctada (S.Payne, pers comm.). The genus has many species in tropical regions all round the world including the Red Sea, Zanzibar, India, the Caribbean and the Pacific. Mother-of-pearl is also widespread in other shells, including fresh-water mussels, ormers and top shells which are native to Britain and the Channel Islands, but most of these are considerably smaller and thinner than Pinctada and are unlikely to be of a sufficient size to produce the handle scales for this knife. The tropical shell may have been available in Tudor England, but with the exception of the Camber Castle example, no handles made from mother-of-pearl have been recorded for this period — there are certainly no examples from any of the periods covered in the Museum of London's *Medieval Knives and Scabbards* volume (Cowgill *et al* 1987).

Bone knife handles
by Julia Huddle
(Fig.9.24)

There are three surviving bone knife handles. One (SF6906) is finely decorated with pins and complements some of the more high status finds from the well. It is comparable with a late 14th-century knife handle from London (Cowgill *et al* 1987, fig.65, no. 134 and pl.4c). Two plain handles (SF6990, not illustrated and 6983) are both probably utilitarian knife handles.

SF6906 **Knife handle**. Scale-tang knife, blade missing, secured to decorated bone scales attached with three evenly spaced iron rivets; scales decorated with tin pins set in lozenge shaped groups, terminal is decoratively concavely-shaped. L: 98mm, handle length = 88mm.
50296, fill of well 50108, Period 5.2, G5/24

SF6983 **Artefact**. Tubular bone object, cut both ends with fine tooth saw, surfaces highly polished. length = 29mm. mid shaft of a caprine metatarsal.
50301, fill of well 50108, Period 5.2, G5/24

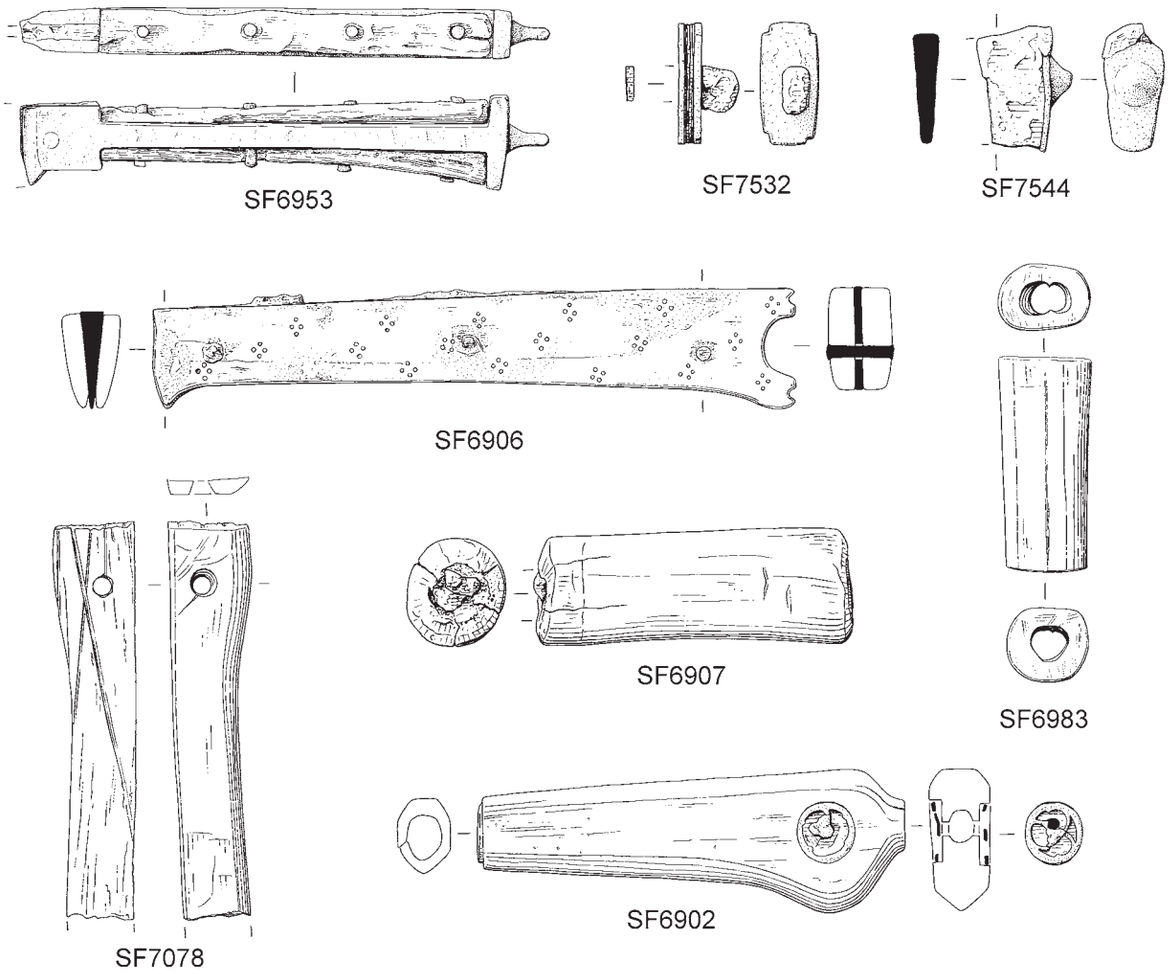


Figure 9.24 Copper alloy knife fittings (SF6953, 7532 & 7544); bone knife handles (SF6906 & 6983); antler knife handles (SF6907 & 7078); ivory knife handle (SF6902). Scale 1:2

Antler knife handles
by Julia Huddle
(Fig.9.24)

Both scale and whittle-tang antler handles were recovered here. An antler scale (SF5649, not illustrated), with three rivet holes is likely to be a simple scale-tang knife handle. One possible handle (SF5656, not illustrated) may be part of a scraper rather than a knife. It consists of an iron plate riveted between two thin (incomplete) strips of fallow deer antler. It is possible that some of the fallow deer antler debris found in deposits associated with the well was used to make this and similar objects, where presumably the large flat areas of the fallow antler beams are ideally suited for the manufacture of handles for knives or scrapers. A plain whittle-tang knife handle with missing blade (SF6907) and a small faceted antler strip fragment (SF6908), which is likely to be part of a whittle or scale-tang knife handle, were also found. Another strip (SF7078) may have been an unfinished knife handle.

SF6907 **Knife handle**. Whittle-tang knife, blade missing, iron tang, and simple antler handle of roughly circular section tapering slightly towards the blade end. Handle length = 43mm
50296, fill of well 50108, Period 5.2, G5/24

SF6908 **Artefact**. Split section of antler tine, one end is sawn the other is broken. One side is faceted and is covered with tiny scratches. ?Incomplete whittle or scale-tang knife handle. Length incomplete = 48mm ?Red deer antler. Not illustrated.
50296, fill of well 50108, Period 5.2, G5/24

SF7078 **Worked antler**. Strip fragment with chamfered edges and splayed perforation near sawn-off end. ?Unfinished knife scale. Not illustrated.
50317, fill of well 50108, Period 5.2, G5/24

Ivory knife handle
by Ian Riddler
(Fig.9.24)

An ornate ivory 'pistol-grip' handle (SF6902) has a heptagonal section with circular indentations within its expanded terminal which carry small silver rosettes. Handles made from ivory are comparatively rare before the post-medieval period and in general, ivory was restricted to whittle tang knives, whilst scale tang knives were manufactured either from bone or antler. Pistol-grip type handles were customarily dated to the 18th century and there are two published from Cork which follow this dating, albeit on typological grounds alone (Hurley 1997, 146 fig. 43, nos 15 and 16). An early example of this type however is known from Winchester from a mid 16th-century context (Hinton 1990, 864 fig. 261, no. 2902). Accordingly, a 16th- or 17th-century date for the handle is quite feasible.

Another ivory handled knife is detailed under iron knives above.

SF6902 **Handle**. An ivory pistol-grip whittle tang handle of heptagonal section. It expands towards the butt to a broader area, where indented circular hollows on either side contain small openwork rosettes of silver. The end of the handle survives as a hollow stub, also of heptagonal section.
50284, fill of well 50108, Period 5.2, G5/24

Miscellaneous Equipment

by Alison Goodall
(Fig.9.25)

Copper alloy skimmer

Skimmers with large perforated, slightly dished bowls mounted on long handles were used either in the kitchen to separate fat or solids from a stew pot or in the dairy to lift the cream or curds (see also a possible craft function; Chapter 9.VI). The handle would have been attached by means of a socket riveted onto the bowl, as in the almost complete example from St Benedicts Gates, Norwich (Hurst and Golson 1955, 99, fig. 24.14). The use of such objects is shown in the 14th-century *Luttrell Psalter* (Ward Perkins 1940, 206, fig. 68.8).

SF7092 **Skimmer**. Perforated, slightly dished circular plate, with holes punched through from the concave side in nine concentric circles around a central hole. The outer edge is neatly turned over. One side of the plate, where a handle could have been attached, is missing. D: 210mm.
50321, fill of well 50108, Period 5.2, G5/24

Copper alloy suspension rings

(Fig.9.25)

A number of plain rings (*e.g*. SF7030 and 7049) may have been used for suspension of a range of items, including curtains or hangings.

SF7030 **Ring**. Suspension ring with sub-rectangular section. D: 22mm
50317, fill of well 50108, Period 5.2, G5/24

SF7049 **Ring**. Suspension ring with sub-rectangular section. D:21mm
50318, fill of well 50108, Period 5.2, G5/24

Buildings

Structural Metalwork

Ironwork

by Quita Mould
(Fig.9.26)

Structural ironwork including wallhooks (*e.g.* SF7129.09), U-shaped staples (*e.g.* SF7527), rectangular staples and heavy strapping were recovered throughout the backfill sequence. Timber nails and their broken shanks (x 935)

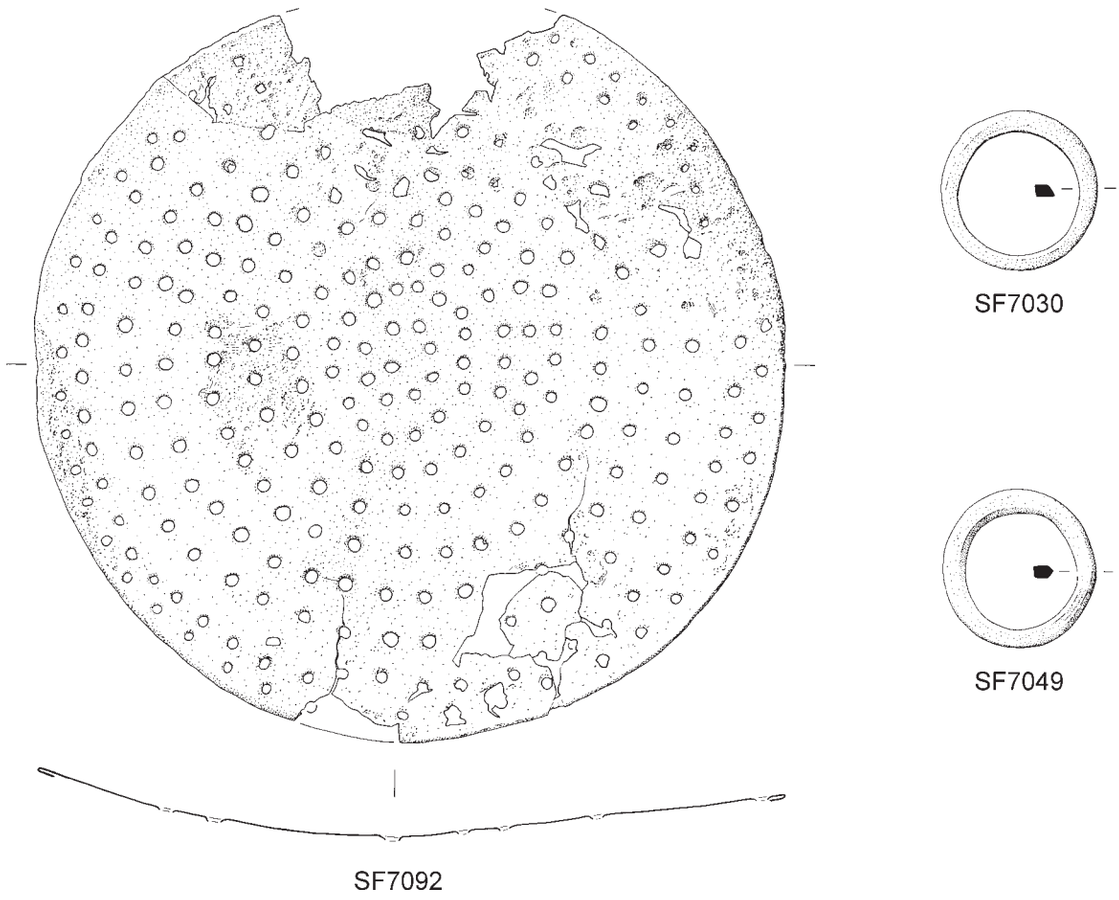


Figure 9.25 Copper alloy skimmer (SF7092), Scale 1:2; copper alloy suspension rings (SF7030 & 7049). Scale 1:1

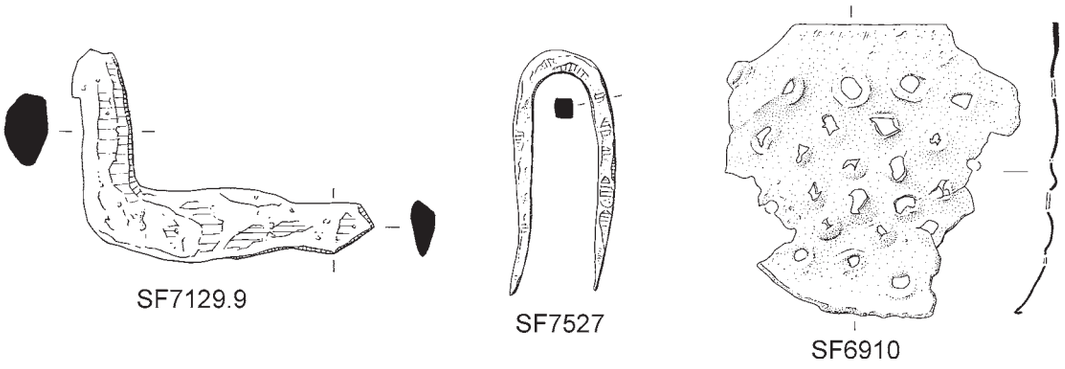


Figure 9.26 Iron fittings: wallhook (SF7129.9), staple (7527); copper alloy ?drain cover (SF6910). Scale 1:2

also occurred: the majority (x 614) measured below 100mm in length and had flat, square or rectangular heads. A small number had flat long rectangular heads (x 83). A group (x 24) of small nails with small, flat round heads were also present, along with a clench bolt and a single example of a heavy conical-headed timber stud of a type used to decorate heavy doors.

SF7527 **U-shaped staple** with rectangular-sectioned upstanding arms L: 66mm w: 27mm
50285, fill of well 50108, Period 5.2, G5/24

SF7129.9 **Wallhook** for use with masonry with rectangular sectioned shank and lozenge-shaped head at right angle L: 81mm head L: 57mm
50321, fill of well 50108, Period 5.2, G5/24

Copper alloy ?drain cover
by Alison Goodall
(Fig.9.26)
A perforated sheet fragment (SF6910) has only one intact edge. Since this is straight, it is unlikely that this object is a skimmer and it is suggested that it might be a drain cover. The perforations have been crudely punched.

SF6910 **Sheet**. Roughly perforated sheet with very irregular holes. The only surviving original edge is straight. Square with concave chamfered corners. Perhaps part of a strainer or drain cover.
50284, fill of well 50108, Period 5.2, G5/24

Door and Window Fittings

Iron hinges and hasps
by Quita Mould
(Fig.9.27)
Eighteen hinge-pivots were retrieved while many fragments (x 51) of nailed strap binding (*e.g.* SF7035.6) derived from hinges or strapping on furniture. Heavier examples would have come from doors, gates and structural timbers. A hooked ring (SF7063.02) probably a drape ring (*cf.* examples from London; Egan 1998, 64) and a latch rest (SF7166.1) were also recovered. Of the two iron hasps or hinges, one has a scrolled terminal (SF7063.29, not illustrated). Both may have been used to secure chests or doors.

SF7035.6 **Nailed strap** with hooked ring terminal. L: 59mm w: 24mm
50317, fill of well 50108, Period 5.2, G5/24

SF7063.02 **Hooked ring**, suggestion of non-ferrous metal plating present. L: 58mm, diam 25mm
50318, fill of well 50108, Period 5.2, G5/24

SF7166.1 **Latch rest** thick rectangular-sectioned shank with a triangular head. L: 61mm head ht 27mm
50320, fill of well 50108, Period 5.2, G5/24

Lock Furniture and Keys

Copper alloy locks and keys
by Alison Goodall
(Fig.9.28)
A lock with a hasp (SF6934) consists of two decorated and possibly gilded plates; there are three staples forming

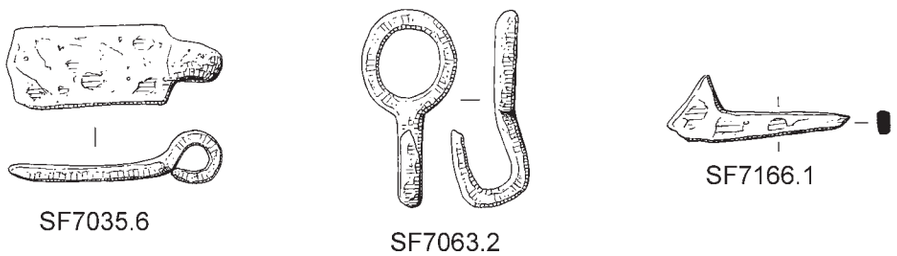


Figure 9.27 Iron hinge (SF7035.6); iron hooked ring (SF7063.2); iron latch rest (SF7166.1). Scale 1:2

rectangular loops through which the hasp passes. Textile fragments under the rivets (Crowfoot, above) suggest that this was the fastening for a cloth-covered casket or box. A small key (SF6969) may also be from a casket. The key stem is of Winchester type 9 (Biddle 1990, *cf.* no. 3851) which is a simple and therefore perhaps long-lived form: the Winchester parallel is from a 15th-century context and all the type 9 copper alloy keys are medieval. SF7391 is a hook, possibly a casket fastening.

SF6934 **Lock**. Two roughly rectangular plates, one overlaps the other. Each plate has three possibly gilded rivets on the outer edges. Where the plates overlap, three evenly spaced staples have been inserted through slots in the upper plate and perforations on the lower plate. A bar has been passed through the loops formed by the staples. At the wider end of the bar is a circular hole to fit a ?latch key, enabling the bar to be pulled out and the ?box /casket opened. The upper surface of each plate is decorated with rocked-tracer ornament, in the form of two arches either side of the central rivets. On the reverse of each plate and underneath the rivets are remains of woven cloth, indicating that the plates were once attached to a cloth covered box or casket. For textile, see Crowfoot above.
50300, fill of well 50108, Period 5.2, G5/24

SF6969 **Key**. Small copper alloy key, with circular bow, solid stem with pierced tip, and simple bit intended on both sides.
50296, fill of well 50108, Period 5.2, G5/24

SF7391 **Hook**. Flat-sectioned bar, with a perforated circular terminal at one end and a slightly offset semi-circular hook at the other. Terminal. L: 33mm.
50295, fill of well 50108, Period 5.2, G5/24

Iron locks and keys
by Quita Mould
(Fig.9.28)

A broken ward lock plate (SF6863.02, not illustrated) and the remains of keys with solid stems and bits with upper and lower slots and notched outer edges (SF6957.38, 6863.03 and 6944.19, not illustrated) were recovered and a broken key bow (SF7166.18, not illustrated) with non-ferrous plating was also found. A single example of a key with a solid stem projecting beyond the end of the bit occurred (SF6957.36) associated with a padlock key stem. This is of a type likely to date to the pre-Conquest or immediately post-Conquest period, coming from a padlock key of Goodall type C (I.H. Goodall in Biddle 1990, 1022, fig. 324, nos 1505–6,). A padlock pivoting fin is of a pre-Conquest form not in use after the 12th century (SF6864.02, not illustrated), while a small double-toothed slide key (SF7062.04) is also of probable pre-Conquest date. Further details of these residual items are given in Chapter 4.III. A key with a large ring bow (SF7063.02, not illustrated) was also found.

SF6864.2 **Padlock pivoting fin** L: 71mm w: 15mm. Not illustrated.
50285, fill of barbican well, Period 5.2, G5/24

SF6957.36 Round-sectioned **key stem** projecting below the small, solid, rectangular bit with non-ferrous metal coating. L: 47mm. Also stem with inlaid bands of non-ferrous metal probably from a key stem of pre-Conquest date. L: 37mm. Not illustrated.
50300, fill of barbican well, Period 5.2, G5/24

SF6957.38 Small **casket key** with round bow, short stem and rectangular bit with non-ferrous metal coating, encrusted to a fragment of knife blade. L: 40mm. Not illustrated.
50300, fill of well 50108, Period 5.2, G5/24

SF7062.4 Small **slide key** with round-sectioned stem handle with rolled loop terminal and simple bit with pair of upstanding teeth. L: 53mm Bit l18mm
50318, fill of barbican well, Period 5.2, G5/24

SF7063.02 Key with large ring bow, short stem and simple bit with a single upstanding tooth at right angle to the stem. L: 58mm bit l 20mm. Not illustrated.
50318, fill of well 50108, Period 5.2, G5/24

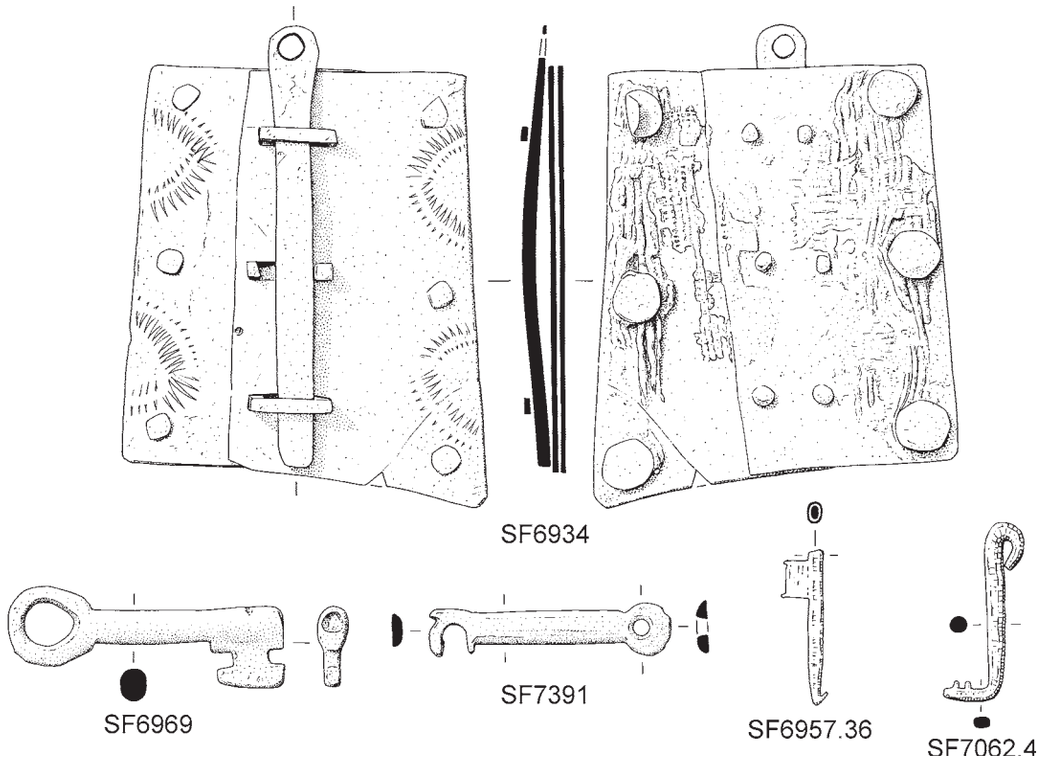


Figure 9.28 Copper alloy lock (SF6934); copper alloy key (SF6969); copper alloy hasp (SF7391); iron locks and keys (SF6957.36 & 7062.4). Scale 1:1, ironwork at 1:2

Window Glass and Cames
by David King
(Fig.9.29)

Window glass
The group of 70 pieces of window glass includes six painted pieces (of a total of only 11 from the site; a selection of which is illustrated). These include two items of particular interest. One (SF7259) is part of a serrated leaf design with strongly drawn veins, the lively articulation of which suggests a date in the second half of the 12th century (and therefore residual in this context). Obviously, such a small fragment is difficult to date with complete confidence, but if this piece is of the suggested date it is the only surviving 12th-century glass painting from Norwich and, as such, is a small but significant piece of evidence for the existence of this medium there at an early date. Twelfth-century glass is known from a number of centres in England including Winchester, Canterbury, Ely, Lincoln and York and a *vitrarius* is recorded at the Abbey of St Benet at Holme, Norfolk in 1155 (Marks 1993, 109–124; Brown and O'Connor 1991, 21). The building of the cathedral from the 1090s onwards in Norwich, together with other stone buildings, would have made it highly probable that the craft would have found work in Norwich, but this is the first piece of evidence for this assumption. The context of this find suggests that the most likely provenance would have been the castle itself, but against this suggestion is the fact that all the fragments of window glass which have been found from domestic contexts in 12th-century England have been unpainted (Marks 1993, 92). However, since the castle was a prestige building of royal foundation, it cannot be ruled out that it was provided with painted glass in the 12th century.

The second fragment (SF7083, cat.no.562) shows part of a relieved leaf design and is painted on thin glass with two grozed edges which are at an angle of 70° to each other. This is close to the 72° required for a pentagon and it is possible, although not certain, that the design was a heraldic cinquefoil. If so, the most common context for this charge in Norfolk would have been one of the various forms of the Bardolf coat of arms (Corder 1965, 366–367). A house known as Bardolf's Place stood less

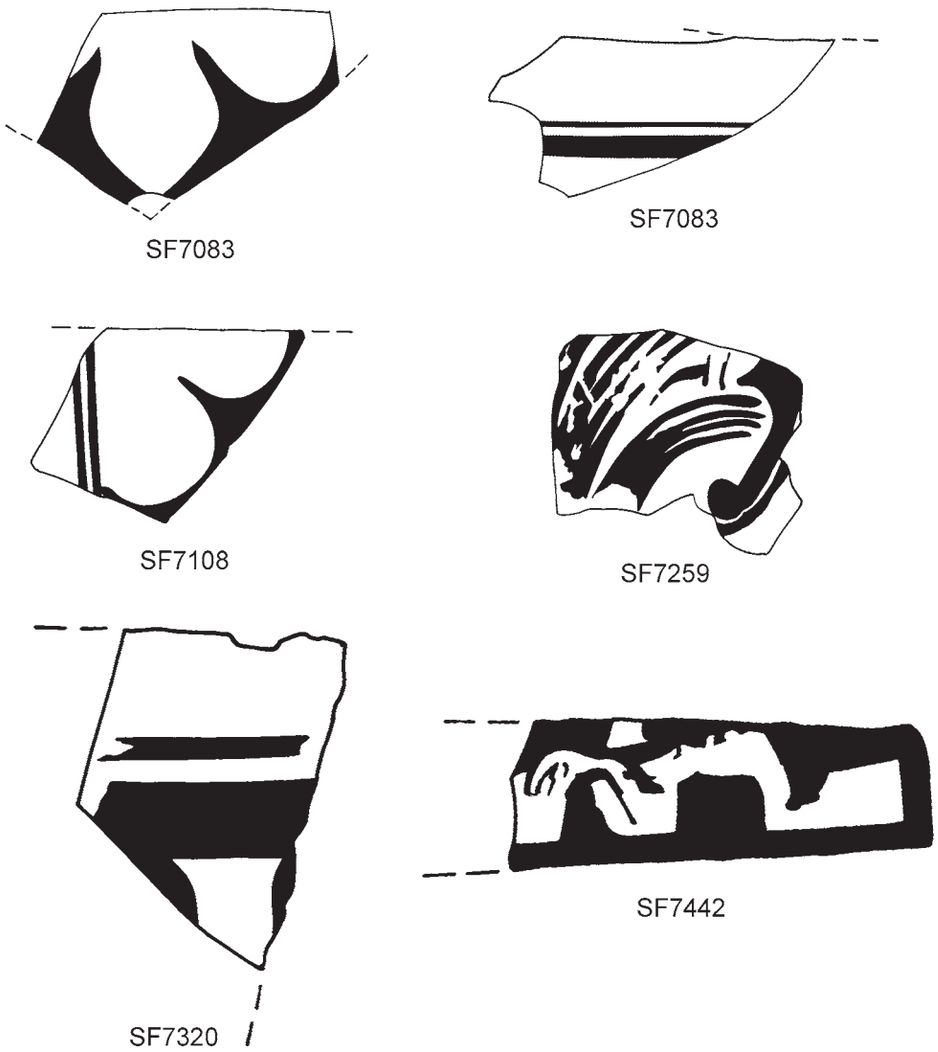


Figure 9.29 Window glass (SF7083 (x 2), 7108, 7259, 7320 & 7442). Scale 1:1

than 350m from the castle ditch on King Street at the junction with Sandgate. It was bought by Lady Agnes Bardolf and her trustee Sir Miles Stapleton, probably in the late 14th century (Blomefield 1806, IV, 83). It is possible that glass including heraldry from this house was dumped into the well.

SF7083 **Window glass**. (cat.no.562) Clear glass with grozed edge; one flashed ruby with painted ?heraldry — 14/15th century. (cat.no.563) painted with unidentified design and trace line and grozed edge — med/post-med.
50321, fill of well 50108, Period 5.2, G5/24

SF7108 **Window glass**. (cat.no.567) Clear glass painted with foliage, one grozed edge — 14th century.
50320, fill of well 50108, Period 5.2, G5/24

SF7259 **Window glass**. (cat.no.573) Opaque glass, painted with foliage and trace line — 12th century.
50295, fill of well 50108, Period 5.2, G5/24

SF7320 **Window glass**. (cat.no.582) Opaque glass, painted, unknown design, trace line, matt wash: ruby red — med.
50318, fill of well 50108, Period 5.2, G5/24

SF7442 **Window glass**. (cat.no.602) Opaque glass, painted with drapery, trace line and one grozed edge — 12th/13th century.
50284, fill of well 50108, Period 5.2, G5/24

Lead cames

Only three pieces of lead window came were recovered from fills of the well, including types A and G (for typology, see Rogerson *et al* 1987, 39).

Ceramic Building Material

by Irena Lentowicz, with Richard Kemp (identification)

A small assemblage of ceramic building material was recovered from the lower backfills of the well (G5/23; 0.280kg) and was dominated by brick fragments including types EB7 and EB8 which are dated to the late 14th and 15th centuries. Roof tile fabrics included types RT103 and RT114 but ceramic fragments in Fabric RT200 were much more common. Similar material was recovered from the dismantling of the upper part of the well shaft (see Chapter 10.III).

By far the largest assemblage attributed to Period 5.2 came from the upper backfills of the well (G5/24, 30.795kg). This group accounted for 54.2% of the sub-period assemblage, and 13.4% of the entire CBM assemblage studied. A wide range of CBM was recovered, although medieval and early post-medieval bricks made up the majority of the assemblage. Type EBB bricks were more common than EBA. Type EB8 bricks (introduced in the late 14th century) were the most common single brick type recovered, but 15th-century type EB7, medieval types EB1, EB2, EB106 and later types LB2 and LB5 were all found in some quantity. These later brick types (which account for approximately 20% of the group assemblage by weight) generally occur in 16th-century deposits in Norwich, although they are known from the mid 15th century elsewhere in East Anglia (see Chapter 13). While it is possible that the presence of the late brick fragments, which occurred steadily throughout the main group of fills considered here, indicates a 16th-century date for the entire period of deposition, the low proportion of other 16th-century objects may indicate that the change in brick manufacture in Norwich occurred slightly earlier than has previously been supposed (*i.e.* before *c*.1500).

Roof tile accounted for a much smaller proportion of the group assemblage. Sandy type RT100/103/111 (late 13th- to 14th-century) were the most common type but other medieval types (RT114 and RT117) were also present, while RT200 was very fragmentary. Miscellaneous material included slate but was predominantly made up of mortar and plaster fragments. No residual Roman fragments were recorded from this feature, though fired clay Fabrics 129 and 136 were present in small quantities.

Architectural Stone

by Stephen Heywood

All of the ten architectural stone fragments recovered from fill *50320* are of probable 12th-century origin and therefore residual. These include door and window dressings and a voussoir (SF7451.05, not illustrated), which are discussed further in Chapter 6.III. A piece of Magnesian limestone window dressing of 15th–16th-century date was recovered from the same fill (SF7451, not illustrated).

Painted Mortar Fragments

by Andrea Kirkham

Four fragments of coarse mortar, carrying a ground layer with a painted red line, were recovered from fill *50285* (SF7398). The mortar was given a very smooth finish, before applying a limewash which retains the brush-strokes. The larger fragments show that the limewash was applied in more than one direction. The limewash ground appears to contain very fine sand, although this may be contamination from the plaster.

All the samples retain some medieval colour. A fairly wide (approx. 8mm) red line can be seen on two fragments, the larger fragment having a pale pink colour at one end. The remains of the same red, with a painted edge, can be seen on a third sample. The limewash ground on the larger fragments is thin and abraded exposing the smooth finish of the mortar. The backs of the fragments are relatively smooth, with little to indicate the surface they had been applied to. The mortar is of uneven thickness. Materials consist of a lime binder with a sand aggregate and some larger aggregate inclusions. The ground layer is most likely to be a limewash and the red a red ochre (although no formal analysis has been carried out).

Although the pieces come from a mid 15th- to early 16th-century context, this type of decoration can be found in numerous medieval contexts. Unfortunately, the pieces are too small, with no distinctive features, to date.

Miscellaneous Iron Fittings

by Quita Mould

(Fig.9.30)

Various fittings occurred which may have served a number of functions in the domestic setting. The large swivel hook (SF7033) probably came from a pot chain, while the five smaller examples may have been used on horse harness, chains, dog leashes *etc.* The four small S-shaped links with non-ferrous coating (*e.g.* 6944.24) may come from fine chain: being of a base metal they are unlikely to be from jewellery and were possibly used to suspend scale pans, purse or chatalaine *etc.* The rings and chain links found may have been used on pot chains at the hearth, on cart fittings *etc.* Two large ring-headed pins (SF7232 and 7288, latter not illustrated) and five smaller hooked stems (*e.g.* SF6944.7/14) and fragments of collar ferrules (*e.g.* SF6863.7) were also found.

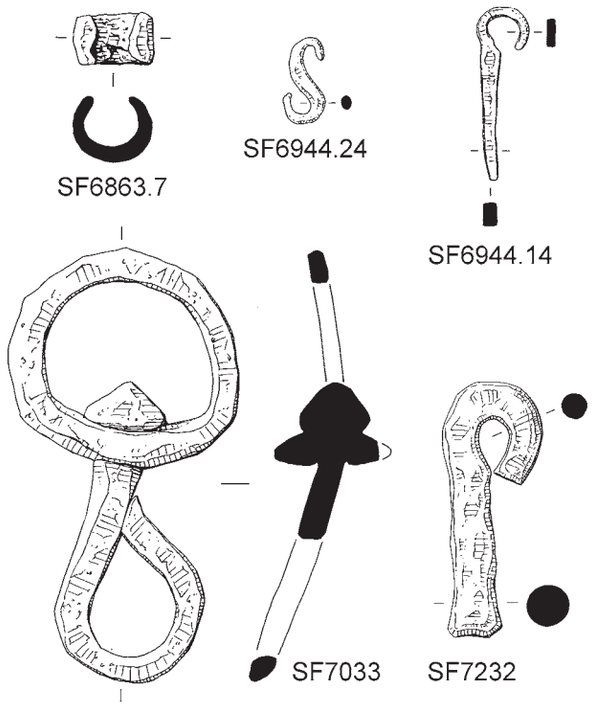


Figure 9.30 Iron fittings (SF6863.7, 6944.14, 6944.24, 7033 & 7232). Scale 1:2

SF6863.7 Small **collar ferrule** of rectangular-sectioned strap. Diam 24mm w: 15mm
50285, fill of well 50108, Period 5.2, G5/24
SF6944.14 Stem with hooked ring terminal. L: 48mm
50296, fill of well 50108, Period 5.2, G5/24
SF6944.24 Small **S-shaped link** with non-ferrous metal coating. L: 24mm
50296, fill of well 50108, Period 5.2, G5/24
SF7033 Large **ring** of round section articulating with a swivel hook with knobbed terminal. Ring diam 70mm hook L: 82mm
50317, fill of well 50108, Period 5.2, G5/24
SF7232 Round sectioned **stem** with rolled ring terminal. L: 80mm
50296, fill of well 50108, Period 5.2, G5/24

Occupations, Industry and Crafts

Metalworking

Introduction
A relatively large amount of ironworking debris and a smaller quantity of copper alloy waste was dumped into the disused well in two major episodes, separated by the deposition of domestic rubbish (25.635kg; 95% of the period assemblage and 19% of the total site assemblage). A range of blacksmithing scrap, ironworking stock and scraps from local workshops was present, complementing the evidence for other local artisan groups (such as spurriers and fletchers) detailed elsewhere in this chapter. Two stone moulds attest to the manufacture of metal artefacts. Fragments of copper alloy sheet may be the result of small-scale manufacture of objects, while fragments of bell mould were also recovered.

Metalworking debris
by Justine Bayley (identification) and Catherine Mortimer (XRF analysis)
The lower backfilling of the well (G5/23) contained smithing slag, hammer scale and copper alloy spillage or miscast which was identified using XRF as leaded copper (lower fill *50308*, Period 5.1). Metalworking debris recovered from the various upper fills (G5/24) included smithing slag, cindery hearth bottom, hearth linings, tuyeres, cinder, hammerscale and a small quantity of copper alloy waste. A total of 11.681kg of ironworking slag, probably smithing slag, came from fills *50295* and *50294*, while fill *50284* contained 11.192kg of similar waste: these three fills were towards the top of the well infill sequence.

Metalworking tools, smithing waste and associated evidence
by Quita Mould
(Fig.9.31)
Iron metalworking tools recovered include a punch (SF6957.35) and three heavy, tapering shanks which may be fragments from broken sets or wedges but are more likely to be partly-worked bar iron from the manufacturing process (SF7166.11/14/17, not illustrated). In addition, a quantity of iron straps/strips (x 161), U-shaped folded straps (x 14), sheet fragments (x 70), bar (x 66), stem/rod (x 6) and wire (x 37) were found which are also ironworking stock and debris. A minimum of 27 items could be positively identified as blacksmithing scrap. The occurrence of smithing slag, fuel ash slag, cinder and hammerscale from blacksmithing is noted above. Even without this, however, the upper backfill of the well contained sufficient blacksmithing debris to suggest that the rubbish from a local workshop was being deliberately dumped into the disused shaft. Fragments of hearth lining with the impression of tuyeres were noted amongst the debris and it is possible that the sheet iron tubes (*e.g.* SF6957.22) recovered may be the nozzles from bellows. Blacksmiths are documented as owning property in the locality in the late 15th and early 16th century (see Chapter 9.I and Fig.9.1).

An oval socket (SF 7191.1) with an irregular runnel of metal along one side has the appearance of a partly-made and subsequently rejected, arrowhead. Small fragments of charcoal, hammerscale and casting waste were also present in the corrosion products of several iron objects including an arrowhead (SF6960), partly-made spur fittings (*e.g.* SF6970.40), small annular buckles and knife blades as well as scrap iron giving some indication of the products of the workshop(s).

A distinctive slightly vitrified, bubbly surface was seen on a number of items (*e.g.* SF6939.30), most notably the dagger grip and fragments of possible plate armour (see Mould, 'Iron Armour'). It is possible that this is the result of a formerly highly polished surface. The level of deterioration of the surface of the ironwork makes interpretation difficult without a programme of research which is beyond the remit of this project. What can be said, however, is that combined with the evidence of charcoal and other signs of metalworking present within the corrosion products of other items from the same contexts, it suggests that these objects had been in close association with high temperature manufacturing processes. The fact that they occurred on items identi-

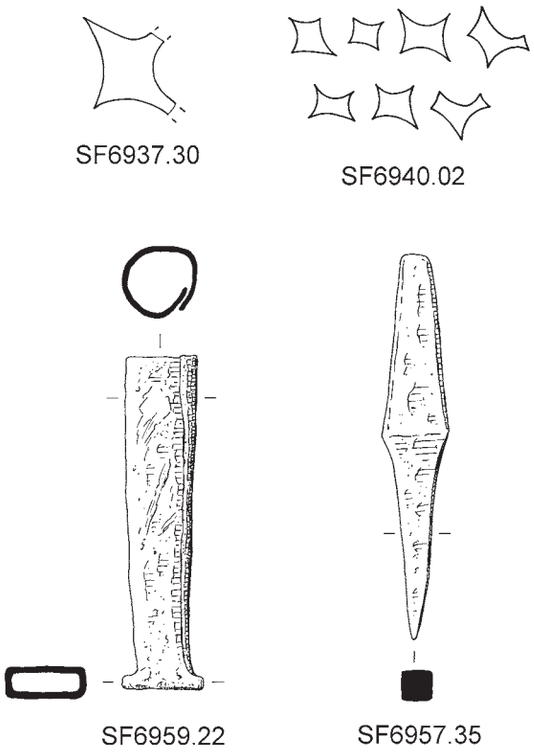


Figure 9.31 Iron sheet (SF6939.30 & 6940.02); iron cylinder (SF6959.22); iron punch (SF6957.35). Scale 1:2

fied as armour, weapons and blades suggests they derive from the clearance of a workshop refitting and repairing military items. Two armourers are recorded in the Fee in the mid to late 14th century, while a sword-finisher was present in St Cuthbert's parish (see Chapter 9.I, Fig.9.1 and Part IV).

In addition, twenty-two small pieces of snipped iron sheet were noted from upper backfills (*50301, 50300, 50296* and *50295*). These included distinctive pieces with concave edges (*e.g.* SF6940.2) apparently offcuts produced from the stamping out of circles like those used to make the heads of dome-headed mounts or rivets used to decorate spur leathers (see Ellis, 'Spurs and Spur Leathers'). Dome-headed mounts from spur leathers occurred in the same contexts as these offcuts and they may have been made in the vicinity. Amongst the hooked spur fittings found in the well backfill was a small group of objects, apparently also spur fittings, discarded before completion (see Mould other 'Spur Fittings'). Four spur buckles appear to have unfinished hooks and were unused when discarded. It is possible, therefore, that debris from a workshop refitting spurs as well as that repairing armour and weaponry was deposited into the well with the domestic rubbish. All these trades are documented around the castle environs in the later 14th century.

SF6939.30 Sheet. Flat-sectioned sheet offcut with distinctive surface possibly originally highly polished. L: 37mm x 33mm.
50301, fill of well 50108, Period 5.2, G5/24

SF6940.02 Sheet. Seven flat-sectioned sheet offcuts with concave sides and pointed corners largest *e.g.* 17x12mm.
50300, fill of well 50108, Period 5.2, G5/24

SF6957.22 Cylinder with a central seam slightly tapering to a rectangular-sectioned mouth with a flattened rim. Possible nozzle from a pair of bellows. L: 89mm diam 20mm
50300, fill of well 50108, Period 5.2, G5/24

SF6957.35 Punch of square-section with a solid handle tapering to a pointed tip from a slight shoulder. L: 108mm max w: 17mm
50300, fill of well 50108, Period 5.2, G5/24

Copper alloy scrap
by Alison Goodall
(Fig.9.32)

Along with a possible casting runnel, a varied collection of offcut sheets, strips, wire and plate (including plate inlay) was recovered from upper fills of the well (x *c.*274), some of which may derived from metalworking activity. Included are possible vessel repair patches and wire in a range of gauges. Two copper alloy sheet fragments (*e.g.* SF7593) do not appear to have been artefacts in their own right and probably represent the waste material after a series of small discs had been removed for making, for instance, small mounts or stud heads. Similarly cut-out plates were found at Billingsgate, London, and have been identified as sheet waste from the manufacture of dress accessories (Egan and Pritchard 1991, 239–240). One piece of wire the same gauge as three round-sectioned rivets in the same context may either be part of a long

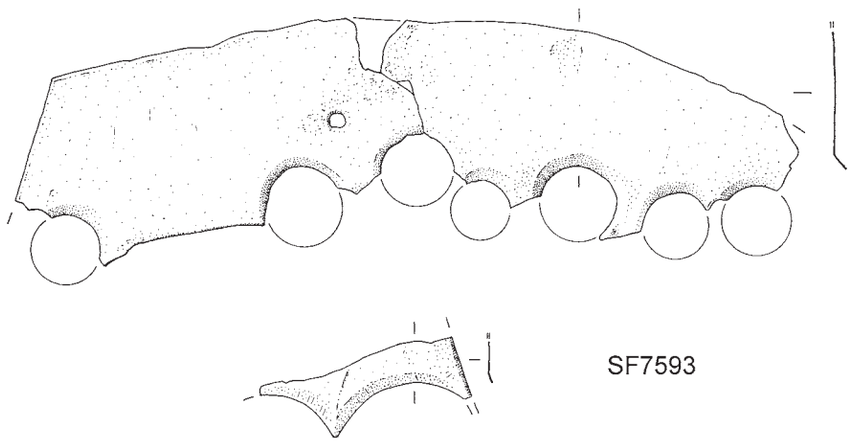


Figure 9.32 Copper alloy punched sheet (SF7593). Scale 1:1

rivet shank or the raw material for cutting into rivets (SF7210, not illustrated).

SF7593 **Sheet**. Two incomplete pieces of strip, both fragmentary. One has had two disc-shapes removed, the other seven smaller discs removed, in both cases by stamping.
50296, fill of well 50108, Period 5.2, G5/24

Leadworking waste
by Elizabeth Shepherd Popescu
All of the leadworking waste associated with the well infilling came from upper deposits (G5/24). It included 16 sheet fragments from fills *50296, 50285, 50284* and *50317*. Of note amongst them was a square example, while another was perforated along one edge (both SF7037, *50284*, not illustrated). Two strips were also found (from fills *50296* and *50284*).

Stone moulds
by Alison Goodall (identification) and Catherine Mortimer (XRF analysis)
(Fig.9.33, Plate 9.7)
Two stone moulds were recovered. One (SF7120) of fine-grained stone displays a series of six grooves arranged in pairs in a well-finished upper face. Although it is possible that this object is a mould and that the V-sectioned grooves were used for casting, the surface of the stone between the grooves seems to be too well finished, as if it was this that was significant rather than the grooves. The presence of two metal rods (perhaps for registering the two halves of mould) are suggestive, however, and a darker colouration of the surface of the stone in parts of this face may have been the result of contact with strong heat. A less well cut groove with a funnel-like opening may be part of an inlet for molten metal but its alignment does not correspond with the use of the metal rods as registration pins. The object remains enigmatic. A strong lead signal was recorded from the surface of the mould, suggesting that it was used to cast a lead-containing artefact. Stone moulds were often used for casting low-melting temperature alloys, especially lead- and tin-rich alloys such as pewter.

The second mould (SF7119, Plate 9.7) came from the same block of fill as the first and was a strap-end mould made from fine-grained stone. Its form is broadly similar to those made with forked spacers in the second half of the 14th century and the beginning of the 15th century. A copper alloy strap-end of broadly similar shape, from France and dated to the end of the 14th century, is illustrated by Fingerlin (1971, 129, fig.214, cat. no. 318).

The very small amount of copper detected on the surface of the mould may be because little residue adhered to the stone, or it may be because the object was cast from a lead/tin alloy containing only small amounts of copper. Stone moulds were often used for casting objects from lead/tin alloys which have a low melting point, while copper alloys with a higher melting point were cast in clay moulds. The introduction of new forms of strap-end in the late 14th century led to large-scale production in tin and pewter to satisfy demand (Egan and Pritchard 1991, 151).

Context	*SF no*	*Fe*	*Cu*	*Zn*	*Pb*	*Sn*
50321	7119	xxx	tr			
50321	7120	xxx	tr		xxx	?

number of 'x's denotes strength of signal, tr = trace, ? = possible

Table 9.10 XRF analyses of stone moulds from the barbican well

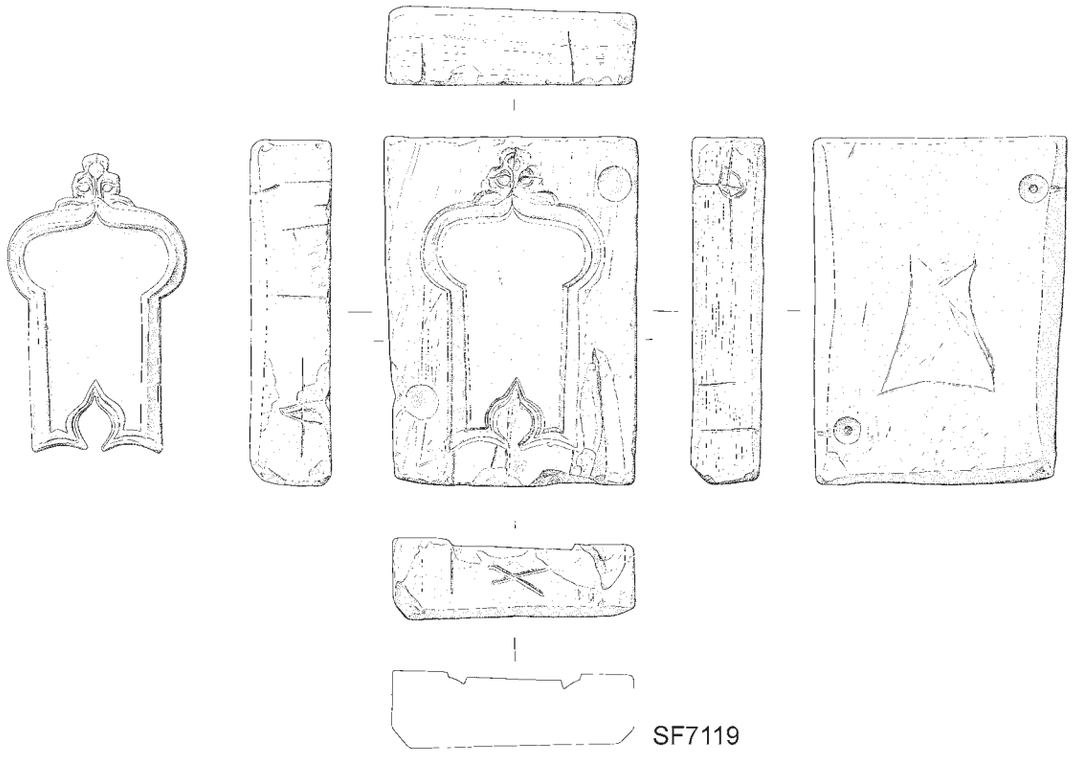
Plate 9.7 Late 14th- to early 15th-century stone strap-end mould (SF7119), with impression (left). For scale, see Fig.9.33

SF7119 **Mould**. Part of a mould made from fine-grained stone, rectangular in shape, 72mm x 50-52mm. One face has a well cut matrix for a strap-end, two indents into which corresponding projections on another mould piece would have fitted, and an inlet for the molten metal which opened into the side of the strap-end. On the opposite face are a further two indents for registration and also a faintly incised outline which may have been an unfinished attempt at cutting another strap-end; mould pieces were sometimes stacked together in order to cast a number of objects at the same time. The upper part is almost parallel sided and broadens out at the lower end, terminating in a trefoil-shaped finial. It has a marked raised ridge defining the edge of the strap-end and there is a tear-drop shaped opening in the upper edge. The finished object may have formed one pair of strap-end plates or very possibly it may have been a one-piece flat-backed strap-end.
50321, fill of well 50108, Period 5.2, G5/24

SF7120 **Mould**. Damaged object of fine-grained stone, 60mm x 29mm x 20mm. One face is striated as if it has been sawn around the edges. The opposite face has two shallow grooves one of which opens out into a funnel-like opening. The `upper' face of the object is well finished and carved with a series of six v-shaped grooves arranged in pairs; at each end of this face the corners of the block are broken and there are revealed the ends of two metal rods, which appear to have been locating pins for registering the halves of the mould.
50321, fill of well 50108, Period 5.2, G5/24

'Bell mould'
The small quantity of 'bell mould' recovered from fills of the well was not examined by a specialist.

Discussion and conclusions
by Elizabeth Shepherd Popescu
By the 14th century, the requirement for ironwork had increased to such an extent that the craft sub-divided into specialist trades (Tylecote 1981, 42). Zoning of urban industries is common in many medieval towns. At Norwich, many such artisans — including lorimers, armourers and bladesmiths — are attested both archaeologically and in documentary sources in the area immediately adjacent to the castle. Metalworkers were particularly prevalent to the west and north, where the



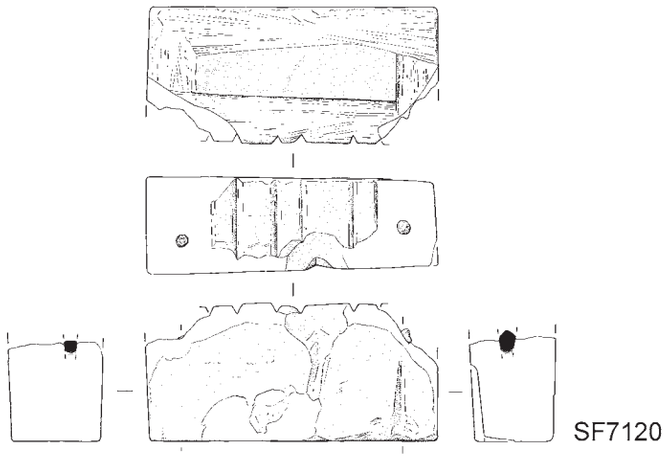


Figure 9.33 Stone moulds (SF7119 & 7120). Scale 1:3

Great Cockey stream would have provided a ready source of water. Documentary evidence attests to a range of other metalworkers and associated trades operating within the Fee at this time, although there have as yet been few archaeological excavations providing evidence to link directly to them. Goldsmiths and a pewterer are also mentioned, while bell-founding continues to be documented in the surrounding area (Cattermole 1987). A smith operating within the Castle Fee in the late 15th century bequeathed his tools including a scythe, bellows, hammers and grindstone (Tillyard, Chapter 9.I). Excavations at 31–51 Pottergate (149N) to the north-west of the castle indicated the presence of a number of workshops, one of which may have been associated with the production of bronze vessels during the 15th century (Carter *et al* 1985, 83). A blacksmith was apparently operating there at the time of a major fire in 1507, although it has been suggested that smithing would not necessarily have been have carried out on the premises, but rather on the outskirts of the city (Margeson 1993, 174). The implications of the Castle Mall well assemblage for metalworking in this part of late medieval Norwich are discussed further in Chapter 9.VI, with concluding comments in Chapter 13.

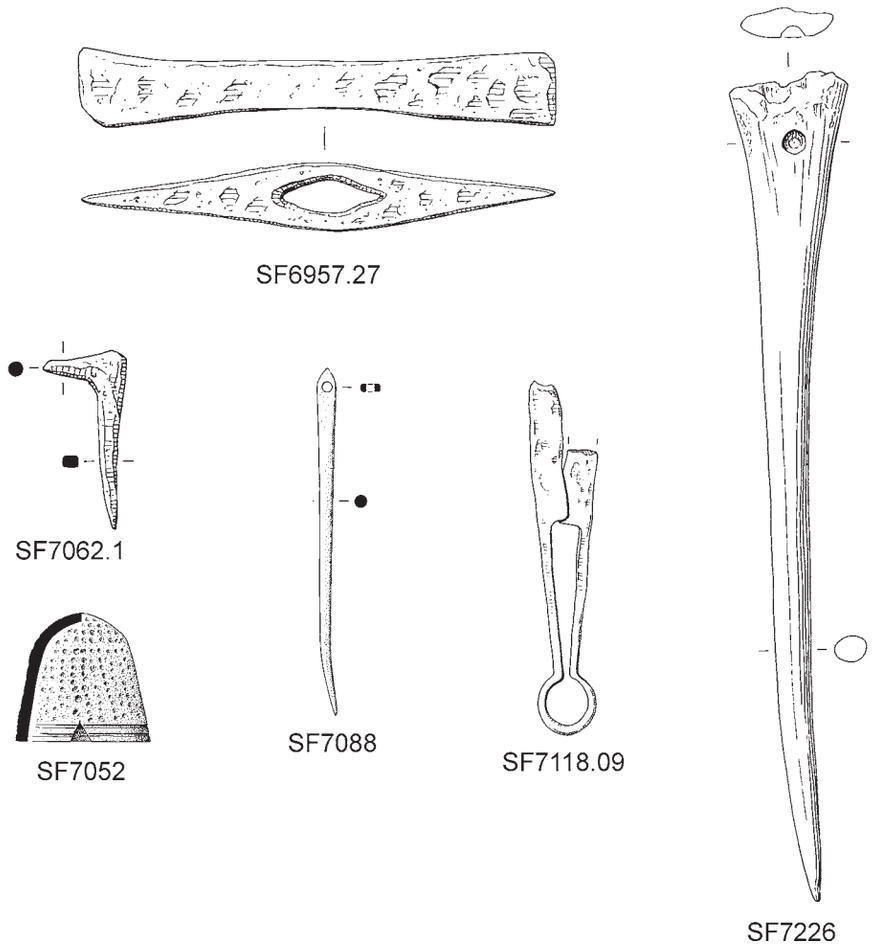


Figure 9.34 Iron axe head (SF6957.27); pin (SF7226), iron tenter hook (SF7062.1), copper alloy thimble (SF7052), copper alloy needle (SF7088), iron shears (SF7118.09). Scale 1:1, ironwork at 1:2

Woodworking
by Quita Mould
(Fig.9.34)
Few woodworking tools were recognised within the Castle Mall assemblage; a small axe was found in the barbican well backfill. A small number of other woodworking tools of the period is noted in Chapter 8.III.

SF6957.27 Small **double-bladed axe** with central elliptical eye and straight-edged blades flattened in the vertical plane. L: 135mm blade w: 20mm
50300, fill of well 50108, Period 5.2, G5/24

Textile Manufacture and Needlework

Pig fibula pins
by Julia Huddle
(Fig.9.34)
Two pig fibula pins came from fills of the well (SF6909 not illustrated, and 7226) where they are likely to be residual. Such objects are normally recovered from Late Saxon deposits; further comments are given in Chapter 4.III.

SF7226 **Pin**, made of pig fibula, shank trimmed and polished; head is partially pierced, forming a small circular depression; there has been no attempt at trimming the head.
50317, fill of well 50108, Period 5.2, G5/24

Chalk spindle whorl
by Julia Huddle
A symmetrical rounded bi-conical spindle whorl weighing 9.1gm was found in fill 50285 (SF6976, not illustrated). Spindle whorls are often recovered from medieval contexts, although chalk examples from Norwich are surprisingly rare, given the local geology. Medieval stone whorls from the Norwich Survey excavations, for example, are all made from Jurassic limestone (Margeson 1993, 185).

Iron tenter hooks
by Quita Mould
(Fig.9.34)
Four tenter hooks were found (*e.g.* SF7062.1). Tenter hooks were used to secure cloth stretched upon frames for drying, although such small L-shaped hooks are also known to have been used to suspend wall hangings and roof tiles (I.H. Goodall 1990b, 234–5).

SF7062.1 **Tenter hook** short pointed shank with upstanding round-sectioned arm. L: 52mm arm ht 24mm
50318, fill of well 50108, Period 5.2, G5/24

Copper alloy thimbles
by Alison Goodall
(Fig.9.34)
Each of the three thimbles was hand-made: the nature of the hand-made indentations and slightly squat profile of one (SF7052) suggest a medieval date.

SF7052 **Thimble** with straight rim with double engraved line. The hand-made indentations are arranged vertically on the sides of the thimble and concentrically at the top. L: 18mm
50318, fill of well 50108, Period 5.2, G5/24

Copper alloy needles
by Alison Goodall
(Fig.9.34)
Four copper alloy needles were found. Needles with heads of similar form to that of SF7088 have been found at Beverley (A.R. Goodall 1992, 140–141); they are very much longer and therefore would probably have had a different use. SF7088 is of a size suitable for most general sewing purposes. A few broken iron needle stems were also recovered.

SF7088 **Needle** with flattened pointed head, pierced by a circular eye.
50320, fill of well 50108, Period 5.2, G5/24

Iron scissors and shears
by Quita Mould
(Fig.9.34)
A pair of scissors (SF6957.15, not illustrated) and two finger-loops from other examples (SF7522 and 7525, not illustrated) were recovered, along with a small pair of shears (SF7118.09) which served a similar function.

SF7118.09 **Shears** with narrow straight-backed blades and rectangular sectioned handles with round spring. L: 97mm.
50321, fill of well 50108, Period 5.2, G5/24

Leatherworking
by Quita Mould
(Figs 9.35–9.36)

Waste leather
A large quantity of waste leather was recovered from well backfills. The leather occurred in 6 individual contexts (see Table 9.11). The bulk derived from five contexts lying one above the other suggesting that the material was deposited in a discrete episode over a relatively limited period of time. A small amount was recovered from fill *50302* and is likely to be intrusive from the layers above.

The leather was recovered in large concreted blocks of leather and soil compacted by the weight of the deposits above. For the most part the blocks proved impossible to separate into their individual components and, regrettably, mould growth could not be prevented on some examples so they could not be fully examined and treated. To minimise any potential health risks and to preserve the maximum quantity of leather concretions in the condition in which they were found a regime of minimum intervention was adopted. Two concretions of leather, from different contexts, were separated into their individual components, which were washed and allowed to air dry. The difference noted between the original weight of the leather in its damp soil matrix and the true dry weight was used to provide an estimated dry weight for all the waste leather recovered, shown in Table 9.11.

The estimated dry weight of the leather recovered is, therefore, a crude estimate of the amount of leather recovered from the well and is certainly significantly less than the amount of leather originally deposited.

The concreted blocks were scanned and the range of individual shapes of the leather waste was noted. In addition, the range of shapes of offcuts from a sample (from context *50301*) were counted and weighed wet and following air-drying, see Table 9.12 and Fig.9.35.

The leather waste was found to comprise almost exclusively of very small pieces of secondary waste; principally thin trimmings (Fig 9.35: a) triangles (b, equilateral and c, isosceles), and d) rectangles). The leather, where identifiable, was predominately bovine. A single piece of primary waste, a fragment of cow udder with two teats, was noted in context *50301*. Occasional fragments of scrap (with all edges torn) were present but occurred in such small a quantity as to be insignificant. The larger of the equilateral triangles were similar to the intersectional cutting pieces produced when cutting out soles during shoemaking, the majority of the triangles recovered, however, were much smaller than those associated with shoemaking waste. Similarly, the other shapes of secondary waste recovered were significantly smaller than that usually interpreted as shoemaking waste. Occasional small offcuts of circular shape with overlap-

context	*dry weight*
50296	4.248kg
50299	0.784kg
50300	3.835kg
50301	2.297kg++
50317	0.065kg++
50302	0.005kg
Total	**11.234kg**

++ = sample only retained, original labels record that much similar material was discarded on site

Table 9.11 Waste leather recovered from flint-lined well backfill, estimated dry weight

		Weight (g)	
Shape	*Quantity*	*Wet*	*Dry*
A	488	142	61
B	171	120	52
C	121	142	61
D	57	68	29
E	3	2	1
F	+	+	+
G	210	206	89
Total	**1,050**	**680**	**293**

(dry weight is estimated; Shape F is unquantified)

Table 9.12 Quantification of leather waste shapes from well fills

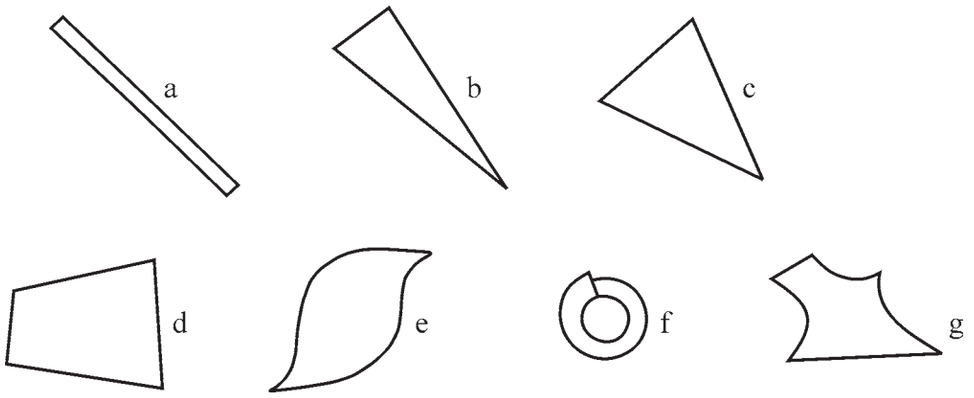


Figure 9.35 Leatherworking waste: secondary waste offcuts from the barbican well. Shapes a–g. Not to scale.

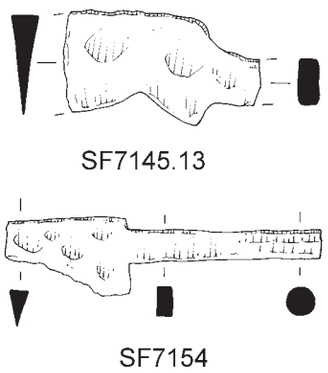


Figure 9.36 Iron leatherworking tools (SF7145.13 & 7154). Scale 1:2

ping terminals (Fig.9.35.f), apparently from enlarging a circular hole, were noted in three separate contexts. A hog bristle was found within a group of offcuts (SF7274 *50317*); hog bristle being flexible was used in preference to needles for sewing in the leatherworking trades.

Parallels for this secondary waste assemblage are difficult to find. The dominance of fine trimmings and small triangular offcuts which may derive from the cutting out of narrow straps and shaping of the terminals suggests the fitting and refurbishment of spur leathers. An individual offcut apparently from the rounded terminal of a wider strap (*c*.35mm) indicates that bridle and harness straps may also have been produced. The quantity of the leather waste recovered appears to represent the dumping of debris from a workshop, probably that of a spurrier or lorimer. The additional evidence for the production of metal mounts for leather (elsewhere in this chapter) and the large quantity of spurs and their fittings recovered in the backfill of the well adds further weight to this interpretation. The presence of both spurriers and lorimers is documented in the environs of the castle in the later 14th century.

Leatherworking tools

Two blades (SF7145.13, 7154) with a distinctly concave cutting edge are of a type found elsewhere in Norwich and identified as leatherworker's knives (I.H. Goodall 1993a, fig. 141 no. 1472–1475).

SF7145.13 **Knife** with wide rectangular-sectioned, centrally-placed tang, broken blade with curving back and concave edge. L: 56mm w: 28mm
50296, fill of well 50108, Period 5.2, G5/24

SF7154 **Knife**. Round-sectioned centrally-placed tang changing to a rectangular section close to the blade, straight shoulder and choil, straight back and concave curved edge, broken before the tip. L: 87mm w: 23mm.
50295, fill of well 50108, Period 5.2, G5/24

Antlerworking

by Julia Huddle

(Fig.9.37)

Evidence for antlerworking debris came from both the well and later deposits in its vicinity (G5/52, Period 6.1; see Chapter 10.III). Of the 13 pieces of sawn waste, only two have been further worked. Four pieces are from fallow deer, the remainder being from red deer (x 4) or unidentified (x 5). Interestingly, an almost complete fallow antler (SF7060) was recovered: it is unusual to find such complete pieces of antler, since ordinarily much of the antler beam would have been cut away and utilised. Fallow deer may have been introduced into the British Isles by the Normans, although the date of their introduction remains controversial (MacGregor 1985, 34; see also Albarella *et al*, Chapters 4.IV, 5.IV and Part III, Chapter 3). Certainly, by the 17th century fallow deer were widespread in Britain. Fallow deer antlers are ideal for working, providing large flat areas of antler tissue.

Antler knife handles from the well are detailed above and it is possible that the waste found in the well relates to handle manufacture. The secondary waste included a strip perforated at one end (SF7078, not illustrated); perhaps an unfinished knife scale and a neatly sawn piece (SF7423).

SF7060 **Sawn antler**. Near complete fallow deer antler including most of the crown. Sawn off from burr with tines broken off.
50318, fill of well 50108, Period 5.2, G5/24

SF7423 **Sawn antler**. Section of neatly sawn cortile tissue.
50237, fill of well 50108, Period 5.2, G5/24

Hornworking

by Julia Huddle

A total of 96 chopped, sawn or cut horn cores were recovered from fills of the well, of which 26 were from cattle and the remainder from sheep/goat. Moreno García

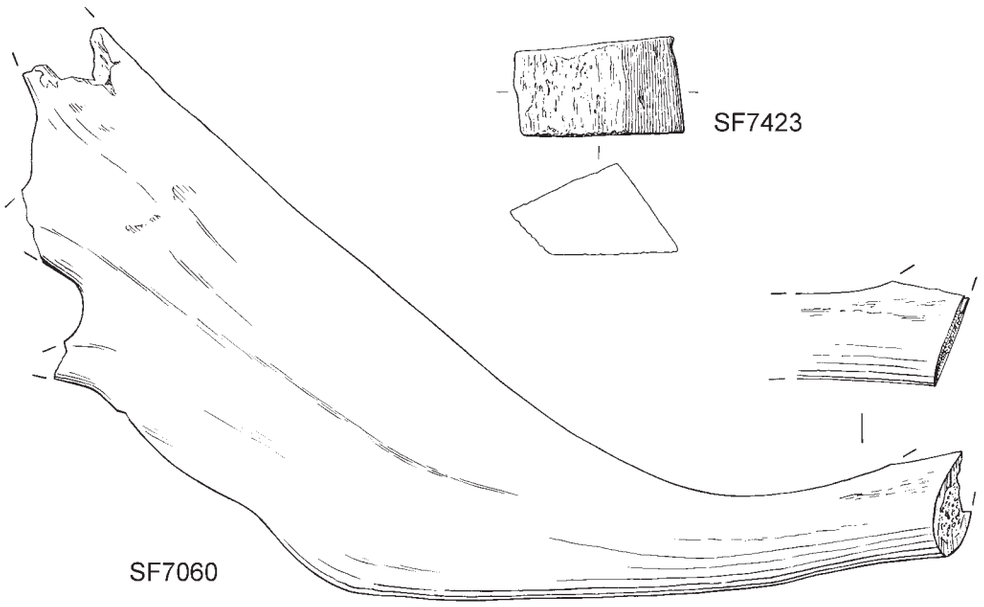


Figure 9.37 Antlerworking waste (SF7060 & 7423). Scale 1:1

interprets these as relating to the processing of sheep skins and subsequent crafts (Chapter 9.IV and Part III, Chapter 4). At least 21% of the horn cores had been sawn off and 6% were knife cut and these traces may indicate that these horn cores at least were removed with the intention of using the horn, illustrating the close links between tanners, tawyers and horners. Another group of tanning/tawing waste was recovered from a late medieval pit within the south bailey (see Albarella *et al*, Chapter 8.III).

Unlike earlier periods (see Chapters 4.III and 5.III) there is very little evidence from the site to indicate what the local horners were manufacturing during the late medieval period. The survival within the well of a single scale tang knife handle made from horn (SF7139) and a horn-handled awl found elsewhere on the site (SF5250; see Chapter 8.III) may, however, be examples of the type of end-products of this period. MacGregor discusses the various other uses to which the material may have been put such as windows, lanterns, possible box mounts and powder horns (MacGregor 1985, 66–67).

Horticultural and Agricultural Tools
by Quita Mould
(Fig.9.38)

Iron tools
Sickle blade fragments (*e.g.* SF7063.13), the tooth from a rake (SF6989.14) and a fragment likely to be a spade-shoe from a wooden spade (SF6957.11, not illustrated; *cf.* those illustrated in Chapter 10.III) were found in backfills of the well.

SF6989.14 Rake tooth oval-sectioned, pointed tine with curved profile. L: 73mm
50301, fill of well 50108, Period 5.2, G5/24

SF7063.13 Sickle, remains of curving blade and thick tang. L: 190mm, blade w: 35mm
50318, fill of well 50108, Period 5.2, G5/24

Whetstones
by J.M. Mills, with David Moore
(Fig.9.39)
The most obvious characteristic of the large group of whetstones recovered from the well (twenty in all; of which four examples are illustrated) is that they are all of

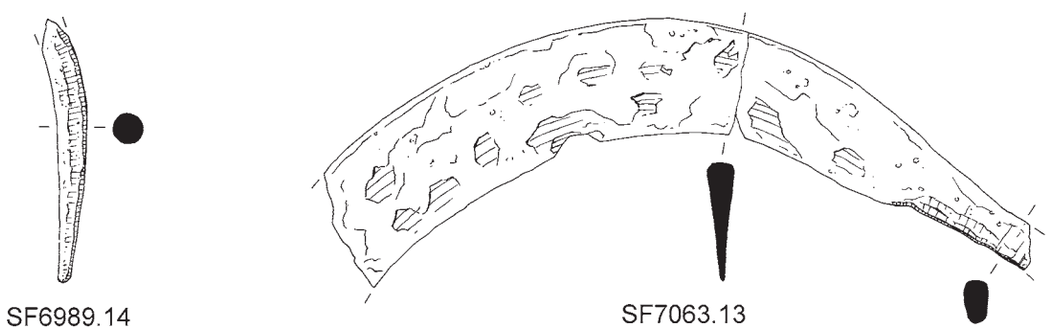


Figure 9.38 Iron rake tooth (SF6989.14); iron sickle blade (SF7063.13). Scale 1:2

Norwegian Ragstone. The absence of other stone types here indicates that it was the preferred material for hones during the late medieval period.

The hones from this assemblage display a range of shapes, sizes and wear patterns; eight of them have grooves, probably from point sharpening, worn in to one or more of the faces. It has been suggested (Chapter 9.VI) that the material dumped into the well may have derived from Spurriers Row and its environs, comprising in the main of waste from industries operating there (such as leather and ironworking). Clearly leatherworkers would have required hones to sharpen a variety of edge tools as well as awls but this would not be the only industry using whetstones in the immediate vicinity of the castle. There does not appear to be sufficient similarity between the whetstones within this assemblage, or any features, to differentiate those from the well infilling from those deposited elsewhere in the excavated area, either to indicate use in a specific way or to suggest that their use was of an 'industrial' nature. This is not to rule it out, but to suggest that beyond edge and point sharpening, it is unlikely that whetstones could be used as indicators for specific activities.

SF7185 **Whetstone**. Medium sized stone of rectangular cross-section. Unusual that the thickness tapers to each end (both incomplete) giving the stone a 'humped-backed' appearance. A v-shaped groove is worn longitudinally in the convex face. 88 x 26 x 14mm. Norwegian ragstone
50296, fill of well 50108, Period 5.2, G5/24

SF7187 **Whetstone**. Possibly a complete stone, markedly waisted by wear. Broad end irregular, other end worn to a rough point. sub-rectangular cross-section. 132 x 27 x 18mm Norwegian ragstone.
50300, fill of well 50108, Period 5.2, G5/24

SF7243 **Whetstone**. Fragment of a large hone stone of sub-oval cross section. The flat faces and one edge worn smooth. one face has v-shaped groove worn in it. Norwegian ragstone
50301, fill of well 50108, Period 5.2, G5/24

SF7448 **Whetstone**. Fragment (?50%) of large hone the extant end is approximately 50 x 25mm, whilst the cross-section has been worn down to 27 x 8mm at the break. All four faces are utilised. There is a long groove, v-shaped at the end, but u-shaped at the break in one face. Norwegian ragstone.
50321, fill of well 50108, Period 5.2, G5/24

Querns

by David Buckley

Six fragments of lava quernstones were recovered from the well shaft (SF7189, *50296*; SF7337, *50284*; SF7350, *50300*; SF7369, *50318* and SF7433, *50317*; none illustrated). As with other fragments of lava quernstone found elsewhere on the site there is no reason to assume that all of them were used for the production of flour and it is possible that at least some were in use for a variety of grinding purposes. Smith and Margeson (1993, 202) concluded that a significant number of the quernstones from the Norwich Survey excavations were used to grind

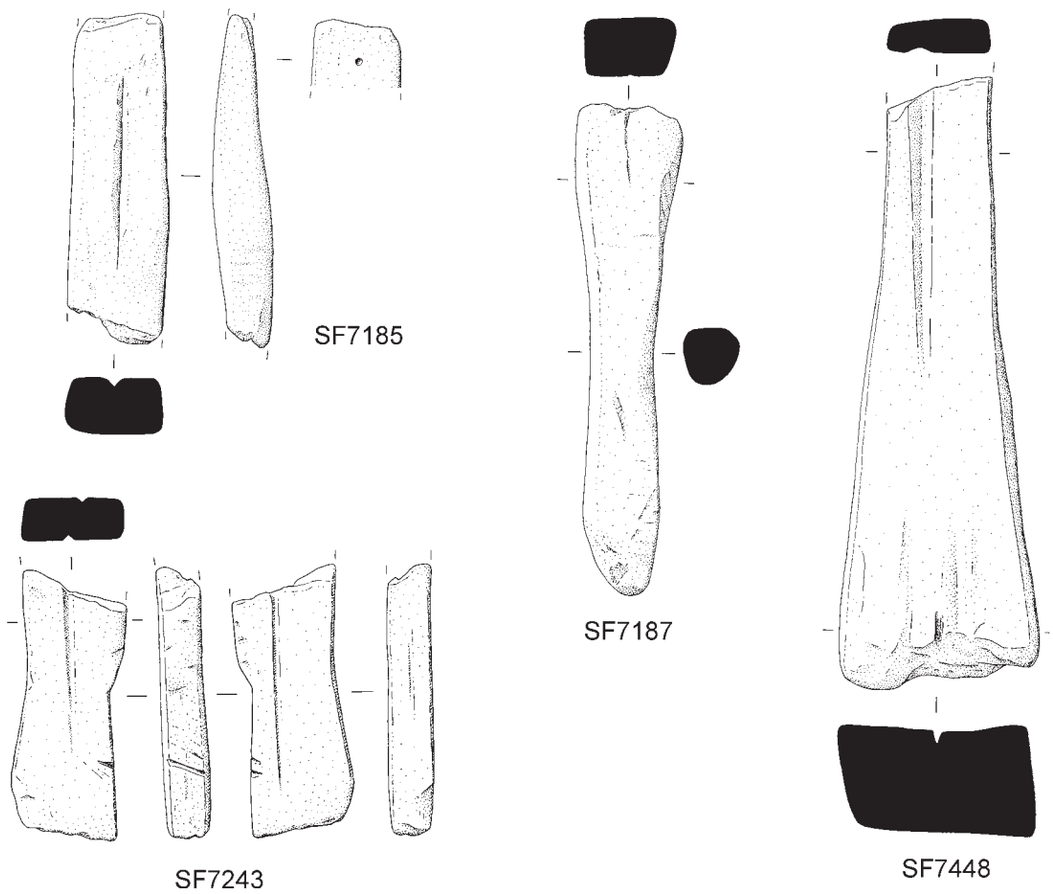


Figure 9.39 Whetstones (SF7185, 7187, 7243 & 7448). Scale 1:2

malt for the brewing industry. There is nothing inherent in the group from the well to suggest any particular purpose, although evidence for malting was found (Murphy, Chapter 9.IV).

Commercial Activity

Coins
by John Davies
Of the eight coins recovered from the well, most were of earlier medieval date and apparently residual here. Many showed a great deal of wear. There is a groat and penny of Edward III (1327–77) and a penny of Edward I (1302–7). One additional coin of interest is a worn and incomplete 'billon mite' of Louis de Crécy, Count of Flanders, between 1322–46. It is interesting to note that another example of this type was found elsewhere in the city, at St Botolph Street (Margeson 1993, 207).

SF6849 **Illegible halfpenny**
Obv: Illegible
Rev: [CIVI]TAS LON[DON]
(London mint)
Wt: 0.34g
50285, fill of well 50108, Period 5.2, G5/24
SF6860 Tiny illegible fragment from the border of a silver coin
14th–16th century
50285, fill of well 50108, Period 5.2, G5/24

SF6898 **Illegible incomplete halfpenny**
AD 1272–1470
Obv: Illegible
Rev: [CIVITAS] LONDON
(London mint)
Wt: 0.33g
50284, fill of well 50108, Period 5.2, G5/24

SF6922 **Illegible long cross penny**
AD 1272–1399
Wt: 0.63g
50301, fill of well 50108, Period 5.2, G5/24

SF6929 **Edward III penny**
AD 1327–77
Obv: [EDWARDVS R]EX ANGLI
Rev: [CIVI]TAS DVNE------
(Durham mint).
Wt: 0.54g
50296, upper fills of barbican well 50108, Period 5.2, G5/24

SF6931 **Edward I broken fragment of penny**
AD 1302–7
Obv: EDWARD R------
Rev: CIVI------N
Class X. Wt: 0.32g
50296, fill of well 50108, Period 5.2, G5/24

SF6933 **Edward III groat**
AD 1351–61
Obv: EDWARDVS REX ANGLIZFRANCI
Rev: CIVITAS LONDON
(London mint) 4th coinage
Wt: 1.55g
50296, fill of well 50108, Period 5.2, G5/24

SF7032 **Louis de Crécy (Count of Flanders) billon 'mite'**
AD 1322–46
(incomplete)
Wt: 0.57g
50296, fill of well 50108, Period 5.2, G5/24

Jettons
by John Davies
Of the seven jettons recovered four were French and three English. Two of the French examples were of the Moor's Head type of 14th–15th-century date and two were of Shield of France Ancient type 1364–80. One of the English jettons was of standing king under canopy type and another of seated king under canopy (both *c.*1350–1400). One example (SF7101) was found with a folded piece of worsted cloth (Crowfoot, this chapter).

SF 6923 **English jetton.** Seated king under canopy type
*c.*AD 1350–1400
Obv: Enthroned king, facing. As Mitchiner 283a
Rev: Short cross fleury. Crowned in each angle. As Mitchiner 271
Wt: 1.52g
50301, fill of well 50108, Period 5.2, G5/24

SF 6965 **English jetton.** Standing king under canopy type
*c.*AD 1350–1400
Obv: Crowned king holding sceptre
Rev: Short cross fleury. Crowned in each angle
Mitchiner 271
Wt: 1.64g
50296, fill of well 50108, Period 5.2, G5/24

SF 7002 French jetton. **Moor's head type**
14th–15th century
Obv: Moor's head R.
Rev: Double-stranded arcuate cross fleury; central lis.
Mitchiner 368
Wt: 1.79g
50317, fill of well 50108, Period 5.2, G5/24

SF 7000 French jetton. **Moor's head type**
14th–15th century
Obv: Moor's head
Rev: Part of arcuate cross visible
Mitchiner 368 Fragment
Wt: 0.28g
50307, fill of well 50108, Period 5.1, G5/23

SF 710 French jetton. **Shield of France ancient type**
AD 1364–80
Obv: Shield with 3 lis
Rev: Triple stranded cross fleuretty in tressure
Mitchiner 434
Wt: 1.32g
50285, fill of well 50108, Period 5.2, G5/24

SF 6926 French jetton. **Shield of France ancient type**
AD 1364–80
Obv: Shield with 3 lis
Rev: Triple stranded cross fleuretty in tresure
Wt: 1.49g
50296, fill of well 50108, Period 5.2, G5/24

SF7010 **Jetton**. Fragment of border from a medieval jetton.
Wt: 0.12g
50317, fill of well 50108, Period 5.2, G5/24

Coin weight
by John Davies
A single coin weight is of medieval French type (SF7020, not illustrated).

SF7020 **French coin weight**. Circular, uniface, for a denier
Medieval
Obv: POIS--OREFCE; lis within border.
Wt: 3.14 g
50317, fill of well 50108, Period 5.2, G5/24

Copper alloy scale pans
by Alison Goodall
(Fig.9.40)
Other objects connected with trade and industry are the two copper alloy scale pans with compass drawn decoration (SF7121 and SF7126), the latter only fragmentary. Scales would have been used for weighing precious commodities such as gold or spices.

SF7121 **Scale pan**. Incomplete dished circular scale pan with possible white-metal coating. Two suspension holes survive near the edge; when complete, the pan would have had three. The pan has eight concentric grooves around a central compass drawn rosette.
50321, fill of well 50108, Period 5.2, G5/24

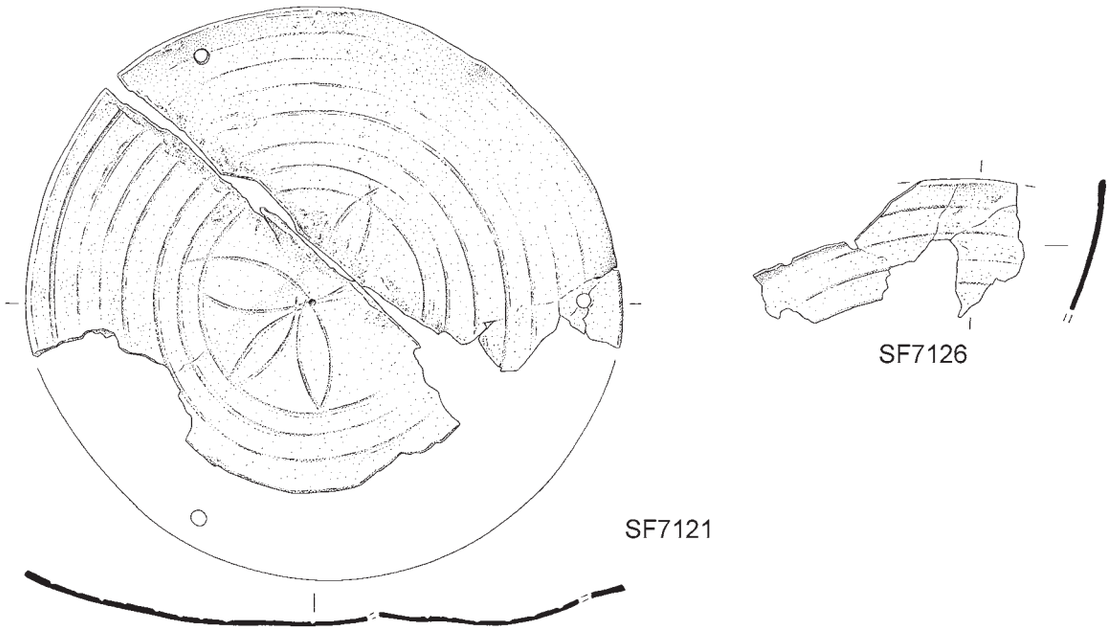


Figure 9.40 Copper alloy scale pans (SF7121 & 7126). Scale 1:1

SF7126 **Scale pan**. Four joining fragments of a scale pan, decorated with concentric grooves. One fragment retains part of a suspension hole.
50321, fill of well 50108, Period 5.2, G5/24

Diversions

Musical Instruments

Antler ?instrument bridge
by Julia Huddle
(Fig.9.41)
An antler object (SF7381) is almost identical to one described from a 15th-century deposit at Winchester, where Graeme Lawson suggests a possible musical use for the object, as part of the bridge of a zither (psaltery) or keyboard instrument (Biddle 1990, 1141, fig. 373, no. 4426). The groove on the Winchester piece, it is suggested, may have been worn by a wire or string and this also seems likely on the Castle Mall piece.

SF7381 **Object**, complete small strip, plano-convex in section, with a square notch cut at each end and deep transverse groove cut into the upper surface at an oblique angle. Possible musical instrument bridge. L: 14mm
50234, fill of well 50108, Period 5.2, G5/24

Iron Jew's harp
by Quita Mould
(Fig.9.41)
A complete iron Jew's harp in unusual in that, although examples of iron and copper alloy are commonly found, it is less common to find an instrument with its central tongue remaining (Lawson 1990,724–5).

SF7294 **Jews harp** with lozenge-sectioned frame and thin iron tongue lying between the two arms. L: 56mm w: 28mm
50302, fill of well 50108, Period 5.2, G5/24

Copper alloy bells
by Alison Goodall
(Fig.9.41)
Two bells were recovered from the well shaft (SF6949.03 (not illustrated) and SF6963). The latter is larger than many sheet metal bells and therefore is unlikely to have been used as a hawking bell. However, it could have been attached to costume or a jester's bauble, or to the collar of a large dog, or it could have been used in music-making.

SF6963 **Bell**. Fragments of sheet copper alloy bell, with suspension loop made from folded strip.
50300, fill of well 50108, Period 5.2, G5/24

SF 6949.03 Upper half of a rumbler **bell** made of sheet metal, with central hole for suspension loop and flanged rim. Not illustrated.
50301, fill of well 50108, Period 5.2, G5/24

Games and Pastimes

Stone gaming board
by Julia Huddle
(Fig.9.41)
A limestone block (SF7450) dating to the 12th century on the basis of the toolmarks present (S.Heywood, pers. comm.) was reused to form a gaming board, perhaps after the stone was removed from its original setting. The game is of Nine Men's Morris or Merrels, the earliest documented record of which is in 1390, but others are known from Viking Age sites (Coad and Streeten 1982; 260) and earlier. The game requires two players using counters (Micklethwaite 1892, 322; Croft 1987).

One other such board is known from Norwich Castle, found during alterations during the 19th century (Micklethwaite 1892, 325). Three complete boards and parts of up to three others were found incised into chalk blocks at Castle Acre Castle (Coad and Streeten 1982, 260, fig. 51, nos 19–24). An excavated example came

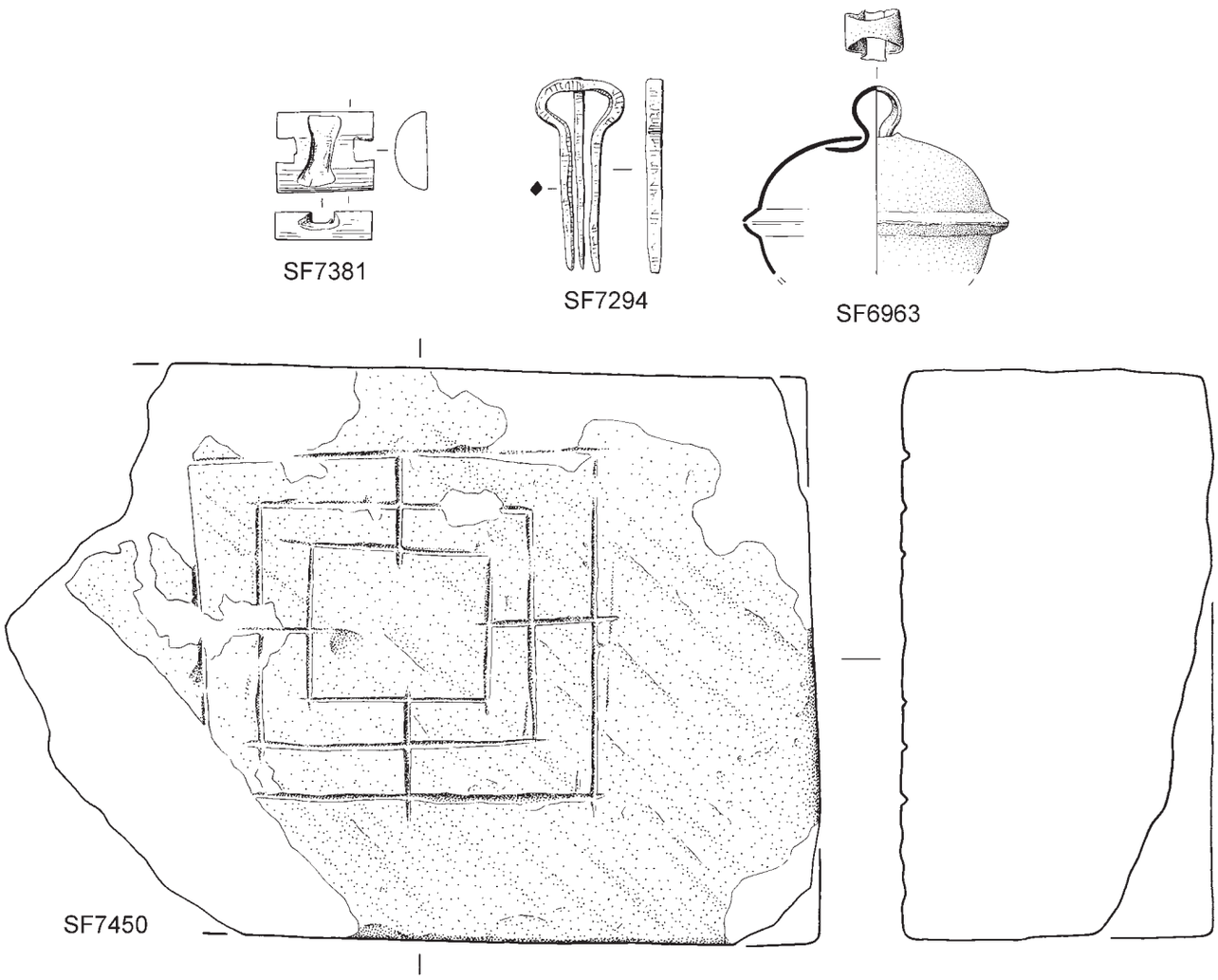


Figure 9.41 Antler instrument bridge (SF7381); iron Jew's harp (SF7294); copper alloy bell (SF6963) limestone gaming board (SF7450). Scale 1:1, ironwork and SF7450 at 1:2

from Wharrham Percy from a deposit sealed by late 12th/early 13th-century pottery. Others have been found carved onto blocks set in walls (these are often reused), steps and on cloister benches. The Castle Mall example, in its 15th- to 16th-century context, is rather later than the parallels cited by Coad and Streeten (1982; 60). It may, however, have been old when it was thrown into the well.

SF7450 **Gaming board**. 'Merrel' or 'Nine Men's Morris' board, incised onto limestone architectural fragment. Sub-rectangular block with weathered diagonal tooling marks on one face. Three other faces have roughly chiselled faces. One face has three concentric squares the sides of each are bisected by an intersecting line.
50320, fill of well 50108, Period 5.2, G5/24

Horse Equipment

Iron spurs
by Blanche Ellis
(Fig.9.42)
The ironwork assemblage includes twenty-four spurs and spur fragments, five detached spur rowels and the probable remains of four more rowels, along with numerous spur fittings and buckles (see below). All of the spurs are in poor condition although x-rays show traces of non-ferrous plating in several cases. Iron spurs were often given a thin coating of tin for a bright, rust-resistant finish (Jope 1956, 35–42; Ellis 1991, 54, 61).

Spur SF6958 can be typologically dated to about 1330–1400. A curved spur side decorated with radiating lines (SF7509) belongs to a group of similarly decorated spurs of the same period from London and Ludgershall Castle, Wiltshire (Ellis 1995, 140–141, figs 99 and 100). The remaining fragments include broken spur sides which curved under the wearer's ankle and broken-off terminals of figure-of-eight type, all appropriate to medieval spurs. An x-radiograph of a severely rusted terminal

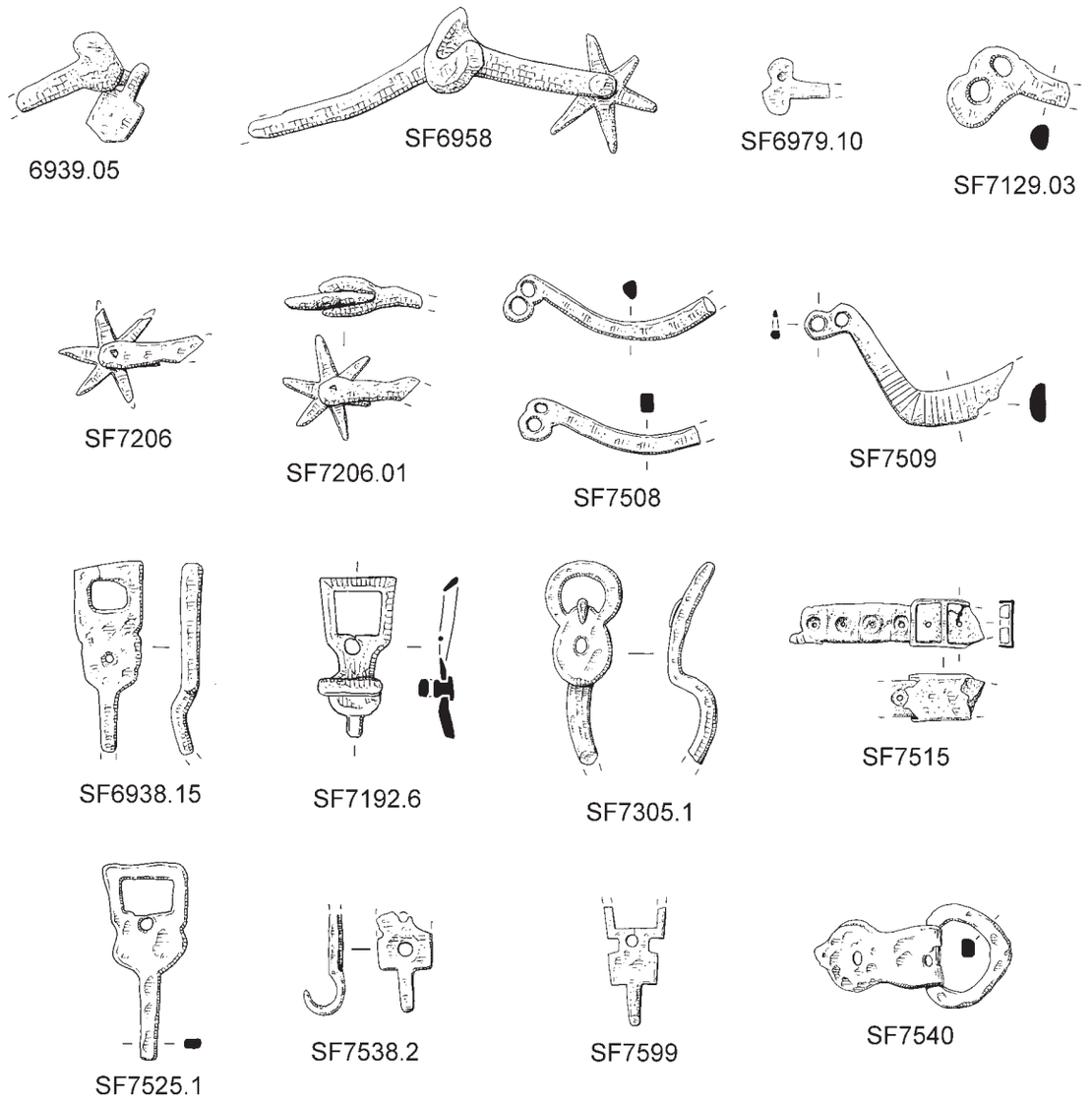


Figure 9.42 Iron spurs (SF6939.05, 6958, 6979.10, 7129.03, 7206, 7206.01, 7508 & 7509); iron spur buckles (SF6938.15, 7192.6, 7305.1, 7515, 7525.1, 7538.2, 7540 & 7599). Scale 1:2

(SF6979.10) appears to have had the rings of its figure-of-eight shape formed to project equally above and below the end of the spur side, as opposed to the more flowing form of figure-of-eight usual for medieval spurs. Such evenly-formed terminals did not appear before the late 16th century and were frequently used on straight-sided spurs from the mid 17th and throughout the 18th century, including nos 9, 14–17 from Beeston Castle, Cheshire (Ellis 1993, 167, fig. 113). In this context, the Castle Mall spur could be an early example, although its rusted condition makes certainty impossible.

The complete rowels (SF6850, 6892, 7206, 7206.01 and 7207.01) are star rowels of moderate size. The buckle fragments are small and, where it is possible to tell, had ring loops opposite to their frames for fixing on to spur terminals.

SF6939.05 Spur and fitting. Spur terminal with an attachment for a leather. The front end of a spur side with a figure-eight terminal. The square-bodied hook attachment, which has traces of non-ferrous plating, is held on to the terminal by its ring hook. Its leather-retaining hook has mostly rusted away. L: (of spur side fragment) *c*.37mm. L: (of attachment) 27mm.
50301, fill of well 50108, Period 5.2, G5/24

SF6958 Spur. Iron rowel spur with D-sectioned sides which have lost their front ends and one side has been pulled outwards. Their top edges form a pointed crest where they join behind the wearer's heel, from where they project forward and downward to curve under the heel. The straight neck has a conical rowel boss flanking a star rowel of six points. Present L: 105mm, neck L: 47mm, rowel diam: 47mm.
50301, fill of well 50108, Period 5.2, G5/24

SF6979.10 Spur. Iron spur terminal of small size of figure-eight with traces of non-ferrous metal plating. The terminal rings project equally above and below the spur side. Remains of a small ring leather attachment also present. L: 24mm.
50296, fill of well 50108, Period 5.2, G5/24

SF7129.03 Spur. Spur terminal. The broken front end of a D-section spur side consisting mainly of its figure-eight terminal. There appears to be what is possibly a slight trace of non-ferrous plating. Max. L: 35mm
50321, fill of well 50108, Period 5.2, G5/24

SF7206 Spur. Iron spur small star rowel of six points within fragments of the broken rowel box. Max diam: 0 25mm.
50295, fill of well 50108, Period 5.2, G5/24

SF7206.01 Spur. Spur rowel within broken fragments of the rowel box. A star rowel of six points, the X-ray reveals small traces of non-ferrous plating between the points. Part of the broken rowel box, L: 31mm, remains on one side with a rowel boss covered in accretions and rust. The other rowel boss has almost completely rusted away. Original diam. c.32mm.
50295, fill of well 50108, Period 5.2, G5/24

SF7508 Spur. Two iron broken spur sides, curved under the wearer's ankle with a figure-eight terminal and D-section. the similarities of their proportions, curve and context suggests that they are probably from the same spur. L: 63mm and 52mm.
50296, fill of well 50108, Period 5.2, G5/24

SF7509 Spur. Iron side of spur, decorated and tinned. The side probably of flattened D-section curves deeply under the wearer's ankle and tapers towards its front end. The figure-eight terminal has a straight bottom edge, its rings showing signs of wear from the attachment for the leathers. Non-ferrous metal plating, almost certainly tin, visible in radiograph and a pattern of radiating vertical lines flanking the curved area of the side. L: 60mm.
50320, fill of well 50108, Period 5.2, G5/24

Iron spur buckles and fittings
by Quita Mould,
catalogue by Quita Mould and Blanche Ellis
(Fig.9.42)

Each spur would have had a buckle and three hook attachments for its leathers. The undersole spur leathers were permanently attached and buckles were only used for the top leathers, these were buckled on the outside of the foot and held by a ring hook to the spur terminal. Each hook attachment was also held on to the terminal by a ring hook which curled the opposite way to the flatter hook at their other end. The flatter hook pierced the end of the spur leather and was compressed to hold it securely.

A minimum of 13 spur buckles were found comprising a small buckle frame of angular or round shape, with an integral plate extending into a hooked terminal. Several small fragments appear to come from other examples. In several examples the integral square buckle plate has a central hole for decoration (*e.g.* SF6938.15, 7192.6, 7538.2 and 7599), or perhaps for the rivet of a retaining loop for the loose end of the spur leather, now missing (*cf.* Ellis 1991, 74, fig. 17b). Four of the buckles have straight tangs (SF6938.15, 7305.1, 7499.10, 7525.1), apparently unfinished hooks, suggesting that the buckles were unused and probably being locally produced. In addition, a rectangular double buckle (SF7515) attached to a narrow leather strap may represent another spur buckle.

SF6938.15 Spur buckle with rectangular-shaped frame, integral plate and slightly curved tang. L: 55mm w: 21mm.
50284, fill of well 50108, Period 5.2, G5/24

SF7192.6 Spur buckle with square-shaped frame and disc plate with short rectangular-sectioned hook, now broken. Round buckle pin hole present close to the frame. The disc plate has central rivet attaching a strip loop beneath to hold the loose end of the spur leather. White metal plated. L: 45mm max w: 17mm
50284, fill of well 50108, Period 5.2, G5/24

SF7305.1 Spur buckle of curved profile with D-shaped frame with integral disc-shaped plate and tanged terminal, hooked pin fragment remaining in pin hole, with rivet hole in the plate. L: 57mm frame w: 27mm
50305, fill of well 50108, Period 5.2, G5/24

SF7540 Spur buckle with oval frame and integral plate, non-ferrous metal plating, random minerally-preserved organic present. D:30mm, L: 58mm
50301, fill of well 50108, Period 5.2, G5/24

SF7515 Rectangular double buckle with fragment of rectangular buckle plate attached to leather strap 10mm wide which has a series of central holes, 2 for the buckle pin, the other 4 appear to have held decorative copper alloy mounts originally. The width of the strap and its decorative mounts suggest it is a spur leather. Ht 13mm W: 25mm
50295, fill of well 50108, Period 5.2, G5/24

SF7525.1 Spur buckle with rectangular-shaped frame, broken pin hole and straight tang. L: 55mm w: 23mm.
50285, fill of well 50108, Period 5.2, G5/24

SF7538.02 Spur buckle with traces of non-ferrous plating. The frame of the buckle has broken across the hole for its pin and both are lost. On the opposite end to the frame is a ring hook to hold the buckle on to the terminal of a spur. L: 29mm, w. of plate : 14mm.
50296, fill of well 50108, Period 5.2, G5/24

SF7599 Spur buckle. The broken plate of the buckle has traces of non-ferrous plating. It is a flat rectangle with its edges cusped next to the remains of a rectangular or square frame, most of which is broken away. There is a small, damaged hole from which the buckle pin is missing. At the opposite end of the plate a curled stump is all that is left of the broken ring hook by which the buckle would have been held on to the terminal of a spur. L: 33mm. Width of frame 19mm.
50229, fill of putlog hole 50259, Period 5.2, G5/24

Hook attachments
by Blanche Ellis and Quita Mould
(Fig.9.43)

A large collection of separate hook attachments was found in the well, a small number of others coming from other contexts dating from the 15th to 17th centuries (Chapters 8.III and 10.III). The attachments for spur leathers are all of the hook type with a ring hook at one end to hold them to a spur terminal, while at their opposite end a flatter hook retained the end of the spur leather.

Many of the hook attachments from the well appear to have one of the attachment hooks broken, probably during deliberate removal from the spur leathers during refurbishment, suggesting that they, and the spur buckles above, come from the clearance of a spurrier's workshop. The majority had flat disc bodies (x 45: *e.g.* SF6935, 7136.02, 7142.08, 7192.08, 7499.06 and 7538), a smaller quantity had angular bodies (x 7: *e.g.* SF7136 and 7538.01); many had a non-ferrous metal coating (x 22). A small number of examples had the terminals curved in the same, rather than opposing, direction (*e.g.* SF7598) in the manner of a strap guide. Square-bodied hook attachments for spur leathers were quite common from the 14th to 16th centuries. They are shown on many monumental brasses of the period such as that commemorating Sir William Bagot (d.1407), at Bagington, Warwickshire (Ward Perkins 1940, 104 fig. 32 no. 5). A group was found together (SF5097.21) in a mid 15th-century context elsewhere on the site (see Chapter 8.III).

SF6935 Spur fitting with central disc plate and two hooked terminals in opposite planes. L: 26mm diam 16mm
50295, fill of well 50108, Period 5.2, G5/24

SF7136 Spur fitting. Hook attachment for a spur leather with traces of non-ferrous plating. the body of the attachment is flat and square with the remains of a ring hook and leather-retaining hook all compressed within accretions. L: *c*.32mm
50284, fill of well 50108, Period 5.2, G5/24

SF7136.02 Spur fitting. Hook attachment for a spur leather. Originally of slender elegant form with a small disc-shaped body. One of its hooks is heavily encrusted with accretions and the other is now incomplete. Specks of brightness suggest possible non-ferrous plating but these are not apparent on the x-ray. L: 33mm.
50284, fill of well 50108, Period 5.2, G5/24

SF7136.04 Spur fitting. Hook attachment for a spur leather. the extremities of both its hooks have rusted away. The body of the attachment is formed into a hollow dome within an oval outline. L: 28mm.
50284, fill of well 50108, Period 5.2, G5/24

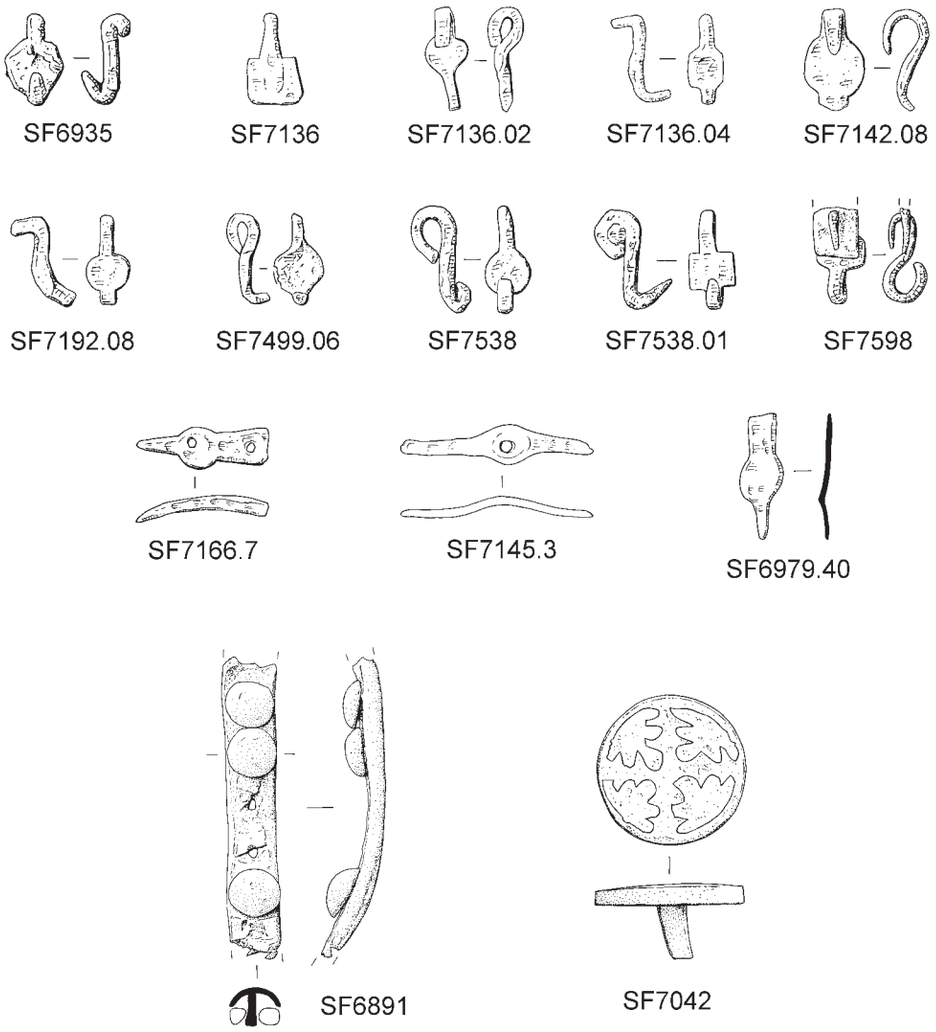


Figure 9.43 Iron spur fittings (SF6935, 7136, 7136.02, 7136.04, 7142.08, 7192.08, 7499.06, 7538, 7538.01, 7598); other iron fittings (SF7166.7, 7145.3, 6979.40); spur leather with copper alloy mounts (SF6891); gilded copper alloy harness mount (SF7042). Scale 1:2; copper alloy at 1:1

SF7142.08 Spur fitting. Hook attachment for spur leather with a large ring and disc shaped body. Only a stump remains of the hook which held the leather but the S-shaped profile shows that it curled the opposite way to the ring hook confirming the identification or the attachment. L: 33mm Max w: 19mm.
50284, fill of well 50108, Period 5.2, G5/24

SF7192.08 Spur fitting. Hook attachment for a spur leather with disc -shaped body. It is fairly complete but embedded in rust. the x-ray reveals traces of non-ferrous plating. L: 26mm.
50284, fill of well 50108, Period 5.2, G5/24

SF7499.06 Spur fitting. Hook attachment for a spur leather complete with disc-shaped body, ring hook and leather-retaining hook. L: 27mm.
50296, fill of well 50108, Period 5.2, G5/4

SF7538 Spur fitting. Hook attachment for a spur leather with traces of non-ferrous plating revealed by x-ray. Heavily rusted but the ring and leather-retaining hook are fairly complete at opposite ends of the disc-shaped body. Overall L: 33mm, w: (of body) 13mm.
50301, fill of well 50108, Period 5.2, G5/24

SF7538.01 Spur fitting with flat rectangular plate with hooked terminal at each end lying in opposite planes with non-ferrous metal coating. L: 30mm, w: 13mm.
50296, fill of well 50108, Period 5.2, G5/24

SF7598 Spur fitting with central disc plate and two hooked terminals. L: 29mm diam 14mm
50295, fill of well 50108, Period 5.2, G5/24

Other spur fittings
by Quita Mould
(Fig.9.43)

Seven other small fittings were recovered alongside the hook attachments and buckles which appear to be closely associated. Each has a rivet hole for attachment and a projecting tang or finial (*e.g.* SF7166.7 and 7145.3). In addition, twelve comparable objects with flat strap bodies and short tangs were found (*e.g.* SF6979.40) which appear to be partly made spur fittings and, therefore, further debris from a spurrier's workshop.

The large quantity of attachments found here strongly suggests that they may have come from the clearance of a workshop. [Margot Tillyard has discussed the presence of spurriers and leatherworkers in Norwich (Chapters 8.I and 9.I) and the castle itself may have had a workshop for repairs to riding equipment, armour, *etc.*.] It would seldom have been necessary to replace spur buckles after the 14th century because by then buckles were normally joined directly on to spur terminals by their own ring loops (see SF7599 and SF7538.02 above). However, it is more likely that the replacement of worn spur leathers by

new ones would have included new attachments for them. See also the evidence for leatherworking, including the remains of spur leathers from the well. Hook attachments were the most popular form of spur fitting from the 14th to the end of the 17th century and examples found separated from their spurs cannot be closely dated by type.

SF7166.7 Fitting with disc plate with tang at one end and strap at the other with rivet holes in the disc and strap, non-ferrous metal coated. L: 40mm diam 15mm
50320, fill of well 50108, Period 5.2, G5/24

SF7145.3 Strip. Narrow rectangular-sectioned strip expanding around a central rivet hole. L: 54mm, max w: 12mm.
50296, fill of well 50108, Period 5.2, G5/24

SF6979.40 Spur fitting with central disc, tang at one end and strap at the other x 2, with casting waste and hammerscale present in the encrustation. Possibly partly-made examples. L: 38mm w: 15mm
50296, fill of well 50108, Period 5.2, G5/24

Spur leathers
by Quita Mould
(Fig.9.43)
Fragments of six upper spur leathers came from fills *50321, 50318, 50301, 50295* and *50284*. The narrow straps ranged in width from 6-12mm, each decorated with a series of round stud mounts (diameters 6-10mm), or rivet holes and staining marking their former position (*e.g*. SF6891). The studs and their shanks were either of copper alloy or iron. Similar round-headed and more elaborate decorative mounts were found separately in the well fills. Along with the large quantity of spur fittings and waste leather offcuts detailed elsewhere in this chapter may derive from a workshop undertaking the refurbishment of spurs. The spur leathers can be paralleled by a late 14th-century group from Baynard's Castle, London (Egan in Clark 1995, 150–156, no. 382–384, 397–8).

SF6891 **Narrow strap**. Narrow strip of leather with three small gilded studs arranged along it and holes for a further two. Torn at each end, one with two holes from a fitting or fastening. Associated with an irregular curved leather strip of similar length but without any studs. Leather worn. L: 40mm w: 7mm.
50284, fill of well 50108, Period 5.2, G5/24

?Saddlery
A roughly semi-circular piece of goatskin (SF6896, not illustrated, fill 50296), with the impressions from a series of round-headed studs along the curved edge, may have been cut from an item of saddlery or upholstery.

Copper alloy harness mount
by Steven Ashley
(Fig.9.43)
A gilded stud with a cross engrailed on an enamelled background (SF7042) was found. Studs with enamelled arms were worn on horse harness, on leather straps, as mounts on stirrup straps and, occasionally, examples with long spikes on the reverse were driven into wooden elements on the harness of dray horses (Ashley 2002, 9, 16). This stud lacks the long spike necessary for attachment to wood, and may be unfinished or unused as it is not burred-over to hold the rove and strap found associated with studs of a similar size (*cf*. Ashley 2002, fig.15, nos 137–9).

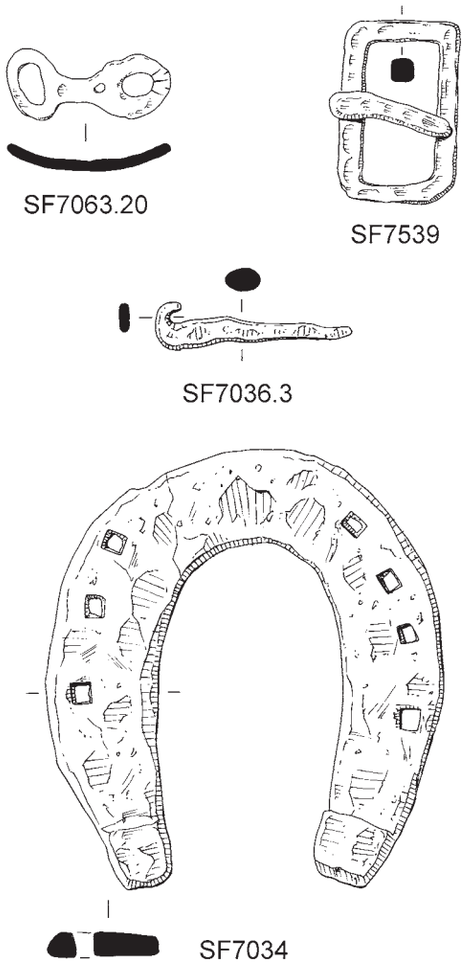


Figure 9.44 Iron harness buckles (SF7063.20 & 7539); iron horse bit (SF7036.3); iron horseshoe (SF7034). Scale 1:2

SF7042 **Stud**. *[?] A cross engrailled Or.* Circular, shank on reverse, decayed (greenish white) enamel present. Traces of gilding on cross and around border.
50284, fill of well 50108, Period 5.2, G5/24

Iron harness buckles
by Quita Mould
(Fig.9.44)
A decorated buckle with two loops and an integral plate between (SF7063.20) is a distinctive late 13th–14th-century type (Egan and Pritchard 1991, 108–110) which is thought to have had a specialised function possibly associated with horse harness. A large rectangular buckle (SF7539) is also likely to belong to harness.

SF7063.20 Buckle with two round-sectioned loops with integral plate between with a single pin hole present and five inlaid bands of non-ferrous metal decorating one loop and non-ferrous metal plating. L: 46mm D: 24mm.
50318, fill of well 50108, Period 5.2, G5/24

SF7539 **Rectangular frame** of round section with buckle pin wrapped around the pin bar. Ht: 54mm
50301, fill of well 50108, Period 5.2, G5/24

Iron horse bits
by Quita Mould
(Fig.9.44)
Four broken links from horse bits were found, including a tapering link of rectangular section (SF7036.3) with a rolled hook terminal at one end, with inlaid non-ferrous metal plating preserved in the cross-hatched decoration.

SF70367.3 Horse bit, tapering link of rectangular section with a rolled hook terminal at one end, the other broken. In radiograph inlaid non-ferrous metal cross-hatched decoration visible. L: 55mm.
50317, fill of well 50108, Period 5.2, G5/24

Iron horseshoes and horseshoe nails
by Quita Mould
(Fig.9.44)
The well fills contained twenty horseshoe fragments. Many more were unclassifiable fragments with rectangular nail holes. Six were of Clark's type 4 (*e.g.* SF7034) commonly found in 14th–15th-century contexts (Clark 1995, 96–7), while two type 2 horseshoe fragments occurred residually.

Ten cuboid-headed nails, which occurred exclusively in the upper backfill of the well, were of a type used on horseshoes of type 4 of later medieval date (like SF7034 above). A fiddlekey and an 'eared' horseshoe nail were also found; the remainder (x 7) were nails with the shank expanded to form a flat, rectangular head — of a type still in use today.

SF7034 **Horseshoe** complete with straight edge, wide web, calkins and tongue-shaped arch, rectangular nail holes four in one side, three in the other, type 4. L: 125mm w: 115mm web w: 35mm
50317, fill of well 50108, Period 5.2, G5/24

Weapons and Armour

Copper alloy armour
by Alison Goodall
(Fig.9.45)
A number of the objects were associated with armour and it is suggested that they may represent the stock of an armourer's workshop. Three items (SF6946, 6952 and 7048) are fragments of mail armour. All are made from open rings with riveted overlapping ends. There are other objects, too, which could have been associated with armour, although they could equally have had other uses. A large number of studs either have plain domed heads or repoussé and decorated heads; any of these could have been used to decorate armour, or they could have had a great many civilian uses. A small hook (SF7391, see 'Caskets' above) may have been the catch of a small casket or it could perhaps have come from plate armour; however, had it been used to fasten armour it would probably have been made of iron. None of the buckles can certainly be ascribed to armour, but a rectangular frame with a central pin-bar (SF7553) has an additional rectangular loop on its lower edge to which a sword belt or sling could have been attached, as shown in portraits of the period. Organic remains attached to this buckle included leather, horsehair and feathers and may suggest stable debris (see Crowfoot, this volume). See below for iron mail armour.

SF6946 **Mail armour**. Two pieces of ring-mail, each made up on interlinked rings of *c.* 8mm in diameter. Each ring is made from circular-sectioned wire with the ends flattened, overlapped and joined with a tiny copper alloy rivet. Each ring has four similarly riveted rings linked through it. A few of the rings are made of iron. *cf.* SF6952.04, which is from the same context and probably part of the same item. Also *cf.*SF7048.
50301, fill of well 50108, Period 5.2, G5/24

SF7048 **Mail armour**. Fragment of ring-mail. Ten interlinked copper alloy rings, made from circular loops of wire with flattened overlapped rivetted ends. each ring has up to four others passing through it. They are identical to the links from SF6946 and SF6952.02.
50318, fill of well 50108, Period 5.2, G5/24

SF7553 **Buckle**. Rectangular buckle with central bar and rectangular loop on one side. Pin missing.
50301, fill of well 50108, Period 5.2, G5/24

Iron armour
by Quita Mould and Thom Richardson
(Fig.9.45)

Mail armour
A maximum of 22 conglomerations of interlocking mail rings were found in the backfill of the well and have individual ring diameters ranging from 7–12mm. Technological details such as the presence of riveted rings were visible in three of the groups (SF7510, 7524 and 7595, latter two not illustrated). These lumps of mail frequently were found in association with the annular buckles described above, but could be distinguished from them by having individual rings of slightly smaller diameter, *c.*7–12mm, than the buckles, *c.*11–14mm. Both the unriveted mail links and the buckle frames would be manufactured in the same way and it is possible that they were the product of the same workshop. Fragments of mail armour were used as a scourer to polish metalwork and it could be that it is this function that they were performing in the contexts from which they derive rather than scrap awaiting melting; however, some conglomerations (SF6913.5 and 7129.1) appear to comprise rings amongst formless fragments of slag and may be debris from the melting process. Mail armour made from copper alloy was also recovered from the well (see Goodall above).

SF7510 **Mail armour**. Interlocking annular rings. Some links can be seen to be riveted.
50320, fill of well 50108, Period 5.2, G5/24

Plate armour
Many fragments (minimum 51) of sheet with round-headed rivets or rivet holes were recovered, amongst which a proportion (18 minimum) may be fragments of plate armour (*e.g.* SF7131 and 7166.19). A complete lozenge-shaped riveted plate with a leather backing from plate armour (SF7158.8) was recovered. This appears to be a plate from a brigandine: the expansion sections around the arms frequently have angled rows of lozenge-shaped plates such as in this example. If this is the correct attribution the general size of the plate would indicate a date of around the early to mid 15th century (*cf.* the Royal Armouries brigandines nos III.1663–6, all Italian about 1450–70). Most brigandines plates, however, have either a single row of rivets or an L-shaped arrangement and, unless it was one of the more erratic plates in the shoulder region, is difficult to make a certain identification of the Norwich plate. Similar plates are even found on pairs of

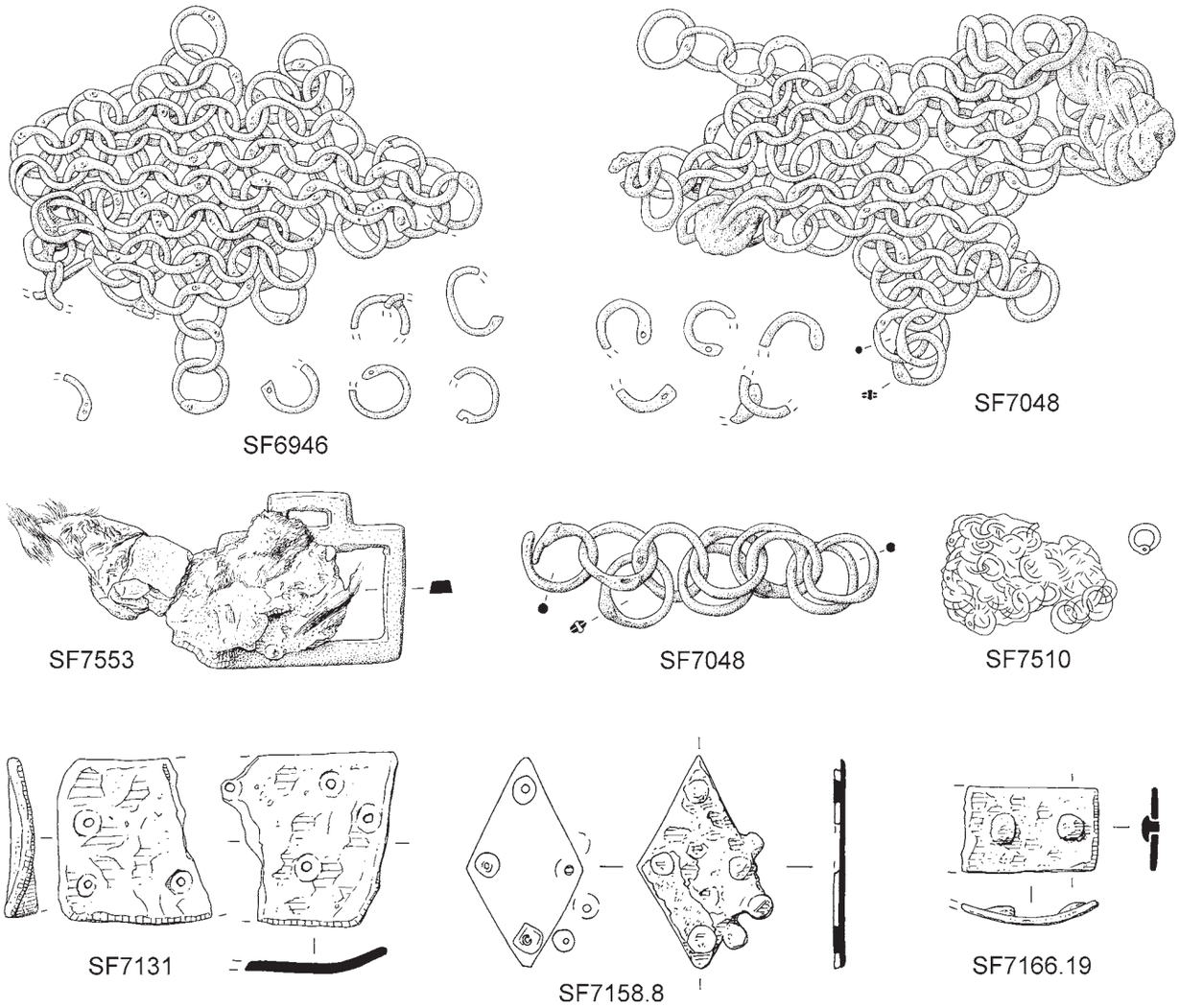


Figure 9.45 Copper alloy mail armour (SF6946 & 7048 x 2); copper alloy armour buckle (SF7553); iron mail armour (SF7510); iron plate armour (SF7131, 7158.8 & 7166.19). Scale 1:1, ironwork at 1:2

plates (or coats of plate) of the late 14th century, such as the lozenge-shaped plates around the arm edge of armour 23 from Wisby, Sweden (Thordemann 1939–40, pl.116), which is a lozenge-shaped plate with four rivets. After the third quarter of the 15th century, brigandine plates tend in general to become smaller and most commonly have rivets in groups, often of three: it would therefore appear that, if the plate from the barbican well comes from a coat of plate or brigandine, it cannot be dated much later. If it is from such a defence, the surviving leather covering would be attached to the outside. Leather was less commonly used than fabric for both defences, but its use is perfectly possible.

The smaller fragments among the group (such as SF7166.19) are too fragmentary to identify with certainly, although this particular example may again have come from a brigandine or pair of plates. The larger fragments (SF7131) appear to be from a pair of plates. The x-ray, however, indicates the presence of rivets with washers: if so they are very unlikely to be from such a defence and much more likely to be broken fragments of a plate armour articulated with internal leathers. Their size fits well with the outer end of part of a tasset (thigh defence), for example. Laminated defences were articulated in this way and of this size from the very end of the 15th century up until the early 17th century.

A distinctive, unencrusted surface was noted on some of the plate armour from the well, often associated with minerally replaced organic remains particularly of leather. On investigation a glassy vitrified residue was present on the surface of a number of the sheet fragments (*e.g.* SF6989.13, 6989.18 and 7158.8) and other items examined, discussed under 'Metalworking' above. The majority derive from the upper backfill of the well or other pit fills of similar date (*e.g.* SF5184). Elsewhere on the site, two small plates from a jack of plate (SF6057.01, Chapter 8.III), a padded protective jacket worn by the common soldiery during the 16th century were found (see discussion of pieces from Beeston Castle, Eaves 1993, 161–164). The skirts and collars of some jacks of plate were filled with mail armour rather than plates: the occurrence of fragments of mail armour in the backfill of the well has already been mentioned above.

SF7131 Two **plates** with cropped corners and gently curved profile with hollow tubular rivets present. L: 42mm w: 48mm; L: 50mm w: 49mm
50321, fill of well 50108, Period 5.2, G5/24

SF7158.8 **Lozenge-shaped plate** with a round-headed rivet in each corner and two present in the encrustation to one side. The highly degraded remains of leather is attached by two rivets to the plate on one surface. L: 63mm w: 36mm
50318, fill of well 50108, Period 5.2, G5/24

SF7166.19 **Strap** with curved profile and pair of dome-headed rivets with non-ferrous metal coated heads. Unencrusted surfaces. L: 40mm, w: 26mm
50320, fill of well 50108, Period 5.2, G5/24

Sword and daggers

by Quita Mould, Robert C. Woosnam-Savage and Alison Goodall (metalwork), Jacqui Watson and Sarah Paynter (minerally preserved organics) (Fig.9.46)

An iron dagger or sword hilt guard (SF7526), a handle possibly for a dagger (SF6957.05) and a fragment of narrow dagger blade (SF7195) were found in the well. The dagger handle (SF6957.05) is of probable 14th-century date, of similar generic type although not identical to some of the London examples (*e.g.* Cowgill *et al* 1987, 102–203, no. 270 dating to the late 14th century). A dagger grip (SF5712.02) likely to be of 15th-century date was found residually elsewhere (see Chapter 8.III). Given its size, the hilt guard from the well (SF7526) is probably a quillon guard from a type of dagger known as a baselard in which the hilt was shaped rather like the letter 'I' and would have formed part of the lower hilt, towards the blade (see Fig.9.46) . The Norwich example is similar to one from Brooks Wharf, London of the 14th to 15th century, now in the Guildhall Museum (Blair 1964, plate 192, no.7553). Analysis of the grip indicates that it was probably of ivory (see below), which fits perfectly with other examples from most periods.

SF7008 is a wheel-shaped sword pommel. Swords with similar pommels in the Wallace Collection are said to be French and are dated to between *c.*1340 and 1400 (1962, 242, nos A459 and A462, pls 105 and 106). Another similar sword, dated to the early 14th century, was found in the Thames at Westminster and still retains its silver scabbard mounts adhering to the blade (Norman 1964, 97, fig.97; Oakeshott 1991, 132). A very good complete example of the type, comparable to Oakeshott type 'J' comes from Ayrshire, Scotland and is held in the collections of Glasgow Museums (A.1987.09). According to Oakeshott's typology, this form of pommel date to between about 1250 and 1425 (Oakeshott 1994, 96). Another similar bronze sword pommel with a clay core was found in Roxburghshire, Scotland. The retention of a clay core which would both have weighted the pommel and protected the shape of the surrounding metal, as in both this and the Castle Mall example, is rare (Stevenson 1974–5, 219). The Royal Armouries holds a solid iron pommel of similar form, also recovered from the River Thames and again dating to the 14th century (IX.2655).

SF6957.5 **Dagger handle?** (iron) round-sectioned, waisted stem with flat-headed terminal L: 85mm.
50300, fill of well 50108, Period 5.2, G5/24

SF7195 Long narrow **dagger knife blade** (iron) with thick back (6mm) tapering to a pointed tip. L: 106mm w: 14mm.
50296, fill of well 50108, Period 5.2, G5/24

SF7526 **Dagger hilt** (iron) guard lozenge-shaped with central tang hole and upward curving tips, three short projections around the hole on the lower side where there is much minerally preserved leather from the hilt. The organic material relating to the grip only remains as a very powdery residue with fine parallel wavy lines which may indicate the use of elephant ivory. L: 85mm max w: 25mm
50285, fill of well 50108, Period 5.2, G5/24

SF7008 **Sword**. Half a copper alloy sword pommel of `wheel' type (Ward Perkins 1940, fig. 1, type 8), filled with burnt clay in which the stain of the ferrous sword tang is clearly visible. The tang passed through a rectangular slot on the bottom of the pommel, and a smaller slot on the top. L: 58mm.
50317, fill of well 50108, Period 5.2, G5/24

Arrowheads

by Quita Mould, Maisie Taylor (wood), Jacqui Watson and Sarah Paynter (minerally preserved organics) (Fig.9.46)

The nine arrowheads link to possible evidence for the fletching of arrows in the form of 392 goose wing tips (see Moreno García, Chapter 9.IV and Part III, Chapter 4, as well as summary discussion in Chapter 9.VI).

All of the arrowheads were socketed, with the exception of two which were broken across the neck and could not be classified. The barbed arrowheads are of two types both of which have been found in Norwich previously (I.H. Goodall 1993e fig. 176, 1865, 1866). The large arrowheads with splayed barbs (*e.g.* SF7505) were 'broadheads' popular in the 13th and 14th centuries and used for hunting game (Jessop 1997, 4). The other type has a lozenge or oval sectioned head with a narrow pair of barbs, better described as fins, running down each side and extending below the socket (SF6957, 6960 and 7421). An example of an oval-sectioned socket (SF7191.1) with an irregular runnel of metal present along one side appears to be a partly-made and rejected arrowhead of this type suggesting that they were being manufactured in the vicinity. The occurrence of hammerscale and casting waste within the corrosion products of a second example (SF6960) provides further evidence for the presence of these arrowheads in a metal workshop situation. Their size and section indicate they were designed to pierce armour, as were two other small arrowheads with leaf-shaped blades (*e.g.* SF7063.30). The shaft of SF7063.30 was of very fine grained, ring-porous wood (*i.e.* willow or poplar). Arrowheads of this date traditionally have poplar shafts (Morris 1997).

A small bullet-shaped socketed arrowhead (SF7155.04, not illustrated, fill 50295) of a type dating to the 16th century was also recovered (Jessop 1996, 197, type MP10).

SF6957 **Arrowhead** with oval-sectioned head with a small fin running down each side to produce barbs extending below the short socket L: 57mm blade w: 15mm.
50300, fill of well 50108, Period 5.2, G5/24

SF6960 **Arrowhead** as 6957 above with lozenge-sectioned head. L: 66mm, blade w: 12mm.
50296, fill of well 50108, Period 5.2, G5/24

SF7191.1 Oval-sectioned **socket** with an irregular runnel of metal along one side. L: 30mm D 8mm
50284, fill of well 50108, Period 5.2, G5/24

SF7063.30 **Arrowhead** with small blade with lozenge-shape and section and nailed socket with much minerally preserved wood from the haft remaining. Very fine grained, ring-porous wood: AML analysis indicates haft is *Salix* sp. (willow) or *Populus* sp. (poplar). L: 43mm w: 15mm
50318, fill of well 50108, Period 5.2, G5/24

SF7505 **Arrowhead** with large flat-sectioned, triangular, barbed blade with round-sectioned socket. L: 80mm blade w: 42mm
50284, fill of well 50108, Period 5.2, G5/24

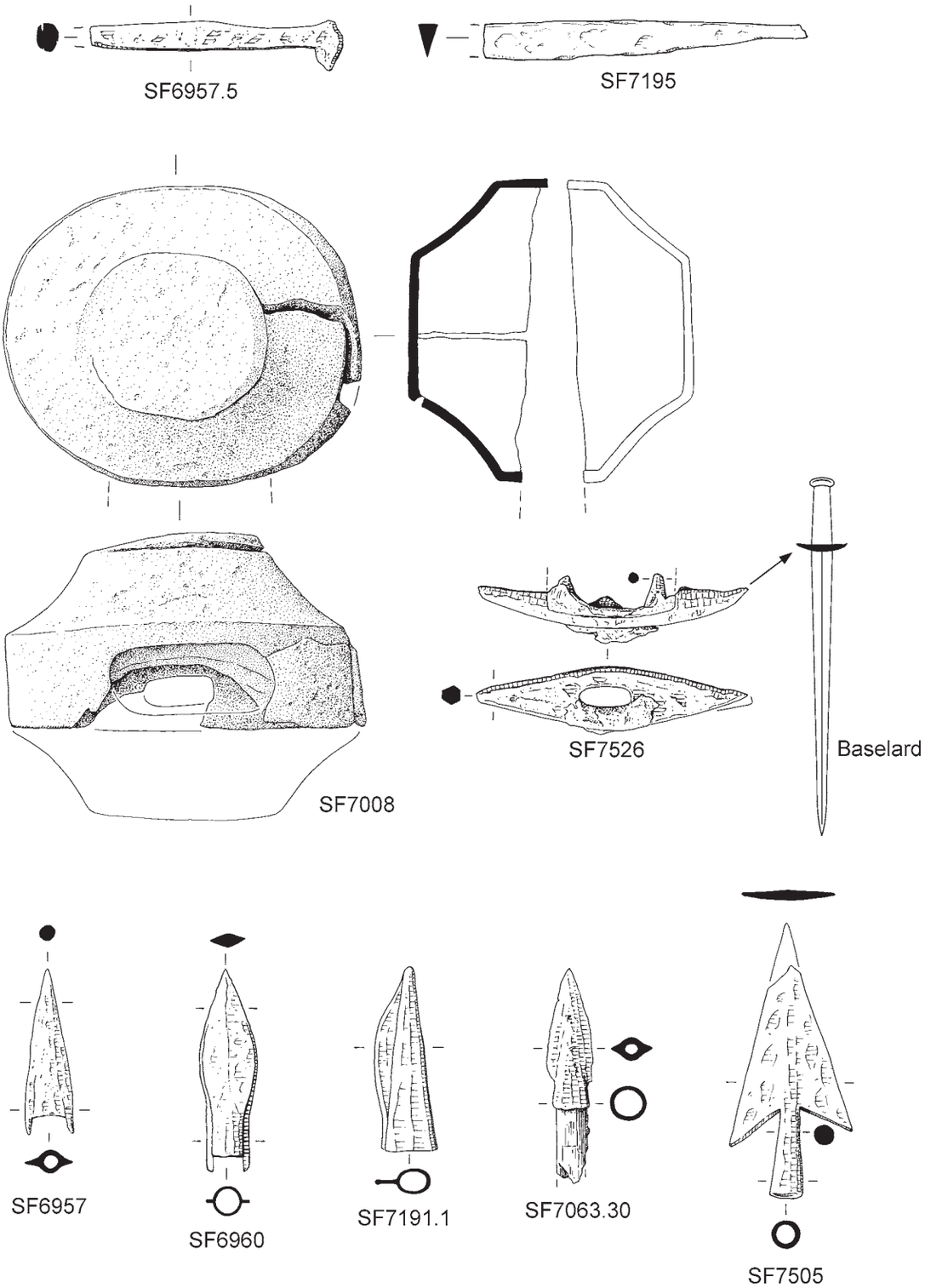


Figure 9.46 Iron daggers (SF6957.5 & 7195); copper alloy sword pommel (SF7008); iron sword hilt (SF7526); iron arrowheads (SF6957, 6960, 7191.1, 7063.30 & 7505). Scale 1:1, ironwork at 1:2

Leather sheaths with copper alloy fittings
by Quita Mould and Alison Goodall
(Fig.9.47)
The remains of three knife sheaths were recovered. The two examples from fill *50321* have decorative copper alloy mounts with serrated lower edges (SF7123 and 7091). All have a central back seam, while two have stamped decoration on the front face. The quatrefoil in lozenge motif (SF7077) can be paralleled on a sheath from a late 13th-century waterfront at Swan Lane, London (Cowgill

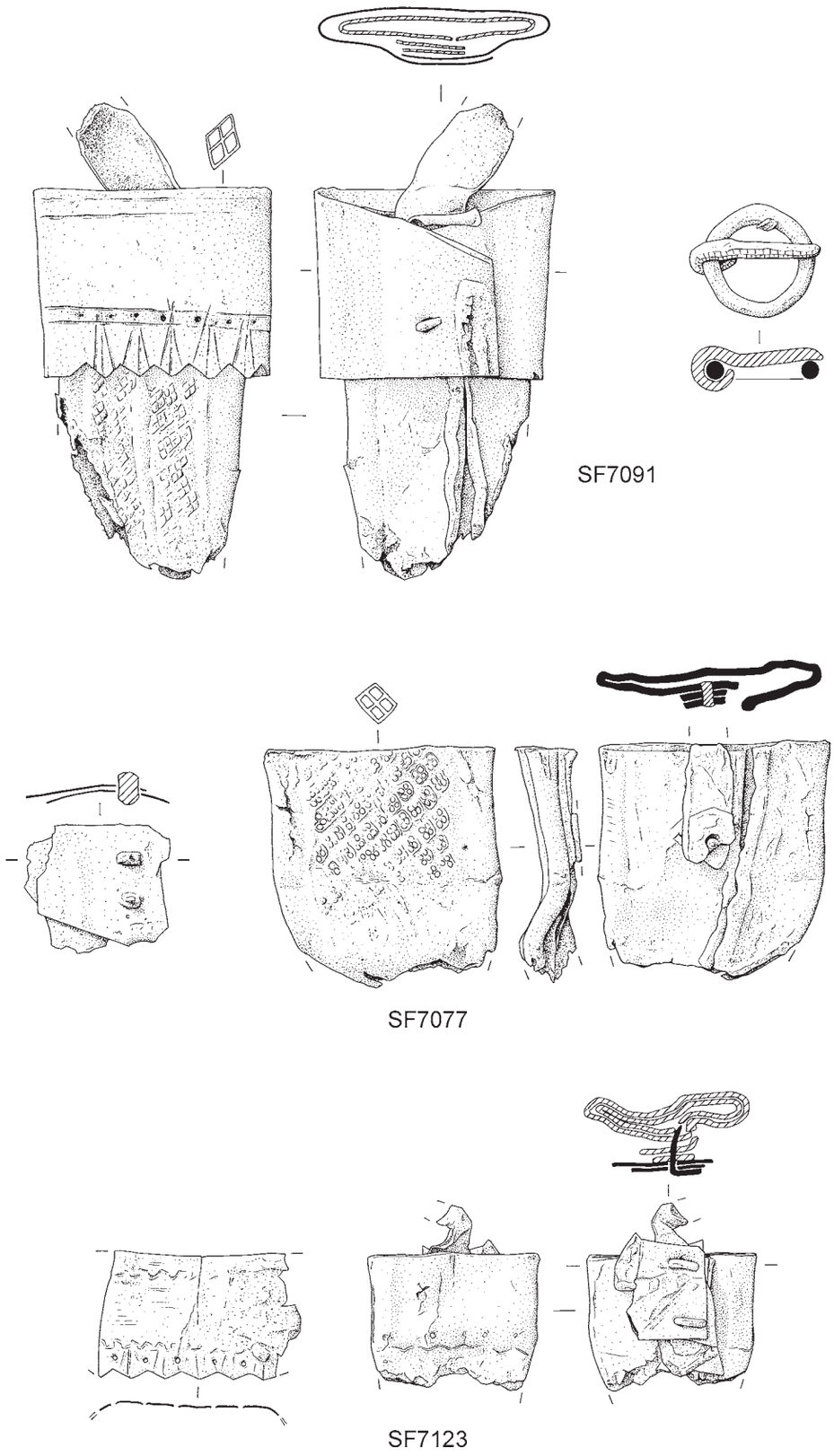


Figure 9.47 Leather sheaths (SF7091, 7077 & 7123). Scale 1:1

et al 1987, 126, fig. 84, pl. 12, no. 399,). The decoration on the second (SF7091), which has a decorative copper alloy binding at the mouth, can be exactly matched on an example from a late 14th-century context at 'Baynard's Castle Dock', London (*ibid*. 154 and fig. 99, no. 460).

The third sheath (SF7123) is a similar fragment but with a less well-made binding.

These three sheaths are notable in having copper alloy mounts and the remains of their suspension straps present, features rarely encountered elsewhere.

SF7077 **Sheath**. Decorated sheath, cut across top, other end degraded but showing shaping, iron staining present suggesting a metal fitting but no fixing holes present. Folded with a closed grain/flesh seam down centre and an iron pin with remains of a suspension strap, width 6mm. Front decorated with series of stamped lozenges containing four raised dots, a crease line runs down each folded edge and down the back which is otherwise plain. Leather worn, probably calfskin. Associated with two copper alloy plates held together by two rivets. Other sheet fragments have possible surface decoration. Length of sheath 36mm, width 35mm
50317, fill of well 50108, Period 5.2, G5/24

SF7091 **Sheath**. Top of decorated sheath with closed grain/flesh back seam. Front decorated with two panels of stamped quatrefoil lozenge in lozenge motifs within raised linear borders. Top has a copper alloy mount with a serrated lower edge from which the stub of a suspension strap protrudes. Copper alloy mouth binding with scalloped binding/feathered lower edge with a row of perforations between incised lines above. The upper edge has a pair of incised lines. At the back the binding is undecorated and is joined with a lap joint. A small leather strap (W: 9mm) may be part of a suspension arrangement. Leather worn, probably calfskin. Length 59mm, width 28mm. Associated with an annular buckle of copper alloy with an iron pin recorded as having been attached to the copper alloy mount by the strap. Diameter 18mm.
50321, fill of well 50108, Period 5.2, G5/24

SF7123 **Sheath**. Fragment of top edge of narrow sheath with an internal lining and central back seam. A line of small stitch holes runs below the edge to attach the accompanying serrated edged copper alloy mount. The remains of a copper alloy plate also adheres to the back held by two rivets across the back seam with a stub from the suspension strap present beneath. Decorative copper alloy mouth binding. Binding has scalloped and feathered edging with a row of small perforations. Back (which is the only part still attached to the leather) is overlapped and secured by two pins. Leather worn, probably calfskin. Length 20mm, width 26mm
50321, fill of well 50108, Period 5.2, G5/24

IV. ZOOLOGICAL AND BOTANICAL EVIDENCE

Mammal and Bird Bone

by Marta Moreno García
(Figs 9.48–9.53, Plates 9.8–9.10)

Introduction

A well-preserved assemblage of 18,495 mammal and bird bones and 351 teeth (NISP) was collected from mid to late 15th- to early 16th-century fills of the barbican well, forming the single most significant faunal assemblage from the Castle Mall site. Its species composition is summarised in Table 9.13. Full details of the complete assemblage and the methodologies employed in its study are given in Part III, Chapter 4, with a short summary presented below for ease of reference.

General Quantification

On the basis of the NISP method, the number of fragments of each taxa has been totalled and is expressed as a percentage of the total number of fragments for either mammals or birds (Table 9.13; see also additional details in Part III, Chapter 4, Tables 46, 48, 51 and 52).

The total number of hand-recovered and sieved mammal fragments is 14,958 (including isolated teeth) and these weigh 131kg. Nearly 40% of the sample is comprised of domestic taxa. An additional 44% includes the general categories 'oxo', 'lar', 'sma' and 'rum'. Given the low number of wild animals (2*%)* (*i.e.* red deer, roe deer and fallow deer) and since the identifiable fraction of the assemblage is dominated by the three main domesticates: cattle (*Bos taurus*), sheep/goat (*Ovis/ Capra*) and pig (*Sus* dom.), it can be assumed that the general categories mainly represent cattle and sheep/goat. Pig bones because of their more characteristic shape are more difficult to misidentify. Dog bones constitute a high proportion of the domestic mammal assemblage, relating to at least fifteen partial burials.

Table 9.13 shows that the total number of bird bone fragments is 3,888, weighing approximately 6kg. There is a high proportion of goose bones (over 31%) followed by domestic fowl (18%). Two additional categories (chicken-size and goose-size) were created to record fragments of long bone, rib, vertebrae and phalanges which could not be assigned confidently to one species, but which very likely belong to domestic fowl and goose. The unidentified bird category includes mainly fragments of skull, pelvic girdle and sternum. The avian assemblage is dominated by domestic taxa. A quantification by fill appears in Table 9.14, linked to a quantification of waste leather (see Mould, Chapter 9.III). The related depositional sequence is illustrated in Fig.9.2.

Assemblage Composition

Both the mammal and bird bones indicate the presence of specialist waste from butchery and craft activities, as well as food waste, and these are considered further alongside the relevant artefactual and historical evidence in Chapter 9.VI. Excluding the fifteen dog partial skeletons and the remains of sixteen cats, most of the identifiable mammal fragments are of cattle, sheep/goat, sheep and pig.

Three methods of quantification are used to estimate the relative proportions of the different taxa in the assemblage: NISP, MNI and 'diagnostic zones' (Rackham 1986). Results from each method are compared (Table 9.15) and the advantages of the last one are put forward.

On the basis of NISP, sheep/goat are the most numerous of the main domestic species (39%), followed very closely by cattle (35%), and then pig (26%). These percentages are slightly biased against sheep/goat and in favour of cattle, since bones of the latter species are more fragmented. As shown in Fig.9.48, 70% of the cattle bones are fragments representing a quarter or less of whole bones, while nearly 50% of the sheep/goat sample is composed by fragments representing more than 50% of complete bones. Such bias becomes evident by the results obtained according to the 'diagnostic zones' method, which shows the overwhelming dominance of sheep/goat to the assemblage, with a mean contribution of more than 50%. In contrast, cattle and pig decrease to 27% and 20%, respectively (Table 9.15). The abundance of sheep/goat is equally maintained when MNIs are estimated. However, pig and cattle swap their positions. Pig is now best represented than cattle (Table 9.15).

Taxa	*Hand collected*	*Sieved*	***Total***
Cattle (*Bos taurus)*	1254 (66)	145 (34)	**1399 (100)**
Sheep/goat (*Ovis/Capra)*	801 (29)	264 (5)	**1065 (34)**
sheep (Ovis aries)	449	32	**481**
Pig (*Sus domesticus)*	892 (104)	166 (37)	**1058 (141)**
Equid (*Equus caballus*)	8	0	**8**
Dog (*Canis familiaris*)	1114 (64)	67 (7)	**1181 (71)**
Cat (*Felis catus)*	427 (5)	18	**445 (5)**
Red deer (*Cervus elaphus)*	1	0	**1**
Fallow deer (*Dama dama*)	6	0	**6**
Deer (*Cervus* sp.)	5	1	**6**
Hare (*Lepus* sp.)	46	8	**54**
Rabbit (*Oryctolagus cuniculus)*	84	80	**164**
Badger (*Meles meles*)	1	0	**1**
Rat (*Rattus* sp.)	4	0	**4**
Dolphin (*Delphinus* sp.)	2	0	**2**
OXO	1563	94	**1657**
LAR	824	426	**1250**
SMA	2004	1183	**3187**
RUM	178	139	**317**
TIM	73	11	**84**
Undetermined mammal bones	788	1449	**2237**
Identified mammal bones	*5094(268)*	*781 (83)*	***5875 (351)***
Unidentified mammal bones	*5430*	*3302*	***8732***
Sub-total mammal bones	*10524 (268)*	*4083 (83)*	***14,607(351)***
Domestic fowl (*Gallus gallus*)	562	152	**714**
Domestic goose (*Anser anser* dom.)	1013	197	**1210**
Domestic duck/mallard (*Anas* dom./*Anas platyrhynchos*)	56	25	**81**
Chicken size	213	180	**393**
Goose size	193	72	**265**
Swan (*Cygnus* sp.)	27	1	**28**
Pheasant (*Phasianus colchicus)*	7	0	**7**
Partridge (*Perdix perdix)*	6	0	**6**
Corvid sp.	0	1	**1**
Domestic pigeon (*Columba livia)*	1	1	**2**
Wood pigeon (*Columba palumbus*)	8	3	**11**
Identified bird bones	*2086*	*632*	***2718***
Unidentified bird bones	*489*	*681*	***1170***
Sub-total bird bones	*2575*	*1313*	***3888***
Total assemblage			**18,495**

NISP = no. of identified specimens
OXO = large artiodactyl and perissodactyl size (horse, red deer and cattle)
LAR = large artiodactyles (red deer, fallow deer and cattle)
SMA = sheep, goats, roe deer and possibly pigs
RUM = small artiodactyles (sheep, goats and roe deer)
TIM = bones of the smallest mammals

Table 9.13 Numbers of mammal and bird bones in the barbican well (Period 5) by collection category (NISP). Teeth are shown in brackets

To conclude, these results support the predominance of sheep/goat in the assemblage followed by cattle and pig in similar proportions.

Cattle

The ageing evidence suggests that most cattle were killed when calves or young adults (Table 9.16 and Fig.9.42). Most likely they were bred for their meat, when rapid growth has ceased at the transition from the juvenile to the sub-adult stage and the meat output no longer increases relative to the food input.

The culling of a high number of calves and young cattle in Norwich at this time (mid/late15th–early 16th centuries) follows the trend that has been observed

Context	*Wt (kg)*	*Bird bone Wt (kg)*	*Waste leather (estimated dry Wt, kg)*
50284	4.895	0.577	0
50285	7.326	0.282	0
50295	16.766	0.359	0
50296	7.790	0.605	4.248
50300+	24.173	1.170	3.835
50301+	13.798	0.861	*2.297
50317+	15.140	0.928	*0.065
50318	9.517	0.247	0
50320	17.630	0.500	0
50321	17.501	0.309	0
Total	**134.536**	**5.838**	**10.445**

* = sample only retained, original labels record that much similar material was discarded on site.
+ = contains a high proportion of goose carpometacarpi

Table 9.14 Weight mammal and bird bone by well fill (*50321* being stratigraphically the lowest), linked to quantity of waste leather (see Mould, Chapter 9.III)

TAXA	**NISP**	**%**
Cattle (*Bos taurus*)	1399	35
Sheep/goat (*Ovis/Capra*)	1546	39
Pig (*Sus* dom.)	1058	26
Total	**4,003**	

a) Numbers and percentage numbers of the main domesticates based on fragment counts (NISP)

TAXA	**%**
Cattle (*Bos taurus*)	27
Sheep/goat (*Ovis/Capra*)	53
Pig (*Sus* dom.)	20

b) Mean relative percentage contribution of the main domesticates to the assemblage based on diagnostic zones (after Rackham 1986)

TAXA	**MNI**	**%**
Cattle (*Bos taurus*)	19	19.5
Sheep/goat (*Ovis/Capra*)	49	50.5
Pig (*Sus* dom.)	29	30.0
Total	**97**	

c) Minimum number of individuals (MNI) and relative frequency of the main domesticates determined by the most common zone for each taxa

TAXA	**IND**	**%**
Cattle (*Bos taurus*)	152	18
Sheep/goat (*Ovis/Capra*)	579	71
Pig (*Sus* dom.)	89	11
Total	**820**	

d) Numbers and percentage numbers of the main domesticates based on the indicators method (IND)

Table 9.15 Barbican well: Comparison of quantification methods for the main domesticates

Bone	*Fusion*		
	unfused NISP	*fused NISP*	*fused %*
Fusion Before Birth			
Metacacarpus proximal	13	4	24
First phalanx distal	-	50	100
Second phalanx distal	-	13	100
Metatarsus proximal	9	3	25
Total	**22**	**70**	**76**
Early Fusion (Birth–1.5 yrs)			
Scapula distal	8	23	74
Humerus distal	5	15	75
Radius proximal	5	19	79
First phalanx proximal	6	44	88
Second phalanx proximal	-	13	100
Total	**24**	**114**	**83**
Middle Fusion (1.5–3 yrs)			
Metacarpus distal	18	9	33
Tibia distal	21	9	30
Metatarsus distal	13	4	24
Metapodium distal	14	1	7
Total	**66**	**23**	**26**
Late Fusion (3–4.5 yrs)			
Calcaneus tuber	23	4	15
Femur proximal	16	6	27
Humerus proximal	17	4	19
Radius distal	13	12	48
Ulna proximal	14	5	26
Ulna distal	2	-	-
Femur distal	19	14	42
Tibia proximal	15	3	17
Total	**119**	**48**	**29**

NISP: number of identified specimens

Table 9.16 Barbican well: Epiphysial fusion data for cattle (after Silver 1969)

in other late medieval urban deposits, such as Exeter (Maltby 1979) and King's Lynn (Noddle 1977). Grant (1988, 156) suggested that '... while cattle were required primarily as working beasts and breeding animals in the early medieval period, their importance as suppliers of meat increased in the later centuries'. It seems therefore that the demand for meat in late medieval towns imposed a change in cattle husbandry practices.

Overall, cattle carcasses were heavily butchered so that no joints were left complete. Chop marks that appear to have been made with a heavy chopper or cleaver are most abundant on the elbow and hip joints. Fine knife-cuts were produced while skinning the carcass and filleting meat off the bones. In addition, the splitting of vertebrae in the sagittal plane, *i.e*. dorso-ventrally down the length of the body (Plate 9.8), indicates that carcasses were cut lengthways to produce two sides of beef.

	Bone	*%*
High quality	Scapula	8.5
	Humerus	11.2
	Pelvis	10.3
	Femur	7.2
	Total	**37.2**
Lesser quality	Tibia	7.0
	Radius	9.2
	Ulna	4.5
	Skull	7.1
	Mandible	15.2
	Total	**43.0**
Total meat-bearing bones		80.2
Low quality	Horn core	2.3
	Metacarpus	5.8
	Calcaneum	5.0
	Metatarsus	2.9
	First phalanx	2.4
	Second phalanx	.6
	Third phalanx	.8
Total waste bones		19.8

Table 9.17 Barbican well: Mean relative percentage contribution of cattle anatomical elements based on diagnostic zones (after Rackham 1986)

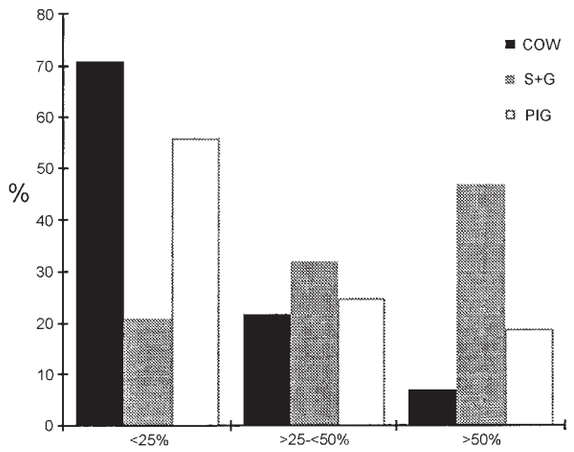


Figure 9.48 Barbican well: bar chart: frequency (%) of cattle (COW), sheep/goat (SG) and pig (PIG) bones with <25%, >25%–<50% and >50% of zones present

	Bone	*OXO (nisp 1657)*	*LAR (nisp 1250)*
		%	*%*
High quality	Scapula	2	6
	Humerus	1	2
	Pelvis	4	7
	Femur	<1	1
	Cervical vx.	<1	1
	Thoracic vx.	3	2
	Lumbar vx.	2	3
	Sacrum	2	2
	Vertebra frag.	7	12
	Caudal vx.	<1	<1
	Sternum	1	1
	Ribs	61	20
	Total	84	58
Lesser quality	Long bone frag.	13	19
	Tibia	1	1
	Radius	<1	2
	Ulna	<1	1
	Skull	<1	12
	Mandible	<1	4
	Total	2	20
Total meat bearing bones		99	97
Low quality	Horn core	-	-
	Hyoid	-	<1
	Atlas	<1	<1
	Axis	-	<1
	Carpal	-	<1
	Metacarpal	-	-
	Patella	-	-
	Astragalus	<1	<1
	Calcaneus	-	<1
	Tarsal	-	-
	Metatarsal	-	-
	Metapodial	<1	<1
	First phalanx	-	-
	Second phalanx	-	-
	Third phalanx	-	-
Total waste bones		1	3

Table 9.18 Barbican Well: Percentage numbers of oxo and lar skeletal elements based on NISP

According to the distribution of skeletal elements (Table 9.17), the total contribution of meat-bearing bones to the cattle assemblage is over 80% as opposed to nearly 20% of the waste bones (lower limb and feet bones). In addition, the high number of vertebrae and ribs recorded under the general categories 'oxo' and 'lar' (Table 9.18) indicates the consumption of meat from the flanks of the animal.

The small sample of bones that could be measured did not allow definitive conclusions on the size and sex of the cattle represented in the barbican well.

Pathological conditions (*i.e.* dental calculus, lateral attrition, and healed bone breakages) occur occasionally, which is not surprising given the young age at slaughter.

Sheep/goat

Both ageing methods, epiphysial fusion of the post-cranial skeleton and mandibular teeth wear stages, show that ovicaprids were killed after reaching maturity. The presence of juveniles and young adults, unlike with cattle, is rather scarce. A similar tendency towards mature sheep is also seen in other medieval English towns such

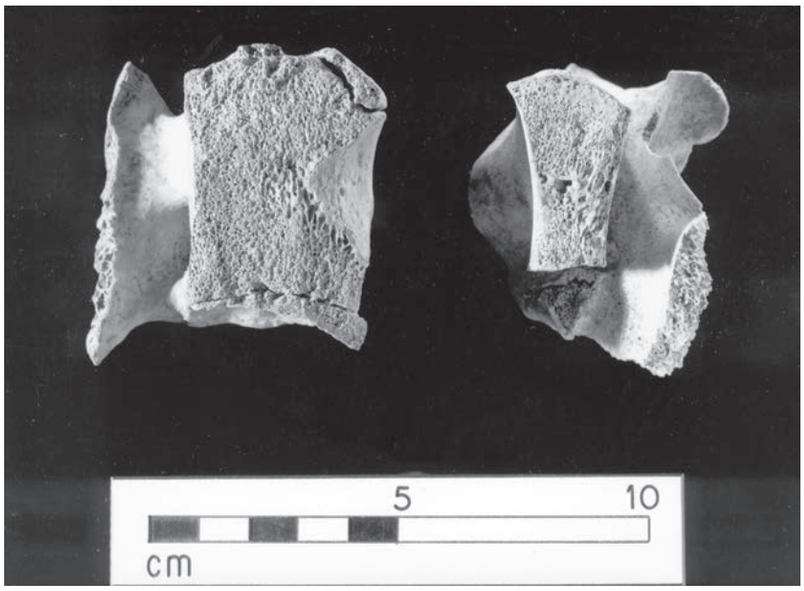
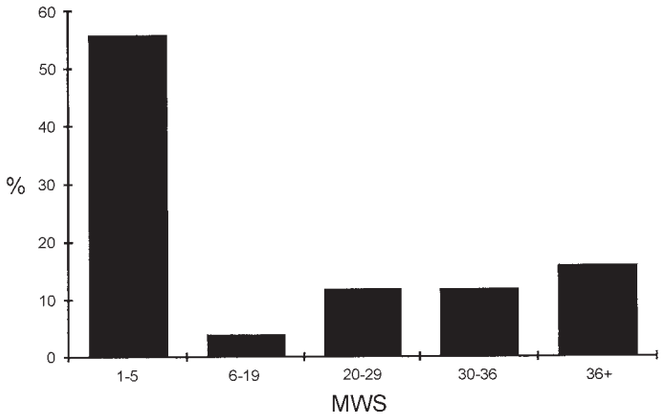


Plate 9.8 Barbican well: cattle thoracic vertebra and sacrum, sagittally split



MWS – mandibular wear stage; 1-5 – neonates (n: 14); 6-19 – young calves (n: 1); 20-29 – young adults (n: 3); 30-36 – adults (n: 3); 36+ – mature (n: 4).

Figure 9.49 Barbican well: Cattle, frequency of mandibles by wear stage (after Grant 1982)

as Lincoln (O'Connor 1982), Southampton (Noddle 1975) and King's Lynn (Noddle 1977). There is no doubt that mature sheep were kept mainly for their wool, milk and breeding purposes before they were eventually slaughtered. Trow-Smith (1957, 247; 1951) mentions that wethers were kept for several seasons to give wool before being fattened for the butcher's and that old and weak ewes were fattened for the winter market.

The splitting of the carcass into sides was undertaken in a similar fashion as that for cattle but their limb bones were not cleaved through. The meat-bearing bones of the front and back leg were not disarticulated to be consumed. Butchery marks recorded on skull fragments are related to the extraction of the brain and chopping off the horns. Thirty-eight out of seventy almost complete sheep horn cores exhibited chop marks, an additional twenty-one were sawn near the base and a few more near the tip. Some of these can be speculatively interpreted as the waste of a horner.

As shown in Table 9.19 the contribution of meat-bearing bones (nearly 60%) is slightly higher than that of waste bones (just over 40%). However, a closer look at the data reveals that metapodials are the most abundant skeletal elements. These appeared to be concentrated in certain contexts (such as *50300*), where 102 fragments were found. Thus, it could be argued that the sheep/goat sample derives from two different sources. On the one hand, the butchered limb bones would be consistent with food debris and on the other hand, the abundance of metapodials could be related to leatherworking activities (see Table 9.14, which indicates nearly 4kg of waste leather from this deposit).

Comparison between the barbican well sheep estimated withers height with those of other medieval sheep assemblages in Britain shows that they were at the lowest end of the range. O'Connor (1982, 25) has suggested that in the medieval period 'the production of wool presupposed nothing about the body size of the sheep, and if sheep were regarded as valuable for wool rather than meat there would have been no impetus towards increased body size'. As mentioned above, the age profile supports the hypothesis that sheep in medieval Norwich were bred for their wool and meat was secondary.

The bimodality evidenced in the plots of some metrical data may be related to sex. The distributions are always skewed to the biggest values indicating a bias towards males, among which the number of castrates likely predominates. In addition, among the pathological conditions observed there was one that may evidence the presence of castrates as well. Thus, seventeen out of seventy partially complete horn-cores bore shallow and irregular depressions, known as 'thumbprints'. Hatting (1975) points out that they are probably formed during periods in which the animals suffered from malnutrition, and that wethers may be more susceptible to having them

	Bone	*%*
High quality	Scapula	8.3
	Humerus	9.0
	Pelvis	9.4
	Femur	5.2
	Total	**31.9**
Lesser quality	Tibia	9.7
	Radius	6.7
	Ulna	1.2
	Skull	1.4
	Mandible	8.6
	Total	**27.6**
Total meat-bearing bones		**59.5**
Low quality	Horn core	2.7
	Metacarpus	16.5
	Calcaneum	4.0
	Metatarsus	13.9
	First phalanx	2.6
	Second phalanx	.4
	Third phalanx	.4
Total waste bones		**40.5**

Table 9.19 Barbican Well: Mean relative percentage contribution of sheep/goat anatomical elements based on diagnostic zones (after Rackham 1986)

considering that the walls of their horn-cores are weaker than in normal cores.

Pig

The kill-off pattern attests to the consumption of piglets, with a mortality rate during the first year of 79%, and especially in the first six months (49%). In the Records of the City of Norwich (Hudson and Tingey 1910) various entries refer to swine kept in the city. Therefore some of these pigs may not have been brought to the market but were possibly raised within the town boundaries.

Dismemberment of such young animals carcasses did not need heavy butchery. Whole joints appear to have been consumed as shown by the abundance of meat-bearing bones and the similar proportions of metapodials and long bones. It appears they were left attached to the rest of the limb and only the phalanges were thrown away. In general, chop marks are very scarce and are limited mainly to sagitally cloven vertebrae. It seems that splitting of the carcasses into sides was a regular established tradition by the 15th century.

As the majority of pig bones were of immature individuals, few measurements were available. It is worth noting that metrically there is no evidence of wild boar in the sample.

Dog

Fifteen dog partial skeletons were recovered from the shaft. There was no evidence of wolf. Their occurrence suggests deliberate burial and that there was some concern about the disposal of their carcasses. The Records of the City of Norwich (Hudson and Tingey 1910, 207) mention the problem caused by vagrant dogs as well as the high esteem in which some breeds were held. Metrical data show a wide range in size, suggesting different breeds were present.

The fifteen skeletons belonged to adult individuals although three bones from a foetal puppy were recovered (context *50321*). Sexual identification of the dogs was determined by the presence of the *os penis* and four males were counted.

An advanced degree of arthritis in three of the individuals indicates that they were quite old animals. The skull of the biggest individual presented fractures on the left and right frontal bones. Scratch marks (claw marks?) were found in the vertical chalk wall of the shaft near to the skeleton together with large limestone blocks. Whether any of these blocks were thrown on top of the dog and caused the skull fractures and its subsequent death, or whether the fractures happened after death is open to speculation.

Only one right calcaneum (Plate 9.9) bore very fine knife cuts. Was it skinned? A few cut marks were found on both cat and dog bones from Bedford (St John's Street site) and Grant (1979, 107) has suggested that these animals may have provided an occasional meal. There is no evidence that this could be the case for the dogs of the well. The occurrence of knife cuts in just one bone implies that either they were very skilled in skinning the animals or that it was a rare practice.

Cat

According to the number of fragments, cats were scarcer than dogs but the MNI results in the presence of at least

Plate 9.9 Barbican well: dog calcaneus exhibiting knife cuts

16 individuals. Five cats were found within putlog holes and appear to have been thrown into the well alive. Most of the cats died at 18 months of age approximately.

Knife cuts were observed on a sacrum (Plate 9.10) and could evidence occasional skinning. However, there was no bias towards a particular group of bones that could indicate they were eaten as was reported for medieval Cambridge (Luff and Moreno García 1995).

Other mammals

Eight other mammal taxa were identified, the most common being the rabbit. Its remains consist mainly of meaty parts. The occurrence of cut marks on some of them suggests their carcasses were cut up in small portions to be consumed. Their remains are clearly food debris. The majority of them were killed when fully grown as juveniles would not have much food value.

The presence of hare is limited to three individuals and horse is scarcely represented. The lack of the latter may be explained by the nature of the deposit. The barbican well was used only for dumping of domestic and craft waste. Horses would have been disposed of as whole or partial burials in others parts outside the city.

Cervid remains, except for antler fragments are present in very low numbers. Red and fallow deer were identified.

Two dolphin (*Delphinus* sp.) vertebrae were identified, one of them chopped through. Although their remains are rare in the archaeological record, it is likely that they were occasionally eaten (Muffet 1655, 173).

Finally, one badger metapodial and a few bones of one rat were recovered from context *50301*.

Birds

Avian remains account for 21% of the total number of faunal remains from the well. Domestic goose followed by domestic fowl and domestic duck/mallard dominate this assemblage (Table 9.13 and Part III, Table 52).

As with the mammal bones, it is clear that the avian material derives from two sources. The large number of goose carpometacarpi (392 complete + 71 fragments) would comprise what is evidently the waste from a specialised craft, such as the production of quills. The rest of the bird bones seem merely food waste as indicated by the butchery and gnawing marks and their anatomical skeletal distribution.

Domestic fowl

Overall the leg bones are strongly represented followed by sterna and the wing bones. The low number of skull fragments seems to argue in favour of removal of the heads and consequently primary butchery of the birds. The low number of butchery marks suggests chickens were consumed as whole carcasses after removing heads and feet.

The low frequency of juvenile bones indicates that domestic fowl was not intensively exploited for meat and highlights the importance of egg-production. Little is known of the laying potential of medieval hens but eggs were consumed in large quantities (Labarge 1965, 81–81).

Hens, capons and cockerels appear to have been consumed as evidenced in Fig.9.50. The tarsometatarsi without a spur form a group at the bottom left hand corner of the plot, being shorter and narrower than those with a spur. Following West (1982) the former are assumed to be hens and those in the centre and at the top right males.

Plate 9.10 Barbican well: cat sacrum exhibiting knife cuts

Domestic goose

All the wing and leg bones are very well represented and it is surprising the high frequency of clavicles and mandibles. The axial bones (clavicle, sternum and pelvis) favour chopping which indicates that geese were split longitudinally into two halves. On the contrary, the limb bones are biased to knife cuts, probably to facilitate dismemberment of the carcass into smaller portions.

There is an absolute dominance of adult individuals. Since goose was mainly raised in rural areas and was driven to the urban market to be sold, it seems likely that not very young animals made the journey.

Several metrical criteria allow us to assume that the barbican well geese belong to the domestic species.

Amongst the avian assemblage is a total of 463 fragments of goose carpometacarpi, of which 75% were retrieved from three consecutive fills (*50300, 50301* and *50317*: Table 9.14 and Fig.9.2) out of the ten that have been analysed. This indicates rapid deposition. The bones are very well preserved and it was possible to measure the greatest length in 328 cases. The remains indicate a minimum discard of 270 left and 122 right goose wing tips. Associated with them, although present in lower numbers, were the first and second digits.

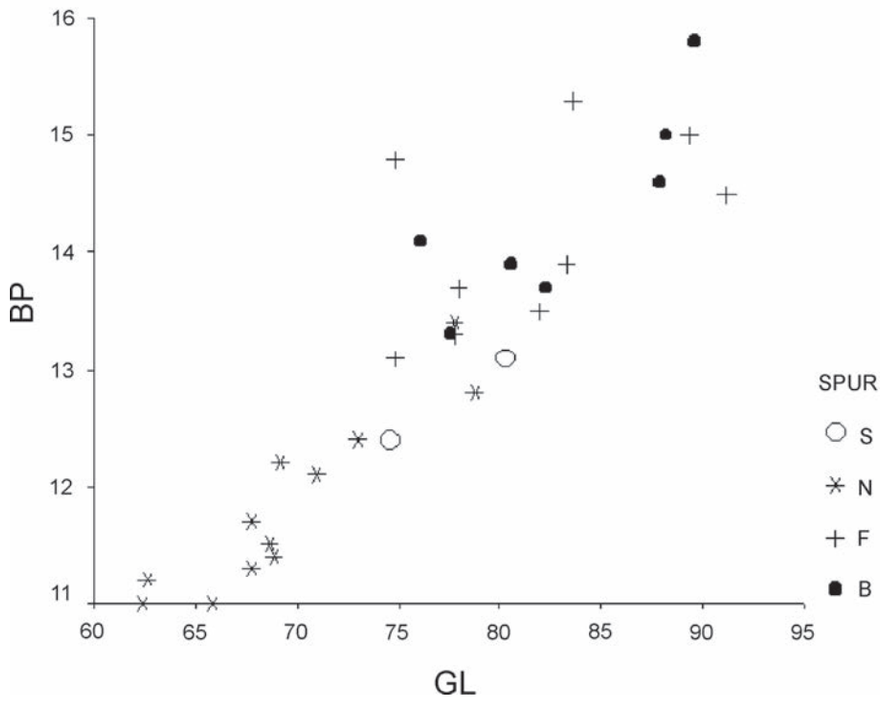
Knife cuts on the proximal end (especially on the internal aspect) were seen on 45% of the carpometacarpi. Chop marks were rarely present, only in 4% of the specimens. These butchery marks indicate the severance of the tip from the edible portion of the wing. Walters and Parker (1976) state that with old ducks and geese one does not need to pluck the flight feathers (which are attached to the carpometacarpi) because during the final dressing process, the last joint of the wing is cut off.

	Mean	*Min.*	*Max.*	*N*
Norwich — Barbican well	84.6	78.0	92.0	20
King's Lynn (Bramwell 1977)	81.1	75.0	86.0	10
Medieval York (Allison 1985)	83.6	78.5	89.2	12
Medieval Wood Quay, Ireland (Hutton-MacDonald *et al*. 1993)	83.9	77.1	90.8	69
Haithabu (Reichstein and Pieper 1986)	86.1	78.0	96.8	37
Modern domestic goose (Bacher 1967)	92.2	81.8	103.0	17
Modern wild goose (Bacher 1967)				
Male	85.1	79.5	91.3	10
Female	79.3	74.4	83.7	11

Table 9.20 Barbican well: Comparison of greatest length (GL) of archaeological domestic goose tarsometatarsi, with modern reference specimens. Measurements in mm

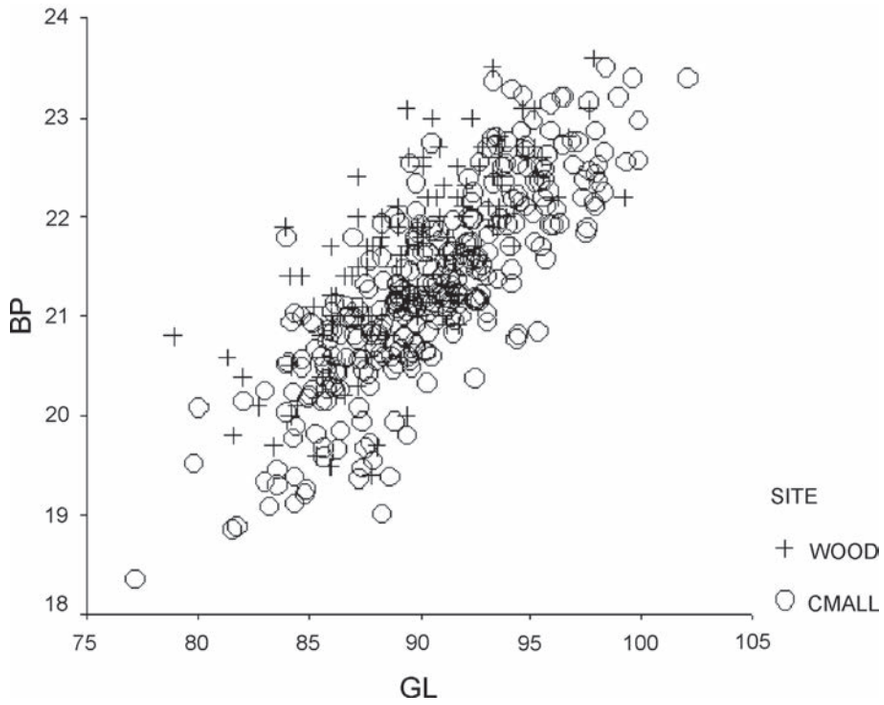
	Mean	*Min.*	*Max.*	*N*
Norwich — Barbican well	21.3	18.3	23.5	365
Medieval Wood Quay, Ireland (Hutton-MacDonald *et al*. 1993)	21.5	19.3	23.6	134
Haithabu (Reichstein and Pieper 1986)	20.8	18.3	23.7	41
Modern domestic goose (Bacher 1967)	23.2	21.0	26.4	16
Modern wild goose (Bacher 1967)				
Male	21.7	20.0	22.9	9
Female	21.0	20.1	23.4	9

Table 9.21 Barbican well: Comparison of proximal breadth (Bp) of archaeological domestic goose carpometacarpi, with modern reference specimens. Measurements in mm



B – broken spur; F – fully developed spur; N – absent spur; S – scar in place of spur.

Figure 9.50 Barbican well: Scattergram of domestic fowl tarsometatarsus greatest length (GL) against breadth of the proximal end (BP) in mm (after von den Driesch 1976) by spur condition



WOOD – medieval Wood Quay, Ireland (Hutton-MacDonald *et al.* 1993); CMAL – barbican well, Castle Mall, Norwich.

Figure 9.51 Barbican well: Scattergram of domestic goose carpometacarpus greatest length (GL) against breadth of the proximal end (BP) in mm (after von den Driesch 1976) by site

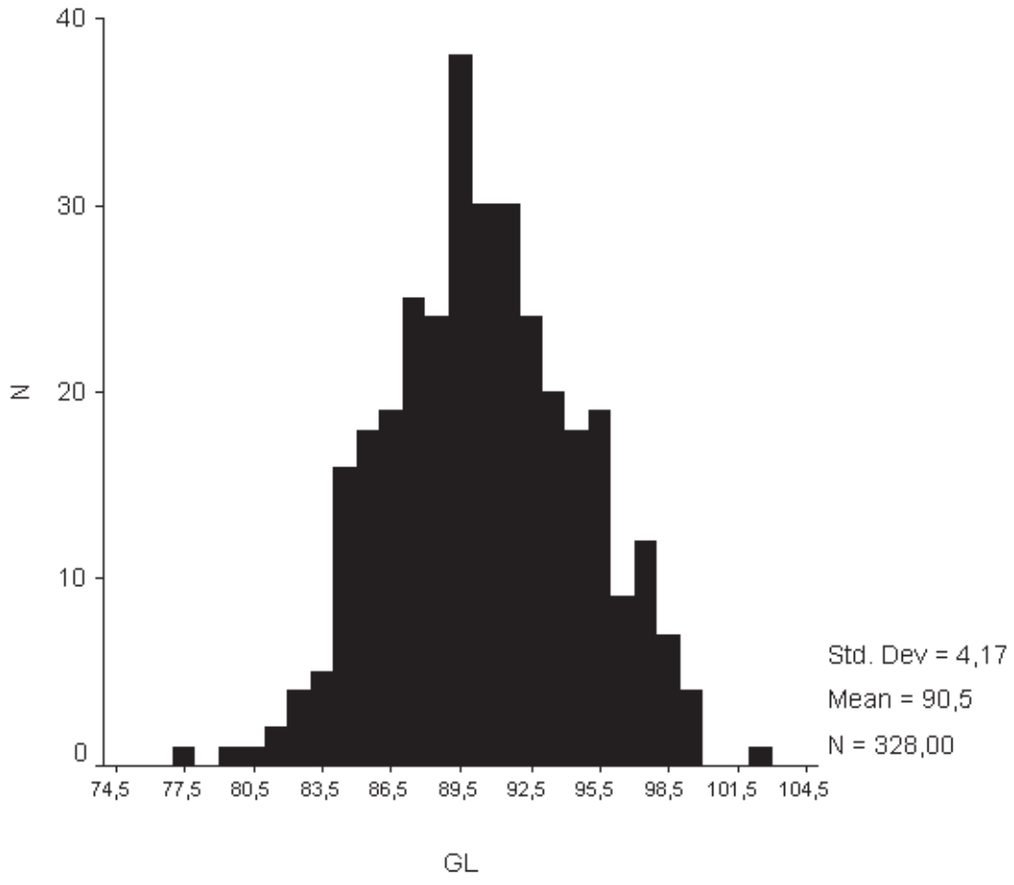


Figure 9.52 Barbican well: Histogram of domestic goose carpometacarpus greatest length (GL) in mm (after von den Driesch 1976)

The primary flight feathers were one of the most valued commodities obtainable from geese. As Heath (1971, 9) says: 'Apart from the obvious benefits of an excellent dinner and, in the sixteenth century at any rate, a down-filled mattress and a ready supply of quills for writing, possibly the most important commodity supplied by this bird was its strong and supple wing-feathers, which were used in vast quantities for fletching arrows'.

Swanson (1989, 101) suggests that the adoption of the longbow as standard equipment for infantry in the late medieval period resulted in the birth of crafts such as bower, stringmaker and fletcher in medieval towns. The most suitable feathers for vanes were of goose pinion feathers and these were needed in enormous numbers: in 1436 the sheriffs of Yorkshire and of York were ordered to provide 100,000 goose wing feathers for arrows; 'the inventory of James Halle (d.1538) contained 6000 feathers valued at 4s; the Winchester fletcher who contracted with a poulterer for 5000 goose feathers in 1403 had to pay 10s for this purchase' (Swanson 1989, 104).

The bias towards the left side in the barbican well goose carpometacarpi may suggest another use of the feathers other than for arrow-flights (although see comments on wing biases relating to arrow fletching in Chapter 9.VI). Finlay (1990, 3) comments on the good qualities of the first five goose feathers from each wing as useful for pens because of their 'elasticity, hardness and durability'. Also he refers to the fens of Lincolnshire and Norfolk as being the main suppliers of quills. A quill is composed of the central barrel and the barbs, that are the little feathers attached to it. The barbs on each side of the barrel and the barrel itself are different for each of the first five goose feathers. Thus, 'the first quill in the wing, called a Pinion, (...) is distinguished by the extreme narrowness of the barbs on that side of the feather which in flight is the leading edge and is exposed to the wind' (Finlay 1990, 4). In the process of preparing the quills to be used as pens, the quill-dresser trimmed the barbs. Right and left feathers curve in different directions so that a right-handed person would prefer to write with a left feather since its curvature bent away from the eyes (Riddle 1943, 154). This may be an explanation for the abundance of left carpometacarpi in the assemblage. It seems possible they are the refuse from a quill-dresser workshop.

Gidney (Gidney 1992/93) reports on a smaller concentration of goose wing tips found in medieval deposits at Leicester. There was a minimum of 36 left and 38 right carpometacarpals. The same author suggests that the use of the goose wings may have been related to the horn and antler found in the same deposit but no exact use for them is offered. Serjeantson (2002) reports two other sites in England that have assemblages in which the carpometacarpi predominate among the goose bones: 13th–14th-century contexts from Victoria Road in Winchester and 33–35 Eastgate, Beverley (Evans and Tomlinson 1992). In the former the carpometacarpi represent 20% of the goose bones and although may derive

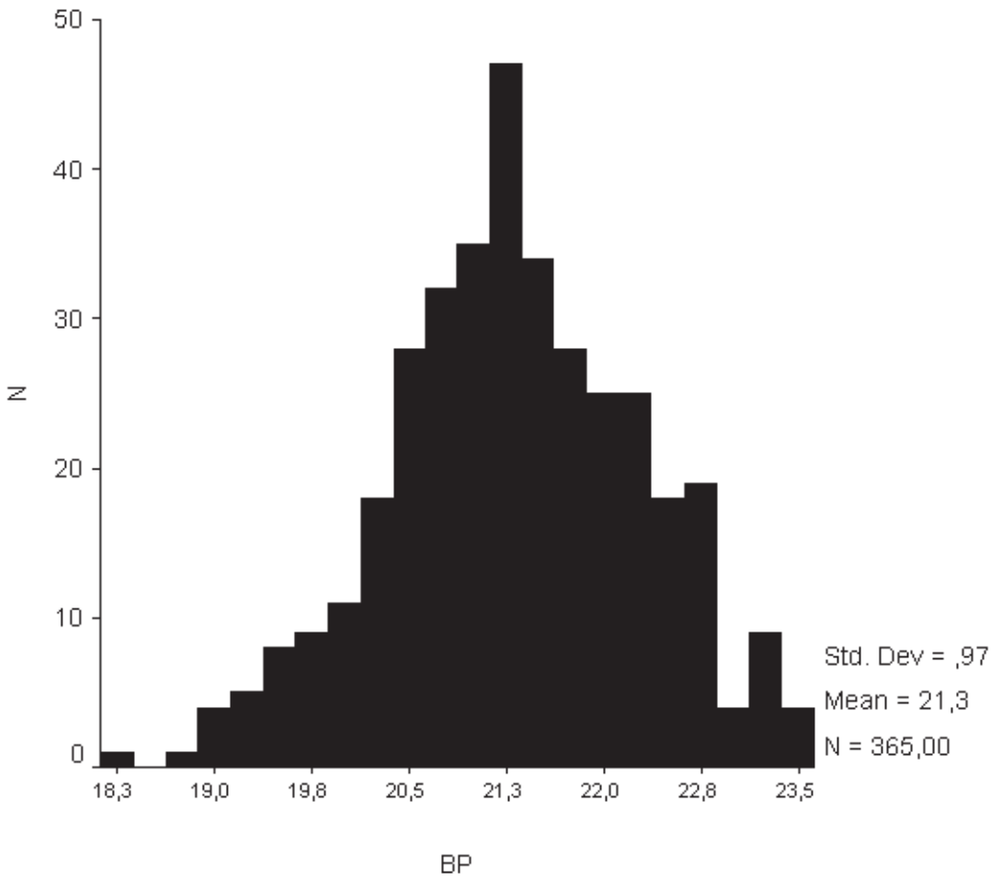


Figure 9.53 Barbican well: Histogram of domestic goose carpometacarpus breadth of the proximal end (BP) in mm (after von den Driesch 1976)

from a butchery deposit and there is no apparent bias towards any of the sides Serjeantson (2002) proposed they could be 'from wings collected to use for quill pens'. The Beverley group are from a site with associations with weaving and two possible interpretations were suggested for these: the quill feathers were collected to use as weaving bobbins or the complete wing was used as a fan to keep the woven fabric moist (Serjeantson 2002).

The lack of parallels of the same importance to the barbican well goose assemblage makes it something unique in the archaeological record. As mentioned above, the good preservation allowed measurement of most of the bones recovered. In Part III, Tables 9.20 and 9.21 compare the greatest length (GL) and proximal breadth (Bp) of the barbican well sample with other archaeological domestic goose carpometacarpi and modern reference specimens of wild and domestic geese. The difference in sample numbers prevents drawing any final conclusions apart from pointing out the similarities of the barbican well geese with those of medieval Wood Quay, Ireland (Hutton-MacDonald *et al*. 1993). A scattergram of the greatest length (GL) against proximal width (BP) for both sites supports the similarity (see Fig.9.51).

Dudley Stamp (1969, 161) comments on the fenlands of East Anglia as an important goose-breeding area where very large flocks were kept. The fact that the geese from the barbican well came from a single population is supported by the normal distributions obtained when greatest length (GL) and proximal width (Bp) are plotted (Figs.9.52 and 9.53, respectively) in a histogram.

Discussion

The full report given in Part III considers in detail the relative numbers of the different species represented in the well and examines the exploitation pattern of each of them. It is appropriate here to draw together the results, in order to consider possible interpretations of the data. In brief, what do the animal remains from the well tell us about Norwich in the mid to late 15th and early 16th centuries?

The problems attached to the interpretation of faunal remains from urban sites have been greatly discussed in the literature (Serjeantson 1989; O'Connor 1989). It is a difficult task to evaluate how much information on the diet, social composition of the urban population and economic system can be obtained from such remains. The archaeological assemblage from the well stems from two particular sources: food preparation and consumption, and an important component derived from specialised crafts and/or industries.

Evidence for the domestic nature of the refuse is provided firstly by the presence of the skeletal elements of those taxa that were butchered for meat. It is clear the abundance of high quality meat bones, in contrast to the low quality meat parts of the carcass. Secondly, the estimation of the relative contribution of the three main domesticate taxa, by the 'diagnostic zones' approach, made it possible to compare more accurately the cattle, sheep/goat and pig samples. This indicated the importance of sheep remains in relation to the other two taxa, which were less common. Thirdly, an examination of the kill-off pattern suggested that whereas cattle were primarily bred for meat, sheep/goat were probably the surplus stock from a different production system, that of wool.

Norfolk's importance as the long-established home of England's worsted industry is well-documented (Munro 1978). The rise in the importance of wool appears to have conditioned, to some extent, the urban food supply in England during the medieval period (O'Connor 1989, 15). There is a general increase over time in the relative frequency of sheep bones to those of cattle, as evidenced from other archaeological urban deposits such as Lincoln (O'Connor 1982), York (O'Connor 1984), Exeter (Maltby 1979) and London (Armitage 1983). The fact that sheep were bred mainly for wool implies that the production of sheep/lamb for the urban market may have been in decline. There is evidence for a change in the exploitation pattern of cattle at this moment, when veal and prime beef appear to increase in the urban meat supply. Norwich, as is shown by the faunal remains from the well and those from other Period 5 contexts at Castle Mall (analysed by Albarella *et al* in Part III, Chapter 3), follows this general trend. Thus, an attempt to reconstruct the diet of the population of Norwich, from the remains analysed, would point to the high consumption of mutton, but prime beef and veal would have provided most of the meat supply. Pig would come in third place together with poultry and game.

It would be most interesting to know how early or how late in the medieval period, the population of Norwich started to take part in this new economic system that seems to have been a countrywide phenomenon.

The 11th-century animal bone assemblage from excavations at St Martin-at-Palace Plain, Norwich (Cartledge 1987) is comprised of 40% of cattle and around 30% of sheep and pig. By the 12th to 13th centuries, sheep increased at the expense of cattle and pig, whereas there is once more a decline in sheep and pig, in favour of cattle by the 14th and 15th centuries. All these percentages are based on NISP and it is right to question how well they reflect the relative proportions of these species, after having discussed the biases of this quantitative method (detailed in Part III, Chapter 4). The same situation applies to Alms Lane, Norwich (Cartledge 1985) animal bone assemblage. However, the apparent increase in sheep remains as early as the 12th to 13th centuries could be reflecting, at a local level, the first stages of the new economic system that would develop in the following centuries.

Particular emphasis has been given to describing the butchery marks yielded by the main domesticates (see Part III). A regularity in the way carcasses were butchered was apparent in most cases. Apart from the sectioning in halves, that was common for cattle, sheep/goat and pig, the skeletons of these three species underwent different processes according to their size. Cattle, with the exception of the very young calves, were heavily chopped at all articulation points. Sheep/goat limb bones seemed to have remained articulated as whole joints after being detached from the body. Pigs appeared to have been consumed as whole carcasses in most instances. The consistency in the occurrence of the butchery marks on the same parts of the carcass points to the work of professional butchers. Thus, the domestic refuse from the well provides evidence for one of the most prosperous crafts in the urban economy, that of the butcher (Swanson 1989).

By the late medieval period rubbish disposal was well organised and butchers were assigned places to dump their wastes (Dyer 1989, 191). The well may have been

one of these places as shown for instance, by the presence of cattle skull fragments. The abundance of other skeletal elements such as sheep metapodials could also be related to butchers' refuse. However, it is known that butchers sold cattle and sheep skins to workers in the leather industry (tanners, glovers, parchment makers, *etc*.) so that the occurrence of these bones is likely to be associated with these other industrial activities. Clarkson (1966) considers the leatherworkers as the second most important component of the industrial population of Norwich from the mid 16th century, after the weavers. Further comments on the Norwich leather industry and allied trades are given in Chapter 9.I, 9.VI and Chapter 13.

The occurrence of sheep horn cores sawn and chopped at the base imply the presence of hornworking activities as well. Nevertheless, the most conclusive evidence on the refuse of a particular craft was provided by the goose carpometacarpi. No published parallels of the same importance have been found for these remains elsewhere in Britain.

The excellent preservation and recovery of the well animal bone has allowed a detailed study of the relative occurrence of the main domestic taxa. The assemblage suggests that in 15th- to 16th-century Norwich, cattle were raised for prime beef production and pigs for pork. Sheep seemed to be more important for other products than meat, such as wool and skin. Chicken and geese supplied meat and eggs, with the latter providing the raw material for fletching arrows and/or producing quills for writing.

Fish Bone

by Alison Locker

The great proportion of fish bones recovered from Period 5 came from this single feature, some 61%. Dated to the later part of the period (mid to late 15th to early 16th century) a much lower percentage of the fish from the barbican well are attributable to bulk sieving than from the rest of the period, as detailed in Chapter 8.IV and Part III, Chapter 5. Only 52.7% of fish bones from the well were retrieved by sieving compared to 77.6% from the other deposits, even though the weight of the whole earth samples is greater at 0.430kg from the well, compared to 0.323kg from the rest of Period 5.

The number of taxa identified from the well was also less than for the rest of the period, 28 compared to 37. The identified fish and their method of collection are summarised below, with further details in Part III, Table 98.

The taxa absent from the well are all species only represented by a few bones in the rest of Period 5 and other periods. There is a higher proportion of herring by bone number from the well compared to other bony fishes. Herring is 67.5% here compared to 35.3% from the rest of Period 5. Eel is 10.2%, while cod and large gadid combined are 5.6%, whiting 4.9%, haddock 0.8% ling 0.06% and pollack is negligible. Cod and whiting are clearly the most numerous gadids. The small flatfishes (plaice/flounder and sole) are 4%, similar to the rest of Period 5, while the sea breams and mackerel are poorly represented or absent. Of the freshwater species nearly all the pike from Period 5 are from this well, while cyprinids were found in both the well and other features.

Taxa	*H Col*	*S R S*	*B S*	***Total***
Elasmobranch	2	4	5	**11**
Ray	0	0	1	**1**
Roker	0	4	1	**5**
Eel	18	55	155	**228**
Conger eel	0	1	1	**2**
Herring	233	430	985	**1,648**
Sprat	0	7	56	**63**
Salmonid	0	1	0	**1**
Smelt	0	0	1	**1**
Pike	7	7	11	**25**
Chub/dace	0	1	0	**1**
Roach	0	9	2	**11**
Cyprinid	8	22	45	**75**
Cod	72	181	31	**284**
Large Gadid	33	64	53	**150**
Haddock	12	17	12	**41**
Whiting	0	64	74	**138**
Pollack	0	0	4	**4**
Ling	6	0	1	**7**
Perch	0	1	0	**1**
Ruffe	0	1	0	**1**
Ballan Wrasse	0	5	0	**5**
Sea Bream indet.	0	0	1	**1**
Mackerel	0	1	6	**7**
Plaice/Flounder	15	52	49	**116**
Halibut	2	0	0	**2**
Sole	0	9	3	**12**
Flatfish	2	3	9	**14**
Total	410	939	1506	**2,855**

Table 9.22 Numbers of identified fish bones from the Barbican Well by collection category
(see Part III Table 98)

As a quantity of food assessed by 'portion' herring, compared against the gadids, shows the highest percentage since Period 1 at 39%, with cod at 40%, whiting is 7%, haddock and pollack 6% and ling 2%. This suggests that, as deposited in this well, herring and cod were of equal volume.

Although there are many finds from the well representing status and specialised craft waste, the fish reflect domestic waste with no evidence for other activities. In fact, being an inexpensive fish, the higher representation of herring might be a reflection of low status deposits. The importance of herring as a food during fast is exemplified by an effigy of Lent in Norwich clad in 'red' and 'white' herring skins in 1444 (Cutting 1955, 72), a date concomitant with the infilling of this well. These were the two common types of stored herring, the 'red' being a famous smoked and salted product from Yarmouth, while the 'white' were salted.

Period	*5.1*												*5.2*	
Area/Group	*5/23*												*5/24*	
Context number	*50306*	*50307*	*50308*	*50309*	*50310*	*50311*	*50312*	*50313*	*50314*	*50315*	*50316*	*50295*	*50320*	*50321*
Sample number	*1881*	*1882*	*1883*	*1884*	*1885*	*1886*	*1887*	*1888*	*1889*	*1890*	*1891*	*1870*	*1896*	*1900*
Cereals and pulses														
Avena sp(p) ca.	2	3	5	3	-	4	5	-	-	-	-	2	11	8
Avena sativa L. fb	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Hordeum sp(p). ca.	10	6	13	8	12	4	6(a)	2(a)	-	-	-	22	12(a)	12(a)
Hordeum sp(p). m.	-	-	1	-	-	-	-	-	-	-	-	-	13	2
Secale cereale L. ca.	-	-	1	-	11	4	7	-	-	-	-	2	-	-
Secale cereale L. m.	-	-	-	3	5	-	4	1	1	-	-	-	1	1
Secale cereale L. lk.	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Secale/Hordeum. m.	-	-	3	-	-	-	-	-	-	-	-	-	2	1
Triticum sp(p). ca.	1	-	8	1	7	7	12	-	-	-	-	4	-	-
Triticum sp(p). rn.	-	-	4	-	5	-	9	-	-	-	-	1	-	-
Triticum aestivum s.l. rn.	-	-	1	-	2	-	2	-	-	-	-	-	-	-
Indeterminate cereal. ca.	11	1	9	21	10	5	28	8	3	1	-	14	11	10
Indeterminate cereal. spr.	-	-	-	-	2	-	3	-	-	-	-	-	4	-
Indeterminate cereal. brn.	-	-	-	-	-	-	4	-	-	-	-	1	-	-
Pisum-type s.	4	8	5	2	1	4	13	-	-	-	-	2	3	2
Pisum-type co.	3	1	3	-	5	-	8	-	-	-	-	-	1	4
Dryland herbs														
Agrostemma githago L.	-	-	-	-	2	-	-	-	-	-	-	-	4	-
Brassica sp.	-	-	1	-	2	-	-	-	-	-	-	-	-	-
Bromus mollis/secalinus	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Caryophyllaceae indet.	-	2	-	-	-	-	-	-	-	-	-	-	-	-
Centaurea sp.	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Chenopodiaceae indet.	-	2	-	-	3	-	3	-	-	-	-	-	-	-
Chenopodium album	-	1	-	-	1	-	-	-	-	-	-	-	1	-
Galium aparine L.	-	-	1	-	-	-	-	-	-	-	-	-	2	-
Poaceae indet.	-	-	-	-	-	1	1	1	-	-	-	-	3	-
Raphanus raphanistrum L.	-	-	-	fr.	-	-	-	-	-	-	-	-	-	-
Reseda sp.	-	-	-	-	2	-	-	-	-	-	-	-	-	-
Rumex acetosella agg.	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Rumex sp.	1	-	7	1	-	-	2	-	-	-	-	2	5	1
Silene sp.	-	-	-	-	2	-	2	-	-	-	-	-	-	-
Trifolium/Medicago-type	-	-	-	-	2	-	-	-	-	-	-	1	1	-
Vicia/Lathyrus sp.	-	-	-	1	-	-	-	-	-	-	-	1	-	-
Heathland plants														
Calluna vulgaris (L.) Hill. caps.	-	-	-	-	x	x	-	-	-	-	-	x	xx	x
Calluna vulgaris. sht/lvs.	x	-	x	x	x	-	x	x	-	-	-	x	xx	x
Erica sp. lvs.	-	-	-	x	x	-	-	-	-	-	-	-	x	x
Ericaceae stem frags.	x	x	x	x	x	x	x	x	x	-	-	x	x	x
Pteridium aquilinum (L.) Kuhn pi.	-	-	x	x	-	-	-	-	-	-	-	-	x	x
Shrubs/trees														
Corylus avellana L.	-	-	-	-	fr.	-	-	-	-	-	-	-	-	-
Wetland plants														
Carex sp.	-	-	-	-	-	1	-	1	-	-	-	-	-	-
Cladium mariscus L.	-	-	-	-	2	1	-	-	-	-	-	-	-	-
Eleocharis palustris/uniglumis	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Juncus sp. s.agg.	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Scirpus sp.	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Indeterminate														
Charcoal	xx	xx	xx	xx	xxx	xx	xx	xxx	x	x	x	xxx	xxx	xxx
Poaceae cn.	-	-	-	-	2	4	5	fr.	-	-		9	2	1

Period	*5.1*												*5.2*	
Area/Group	*5/23*												*5/24*	
Context number	*50306*	*50307*	*50308*	*50309*	*50310*	*50311*	*50312*	*50313*	*50314*	*50315*	*50316*	*50295*	*50320*	*50321*
Sample number	*1881*	*1882*	*1883*	*1884*	*1885*	*1886*	*1887*	*1888*	*1889*	*1890*	*1891*	*1870*	*1896*	*1900*
Rhizome fragment	-	-	-	-	-	-	-	x	-	-	-	-	-	-
Thorn	-	-	x	x	-	-	-	-	-	-	-	-	x	-
Buds	-	x	x	x	x	x	-	-	-	-	-	-	x	-
Moss stem frags.	x	x	x	-	-	-	-	x	-	-	-	x	-	-
Seeds etc.	-	-	-	-	1	-	4	-	1	-	-	1	4	-
Sample volume (l.)	15	15	15	15	15	15	15	15	15	15	15	30	30	n.r
Flot volume (ml)	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	400	1500	2600
% flot sorted	100	100	100	100	25	100	100	25	100	100	100	12.5	c.10	3.125

Table 9.23 Charred plant macrofossils from the Barbican Well fills (Period 5)

Plant Macrofossils

by Peter Murphy
(Fig.9.54)

Sampling and Analysis

Bulk samples were taken from many of the blocks of fill (G5/23, Period 5.1 and G5/24, Period 5.2). The samples were processed in a bulk sieving/flotation tank using 0.5mm meshes throughout. The dried sieve residues were then scanned under a binocular microscope at low power, for assessment purposes. Following assessment, it was decided that plant macrofossils and invertebrate remains from three representative samples of the upper fills (G5/24, *50295, 50320* and *50321*) and all samples from the lower fills (G5/23, Period 5.1) should be fully analysed. The samples from the upper fills contained relatively large flots (up to 1100ml), mainly composed of charcoal, cinder and coal, with a range of macrofossils. The flots from lower fills were much smaller (<200ml). Plant macrofossils, molluscs and other 'shelly' macrofossils are listed in Tables 9.23–25, together with context and sample information.

Hydrology and Macrofossil Preservation

When excavated, all fills of the well were de-watered and this led to the decision to process the fills as bulk samples in a tank, rather than undertaking laboratory extraction. Exactly when this de-watering occurred is uncertain, but it could perhaps have begun during the medieval period, as a result of abstraction from the chalk aquifer by other wells in the city and because of lower water table caused by chalk/flint mining (possibly not until the 16th century) and, indeed, the existence of the castle ditches. The decision to backfill with refuse presumably followed the demise of the well as a reliable water supply.

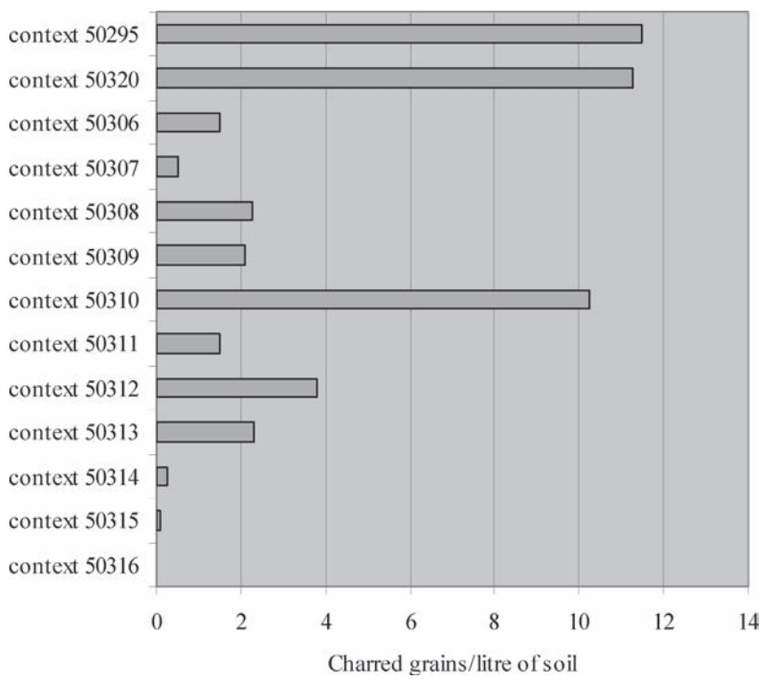


Figure 9.54 Densities of charred cereal grains in the barbican well, by context

A Late Saxon well within the castle's north-east bailey (Site 416N) was cored as part of commercial site investigation work and, incidentally, to obtain samples (Murphy and MacPhail 1985). Wet structured organic deposits were not encountered until a depth of 13.00m from the top of chalk. It is therefore unsurprising that the Castle Mall well, at a higher level, did not include wet sediments.

However, unexpectedly, the samples did prove to include a small component of uncharred macrofossils, in a rather degraded state (see Table 9.23 on CD). It appears that there were still surviving anoxic micro-sites within the deposits maintained, presumably, by the great mass of overlying deposits and, perhaps, by the presence of compacted clayey deposits; both of which would have inhibited free diffusion of oxygen.

Plant Macrofossils

The deposits were clearly very mixed and included inputs of plants and material from a number of sources.

a) charred crop remains and weeds

Charred grains and chaff of *Avena sativa* (oats), *Avena* sp., *Horderum* sp. (barley), *Triticum* sp., including *Triticum aestivum* s.l. (bread wheat), *Secale cereale* (rye), *Vicia faba* (horsebean) and *Pisum*-type (probably pea). Preservation was in general rather poor and the assemblages small, which makes any interpretation in terms of activities difficult. Some *Hordeum* grains, however, had germinated before charring and these might relate to malting. Charred seeds of dryland herbs are almost all common arable weed and presumably represented contaminants of batches of cereals.

It is notable that charred cereal remains (indeed all types of refuse) were very rare in the lowest fills (see Table 9.23 and Fig.9.54). This gives grounds for suggesting that fills *50316, 50315* and probably *50314*, pre-dated the use of the well for refuse disposal and may have been primary fills relating to its original use.

b) uncharred crop remains and weeds

These included small numbers of *Ficus carica* (fig) and *Vitis inifera* (grape) seeds, with weed taxa and other species, such as *Corylus avellana* (hazelnuts), elder seeds (*Sambucus nigra)* and a rose fruitstone (*Rosa* sp.), which might represent either food waste or plants growing wild locally.

A few fragments of *Agrostemma githago* (corn-cockle) testa were noted. These commonly occur in latrine deposits, having originally been contaminants of wholemeal flour. Fig and grape seeds are likewise frequent in medieval latrines at Castle Mall as elsewhere at urban sites. The quantities present in these samples are, however, exceedingly small and other indicators of sewage (mineral-replaced fly puparia and seeds, faecal concretions) are either absent or very rare. On these grounds it does not appear that there was any significant disposal of sewage into the disused well.

c) heathland plants

Charred and uncharred remains of *Calluna vulgaris* (ling), *Erica* sp. (cross-leaved or bell heather) and *Ptedidium aquilinum* (bracken) were quite consistently present. These probably represent the remains of litter or flooring materials, subsequently charred whilst being burnt as refuse.

d) wetland plants

Carex spp. (sedges), *Cladium mariscus* (saw-sedge), *Eleocharis palustris/uniglumis* (spike-rush), *Juncus* sp (rushes) and *Scirpus* sp. (bulrush) were represented by charred and/or uncharred plant macrofossils. Some of the large grass (Poaceae) culm nodes from the samples are probably of reed (*Phragmites communis*), for they show adventitious buds above the nodes; others are of smaller grasses and/or cereals. These wetland plant remains are likely to represent flooring or perhaps thatching materials.

In summary, the plant remains from these samples are very mixed assemblages representing several types of waste disposal, but there was no evidence for sewage disposal. The lowest fills seem to represent 'natural' deposition rather than dumping.

Terrestrial Arthropods

by Mark Robinson

The samples only yielded undecayed arthropod remains, mostly Coleoptera (Table 9.25 on CD). They gave no indication of sewage. Most were species which commonly occur indoors, the most numerous being *Sitophilus granarius* (the grain weevil). Its presence in all but one of the seven samples examined suggests that grain was stored in the vicinity of the well and insects crawled into it. *S. granarius* can cause severe damage to stored grain.

Of the other beetles, *Tipnus unicolor* and *Ptinus fur* have been recorded in granary refuse but they occur more generally in indoor habitats. They are omnivorous on a wide range of rather dry decaying animal, and some starchy plant, material. They tend to be found in, for example, neglected corners of dirty kitchens. *Mycetea hirta* is a fungal feeder which also occurs in buildings, where it is sometimes associated with fungi in structural timber. *Trox scaber* feeds on dry animal carcasses. It often occurs in nests of predatory birds, such as owls, which contain old bones (Jessop 1986, 14). The discovery of one individual of this beetle in BS1870 (fill *50295*, G5/24, Period 5.2) and two examples from BS1883 (fill *50308*, G5/23, Period 5.1) might suggest that a suitable habitat existed close to the well shaft.

The Coleoptera in this and some of the other samples also included species from a rural 'background' fauna of insects. There were species such as the clover- and vetch-feeding weevil *Sitona* sp which had probably flown to the site from the surrounding landscape.

Molluscs and Marine Crustaceans

by Peter Murphy

Food waste from the samples (Table 9.24 on CD) comprised shells of *Buccinum/Neptunea* (whelk), *Cerastoderma edule* (cockle), *Littorina littorea* (winkle), *Mytilus edulis* (mussel) and *Ostrea edulis* (oyster), with a single cheliped fragment of the edible crab (*Cancer pagurus*). The latter must have come from the north-east Norfolk coast, in the Cromer-Sheringham area where there is a hard bed of chalk providing suitable substrates

for crabs and lobsters. Remains of edible crab have been recovered in small quantities from elsewhere on the site.

The samples also included small numbers of shells of freshwater and marsh molluscs, most of which were greyish or black in colour as a result of burning. It seems very probable that these reached the site accidentally, attached to wetland plants collected for use as flooring or thatching.

Land mollusc shells were infrequent, occurring in only three samples. They include synanthropic snails and species of open habitats.

V. HUMAN BONE

by Sue Anderson

The remains of two infants were recovered from well fills *50320* and overlying *50318*. The former was an almost complete newborn baby (foetal age approximately 38 weeks from humerus and femur lengths; Scheur *et al.* 1980) and the latter a right humerus (not measured). Pitting and striation was seen on the outer surface of cranial fragments from the more complete infant, with unusual patterns of erosion presumably as a result of immersion in water. The most likely explanation for the presence of these two children in the well is an attempt to conceal their birth and/or death. It is unlikely that they have any ritual significance, despite their association with articulated animal skeletons. The near complete burial was recovered from the same block of fill as the large dog skeleton (see Chapter 9.II & IV and Part 3, Chapter 4).

VI. DISCUSSION

Norwich Castle's barbican well clearly served as one of the city's major rubbish tips for a considerable period, although its existence was completely unknown prior to the Castle Mall excavation. The prolific dumping of waste into it may be a reflection of the city authority's attempts to keep the barbican and motte ditches clear: archaeological evidence outlined in the previous chapter indicates that — despite the documentary references to its continued occurrence — very little waste of the period was present in the barbican ditch which remained substantially open. By the mid 16th century, the sheriff was still spying on those dumping muck into the motte and barbican ditches (Chapter 8.I). Little of the motte ditch has yet been explored archaeologically and it is possible that refuse of the period was dumped into it: for those whose properties backed onto it, the temptation must certainly have been strong. This ditch was, however, still in Crown hands and may have been clearly demarcated as such through the use of stone boundary markers (Shepherd Popescu *et al* in press). Much of the south bailey ditch was still in use for refuse disposal during the 16th century and the same may hold true for the former defences of the Castle Meadow. The rear abuttals of properties here are interestingly largely made to the Meadow, rather than its ditch. This may indicate that the ditch was already infilled and its rampart largely quarried and levelled, although traces of it survived in gardens later (see further discussion in Chapters 2 and 10).

Rate and Date of Deposition

(Figs 9.3 and 9.4)

It was perhaps the access to the well provided by the 1345 transfer of the baileys to the city, combined with the evident loss of water, that triggered its use as a rubbish dump. De-watering may have resulted from the combined effects of the presence of the castle ditches, the growing number of local quarries and the opening up of the city's chalk and flint mines, although the latter may not have been active until the 16th century (see Chapter 8.V).

Approximately 29m of fill was recorded within the well and would presumably have been subject to gradual compression. The 12th-century masonry shaft was 2.50m square internally, with the lower circular shaft having a slightly smaller diameter (see Chapter 6.II for constructional details). A simple calculation based on these figures suggests that *c.*181.25m³ of material accumulated or was dumped within a period of perhaps 255 years (assuming that deposition was confined within the period *c.*1345–*c.*1600). This represents a total of about 181 tonnes indicating an average deposition rate of *c.*0.7 tonnes per annum. The bulk of the infilling may, however, have happened quickly and appears to have been erratic rather than regular. The deposition of artefacts was certainly not regular in terms of either quantity and type, but was concentrated within a sequence of fills occurring at the junction of the masonry shaft with the chalk. The fills which appear to span *c.*1450 to *c.*1500 were approximately 9m in depth.

Fills of late 14th-century date were recorded at around 0m OD, with only those beneath this level possibly attributable to earlier in the medieval period (a few pieces of Local Medieval Unglazed ware of 11th–14th- century date were recovered from the lowest metre of fill). The somewhat conflicting evidence for the date of deposition of subsequent fills requires further consideration in relation to issues of intrusion and residuality. Both the nature of the deposits and specialist observations demonstrate that the fills examined had remained undisturbed, with indications from several categories (both finds and environmental) to suggest rapid deposition from identifiable sources. Combined with this, the majority of the large pottery assemblage (nearly 40kg) indicates a date in the mid to late 15th century. In particular the stonewares include nothing post-1500 in the majority of fills, with many indicating a date of 1470 or earlier. This is supported by the virtual absence of particular artefact types (specifically lace-tags) and the absence of, for example, late 15th-century pottery types in any quantity until the upper fills. Only 9 sherds of Tudor Green wares, a fabric which reached Norwich in the late 15th century, were found. Products from Raeren-Aachen (late 15th to 16th century) occurred exclusively in the uppermost fill included here.

Contradicting this is the presence of a small number of objects of possible 16th- or late 16th-century date (9 artefacts representing 0.001% of the assemblage total), along with pottery sherds post-dating 1485 to the 16th century (18 sherds, 1% of the pottery assemblage) and a quantity of brick possibly attributable to the 16th century. Most problematic amongst these finds are the few items that appear to indicate a late 16th- (to 17th-) century date. A total of 20 pottery sherds were obviously intrusive, verifying that minor contamination had occurred.

Possible sources of this contamination include the potential introduction of later material into lower fills via the modern borehole (associated with the Castle Mall excavations), through voids/cracks within the fills as a result of shrinkage (one of which was recorded archaeologically), or animal action, or during transfer of spoil off site for finds recovery. Any combination of these factors is possible.

Clearly, a proportion of the objects recovered from the well were residual. The low quantity of obviously earlier pottery (only 27 sherds of Thetford-type ware) and the nature of the residual objects (many of which are of types likely to have been long-lived or curated) does not indicate that residuality is a factor likely to have affected other material groups, specifically the faunal remains.

On balance, it is suggested that the bulk infilling considered in this chapter dates between the mid to late 15th and early 16th centuries.

Sources of Waste and Depositional Processes

(Figs 8.61, 9.1 and 9.4)

Rubbish was presumably dumped into the well by the bucket or basket load, some of the larger dumps probably having been transferred there by hand-, horse- or ox-cart (see reconstruction in Fig.8.61). The demolition of the upper part of the well superstructure (detailed in Chapter 8.II) may have been in part to facilitate access during infilling. The well appears to have been approached by pathways or narrow lanes: two from the direction of the market to the west, one from the south and another from the Castle Meadow to the north-east (Fig.9.1; see 'Street Pattern' in Chapter 8.V). The distance that material travelled is indicated by a piece of glass that may have come from a house on Sand Gate some 350m to the south-east. A radius of this size would have taken in a substantial part of the late medieval city, including the traders in the market place and artisans ranged along the Great Cockey stream and Cutlerrowe (now London Street).

Basal fills of the Norwich well may have resulted largely from natural erosion, although it apparently remained open almost to its original base until the latter part of the 14th century. Building materials found here may either have derived from original construction or from subsequent robbing activities. By the mid 15th century, the well clearly became a major focus of refuse dumping from two main sources: domestic waste and craft/industrial activities. There was remarkably little indication of the disposal of sewage. Although excavated in separate blocks of spoil, the partial section across fills of the well indicates tip lines and identifiable layers/lenses within thick homogeneous dumps (Fig.9.4). Some layers were clearly from an identifiable source such as leather- or metalworking.

One of the notable aspects of the well assemblage is the presence of status items, some of which may suggest a link with the castle. The combined evidence from each of the various sources indicates a range of processes behind deposition into the well. These include natural erosion, deliberate disposal, concealment, accidental or incidental loss and possible 'symbolic' meaning (in the manner of modern dropping of coins for wishes). The deliberate casting of objects — particularly metalwork — into water is a custom well-known to have originated in the prehistoric period. The modern practice, however, relates to the medieval tradition of making offerings at holy and healing wells, often dedicated to a particular saint (Simpson and Roud 2000, 393). In some places, pins and pebbles are known to have been dropped into wells in a ritualistic way. Although Norwich Castle's barbican well no longer contained water, the possibility that a few of the metal objects may have been wrapped in textile prior to disposal is perhaps suggestive, although the evidence is equivocal.

The disposal of the remains of two children within the well may have been an attempt to conceal their birth. Infanticide, especially of girls, was widespread during the medieval period and continued in England well into the 20th century (Daniell 1997, 126–127). It seems probable that the two children had not been baptised: unbaptised children would have received very different treatment in terms of burial practice and would often have been buried outside churchyards. The bones of one child from the well appeared to have lain in water for some time, conflicting with evidence that it no longer contained water (Anderson, Chapter 9.V). This may perhaps indicate saturation by rainwater, given that the well appears to have been open to the elements at this date.

A number of animals may have been deposited or fallen into the well alive and may have reached their final resting place in the well for a number of reasons. That at least some of the sixteen cats were alive on entering the well is indicated by the fact that they had crawled into putlog holes. Only one had cut marks indicating possible skinning. The live animals may have been dropped into the dry well simply to get rid of them (although obviously not drowned) and may have been unwanted ferals. English folklore has it that kittens born in May should be drowned, as they are notoriously bad mousers and are considered unlucky (Simpson and Roud 2000, 49). Such actions resonate with the familiar rhyme 'Ding dong bell' which was first documented in the late 16th century (Opie and Opie 1951, 149). The cats recovered from the Norwich well, however, all appeared to be more than 6 months/1 year old and the disposal of unwanted kittens is therefore not indicated.

At least fifteen partial dog skeletons were present and ranged in size, although most were of medium stature. Again, there were very few cut marks to indicate skinning. The largest was the size of a modern Alsatian. There were a few bones from a puppy, although the remainder were adult and some were quite old. The skull of the largest individual had been fractured and it is possible that this animal was alive when it entered the well. Possible claw marks in the surrounding chalk wall (Plate 9.5) may confirm this interpretation and a number of limestone blocks were found in immediate association, having perhaps been deliberately dropped onto the dog. The occurrence of these partial skeletons in the shaft suggests deliberate burial. Norwich is known to have had a problem with vagrant dogs, which were liable to be killed in accordance with a city ordinance of 1354, although certain breeds such as greyhounds, spaniels and hunting dogs were valued (Hudson and Tingey 1910, 207). Although many of these mid 14th-century animals may have been feral, some of the more favoured breeds may have come from a domestic context, perhaps displaced from home by the plague of 1349.

Crafts and Occupations

(Fig.9.1)

The well assemblage provides evidence for a range of Norwich workshops. Raw materials, manufacturing processes (primary and secondary waste), unfinished products (such as spur fittings and arrowheads) and finished items linking to particular workshops (such as the knife blades and silk tablets) are all in evidence. Although there are some indications of recycling of materials within the well assemblage, other items which could have been reused were simply thrown away. These include many categories of object which may simply have gone out of fashion.

Urban workshops operated in cramped conditions, often in a domestic dwelling, on narrow frontages in small streets with associated shops simply projecting from the front of the house (Miller and Hatcher 1995, 82). The shops and stalls within Norwich market are known to have ranged in width from 15ft (4.5m) to just 2ft (0.6m) in the case of a simple bakery basket stand (Priestley 1987, 9). Craftsmen working and selling goods along the eastern bank of the Great Cockey were physically cramped along the narrow Cockey Lane which ran between it and the castle, although open spaces, such as the madder yard, evidently still existed. Craft workshops were positioned both along the lane and in the spaces behind frontages, particularly further north along Cutlerrowe (Figs 8.2 and 9.1).

Medieval craftsmen often had secondary occupations, some of which were seasonal. Craft hierarchies were particularly evident for inter-dependent trades and the manufacture of composite objects; cutlers, for example, would have employed both sheathers and bladesmiths. Craft of the period was labour intensive, as is witnessed by the complex construction of a number of composite knives found in the well. It was often conducted within a domestic context demanding low levels of fixed capital with most money invested in stock rather than equipment (Miller and Hatcher 1995, 54–55). Both tools and stock are documented within Norwich Castle Fee properties, including bow-staves and blacksmiths' and goldsmiths' equipment (see Tillyard, Chapter 9.I). Many of the property owners within the Fee were clearly there over long periods, such as Thomas of Surlingham, cutler (1332–1390), at Property 6, St Andrew and Robert Roo, skinner (1421/2–1457) at Property 69, St Michael at Plea (see Tillyard, Part IV).

Metalworking

Evidence for ferrous metalworking from the well comprised processing waste (such as cinders, smithing slag and corrosion products), several iron fragments which may have been nozzles from bellows, probable ironworking stock and debris (including blacksmithing scrap and snipped metal sheets) and part-made objects (Bayley; Mould, Chapter 9.III). Many of the latter are military items, such as armour and weaponry, indicating possible workshop clearance and repair. Lumps of chain armour were frequently found in association with annular buckles; both chain links and annular buckles would be manufactured in the same way and it is possible that they were the product of the same workshop. Some of the chain armour was part melted, indicating its collection for reuse. Certain plate and knife blade fragments had a glassy, vitrified residue present on the surface, thought to be the result of having been close to high temperature processes, again suggesting debris from a metalworkshop. Earlier discussion (Chapter 9.I) has noted the prevalence of spurriers and leatherworkers in Norwich and the castle itself may have had a workshop for repairs to riding equipment, armour and weapons whose debris was disposed of in the well. Twelve of the iron knife blades have maker's marks and three with the same double mark may have come from a single workshop (Fig.9.23). One knife with a proto-bolster may have had a craft function and had apparently come into contact with a metalworking hearth.

Waste from non-ferrous working was also present (Goodall, Chapter 9.III). Two sheets of copper alloy had been used to produce a series of small discs (SF7593, Fig.9.32), probably linked to the manufacture of small mounts or stud heads similar to the large number of studs and dome-headed mounts also recovered from fills of the well (parallels in London were interpreted as possibly linking to the production of dress fittings). Two stone moulds may have been used in the manufacture of objects made from lead and related alloys, such as pewter (SF7119 and 7120, Fig.9.33; Goodall and Mortimer, Chapter 9.III). A large number of whetstones recovered from the well could have been used in association with many of the craft activities indicated by other material groups (Mills, Chapter 9.III; Fig.9.39).

The large mould fragments, indicative of bell and other founding, may have derived from one of the many founding sites surrounding the castle in the 13th to 15th centuries, which have been discussed in Chapter 9.I and Chapter 8. The closest source would have been the great workshops sited to the south-west.

Spurs and Associated Waste

Alongside the completed spurs, spur buckles, hook attachments for spur leathers and spur leathers themselves (Ellis and Mould, Chapter 9.III; Fig.9.42), evidence for the waste materials from at least one spurrier/lorimer workshop was found, supplementing earlier evidence on a much smaller scale located by the Norwich Survey at St Benedict's Street (Margeson 1993, 235). Both these trades are documented in the immediate vicinity of the Castle Fee (see Chapter 9.I). Several hundred small annular buckles from the barbican well may have been used in association with spurs and amongst more than seventy hook attachments were several unfinished examples (Fig.9.43). The large quantity suggests that they had been cleared from a workshop in which they may have been stored prior to attachment to spur leathers. Many of the hook attachments were broken, probably during deliberate removal for repair. Secondary leatherworking waste indicates that this apparently unparalleled assemblage relates to the fitting and refurbishment of spur leathers (Fig.9.35). Bridlery, harness straps and other saddlery are also present, along with a large quantity of mounts for leather which were also being produced in the vicinity (Mould, Chapter 9.III).

At least one of the late 14th century gaolers (at Property 46, St Martin-in-Balliva; Fig.9.1) also worked as a lorimer and the castle may have retained its own workshop for repairs to riding equipment and armour. Another lorimer is noted in Property 45 in 1361, while Thomas Lorymer was at Property 43 in 1397. The nearest identified lorimer to the well was John of Ely to

the west at Property 2 (before 1344), while the closest spurriers of the period were Henry Cole to the south and east at Properties (h) and 42 in 1379, and probably also at Property 36 (before 1397). Also at Property 36 was Thomas Cole le sporier in 1359.

Butchery, Skinning, Leatherworking and Associated Crafts

Within the Castle Fee at Norwich, the craftsmen deriving their raw materials from butchery would no doubt have been supplied by the butchers working in the Berstete sub-leet. There is also evidence, however, that animals were raised within the open ground of the castle ditches and these may have provided another source, their presence being well attested in the documentary record as well as archeologically (Tillyard, Part IV; Albarella *et al* Part III). Raw materials would have included skins, furs/pelts, feathers, bone, horn and antler, used in clothing and artefacts of varying type. Even hog bristles could be utilised as needles (Mould, Chapter 9.III). The animal bones recovered from the site attest to the skinning of cattle, sheep/goat, pig and horse, possibly alongside dog and cat. For other species (hare, rabbit, badger and deer) the situation is less certain. Raw fibres present in the textile assemblage from the well may be the remnants of sheepskin and other animal pelts, one of which was pigmented (Walton Rogers, Chapter 9.III), paralleling the evidence for skinning of numerous types of animal. Although identified as possible mouse fur, evidence for working of the fibres and the presence of pigment may indicate that this was actually rabbit or hare.

Some of the large number of knives recovered from the well include possible butchery/boning knives. Moreno García's analysis (Chapter 9.IV and Part III) suggests that the consistency in the occurrence of the butchery marks on the same parts of the animal bone carcasses points to the work of professional butchers, one of the most prosperous crafts in the urban economy (Swanson 1989). By the late medieval period rubbish disposal was well organised and butchers were assigned places to dump their wastes (Dyer 1989, 191). The well may have been one of these places as shown for instance, by the presence of cattle skull fragments. The abundance of other skeletal elements such as sheep metapodials could also be related to butchers' refuse. It is known that butchers sold cattle and sheep skins to a wide range of workers in the leather industry and the occurrence of these bones may also have been associated with these other industrial activities. The cattle remains indicate the secondary butchery of carcasses, with possible links to craft processes such as hornworking and tanning. The remains of domestic fowl indicate primary butchery, while the goose remains demonstrate the severance of the meatless part of the wing in the initial butchery process (see below).

Leatherworkers were notorious for their pollution of water and the smell associated with tanning processes and are therefore often found on the fringes of medieval towns and cities. At Lincoln, for example, they worked in the suburb of Wigford which lay on southern edge of city with a plentiful supply of water (Schofield and Vince 1994, 99). Clarkson (1966) considers the leatherworkers the second most important component of the industrial population of Norwich from the mid 16th century, after the weavers. Leather waste from Norwich's barbican well was predominantly bovine (even containing part of a cow udder) and included probable calfskin used for spur leathers and knife sheaths (Mould, Chapter 9.III). A small quantity of goatskin was found which may have been used in saddlery/upholstery. Associated processes, such as tanning and tawing, have been detailed in Chapter 8, but are also apparent in the material from the well (see below). Along with two possible leather-cutting knives, smaller examples may have been penknives used in a range of craft and other activities.

Some of the larger pieces of scrap leather retrieved may have been the offcuts from shoemaking. Several shoemakers or cordwainers are documented as working within the Fee at this period. Moss was recovered from one well fill and may have been imported to the site to stuff the toes of shoes, as is attested in London during the late medieval period (Grew and de Neergaard 1988). Other leather waste comes from the refitting of spur leathers (see above). Along with the primary and secondary leather waste, the end products of the leatherworkers present within the well include shoes, knife sheaths, spurs, belts and straps. A subsidiary trade related to the leather industry was represented by the parchment makers who are also documented within Fee (*e.g.* Property 67, St Michael at Plea, 1438), although no archaeological evidence attesting to their presence was found.

Many of the sheep/goat bones appeared to have been boiled. This may reflect processes such as oil extraction from sheep trotters, which would have required constant skimming (a copper alloy skimmer was also retrieved from the well). The resulting product could have been used as food when fresh, or later sold to a gluemaker.

The occurrence of sheep horn cores sawn and chopped at the base implies the presence of hornworking activities as well. Cattle horn would have been used for handles, combs, lanterns and windows. The frequency of horncores, metapodials and phalanges may all point to a link with tanning/tawing or leatherworking. A substantial assemblage of sheep metapodials of similar date was recovered from a pit within the south bailey (see Chapter 8 and Part III, Chapter 3) where the feet were also apparently left attached to the skin.

Antler waste from the well indicates the probable manufacture of handles in the vicinity (Huddle, Chapter 9.III and 10.III). This is largely secondary waste, but includes (unusually) raw material in the form of a near-complete fallow antler.

Fletching and/or Quill-Dressing

The most conclusive evidence from the animal bone refuse of a particular craft is provided by the remarkable group of goose carpometacarpi (Moreno García, Chapter 9.IV and Part III), for which no parallels of the same importance have been published in Britain. Goose wing tips would have been valued for their primary feathers and a minimum of 270 left and 122 right wing tips were recovered from the well, along with many other wing bones and matted lumps of feathers. In his guide to the art of archery written in the mid 16th century, Ascham wrote 'The pinion fether as it hath the firste place in the winge, so it hath the fyrst place in good fetheringe' (Wright 1904, 90). The bias towards the left wing may indicate that these are the residue from a quill-dresser workshop, these being the preferred wing for right-handed quill users (as the feather curves away from the eye). A substantial group of bird bone ?pens made from goose and chicken

radii also recovered from the well may have been used in association with wax tablets, but appeared to have been deposited prior to usage (Huddle, Chapter 9.III).

An alternative is that the bias may link to the fletching of arrows, during which feathers from a single wing would have been used (Hoste Spalding, pers. comm.). Roger Ascham states that the goose feather is the only feather to be used when fletching arrows: 'Betwixt the winges is lytle difference, but that you must have divers shaftes of one flight, fethered with divers winges, for divers windes; for if the wynd and the fether go both one way, the shaft wyl be caryed to moche [too much]' (Wright 1904, 90). The behaviour of incorrectly fletched arrows, which do not fly true, is known amongst archers as 'flirting' (Hoste Spalding, pers. comm.). Evidence for arrow manufacture in the locality comes both from documentary evidence for the presence of fletchers and bowyers and from the discovery of part-made armour-piercing arrows within the well. Wood for the arrow shafts may have been worked locally: a turner, for instance, is documented at Property 6 St Peter Mancroft in 1390. 'During the 14th and 15th centuries, arrowheads were made by specialist smiths whose work appears to have been regulated by the Crown. Arrowheads were stored in boxes, chests or barrels which were easily transportable and compact to store' (Jessop 1997, 2). A pine chest is notably documented in a will of one of the Castle Fee bowyers (Property 6, Chapter 9.I and Part IV).

This was the period of the longbow, when arrows were in high demand and when arms and raw materials had to be supplied to the Crown for its military campaigns. In 1417, six feathers from every goose within twenty southern English counties was to be supplied to the Tower, while the following year sheriffs were commanded to supply 1,190,000 goose feathers by Michaelmas (Cal. Pat. Rolls, 1416–22, 178; cited in Hardy 1994, 168). Further discussion of arms and armour, including arrows, is given below.

Both fletching and quill manufacture may have been by-products of the use of other parts of the bird carcass, although during the Middle Ages geese were not killed for their feathers but regularly plucked live twice a year, in spring and autumn (Grand and Delatouche 1950).

Textiles and Needlework

As has been noted, the textile trade was a major contributor to Norwich's medieval wealth. Documentary evidence for textile working within the Castle Fee attests to the presence of wool, worsted and silk, as well as embroidery (Crowfoot and Walton Rogers, Chapter 9.III; Fig.9.15), while madder was also grown (see Property 2, St Peter Mancroft; Tillyard, Part IV). The textile remains themselves, along with associated trades (such as drapers, tailors and hatters), are commented on in 'Dress' below. Sheep of the period may have been reared substantially for wool, the fleeces of wethers being considered the best. Artefacts from the well relating to textile manufacture/processing and needlework include tenter hooks, a spindle whorl, thimbles, needles, scissors and shears. Several copper alloy hooked fasteners may have acted as harbicks or shear-board hooks (used when cropping the nap from cloth).

Trade and Commerce

A small group of eight coins and seven jettons came from the well (Davies, Chapter 9.III). Most of the coins were residual, although a French billon mite was an interesting contemporary inclusion. A French coin weight was also retrieved, along with fragments of scale pans which would have been used for weighing valuable commodities such as gold and spices. A spicer owned property at Property 2 in the late 14th century, while a large number of goldsmiths were working within and around the Fee at the relevant period (Tillyard, Part IV).

As well as locally traded products, evidence from the well indicates imports both from elsewhere in Britain (such as jet, probably from Whitby in Yorkshire; Egan and Pritchard 1991, 309) and the Continent. Foreign imports include the familiar Dutch and German pottery and fine-grained stone for hones from Norway. The importation of Dyer's madder from the Netherlands is indicated, along with silk from Italy. In a single year (1441–2) one Venetian trading family acquired 58 bales of pepper, various other drugs and spices, as well as silk and other precious cloth and 174 balets of woad for over £3,000: much of this was traded with London merchants for more than £6,000, when cloth and wool were purchased in return (Bolton 1980, 313). The raw material for the tiny red coral bead found in the Norwich well also probably came from the Mediterranean, possibly as a linked trade with other goods such as spices and Italian textiles (Egan and Pritchard 1991, 310). During the medieval period elephant ivory (evident in both knife handles and sword fittings from the well) would have reached Britain from a variety of sources, including the French and Flemish ports (MacGregor 1985, 39). The possible mother-of-pearl used in another knife handle may have come from the tropics and appears to be only the second known example of its type from Britain (SF7162/3, Fig.9.23; Watson and Paynter, Chapter 9.III).

People and Possessions

Dress and Personal Possessions

Many of the artisans ranged around the castle catered for the rich man's market, including the goldsmiths, embroiders/vestment makers, high quality saddlers, armourers and jewellers. Fashion was clearly a significant element in the 15th-century gentlewoman's mind. In a letter to her husband John of 1453, Margaret Paston wrote 'I pray that you will buy me a gift for Witsuntide, that I might have something for my neck. When the Queen [Margaret] was here I borrowed my cousin, Elizabeth Clare's necklace, for I dursnt not go for shame among so many fresh [gaily attired] gentlewomen as were here at that time' (Virgoe 1989, 77).

Although many of the dress objects within the well attest to the wealth of their former owners, the presence of cheaper dress fittings (such as the finger ring with a glass setting in imitation of a gem; SF6992, Fig.9.5) attests to catchment from a wide social range. Other jewellery includes a few jet, coral, bone and pewter beads (Huddle, Chapter 9.III) alongside a wide range of dress/head-dress pins (Goodall, Chapter 9.III; Fig.9.5). A fine piece of knotted textile may have been part of a veil of the type secured by such pins (SF6986, Fig.9.15; Crowfoot, Chapter 9.III).

The copper alloy dress buckles and clasps range from 13th- or 14th-century to late medieval in date and many were found in association with leather, textile or silk straps/bands (Fig.9.6). None appear to have been damaged and it may rather have been damage to the straps and/or changes in fashion that rendered them unfit for use. Amongst an extensive range of other dress and shoe fasteners (such as hooks, buckles and buttons) were over 750 small annular buckles which may have been used to fasten shoes or hose, although other evidence from the well indicates a possible association with spur leathers (noted above; see Mould, Chapter 9.III; Fig.9.7). One of the younger Paston sons (John III) wrote to his mother in September 1465 'I beseech you that it might be arranged that I be sent home .. two pairs of hose, one black pair and another russet … I beseech you that this gear is not forgotten, for I have not a usable whole hose' (Virgoe 1989, 146). Standard male attire of the time comprised a tunic or doublet worn over a linen shirt and drawers. Hose would be tied to the tunic by laces and the outfit completed by a cloak and bonnet or hat (Virgoe 1989, 42). Doublets might be made of fine worsted or imported materials such as silk, velvet and fur.

Belts and girdles are also well represented in the excavated assemblage. Girdles would have been worn around the waist or hips, hanging in some cases to the feet of the wearer, and would have been fashionable items of the period. In 1441, Margaret Paston complained in a letter to her husband 'As for the girdle that my father promised me, I spoke to him of it a little before he went to London last, and he said to me that the fault was in you, that you would not think thereupon to have it made … I pray you … that you will take it upon you that you will vouchsafe to have it made before you come home for I had never more need of it now; for I have grown so slim that I cannot be girt into any girdle I have except one' (Virgoe 1989, 41). Girdles are represented in the Norwich well assemblage both by silk tablet bands and associated decorative mounts. The most opulent item is a 15th-century example with gilded mounts depicting displayed eagles (SF7076, Fig.9.9, Goodall, Chapter 9.III). This and other textile fragments from the well were patterned with madder, some of which may have been grown locally. Other silk includes threads from embroidery, another activity documented within the Fee. Silkworkers within the Fee and the work of the Norwich silkwomen has been detailed elsewhere in this volume by Tillyard (Chapter 9.I) and Crowfoot (Chapter 9.III). Their presence indicates connections with the city's wealthier households.

Textile and leather belts were also found, along with numerous belt mounts (Figs 9.9–9.10). Other mounts may have been used on costume, harness or upholstery. Localised manufacture of some types of mount is indicated in the evidence for metalworking (see above). Strap-ends of late 13th- to 15th-century type were present, some of which may have been used on shoes or spur leathers (Figs 9.11–9.12). A notably small quantity of lace-tags included one large iron example which may have come from horse harness, upholstery or a bag. Documentary evidence attests to several pouchmakers in the vicinity of the Fee and fragments of a purse frame also came from the well.

Decorated knife sheaths, such as the three examples from the well, would have been attached to the owner's belt by a thong, one of the Castle Mall examples having a related buckle to keep it in place (Mould, Chapter 9.III; Fig.9.47). These items were originally designed to hold a dual purpose knife, used both for eating and personal protection (Jackson 1985, 15). Such scabbards may have been painted and/or gilded and would probably have been decorated in accordance with current fashion rather than the whim of the owner (de Neergaard 1987, 40). Sheathers and curriers both owned Castle Fee properties.

Other personal items from the well include half of a small decorative mirror case (SF6932, Fig.9.13). Books and writing are represented by numerous bone pens/stylii (Fig.9.14), possible waste from a quill-dresser workshop (see above) and book mounts (Fig.9.17).

Food and Kitchen Equipment

A substantial proportion of the material recovered from the well relates to food preparation and waste. The inclusion of lower status domestic refuse is indicated by a wide range of finds including metal and ceramic vessels, while some of the beetle species present are of types commonly found in dirty kitchen environments.

The large group of knives (totalling 132 blades and handles) displays a wide range of functions and includes general purpose examples, others used in boning/butchery and crafts including metalworking and leather-cutting, penknives and ornate table knives of complex construction (Mould, Chapter 9.III; Figs 9.23–9.24). Decorative handles include examples made from the usual bone, antler, horn and wood, with more notable examples in ivory and, exceptionally, possible mother-of-pearl. The well knife assemblage is of comparable size to the 138 examples from nearly forty sites catalogued by the Norwich Survey (Margeson 1993), indicating the high proportion of knives reaching the well. A copper alloy skimmer may have come from a domestic context, although it could also have been associated with a craft process (see above and SF7092, Fig.9.25).

As well as pottery and copper alloy cooking pots or skillets, stave built vessels, bucket handles, and glassware drinking vessels were found. The ceramics display a range of utilitarian kitchenwares (locally-made bowls, jugs, pancheons, skillets, dripping pans, cisterns (for brewing); imported skillets, pancheons, handled bowls, dripping pans, pipkins) and table wares (drinking vessels/jugs) (Lentowicz, Chapter 9.II and 9.III; Fig.9.19).

Linking to the evidence for kitchen equipment is the evidence for food waste. The frequency of high quality meat bones indicates that much of the waste within the well derived from food consumption (Moreno García, Chapter 9.IV and Part III). The assemblage suggests that, in contemporary Norwich, cattle were raised for prime beef production (with a notable increase in veal consumption) and pigs for pork. As has been noted, much of the cattle waste retrived from the well came from the secondary butchery of carcasses, as well as the remains from consumption. Pigs may have been reared within the former castle baileys (see Chapter 8 and Albarella *et al*, Part III). Sheep were apparently more important for other products than meat, such as wool and skin. Rabbits and hares may also have reached the well as food waste and it is possible that other minor species may also have been eaten. Chicken, ducks and geese supplied meat and eggs, with the latter providing the raw material for crafts.

The domestic bird species were supplemented by swan, pheasant, partridge and pigeon.

No particular disposal patterns were evident in the fish bone remains, which again link to food consumption (Locker, Chapter 9.III and Part IV). Marine fish were the most significant (particularly herring, cod and other whitefish). Shoreline fisheries off the Norfolk coast are indicated by the presence of, for example, flatfish. Eels were dominant among the freshwater species. Some of the fish bone had been burnt, but none showed clear butchery marks. A dolphin may also have been an unusual food source. Fish at this time would have been pickled, dried, smoked and salted, as well as eaten fresh. Marine shellfish also indicates food waste and includes whelks, cockles, winkles, mussels and oyster. A single fragment of edible crab was recovered. As noted above, a fishman, is documented within the Fee (Property 14) in 1397. The main fish market lay just to the south of the Guildhall (Sandred and Lindström 1989, 74).

Plant remains include crops and weeds which may indicate both malting and food residues (Murphy, Chapter 9.III). The latter includes oats, barley, bread wheat, rye, horsebean and ?pea. From the 15th century, public houses — such as the *Angel* — were present just to the west of the Castle Fee and, as in earlier periods, brewing was evidently still taking place elsewhere on the site (see Chapter 8). As much as a gallon of ale a day may have been consumed by each household of the time (Virgoe 1989, 72). Terrestrial arthropods from the well include the grain weevil, the presence of which indicates that grain may have been stored nearby: a baker is, for example, documented just outside the Fee at Property (f) in 1504. Other remains include fig and grape while hazelnuts, elder and a rose fruitstone may indicate the character of local vegetation. Figs would have been expensive luxuries at the time: 'you sent me word in a letter of 12 pounds of figs and 8 pounds of raisins. These have not been delivered as yet, but I doubt not [that they] will be, for Alwedyr … said they came on afterwards in another barge [up the Thames from London]' (letter from William Paston while at Eton to Sir John Paston, 1479; Virgoe 1989, 263).

Furnishings and Buildings

A large quantity of brick and roof tile was recovered from the well the majority of which was medieval including types in use in Norwich in the late 14th and 15th centuries (Lentowicz and Kemp, Chapter 9.III). Later brick types were also present and are generally believed to have been in use in Norwich later than in the remainder of East Anglia. They occur from the mid 15th century elsewhere but in Norwich contexts are generally considered to be of 16th-century manufacture (Lentowicz, Chapter 13). Although a dozen pieces of architectural stone were recovered from well fills, only one window dressing was from a contemporary structure, the others being Norman in origin (Heywood, Chapter 9.III).

Other building materials include fragments of painted plaster and window glass (Kirkham; King, Chapter 9.III). The latter includes many painted examples such as an important ?Norman piece which may have come from the castle. Other glass may link to the Bardolf family who owned property near the castle in the late 14th century. Constructional metalwork includes a large number of timber nails and strapping and studs from furniture, doors *etc.* as well as a latch rest.

Textiles from the well include worsted fragments which may have been used as hangings and in other household furnishings. Suspension rings may have been used for curtains or hangings. Plant remains include heathland and wetland species which may indicate litter/flooring and/or thatching. Five reeders (thatchers) held property within the Fee, including one at Property (a), St John's in 1401. Further comments on raw materials and buildings of the period are given in the preceding chapter.

Although the wealthy 15th-century household would have been well supplied with candlesticks, plate, tapestries and arrases, the range of household furniture was still relatively limited and would have included beds, cupboards and chests (Virgoe 1989, 76). In a letter from Margaret Paston to John Paston in December 1461, Margaret wrote: 'if you will be at home this Christmas, it would be well for you to obtain a garnish [set] or two of pewter vessels, 2 basins, 2 ewers and 12 candlesticks, for you have too few of these to serve this place' (Virgoe 1989, 121).

Many of the locks and keys from the well may relate to caskets or boxes, at least one of which was covered with patterned cloth (Fig.9.28). One of the earliest copper alloy objects was a gilt strip of 12th–13th-century type, often found on castle sites (SF6852, Fig.9.17; Goodall, Chapter 9.III). Again, this may have come from a box or casket. Two finely carved bone objects (from a possible reliquary and diptych or similar) may have an ecclesiastical origin (SF7441 and 6901, Fig.9.6; Huddle, Chapter 9.III). A number of workmen with possible ecclesiastical associations were noted within the Castle Meadow (see Part IV).

Military Items, Hunting and Horse Equipment

Much of the weaponry and armour found within the well may have been from the stock of a lorimer/armourer(s) (see 'Crafts' above). Copper alloy armour includes mail and a large number of studs (many decorated and possibly from armour) and a possible sword belt buckle which appeared to have stable debris adhering to it (Goodall, Chapter 9.III; Fig.9.45). Iron armour includes more than twenty conglomerations of mail (Mould and Richardson, Chapter 9.III). This may have been used to scour metalwork, rather than simply being scrap awaiting melting. Some, however, had already been partially melted. Mail armour was the earliest type of metal armour and continued to be manufactured in Europe until the end of the 17th century (Pfaffenbilcher 1992, 56). Its strengths lay in the fact that it could be easily produced, was highly flexible and could withstand cutting blows. It could not, however, resist missiles (such as crossbow bolts) with such success. The process of manufacture would have been carried out by different people within the same workshop: the early repetitive tasks by apprentices and assistants and the finishing by the master craftsman. Mail armour could be produced by varying methods although, in the examples from Castle Mall, the rings had been joined together using tiny rivets.

Of the numerous fragments of riveted iron sheet recovered from the well, many may have been plate armour (including pieces possibly from brigandines and tassets) and several retained a vitrified residue indica-

tive of metalworking (Mould and Richardson, Chapter 9.III). Some showed traces of their leather backing. Plate armour was produced from about 1340 (Pfaffenbilcher 1992, 9) and had improved so much in quality by the 15th century that it could withstand the crossbow and longbow at all but very short range (Virgoe 1989, 90). Its manufacture was a complex process and, in larger armouries, locksmiths could have been employed to make the various hinges and fastenings. A small copper alloy hook retrieved from the well may have been used in this fashion. By around 1500, the increasing use of fire-arms was gradually making full plate armour obsolete. The remains of swords and daggers were also found in the well, along with the three decorated leather sheaths noted above. Of particular note is a dagger of baselard type (SF7526, Fig.9.46) and a sword pommel (SF7008, Fig.9.46) of probable 14th-century date which retained its clay core (Mould and Woosnam-Savage, Chapter 9.III).

Arrowheads, shafts, feathers, bow-staves, bows and bowstrings would have been in constant demand, both for hunting and military purposes, the latter particularly during the military campaigns of the period: the Hundred Years War (1337–1451) and the Wars of the Roses (1455–1487). Norfolk musters relating to the latter conflict included archers among the company (Virgoe 1989, 237). In the earlier part of the period, the proportion of archers to men-at-arms could be as much as 20:1, while by the early 16th century, this proportion had reduced to around 3:1 (Hardy 1994, 163, 170). The documented numbers of bows and arrows required, along with the materials for their manufacture, is staggering. In 1359, for example, the Tower was supplied by the counties with 850,000 arrows, 20,000 bows and 50,000 bowstrings (Hardy 1994, 169).

Arrowheads from the barbican well included examples with broadheads used for hunting game as well as armour piercing examples (Mould, Chapter 9.III; Fig.9.46). One was part-made and provided evidence for corrosion products (paralleled in other similar finds). A single arrow had its wooden shaft remaining, which was identified as willow/poplar (SF7063.30 , Fig,9.46; Taylor, Chapter 9.III). Neither of these woods is listed amongst the fifteen woods suitable for arrow shafts listed by Ascham in his *Toxophilus* (Wright 1904, 83–4). The significant bird bone assemblage included an unusually large number of goose wings, probably relating to the manufacture of either arrows or quill pens. The most suitable feathers for arrow vanes were goose pinion feathers and these were used in enormous numbers (see above).

Horse equipment includes a range of objects such as spurs, spur buckles and fittings, hook attachments and spur leathers (Figs 9.42–9.43). Harness buckles, horse bits, horseshoes and nails were also present, as well as a piece of decorated goatskin which may have been part of a saddle or piece of upholstery. Further details of evidence for the activities of spurriers are given above. One example of tablet weave found associated with a stirrup buckle is exactly paralleled by another example from Felixstowe, Suffolk and it is possible that both may have been produced by the same weaver (SF7026, Fig.9.15, Crowfoot, Chapter 9.III). This would have been very strong and may have been used on a stirrup strap in place of leather. Such an item would presumably have been more expensive and of higher status than the usual leather straps.

Stable debris, including horsehair and decayed leather, was found matted around a sword buckle and a copper alloy plate. Horse remains themselves were rare within the well assemblage. This is entirely consistent with the nature of the deposit and large horsebones would probably have been disposed of elsewhere.

Games and Pastimes

Games and pastimes represented in the well assemblage include musical instruments (such as a complete Jew's harp, part of a zither or psaltry and bells) and a Nine Men's Morris or Merrel's board (Fig.9.41). It is possible that some of the cockerels found within the well were used in cock-fighting. As noted above hunting is represented by arrowheads and horse equipment, as well as possible fittings from dog leashes.

Local Environment

Both the beetle and mollusc species present indicate the presence of a rural open landscape in the surrounding area, resonating with the substantially open ground of the castle ditches. One beetle of a type often found in the nests of predatory birds (such as owls) suggests that a suitable environment may have existed nearby. Although tree/shrub cover in the area is evident, both from beetles of the period (Robinson, Chapter 8.IV) and the plant remains (Murphy, Chapter 9.IV), owls usually prefer to nest on the fringes of urban sites in quiet church towers, roofs and barns.

Comparisons with Other Assemblages

Both the barbican well assemblage and the deposits resulting from the 1507 fires recovered by the Norwich Survey at 31–51 Pottergate (Site 149N, Evans and Carter 1985) provide evocative accounts of the events of the period. The Pottergate assemblages focus around the kitchens of wealthy households, although they include evidence for a possible blacksmith's workshop (Carter *et al* 1985, 78–84). While the assemblage from the castle well complements the previous evidence, its catchment range extends to include valuable insights into a wide range of specific craft activities within and on the fringes of the Castle Fee, which in turn supplement those for other workshops, shops and trading outlets uncovered elsewhere in the city or implied by artefactual evidence. In conjunction with the information from other Norwich Survey investigations (Margeson 1993; Atkins *et al* 1985; Atkin and Evans 2002) and more recent excavations by the NAU, in particular those adjacent to the market place (Percival and Hutcheson in prep.; Shelley and Tremlett in prep.) and at Dragon Hall on King Street (Shelley 2005), the city now boasts an enviable dataset of 15th- and early 16th-century material encompassing the entire social scale. One unique aspect of the Castle Mall assemblage is its sheer scale: the knife assemblage alone matches in size the published groups from more than forty Norwich Survey sites (see above), while many of the various material groups supersede those generated by other Norwich excavations (although direct parallels in terms of assemblage size are often hampered by the lack of detailed quantification for previously published assem-

blages). Other notable groups include several hundreds of tiny iron buckles, either from hose or spurs, which had previously only been recovered in small numbers from the city.

Although many of the craft assemblages are paralleled in, for example, London, others such as the large groups of waste leather from fitting spurs appear unique. Individual objects, such as the handle that may have been fashioned from tropical shell, are new introductions to Norwich's Tudor repertoire. A number of other objects may represent early examples of their type.

The faunal remains from the well again provide much new information, particularly the unparalleled group of craft waste represented by the large group of over 450 goose wing-tips. Although in Norwich terms the assemblage of 16 cats from the well is notable, a remarkable group of 79 were recovered from a medieval well in Cambridge (Luff and Moreno García 1995).

Conclusions

The archaeological evidence gathered from the infilling of Norwich Castle's barbican well makes a major contribution to the understanding of the development of this great city during its recovery from the ravages of the Black Death. Set within a rich documentary and historical framework, it provides a snapshot of domestic and artisan life at the transition between late medieval and post-medieval traditions, thereby directly addressing one of the project's stated objectives. It is perhaps appropriate that so much of the assemblage has military connotations, during a period in which England was engaged in both internal and external conflict.

Endnotes

1. The author is grateful to Steven Ashley for the Dublin reference, to Ian Riddler for the Bedford and Hereford references and to John Clark Curator (Medieval) Museum of London for sending photocopied images of castellated bone plaque from London Wall described in the Guildhall Museum Catalogue 1908, an unpublished drawing of a castellated bone object (Museum of London acc. no. 86.419/1) and two photocopied images of castellated bone objects in the Museum of London's collections (acc. nos 79.233/5 and A379).

10. The Second City (late 16th to 18th century)

'that goodly castle, which though in great ruines is yet standing'
Alexander Nevyll, *De furoribus Norfolciensium* ... 1582

'On a hill in the middle of the town, from where one has a fine view over the town and countryside, is the Castle, which houses the prison …'
The Journal of William Schellinks: Travels in England 1661–63, 11 October 1662; Exwood and Lehman 1993, 158

'The improvements now taking place within the limits of the Castle Hill in this city, are such as will prove a most agreeable object of public notice …. rendering this uncultivated spot an uniform scene of ornament and delight.'
Norwich Mercury, 19 June 1784)

I. ARCHAEOLOGICAL, HISTORICAL AND DOCUMENTARY BACKGROUND

Post-Medieval Norwich

(Plates 10.1 and 10.3)

The wealth of post-medieval Norwich remained rooted in the textile trade and the city maintained its position throughout the period as a major centre of commerce and government (Campbell 1975, 17–18). There were, however, changing fortunes during the period. The major fires that affected the city during the early 16th century have been discussed in Chapter 8.I. Many of the areas affected by the conflagrations were not built up again until the late 16th or even 17th century (Ayers 1991, 5), while some remained unoccupied until the late 17th or 18th century (Pound 1988, 23). A recession badly affected worsted exports during the first part of the 16th century (Ayers 1991, 3), while plague was a recurrent problem with outbreaks in 1578–9, 1583–6, 1590–3 and 1666. During the Civil War, Norwich was loyal to parliament and, although not involved in military action, the city saw a number of riots. Its defences were strengthened

Date	*Event*
1565	Dutch and Walloon 'Strangers' invited to Norwich to work in textile industry
1579	New Shirehouse built on the Castle Mound
1582	Alexander Nevill writes his description of Norwich
1616	Livestock to be sold only in the castle dykes
1637	Part of Hog Market moved into castle ditches
1638	First documented use of ceremonial guns in south bailey
1640s	Most of medieval curtain wall at top of Castle Mound demolished, part in north-east corner destroyed to build gun platform during Civil War
1666	Plague: burial of animals in castle ditches
1696	Cleer's map of Norwich
1707	Last curtain wall tower removed
1716	Kirkpatrick's Prospect
1721	New carriageway inserted to top of Castle Mound
1738	Buck's sketch of Norwich Castle, prior to landscaping associated with construction of new Cattle Market
1741	New city Gunhouse built in south bailey
1746	Shirehouse burnt down
1766	King's map
1774–5	Mound becomes public garden surrounded by terrace walk
1789	Hochstetter's map; old gaol removed
1792	Keep gutted for Sir John Soane's new gaol
1790s	Construction of new roads across the south bailey
1793	Hay-weighing engine moved into south bailey

Table 10.1 Key events — late 16th to 18th century

and a gun platform was constructed on top of the Castle Mound.

At the beginning of the post-medieval period, the plan of Norwich's major streets remained substantially unchanged, although in the 16th century changes were often made to minor routes and lanes were frequently closed to be built upon. The city's outer boundaries, its walls and gates, were maintained. Intramural open spaces in 1700 were generally the same as they had been two centuries earlier, the city retaining its rural character. During the 16th century exploitation of open areas for quarrying and limeburning continued. Limekilns are known along King Street with associated quarries cutting into the Ber Street ridge, although these appear to have begun to be infilled in the late 16th century (Ayers 1991, 7). A system of flint and chalk mines beneath the city may have originated in the 16th century and they were certainly in use by 1571 (Atkin 1983, 313). With the Reformation, many ecclesiastical buildings were demolished while others were taken over for a wide range of secular uses (Campbell 1975, 19). A number of parish churches were also demolished in the 16th century, including St Martin-in-Balliva, with concomitant changes in parish organisation.

Between 1500 and 1700 the city's population had increased to reach a figure of nearly 29,000 in the 1693 census (mirroring population increases more widely in East Anglia and across England; Campbell 1975, 17–18). As time passed, economic factors drew increasing numbers into the city from the surrounding countryside. The higher population density increased the demand for housing; although large houses of the period were common, they may have accommodated numerous families either within the main building or in small dwellings around courtyards. The 1570 *Census of the Poor* (Pound 1971) lists well over 2,000 individuals, those residing in the parish of St John Timberhill being detailed by Ives in Part IV, Chapter 3.

By the 16th century (and probably considerably earlier), the county's farmers were engaged in both widespread national and internal trade. Such contacts inevitably affected Norwich and the city increasingly became a centre for conspicuous consumption (Campbell 1975, 18).

After *c.*1530, declining trade was given new life with the introduction of new techniques from the settlement of Protestant Dutch and Walloon Strangers who were invited to the city from 1565. After the Massacre of St Bartholomew (1572) London became overcrowded with Strangers from the Low Countries and northern France, escaping from persecution. Permission was granted by the Privy Council for them to go to places already licensed for Strangers to reside and a number came to Norwich (see Ives, Part IV, Chapter 3). Before 1579/80, around 6,000 had settled in the city, their numbers being reduced by plague to less than 5,000 by 1583 (Evans and Atkin 1990, 242). Those who settled in the parish of St John, Timberhill are detailed in Part IV. The Dutch made woollen cloths and the Walloons finer cloths comparable to worsteds (Campbell 1975, 18), with small groups of weavers working under a master weaver (*e.g.* Lancelote Vanstaple in St John Timberhill parish in 1594). By 1650, only about 1000 Strangers remained.

The earliest recorded tin-glazed pottery in England may have originated in Norwich in 1567, when two refugee potters (Jaspar Andries and Jacob Janson/Johnson) from Antwerp established works in city. Their kiln may have been located on Ber Street although it

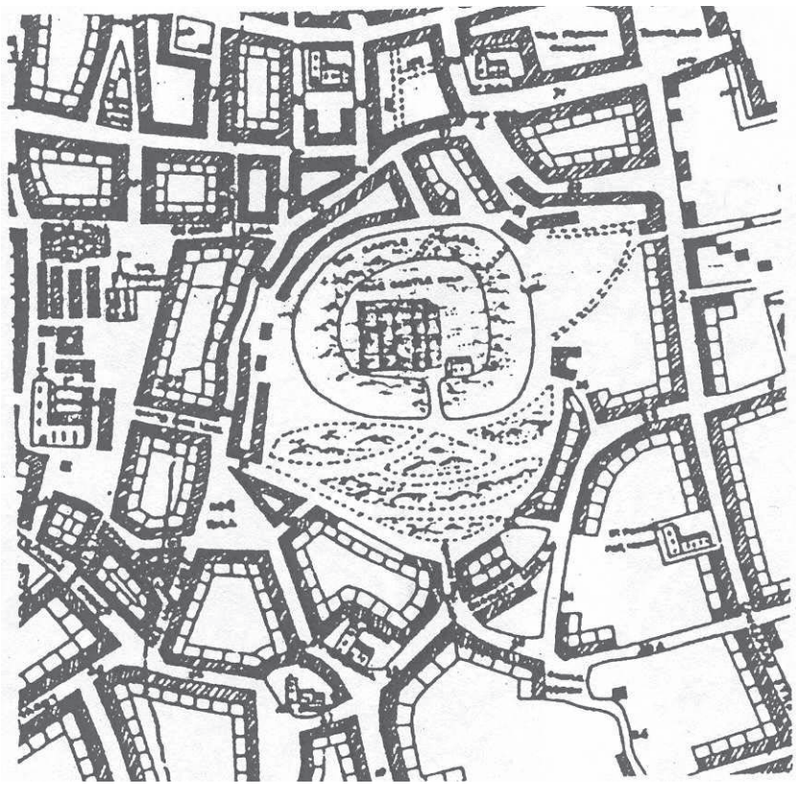
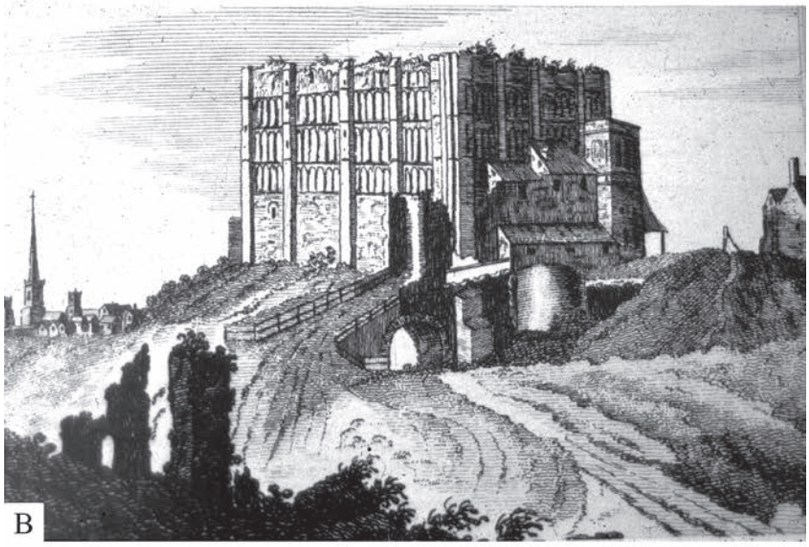
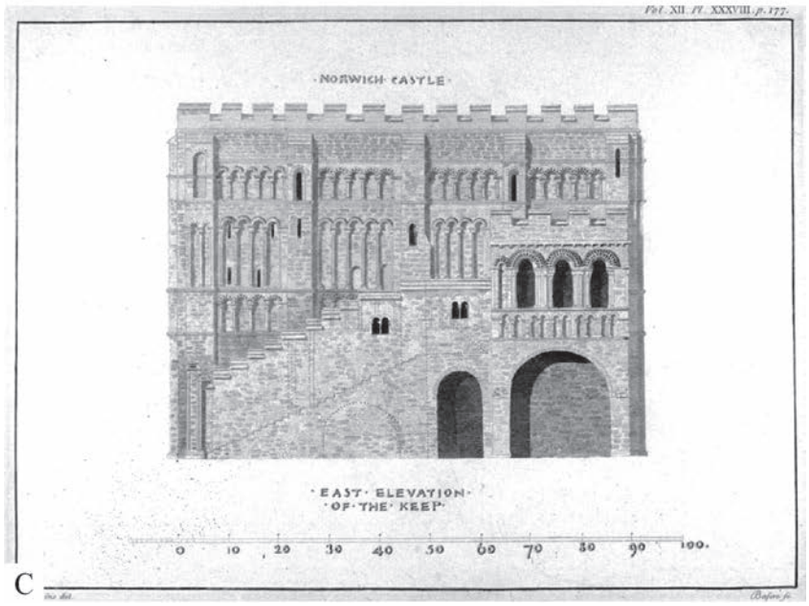


Plate 10.1 John Kirkpatrick's 1720s version of Cleer's map of 1696





A – John Kirkpatrick's sketch (1720s), showing the possible 13th-century aisled hall on the north face of the Keep (NWHCM 1694.76.94)
B – Buck brothers' engraving (1738), showing the Keep from the south-east and the ?13th-century gate on the castle bridge (NWHCM 1931.18F.18.931)
C – Wilkins elevation (1796), viewing the Keep from the east to show the principal entrance and Bigod's Tower (NWHCM FAW 474:F)

Plate 10.2 An 18th-century circuit of the Castle Keep and Mound

has yet to be located archaeologically, despite the presence of waster sherds (Ayers 1991, 6). Potters named in the parish of St John Timberhill include Jacob Johnson (who came to England in 1568 and was in Norwich by 1576) and possibly Matthew Lambert (see Ives, Part IV, Chapter 3).

At the beginning of the 18th century, Norwich was the second most important manufacturing centre after London. By the end of the century, however, textile manufacture began to be overshadowed by the great textile centres of the north. Despite this the city remained an important centre for light fabrics, an industry which did not go into decline until long after 1800. Manufacturing remained based within households/small workshops well into the 19th century (Campbell 1975, 22). The county's agriculture thrived during this century and was dominated by the production of barley and malt. Grain prices were high during the Revolutionary and Napoleonic wars and, by the end of the century, several large breweries were established in the city.

Enlargement of the city's intramural cattle market in 1738 demonstrates an increasing trade in livestock, with cattle being grazed on marshland to the east of city. Horsham St Faiths (just to the north of the city) was one of the largest livestock markets in England at this period. The leather trade maintained its importance and by the mid 19th century the city depended — as it had in the 13th century — on leather rather than textiles. An important shoe-making industry developed and again remain focused in a domestic setting (Campbell 1975, 20–23).

Norwich's first bank opened in 1756 (Campbell 1975, 20), run by the Quaker Gurney family, and was sited just to the north-east of the castle (Properties 20 and 21). The city's first Norwich Directory of 1783 (Campbell 1975, 22) demonstrated aids to the circulation of traffic, the provision of an improved water supply and public gardens.

Again, the footprint of the settled area remained broadly as previously, although extending outside the walls in a few areas. Some formerly open spaces were now occupied, including the castle baileys which housed the new cattle market. The castle earthworks were levelled in stages from late 17th century, until by the end of the 18th century most of the site had been converted. The city gates were all removed between 1791–1801. Changes in taste were evident, such as new building types using brick rather than timber-framing. New public buildings of the late 18th century included a new Shirehouse and County Gaol, both on the Castle Mound. Many streets were widened and former paths converted into lanes or minor roads to provide new and more direct routes for the ever increasing traffic. Both the improving quality of the roads and the ease of coach travel led to increasing numbers visiting the city, bringing new trade to the market place and adjacent shops.

The Post-Medieval Castle

by Margot Tillyard and Elizabeth Shepherd Popescu

Antiquarians and Map Makers

(Plates 8.1 and 10.1–10.3)

Extensive use is made throughout this report of the information provided by 18th-century antiquarians, but their major observations in relation to the castle are summarised here for ease of reference. Kirkpatrick (d.1728) saw the remains of the perimeter wall around the mound and its associated towers: 'anciently the top of the Hill or Castle-yard was encompassed on all sides by a strong wall, fortified with diverse towers built of brick and stone, the bricks very large, a good piece of which remains still on the south side; but the earth on the outside of it is settled or washed away lower than the foundation of it' (Kirkpatrick 1845, 240–241). He continues 'a great part of the said walls (without doubt much decayed by time before) were thrown down by engines into the ditch, in the time of the great rebellion, when they made the platform … on the east side of the hill ... but there was much of the walls standing afterwards on the west and north sides of the hill, in the memory of ancient men' (1845, 241). He maintained that the south-western angle of the mound had been defaced by sand-digging 'which has caused much of the Hill to fall down'. Kirkpatrick also noted the cracking of the keep and the removal of its battlements, as well as describing the state of the castle ditches before systematic roads were made across them. He criticised construction of a carriage-way up the north-east side of the mound in 1721. He interpreted masonry in the outer ditch (*i.e.* the barbican) as the remains of a gate-tower which had once stood on its north side: 'as to the large pieces of old walls which now lie in the second [barbican] ditch, whereof one is pitched so perpendicular or upright on an end, that it might be supposed to have been built there; yet upon information from ancient persons, I find those pieces did stand on the hill, near the north side of that ditch, and the ground settling, or being undermined to dig sand, they fell down into it. These walls, when standing, did seem to have been part of a great gate and tower, which stood here at the ends of the walls of the bridge, which probably were continued further south than now they are, and ran across the bank which lies between the two ditches, unto the said wooden bridge. And if you observe the largest of those pieces of wall, it is evident that it could not be built in the ditch where it lies, because the courses of the mortar and stones of it do run parallel with the perpendicular of its height, which, if it had been built there, must have been parallel with the horizon, as it is in all buildings' (Kirkpatrick 1845, 243–4).

There being no evidence for stone foundations for a second bridge (over the barbican), Kirkpatrick supposed that the lack of ruins meant that the bridge was wooden. He placed the old Shirehouse on high land beyond the outer ditch near the 'hollow road'. He noted that a rampart outside the motte ditch (*i.e.* on the inner side of the barbican?) survived to the east of the bridge, but to the west 'has been in the memory of man thrown down, made much lower, and more level or plain, and the form of it quite altered by cart-ways made through it, and by the uttermost ditch of it being filled up' (1845, 243).

Thornaugh Gurdon (1728) considered that 'the old Foundations and remaining Ruins' in the outer bailey were the remains of a Grange for the Constable. His map shows paths across the inner ditch both on the north and north-east sides.

In 1738, the area between Golden Ball Lane and the Castle Bridge was levelled by pushing the centre of the bank of the barbican ditch into the ditch. Human bones were found, although their location was not recorded (see Part I, Chapters 2 and 4). The Cattle Market then moved to this area. The same year, the Buck brothers depicted

A – King (1766; NWHCM Todd 5, 10); B – Hochstetter (1789, NWHCM Todd 5, 7)
C – Hochstetter (1789, NWHCM Todd 5,7), detail of the castle area

Plate 10.3 Eighteenth-century maps of the castle area

considerable ruins still standing on what appears to be an outer bank of the barbican ditch, although slopes in the foreground appear exaggerated for artistic effect. Perhaps seeing the masonry at the bottom of the ditch about to be covered they 're-erected' it to form the foreground of their picture (see further comments in Chapter 2).

Blomefield (1741) realised the rare nature of the bridge over the inner (*i.e.* motte) ditch and noted that the gate on it was in ruins. He placed the original Shirehouse further west than Kirkpatrick and believed that recently built stables were sited on part of its ruins. He stated that the ruins of the second bridge (*i.e*. the collapsed gate-house) remained 'til the Ditches were lately levelled by the City, for to keep their market' (Blomefield 1806, II, 124).

In 1792 a road was made across the ditches from Orford Street to the Griffin passage (in the Castle Meadow). The south-western part of the castle ditches, already much eroded by sand-digging and cart-tracks, must have been levelled further. Wilkins (1796) remembered vestiges of a ditch levelled in Castle Meadow 'thirty years' before, but gave no precise location. He believed there to have been a barbican ditch beginning at Orford Street and curving round for 220yds. He also stated that foundations of the bridge over the middle ditch (*i.e*. the barbican; actually remnants of the gatehouse) were still visible in some places on a line between Golden Ball Street and the inner bridge. Vestiges of the barbican ditch were to be seen in a south-easterly direction and towards the north-west, where some yards descended 18–20ft. Access to Pottergate (now Bedford Street) from London Lane had been by steps until only a few years before.

Cartographic evidence of the period includes Cuningham's view of 1558 (Plate 8.1.B) and Braun and Hogenberg's reworking of it in 1581. Cleer's one- and four-sheet plans of 1696 provide the first real maps of the city (*e.g*. Plate 10.1). There are numerous 18th-century maps and views including Kirkpatrick (1720s; Plate 10.2.A), Corbridge (1727), King (1766, Plate 10.3.A) and Hochstetter (1789, Plate 10.3.C). Cleer's map indicates the survival of substantial areas of undulating open ground around the castle (Plate 10.1). Maps of the castle area before the 1738 levelling include those of Kirkpatrick (1716) and Thornaugh Gurdon (1728). Hochstetter's late 18th-century map shows that the inner part of the Timberhill block had become substantially infilled with buildings by this time, although there were still open spaces for yards/gardens surrounded by the buildings (Plate 10.3.C).

The Keep

(Plates 8.1 and 10.2)

By the end of the 17th century serious cracking of the keep walls was apparent. There was a large fissure towards the east of the south side, reaching almost to the base. This and another crack on the east side were repaired in 1707, when stone for these and 'other repairs' was obtained by dismantling the battlements (Kirkpatrick 1845, 241). The battlements were reinstated between 1769 and 1776. It may have been at the same time that a crack to the west of the north front was repaired and part of the west front was refaced. This was the upper part of the central section amounting to more than a quarter of the whole (King 1786, 401).[1]

The Castle Mound and Ditch

(Plates 10.1–10.3)

Alexander Nevill writing in 1582 begins his description of Norwich with (in the words of the English translation of 1623) 'that goodly castle, which though in great ruines is yet standing therein'. By then, there can have been little trace of the outer bailey ditches. He describes the square keep of white stone and mentions the surrounding wall and double ditches, one round the mound, the other in front of the gate and bridge.

At the beginning of this period much of the mound's perimeter wall remained, but almost all had disappeared by the end of the 17th century. As noted above, Kirkpatrick concluded that the large section near the north-east corner had been destroyed for a gun platform during the Civil War. Old people in his time could remember large parts on the north and west sides still standing and he himself when young saw quantities of its big bricks there. The foundation was revealed when the carriage-way to the top of the mound was built at the north east corner in 1721.

At the same time the last section of the wall to remain, which was on the south side of the top of the bridge, was being undermined by sand diggers and on the point of collapse. Adjoining this was the gaoler's house which had been rebuilt in 1662. At the east end of the house stood the last of the perimeter towers, which is to be seen on an early 18th-century painting of the castle (Cozens-Hardy and Green 1970, 147). It was destroyed in 1707 when the house was extended (Kirkpatrick 1845, 241). The house was quite a large building and the gaoler ran a popular tavern there until wine in gaols was forbidden in the early 19th century (Browne 1814, 383). It disappeared in the gaol rebuilding of 1824.[2]

There had also been a pair of 13th-century towers at the upper end of the bridge (see Chapter 7). The basement of the one on the west, connecting underground with the castle dungeons, formed part of the prison. The one on the east was pulled down in 1824. The foundation of the perimeter wall at the north-east corner of the mound was seen again in 1807 when the iron palisading was put in there (Woodward 1847, 12).

The castle mound ditch was transformed into allotments in the late 18th century. Browne (1785, 16) states that '...from whence [the mound] there is a beautiful view of the improvements lately made by converting the ditch in [*sic*] gardens, enclosed by a strong hedge on the outside; some of them are very elegantly laid out'. Hochstetter shows the plan of these features (Plate 10.3.C). A further reference to the work comes from the *Norwich Mercury* of 19 June 1784: 'The improvements now taking place within the limits of the Castle Hill in this city, are such as will prove a most agreeable object of public notice, and of vast utility to the county of Norfolk, by preserving the fences and plantations of that most beautiful area. The Lord Lieutenant, the Justices and the gentlemen to whom the disposal of the grounds are given, have each a claim to the merit of rendering this uncultivated spot an uniform scene of ornament and delight.'

The Castle Bridge

(Plates 6.6.A and 10.2)

The bridge had originally been built with a gap in the centre, closed only by a drawbridge which was housed in a gate on the upper side 'vaulted over, with a lofty and

strong tower upon it' (Kirkpatrick 1845, 241). By the late 17th century only parts of the sidewalls of this were left, still decorated on their inner faces with blind arcading (Plate 10.2.B). The remains were removed at some time after 1738, perhaps at the same time as a masonry arch to close the gap in the bridge was inserted or renewed. This was seen in 1796. It had been 'formed with two ribs of stone four feet three inches each in thickness upon which rested an internal soffit of brickwork'. By then the exterior flintwork of the bridge had become very dilapidated and the ditch further choked up by the depositing of large quantities of rubbish during the building of the new gaol (Wilkins 1796, 176).

The Shirehouse and the Minor Prisons

By 1568 the old Shirehouse within the western part of the south bailey had become too small and at the Mayor's Court on 3 May that year there was recorded 'a request made by Sir Xpofer Haydon and Mr William Paston Esq two of the Justices of the pece in the countie of Norffolk for a peece of ground to enlardge the Shirehows whiche they with the rest of the Justices .. are mynded to reedifye and enlardge, this day this hows .. have agreed that the Chamberleyn of the said cittie and his councellours shall have power and auctorytee to appoynt so moche ground as shall serve to satisfye their request' (at a suitable rent) (NRO CB7 152). Nothing came of this. In July 1570 Queen Elizabeth granted to Sir Thomas Wentworth in fee farm for service to Edward VI, Queen Mary and herself £200-worth of lands escheated to the Crown which included 'le olde Sherehouse and ruined premises' in Norwich worth 2s per annum (Cal. Pat. Rolls). After William's death in 1585 the Shirehouse was sold to Theophilus Adam and Thomas Butler of London, through whom the city must have acquired it (PRO Tps Cal. Pat. Rolls, 61).

The new Shirehouse was built on the Castle Mound, adjacent to the north wall of the keep in 1579 (see Morgan 1996). The building account includes also an item 'for gravell to Amend the Bridge' (Bodleian Library, Tanner MSS Vol 311, 247). Part of the old building may have been a prison, or the buildings were converted into one. William Rogers 'Gaoler of the Prison called 'le Sherehouse' was pardoned by the Queen in 1574 for mortally wounding a prisoner there (Cal. Pat. Rolls 9 July). Charles Flower of Wymondham 'a prisoner out of the Shirehouse' was buried in 1596 and 'a poore boy that dyed in the Sheerehouse' in 1634 (Beecheno 1888, 55). They are recorded in the register of St Michael at Thorne, to which St Martin at Bale (in-Balliva) had been joined in 1562. The inquest of a prisoner who had died in the Shirehouse in 1574 was held in St Michael's parish. This may have been because the Shirehouse was regarded as part of the castle which was nominally in St Martin at Bale, or it was in fact in that parish and Blomefield was mistaken in placing it in St John Timberhill. Certainly the garden immediately opposite the Shirehouse to the south was in St Martin's parish (*i.e.* Property 48, Fig.8.2).

It is not known when the Shirehouse finally fell into disuse, nor when the houses on either side of the lane that ran from it were first run as prisons — for the better sort of prisoner. In 1614 a prisoner was drowned 'in the well at Mr Worsley's'. Though first recorded on the later Golden Ball site (Property 46) in 1607–8 Worsely was probably there before 1603, when he was granted more land next to some he was already leasing behind the old Shirehouse (Kirkpatrick 1845, 313). When he died in 1638 the Corporation was offered his house for £200. Probably the prison was taken over by a Mr Gardner, in whose care the first prisoner died the following year (Beecheno 1888, 55).

By the beginning of the 17th century the property on the western corner of the lane (Property 48) seems to have been divided into at least four parts. Henry Fulcis, who had been apprenticed to a locksmith in 1603–4, acquired the greater part of the north-east corner of it in 1631.[3] It was described as a messuage with orchard garden and yard 'opposite the old Sherehouse' with the road in part on the north and the lane running from the Sherehouse on the east. Fulcis may have occupied the property earlier. He was already a gaoler in 1625 when a prisoner from his house died and may still have been alive when Henry Raven, who had been a witness to the purchase of the property and became the clerk of the gaol, was buried in 1641.

The house became known as the Old Gaol, but the house on the later Golden Ball Lane site (Property 46) continued as a prison for many years. Even after a new house had been built for the Gaoler on the castle mound the tradition persisted. In 1697, for instance, 'part of a capital messuage called the Gaole or Gaolehouse' constituted the marriage-portion of a worsted-weaver's daughter. It consisted of two messuages or tenements 'lately built ... on a former bowling-ground'[4] with a brick wall to the north and the road east and other tenements in an upper yard and enclosed there, having the road to the west and Castle hill north, as well as an orchard with a well to the north and east, all sharing a pump.[5] By Kirkpatrick's time, though remembered as a prison, the house on the north-east corner of the lane had become *Golden Ball Inn* (Fig.11.4). The large gilded ball which formed the inn-sign now hangs in the undercroft of the Stranger's Hall.

As for the old Shirehouse, he knew elderly people who remembered part of an old stone house with barred windows standing in their youth on the hill there which was probably the vestiges of it (Kirkpatrick 1845, 312). It seems the remains had disappeared by 1678, for in that year the city Ordnance was to be fired 'either on the bank by the meadow, or upon the hill where the old Sherehouse stood'. The earliest record so far noted of ceremonial guns in the south bailey dates from 1638 when an order called for them to be drawn to 'the hill against (opposite) the old Gaol' which may indicate that the Shirehouse was already disused (Rye 1921). The Castle Leet Court of 1683 was held 'on the outward hill opposite the Castle Bridge', that is in the open air on the site of the Old Shirehouse (Hudson 1892, 96n). Any foundations left below ground would have been removed in 1738 when the area was partially levelled for an extension of the cattle market and a road made further east from the Golden Ball to Castle Meadow.

The Post-Medieval City

Activities in the Baileys
by Margot Tillyard

Tents and booths
The Corporation had permitted the erection of booths near the Shirehouse when the courts were sitting and went on doing so at least until the middle of the 17th century. In 1584 Robert Catton was paid 13s 4d for 'his advyse and attendance abowt the building of the Boothe in the Castledyche for the Judgys at the last Assyses'. Thirty borrowed 'tilts' (large sheets of canvas) were used and the ground was strewn with rushes and 'gall' (sedge). Six men worked for a day amending the Wayes and buryeing the Muck in the ditches and three others cleaned the Castledyches wheare the Judges go.[6] Two men were licensed to put up tents and huts 'pitching and building of booths in and about the castle dykes and hills' in 1655 (Kirkpatrick 1845, 314).

Digging, dumping and drainage
The Mayor's court spent much time in the 17th century dealing with unlicensed digging and dumping in the castle ditches. One approach was to license dumping. In the 1580s Mr William Steward was given permission 'to dygg A pytt in the Castlemedowe and thear to burye Colder' (*i.e*. rubbish) 'so as he laye the earth A yard thick over the colder and so levell the ground' (NRO CB11, 227). A basketmaker John Kettle appeared before the Mayor's Court several times in 1625 and 1626 when, having been refused leave to 'bury his necessary in the Castle Ditches' he nevertheless got his servant to do so.[7] Animals were buried there, both officially during the outbreak of plague in 1666 when a man was appointed to bury strays 'at the bottom of the Castle Dykes' and unofficially as in 1673 when John Jaxon was accused at the Castle Fee Leet Court of throwing several dead horses down into the ditch.[8]

Men were committed to the Bridewell for digging sand and as many as thirteen were accused of this in 1633 (Sachse 1967, 57, 109) but such measures were ineffectual. Kirkpatrick blamed undermining by sand-diggers for the collapse of the castle gate into the outer ditch and of the fall in his time of the remaining southern sections of the perimeter wall around the top of the motte (Kirkpatrick 1845, 240, 243).

The dumping of rubbish in the ditches continued in spite of preventative and punitive measures adopted by the Mayor's Courts. The owner of the southernmost property on the east side of White Lion Lane allowed so much rubbish to pile up outside his house in 1692 that he blocked the way to the Castle Bridge (the later York Alley).[9] Dumping may have been sanctioned in specific areas: in 1673 the city Chamberlain was accused of permitting 'a defective way between the hills and the pitt in the dikes'.[10] 'Colder' or builders' rubbish was welcomed by the Tonnage Committee when they needed infill for a cellar they had acquired under Rochester Lane (later Orford Street).[11]

The nearness of what was still a deep ditch north-west of the castle in the 17th century enabled those living in that part of Cockey Lane to run their drains or overflows from cess pits into it. One householder was fined for not repairing his and another for a nuisance caused by allowing his to run the other way into the common sewer (Rye 1905, 141). There was also a public drain that ran into the 'Castle Hills'.[12]

Markets
Apart from the need to improve communications between one part of the city and another, the incentive behind changes in the castle baileys was the expanding needs of the Saturday Cattle Market. In 1616 the Assembly rejected a plan for cattle-pens on Hog Hill and decided that from then on cattle should be sold only in the 'castle dykes'. Part of the hog-market was itself moved into the ditches in 1637 and at the beginning of the 18th century cattle and pigs were found in both Hog Hill and the south-western part of the bailey (Kirkpatrick 1845, 319: 1889, 20). The term 'cattle' may be understood to include sheep.

After the 1738 levelling, the area south of the Castle Bridge was available for the sale of 'Horses, Cows, Sheep, Swine, *etc*' (Kings' map of 1766; Plate 10.3.A). From 1793, when the hay-engine was removed from Hay Hill to the Ditches, hay was sold every day except Saturday (Browne 1814, 145). Horses were 'tied to the gable end of one of the buildings adjacent to the Hayhouse'.

Castle Meadow had long been used on Tombland Fair Days, that is on four days around Good Friday, Whitsun and Trinity, for the sale of bullocks sent from Scotland or the north of England for fattening on Norfolk pastures. These fairs attracted 'a vast concourse of people and wares a full trade' (Kirkpatrick 1845, 319; Morris 1949, 149).

The Gunhouse and the hay-weighing machine
In the 1809 prospect taken from the Castle (see Chapter 11.I, Plate 11.1) a substantial group of buildings can be seen high on the hill to the south of a line between the bridge and Orford Street. They have been convincingly identified with a water-colour by Sillett who lived nearby from 1821 to 1824 (Fiske 1984, 4). The longer, western range of the buildings was a 'tenement with coach house and stables' put up in 1735 by a butcher, Nicholas Lane, who lived in Rochester Row.[13] The previous year he had leased from the Corporation land facing south-east towards Garter Hill measuring 12yds by 8yds, and shortly afterwards another 8yds 'at the end of his new building ... facing the Golden Ball Lane'.[14] These must be the buildings to which Blomefield referred as 'stables lately built' on part of the Shirehouse ruins. They were on part of what had been Shirehouse Green, but the Shirehouse itself was further east, nearer Golden Ball Lane (Blomefield 1806, II, 126).

The shorter, eastern arm, of this block of buildings, at right angles with the first was the new city Gunhouse. In 1740 the carpenter Robert Rushbrook leased the old city Gunhouse and other buildings to the north of the Guildhall.[15] and the following year contracted to build a new one for £60 'next the eastern gable of Nicholas Lane's building adjoining the Castle Dikes'. It was to be 30ft by 17ft inside the walls and 12ft high, very substantially built and with a tiled roof.[16] The following year the city guns were carried 'to the new house on the Hill' to be fired thereafter on ceremonial occasions only.[17] Even this use came to an end in 1790 together with other retrenchments of Council expenditure.[18]

In 1793 it became necessary to move the Hay Market from the congested square south of St Peter Mancroft church due to the number of accidents there.[19] A committee recommended a spot 'in part upon and contiguous to the present guard-house' as a new site for the hay-weighing engine, involving the removal of eight feet of the thirty-two foot building.[20] This measurement, the lack of any map indication of other building here and Browne's statement concerning the guard-house 'formerly appropriated as a depôt for military stores ... here was kept the city ordinance' (Browne 1814, 114) — all these seem to indicate that this was the gun-house by another name.

Browne went on to say that the steelyard (in 1814) was at the north end of the guard-house and it can be identified as the tiny mark beside that building (both unlabelled) on a map of 1824.[21]

It is not known how much of the old gun-house was pulled down, if any, when the north end was reconstructed to become the hay-weigher's house and office. Charges for carpenter's and bricklayer's work on this amounted to £75 14s and an iron range was bought for 6s 6d.[22]

In 1795 the Corporation gave up a part of the gunhouse (the remaining part?) measuring sixteen by seventeen feet to provide further accommodation 'near the present Guard House for the use of the Officer on Guard'. This was to be for the duration of the war only and on condition that the Government built 'a lean-to at the end of the Gun House for the receipt of the city's Cannon and other further uses of the Corporation'.[23]

Other activities on the Castle Ditches

In 1581 Alderman Thomas Sotherton proposed building a windmill 'in the castle hills'. He would then either pay the city rent for the site or sell the building to them. Other Aldermen were commissioned 'to view a new plott of ground nere the Shirehous and to confer with Mr Sotherton for the price and with Mr Myller of the newmyles for the taking of the same ... if the Cittie shall buye it'. Nothing came of this, however, and Sotherton is next heard of proposing an alternative site in Gildencroft (NRO AB3, 305, 315d).

Streets and Lanes

by Elizabeth Shepherd Popescu and Margot Tillyard
(Plates 10.1 and 10.3)

Roads surrounding the Castle

1. Ber Street

References to Ber Street and is many variant spellings (including Bear and Burg) appear throughout the late 16th to 18th centuries (Sandred and Lindström 1989, 88).

2. Timberhill

From the early 16th century, former Oldswynemarket Hill gained its modern name of Timbermarket Hill or Timberhill, after the market located at the northern end of Ber Street (Sandred and Lindström 1989, 147).

3. White Lion Lane/Street

Although occasionally still referenced with its former name (Sporier Row), this road was renamed (White) Lyon/Lion Lane in the early 17th century. The *White Lion Inn* stood along its northern side (Sandred and Lindström 1989, 153). This hostelry was long known to the local soldiery as 'the *Blue Monkey*' and was one of the haunts of Norwich's infamous Hell Fire Club during the 18th century (Riddington Young 1975, 41).

4. Back of the Inns/Castle Street

Former Cockey Lane became known as 'back lane' by 1670, the name transformed to the Backside of the Inns by *c.*1720 and ultimately to Back of the Inns by 1766 (Sandred and Lindström 1989, 84–85). It took its name from the inns ranged between it and the market place.

5. London Lane (now London Street)

Although recently improved, at the time Woodward was writing (1820s), London Lane was very narrow and still had many houses with projecting floors. He described a house at the corner of White Lion Lane and Back of the Inns bearing the date of 1623 on the panelling of an upper room. There were three passages through to the ditches. East of the one opposite the top of St Andrew's steps 'in the front of a cooper's shop was a large [?late 15th-century] arch'. This is almost certainly the one revealed in 1855 during widening of the narrowest part of the lane (*Norwich Mercury* 1855). This 'wide stone arch with simple mouldings' was found inside a house 'lately used by Mr Fountain, painter, standing in the nook against the shop of Mr Wright, shoemaker'. According to the reporter it stood a few yards higher up the street from the only passage then still 'permanently open' (Harrod 1857, 39, 41). This was almost certainly the public way opposite St Andrew's steps, not long afterwards widened to form Opie Street. Moreover, Hochstetter's map of 1789 shows just to the east at a very narrow place a building projecting into the street which could have formed the 'nook'. Woodward lists other passages into the ditches closed in his lifetime (for a full list see Chapter 11.1) which, like the road-widening schemes of the period, were mainly in the Castle Meadow area.

6. Blue Boar Lane/Bank Plain

The name Blue Boar Lane originated in the 18th century, from the sign of a public house (Sandred and Lindström 1989, 85).

7. King Street

Former references to this street as Conesford (originating in the 12th century) appear to have ceased in the 18th century (Sandred and Lindström 1989, 114). It appears as Conesford Street on both Cleer's 1696 map and King's map of 1766, but as King Street on Hochstetter's 1789 map.

8. Beaumont's Hill/Common Pump Street (Cattle Market Street)

Cattle Market Street ran from Rose Lane to Golden Ball Street along the east side of the Old Cattle Market. Kirkpatrick gave the name Common Pump Street to the entire stretch of road from Ber Street (Timberhill) to Rose Lane. The pump, according to him, stood where Golden Ball Street now joins Cattle Market Street. Beecheno, however, placed it where Rose Avenue joins the latter. King and most map-makers assign the name Common Pump Street only to the northern half of what is now Cattle Market Street. The name of the southern half is variously given as Beaumont's Hill or Buff Coat

Lane. 'Father' Beaumont was an inn-keeper in 1564 and Thomas Bearmonde was an alderman in 1571. The *Buff Coat* was an inn on the east side of modern Cattle Market Street, not far from the entrance to modern Rouen Road (see Chapter 11.I).

9. Lane/Alley (now Golden Ball Street)
This was described in 1631 as the lane 'running from the Sherehouse'.[24] In 1632 the 'Chamberlyn's Counsell and the Aldermen of the ward of Berstrete' were requested to view the 'way near the County Gayle, And to Certify their opinion conserning the same' (Sachse 1967, 13). At this date the gaol for the better prisoners occupied the house at the north-west corner of the lane. Though probably repaired after the inspection, Kirkpatrick called it an alley and it remained very narrow until about 1810 when it was 'opened and made a good street' (Browne 1814, 143).

10. Stepping Lane
The former Toftes or Cockeral Lane was first noted as Stepping Lane in the early 18th century. The name probably derives from a personal name (Sandred and Lindström 1989, 143).

Roads, lanes and paths within the baileys
Kirkpatrick shows the roads as they existed in 1738 (1889 frontispiece; his version of Cleer's 1696 map (Plate 10.1); see also Thomas Kirpatrick's plan of 1723, Frostick 2002, fig. 23). Paths are shown between rubbish piles up to the castle bridge from west and east and apparently along the line of the bottom of the barbican ditch and along the top of its bank. A major programme of levelling was undertaken in 1738 when much of the central part of this bank was pushed into the ditch, greatly increasing the usable area and making possible new roads. Some work undertaken in Castle Meadow may have been the elimination of a feature marked in Kirkpatrick's 1716 map, possibly the remains of a bank or ditch east of the mound ditch.

Subsidence was a problem. In 1738 deficiencies 'in the new work towards Castlehill Bridge' had to be made good and the following year labourers were employed to level 'the Breaches in the new made ground near Castle Hill and in Castle Meadow and the walk from the said hill to the Griffin gate'.[25] While Blomefield (1806, II, 122–126) is uninformative, the editor of the *Norwich Gazette* wrote 'A large outer Ditch opposite to the Bridge foot leading onto Castle Hill was filled up by Cutting down a Ridge of Hill Ranging along by the side of said Ditch and the whole Space of ground between the Golden Ball Lane and the Bridge was Completely levelled which made a fine Spot of ground'.[26]

The new late 18th-century roads detailed below can be seen on the Town Clerk's map of 1824.[27]

1. Carriageway (later Bell Avenue)
In 1792 'a fair carriageway' (later Bell Avenue) was constructed right across the ditches between the widened approaches of Rochester Lane (after this called Orford Street) and the Griffin passage (Woodward 1847, 41).

2. New Road (later Market Avenue)
Another new road was inserted across the infilled barbican ditch (after 1738) running from the Golden Ball to the Duke (later Market Avenue).

3. Shirehouse Gap/Pig Lane (lost)
The Shirehouse Gap (or Pig Lane) continued to be referenced until lost in the alterations to the Cattle Market made in the 1860s.

4. 'Hollow Road'
Kirkpatrick's map shows a road around the southern edge of the south bailey from Castledych Alley to the Shirehouse Gap. Kirkpatrick called the part of this towards Golden Ball Lane 'the hollow road' (1845, 311).

5. Rochester Lane/Orford Street
Rochester Lane may have been the 'way leading from the Castle Ditches' which was amended in 1632 (Sachse 1967, 13). Kirkpatrick describes it as 'ascending and descending' into the Ditches (1889, 19). There are frequent 18th-century references to 'lock-posts' at the end of it to prevent cattle straying from the market.[28] In 1737 it was paved 'so as to be comodious for the passage of carts'[29] and twenty years later a cellar under the lane was bought by the Corporation and filled in.[30] Rochester Lane was widened in 1792 as the western approach to a new road across the Ditches and Castle Meadow, to permit which the *Bell Inn* stable had to be relocated.[31] The street was renamed 'Orford Street' after Lord Orford the most generous subscriber to the cost.[32]

6. Angel Street (now Arcade Street)
The eastern part of the steep little lane leading from what is now the Royal Arcade (former Bear Yard) towards the castle is now Arcade Street. It probably originated as a cut through from the market place into the castle ditches, appearing as such on Hochstetter's map. The *Angel Inn* (later the *Royal Hotel*, which subsequently moved to Bank Plain), from which the street took its name, was one of the oldest inns in the city, originating in the 15th century (Thompson 1947, 55).

7. Castledyk Alley/York Alley
This passage from White Lion Street was so narrow as to be liable to blockage by household rubbish.[33] It has never been widened.[34]

8. Castle Inn Yard
Castle Inn Yard may have been the new right of way complained of in 1673 'where never was any, by which ancient ways are disused to the prejudice of the Lyon Lane'.[35] It was closed up between 1812 and 1820.

9. King's Head Yard
The King's Head Yard became the new street of Davey Place in 1812. Its east end was cut into the bank of the Castle Ditch necessitating a flight of steps to connect with the road above.

10. Path/lane (later Castle Meadow)
In the early 17th century the way here was still only a path along the top of the outer bank of the mound ditch (what is now Castle Meadow). It became narrower, even perilous due to encroachments from neighbouring properties, until one part was only passable on a plank. In 1651 the Assembly considered making a cartway, but did nothing (Kirkpatrick 1845, 318) and a resident was fined £1 in 1681 for 'suffering A very dangerous place by his garden in the Castell Dikes'.[36] However, from about 1700

when more houses were built on the west side, enough of the ditch was filled in to make a road in front of them.

11. Opie Street
The present name of this street commemorates Amelia Opie, the novelist (1769–1853), who lived near the castle (Sandred and Lindström 1989, 122).

12. King's Arms Lane
King's Arms Tavern was at the north-west corner of this lane which Kirkpatrick thought had also been known as Berningham's Stile. He seems to have been followed by King (map 1760) but this appears to be an error (Kirkpatrick 1889, 46, n6).

13. Griffin Passage and Other Paths in the Castle Meadow
Griffin Passage may not have existed before 1704 (Harrod 1857, 141). That year the Corporation leased land in the Castle Meadow behind the *Griffin* public house, 'reserving a right of way from the Castle Fee to the street for Coaches ... Carts or Carriages through a Gateway there to be made', with a footpath 3ft wide.[37] It is shown on Kirkpatrick's map of 1716. Two paths shown in Kirkpatrick's 1738 map led from the *Griffin* gateway, again opened in 1704, one along the north side of the Meadow and the other across it, curving slightly towards the south, to the south west corner. In 1760 posts obstructing Griffin Passage were ordered to be removed and in 1792, in connection with major improvement of the roads across the ditches, the passage was widened to 22ft with a 6ft footway to the north, guarded by posts and chains. A dwelling house, a blacksmith's shop and a block of stables were demolished.[38]

The Great Cockey
The Great Cockey had been completely culverted by the 18th century, outflowing into the River Wensum near St George's bridge. Harrod noted that the culverted stream ran 'in some places thirteen feet beneath the pavement of the street' (Harrod 1857, 131). As was noted in Chapter 3, Cockey Lane (now lost) appears to have followed the upper course of the stream: the same name was applied to part of London Street in the late 17th and 18th centuries (Sandred and Lindström 1989, 98, 116).

Tenement Development
by Margot Tillyard and Elizabeth Shepherd Popescu
(Fig.8.1; Plates 10.1–10.3)

Development on the edges of the baileys (including Castle Fee rents)
In 1601 the city Assembly, worried by debt, were considering the legality of further leases.[39] Leasing, however, continued and in 1721 the city Committee, which was in charge of all the city's estates, was advertising land to let.[40] Throughout this period leases were granted for new buildings all round the edges of the old Castle Fee. The City Committee also raised money by selling the old Castle Fee rents. Ten people redeemed theirs in 1749 at twenty-five years' purchase.[41] These included Nicholas Lane for his property in Rochester Row (Properties 52–53). He also owned the stables north of the Gun House, the renewal of the lease for which cost his heir £10 in 1788.[42] It is perhaps surprising that there was only ever one small group of properties actually in the southern bailey, the stables/Gunhouse block (see above) south of the Bridge and even that lasted less than a hundred years.

As well as the redemption of leases, another official economy was to encourage a householder to take over something he would not normally be responsible for. In 1781 the city Committee allowed Jehosophat Postle to level the Castle Meadow opposite his house at his own expense.[43] This may have been the large house at the north-east corner which belonged to successive lawyers from the late 18th century onwards. When the road was widened between there and the *Griffin* public house in 1792, the owner, Morphew, received a piece of the Meadow measuring 50 x 30ft in compensation for what was taken for the scheme (he was to enclose it with a 9ft wall, which was not to be over-topped by anything he built behind).[44]

Cleer's map of 1696 (Plate 10.1) shows undeveloped land west of the Castle (broadly, Property 5, Fig.8.1). In this area four contiguous strips were leased in 1701, all just under 20ft wide and totalling nearly 160ft in length (see Part IV).[45] The building put up on the most northerly of these was over an existing drain running from the house to the west presumably into the Castle ditch there. The owner complained to the Assembly, which ordered work to cease until his case had been heard.[46]

While in the early 18th century the trend was for the setting out of the ground floors of jettied houses, towards the end of the century permission was sought for bow windows with their protecting posts and for the enlargement of cellars under roads. As in many other towns and cities, property numbers were not commonly used in Norwich until the late 18th century (Priestley and Fenner 1985, 4) and this and the following chapter refer to the Castle Fee and city letter and numbering system adopted in previous chapters, cross-referenced to the late 18th century and modern property numbers where appropriate.

The Castle Meadow and London Lane
Land was granted for the planting of trees on the east and south sides of Castle Meadow. A guinea was paid by one householder for leave to extend 'his necessary House farther into the Castle Ditches twelve inches for a length of nine feet' in 1760[47] and 10s by another 'to set out the Steps of the House lately Erected next to the Castle Ditches into the Highway there three feet'.[48]

Many encroachments were sanctioned by later leases, but not all. A long list of people were reprimanded in 1744 for 'setting out Shop windows, posts and cellar Stairs too far into the Street in London Lane ... to the great annoyance and danger of Passengers when Coaches and Carriages are drawn through the narrow street'.[49] Nevertheless worsening conditions led to a request in 1826 for more land to be made available on the Ditches so that deliveries to premises on London Lane could take place there instead.[50]

As late as 1810 some gaps remained on the north side of the Castle Ditches. In that year licence was given for a new house to be built on a line between the south-west corner of one and the south-east corner of another there.[51]

On the northern side of the lane leading into the Castle Meadow was a house (later The Duke; Property

37) at the south-west corner of the Castle Meadow, the owner of which agreed in 1738 to pay 1s per annum for 'continuing his MuckBing (*sic*) in the Castle Ditches'.[52] Next to this house was the *Jew's/Jesus' Inn*, by 1682 the *Holy Lamb* (Property 36). This later became a forge and veterinary establishment. In 1790 the farrier built a stable on this property 50ft long, one wall of which was on newly leased land at the edge of Castle Meadow. Thirty years later this strip was sold to him.[53]

Block I: St Michael at Thorn (formerly St Martin-in-Balliva)

All of the properties on former Castle Fee land that developed within this block were eventually swept away by landscaping associated with the Cattle Market in 1862, detailed in the following chapter. Running between the two sets of properties was the Shirehouse Gap (Sherrod's Gap/Pig Lane).

Property 38
In 1607 and 1626 the rent for this property was paid by Mr Proctor. The public house which became the *Holkham Arms* was on this property, facing west into the ditches. It was unnamed in 1761 when it was mortgaged by Mrs Judith le Grys (she had bought off the Castle Fee rent in 1749). It was a messuage, with a house, edifices, yards, gardens, cellars and sollers, and had at least six occupants or sub-tenants. The mortgagee was Richard Browne, who died in 1768 (NRO 22b.13).

Property 39
Seventeenth-century rent-payers for this property were William Rochester, Henry Balles (1607) and Mr Debney, alderman (1626). Public houses which developed on the property in the 19th century are detailed in Chapter 11.I.

Property 40
No 17th- or 18th-century rent payers for this property have been traced. Its later history is detailed in the following chapter and Part IV.

Property 41
The rent for this property was paid by George Burwell in 1584 and 1607 and finally Thomas Burrell (or Burwell) in 1626.

Property 42
After the late 16th century, the only reliable record so far established for this property is found in the Castle Fee rent lists. The widow Clerk paid it in 1584, Edmund Kytson, late Henry Balles in 1607 and Edmund Pyringe in 1626. It eventually became the *White Horse* public house.

Property 43
The freehold of the houses built along the southern frontage were left to the Churchwardens of St John's Madder-market in 1712 to provide for the preaching of sermons. The south-west corner was occupied by the *Boarded House Inn*, at least as early as 1836 (N/EN/20/184), but probably earlier. Due to the complexity of the record, the documentary information is set out as a chronological list, mainly without abuttals, though all the properties faced either the ditches or the street on the east and sometimes both.

Properties 44–46
Thomas Worsley who owned the whole of the Golden Ball block died in 1625. In his will he left annuities to his children and a grandson and to his son John he bequeathed the house in which he lived 'with all the yardes, gardens and Orchardes, together with the houses or tenements thereto belonging'. These gifts would have brought nothing to the recipients for some time, as he stipulated that all the profits deriving from the 'Seller' and the 'Lodginges' for three years were to be used for settling his debts and honouring his other legacies. This confirms the existence of both public house and private prison at this date (see 'Minor Prisons' above; Property 46 also housed the *Golden Ball Inn*). The Inventory of his estate lists twenty rooms, the contents of which were valued at £551. There were at least two rooms in which meals could be taken, a hall and an 'ordinary' in which no doubt guests were served. There were two kitchens, a buttery and a parlour, and eleven chambers most of which were bedrooms, though the names of the 'Drienge' Chamber, the 'Shewehouse' Chamber and the 'Candle' suggest other use.

The timber-framed Tudor buildings along the eastern side of Golden Ball Street, swept away in the mid 20th century, included No.9 (the old *Woolpack Inn*) and No.7 which may originally have formed part of the same property.

Block II: St John de Berstrete (Timberhill) and St Michael at Thorn (formerly St Martin-in-Balliva)

Property 48
This property housed one of the minor prisons, owned by Henry Fulcis in 1631 (see above). It had become the *Plough Inn* (now *Le Rouen*) before 1742, the date of its deeds (see Chapter 11.I). Although the *Plough* was a popular name for hostelries with an agricultural connection, it was also the main heraldic device of the Crawshay family of local brewers (Riddington Young 1975, 34). The inn was recently renamed *Le Rouen* in honour of Norwich's twinning with the city (Riddington Young 1975, 94).

Properties 49–51
In 1568 when Property 50–51 was acquired by the owner of the *Castle Hotel*, this was a garden, part 'Segors' and included a stone wall and was surrounded on all sides by gardens except the north, along which ran the 'road next to the Sherehous'.

Properties (a–h)
In 1569 William Rochester a cordwaner bought the 'tenement once called *Segorys Inne*' (Property b), named after a late 14th-century owner (see Chapter 8.I). The garden and the tenement to the north (Property a) were by then held by the parishioners of St John Berstrete (Timberhill). Blomefield states that they were left this 'part of a tenement called

Date	*Owner*	*Castle Fee rent*	*Source*
1607	Thomas Clere, late Robert Hall, late Wyseman, Mr Thornton, late Goodwyn	3d	
1621	Thomas Clere to John Loveland, messuage		Roll 3m48
1626	John Loveland and Mr Thornton	3d	
1629 xs	John Loveland, gentleman, hosier to Christopher Styll brasier messuage and adjacent garden (south abuttal orchard of Thornton) once Thomas Clere, Scholemaster, for £25		Roll 37m20
1683 xs	John Thurston, worstedweaver to William Baldwyn messuage with houses, edifyings, buildings and yards, late Ann Hill, widow (southern abuttal orchard of Thomas Mottley); near the Castle Ditches for £30		Roll 43m50
1685	John Thurston to William Baldwyn, the remainder of the thousand year lease on the above property		Roll 43m69
1712 s	Francis Gilliam, worstedweaver left all his houses called Sherrod's Gap to churchwardens of St John Maddermarket for sermons		Blomefield 1806, 696

x – abuts on Castle Dykes to west; o – abuts on road to east; s – abuts on Shirehousegappe to south

Table 10.2 Ownership of Property 43, St Martin at Bale (in-Balliva), *c.*1600–1712

Segores Inn, with a Yard and Outhouses ... with Liberty of a Well' and subject to 1½d landgable in 1586. The hostelries that developed along Timberhill (within Properties (a–f)) became notorious haunts of the city's prostitutes. The extant public house on one property, possibly on the same site as former *Segor's Inn*, is double-named — the *Gardener's Arms*/the *Murderer's* (part of former Property b), now in extended form at Nos 4–8 Timberhill). It takes its sinister name from an alleged mid 18th-century argument between a prostitute and client, resulting in the fatal stabbing of the woman (Riddington Young 1975, 16).

In 1570 Property (f) was a messuage with houses, buildings, garden and orchard which was sold for £53 6s 8d (Roll 26 m9). The extant building at No.16 Golden Ball Street (part of Property g) was built *c*.1600 (see Chapter 1 and 11.I).[54]

Blocks II–VIII: St John, Timberhill, St Peter Mancroft, St Andrew, St Michael at Plea, St Cuthbert and St Peter Parmentergate

The development of properties within these blocks (Fig.8.1) from the late 16th century until 1626 is fully detailed in Part IV, with a few additional details given below.

Properties 52–53: the *Blew Bell* (later the *Bell Inn*)

This property in Block II was first recorded under the name of the *Blew Bell* in 1629 when it was extended. That year the Corporation leased to the owners a small piece of land on the south-west side of the road next to the Castle Ditches on which a wall had recently been built.[55] This wall may have been part of the stable which was to be removed in 1791 for the widening of Rochester Lane. Land measuring 50ft by 27ft, later enlarged to 56½ by 43ft, at the back of the inn was leased to the owner instead.[56] The relocated stable is to be seen on the 1809 Panorama, a low structure forward of the building line with two small windows (Plate 11.1). An interesting glimpse of the *Blew Bell*, in the form of the inventory of its landlord Thomas Sparkhall, is to be had in the early 17th century and is fully detailed in Part IV.

Property 1, St Peter Mancroft (later *York Tavern*)

In 1638 Francis Gardner who lived in this messuage was granted land on the east side of the house, part of the Castle Fee, 84ft by 19ft, as long as he ensured that the passage to the south would not as a result be further narrowed.[57] In 1699 he obtained permission to pull down and rebuild his frontage on White Lion Lane and enlarge his cellar into the street there. It had been established that neighbouring owners had no objection to this — rather, they believed from the plan shown them that the new building 'would be an Ornament to the said Lane'.[58] Two years later the city Chamberlain paid him £7 8s 2d, being the city's share of the charge for 'paveing, Carpenter and other work done at the Castle Ditches', which was probably connected with the rebuilding.[59] Further details are given in Part IV.

Property 2, St Peter Mancroft (later the *Castle Inn*)

When this property became the *Castle Inn* (formerly the *Signe of the Castle*) is not known. Its landlord (Thomas Sparkhall) may also have been the landlord of the *Blew Bell Inn* (see above).

Parishes, Churches and Cemeteries

With the demolition of St Martin at Bale (-in-Balliva) in 1562, the parish became part of St Michael at Thorn (see Chapter 8.I). The parish of St Cuthbert was united at the end of the 15th century to St Mary the Less, finally becoming part of St George Tombland in 1542 (see Part IV, Chapter 2).

Sixteenth-century details relating to the church of St John, Timberhill are given in Chapter 8.I. The church continued to be known as St John of Timberhill and St John's on the Hill during the 16th and 17th centuries (Sandred and Lindström 1989, 42). An anchorage on the north side of the church tower was rebuilt as a house in 1641, although it was subsequently pulled down as it 'made the churchyard publick, which now hath no common passage through it' (Blomefield 1806, II, 128). Numerous gravestones and tombs of the period within the church are noted by Blomefield, along with priests and curates (1806, II, 127–128). Inside the church is an 18th-century wrought iron sword-rest (Pevsner 1988, 244). The register demonstrates the local burial rate, which according to Blomefield can be linked to outbreaks of plague: 64 people were buried in the cemetery here in 1559, 55 in 1585 and 72 in 1665 (Blomefield 1806, II, 129). The tower fell in 1784 and the five bells were sold to offset the cost of damage to the western part of the church (Messent 1932, 161).

II. ARCHAEOLOGICAL SEQUENCE

Period 6.1: Post-Medieval (late 16th century to c.1650)

Summary

(Fig.10.1)

During this period, tenements continued to develop along the eastern side of the barbican ditch and concerted refuse dumping into parts of the ditch began. Rubbish was also tipped into the motte ditch and the upper part of the well within the barbican. A total of 112 pits attributable to this sub-period was recorded at Castle Mall, along with a single example at Golden Ball Street. Pitting in the eastern part of the barbican may relate to the encroachment of tenement-related activity across the ditch. Tenements continued to encroach into the former south bailey and on its fringes, with the development of associated boundary walls, wells, pitting and other features including a malting kiln.

The Decline of the Castle Defences

The Motte Ditch

by Elizabeth Shepherd Popescu and Andy Shelley

(Fig.10.2)

Ditch 11, Phase 4

Fills of the motte ditch were examined during watching briefs. One observation was made along the southern edge of the ditch, near to present day Castle Meadow (T100/14), the area of fill sectioned (S.188) lying immediately to the south of the existing Castle Gardens. Here the ditch had been backfilled with a mixture of building material and household waste. Sealing earlier, medieval fills (T100/15, Period 4.2) was a series of mixed fills, including a layer of midden-like organic material containing charcoal and shellfish (*12189, 12188, 12187 and 12186*).

Pottery

The pottery included Frechen stoneware and Surrey White ware, indicating a late 16th- to early 17th-century date.

Figure 10.1 Period 6.1: Phase plan (late 16th to mid 17th century). Scale 1:1250

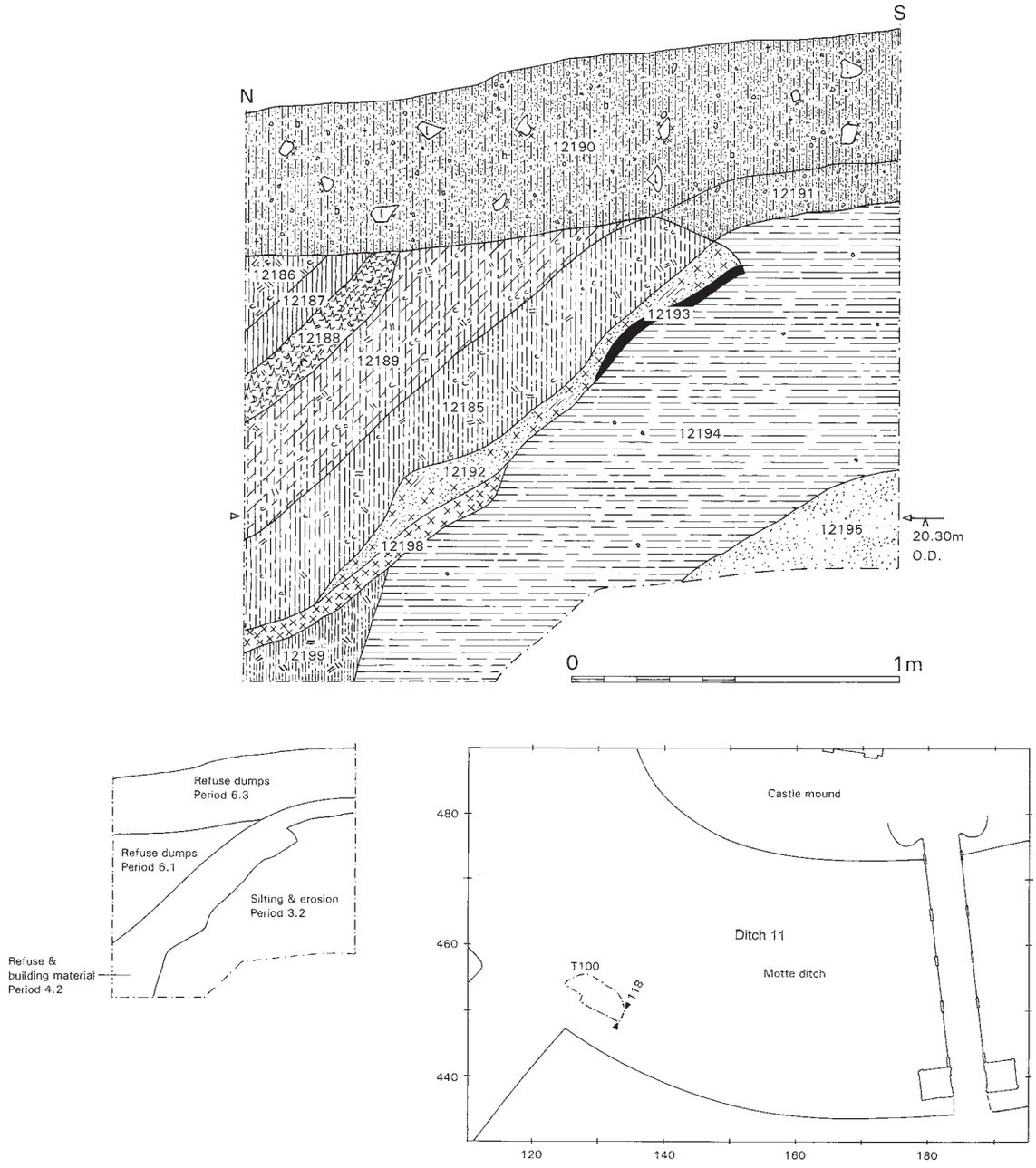


Figure 10.2 North-west facing section across infilling of Ditch 11 (motte ditch) (T100). Scale 1:20

The Barbican
by Elizabeth Shepherd Popescu, Andy Shelley and Niall Donald

Open Area 21: demolition of the upper part of the barbican well
(Fig.8.6)
It appears that, during the late 16th or early 17th century, the level of the surviving well superstructure was reduced, presumably removing any remnant above ground structure to contemporary ground level. The resultant rubble was mixed with refuse and then tipped into and around the upper part of the well shaft, above fills of probable 16th-century date (*e.g. 50120*, Period 5.2, Chapter 9.II). Two spits of fill were recorded at the top of the well shaft, before its immense depth was appreciated (G5/24 part), lying between *c.*26.00 and 26.50m OD. The lower fill (*50202*) consisted of mortar and silt with abundant flints, while the uppermost (*50201*) was of dark brown sand, clay and silt with common flint and mortar.

Similar deposits of building waste surrounded the well, again presumably derived from the demolition of its upper part (G5/52, S.314). A series of six deposits overlay earlier demolition rubble and infilled the top of a robber cut (described in Period 5.1, G5/51). The earliest (*50083*) consisted of mottled grey brown sand, clay silt with abundant mortar fragments. Above this was a similar deposit (*50082*) containing limestone fragments and occasional flint nodules and mortar lumps. This was sealed by a layer of white mortar and flint rubble (*50153*),

Figure 10.3 Plan of Ditch 13 (barbican), including observations at Site 150N. Scale 1:1250

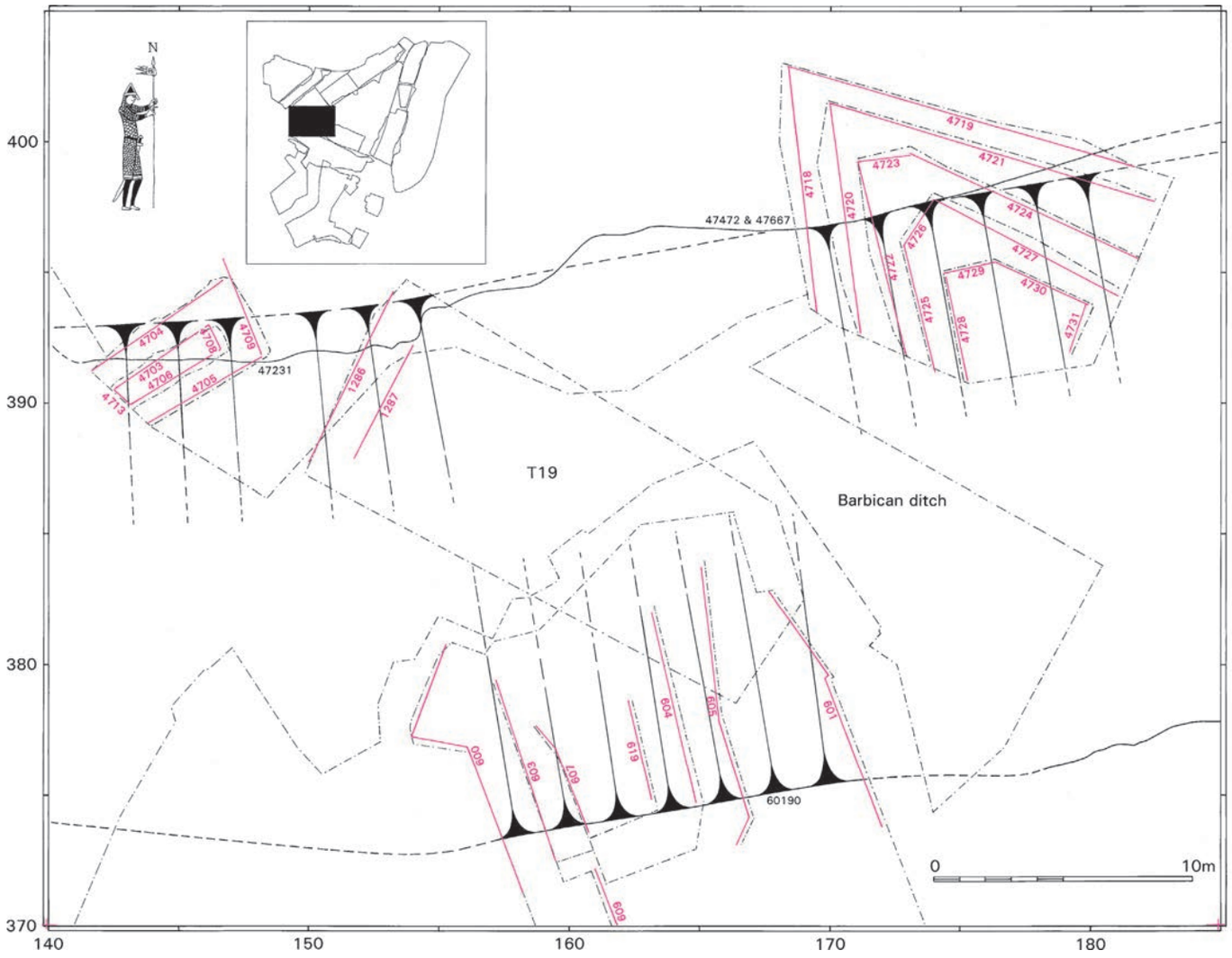


Figure 10.4 Plan of machine trenches through Ditch 13 (barbican) (Areas 6, 47 & T19). Scale 1:250

lying against the external face of the well at the level at which the top of the well shaft survived (26.37m OD). Above this rubble, was a layer (*50077*) of dark brown sand, clay, silt with occasional brick flecks, chalk and white mortar fragments and frequent oyster shell. This refuse dump, which contained evidence for the disposal of waste from knife handle manufacture (see below), overlay both the deposits around the well and the top of the well itself. Above it was a lens of limestone rubble (*50152*) lying at 26.60m OD, followed by another refuse deposit (*50081*).

The presence of the well caused subsidence right into the modern period, evidence for which is detailed in Chapter 11.

Small Finds

Finds from well fill *50202* included brick, slag, two copper alloy type 1 lace-tags (SF6754), a copper alloy dress pin (SF6754.1), window glass x 6 (SF5742), two nail shanks (SF5741) and an iron nail and shank (SF6794). Layer *50083* contained two antler strips/knife scales (SF5683), antler knife handle or scraper (SF5656, Fig.10.54), unfinished antler knife scale (SF5683), copper alloy lace-tag (SF5720), copper alloy sheet (SF5720.01, iron sheet (SF5670), iron knife with a wooden handle (SF5658), iron dagger hilt grip of 15th-century type (SF5712.02; see Chapter 8.III, Fig.8.60), nail (SF5712), iron knife blade (SF5712.01) and a flake from a reworked lava quernstone (SF5802). Layer *50082* contained window glass (SF5619). The decorated dagger grip (SF5712.02) has a glassy vitrifed deposit on the surface suggesting it had been in close proximity to high temperature processes in a forge *etc*; it is therefore likely to be residual from the earlier barbican well deposits (see Chapter 9.III).

Numerous finds (x 29) were recovered from layer *50077* and are tabulated in Table 10.3 on CD. Of most significance was a group of worked antler and antler/bone knife handles which may indicate the disposal of waste from the manufacture of handles (see Huddle, Chapter 10.III). The group includes 19 pieces of sawn/worked antler (*e.g.* SF1035, Fig.10.64) and a number of knife handles (*e.g.* SF5649, Fig.10.54 and SF1036, Fig.10.53), as well as an antler artefact of unknown function (SF7223, Fig.10.75).

Pottery

by Irena Lentowicz

(Fig.10.32 on CD)

A total of 2.235kg of pottery was recovered. The pottery recovered from the late well fills (0.213kg) is almost entirely residual, although as the date for the main portion of backfilling has been established as ending in the early 16th century (see Chapter 9.III), the LMT body sherds present may be contemporary and could date to the 16th century. See Appendix 6.

The assemblage from deposits in the area around the well is illustrated in Fig. 10.32 on CD (G5/52; 2.022kg). Contemporary pottery includes GTGW, LMT, GRE, EPM and West Norfolk Bichrome ware (see Appendix 6). Table wares such as drinking and pouring vessels were represented by Rhenish imports from Cologne-Frechen and

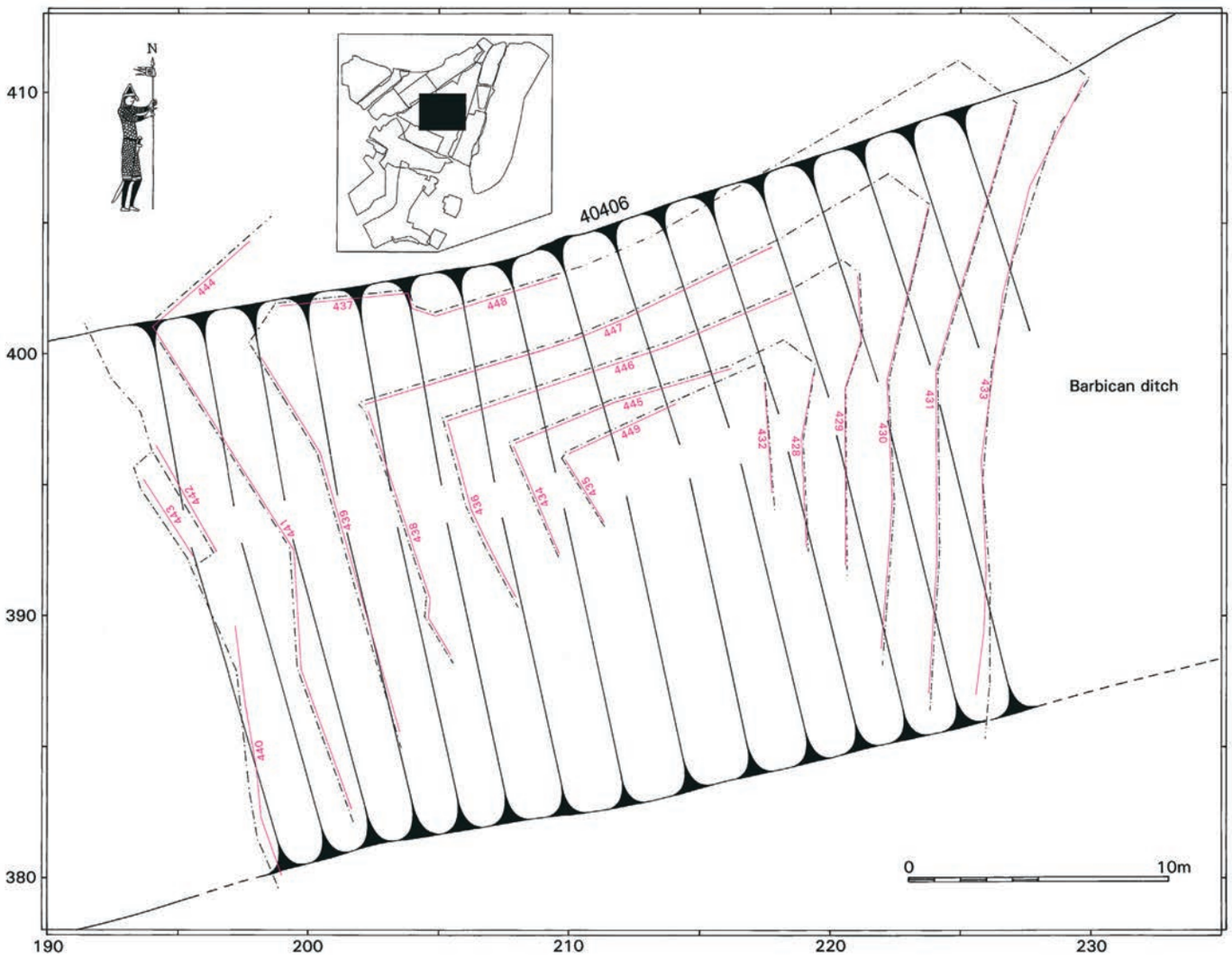


Figure 10.5 Plan of machine trenches through Ditch 13 (barbican) (Area 4). Scale 1:250

Frechen *bartmann* bases, along with a TGE plate fragment (Fig.10.32, no.4). The presence of West Norfolk Bichrome dates this group to the late 16th to early 17th century, supported by the absence of IGBW.

Open Area 21: ?quarrying

Just to the west of the barbican well, a series of intercutting pits probably related to quarrying activity (*50150*, G5/53). They were not investigated in detail, the eastern edge having been defined by hand over a length of 6.5m, with fills subsequently being machined out. Several fills contained clay pipe. The pits cut into layers related to the construction of the well and were overlain by a cobbled surface relating to the Cattle Market.

Small Finds

The pit fills contained four small fragments of 12th-century dressed Caen stone (SF7457) and an iron nail (SF5609).

Pottery

Just over 100g of pottery was recovered, a proportion of which was residual or probably residual. Contemporary pottery was represented by a single sherd from an abraded GRE base and a body sherd from a Fulmodeston IGBW jug.

Open Area 29: pitting

In the eastern part of the former barbican, a series of pits and other features ran in a line from north-east to south-west (not illustrated separately). Their alignment may indicate that they were placed in relation to the surviving barbican rampart which they would have lain at the rear of. Tenement encroachment along the eastern side of the barbican ditch was clearly taking place during the 16th and 17th centuries, the ditch line still forming a boundary along with the remains of the rampart. These pits would therefore have been somewhat isolated from surrounding tenements. The presence of human bone from 11 out of the 26 pit fills indicates the disturbance of a Middle Saxon burial ground which they directly overlay (see Cemetery 2, Part I, Chapter 4, Period 1.1).

To the north-east were four post-holes (G45/11, *45182, 45168, 45225 and 45212*) a maximum of 0.61m deep, cut into by two pits (G45/15). A series of fourteen pits followed, many of which were intercutting (G45/5). Isolated from the rest some *c.*1.50m to the east was a sub-square pit (*45041*), containing a mix of sand, gravel and cobbles. Many of the main cluster of pits contained charcoal-rich and/or ashy fills, some with coal inclusions.

Three contained copper alloy slag or flecks of copper alloy (*45218, 45134 and 45100*). Many cut into earlier pits and were of varying character, size and shape (*45122, 45218, 45186, 45206, 45200=46191, 45230, 45134, 45100, 45088, 45242, 45099 and 45150,* G45/4). They had an average depth of 0.60m and ranged in size from small (perhaps post-pits) to large (*e.g. 45134*). One possible post-pit (*45200=46191*) contained a large number of flints in its lower fill, perhaps placed to support a timber. More pits lay to the west, three of which (*46131 46133 and 46146,* G46/5) were intercutting. To the north-east was an isolated pit or post-hole (T9/31, *12036*).

Small and Bulk Finds

Post-hole *45225* contained a copper alloy Nuremberg jetton dated 1562–1635 (SF6499). Pit *45041* contained a limestone fragment (SF6526); a piece of post-medieval base or cornice ogee moulding fashioned from smooth limestone. Pit *45097* contained a variety of finds including brick/tile, human bone, plaster/mortar, window glass (SF7477), vessel glass (SF6518), nails (SF6519), an unofficial lead disk/weight (SF6503) and a copper alloy coin/token (SF6504). Pit *45122* contained human bone and a piece of lead came (SF6521). Pit *45099* contained a nail (SF6535).

Pit *45218* contained tile, lead sheet (SF6601), many fragments of thin copper alloy sheet (SF6509) and window glass (SF6549).Pit *45230* contained human bone, as well as slag, glass goblet bowls (SF6554) and nails (SF6525). Pit *45100* contained human bone, window and vessel glass (SF6552 and 6639, cat.no.32, Fig.10.47), the latter a wine glass stem of late 16th- to early 17th-century date) and a copper alloy jetton dating to 1586–1635 (SF1106). Pit *45242* contained a residual copper alloy purse frame dating to the first half of the 16th century (SF1107; see Chapter 8.III, Fig.8.38).

Pottery

by Irena Lentowicz

(Fig.10.33)

A total of 2.753kg of pottery was recovered. The ceramic assemblages recovered from some pits were particularly good (G45/5; 2.681kg). The easternmost pit *45097* (1.574kg) contained residual earlier material as well as late medieval/transitional fabrics which may also be residual at this stage, but were probably contemporary. The LMT was represented by a pipkin base and handle (Fig.10.33, no.1), and by the bases of three jars; these were noted as quite crudely manufactured. What is unusual is that this pit contained no GRE, although other post-medieval wares were present. This included a small IGBW body sherd, a Surrey White ware colander base (Fig.10.33, no.2), a Frechen stoneware jug rim (Fig.10.33, no.3) and the rim and neck from a Martincamp flask (Fig.10.33, no.4). These vessels dated the pit group to the early–mid 17th century. However, what is most interesting about this pit group is that cross-context joins were noted between this pit and pit *45122* (0.113kg), which pit *45097* clipped to the north. This pit also contained a small quantity of residual EMW, as well as an LMT base and body sherds from a Frechen stoneware vessel and Martincamp flask. Again, no GRE was recovered from this pit, which also appears to date to the early to mid 17th century.

Two other pits also contained residual pottery. One pit (*45230*, 0.174kg) also contained an LMT body sherd, as well as post-medieval wares. GRE was represented by rims from a shallow bowl (Fig.10.33, no.7) and a dripping pan (Fig.10.33, no.8); the only other vessel represented by a rim was a TGE dish rim (Fig.10.33, no.9). The other fabrics, Surrey White ware and an unspecified stoneware, were represented by body sherds only. The other pit (*45088*) contained only 0.035kg of pottery, as residual LMU body sherd and a contemporary Frechen stoneware *bartmann* jug sherd. Both of these pits are dated early to mid 17th-century.

Three other pits contained late medieval/transitional wares as well as post-medieval pottery. Pit *45100* (0.305kg) which contained an LMT jar base, as well as contemporary wares. Of three GRE pipkin rims two of which were noted as small (Fig.10.33, nos 13 and 14); a flatware base was also recorded. TGE was represented by a rim from a plate or charger. The only other pottery recorded was a Cologne-Frechen stoneware body sherd. Although less pottery was recovered from pit *45186* (66g) it is of similar nature, including an LMT bowl rim (Fig.10.33, no.6) and a GRE body sherd. These pits are dated to the late 16th or early 17th century. The assemblage from refuse pit *45134* (0.250kg) was of different character. The late medieval/transitional pottery present was a small Tudor Green-type ware handled bowl (Fig.10.33, no.10), which may have been residual or long-lived as this is a fine vessel. The contemporary material was represented by a rim and body sherds from a GRE jar (Fig.10.33, no.11) , a Surrey White ware jar with a folded rim (Fig.10.33, no. 12) and a small Metropolitan hollow ware mug base. This latter vessel dated this pit to the early–mid 17th century.

The remaining pits contained only post-medieval pottery; however, no large assemblages were recovered. pit *45218* (0.022kg) and contained a GRE bowl rim and body sherd (Fig.10.33, no.5). Two features contained GRE and other post-medieval wares. Pit *45160* (0.003kg) included a small IGBW body sherd and pit *45099* (0.107kg) a small hollow ware Metropolitan slipware mug.

Pottery from the remaining pits and post-holes is detailed in Appendix 6 and includes IGBW, Metropolitan slipware and LEPM, dating to the 17th century.

Ditch 13: barbican, Phase 6

(Figs 8.8, 8.9, 8.26, 8.27, 10.3–10.7)

Between the late 16th century and *c.*1700 (Periods 6.1 and 6.2), substantial refuse dumping into the barbican ditch comprised largely homogeneous deposits of dark fills at least 5m in depth. The earliest deposits appear to date to the late 16th century. Few fills of late medieval/transitional date were recorded indicating either that no significant refuse disposal had taken place during the late medieval period, or that any such deposition had been cleaned out. The bulk of the infilling, dating substantially to the mid to late 17th century and coming from tenements in the north-eastern part of the site, is described in Period 6.2.

Barbican ditch west (Watching Brief T58)

Beneath and adjacent to the Castle Hotel to the west of the site (T58), no fills of late 16th- to mid 17th-century date were apparent. Subsequent fills of mid to late 17th-century date are described in Period 6.2.

Barbican ditch south (Areas 2, 4, 6 and 47), Phase 6 a–c

Along the southern stretch of the ditch that passed across Area 4, there was a gap in infilling between the 16th century (G2/29, Period 5.2) and the mid to late 17th century (G2/30, Period 6.2). Just to the west, in Area 47, fills recorded in east-facing sections through a machine trench again appeared to be later in date and are described in Period 6.2 and Period 6.3.

Phase 6a, fills

Recorded in west-facing sections in Area 47, a series of fills (G47/30 and 47/27; Fig.10.4) may relate either to fills of the ditch or to quarrying along its northern edge (G48/3 etc described below). The earliest deposits (*47342, 47466, 47440, 47441* and *47471*, G47/30, S.4727 and 4730) were heavily compacted and consisted principally of sand, clay or silt containing gravel. These fills may be the result of erosion and/or redeposited rampart, deliberate infilling (dumped into the ditch to form an access route across it) or perhaps the result of quarrying residue.

Phase 6b, quarries or post-pits

Five pits with near vertical sides, two having flattish bases (*47501, 47504, 47503 and 47502 and 47304,* G47/29, S.4730), were recorded in the second of the west-facing machine sections through the ditch in this area (not illustrated), cutting both into the earlier ditch fills and natural deposits. Most of the fills comprised clay sand although contained building materials (such as brick, plaster/mortar and tile). They may have been quarries for small scale gravel/sand extraction or were perhaps the settings for large posts, perhaps even for a bridge over the ditch. One pit (*47503*) may have contained a collapsed post-pipe.

Phase 6c, fills

More ditch fills were recorded on the next machine step (*47469, 47467, 47468, 47478, 47400, 47483, 47485, 47484, 47488, 47303*, S.4724, G47/27). They were predominantly of clay sand and/or silt and many contained building material. No pottery was recovered, but these fills were cut by a well-dated mid 17th-century pit which cut through them (described in Period 6.2, G47/28).

insert

fold-out

insert

fold-out

Small Finds
Finds were of clay pipe and 3 iron nails (SF6823, 6823.01 and SF6777).

Pottery
A small amount of pottery (0.063kg) was recovered from samples. Residual fabrics made up the largest proportion and the group is allocated a general 17th-century date on the basis of the presence of GRE and TGE. See Appendix 6.

Barbican ditch east (Area 9), Phase 6d
(Figs 8.9, 10.6, 10.7)

Refuse deposition into the barbican ditch was recorded in stepped sections to the north-east (in Area 9), with additional information coming from Trial Hole 1 (G9/41 part). The main excavation focused on the overall infill processes (with low emphasis on finds recovery), with the trial excavation concentrating on finds recovery and the recording of features evident within the ditch. Two main sections across the ditch were linked to a longitudinal section along the western side and a more limited section along the eastern edge. The northern sections were placed at roughly at right-angles to the line of the ditch, whilst the others set obliquely and therefore present some distortion. It has proved possible to link the main area excavation fills with those recorded during trial work. Fills recorded in Trial Hole 1 are consistently of mid to late 17th-century date and are therefore detailed in Period 6.2. The sections recorded in the main excavation indicate the gradual infilling of the ditch with refuse during the late 16th and 17th centuries.

A major observation of infilling was made in south-facing sections relating to a series of ten machine steps placed across the northern part of the ditch. Fills here overlay earlier deposits of late medieval transitional date (G9/37, Period 5.1) and had apparently been tipped into the ditch from the east. They were recorded on the third to ninth machine steps (Fig.8.9).

Infilling the contemporary base of the ditch and running up its eastern side was a layer of compacted mid grey silt sand clay with frequent chalk and clay inclusions (*91450*, S.978, 984 and 992), above which at the base was a thin layer of dark grey silty ash and charcoal (*91454*, S.978). This was sealed by a sequence of fills (*91453, 91452, 91451 and 91452,* S.978 and 984), again tipping down the eastern side of the ditch and beginning to accumulate at its base. These were of dark grey brown silty sand with some ash and frequent charcoal (*91453*), followed by a layer of dark grey brown silt sand clay containing frequent large flints (*91451*). Two small patches of fill survived on the fifth step (S.992), consisting of dark grey silty ashy charcoal (*91439*). At a slightly higher level was more dark grey ashy silty charcoal (*91533*).

A small patch of compacted mid grey brown silty sand followed (*91505*, S.978), with more fills on the next two steps (both recorded as *91392*) — dark grey brown sandy silt with frequent pebbles, charcoal and building material. Above was a thicker sequence of dumps, spanning the third to seventh machine steps (S.978, 984, 992, 996 and 998). At the contemporary base of the ditch was a layer of mid yellow brown sandy silt with moderate charcoal and pebbles (*91391*), suggestive of erosion. The same fill (or equivalents given the same context number) were recorded on the next three machine steps, tipping down the eastern side of the ditch.

A thick dump was now tipped into the base of the ditch (*91390*, S.984, 992, 996 and 998) and consisted of dark grey brown sandy silt with frequent charcoal and pebbles and some building material. This same fill was recorded in the next two machine steps, along the eastern edge of the ditch. Fills in higher machine steps (S.9108 and 9109) may have been contemporary. These included a thick deposit of mid brown sand silt clay (*91437*) with moderate chalk, followed by a thin layer of dark grey brown loam silt sand (*91430*) with frequent pebbles. Fills above these layers consistently contained mid 17th-century pottery and are described in detail in Period 6.2 (G9/41). The base of this part of the ditch would appear to have been infilled to a depth of about 3.5m by the middle of the 17th century.

Fills of the ditch were also recorded in west-, east- and north-facing sections (see plan Fig.10.6), with a possible equation between fills (*91390* in the south-facing sections and *91605, 90640, 91641 and 91673* in north-east facing sections). These were of similar character to those described above. The earliest of the fills, running up the eastern side of the ditch, were generally of redeposited or weathered natural notable for the quantities of pebbles they contained. Some of the later fills were darker and siltier in character, perhaps suggesting the commencement of the influx of rubbish, such as cess, although without the huge quantities of finds or organic nature which was apparent in later fills (see Period 6.2).

Small Finds
Small Finds (x 32) recovered from this phase of the barbican ditch are summrised by fill in Table 10.4 on CD. Of particular note is a powder horn; the style of carving, the costume and the subject suggest a date in the middle or late 16th century (SF6191, Fig.10.71; Huddle, Chapter 10. III). A copper alloy Royal farthing token of Charles I dates to 1625–1634 (SF6915; Davies, Chapter 10.III). Illustrated finds include a bone knife handle (SF6251, Fig.10.53; Huddle, Chapter 10.III), a copper alloy buckle (SF6252, Fig.10.22; Goodall, Chapter 10.III), an unparalleled lead disk (perhaps a token; SF6506, Fig.10.67; Davies, Chapter 10.III), an iron pruning hook (SF6364, Fig.10.66; Mould, Chapter 10.III), a bone bead (SF6488, Fig.10.22; Huddle, Chapter 10.III) and a glass beaker of 16th- to early 17th-century date (SF6361, Fig.10.46; Shepherd, Chapter 10.III).

Pottery
by Irena Lentowicz
Almost one fifth of the entire ceramic assemblage from the site was recovered from contexts assigned to Group 9/41 (19.0%); the majority of this, however, was allocated to Period 6.2 and only 0.5% of this large group was assigned to Period 6.1 (1.286kg). The pottery was retrieved from the stepped excavation of the barbican ditch and the majority of the material came from samples and, in many cases, was noted as fragmentary. The lowest fill included here (context 91450; 0.106kg) contained residual earlier pottery, with a small quantity of LMT and post-medieval ceramics represented by GRE and a Cologne-Frechen jug rim. This dates the beginning of the major period of infilling to the late 16th century.

The assemblages recovered from the sections almost invariably included a small residual element of combinations of Late Saxon, early medieval and medieval pottery. Late medieval/transitional wares were restricted to LMT body sherds and Langerwehe stoneware jug sherds, with the only other fabric present a small Tudor Green-type ware drinking vessel. Post-medieval wares were dominated by GRE represented mainly by body sherds but including a colander base and rims from a jar and dish. Other kitchen wares included a West Norfolk Bichrome ware pipkin rim, and a Surrey White ware pipkin. Other local wares included IGBW and, more unusually, Local Slipware body sherds from drinking vessels. Jugs and drinking vessels were better represented by Rhenish stonewares from Cologne and Frechen. Tablewares were represented by TGE and Low Countries slipware. Other imports were represented by sherds from a Martincamp flask.

Full details of fabrics and forms, dating to the 16th to 17th century, appear in Appendix 6.

Clay Pipe
by Susanne Atkin
Clay pipe from fill *91615* comprised 3 stems and 5 bowl fragments, including bowls dating to 1660–1680s which may be intrusive. A mouthpiece came from fill *91673*.

Plant Macrofossils
by Peter Murphy
An extensive series of SRS samples was collected from these and subsequent fills of the barbican ditch for bone and artefact retrieval, but few bulk samples were collected (*91453* (BS1459), *91439* (BS1287), *91533* (BS1288) and *91625* (BS1239)). The flots from *91439* and *91533* were largely composed of cinder, with coal and charcoal; those from 91625 and 91453 were more charcoal-rich. The latter also produced a few charred cereal grains, in poor condition, and a charred seed of *Agrostemma githago* (corn-cockle). Other components included occasional land mollusc shells (*Vallonia* sp, *Zonitidae*), a few fish bones and burnt and unburnt bone fragments. These assemblages do not appear to be either interpretable or informative.

City Encroachment

Properties in Block I (east of castle approach)
by Elizabeth Shepherd Popescu and Niall Donald
(Fig.10.1)

Open Area 54 (Property 41): pit
A pit infilled with refuse and building material (*91226*, G9/45 part), appeared to be funnel-shaped in profile (not bottomed) and contained a sequence of fills including ash and burnt clay. Another example (*91221*) lay further east.

Small Finds
Finds from pit *91226* were of vessel glass, including beaker fragments (SF6358, no.36, Fig.10.45, SF6236, SF6275 and 6282, latter no.17, Fig.10.45), pharmaceutical phial (no.65, SF6358, Fig.10.48), an iron nail (SF6237) and a Charles I token dating to 1625–1634 (SF6294). Pit *91221* contained ten nails including horseshoe nails (SF6403.01, 6403.02, 6197 and 9237), iron strip (SF6403), copper alloy mount or rove (SF6420.01), type 1 lace-tag (SF6420), vessel glass (SF6492, copper alloy strip/sheet (SF6332).

Pottery
A total of 2.198kg of 17th-century pottery was recovered from both pits and is detailed in Appendix 6. Contemporary fabrics consist of GRE, Surrey White ware, IGBW and Cologne-Frechen.

Open Area 48, (Property 42): pit
There was apparently a brief continuation of the use of this area for refuse pitting (previous late medieval/transitional pits are described in Period 5.2). The uppermost in a sequence of three pits (*91800*, G9/118) was subsequently cut by the construction of an 18th-century cellar (Period 6.3, G9/119). The pit was 0.42m deep and contained grey brown sandy silt with occasional brick and tile fragments.

Small Finds
Three nails were found (SF6351).

Pottery
Pottery (0.231kg) included a small amount of residual material, but was dominated by 16th- and 17th-century Rhenish stonewares (Langerwehe and Cologne-Frechen), as well as DUTR and GRE. A date of late 16th- to early 17th-century is suggested. See Appendix 6.

Open Area 55 (rear of Properties 44–46): pits
Three pits lay to the north-west of the probable extent of the tenement buildings to the south-east (G22/156, *22007 and 22141*; G9/99, *92646*; not illustrated separately). These were of irregular plan, apparently used for the disposal of domestic waste (including building rubble, shell, clay pipe and fish bone) in an area which may have remained open ground.

Small Finds
Finds were of nails (SF522, 523), a possible whetstone fragment (SF521) and window glass (SF6574).

Pottery
A total of 0.802kg of pottery was recovered, suggesting infill dates between the late 16th and 17th centuries. Contemporary pottery probably includes LMT, along with fine wares represented by Tudor Green type ware and Raeren-Aachen stoneware. Other fabrics include DUTR, GRE, West Norfolk Bichrome ware and Frechen stoneware. See Appendix 6.

Open Area 50 (Property 45): well
A well which had probably been constructed in the late medieval/transitional period (*90132*, G9/123, see Period 5.2) was apparently reused. Within the masonry shaft were two linings, firstly a cream brown mortar and clay mix, followed by black/grey red mottled and mixed loam and fired clay. Towards the bottom of the excavated depth this formed a 'floor' over which thin layers of sand and chalk were deposited. There was then a deliberate back-fill, subsequently partially removed. The interpretation of these deposits is problematic: the feature may have been reused to house a fire or may simply have been burnt as part of a cleaning process during reuse as a cess pit (there was insufficient evidence to suggest an association with a craft process). Refuse dumped into the well included clay pipe, shell, daub, plaster/mortar and brick/tile.

Small Finds
A copper alloy lace-tag was found (SF6140).

Pottery
Only 0.081kg of pottery was recovered, contemporary fabrics comprising GTGW, LMT and polychrome TGE. Although TGE is known from 14th-century contexts in Norwich it is unlikely that this sherd is earlier than the late 16th to 17th century. See Appendix 6.

Properties in Block II (west of castle approach)

Open Area 56 (former Shirehouseyard): pits
Three isolated pits (G6/43, not illustrated separately) lay in open ground to the north of tenements/gardens, in the remnants of the Shirehouseyard. The largest example (*60479*) was roughly circular and was 0.50m deep. Its lower fill consisted of dark brown peaty loam, perhaps organic refuse disposal, with some rust/metal staining. To the south-west was a T-shaped cut (*60612*), 0.50m deep, above a Late Saxon grave (Cemetery 3, Period 1.3). This appears to be a refuse-type fill, although the reason for the odd shape of the feature is unclear (*cf.* another feature of similar form in Open Area 39 below). The inclusion of residual medieval finds may suggest the presence of medieval activity in the area, subsequently truncated away. To the north-east was another small pit (*60500*), sub-rectangular in plan and augered to a depth of 1.20m, filled with charcoal and slag, suggesting the disposal of domestic/industrial waste.

Small Finds
Pit *60479* contained brick and tile and a nail (SF6050). Pit *60612* contained brick/tile, clay pipe, slag, a bone scoop or apple corer (SF5682), window and vessel glass (SF7558 and 5688) and an iron nail (SF5699). Finds from pit *60500* were of window glass (SF5647,

5673 and 5749), 10 nails (SF5710 and 5747), a whetstone (SF5948), brick/tile, clay pipe, plaster and eight iron strap fragments (SF5747.1).

Pottery
An assemblage of 1.435kg of pottery was recovered. Contemporary fabrics consisted of (LMT), GRE, IGBW, TGE and Frechen stoneware. Infill dates of late 16th–17th- and mid 17th-century are suggested. See Appendix 6.

Clay Pipe
Four bowls and three stems were recovered from pit *60500*, the bowls dating to the period 1610–40. Pit *60612* contained 1 mouthpiece and 22 stems.

Plant Macrofossils
Two fills were sampled, one containing abundant cereals. This (BS554 from fill *60480*) was of charred cereal remains and weed seeds, dominated by oats (see Table 10.46). It was notably similar to samples from 10th- to 12th-century contexts.

Open Area 38 (?Property 49): pits
Two pits lay above the remains of the south bailey rampart (not illustrated separately). The westernmost (*11071*, G1/24 part) was irregular in plan and 0.51m deep. To the east lay another oval pit (*11013*), not bottomed at 1.50m. The notable presence of land snails (see Murphy below) between its two silty fills indicates that it remained open at some time.

Small Finds and Clay Pipe
Finds from pit *11071* were a nail (SF5485) and an undatable clay pipe bowl fragment. Finds from pit *11013* were of two pieces of faceted bone (SF5364 and7611, included amongst those illustrated in Plate 10.21), a copper alloy Nuremberg jetton of late 16th- to early 17th-century type (SF5483), copper alloy square plate with chamfered corners (SF5484), dress-making pin (SF5457), nails (SF5503 and SF5359), formless fragments (SF5359.01), an iron ward lock plate (SF5370), nail (SF5370.01), formless fragments (SF5730.02), an official lead weight of James I (SF5456, Fig.10.67), Delft wall tile and clay pipe (an undatable bowl fragment).

Pottery
Less than half a kilo of pottery was recovered from the two pits (0.449kg), which appear to have been infilled in the late 16th to early 17th century (see Appendix 6). Contemporary fabrics consist of LMT and Dutch Red Earthenware (both of which may also be residual by this period), along with LEPM ware. The remaining fabrics are dominated by continental imports such as DWE, Cologne-Frechen and Martincamp.

Plant Macrofossils
by Peter Murphy
The flot from the fill of pit *11013* was small and contained charcoal, slag and cinder with a few poor preserved charred cereal grains, uncharred macrofossils of *Ficus carica* (fig), *Rubus* sp. (bramble/raspberry), *Sambucus nigra* (elder), degraded scraps of wood and bone fragments. It also produced shells of land molluscs including *Cochlicopa* spp., *Helix aspersa*, *Trichia hispida* gp., *Vallonia* spp and *Zonitidae*: a mixed assemblage of predominantly open-country and synanthropic species. The fill evidently included macrofossils from a variety of sources.

Open Area 57 (Property 50/51): pits to the north-east of retaining wall
(Fig.10.8)
Two isolated features (*80173 and 80026,* G8/29 part) lay to the north-east of a pre-existing retaining wall (*80034*, Period 5.2). These two small refuse pits, which were probably post-medieval, would have lain at the rear of the northernmost property along Rochester Lane or in open ground above the remnants of the south bailey rampart.

Small Finds
An upper fill of pit *80026* contained a copper alloy dress pin (SF5858).

Open Area 39 (Properties a and b): pitting to the south of retaining wall
(Fig.10.8, Plate 10.4)
A total of 22 pits and two posts lay to the south of the late medieval garden wall, within gardens/yards at the rear of properties. The northernmost feature was a post-hole (*80023*), cut by a T-shaped cut (*80018*, S.803), possibly dug as a post support. To the south was a concentrated area of pitting. A roughly oval pit (*80136*), 1.00m deep contained a refuse-type fill containing frequent brick, mortar, clay pipe and pottery. Just to the south-east was a sequence of five intercutting refuse pits (*80149, 80185, 80141, 80107, 80098*). A small, isolated feature just to the south (*80102*) may have been a post-pit, the post having apparently been rocked from side to side before removal. A refuse-type fill contained redeposited burnt matter and large mammal bones. Just to the south-west was another sequence of intercutting pits (*80111, 80190, 80147, 80145*), the latter containing building rubble. Pit *80111* appears in Plate 10.4.

To the north-east, cutting into earlier pits a large pit (*80188*) used for refuse disposal. This was steep-sided and not bottomed at a depth of *c.*1.40m. A complex sequence of fills was apparent. The lowest recorded fill was of brown peaty material, presumably resulting from composted waste. This contained a large finds assemblage including pottery and there was good organic preservation (seeds, a leather shoe and textile). Later fills dating

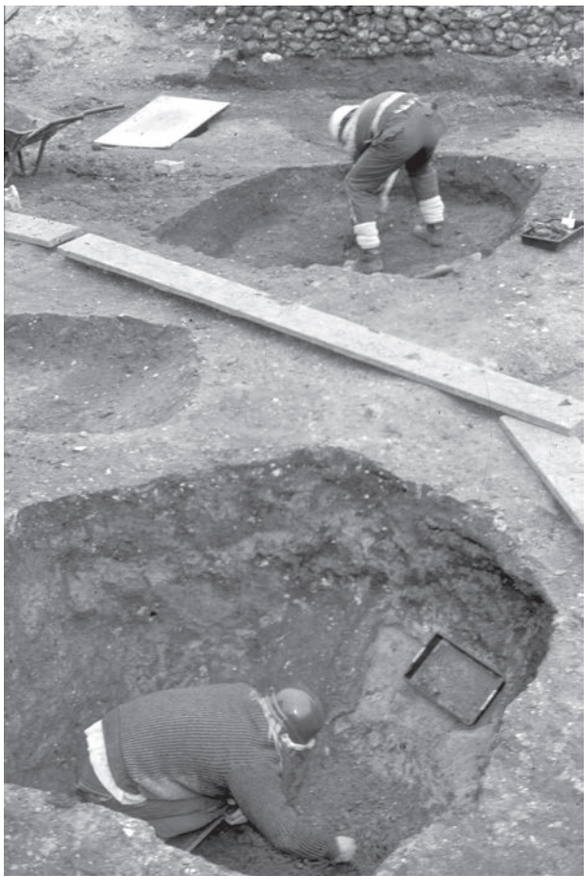


Plate 10.4 Post-medieval pits in garden to the south of terrace wall *80034*, with mid 17th-century pit *80111* in the foreground (Open Area 39, Property a/b, Period 6.1)

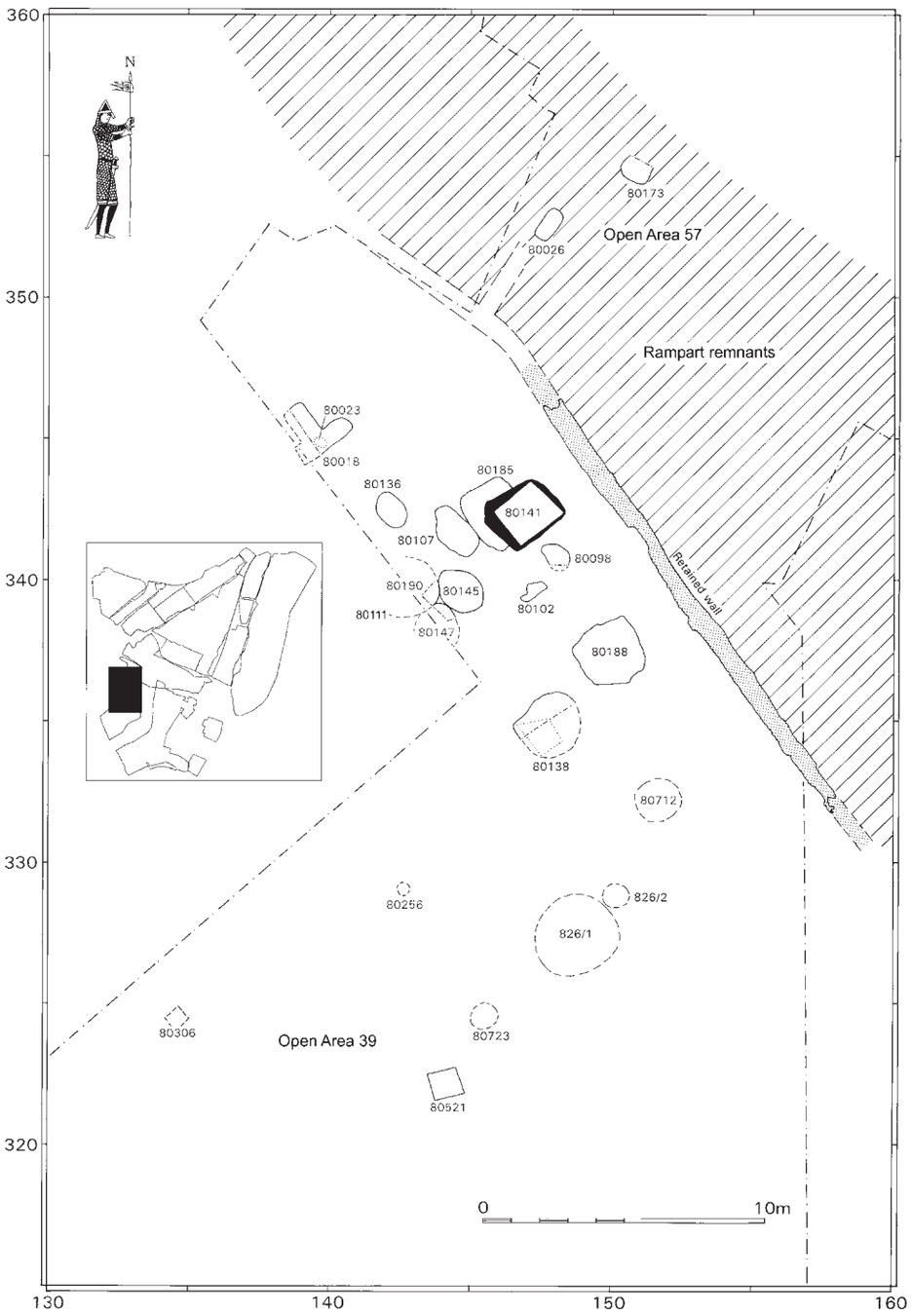


Figure 10.8 Period 6.1: Plan of Open Areas 39 and 57, showing retained terrace wall (Area 8) (Castle Fee Property 50/51). Scale 1:250

to the mid to late 17th century, which contained parrot bones, are described in Period 6.2.

Another sequence of pits was recorded just to the north of the edge of the south bailey ditch (S.812; *80138, 812/1 and 80232*; latter G8/23). Further to the south (S.824 and S.826) along the machine steps through the south bailey ditch were a number of pits and post-holes (*80256, 80448, 80712, 826/1, 826/2, 80723, 80521 and 80306*). The pits had been used for refuse and/or cess disposal.

Small Finds

Pit *80185* contained clay pipe, copper alloy strip (SF5796), two dress pins (SF5816 and 5820, Fig.10.22). Pit *80141* contained a copper alloy sheet (SF6146), 4 dress-making pins (SF5828), 2 dress pins (SF5828.01), 2 lace-tags of types 1 and 2 (SF5828.02), clay pipe, coal, plaster/mortar and brick/tile. Pit *80107* contained shell, 3 nails (SF6149), glass urinal of 14th- to 17th-century type (SF6153, no.51, Fig.10.48), clay pipe and tile. Pit *80102* contained metal, wood, shell, clay pipe, brick and an iron padlock key (SF5941, Fig.10.58). Pit *80145* contained window glass (SF5838) and 8 pieces of copper alloy sheet (SF5861).

Pit *812/2* contained four copper alloy pins (SF5807, Fig.10.22), a copper alloy harness or belt mount (SF6170, Fig.10.23), copper alloy wire of 3 different gauges (SF5873.01), dress pin (SF5873), iron knife blade (SF5874.02), 14 nails (SF5874.01 and 5819), iron plate (SF5874), Dutch clay pipe (SF7615; see below), window glass (SF6052 and 5842)

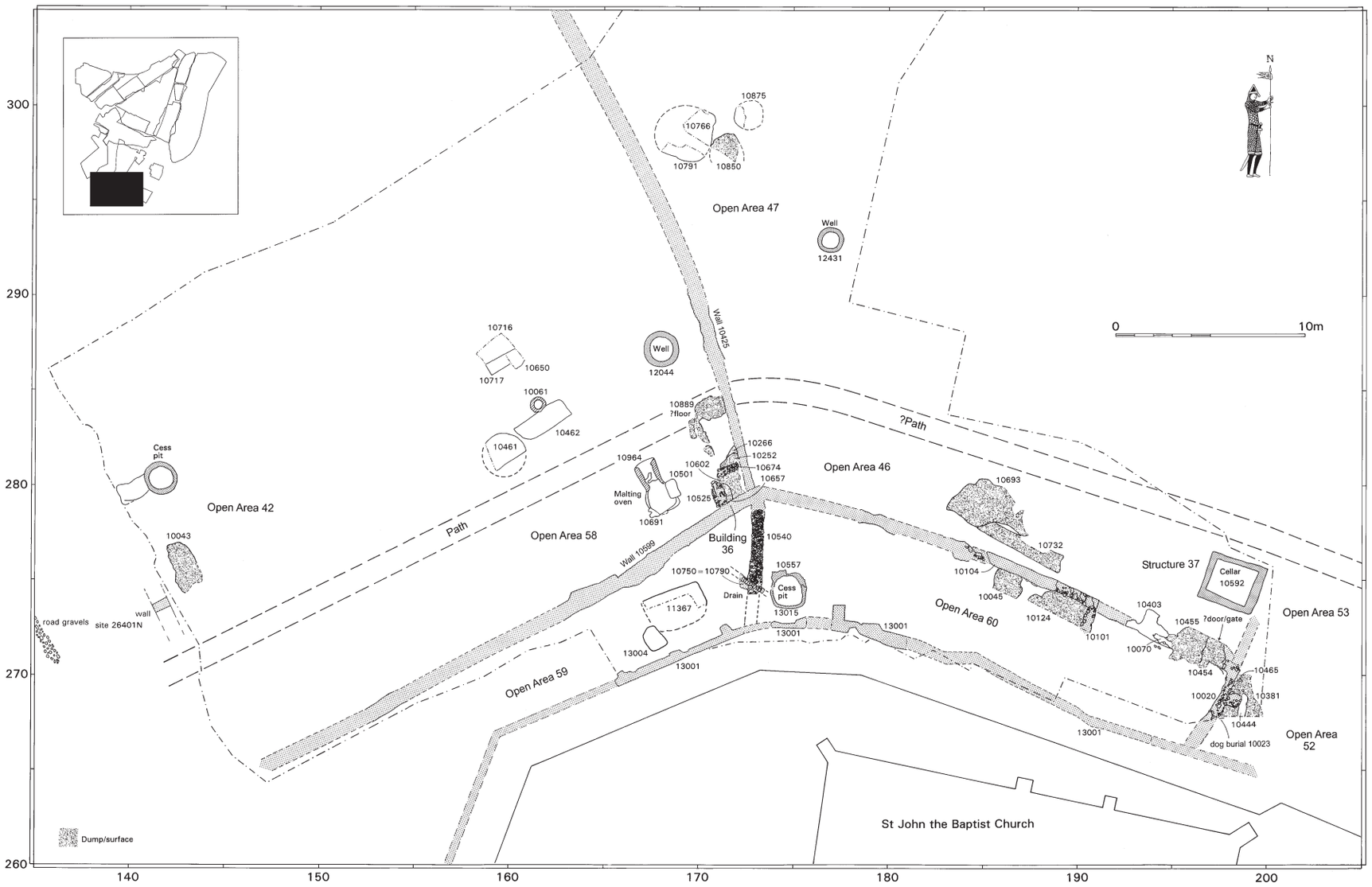


Figure 10.9 Period 6.1: Properties in the Timberhill block (Open Areas 42, 46, 47, 52 & 58–60), showing malting kiln *10964*, surrounding walls and cellar (Structure 37) (Areas 1 & 13) (City Properties c–g). Scale 1:300

and vessel glass (SF5844). Pit *80111* contained medieval window glass (SF5950 and 5839), a bone hawk handle of 13th- or 14th-century date (SF5775; see Chapter 7.III, Fig.7.32, Plate 7.16), a James I farthing token of 1614–25 (SF5774) and a Norwich farthing token of 1658–72 (SF5776) and a copper alloy lid or cap (SF5825).

Finds from the lower fills of pit *81088* (x 42) are presented in Table 10.5 on CD, with later fills detailed in Period 6.2, Table 10.19 on CD. The illustrated items include a fragment of broadcloth (SF5960, Fig.10.27; Crowfoot, Chapter 10.III) and various glass vessels (SF5791, Fig.10.45 and 10.51; SF5841, Fig.10.45; SF6276, Fig.10.45) and SF7481, Fig.10.46; see Shepherd, Chapter 10.III).

Pottery
(Fig.10.34 on CD)
Almost 10kg of pottery (9.482kg, Fig.10.34 on CD) was recovered from these pits and is fully detailed in Appendix 6. Some contained only residual ceramics (including late medieval/transitional types). Contemporary fabrics include GRE, possible English stoneware, LEPM, IGBW, TGE, Tudor Green-type ware, Metropolitan slipware, Surrey White ware, Speckled Glazed ware, Low Countries slipware, North Holland slipware, Westerwald stoneware, Martincamp and Rhenish stonewares from Cologne, Frechen, Langerwehe and Raeren-Aachen. Some of the pit groups indicate table rather than domestic, utilitarian kitchen assemblages (see Appendix 6). The majority of the infill dates are early to mid 17th-century (see Appendix 6).

Clay Pipe
by Susanne Atkin
The largest assemblage came from pit *812/2* (dated ceramically to the mid 17th century), which contained 45 stems, 15 bowls, 6 mouthpieces and 1 base. Bowl dates are of 1650–80 (2 of 1620–40). One notable bowl is marked with a fleur on the stem, a leaf on the bowl and rouletting around the rim (SF7615, Fig.10.24, no. 16) and is suggestive of Dutch manufacture, not inconsistent with similarly dated finds on other Norwich sites (see Chapter 10.III). Pit *80111* contained 9 bowls of the period 1640–60, all waisted. A similar bowl came from pit *80141*, along with 14 stems and a mouthpiece. Four stems came from pit 80102 and another from pit *80145*. Pit *80136* contained 4 bowls of 1660–80 (2 waisted) and a stem. Pit *80185* contained 2 bowls of the period 1640–60 and 1660–80, while lower fills of pit *80188* contained a single stem.

Plant Macrofossils
by Peter Murphy
Most flots from pits fills were small and consisted mainly of cinders and charcoal with some poorly preserved charred grains of *Hordeum* (barley) and *Avena* (oat), pinnules of *Pteridium aquilinum* (bracken), uncharred *Sambucus nigra* (elder) and occasional fish bones and bone fragments. One from pit *80188* (fill *80187*, BS865) was a cess pit assemblage with mineral replaced fig, grape, plum, raspberry, bramble, apple and weed seed testa fragments, the latter probably derived from wholemeal flour. See further details in Table 10.47 and Chapter 10.IV.

Open Area 42 (?Property c/d)
(Fig.10.9)
As in the previous period, there is no excavated evidence for any property division between this area and features just to the south-east.

Wall
Just to the west of the limits of Area 1, a flint wall was observed (Timberhill watching brief, 26401N, TH2), bonded with cream mortar. The wall foundation was of banded clay, sand and silt overlying cobbles. The wall may have formed the front of a tenement building and road gravels were recorded to its west.

Pits
The infilling of an earlier lined cess pit (*10215*, G1/155, Period 5.2) took place in the mid 17th century. Only the upper fills were excavated and were a mixture of domestic and building waste. An overflow pit to the west was also filled with domestic waste including textile fragments. This pit lay very close to the road frontage (even if the road was narrower at this date) and may have lain within one room of a tenement. The backfill of the overflow to the pit (*10198*) was of mid yellow mortar at the top, with a darker brown deposit towards the base. The mortar had apparently come through an overflow void in the cess pit lining (described in Chapter 8). Just to the south was a patch of deposit, containing frequent flint, brick and chalk (*10043*, G1/154), in part sealing earlier pits and acting to level the uneven ground surface.

Five pits (G1/133) lay to the north of boundary wall *10599* and west of wall *10425*. To the north were two patches of possible wall construction/destruction debris (*10717 and 10650*), consisting of chalk and mortar. Cutting them to the north were the truncated remains of a pit (*10716*), surviving to 0.29m deep. To the south was a large circular pit (*10461*). Just to the east of this was a strange linear/rectangular cut (*10462*), 0.10m deep with the base sloping from east to west. Its function is uncertain and its backfill was similar to that of the adjacent pit. Above was a small, roughly circular pit (*10061*), flat-based and 0.61m deep which had been used for *in situ* burning. The primary fill was of burnt clay, possibly a lining, containing brick/tile, above which were mixed backfills. This may have been associated with malting activities just to the south-east (see below).

Well
Further to the north-east (probably at the rear of the property) was a well (*12044*, G1/104, T16) of flint construction with very occasional brick, bonded with grey mortar with frequent white (?lime) flecks. The recorded fill was of loose mortar and flints, although the rubble may have been introduced during ground reduction. Its constructional date is unknown, but it has been assumed to be of post-medieval origin. A comparison of its position with Hochstetter's map of 1789 suggests that it could have remained in use (or been constructed) as late as the late 18th century. This well lay adjacent to a malting kiln (see below) which it may have served as a source of water.

Small Finds
The upper fill of pit *10215* contained an iron hinge staple (SF5116). The deposit within the cess pit overflow (*10198*) contained many finds; a bone object (SF5095), copper alloy flat circular button (SF1006), copper alloy dress-making pins x 12 (SF5804, 5804.01 and 5804.04), dress/hair pin (SF5804.02), 10 pieces of copper alloy wire (SF5804.05), type 1 lace-tags (x 5, SF5122), four fragments of textile, including scraps of a possible shirt or cap (SF5109, Fig.10.27), nail (SF5114), a fragment of scale-tang knife (SF5121), 5 nail shanks (SF5121.01) and leather/textile (SF5110 — carbonised fragments of felt or fulled wool tabby). Layer 10043 contained a nail (SF5045).

Pit *10716* contained a pinner's bone (SF5165), window glass (SF5166), 2 iron split-spiked loops (SF5266.02 and 5266) and nails (SF5266.01 and 5266.02). Cut *10462* contained a copper alloy object (SF5117), copper plate (SF5135) and 13 nails (SF5382, 5041 and 5042). Pit *10461* contained a nail (SF5058), copper alloy buckle (SF5057) and wire (SG5057.01).

Pottery
A total of 0.973kg of pottery was recovered, with infill dates of late 16th–17th-century and early to mid 17th-century being suggested (see Appendix 6). Contemporary fabrics consist of GRE, EPM, Cologne-Frechen, IGBW and Tudor Green ware.

Open Area 58 (Property e): malting oven and surrounding features
(Figs 10.9–10.10, Plate 10.5)

Malting Oven

Aligned with surrounding walls (*10599* and *10425*; both Period 5.2) was a malting oven (G1/130). This cut into fills of the earlier cemetery boundary ditch of St John de Berstrete (Ditch 2, Period 1.4), the existence of which was presumably unknown at this date.

Phase 1: construction

A large post (*11002*) was cut into by the main oven chamber, although was probably contemporary with it. It was 0.30m deep, circular and contained a square/rectangular wooden post packed with clay, with frequent charcoal included in the fill. The construction cut for the oven (*10964*) consisted of two elements: a rectangular flue area to the north (0.27m deep), with a slightly stepped profile and a concave base. To the south was the main chamber, roughly square and again with a concave base (0.38m deep). Each side of the flue was lined with mid grey/orange clay containing decomposed ?straw. The inner sides of this lining had been burnt along the southernmost 0.50m. The burning extended across the central part of the flue and may in part have been formed of debris from raking out. Four small circular stakes lay within the main oven area and may have decayed *in situ*. Depths ranged from 0.15–0.24m. The stakes may have related to the initial construction of later use of the kiln, although they showed no signs of burning. Two other stakes of similar size (*10989 and 11076*), both of which had decayed *in situ*, lay to the south of the oven and may have related to it.

Phase 2: ?recut of flue

The central part of the flue may have been recut (*10438*) and was later infilled with ?redeposited ditch fills from the cemetery boundary ditch, acting to level up the area for the subsequent insertion of a floor.

Phase 3: floor and overlying fire debris

A floor, lining both the flue and main cut, consisted of clayey sand. This surface may have been deliberately laid, or was simply the result of the use of the area (*i.e.* trampled hearth rakeout). An overlying deposit of fire residue filled the flue and oven areas and contained frequent charcoal and lenses of clay as well as occasional fragments of decayed wood. It had a very irregular and undulating surface and contained a number of lenses of burnt matter including soot and ash.

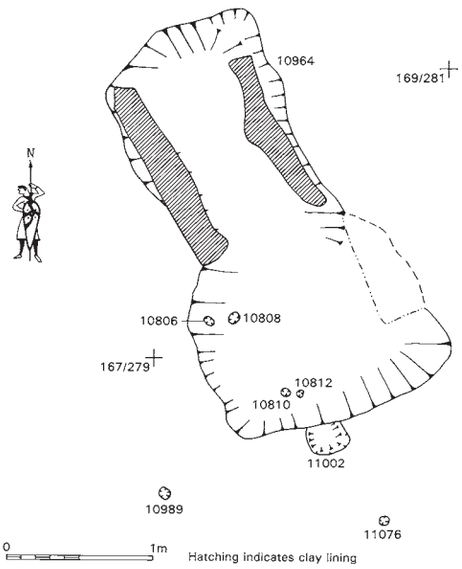


Figure 10.10 Period 6.1: Plan of malting oven *10964* (Area 1) (City Property e). Scale 1:50

Phase 4: disuse

The oven was subsequently backfilled (G1/131) with refuse dumps. The first dumps were concentrated to the south-west and consisted of a mixed, uneven spread of sandy clay with lenses of straw and a high ?ferrous content (numerous nails were recovered from it). A small

Plate 10.5 Late 16th to 17th century malting oven *10964*, (Open Area 58, Property e, Period 6.1)

patch of decayed wood also lay to the south-west, either dumped from elsewhere or the result of structural collapse. Above these was a mixed dump containing frequent chalk and some animal and fish bone. Many smaller dumps lay above, often mixed and containing clay and chalk. A small rectangular pit (*10501*) was made to the east during the backfill sequence and its function is unknown. It was 0.29m deep and contained large mammal bones at the base. The last major dump in the sequence overlay the pit. Presumably, these fills indicate deliberate levelling/backfilling dumps laid down once the oven/kiln had fallen out of use.

Building 36

To the south-east of the oven were two stubs of wall, apparently forming an area *c.*1m square against the northern and western sides of walls 10599 and 10425. To the west of wall 10425 was a cut dug for the insertion of a floor (*10889*, G1/109), forming an irregular rectangle 0.17m deep. The floor itself was of beaten earth and may originally have been L-shaped. The clay was laminated with impressions of straw/grass and contained lenses of ash and burnt clay, brick/tile and pebbles. To the south was a short surviving length of foundation (*10674*) at right angles to wall 10425. It was made up of flint and 5% brick. Most (c.90%) of the flint was unworked, with the remainder being knapped on one face. Both types of building material appeared to have been reused as they had different, hard yellow/white mortar adhering to them. Some had been burnt (although not *in situ*). The mortar bonding had a very high sand content and contained frequent small pebbles and occasional chalk fragments. The structure appears to have been an insubstantial cross-wall, possibly enclosing the floor described above, the small size of the area to the south indicating a lean-to type structure.

Also lying at the junction of walls 10425 and 10599 was a series of deposits and features, perhaps surfaces, dumps and features associated with the use of the surrounding walls. These patches included ash, charcoal, burnt bone and flint (*11398, 11399, 10602 and 10633*). These apparently survived in position due to their sheltered location at the junction of two walls. Cutting these deposits was a feature (*10657*), its mixed mortar and building material fill contained many fragments of copper alloy waste. A later wall foundation (*10562*) ran northwards from the junction with wall 10599. The foundation cut was 0.71m deep and the foundation itself of rough hewn flint (less than 5% brick) bonded with light yellow white sandy mortar and random coursed, the mortar containing straw/twigs. The foundation was trench-built and survived to 0.63m. In the south-east corner of what may have been the same structure was a patch of clay floor or make-up (*10266*).

Small Finds

Finds from the kiln included 8 nails (SF5642, 5514, 5333 and 5434), while the final backfill contained 34 nails (SF5182, 5196, 5291, 5336, 5392, 5421 and 5429) and an iron strip (SF5392.01). Layers *10602* and *10633* contained an iron buckle (SF5279), three copper alloy pins (SF5176, 5177 and 5173) and a copper alloy coin of Henry VII dated to 1485–1500 (SF5174; see Davies, Chapter 8.III), as well as 19 nails (SF5168, 5168.01, 5170, 5171, 5172, 5187, 5293 and 5279.01). Clay layer *10266* contained an iron buckle pin (SF5241). A single clay pipe stem was recovered.

Pottery

A total of 0.665kg of pottery was recovered (see Appendix 6). Approximately a third of the pottery recovered from construction and use deposits of the oven (0.313kg) was residual earlier material, presumably derived from fills of the ditch into which it cut. Contemporary fabrics consist of Raeren-Aachen and GRE. The disuse fills (G1/131; 0.228kg) included a small quantity of pottery made up entirely of residual fabrics. The fills were allocated a general late 16th–17th-century date. GRE was recovered from the possible building (0.124kg) and a general late 16th–17th-century date is again suggested.

Plant Macrofossils

Samples from the malting kiln were fully analysed (Table 10.46) and appear to represent fuel residues, mixed with sprouted grains accidentally charred during malt-drying or roasting. Further details are given in Chapter 10.IV.

Open Area 59 (Properties f and g): tenement walls and pits

(Fig.10.9)

Two earlier walls (*10425* and *10599*, Period 5.2, Chapter 8.II) appear to have been retained into the post-medieval period. Running southwards from their junction was another wall (*10770, 10540 and 10456,* G1/112), possibly a replacement for an earlier wall in the same position. This north-to-south running wall was recorded over a distance of 4m and probably extended further south to join another wall (*13001*, G1/121) which formed the northern limit of an alley. The north-to-south wall was not noted in Area 13.

The foundation trench was flat-based, having slumped to the south where it overlay an earlier pit. The wall/foundation itself (*10540*) survived to 0.73m high and consisted of unworked flint with no apparent bonding although the last 0.50m to the south had a covering of cream/sand mortar. The size of the flints also increased towards the south, suggesting a heavier build above the underlying pit. Some flints had a different type of mortar adhering to them, suggesting reuse.

The southern part of the wall was subsequently removed for the insertion of a brick-built drain (G1/113) which may have fed into an adjacent cess pit (*10557*). The wall above the drain was replaced with a flint rebuild and the drain gradually infilled with a silty deposit. The construction cut for the drain (*10750=10790*) reflected an area of slumping into the underlying pit into which it partially subsided. The drain was of brick construction and was bonded with pink soapy mortar with small flint fragments, pebbles and charcoal flecks. One of the lining bricks was curved in section. The drain was later cut by a 17th-century pit at its western end.

Wall 10540 was subsequently replaced above the drain (*10718*), the repair being of rough faced flint, bonded with brown clay and mortar lumps in cream mortar. No coursing was apparent and the wall survived to 0.40–0.50m in height. The line of the previous wall was now completely replaced. The drain, which presumably served adjacent tenements, eventually silted up.

Two pits (G1/125) of early to mid 17th-century date lay within the area confined by the walls. To the south (*13004*) was a sub-rectangular pit, surviving to a depth of 0.30m. Its organic fill may indicate use as a cess pit. A large ?square pit (*11367*) was not bottomed at 0.60m deep and had vertical sides. Its fills were again peaty/fibrous in character.

Small Finds

Fills of the drain contained window glass (SF6778). Pit *13004* contained an iron oxshoe (SF5667, Fig.10.74), the heel of a horseshoe (SF5667.03), 4 oval chain links (SF5667.02), nail (SF5667.01), vessel glass (SF5705 and 5697), window glass (SF7484) and copper alloy sheet (SF5675 and 5677). Pit *11367* contained window glass (SF5536), an iron holdfast and hinge strap (SF5530), and a book clasp of early post-medieval type (SF5530.01, Fig.10.56).

Pottery
A total of 0.280kg of pottery was recovered, contemporary fabrics consisting of (LMT, GRE,) DUTR, IGBW, Low Countries Decorated slipware. Infill dates of (late 16th)/early to mid 17th-century are indicated (see Appendix 6).

East-to-west wall: path boundary
(Fig.10.9)
A long stretch of wall (*c*.30m) was recorded running along the southern length of Area 13, forming the northern boundary of what is now Grout's Thoroughfare and the southern limit of properties to the north of it (*13001*, G1/121). It was of flint and brick construction, bonded with grey/white mortar, random coursed and surviving to a height of 0.75m. There was some indication that it had been built in two phases, with a shallower foundation to the east and a deeper one to the west, the latter probably because of the underlying ditch described in Chapter 4, Part I (Ditch 1, Period 1.3). The wall curved round with three buttresses on its northern side and apparently continued further westwards towards Timberhill. Workmen hit a wall on this alignment during the construction of hoardings around the excavation site.

The wall cut through burials and was buttressed on its northern side. Plates 8.7 and 8.8 indicate the depth of cemetery deposits to its north. The wall ran along the same alignment (although between *c.*1 and 2m to the north of) the present day north wall of the cemetery of St John the Baptist, Timberhill. The excavated wall may have been constructed in the 16th century, with later repairs/additions accounting for the brickwork patches visible in the photographs of it. In origin, it may even relate to the constriction of the cemetery (see Chapter 8).

Open Area 60: Property (g)
(Fig.10.9)

Walls
Further east, an alteration was made to previous walls which it was thought on site might have formed the northern boundary wall of the cemetery and also the southern limit of a precursor to Grout's Thoroughfare, although it now appears that the precursor lay further to the north (see further discussion in Chapter 10.VI).

A late medieval/early post-medieval wall (10378, Period 5.2) was ?robbed/demolished as is indicated by the presence of a sequence of dumps containing building debris (G1/82). These contained LB2 (dating to the early to mid 16th century onwards) and LB5, confirming a post-medieval date for the rebuild. The rebuild sequence began with a small pit (*10214*) filled with sand, containing some charcoal, brick and chalk. Overlying this pit and spreading out to either side of it above the former wall were dumps (*10134, 10124, 10514, 10454, 10455 and 10728*) of destruction/construction debris (charcoal, chalk, brick, tile, mortar, flint nodules, sandstone). The presence of copper alloy flecks indicates redeposition from underlying metalworking.

Two new walls now replaced the earlier one(s), confirming the presence of narrow tenements running across the whole of the Timberhill block, occasionally sub-divided. To the west, with the possible continued presence of a gate through it at its eastern end, a new wall (G1/84) replacing an earlier version in the same position (10378). Another wall projected southwards from it, possibly suggesting the presence of a room or the subdivision of a yard area. The walls contained early brick forms, along with LB1 and 5. This north-west/south-east running wall (*10104*) was built directly above the earlier one, reusing its foundations. It was constructed of flint and fragmented brick, glazed peg tile and Flemish floor tile. Also included was a fragment of fair-faced granite, probably reused from another building. The wall was bonded with pale yellow sandy mortar on the lower course and hard white mortar with occasional brick flecks on the upper courses. The flint was rough hewn and the wall random coursed. The wall was founded more deeply towards the west, the lower part (which had yellow mortar) perhaps forming the foundation. Part way along its southern side was a short length of slot (*10101*), apparently the foundation for a wall running southwards at right angles to it. This wall was of rough hewn flint nodules bonded with pale yellow sandy mortar. Only the lower course survived, the remainder having been robbed. The mortar type could suggest an earlier date.

To the south very little of the foundation survived to suggest a rebuild of this section of the wall. A linear strip of brown/yellow mortar (*10070*) may have formed the base of a foundation for the same wall or perhaps a later repair. Again, this wall appears to be 16th-century at the earliest.

To the east, forming the other side of the possible gateway, was another wall (*10020*). The foundation trench, recorded over a distance of just over 3m, was shallow (0.13m deep), flat base and irregular in plan to accommodate a buttress to the east, about half way along its recorded length. Another square slot lay towards the north-west of its recorded length and may have held a gatepost. The wall itself was of flint nodules (to 0.20m) and brick fragments (<10%, to 0.30m), bonded with hard white mortar containing brick fragments. It was random uncoursed (although only one course survived) and stood to *c*.0.20m above modern ground level, having been much damaged by machining. The presence of larger, squared masonry blocks in the slot to the north suggests that this may have formed a gate post (with the other side formed by wall *10104*).

Small Finds
Dump *10124* contained 2 nails (SF5132) and a pierced iron plate (SF5132.01). Foundation trench fill *10514* contained a copper alloy dress-making pin (SF5191), a type 1 lace-tag (SF5191.01), a copper alloy strap end of medieval type (SF7560; see Chapter 7.III, Fig.7.24), 2 iron nails (SF5217), a knife (SF5217.01) and formless fragments (SF5217.02). Pit *10465* contained a fragment of 12th-century Caen stone dressing. Layer *10571* contained a late medieval copper alloy ornamental plaque (SF5331, Fig.8.54). An iron belt buckle (SF5276) came from dump *10381*. Dump *10045* contained copper alloy sheet (x 5, SF5030) and wire (SF5083). Layer *10418* contained a nail (SF5159).

Pottery
A total of 3.537kg of pottery was recovered and is detailed in Appendix 6. Many of the fabrics were residual and the groups included LMT, GTGW, DUTR, GRE and Langerwehe and Raeren-Aachen stonewares. This combination suggests that some of this activity was late 16th-century rather than later.

Well/Cess Pit
Adjacent to wall *10540* at the rear of the southernmost tenement on the eastern side of the Timberhill block (Property g) was a lined cess pit/well, confined within the walls described above, which was eventually filled with domestic refuse of 17th-century date. It may have

Plate 10.6 ?Sixteenth- to 17th-century cellar, Property (g) (Structure 37, Area 1, Period 6.1)

been built considerably earlier and an alteration to it is described in Period 6.2.

This sub-circular well or cess pit (*10557= 13023=13015*, G1/116) was lined with flint, limestone and tile bonded with yellow sandy mortar. The limestone was rough hewn, with occasional square cut blocks and the flint unhewn. The lining was exposed to a maximum depth of 1.9m. The inner face had originally been plastered and subsequently stained by refuse. Where the lining was not flush with the sides of the construction cut, the gap had been backfilled with sand. A drain led into it (see above), the feature acting as a sump. A series of infills suggest a secondary use for the disposal of domestic/industrial waste, comprising refuse followed by layers of refuse and ash mixed with demolition debris (brick, tile and mortar).

Small Finds
The pottery indicates an early to mid 17th-century date for deposition, although late 17th- to 18th-century glass and clay pipe of similar date may either indicate contamination or a more appropriate date for the assemblage. Small Finds (x 27) are summarised in Table 10.6 on CD. Illustrated items consist of fragments of English wine bottles of 17th- or 18th-century date (SF5665, Fig.10.49 and SF5685, Fig.10.50; Shepherd, Chapter 10.III).

Pottery
(Fig.10.35 on CD)
A particularly large and interesting ceramic assemblage was recovered from cess pit/well *10557* (G1/116; 2.548kg, Fig. 10.35 on CD) and has been compared with the St Stephen's Street well assemblage (Jennings and Atkin 1984; see Goffin, Chapter 10.III). Fabrics included GRE, IGBW, Metropolitan slipware, Surrey White ware. TGE recovered from contexts assigned to this date could be either from the Netherlands or English, and should be classed as Anglo-Netherlands. Recorded rims included six plates and two bowls, including a rather fine fluted example (Fig.10.35 on CD, no.1). Other imports included Dutch White Earthenware and the more usual Rhenish stoneware vessels from Cologne-Frechen and Frechen. The latest pottery recovered was Staffordshire slipware. The range of fabrics and vessels recovered from this well corresponds to the Phase I and II assemblage from the St Stephen's Street well. The Staffordshire slipware mug rim is the only anomaly, but could be an early example, and the well infill was therefore dated early to mid 17th-century. See further details in Appendix 6.

Clay Pipe
Clay pipes include 48 stems, 16 bowls, 6 mouthpieces and 2 bases. Twelve of the bowls are of the period 1680–1710.

Structure 37 (Property g): cellar
(Fig.10.9, Plate 10.6)
To the north of the new walls (just north of the postulated gateway) was a square cellar (G1/92) possibly forming part of the same or an adjacent tenement. Use deposits within the cellar (described in Period 6.2) contained pottery of mid 17th-century date and a 16th- or 17th-century date for cellar construction is therefore indicated (Plate 10.6). This square cellar was constructed lay in the far eastern corner of Area 1, cutting through upper fills of the ?Castle Fee boundary ditch. It was flat based and survived to *c.*1.10m from modern ground level. The cellar walls (*10592*), built up against the surrounding soil, were constructed of flint and brick bonded with white sandy mortar containing frequent chalk flecks and fragments. The flint was unknapped and random uncoursed. A brick buttress had been added later, above a tile floor (*10000a*). The Flemish floor tiles were 190x190mm square, laid in square tessellation. The walls had brick quoining and there was evidence for repair. They had been repeatedly whitewashed, with a sooty layer trapped between repaintings.

Open Area 46 (Property g): dumps
(Fig.10.9)
To the north of wall *10104* were two dumps (G1/86) which had probably slumped into the upper part of the underlying ?Castle Fee ditch. These consisted of loose mixed flint, clay and sand with frequent brick and gravelly loam (*10732 and 10693*).

Small Finds
Layer *10732* contained window glass (SF5308) and bone waste (SF7606).

Pottery
Less than a kilogramme of pottery was recovered (G1/86; 0.781kg). Fabrics include LMT, GRE and Werra ware. The latest date for deposition appears to be mid 17th-century (see Appendix 6).

Open Area 52 (Property g): features and dog burial
(Fig.10.9)
To the east of earlier wall 10543 was a linear cut (*10444*, G1/82), 0.07m deep of uncertain function, but lying just next to a buttress on the subsequent wall (*10020*). Another small cut (*10465*) of uncertain function was filled with chalk. Overlying the whole area was a dump (*10381*) of grey clay loam which may have accumulated against the adjacent wall. Immediately adjacent to wall *10020* was an isolated dog burial (*10023*, G1/87), presumably a domestic pet. This small articulated dog was recorded lying on its right hand side. A total of 10.5 bones and teeth was recovered. No grave cut was evident although finds were recovered from the surrounding deposit. Dating remains uncertain.

Small and Bulk Finds
Finds associated with the dog burial were clay pipe, copper alloy dress-making pin (SF5020), two fragments of medieval/post-medieval window glass (SF5021) and 3 nail shanks (SF5022). Cut *10444* contained 2 nails (SF5159).

Pottery
Pottery from gully *10444* (43g) includes abraded LMU and LMT, along with fresh body sherds of GRE.

Open Area 53 (Property g): pit
by Elizabeth Shepherd Popescu and David Whitmore
Further to the north-east at the Golden Ball Street site, a small sub-square pit with a notable finds assemblage (*146*, GBS Group 9) had been cut by the south-west corner of the cellar of No.14 Golden Ball Street. The pit was a sub-square shape and 1.14m deep. Its primary fill was a dark greyish brown clay silt (*213=166*), overlain by a thin dump of roof tiles which in turn was covered by a dark greyish brown sandy silt backfill (*145*). All of the fills were probably the product of deliberate backfilling. Faunal remains from the pit are noted by Curl in Part III, Chapter 6.

Small Finds
Alongside a complete ceramic money box (GBS SF38, Fig.8.51; see below), fill 145 contained: iron formless fragments x13, representing at least 4 flat-headed nails (GBS SF2); iron rotary key, with a kidney-shaped bow with double internal point, decorative collar moulding at neck, round-sectioned stem and rectangular bit with a large cleft above and below (GBS SF3); flat-headed iron nail (GBS SF12); copper alloy pin or needle shank (GBS SF15); flat headed nails (GBS SF16, SF17); iron nail shanks (GBS SF19, SF20 and SF21); copper alloy artefact or metalworking debris (GBS SF25); large iron nail (GBS SF26); iron nail (GBS SF27); incomplete mould-blown glass beaker and several fragments (GBS SF41, Fig.10.46); iron artefact (GBS SF120); iron ?nail fragments x2 (GBS SF126). Fill 166 contained an iron nail shanks (GBS SF5 and 7); flat-headed iron nail (GBS SF6); copper alloy ?lace-tag (GBS SF111). Many of the nails were associated with minerally-preserved organic materials, including wood identifiable as oak in one example (GBS SF21).

Pottery
(Fig. 8.51)
A total of 1.300kg of pottery was recovered, including a small bottle-shaped moneybox (SF38) with a knob finial and slit which had been enlarged with a chisel, perhaps to release the contents without breaking the vessel open completely (Fig.8.51). The moneybox was made in a LMT fabric, which has a broad date range of the 15th through to the 16th centuries. In view of the presence of fabrics and forms of a later date than the LMT moneybox within the pit fill, it is likely that this vessel was residual, since some of the pottery and the clay pipes (see below) date to the early to mid 17th century. However, in view of its specialist function, it is possible that the moneybox may have been treasured as a valued item for several generations, and was not discarded as readily as more commonly available ceramics. In addition to residual material 16th- and early to mid 17th-century fabrics from the pit include IGBW, Langerwehe stoneware, Raeren stoneware, Frechen stoneware, DUTR and LEPM, as well as a probable Low Countries import (see Appendix 6).

Clay Pipe
by Richenda Goffin
(Fig.10.24)
Fill *145* contained 30 fragments of ceramic tobacco pipe, including 5 bowl fragments. Interestingly, the surviving tobacco bowls were all of the same type. They were all small with pedestal feet with fine rouletting around the rims. Three of the bowls have the same mark stamped in relief on their feet, that is a five-heart-shaped leaved rose (Fig.10.24, no.18). Such a stamp has been recovered elsewhere and has been dated 1640–1660 (fig. 3, nos 29–30, Unprov, Yarmouth (GYM P58) (S. Atkin 1985a, 129). The attribution of the stamp is unclear, as it may have a London origin or otherwise (S. Atkin 1985a, 129). Stamped relief decorations of this type are also associated with the Dutch pipe making industry in the early 17th century, and it is possible that these bowls were imported (*ibid*.). In view of the influx of Dutch and Flemish immigrants into Norwich during this period, this is perhaps likely.

Open Area 47 (Property g): well and pits
(Fig.10.9)
A flint-lined well (*10012=12431*, G1/99) probably lay at the rear of a tenement fronting the lane (now Golden Ball Street). Its upper fills were recorded in 1989, with the lining recorded during a watching brief (T32) in January 1991. The lining was of random coursed flint. Its inner face was finished/lined with knapped flint. The lowest fill recorded during the watching brief had been disturbed during the recent development and contained building rubble. The lowest of the fills recorded during the main excavation was of frequent mortar and bricks/tiles with ashy lenses. An overlying ashy fill was followed by mixed backfilling, again of building material. As noted (Chapter 8), this may have been late medieval in origin, only infilled during the 17th century with building rubble and incidental refuse.

Just to the north-west of the well were two pits (G1/98) with early 17th-century infill dates, containing fairly wide-ranging finds assemblages suggesting the disposal of domestic waste. A layer associated with the pits (*10850*) contained a partially articulated domestic fowl. This layer was just cut to the west by one pit (*10766=10791*), 1.31m deep, with a flat base. A sequence of fills included erosion/side collapse, organic fills and later refuse dumps. Animal bone from this pit included a partially articulated dog. The other smaller pit lay just to the east (*10875*).

Small Finds
The well contained iron shears (SF5008), intrusive glass bottle fragments of late 17th–18th-century date (SF5017), an iron crucible (SF5006), Layer *10850* contained a bone bead (SF5285; Fig.10.22), copper alloy dress-making pin (SF5418), post-medieval window glass (SF5356 and 7489), iron wire (SF5354) and nails (5354.01 and 5369). Small Finds from fills of the pits (G1/98), from which 75 objects were recovered, are tabulated in Table 10.7 on CD. Illustrated finds include fragments of eight different textiles (SF1010 and 6781, Fig.10.27; Crowfoot, Chapter 10.28) and a scale tang knife for use in butchery (SF5321, Fig.10.52; Mould, Chapter 10.III).

Pottery
A total of 3.232kg of pottery was recovered, including a fine mid 17th-century assemblage from well *10012* (G1/99; 0.438kg). Other pit fills date to the 16th to 17th centuries. Fabrics include GRE, TGE, IGBW, Speckled Glazed ware, West Norfolk Bichrome ware, North Holland slipware and DUTR. Imports are dominated by Rhenish stoneware drinking vessels and *bartmann* jugs from Raeren-Aachen, Cologne and Frechen, but also include a rim from a Weser ware plate and a North Holland slipware dish. See Appendix 6.

Clay Pipe
A total of 9 stems was recovered, none of them datable.

Plant Macrofossils
A sample from pit *10766* (BS67) is detailed in Table 10.47; the contents indicate use as a latrine pit.

Period 6.2: Post-medieval (c.1650 to c.1738)

Summary
(Fig.10.11)
A mass burial of felons from the prison (six adults and a child) was made at the top of the Castle Mound and is attributable to the mid to late 17th century. The Cattle Market, which had been established within the castle baileys in the early 17th century, continued to expand. At the beginning of the 18th century, cattle, sheep and pigs were for sale in both Hog Hill and the south-western part of the south bailey. Quarrying of the barbican rampart continued throughout the 17th and early 18th centuries, eventually leading to the collapse of one of the castle gatehouses. Kirkpatrick noted that sand-digging in the south-western angle of the Castle Mound had caused much of it to fall down. The barbican rampart was also reduced at this time, with cartways made through it. Contemporary images, such as Cleer's map of 1696 (Plate 10.1), suggest that there was no longer a direct south-to-north route towards the base of the castle bridge. Substantial refuse disposal into the barbican ditch came largely from the burgeoning tenements develop along its fringes, particularly to the east. New roads and alleys developed, while tenements encroached further north towards the barbican area. A group of 123 pits was recorded at Castle Mall, with a further 16 at Golden Ball Street.

Burials on the Castle Mound
by Elizabeth Shepherd Popescu and Andy Shelley
(Fig.10.12 and Plate 10.7)
Two watching briefs at the top of the Castle Mound took place prior to the insertion of a temporary bridge (T49 and 51). Although it was anticipated that the 13th-century curtain wall around the top of the motte might be located during this work, in the event a robber cut proved to have removed the perimeter wall (T47and51/3). This cut was the unexpected resting place for a group of human burials.

Cemetery 5: robbing and burials
Although few details of the robber trench (*12309=12362*) were recorded due to limited area available for excavation, it was noted to run parallel to the edge of the motte (some distance inside its modern edge) to a depth of about 0.60m. The lower part of the robber trench (*12362*) contained a mixed deposit of fire debris and building material. A square cut to the north (*12350*, not illustrated) may have acted as a buttress to the robbed wall, while another cut (*12353*, not illustrated) contained a dog burial. The trench was infilled with refuse. The earliest (*12351*) was a dark grey mix of charcoal, ash, silt and building material, up to 0.55m thick. Above it was a rich mid brown silty loam (*12343*, T47and51/2) containing building material and a large quantity of mid to late 17th-century pottery. It was within this layer that the human burials were located (see below), along with a large number of finds. This refuse was presumably from the prison, the convenient hole being used as a waste tip. It was sealed by a modern layer (*12340*, Period 7.1).

As the watching brief took place in two parts, due to an enlargement of the bridge foundations, parts of the same skeleton were assigned different numbers. The bodies had been buried together and were aligned roughly east-to-west, all being supine (Plate 10.7). Three had their heads to the east and three to the west. No grave cut was apparent, although the bodies were arranged in quite an orderly fashion. They were packed two abreast, in a sequence of three 'layers'.

Small Finds
It appears that at least some of the pins found in association with the burials and in the surrounding deposit were used as shroud pins. The artefactual evidence indicates that the burials were not clothed (see Chapter 10.III; 'Copper Alloy Dress and Shroud Pins'), although adhering to the foot of one individual were fragments of a leather belt or strap (see above SF6172, Fig.10.27; see Crowfoot, Chapter 10.III and discussion in Chapter 10.VI). Small Finds (x 34) from deposits associated with the burials appear in Table 10.9 on CD. Notable items include a Nuremberg jetton of Hans Krauwinckel II (1538–1635; SF1094; Davies, Chapter 10.9). Illustrated items consist of a spade shoe (SF1040, Fig.10.66; Mould, Chapter 10.III), fragment of a bottle or phial of 16th- to early 17th-century date (SF5664, Fig.10.49; Shepherd, Chapter 10.III), dress pin (SF5624.01, Fig.10.22; Goodall, Chapter 10.III) and a hinge (SF6431, Fig.10.57).

Pottery
Although residual ceramics made up an element of the assemblage from the robber trench (2.386kg in total), the majority of the pottery is contemporary 17th-century fabrics. Locally produced wares were most common, with non-local English wares (Surrey White ware)

Skeleton	*Burial Position*	*Finds*
Sk.12344/12357	Head to east	
Sk.12361	Head to west, almost complete skeleton	
Sk.12356	Head to west, only half of skeleton excavated	CA pin (SF1091)
Sk.12355	Head to west, left arm folded at elbow, with left hand on right shoulder	
Sk.12354	Head to east	CA pins x 3 (SF1089, 1090 and 1092)
Sk.12345/12358/12359	Head to east	leather adhering to right ankle and foot (SF6172, Fig.10.27)

Table 10.8 Cemetery 5: Summary of mid to late 17th-century prison burials on Castle Mound (T49 and 51, Period 6.2)

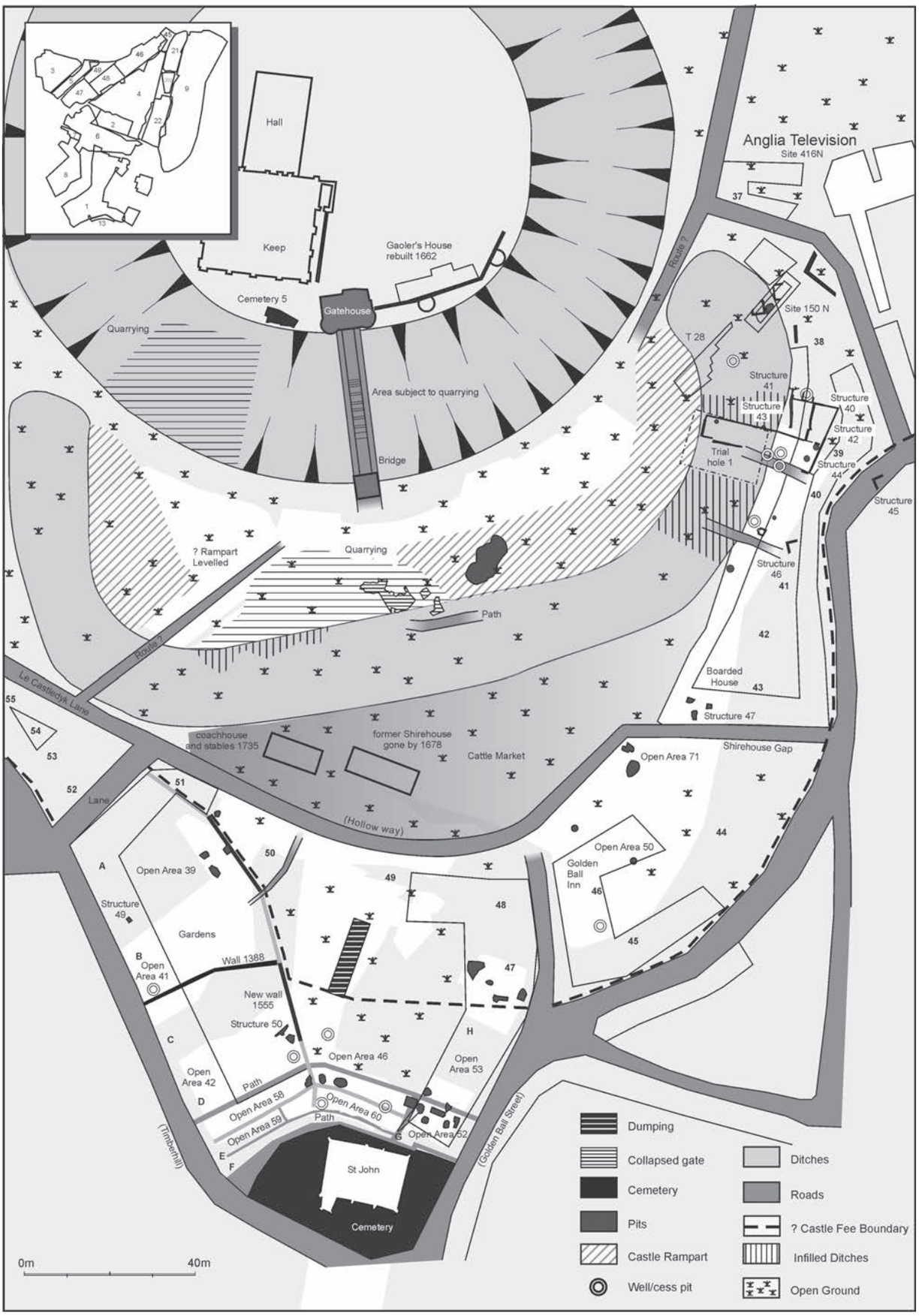


Figure 10.11 Period 6.2: Phase plan (mid 17th century to *c*.1738). Scale 1:1250

Plate 10.7 Seventeenth-century prison burials on Castle Mound (Cemetery 5, Period 6.2)

and continental imports present (Anglo-Netherlands TGE, Frechen stoneware and Werra ware). Other fabrics include GRE, IGBW, Speckled Glazed ware by body sherds only. The latest fabric recovered was Whieldon-type ware (late 17th to 18th century); taken alongside the remainder of the assemblage a date of mid to late 17th-century is suggested. See further details in Appendix 6.

Clay Pipe
The group comprises 4 bowls, 26 stems and a base. Diagnostic pieces include a bowl dated 1640–60 and an AB crowned base of 1620–60.

Human Bone
by Sue Anderson
From the original 12 skeleton numbers assigned, the remains of seven individuals (6 adults and a juvenile) have been identified. The six adults were all young to middle aged ?men with an average height of 5ft 5ins. Three displayed head wounds that had subsequently healed. The group showed little evidence of malnourishment or infectious disease, although their bones did display evidence of stress-related disorders such as may occur when carrying loads. The cause of death was not apparent, but at least one individual had not been hanged. Lesions to their shin bones indicate that they may have worked in a chain gang (although see further discussion in Chapter 10.VI). Further details of the skeletal remains are given in Chapter 10.V.

Open Area 61: cobbled surfaces
A series of metalled or cobbled surfaces was recorded across the northern part of Area 5 (G5/54). The most extensive consisted of flint cobbles set in sand and clay (*50067*) and ran from east-to-west across the whole area, over the top of the infilled barbican well. A large amount of modern brick fragments and occasional pieces of concrete had been introduced into the surface. The uppermost level of this surface, at 26.91m OD, was considerably higher than earlier pulverised limestone surfaces in the same area (see Chapter 8, Period 5.1) which lay at around 26.30m OD. The ground surface rose towards the base of the castle bridge. Other less extensive surfaces included a cobbled example (*50043*) which had been patched with limestone blocks. Other surface patches, some of which overlay earlier post-medieval pits (Period 6.1) included repairs to the main surface and contained clay pipe (*50088, 50060, 50059 and 50098*).

Small Finds
Layer *50088* contained a Wisbech farthing dated to 1665 (SF5582). Layer *50060* contained a hinge pivot (SF5906).

Pottery
A single sherd of residual medieval pottery was recovered from these surfaces.

Quarrying within the Barbican
by Elizabeth Shepherd Popescu and Andy Shelley
(Fig.10.13)
Quarrying of the south bailey rampart had been undertaken in the late medieval period (Chapter 8, Period 5.1). Within the barbican area, however, such activity does not appear to have begun until the post-medieval period, although this may in part be the result of the fact that any earlier quarries cut through the upper part of the rampart had been swept away during later landscaping. This late quarrying probably cut through the remnants of the rampart to reach underlying sands and gravels. The total area subjected to quarrying was about 20m north-to-south by *c.*70m east-to-west. A depth of at least 4–5m was quarried, not including the remains of the postulated rampart. In some places, the quarrying appears to have been flat-based, while in others the numerous small pits indicate an undulating appearance. Smaller scale quarrying appears to have taken place elsewhere in the vicinity.

Open Area 62: quarrying to the west
Quarrying radiated from the northern edge of the barbican ditch, fanning out from the base of the castle bridge. There is little dating evidence for these activities. Whilst elsewhere on the site, quarries were infilled relatively quickly to make way for gardens and tenements (see Chapter 8), here there was no such pressure and the pits may have stood open for a considerable time.

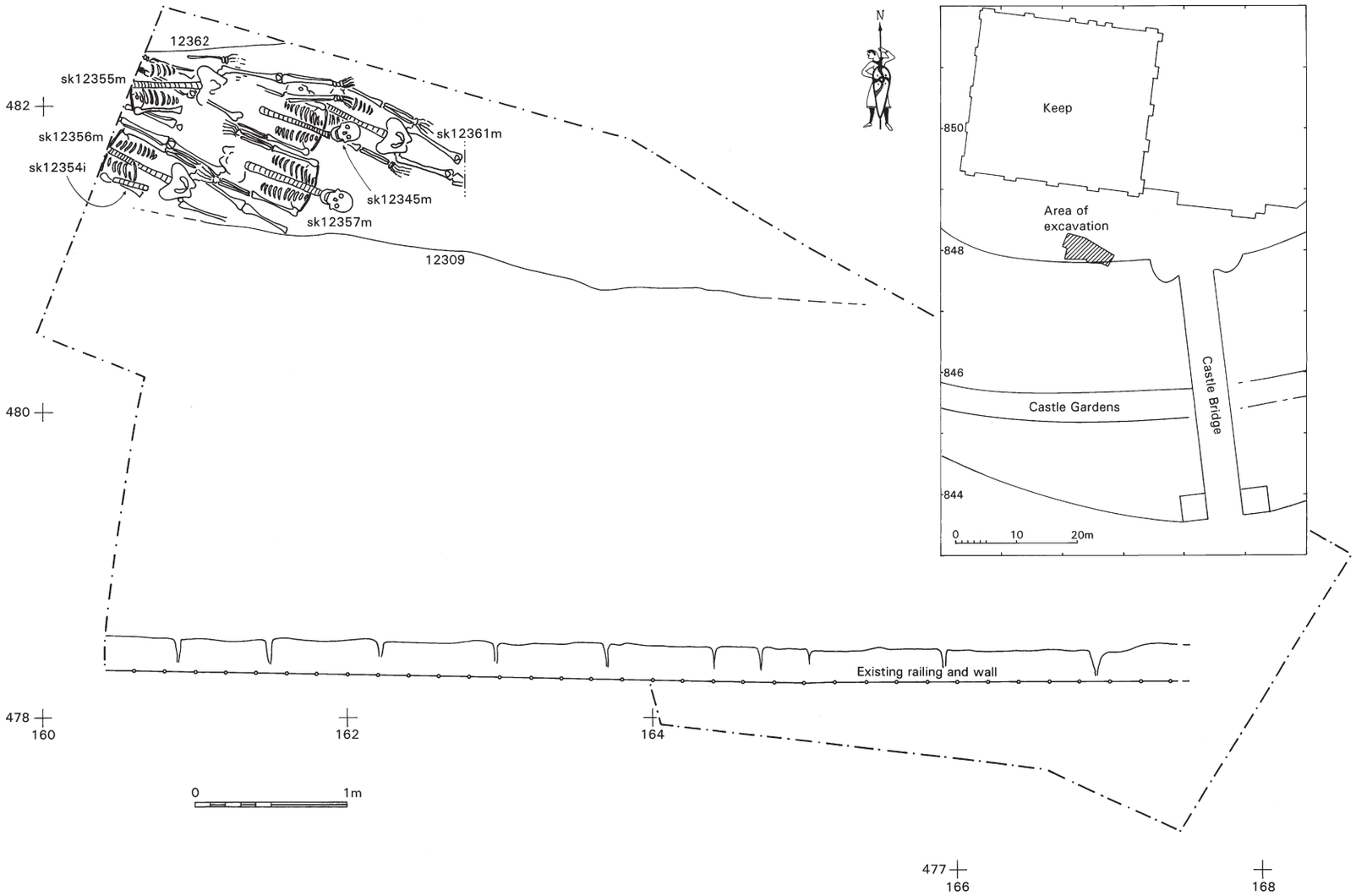


Figure 10.12 Period 6.2: Plan of Cemetery 5, 17th-century prison burials on the castle mound (T47=51). Scale 1:40

What may have been the result of quarrying was recorded to the west in a small machine trench in Area 47. Observations in both plan and section indicate the presence of a large feature to the north of the barbican ditch, probably a quarry cutting into its northern edge; this in fact appears to have consisted of a multitude of individual quarries and occasional post-holes (*47227, 47240, 47094, 47249, 47701, 47707, 47257, 47231, 47747*, *47656, 47675, 47667, 47549, 47679 and 57085;* G47/12, 47/25, G47/26, G47/31, G47/34, G47/40, 47/41 and G47/56). Most contained redeposited natural, some with organic or silty fills within their infill sequence. One pit (*47231*) had a group of post-holes and a slot set at its base, perhaps relating to a post-built feature within it. Some contained building waste such as mortar and flint. As an example of the level of extraction here, one quarry (*57091*) had overall dimensions of 2.83m x 4.58m x 0.95m, indicating an approximate extraction of around 12.31m² of sand and gravel in this instance (weighing approximately 12 tons).

Possible quarrying was also recorded in adjacent Areas 5 and 49, where more quarries and associated dumps were noted (S.4911; *49405, 49412, 49361,49350*; G5/42). Further quarrying in the immediate vicinity was recorded in section over a distance of 13m (G5/44). This observation indicates that quarrying encroached initially from the south-east, closely related to the position of the barbican rampart.

Small Finds
Pit *49361* contained an iron nail (SF7357) while pit *49350* contained a type 2A wavy-edged horseshoe (SF6835).

Pottery
A total of 0.589kg of pottery was recovered, indicating late 17th-century infill dates. Fabrics include GRE, IGBW, Speckled Glazed ware, Surrey White ware and Staffordshire slipware. Imports are limited to Anglo-Netherlands TGE and Frechen stoneware. See Appendix 6.

Clay Pipe
Amongst the small group of clay pipes from these features was a single datable bowl of 1660–80.

Open Area 62: large quarry
(Fig. 8.27, 10.13 and 10.14)
A very large quarry pit dug in front of the motte bridge appears to have been responsible for the collapse of a gatehouse (Gate 4; see Chapter 6.II), the remnants of which were found within its eastern part. The quarry cut through the remains of the rampart and underlying natural at the northern edge of the barbican ditch. Its relationship to a smaller series of quarries to the west (detailed above) is uncertain. Evidence for its extent was recorded in the main excavation and in Trial Hole 4.

Phase 1: the quarry cut
The surviving depth of the quarry was about 3.32m, with about 1–1.50m to be added to this figure to account for later landscaping. Its sides varied and numerous pits may actually have been contained within the large 'pit', giving an uneven character to its base. It measured about 41.5m from east-to-west and 21m from north-to-south, extracting approximately 4,200m^3 of sand and gravel.

Trial hole 4 was placed immediately to the south of Bell Avenue, opposite the end of the castle bridge (Fig.1.5). Deposits were recorded to a depth of 4.5m and included two large fragments of collapsed gatehouse. The eastern edge of the large quarry was recorded after the removal of the masonry. A series of small irregular post-holes (*40918*, G48/5) may have formed part of a structure within the quarry (see below).

The western side of the quarry was recorded in Area 47 (*47027*, G47/32), probably cutting into a sequence of already infilled quarries. Sections recorded across it indicate that the larger quarry consisted of two or three pits. Four machine steps were dug across its centre, recording both the sequence of infills and positioning of parts of the collapsed/demolished gatehouse within it (Fig.8.27, 10.13 and 10.14). The main observation was made to the east (*48224*, G48/3), where the top of the cut had survived landscaping at a level of 23.5–24.87m OD. The pit may have been relatively flat based at *c.*21.55–22.25m OD. Groups of post-holes at the quarry base (G48/19) may have formed parts of structures within it, perhaps acting to support its sides. At least two of them suggest fairly substantial posts (surviving to 0.60m deep). All had been infilled with redeposited natural sand.

Phase 2: infilling
In Trial Hole 4, quarrying residue was recorded beneath the collapsed masonry blocks (*40918 and 40922*, G48/5, Fig.8.27), containing early to mid 17th-century pottery. The earliest fill recorded between the two masonry blocks here (40881 and 40889) was a thick dump of redeposited sand and gravel (*40892*, S.54) containing building material and clay pipe. It was overlain by a deposit of very dark brown loam (*40880*) with frequent pebbles and brick fragments. This layer tipped down between the two blocks (to the south of which fills of the barbican ditch banked up against the southernmost masonry block). A layer of ash, mortar and brick (*40917*) was recorded to the north. To the south-east fills (*40926*, G48/6 part) consisted of layers of charcoal, ash and cinders and were sealed by later fills of the barbican ditch.

Fills recorded in the main excavation lay largely at what must have been the junction of the barbican ditch and the large area of quarrying cutting into its northern edge. In Area 4, fills were recorded in section along the northern edge of the barbican ditch (G48/5). A section to the east (S.448) crossed the former Trial Hole and recorded fills either side of it consisting of layers of sand and silt, with natural deposits recorded at a level of *c.*21.30m OD. These deposits lay at the very top edge of the barbican ditch. Similar deposits at the same level (S.437) were probably quarrying residue, or the redeposition of the rampart into the ditch.

Fills of the quarry were also recorded in five machine dug, stepped sections in Area 47 (G47/58). In the east-facing sections (S.4728, 4725, 4726, 4722, 4720 and 4718, located in Fig.10.4) an area of disturbed natural was recorded, cut into to the north by the quarry and to the south by the barbican ditch, the fills of which later overlapped the fills of the quarry. The lowest fill (*47301*, S.4725) may have lain towards the base of the quarry and was recorded at a base level of *c.*21.40m OD. This was of loam clay sand with frequent pebbles. On the next machine step (S.4722), the distinction between fills of the quarry and fills of the ditch is slightly unclear. Two quarry fills were recorded, although these contained many lenses (*47299 and 47298*), consisting of light yellow brown sandy clay with some silt and charcoal flecks. Similar fills were recorded on the next two steps

insert

fold-out

insert

fold-out

Plate 10.9 Path surfaces adjacent to collapsed gatehouse recorded in Trial Hole 4, looking west. One of the collapsed blocks of the barbican gatehouse lies in the right of the photograph (Period 6.2)

Plate 10.10 Excavation of the barbican ditch (Area 9)

(S.4720 and 4718, *47335b, 47337, 47389, 47263, 47387, 47384, 47382 and 47381b*), again consisting of redeposited natural sands and clays, some clean and some silty and darker in colour. Some humic loam (*e.g. 47337*) was incorporated, some layers consisting of patches of chalk. These fills may in part at least have been redeposition of the rampart and quarry waste into the quarry. They infilled the quarry to a depth of over 3m.

The west-facing sections were placed in such a position that they recorded mainly fills of the quarry rather than fills of the barbican ditch (S.4731, 4730, 4727, 4724, 4721 and 4719). Again, it has proved difficult to isolate fills of the quarry from those of the ditch, but those fills recorded in the northern part of the sections would appear more likely to be fills of the quarry. Numerous deposits were recorded, generally of redeposited sand and clay, some containing building materials such as chalk, mortar and tile. Tip lines evident within this sequence may indicate the presence of other quarry cuts, perhaps similar to the one recorded separately (see below).

Fills of quarrying beneath the collapsed masonry were also recorded in Area 48 (G48/5), north of the barbican ditch edge. Furthest to the north, beneath a large fragment of masonry (48002) were fills of a large quarry (S.4841, *48330*), the edge of which was recorded here. It was infilled with mixed redeposited natural (*48239, 48328, 48320 and 48319*), some of which contained flints. Later fills (such as *48318*) extended beyond the limits of the quarry. Just to the south another section (S.4842) recorded similar fills (also G48/5), again beneath fragments of masonry (*48350, 48349, 48351 and 48344*). A third section (S.4804) also recorded deposits adjacent to/beneath masonry 48002. The earliest (*48020*) contained patches of yellow decayed mortar and frequent flint lying directly beneath the masonry.

Sand and clay (G48/12) was dumped into the northern part of the large quarry, recorded in another machine dug, stepped trench was excavated, with three steps in all. The north-west facing sections (S.4815, 4812, 4813, 4814 and 4806) recorded thick dumps coming from the east and west. Numerous fills were recorded, the lowest of which (*48055*, S.4815) was of brown clay loam sand with moderate brick, tile and mortar. This had been much mixed with layers of soft, natural sand at the base of the quarry. Above were layers of redeposited natural sands and clays, some of which (*e.g. 48040*) contained charcoal, marine molluscs, fish bone, mortar and other finds suggesting the influx of refuse.

Further observations were made in the south-east facing sections (S.4818, 4817, 4816, 4811 and 4844), although here the edge of the quarry proper was not easy to define. The lower sections (S.4818 and 4817) substantially recorded natural deposits, cut into by numerous pits. At the southern end of the second step (S.4817) was a larger pit (*48146*) which may indicate the edge of this quarry. Thick dumps recorded in the uppermost step (*e.g. 48118*) may either have been general ground levelling in the post-medieval period or later, or could perhaps have been tipped into the upper part of the quarry to the south.

Small Finds

A residual silver English penny dated to 1272–1470 (SF6766) was recovered from quarry fill *47382*. Pit *40906* (G48/13) contained a fragment of 'English' wine bottle, late 17th- to early 18th-century (SF849), 4 dress-making pins (SF682, 683, 686 and 689), lead waste (SF681), formless fragments of iron (SF680) and 2 nails (SF698 and 851). Other Small Finds (x32) from the quarry are tabulated in Table 10.10 on CD. These include a farthing token of Charles I (1635–44; SF700; Davies, Chapter 10.III), a copper alloy eyelet (SF671, Fig.10.23), a type 1 lace-tag (SF678, Fig.10.23) and a pharmaceutical phial (SF6886, Fig.10.48).

Pottery

A total of 10.094kg of pottery was recovered from the quarries. Forms included a near complete GRE dish. Infill dates of early–mid and mid–late 17th-century are indicated by fabrics consisting of GRE, Metropolitan slipware, Speckled Glazed ware and TGE, as well as stonewares from Raeren-Aachen, Frechen and Westerwald (see Appendix 6).

Clay Pipe

A total of 3 bowls and 13 stems were recovered (G48/5), datable examples amongst the latter being of 1660–80 and 1680–1720. Fills assigned to G48/12 contained 5 stems.

Phase 3: later quarry

(Fig.10.13)

Cutting into fills at the junction of the quarry and the barbican ditch was a large pit (*57136*, G47/28, S.4724), measuring over 6m from north-to-south and not bottomed at a depth of just over a metre. It appears to have been cut during the time at which the large quarry to the north lay largely infilled. This pit was filled with layers of sandy silt, with building material and other refuse such as shell included. The fills included one (*47190*) which produced a fine collection of post-medieval pottery indicative of refuse disposal. A sample from the this layer suggests that it included sewage waste which contained a pumpkin/marrow seed (see below). Upper fills of the pit were of redeposited natural sand and clay, which were subsequently sealed by fills tipping southwards into the barbican ditch (see G47/26).

Small Finds

Finds from fill *47190* included 5 copper alloy pins (SF6787), window glass (SF6782 and 7475), vessel glass (SF6872) and an iron nail shank (SF6785).

Pottery

by Irena Lentowicz

(Fig.10.36, Plate 10.14)

An extremely fine assemblage of fresh mid/late 17th- to early 18th-century pottery was recovered from fills of quarry *57136* (G47/28; 7.916kg; Fig.10.36). The group included only a very small proportion of residual or possibly residual material. The assemblage was dominated not as would be expected by locally produced GRE, but by TGE. Vessels represented in this fabric included at least six octagonal plates decorated with 'Dutch-type' scenes in the centre (Fig.10.36, nos 6 and 7, Plate 10.14), at least three circular, plain plates (Fig.10.36, nos 4 and 5), two undecorated porringers (Fig.10.36, no. 11) and one decorated with blue-painted motifs (Fig.10.36, no. 12), the rims and base of three bowls (Fig.10.36, nos 8, 9 and 10), a small drug jar (Fig.10.36, no. 17) and a small pedestal cup probably an eye-bath (Fig.10.36, no. 16). These vessels are most useful in dating the assemblage, and it would appear that a late 17th-/early 18th-century date is more appropriate for this group. Although these vessels are recorded as Anglo-Netherlands TGE, it was not possible to provenance them further.

Other fine table wares included a virtually complete North Italian Marbled ware bowl (Fig.10.36, no. 13), along with body sherds from another vessel. The only other continental imports recorded were Rhenish stonewares including a Frechen mug profile and a Westerwald rim from a jug or mug (Fig.10.36, no. 15). This was elaborately decorated with applied, cobalt painted lozenge and prunt motifs and it has a rivet for a lid on the handle. It supports the mid to late 17th-century dating of this group. Sherds from at least one other vessel were present.

Non-local fine wares include the rim of a large Metropolitan slipware dish and two one-handled Surrey White ware cups (Fig.10.36, nos 3b and 3c). Locally produced drinking vessels are represented by the profile of an IGBW tyg (Fig.10.36, no. 14) and the base of another vessel, and by a substantial quantity of Speckled Glazed ware represented by profiles of a jug and a mug, also a cup base. The remainder

of the assemblage was made up of utilitarian GRE kitchen wares, including rims from a pipkin (Fig.10.36, no. 3), three dishes, two small handled bowls (Fig.10.36, nos 1 and 2), a small bowl and the base of a chafing dish (Fig.10.36, no.3d).

Clay Pipe
by Susanne Atkin
Context *47190* contained 14 bowls, 8 stems and 1 mouthpiece. Of note are three well-made bowls, including one burnished and unsmoked? marked IS (1650–70), a similar example coming from a sample. There are no records of a maker with this mark (see Chapter 10.III). Others in the group date to 1650–70 and 1650–80.

Plant Macrofossils
by Peter Murphy
(Plate 10.33)
A sample taken from fill *47190* (G47/28, BS1755) included mineral concretions with abundant *Ficus carica* and *Rubus* sp. seeds. It appeared to represent sewage waste and was fully analysed. It proved to contain seed fragments of *Curcurbita* sp. (pumpkin/marrow), Plate 10.33; see Table 10.47 and Murphy, Chapter 10.IV and Chapter 13.

Phase 4: collapse/demolition of the gatehouse
(Figs 10.13 and 10.14; Plate 10.8)
The gatehouse, which had previously lain to the north of the barbican ditch, collapsed, finally coming to rest within the large quarry described above (Plate 10.8; see additional plates in Chapter 6): it seems unlikely that the massive fragments would have been moved far from their original position. Some may have been robbed for reuse and the rest perhaps pushed into the convenient hole to the south of it. Areas of masonry debris, mostly lying beneath the blocks, were also recorded and appear to indicate demolition or robbing rubble. (Constructional details of the gate are described in Part I, Chapter 6.II, Period 3.1.)

Two deposits of rubble (*48245 and 48244*) beneath the masonry blocks in Area 48, lay above earlier fills of the quarry. The uppermost was a layer of mortar containing frequent broken flints (*48244*), perhaps the result of frost damage to the collapsed masonry.

During temporary works along the southern edge of Bell Avenue, a block of flint and mortar masonry was recorded (*12001*, T2/28). This was later recorded in more detail in Area 48 (*48003*). The watching brief observation demonstrated that the masonry lay immediately beneath the granite setts of the 1862 road (Plate 6.15), supporting the documentary evidence that the masonry was substantially lowered for road levelling in the 19th century. A modern pipe trench had been cut across the north-west corner of the block, with the suggestion of another trench roughly parallel to it about 0.30m to the north-west (which could have been caused by a machine bucket tooth).

Six pieces of masonry were recorded in Area 4 (G2/40=G48/2), although some of these were recorded again during work in Area 48 (with different context numbers assigned). The largest fragment (*40412 = 40631*) was turned by machine and the underlying face recorded revealing evidence for gate fittings (see Chapter 6). This block lay to the south (*40412*) and measured 6 by 4m in plan, overlain by another block (also 40412). A series of sections recorded around the southern side of the lower part of the block indicate a height (*i.e.* wall thickness) of just over 1m. The upper part of the block was again recorded in a series of sections (S.454, 459, 458, 457, 462/452 and 455). To the north, it survived to a level of *c.*25.00m OD, having been cut/eroded away to the south (to *c.*23.70m OD). Its maximum recorded thickness was just under 2.20m. A number of smaller fragments lay scattered between blocks *48002* and *40412* (Fig.10.14).

Two fragments of masonry were recorded in Trial Hole 4 (Plate 6.19). The southernmost (*40881*) lay with its southern edge on the northern limit of the barbican ditch. It was 'L'-shaped, measuring 3.2m east-to-west and 4.5m north-to-south. Little facing survived although there were four quoins (*40903*) at its internal angle with tooling marks visible on the bottom, eastern quoin. The whole block was 1m high to the west and 1.20m high to the east, sloping down from south to north. To the north was a square block (*40889*) measuring *c.*2 by 2.5m, again of flint and mortar bonded with hard cream-coloured lime mortar. It had large worn flint cobbles on the surface, which were interpreted on site as indicating reuse as a threshold or worn surface. This block sloped down from west to east and was faced for two courses on its western side. These two blocks lay 2–3m from the eastern edge of the quarry cut (described above). Around and above the masonry was a layer of dark brown silty sand (*40411*, S.456, G48/2), covering an area of about 7.20 by 3.5m and about 1.35m deep. This contained frequent tile and flint rubble, as well as moderate oystershell.

Small Finds
Small Finds (x 9) are presented in Table 10.11 on CD. Notable items include a bone comb trial piece (SF5763, Fig.10.26; Huddle, Chapter 10.III) and a William III halfpenny (1694–1702; SF1057; Davies, Chapter 10.III).

Pottery
(Fig.10.37 on CD)
Pottery (G48/2; 0.167kg) included the base of a Cologne-Frechen stoneware jug from fill *48005* as well as a fragment from a GRE dripping pan base (Fig.10.37 on CD, no.1).

Clay Pipe
Fill *40411* contained 5 bowls of the period 1680–1720. A further 7 bowls, 3 bases and 18 stems came from fill *40882*, including 6 of the period 1670–90, with white exteriors.

Open Area 62: other quarries
Other quarries were scattered across the barbican area. Six pits lay to the north-east of the large area of quarrying, some being cut by it (*e.g. 48221*, G48/18, not illustrated). Recording of additional quarrying to the east was again minimal due to time constraints. Three 'quarry pits' were recorded (G2/29). One (*40097*) was irregular in plan with a flat base and regular, straight or slightly concave sides. It was filled with mixed sands, silts and clays and dumps of masonry (flint cobbles, worked limestone, mortar, brick and tiles). What was probably part of the same pit (*40110*) was recorded on the other side of an air raid shelter. The presence of quantities of masonry may suggest an association with the collapse/demolition of the gatehouse to the west.

A section recorded to the far west of the site (S.301, G3/4) may either indicate fills of the barbican ditch or of a quarry along its eastern edge. No finds were recovered. Other post-medieval pits were recorded to the west (G3/11, *30028* and *30040; 30038*, G3/12).

Three large pits were recorded on a south-facing section (T20/12, S.128–5 and S.1270) beneath the Rose Lane/Castle Bridge footpath (*12841, 12144* and *12819*, S.128–5) Only residual pottery was recovered and the dating of these features remains uncertain.

Small Finds
Pit *21841* contained a nail (SF6520). Pit *30038* contained an iron punch, swivel hook, formless industrial debris and a nail (SF5557.0–.03).

Pottery
A total of 0.175kg of pottery was recovered consisting of IGBW, GTGW, Frechen stoneware and undetermined stoneware (see Appendix 6). Infill dates of late 16th–17th-century, mid 17th-century and late 17th-century are suggested.

Barbican ditch: infilling

by Elizabeth Shepherd Popescu, Andy Shelley and Niall Donald

By the middle of the 17th century, the barbican ditch was being rapidly infilled with refuse along its eastern and western arms (the latter part being substantially infilled by 1738). Quarrying waste from the rampart filled parts of the southern stretch of the ditch. Parts of the earthwork were, however, still visible in the landscape in the late 18th century and exerted a constraining influence on the development of the surrounding city. The final backfilling of the eastern part of the ditch appears to have taken place between *c.*1789 (Hochstetter) and the Cattle Market alterations of 1862 and is summarised in Period 6.3 and Period 7, Chapter 10.II. Infilling of the ditch is described below from west to east (Fig.10.3).

Ditch 13: barbican, Phase 7

Barbican ditch west (Area 3), Phase 7
(Fig.8.8)

Along the western arm of the ditch (beneath modern Castle Meadow) ditch fills were similar to those of the same date recorded elsewhere on the site. One series (all *30054*; G3/7, S.301) comprised clay, sand and chalk, much of which may have been redeposited rampart. The chalk is accounted for by the fact that it made up the disturbed natural in this area. No finds were recovered. Further fills recorded above (*30041 and 30042,* G3/8) comprised thin layers of refuse and building materials, representing the final phase of refuse dumping prior to landfill relating to the construction of the Cattle Market in 1738 (see Period 6.3).

Small Finds
Finds included medieval vessel glass (SF5518), 19 pieces of window glass (SF7471), 7 copper alloy dress-making pins (SF5589) and 6 nails (SF5568 and 5568). Of note was the recovery of human bone; the right humerus from an adult.

Pottery
A good post-medieval assemblage was recovered from these barbican ditch fills (1.569kg). The range of fabrics (GRE, TGE, Surrey White ware, IGBW, Speckled Glazed ware, DUTR, Frechen stoneware, Westerwald stoneware and North Holland slipware) and vessel forms dates these fills to the mid to late 17th century. See Appendix 6.

Clay Pipe
Clay pipes comprise 3 bowls, 11 stems and one base of 17th-century date. Three bowls date to 1660–80.

Barbican ditch south (Area 6), Phase 7
(Fig.10.4, Plate 7.6)

A total of eight section drawings were made of machine dug sections through fills of the barbican ditch in Area 6 (G6/33). The lower fills tended to be thinner with the depths of dumps increasing higher up the sequence. These were interspersed with ash and charcoal, although there was no indication of the inclusion of domestic refuse. Many of the fills, particularly those towards the top, contained high proportions of building materials including mortar, brick, tile and chalk. Some of these may relate to levelling activities prior to the construction of the Cattle Market in 1738, although ceramics present date the fills to the mid 17th century. Possible tipping from the south was evident in east-facing sections although west-facing ones show fairly level dumps. Some fills were cut by later pits, in turn sealed by relatively recent ditch fills (G6/35, Period 7).

Small Finds
One ditch fill contained facetted bone (SF5702), post-medieval window glass (SF5743), a copper alloy Type 2 lace-tag (SF5618) and 2 horseshoe nails (SF5716), a hinge pivot (SF5716.01) and 7 nails (SF5716.02). Another contained a formless fragment of iron (SF5630). The building debris dumps contained 8 copper alloy dress-making pins (SF6200 and 5927), a dress pin (SF5735, Fig.10.22), type 2 lace-tag (SF5927.01), window glass (SF5970 and 5952) and vessel glass x 3 (SF7470). A number of clay pipes of note were recovered (see below).

Pottery
A total of 1.483kg of pottery was recovered, of which almost a third was residual. A range of local wares and imports were found including GRE, IGBW (including a vessel possibly made at Fulmodeston), Surrey White ware, TGE, Frechen stoneware and Low Countries Earthen ware. These date the fills to the mid 17th century. See Appendix 6.

Clay Pipe
by Susanne Atkin
A total of 18 bowls, 3 mouthpieces and 72 stems were recovered from these fills. Fourteen of the bowls date to *c.*1600–1640, while another three were also of early 17th-century type. A few of the clay pipes from these ditch fills are illustrated (Fig.10.24, nos 3–5, 10, SF7619, 7620, 7622 and 7625). The assemblage from this area, including a number found unstratified, are some of the earliest from the site and many had not been smoked, suggesting that they may have formed part of a batch. Further comments are given in Chapter 10.III.

Barbican ditch south (Watching Brief T19), Phase 7
(Fig.10.4)

Further fills of the barbican ditch were recorded during another watching brief (T19/40). These consisted of layers of sandy silt, mixed with occasional building materials and layers of chalk, mortar and ash. Again, these probably represent infills prior to the construction of the Cattle Market in the early 18th century.

Barbican ditch south (Area 47), Phase 7
(Fig.10.4)

Late 17th-century fills of the ditch were recorded in Area 47 (G47/26) in both sides of stepped machine sections. It appears that an earlier quarry (G47/3) was backfilled at about the same time as the ditch, the fills comprising waste from quarrying of the rampart and underlying natural. Generally, these fills were of clay and sand with occasional layers of pure building material. The fills had been deposited in thick layers from the north-east. The fills recorded in the east-facing sections were more uniform than those in the west-facing sections. Overlying fills (G47/25) appear to have related to the construction of the Cattle Market and are described in Period 6.3.

Small Finds
Finds from fill *47382* contained a silver coin of 1272–1470 (SF6766). Other Small Finds (totalling 154) are tabulated in Table 10.12 on CD, of note amongst which is the large quantity of window glass providing evidence for window glazing in the vicinity (see King, Chapter 10.III). Other finds include a Nuremberg jetton (1500–85; SF6713; Davies, Chapter 10.III) and an iron key stem (SF6727.01, Fig.10.58, Mould, Chapter 10.III).

Pottery
A total of 0.323kg of pottery was recovered, including GRE, IGBW, Speckled Glazed ware, Surrey White ware, Staffordshire slipware, Anglo-Netherlands TGE and Frechen stoneware. The range of fabrics dates these fills to the late 17th century. See Appendix 6.

Clay Pipe
Clay pipe included 11 stems, 4 bases/base fragments (one dated 1660–80) and 2 mouthpieces.

Barbican ditch south (Areas 2 and 4), Phase 7
(Fig.8.27)
Within the southern part of the barbican ditch, earlier organic fills (Period 5.2) were sealed by an influx of new fills of redeposited natural (G2/30) which probably represent a mixture of refuse and waste from quarrying to the north of the ditch edge. These fills were recorded in the east-facing machine stepped sections (Fig.8.27) and were 0.70m deep. Overlying the earlier quarry waste was a 0.65m thick localised dump of ashy waste (eg *40518*, G2/31). This was a localised deposit, such ashy layers not being recorded to the east or west.

The ashy refuse deposits were overlain by more quarrying residue to the west (G2/32), about 1m thick, which were interleaved with sporadic layers of refuse. In both the west- and east-facing sections, the fills extended across the width of the ditch. Fills in the east-facing section (Fig.8.27) were either of thin clay-rich deposits, presumably from erosion and/or quarrying activities, or refuse fills apparently coming from both sides of the ditch (*e.g. 40532*). Fills recorded in the west-facing section were slightly different (Fig.8.26). Many more of them were of refuse type (dark grey silts) and there were thicker layers across the base and up the southern ditch edge (*e.g. 40767*). Finds recovered from these fills included animal bone, brick/tile, clay pipe, pottery and other artefacts (tabulated below). Despite these additional infills, the southern part of the ditch was still at least 4.5m deep, in reality much deeper if the effects of landscaping are taken into account. The upper level of the top fills considered here was at roughly 21.00m OD, considerably higher than the revetment within the ditch to the east (G9/41, described below), but relatively lower given the fall of the ditch base to the east.

Deposition of refuse and quarry waste continued to a depth of around 4m (a total of 151 fills, G2/33; Figs 8.26 and 8.27). The earlier layers included here were relatively thin and were perhaps the continuation of earlier processes, deriving from a combination of quarry residue and domestic waste and consisting of dark brown loams and clean redeposited sand, gravel and clay. Above these thin layers were thicker deposits of loam and clay with building material such as brick, mortar and chalk, interspersed with layers of ash (*e.g. 40610*). Other fills consisted of burnt silt (*e.g. 40585 and 40604*) and one (*40582*) comprised 80% animal bone. These fills brought the level of ditch fills almost to the surviving top. They were substantially thicker in the east-facing sections (Fig.8.27). Most of the fills appeared to have been tipped into the ditch from the south. The large amounts of building material in later fills must have been imported from outside the immediate area. This part of the ditch was notable for the inclusion of alternating layers of rubble and silt, perhaps suggesting the accumulation of rain-washed materials between rubble dumps/surfaces used to consolidate the base of the ditch. Some of these probably relate to paths or tracks along its base, similar to that recorded during trial work (see Plate 10.9). The presence of such routes across the former defences is attested both by documentary and cartographic records (see Chapter 10.VI).

Small Finds
Small Finds (x 52) from these ditch fills are presented in Table 10.13 on CD. Of note are two residual objects: a gilded dress fitting of 14th-century date (SF5945, Fig.7.24; Goodall, Chapter 7.III) and a ?Norman ?box mount (SF5765, Fig.6.44, Plate 6.34; Goodall, Chapter 6.III).

Pottery
A total of 3.797kg of pottery was recovered and is fully detailed by infill group/context in Appendix 6. Almost a kilogram (0.922kg) of pottery was recovered from lower fills (G2/30). which date to the mid to late 17th century. Although less than half a kilo (0.408kg) of pottery was recovered from later fills of this part of the ditch (G2/31), the assemblages are unusual in that they contain only locally produced wares. The range of fabrics dates the assemblage to the mid 17th century. The pottery from fills G2/32 (0.624kg) was retrieved entirely from samples. The group is dated to the late 17th century based on the presence of a Staffordshire slipware sherd. Although a larger quantity of pottery was recovered from upper fills (G2/33, 1.843kg) it had the same general characteristics as ceramics from earlier fills (G2/32 described above). The range of fabrics and forms dates these fills to the mid to late 17th century.

Overall, very few diagnostic vessel sherds were recovered from these groups of fills. A number of contexts contained only residual Late Saxon, early medieval pottery and medieval pottery, and almost all contexts contained some residual elements. Of the contemporary wares, locally produced products were the most common, and included GRE body sherds and IGBW, including a tyg base. English wares were represented by products of Surrey White ware and a Staffordshire slipware body sherd. It was the continental imports which were more interesting, contrasting with material from sections in the eastern arm of the ditch which produced fewer foreign imports. As well as the ubiquitous Rhenish stoneware drinking and pouring vessels from Raeren-Aachen and Frechen, these included a Werra ware plate rim and sherds from a North Holland slipware cockerel bowl, as well as a few sherds of Anglo-Netherlands TGE.

Clay Pipe
by Susanne Atkin
Clay pipes included 24 stems, 9 bowls and 4 bases. Amongst the bowls are examples datable to 1620–40, 1640–70, 1660–80 and 1680–1720, the latter stamped IM (fill 40427). This mark is attributed to Jane Morgan. Another example is of AB crowned (fill *40452*). Both marks occur on other parts of the site (see Chapter 10.III).

Barbican ditch south (Trial Hole 4), Phase 7
(Fig.8.27)
Further layers were recorded to the south, filling part of the barbican ditch (G48/11 part) and included mortar-rich deposits. Later ditch fills consisted of thick dumps of loamy material (*40899 and 40908,* G48/4, Fig.8.27). An area of compacted mortar patches (*40913*) with frequent small fragments of brick and chalk ran diagonally across the trench from north-west to south-east and may have formed a pathway, repeatedly consolidated with rubble (Figs 10.13–10.14, Plate 10.9). This lay at a level of 21.26m OD and could, perhaps, have led into/across the barbican ditch and quarry. Its level suggests that it could have been in place prior to the collapse of the masonry, as it was lower than the base of the southern masonry block (*40881*, detailed above). The path, however, appears to have lain within a dip or 'hollow way' at the base of the ditch. A later observation in Area 4 (S.447) recorded a sequence of mortar layers, which may support the interpretation of a path at this point. Some were thick mortar rubble, while others (such as *40826*, G2/33) were thinner and lay at around the same level. Layer *40826* was of brick and mortar rubble, stretching for a distance of *c.*10.5m

east-to-west, suggesting when combined with the trial hole observation a path about 2m wide (Fig.10.13).

The first fill to abut the southern block of masonry from the collapsed gate (40881) was of brown sand/loam and mortar (*40904*). A series of thinner fills followed (*e.g. 40900*), forming fairly level bands within the ditch and abutting the masonry block. These were of grey brown sandy loam with building rubble, one of reddish brown and generally interleaving with each other. Overlying these was a layer of compacted mortared brick, flint and pebbles (*40890*), which ran across the south-western corner of the trench in a similar way to the earlier possible path, running parallel to the edge of the masonry block. This was sealed by dark brown loam (*40885*) with frequent pebbles, which again may have formed a rough, stony path, a total of five possible path surfaces being recorded in all. Later fills (*40886 and 40883*) covered the same area. Subsequent deposits extended further north to abut or cover the southern masonry block, extending northwards to cover fills of the quarry as well.

Observed along the eastern side of the trench (G48/6, part, not illustrated) were dumps of post-medieval date, of dark brown sandy loam and gravel in thick bands showing tip lines (*e.g. 40869*), sloping down from south to north. Much of this material may have been the remnants of the barbican rampart, being pushed into the ditch although the dark, silty nature of some suggests refuse deposition. A major fill (*40873*) of brown sandy loam was recorded to the east. This was sealed by later fills, filling both the quarry and ditch.

Small Finds

An assemblage of 98 Small Finds was recovered from these fills (Table 10.14 on CD). These include a coin of William III (1699; SF650; Davies, Chapter 10.III) and a copper alloy token (1626–1635; SF609; Davies, Chapter 10.III). Illustrated items consist of an iron buckle plate (Sf839, Fig.10.23; Mould, Chapter 10.III) and a glass bottle with seal of late 17th- to 18th-century date (SF587, Fig.10.49; Shepherd, Chapter 10.III).

Pottery

A total of 3.893kg of pottery was recovered, comprising GRE, IGBW, TGE, Speckled Glazed wares, Surrey White ware, Whieldon-type ware, Metropolitan slipware, Rhenish stonewares from Cologne, Frechen and Westerwald. Fills assigned to G48/6 (part) have been assigned a general 17th-century date, while the much larger assemblage from G48/4 (3.604kg) appears to date to the 18th century (on the basis of the presence of Whieldon type ware), although a pre-1738 date is not precluded. See Appendix 6.

Clay Pipe

by Susanne Atkin

A large assemblage of 255 clay pipes came from G48/4 fills of the barbican ditch, comprising 16 bowls/bowl fragments, 5 bases, 231 stems and 3 mouthpieces. One stamped pedestal base (SF819) is of WA, possibly William Adamson, recorded in the period 1763–9, although an earlier date is possible (see Chapter 10.III). Datable pieces are of 1670–90 and 1680–1720. The G48/6 fills contained a further 71 pipes, comprising 8 bowls/fragments, 3 bases, 59 stems and one mouthpiece. Date ranges are 1660–80, 1680–1710 and 1680–1720.

Barbican ditch east (Area 9 and Trial Hole 1), Phase 7 (Figs 8.9, 10.6, 10.15–10.16, Plates 1.10 and 10.10)

Substantial infills of the barbican ditch were recorded in Area 9 and Trial Hole 1, with the trial excavation concentrating on finds recovery and the recording of features evident within the ditch. The overall depth of refuse fills above earlier deposits and below later fills related to Cattle Market landscaping (of 1862 in this area) was about 5m. Given that it is known that the ditch was cleaned out and that a considerable degree of shrinkage of organic fills is likely, the original quantity of refuse deposited into the ditch must have been massive. The tipping of individual fills suggests that most of the refuse came from tenements to the east. Fills included here were generally dark, often with an organic content (G9/41 part). The sections recorded in the main excavation show the process of infilling as being one of gradual and probably continual deposition. Some fills in particular were very widespread, deep deposits which were either homogeneous or composed of merging lenses of different soils.

Trial Hole 1: this trial trench, placed above the eastern stretch of the barbican ditch (Plate 1.10), measured 20.5 by 14m at the surface and was stepped to a full depth of 7m from the modern ground surface (see further details in Part 1, Chapter 1). The area examined by the trial work was later machined away during the stepped excavation as part of the main site. Distinct phases of activity were apparent within the deposits excavated in the trial trench, including the construction of a revetment across the ditch. The lowest of the fills recorded in the trial hole lay slightly above those assigned to this period from the main excavation and were different in character, being distinctly organic and of refuse-type, containing very large finds assemblages. Ditch fills exposed in Trial Hole 1 were recorded in plan and section in two steps (Fig.10.7, S.4, 6, 8 and 10–14). Some equations with adjacent fills recorded during the subsequent open area excavation have been possible.

Phase 7a, refuse dumps: the lower of the refuse fills would presumably have overlain fills of late 16th–17th-century date (Period 6.1) recorded in the machine-stepped excavation. Above this fairly thick sequence of dumps (*e.g 92778*) was a shallow sub-circular pit (*92772*) lined with chalk blocks, with a diameter of 1.60m and 0.29m deep. Thick dumps of mixed yellow brown or dark brown clay sand or clay followed (*e.g. 92771*), including a layer of rubble. These fills included particularly large quantities of finds. Subsequent fills consisted of dark coloured loams (e.g. *92764,* S.6 and 8), again containing large quantities of refuse. Later fills recorded in the sections (S.4) can be equated with those recorded in the main excavation (see *91614*, etc below), some of which may have been used as makeup dumps prior to the construction of the revetment.

Small Finds

Table 10.15 on CD shows the Small Finds (x 445) recovered from this phase of barbican ditch infilling in context number order. Illustrated residual items consist of a sawn antler ?wedge of ?Late Saxon date (SF143, Fig.4.102; Huddle, Chapter 4.III) and a 15th-century iron purse frame (SF347, Fig.8.38; Mould, Chapter 8.III). Illustrated post-medieval finds comprise: tin glazed wall tiles (SF492, SF504, SF832, SF434, SF434.01, SF454.02, SF833, SF460.01, SF460.02, SF466, SF467, SF830, Fig.10.59; Goffin, Chapter 10.III); large iron door knocker (SF29, Fig.10.57; Mould, Chapter 10.III); copper alloy ?Dutch head dress pin dating to the ?first half of the 17th century (SF53, Fig.10.22; Goodall, Chapter 10.III); iron harness buckles (SF2, SF62, Fig.10.73; Mould, Chapter 10.III); vessel glass (SF499, SF78, SF390, SF315, Figs 10.47, 10.48 and 10.49; Shepherd, Chapter 10.III); bone knife handles (SF107, SF437, Fig.10.53; Huddle, Chapter 10.III); iron colander or skimmer (SF865, Fig.10.56; Mould, Chapter 10.III); iron spur rowel and spurs (SF33, SF49, SF54, Fig.10.72, Mould, Chapter 10.III); spur leather (SF398, SF320, Fig.10.72; Mould, Chapter 10.III); iron staple hasp (SF39, Fig.10.58; Mould, Chapter 10.III); iron locks (SF41, SF93, Fig.10.58; Mould, Chapter 10.III); knife blades (SF46, SF209, Fig.10.52; Mould, Chapter 10.III); copper alloy buckle (SF55, Fig.10.22; Goodall, Chapter 10.III); leather shoes (SF63, SF74, SF88, SF206, Fig.10.30 and 10.31; Mould, Chapter 10.III); bone scoops (SF117, Fig.10.56; Huddle, Chapter 10.III); iron scissors (SF89,

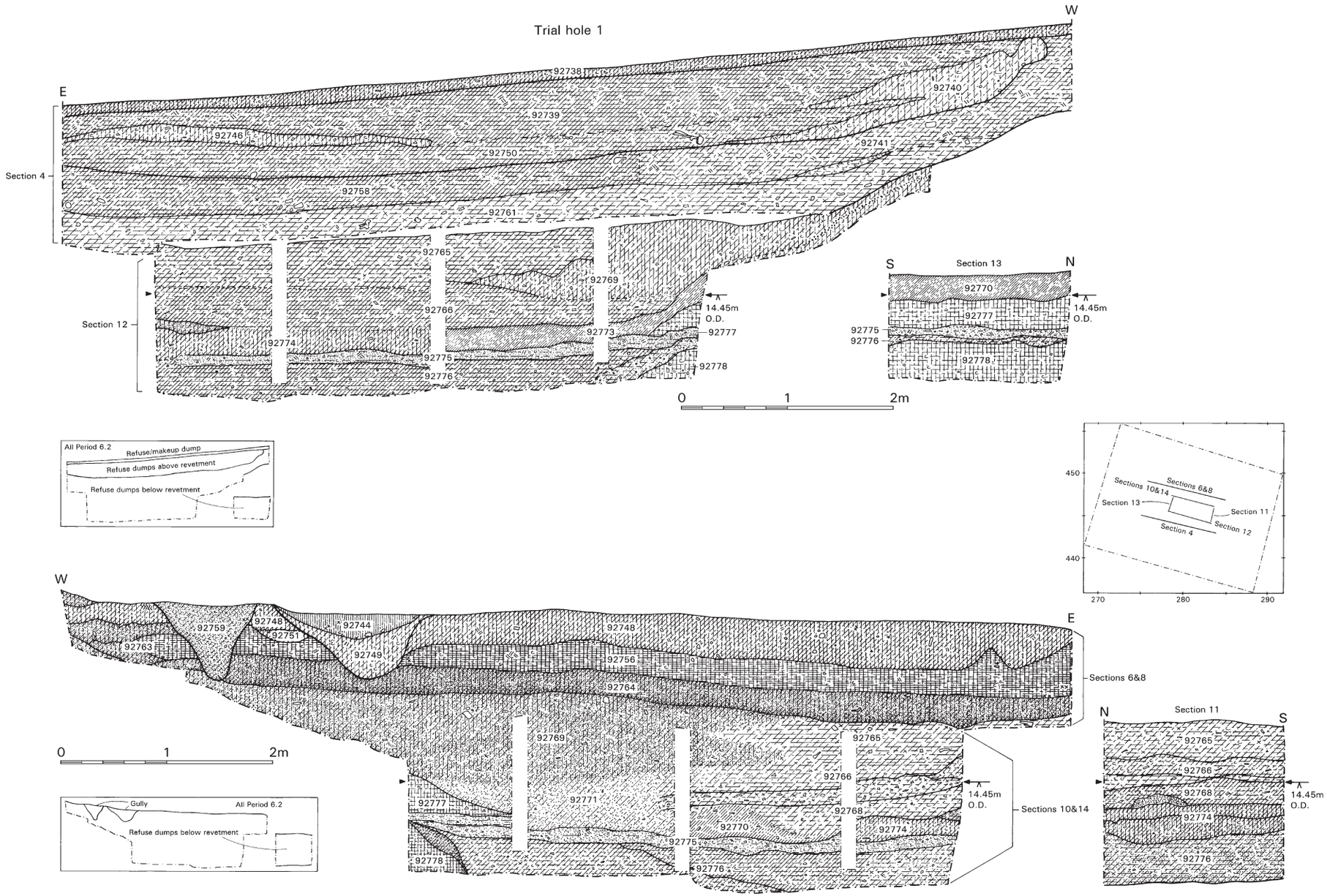


Figure 10.15 Period 6.2: Sections within Trial Hole 1, showing barbican ditch fills. See Fig.10.11 for location. Scale 1:50

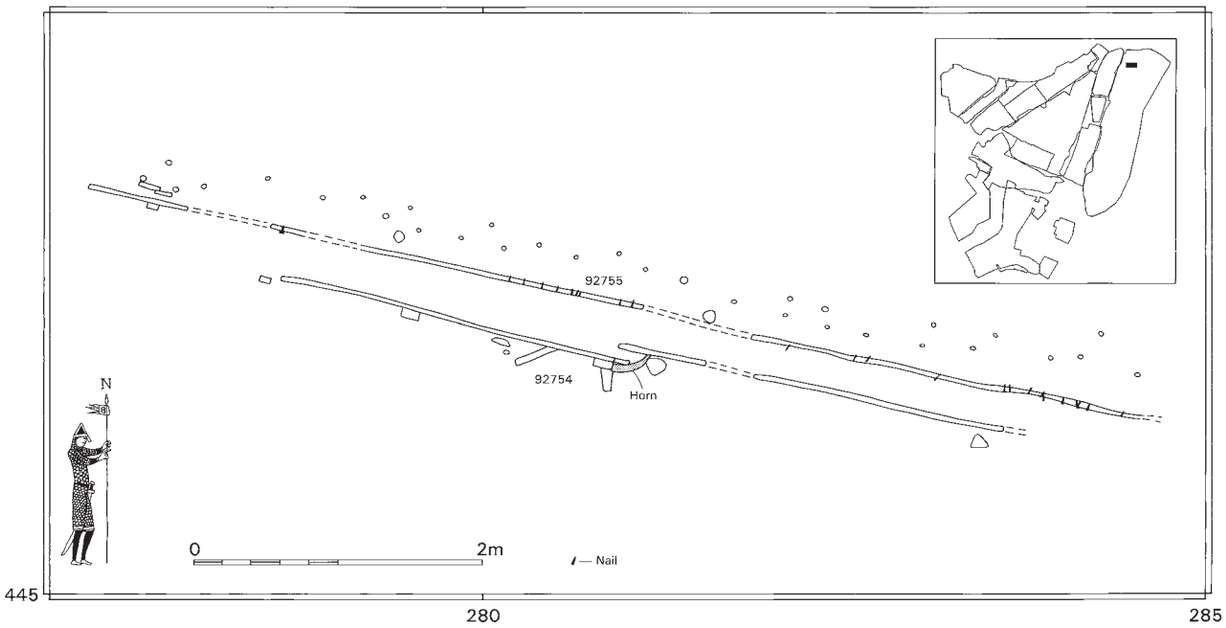


Figure 10.16 Period 6.2: Timber revetment within barbican ditch infill sequence (Trial Hole 1). See Fig.10.17 for location. Scale 1:50

Fig.10.67; Mould, Chapter 10.III); iron ?pot hanging mechanism (SF214, Fig.10.56; Mould, Chapter 10.III); decorated clay pipes (SF394, Fig.10.24; Atkins, Chapter 10.III); iron ring (SF81, Fig.10.75; Mould, Chapter 10.III); textile (SF91, Fig.10.27; Crowfoot, Chapter 10.III); leather harness strap (SF96, Fig.10.73; Mould, Chapter 10.III); iron vessel (SF208, Fig.10.51; Mould, Chapter 10.III); ivory comb (SF205, Fig.10.31; Riddler, Chapter 10.III).

Pottery
by Irena Lentowicz, with Anthony Thwaite (stonewares)
(Figs 10.38–42)

Overview
Almost one fifth of the entire ceramic assemblage from the site was recovered from fills of the barbican ditch recorded in Area 9 (G9/41), the majority of which (99.5%) was allocated to Period 6.2. It is not reasonable to discuss the post-medieval dumping into the barbican ditch as a single entity, and the assemblage is described throughout this chapter using the phasing of this complex feature, providing at least some degree of sequential analysis of the depositional processes. The majority of the discussion is based on the material excavated from the trial excavation (Trial Hole 1); the pottery from the excavation was recovered in the main from the stepped excavation of the ditch and comes from samples. For the larger groups, the post-medieval assemblage is discussed in general terms of fabric types and forms. Additional details are presented in Appendix 6.

Phase 7a: Refuse dumps
(Figs 10.38–10.40)
The lowest fills assigned to this phase date to the mid 17th century, while the upper fills are attributable to the late 17th century. Fabrics and forms are detailed in Appendix 6 in stratigraphic order, with only the significant illustrated groups detailed here. In total, this first phase of post-medieval refuse dumping produced 177.822kg of pottery, 67% of the group assemblage (G9/41), dating to the mid 17th century. The range of fabrics consists of local wares, English and continental imports (GRE, IGBW, Speckled Glazed ware, Metropolitan slipware, West Norfolk Bichrome ware, King's Lynn NS ware, Staffordshire slipware, Surrey White ware, TGE, Anglo-Netherlands TGE, Martincamp, North Holland slipware, DWE, North Italian Marbled ware, Spanish Lustreware, Spanish amphora and stonewares from Frechen, Cologne and Westerwald).

Selected pottery from this substantial assemblage is illustrated in Figs 10.38–40. GRE from fill *92776* included a dish/plate (Fig.10.38, no.7). Both IGBW and Speckled Glazed ware appeared to be providing requirements for drinking vessels, supplemented by other non-local English fabrics mentioned above. Rims, bases and handles from a number of IGBW cups, mugs, tankards and tygs, as well as two jug bases, were recorded (92768, Fig.10.38, no.1), and included a small miniature Speckled Glazed ware jug or possibly a vase (Fig.10.38, no.6). The absence of Rhenish stoneware drinking vessels was apparent. Although products from Cologne and Frechen appeared throughout the fills, these appear to be mainly from jugs and *bartmann* flasks (92768, Fig.10.38, no.2). The small drinking mugs of Cologne-Frechen production were entirely absent and although Westerwald stoneware mugs began to make an appearance these were not very common, although found from the lowest contexts including a highly decorated body sherd (92770, Fig.10.38, no.3). In addition, Raeren-Aachen stoneware vessels continued to be used and a rather fine decorated body sherd was recovered showing the head, in profile, of a woman (92768, Fig.10.38, no.4). Metropolitan slipware was represented by a bowl (92776, Fig.10.38, no.8).

It is the fine wares that provide the most interesting pottery. TGE includes a number of serving vessels, including rims and bases from bowls and plates, as well as a rim and handle from a *malling* jug (92776, Fig.10.38, no.5); other vessels include rims and bases from drug jars and smaller ointment pots. However, a single sherd of a Spanish Lustreware vessel was recovered; these are uncommon in Norwich. The sherd is burnt or corroded due to post-depositional changes in the soil. In addition, a sherd of Spanish Amphora was also recorded.

These layers and dumps were followed by layers which contained pottery dated to the late 17th century (Fig.10.39). Although the range of post-medieval fabrics was similar, vessel forms and diagnostic sherds appeared to indicate a mid to late 17th-century date. GRE, IGBW, Speckled Glazed ware, Metropolitan slipware and other local and English wares included the same forms. IGBW included a tankard base (92761, Fig.10.39, no.16). GRE vessels included deep and shallow bowls, small handled jars/bowls, dishes and large chargers, jars of varying sizes and ornamentation including plain butter jars, pierced jars and jars or bows with frilled handles as well as less common, more unusual vessels such as chafing dishes (92741 and 92758, Fig.10.39, nos 1–10). However, Rhenish stonewares provided more detailed dating including a number of late medallions and motifs on Cologne and Frechen *bartmann* flasks (Fig.10.39, no.19). Westerwald stoneware was decorated with manganese and cobalt painted decoration and motifs which indicated a post 1660 date for these vessels. Forms included a jug with ribbed neck (92761, Fig.10.39, no.17) and a chamberpot with lion and medallion on applied pads (92741, Fig.10.39, no.18; see below): this decorative technique was introduced from 1680 onwards. TGE also provided dating evidence; along with an eyebath base (92761, Fig.10.39, no.11, a body sherd bearing script (92765, Fig.10.39, no.12), a dated fragment from a hollow ware vessel (probably a mug or jug) was also recorded bearing the numbers [16]61 (92765, Fig.10.39, no.13). Other TGE forms included a bowl base (92761, Fig.10.39, no.14) and a decorated

drug jar (92761, Fig.10.39, no.15). Although Staffordshire slipware is not so evident in these contexts, the combed slipware indicates a post 1680 date.

A further 13.206kg of pottery came from fills *92764* and *92763* (Fig.10.40). Again the range of fabrics and forms is similar, with a small quantity of residual earlier fabrics present. GRE kitchen and serving wares being most common (including rims from plates/dishes, jars, small handled jars/bowls, pancheons, butter/storage jars and a storage jar base: Fig.10.40, nos 1–6), supplemented by Metropolitan slipware dishes and a Surrey White ware bowl (Fig.10.40, no.12). Drinking vessels are again dominated by IGBW represented mainly by bases from tygs and other drinking vessels, while only a few sherds of Speckled Glazed ware were recorded. Westerwald stoneware again is represented by drinking vessel rims and bases, with products from Cologne-Frechen including *bartmann* flasks and a small jug, as well as a jar rim. TGE forms are beginning to be dominated by plates (Fig.10.40, no.10) and drug jars (Fig.10.40, no.9), represented by both rims and bases, although bowls (Fig.10.40.7) and a possible teacup (Fig.10.40, no.8) were also present. One new fabric was recorded; the bottle rim of King's Lynn NS ware (Clarke and Carter 1977, 238). Four very small sherds of Staffordshire slipware were also recorded (Fig.10.40, no.13), but again, these may be intrusive. A mid 17th-century date was also allocated to this group.

Clay pipe
by Susanne Atkin
A total of 959 clay pipe fragments came from these fills, of which the majority came from fills 92766 and 92768. Fill 92766 contained 102 bowls and bowl fragments, 14 bases, 305 stems, 16 mouthpieces and kiln debris (SF867 and 387). Further kiln debris was recovered from fills 92761 (SF355) and 92765 (SF196). Fill 92768 contained 145 bowls/bowl fragments, 17 bases, 331 stems, 13 mouthpieces and 13 spurs. Five bowls of 1640–80 marked IS occurred in *92768* (the same mark was found in Area 8). Illustrated pipes from these fills appear in Fig.10.24, nos 12–13. Datable bowls were of 1640–80, 1650–70, 1660–80 (one with TB stamped on its sides; SF436) and 1680–1720.

Animal Bone
A large assemblage of animal bone was recovered from fills of the barbican ditch, including a substantial number of complete horse, dog and cat bones. Whilst not found in articulation it is probable that these bones derive from complete skeletons discarded in the ditch and subsequently reworked. Further details of the assemblage are given by Albarella *et al* in Part III, Chapter 3, with summary information in Chapter 10.IV.

Phase 7b, construction of a timber revetment: a timber revetment was recorded in the eastern part of the ditch during trial work, being 'sandwiched' between post-medieval fills (Fig.10.16). It ran across the width of the ditch, at right angles to its sides, and may have extended the full width of the ditch (although only recorded for a length of less than 7m). It probably allowed access to the ditch for refuse disposal and/or access across the ditch itself. Waste was tipped onto the ditch on both sides of the revetment, which appears to have been relatively quickly covered itself.

The revetment was constructed from re-used timber planks, braced with timber uprights, and survived to 0.50m in height. The width of any associated causeway remains unknown, although this may rather have served as a property boundary. The two parallel sets of planking were inserted about 0.30–0.40m apart (*92755 and 92754*), the gap between them being filled with yellow clay (*92752=92762*). The easternmost of three narrow upright planks to the south was offset slightly behind the others and at the junction of the two a horncore had been used to hold two of the planks together, combined with a roughly circular post-hole and other pieces of timber. Most of the bracing posts were set on the outer face of the planks, while nails had been hammered along their length. A multitude of small stakes (34 in all) were recorded to the north, with two squared timbers to the far west. Two of these, closest to the planking were larger than the rest and may have braced the planks on that side. The small stakes suggest placement in two approximate rows.

Small Finds
A total of 25 Small Finds were recovered from deposits associated with the construction of the revetment (Table 10.16 on CD). Of note is an antler hammer (SF7397, Fig.10.64; Huddle, Chapter 10.III).

Pottery
The pottery from fills connected with the construction of the revetment (from contexts *92752 and 92762*; 4.491kg) was similar and is detailed in Appendix 6, indicating a mid to late 17th-century date. Contemporary fabrics comprising kitchen and table wares consist of GRE, Metropolitan slipware, IGBW, Speckled Glazed ware, Cologne and Frechen stonewares and DWE.

Phase 7c, refuse dumps: the revetment was overlain by further refuse dumps. The first of these (*92750*) was of very dark grey clay silt with frequent brick inclusions, containing much refuse and artefacts including a sixpence of William III (1694–1702). A large quantity of pottery was again present (over 56kg), the forms supporting a late 17th-century date for deposition. The final dumps in this refuse sequence were of dark yellow brown clay loam with frequent chalk (*92746*), followed by very dark brown silty clay (*92738/92739*). The presence of three sherds of Whieldon ware (the only ones recovered from the ditch) date these final domestic refuse deposits to the early 18th century, indicating that these were the last surviving refuse fills in this part of the ditch, prior to the construction of the Cattle Market in 1738.

Small Finds
An assemblage of 136 Small Finds was recovered from these deposits (summarised in Table 10.17 on CD). Significant finds include a horse jaw-bone sledge of probable Dutch influence (SF421, Figs, 10.69 and 10.70, Plates 10.23 and 10.24; Huddle *et al*, Chapter 10.III). Illustrated items consist of copper alloy buckles (SF168, SF4, Fig.10.22; Goodall, Chapter 10.III); vessel glass (SF12, SF16, SF159, SF160, SF180, SF148, Figs 10.45, 10.47, 10.48 and 10.49; Shepherd, Chapter 10.III); tin-glazed wall tile (SF412, SF7630, Fig.10.59; Goffin, Chapter 10.III); iron lock (SF131, Fig.10.58; Mould, Chapter 10.III); moulded wall plaster, leaf motif (SF863, Fig.10.60; Kirkham, Chapter 10.III).

Pottery
by Irena Lentowicz
(Figs10.41–10.42)
Earlier deposits were sealed by fill *92750* from which a large quantity of pottery was recovered which accounted for almost 6% of the entire ceramic assemblage (56.190kg; (Fig.10.41). This assemblage was dominated by GRE kitchen wares dominated and some fine vessels were recovered. The range of forms includes jars (fifty one rims), storage jars (fourteen rims), bowls (seven rims), dishes (fifty five rims), handled bowls (nine rims), pancheons (seven rims), small handled jar/bowls (thirty six rims), large bowls (six rims), as well as less common vessels such as Dutch ovens (two rims), colanders (complete profile) and jugs (four rims). Metropolitan slipwares and Surrey White wares complemented these with seven dish rims of the former, while the latter included rims from a bowl, chamber pot, dish and handled bowl, as well three jar bases and a possible drinking vessel base. Drinking vessels were again dominated by IGBW and Speckled Glazed ware, though the latter was less common. Along with the usual IGBW tyg bases and drinking vessel rims (thirty three examples in total), Speckled Glazed ware was represented not only by bases from cups and drinking vessels (five examples), but also by a jar rim and base, and more unusually two flatware bases. What dated this context firmly to the late 17th century however, is the presence of a small quantity of Staffordshire slipware represented by the rims from two small mugs. Other drinking vessels included a small number of Westerwald stoneware mugs, but Rhenish stonewares were still represented in the main by jugs and *bartmann* flasks from Cologne and Frechen. TGE included a wide range of serving and household wares represented by rims and bases from plates, bowls, dishes, chargers, porringers, handled bowls as well as chamber pots and drug jars (Fig.10.41, nos 1 and 2). Two small body sherds of North Italian slipware were also recorded; these could be residual during this

phase or represents a long-lived vessel. In addition, a coin of William II dated 1694–1702 was also recovered from this context, providing external dating evidence to support the ceramic date.

The pottery from fills *92746* and *92739* (18.928kg) was remarkably similar, with GRE kitchen wares supplemented by Metropolitan slipware and Surrey White ware (Fig.10.42). The assemblage from these fills was very similar, though the group from 92746 was much smaller and consisted of GRE body sherds, a TGE bowl, a Surrey White ware mug base and a Staffordshire slipware mug rim and handle. The assemblage from 92739 was much larger with GRE kitchen wares supplemented by Metropolitan slipware and Surrey White ware. The range of vessels forms recovered was not so varied, and included dishes (twenty six rims), jars (twenty one rims), handled jars (eight rims), small handled jar/bowls (eight rims), storage jars (four rims), pancheons (four rims), pipkins (two rims), a butter jar (Fig.10.42, no.4) and spouted dishes (two rims). Surrey White ware was restricted to two bowl rims and a small saucer-like vessel, while Metropolitan slipware was represented by sherds from a single dish. The quantity of Staffordshire slipware increased, and included rims from dishes, plates and posset pots as well as a number of mug rims, bases and handles (Fig.10.42, no.1). It appears that in the late 17th century, kitchen wares began to be increasingly provided by the Staffordshire Potteries with other non-local industries going into decline. Drinking vessels were dominated by IGBW, which included tygs and cups (twelve rims and seven bases (Fig.10.42, nos 2 and 3), as well as jar or jug bases. Speckled Glazed ware was again less common but also included a jar base as well as cup bases (three examples). Rhenish stonewares were represented by *bartmann* flasks (Fig.10.42, no.5) and jugs from Frechen, with no products from Cologne recorded, while Westerwald stonewares included rim and base sherds from mugs. Other imports included a fragment of Spanish Amphora. Table wares were represented by TGE dishes (four rims), bowl, handled bowls (two rims) and plates (six rims), as well as by household forms such as chamber pots (four rims) and drug jars (one rim and six bases). The latest pottery recovered from these fills, and indeed from G9/41 as a whole are three sherds of Whieldon-type ware, which dated this context to the early 18th century.

Clay Pipe
by Susanne Atkin
Four fills (of which two appear in Phase 7a above) produced a remarkably high number of finds; 495 bowls, 1,006 stems and bases and 41 mouthpieces. The bowls divide into two main date ranges: 1640–80 (see Phase 7a above) and 1680–1720. Fill *92750* contained 125 bowls and bowl fragments, 16 bases, 204 stems and 5 mouthpieces. Of the bowls, 119 were of 1680–1720 date. Fill *92739* contained 86 bowls/fragments, 6 bases, 118 stems and 7 mouthpieces. Late marks on these are IM (Jane Morgan), NS (unknown maker) and IR/RI (unknown maker; Fig.10.24, nos 14–15) and are of the period 1680–1740. The 1680–1720 group and the 1680–1740 marks are often found in combination on Norwich sites and mark a transitional phase between the 17th and the 18th centuries; they are usually followed by the pedestal-base types, none of which occur in this trial hole or in other contexts in Area 9, suggesting a cut-off date before 1740. Further discussion is given in Chapter 10.III.

Phase 7d, gullies: the revetment was cut into by two later gullies (G9/43, Fig.10.15). The smaller example (*92760*) was recorded to the west had a v-shaped profile, surviving to 0.90m long and 0.40m wide. It ran north-to-south and was filled with very dark greyish brown sandy clay with a concentration of charcoal in the base. Just to the east was a slightly wider gully (*92743*) and surviving to almost 5m long and 1.5m wide. This curved round to a butt end to the south-east and had a more concave base than the adjacent gully.

Small Finds
Gully 92743 contained an iron and copper alloy blood-letting knife (SF5), glass bottles, including phials (SF339), window glass (SF340), iron nails (SF341), iron sheet (SF342), lead sheet (SF344), bone waste (SF496), bottle glass of late 17th- to early 19th-century date (SF146), window glass (SF147), wine glass of early 18th-century type (SF148), window glass (SF494), iron nail (SF149), iron encrustation (SF495), nail (SF495.01) and a circular wooden object with a centrally pierced hole (SF150). Gully 92760 contained an iron nailed binding (SF27). A subsequent makeup dump above the barbican ditch (*92779*, G9/43) contained a coin of Aethelred (SF1).

Pottery
Pottery was recovered from gully *92743* (2.675kg). Contemporary fabrics consist of GRE, TGE, Metropolitan slipware, Surrey White ware, Staffordshire slipware, IGBW, Speckled Glazed wares and Frechen stoneware. Most of the assemblage is late 17th-century in character. See Appendix 6.

Area 9, Phase 7 (Fig.8.9): overlying Period 6.1 fills of probable late 16th- to 17th-century date recorded in the south-facing sections of the barbican ditch, were fills of distinctly refuse type, again tipped into the ditch from the east. They were broadly contemporary with those recorded in Trial Hole 1 (Phase 7a–c above) and any equated with those recorded earlier are noted above. The earliest consisted of dark grey brown sandy silt (*91387*) with frequent charcoal, pebbles and moderate building material, as well as a partially articulated pig (S.992, 996 and 998, Fig.8.9). Large quantities of infills followed (*91527* to *91480* in Fig.8.9), ranging in thickness and character and including refuse and building rubble. Many of the fills were concentrated in the western part of the ditch, tipping from the east having effectively shifted its base westwards. Upper fills included a layer of compacted chalk (*91431*) which may have served to stablise earlier fills and permit access to the ditch base. At the end of this sequence of fills, the ditch had been infilled along this stretch to a depth of about 7m from its base. It would still have formed a dip of some 3m deep from contemporary ground level.

A large number of other fills, similar to those detailed above were recorded in further sections across the barbican ditch (full details are available in the project archive). Again they indicate the disposal of refuse into the ditch during the mid to late 17th century.

Small Finds
Table 10.18 on CD shows finds from the main excavation in context number order. Illustrated items consist of a pharmaceutical phial (SF6359, Fig.10.48; Shepherd, Chapter 10.III); iron hook fastener (SF6256, Fig.10.23; Mould, Chapter 10.III); wooden spoon (SF1097, Fig.10.56; Huddle and Taylor, Chapter 10.III); iron key (SF6296, Fig.10.58; Mould, Chapter 10.III), gilded copper alloy finger ring (SF6390, Fig.10.22; Goodall, Chapter 10.III) and a copper alloy buckle (SF6263, Fig.10.22; Goodall, Chapter 10.III).

Pottery
A total of 5.034kg of pottery was recovered. Comments on pottery from fills which could be linked directly to those recorded in Trial Hole 1 are given in Appendix 6 (phases 7a–c). Contemporary fabrics recovered include GRE, IGBW, West Norfolk Bichrome ware, Metropolitan slipware, Surrey White ware, TGE, Frechen stoneware and Cologne-Frechen stoneware. Infilling during the mid 17th century is indicated (see Appendix 6).

Clay Pipe
by Susanne Atkin
Much of the clay pipe assemblage from the stepped machine sections through the barbican ditch came from samples and is therefore small-scale. A total assemblage of 223 clay pipe fragments was recovered from these fills, comprising 56 bowls/bowl fragments, 156 stems, 4 mouthpieces, 6 heels and a spur. Date ranges of bowls are 1630–60, 1640–50, 1640–60, 1660–80 and 1680s. The largest individual groups came from fills 91717, 91731 and 91732, each of which contained material attributable to the 1680s. Possible kiln waste came from fills 91665 and 91731, while bowls from several other fills were unfinished.

Barbican ditch east (Watching Brief T28), Phase 7
Late fills of the ditch were recorded in a series of machine steps dug through fills of the barbican ditch in watching briefs to the north of Area 21 and Area 9 (T28/177). The

recorded fills spanned *c.*16.20 to 19.00m OD (S.1267, 1269, 1261/1262, 1263 and 1264). Some were of redeposited natural sand and gravel, with thick deposits of chalk being present. Others were darker grey or brown and siltier in character, some with high proportions of ash or charcoal, and had apparently been tipped into the ditch from the west. Adjacent fills were recorded at Site 150N (see Chapter 10.VI).

The Early Cattle Market

by Elizabeth Shepherd Popescu and Andy Shelley

The informal pre-1738 cattle market may well have expanded over the largely backfilled barbican ditch from Hog Hill to the area in front of the Castle Mound bridge. There were, however, only patches of surfacing surviving which may have dated to this period. These overlay earlier activity dating to the late 16th to early 17th century (G5/52 and G5/53, Period 6.1) and the succession of surfaces recorded indicates patching and repair, in a process which continued between the late 17th and the 20th centuries.

Block I: St Michael at Thorn (formerly St Martin-in-Balliva)

by Elizabeth Shepherd Popescu and Niall Donald

(Figs 8.1, 10.11 and 10.17; Plates 10.1 and 10.3)

It appears that in the latter part of the 17th century, tenements encroaching right up to the edge of the barbican ditch were well established and the ditch itself was being used systematically by the local inhabitants for the disposal of waste. Some of the properties overlay the infilled outer boundary of the castle's north-east bailey. Evidence broadly relating to Castle Fee Properties 38–43 (Figs 8.1 and 10.11) was recorded in the north-eastern part of the site. Although the archaeological record of these tenements is limited, largely because evidence was machined away in order to allow the recording of underlying ditches, such masonry (usually cellars) and wells as were recorded seem to conform broadly to the alignments recorded by Cleer (1696; Plate 10.1), King (1766, Plate 10.3) and Hochstetter (1789; Plate 10.3).

Cartographic evidence (*e.g.* Cleer 1696 (Plate 10.1) and Corbridge 1727) indicates that the north-eastern part of the Beaumont Lane block (Properties 44–46) remained open space well into the 18th century. The only clear excavated evidence for the presence of tenements in the south-western part of the block is the number of wells. The construction and use dates of most of these, however, are unknown, although they have been placed here to indicate a general post-medieval date (some could be earlier or later in date).

Structure 38, Cellar (?Property 36)

The only archaeological evidence for this property during the recent excavation were two walls recorded during a watching brief (T42, G9/43). These may represent a cellar beneath Holkham Lane, perhaps a later addition to a pre-existing structure.

Structure 39, Cellar and Open Area 63 (Property 38)

Both a cellar (T29/1) and an isolated well to the west (T105) may have related to this property. The well was about 1.50m in diameter and was constructed of red brick bonded with white mortar. It had been left void when a brick capping was placed above it. A 17th- to 18th-century date seems probable. Two further cellars and a series of yard surfaces had been recorded during an excavation in 1973 (Site 150N; see Chapter 10.VI).

Structures 40–44 and Open Areas 64–66, Cellars, Buildings and Yards (Property 39)

(Fig.10.17)

Cleer's 1696 map (Plate 10.1) shows this area as occupied, with a number of possible subdivisions within the former tenement. Cellars and a well were recorded during a watching brief (T102). The easternmost cellar (Structure 40, *12654*) was probably incorporated into the original building that fronted Pump Street. The cellar to the rear appeared to incorporate medieval masonry (see Chapter 6.II). The alignment of the eastern cellar replicates that of the barbican ditch edge to the west. The well (*12691*) was built of flint, brick and mortar and had been backfilled before being capped with flint and mortar. It lay within a yard (Open Area 64) between the two cellars, the yard surface being cobbled with flint and occasional brick (*12690*). The rear wall of the eastern cellar (*12655*) was constructed from two thicknesses of flint and mortar with a loose rubble infill between the two. Its internal face was covered with coal dust. The western cellar (Structure 41) incorporated a niche at floor level along its northern wall. The wall was rendered internally and the room had a mortar floor. The northern part of the property was not investigated.

Recorded walls suggest that a building followed the alignment of the barbican ditch to the west. To the east, two walls (Structure 42, *91230 and 91337*, G9/43) probably formed part of a structure fronting onto Common Pump Street. This had a cobbled floor surface laid at 14.90m OD. Between the rear of the property and the ditch lay another wall (Structure 43, *91426*). Its alignment differed from the others and it survived to a substantial height (*c*.3m). The northern face of the uppermost metre was rendered. The rear wall of the cellar to the east (also *91230*) was recorded at a much lower level, an effect probably caused by Victorian truncation and machining during site clearance. The rear wall probably formed part of a cellar. Between the two structures lay a brick floor (*91335*) at 15.10m OD. A well (*92854*) lay within the same property, while an isolated pit (*91395*, G9/45) cut into ditch fills to the west (Open Area 65).

Further south, what may have been a separate property was bounded to the west by a north-to-south running wall (*91712*, G9/43) of mortared flint and brick rubble which survived to a height of at least 0.70m. This was the only wall to stand actually above fills of the barbican ditch. Its base lay at 16.75m OD where it cut into natural sands. The southern end of the wall may have formed a right-angled corner with a timber revetment running across the width of the ditch (see further description above). At the front of the property were two further walls (*91268 and 91269*) forming a possible building (Structure 44) fronting onto Common Pump Street. A possible gravel surface was recorded within the building (*91287*), along with three pits and two wells (*91435, 91218, 91377 and 91448*, G9/43). One of the pits probably lay within a yard at the rear (Open Area 66).

Small Finds

Pit *91218* contained a copper alloy plate (SF6347), lead waste (SF6344), clay pipe and an iron nail (SF6322). Finds from pit *91448* were 6 nails (SF6311, 6305 and 6462).

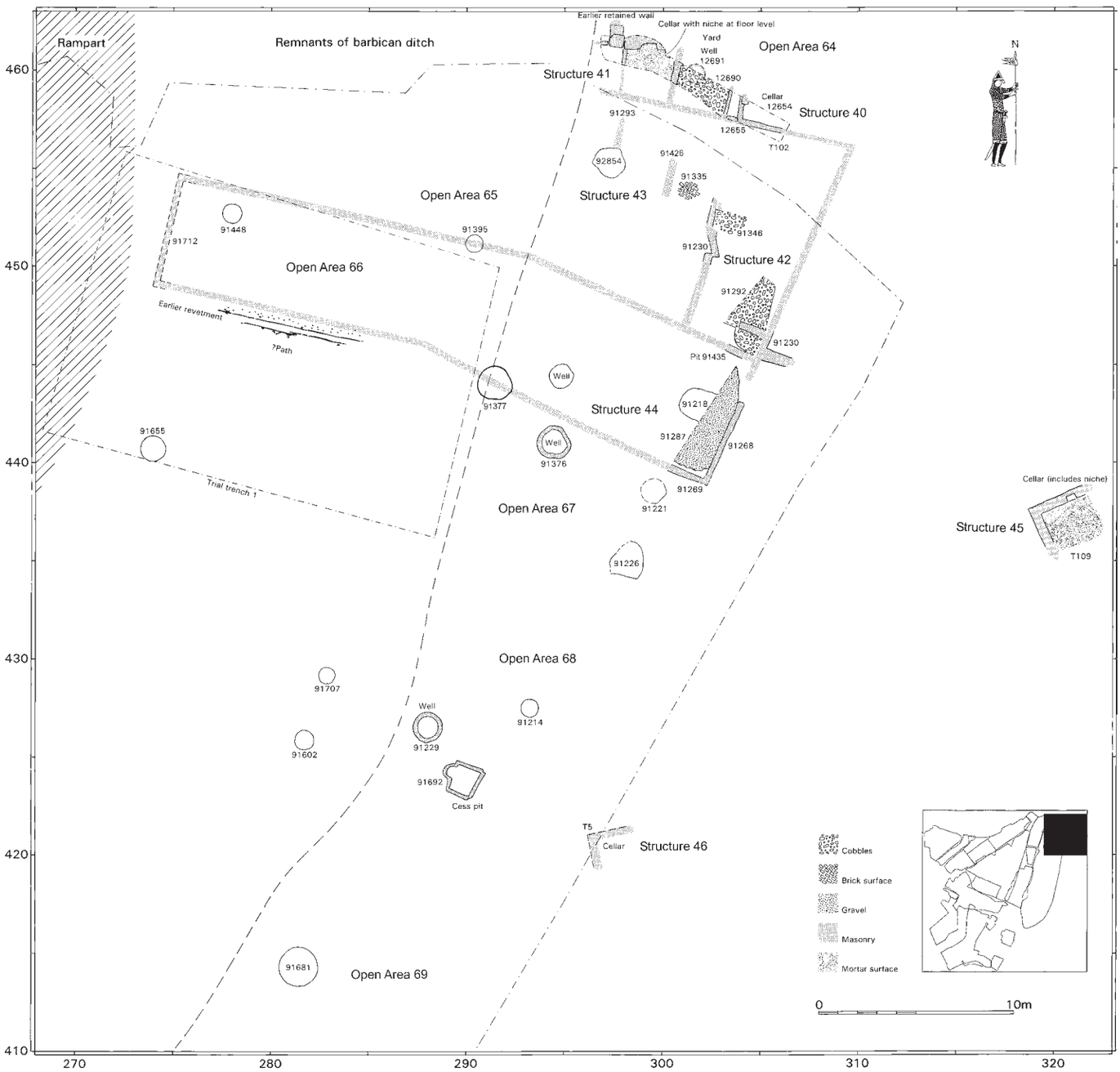


Figure 10.17 Period 6.2: Walls, cellars and features relating to properties to the north-east, which were finally demolished in 1862 (Area 9) (Castle Fee Properties 39–41). Scale 1:300

Pottery
The range of pottery from the pits included here (G9/43, part; 1.780kg) was not extensive. Contemporary fabrics consist of 17th-century ceramics (GRE, IGBW, Speckled Glazed ware, Metropolitan slipware, TGE and Cologne Frechen stoneware). See Appendix 6.

Structure 45: Property on the Eastern Side of Common Pump Street
An observation of another cellar (Structure 45) was made to the east of Common Pump Street during a watching brief (T109), lying along the southern side of the street, opposite the entrance to Holkham Lane. The cellar survived to at least 1.28m in height, its walls constructed from coursed flint with an internal render, with a bricked-up niche along its northern side. Alongside this was a sloping rendered surface laid on a brick inset, perhaps acting as a coal-hole. The alignment of the cellar, the northern wall of which was probably on the line of the street frontage, predicts the southern line of Common Pump Street, although it may have lain beneath the line of the road.

?Alley between Properties 39 and 40
Although not indicated by Cleer, both King (1766; Plate 10.3) and Thomson's (1779) maps illustrate the presence of a narrow alley between two tenements, roughly

according with position of the timber revetment detailed within the ditch infill sequence above. The revetment may have served to provide access into the ditch for refuse disposal or may have formed a causeway across the ditch. The location of a wall (*91269*) could reflect the possible position of an alley, although the presence of wells and pits along its line argues against this.

Open Areas 67 and 68 (Property 40)
No archaeological evidence was recorded for a building on this property, although it appears on later maps and plans. Two wells were recorded (*91376 and 91377*, G9/43). The former well had been backfilled with rubble at an unknown date. An earlier pit in the vicinity (*91221*) also appears to have been infilled in the late 17th century. A pit lay isolated to the west (*91655*, G9/41), cutting into fills of the barbican ditch.

In the southern part of what may have been the same or an adjacent property was a cellar (Structure 46) , located during a watching brief to the east (T5), perhaps lying beneath Common Pump Street. To the east was a flint and mortar lined cess pit (*91692*, G9/43), square but with a semi-circular addition on its western side. This aligned with the road frontage to the east. To the north of this lay a pit (*91214*, G9/45) and a well, lying at what may have been the rear of the building. This well (*91229*, G9/43) was circular and brick-built. It had been back-filled with ash and sand as well as plentiful brick and tile. Two further pits to the west cut into fills of the ditch (*91602 and 91707*, G9/45).

Small Finds
Pit *91602* contained a glass beaker fragment, 16th- or early 17th-century (no.7, SF6495, Fig.10.46), glass jar/bottle (no.84, SF6495, Fig.10.48), copper alloy tack (SF6473.01), copper alloy object (SF6383), paper-clip rivet (SF6473) and a nail (SF6472). Pit *91214* contained a nail attached to a piece of pottery (SF6222).

Pottery
A total of 5.075kg of pottery was recovered. Infill dates of mid and late 17th-century are suggested (see Appendix 6). Contemporary fabrics comprise GRE, IGBW, Speckled Glazed ware, Staffordshire slipware, Surrey White ware, Dutch TGE, Cologne-Frechen, Frechen and Westerwald stoneware.

?Alley between Properties 40 and 41
All of the late 18th-century maps of the city show a major alley running between Common Pump Street and the ditch, although there was no archaeological evidence for its presence in this earlier time.

Open Area 69 (Property 41)
There was very little recorded evidence for activity in this area. A pit (*91681*, G9/45) probably lay towards the rear of the property and contained large amounts of ash, charcoal and cinder. Its fill contained a considerable number of clay pipes, although these were not collected.

Small Finds
Pit *91681* contained vessel glass (SF7565), a lace-tag (SF6250.02), copper alloy James I/Charles I Royal farthing token, 1613–34 (SF6250), iron staple (SF6293.01), 12 nails (SF6293 and 6286), iron knife (SF6293.02), iron strip (SF6286.01), copper alloy pin (SF6250.03) and sheet (SF6250.01).

Pottery
A total of 0.345kg was recovered. The pit contained a similar range of post-medieval fabrics to adjacent pits (GRE, IGBW, TGE and Cologne-Frechen stoneware). Again, this pit is dated to the mid 17th century.

Open Area 70 and Structure 47 (Property 43)
Two pits (*90451 and 90402*, G9/114) had been back-filled with demolition rubble consisting of very large pieces of masonry (*c.*0.80m+), large flints, mortar lumps and brick fragments. The masonry consisted of yellow/cream mortar bonding together brick and flint. To the north-west was a brick and flint built well (*90509*); a circular shaft in a square construction cut, bonded with creamy white mortar. Further south was a possible cellar (Structure 47) represented by a rubble filled robber trench (*90566=90957,* G9/115). This may have lain beneath or adjacent to a lane leading into the former castle baileys. Other interpretations include a gateway or the construction cut for a large well.

Small Finds
Finds from pit *90451* included a stone mortar of medieval type (SF6175; see Chapter 7.III, Fig.7.34) and nail (SF6110). Finds from pit *90402* were of clay pipe, a wooden brush (SF5940) and a whetstone (SF5922).

Pottery
Only residual pottery was recovered from the pits containing demolition debris (59g, G9/114) and from the possible cellar (G9/115, 92g).

Open Area 72 (Property 44): pits
Four small intercutting pits had apparently been used for the disposal of domestic waste and cess (G9/95) and probably served a tenement just to the south-west (*90257, 90180, 90166 and 90224*).

Pottery
A total of 0.321kg of pottery was found. Contemporary fabrics comprise GRE, IGBW and Rhenish stonewares. The fill dates to the mid to late 17th century (see Appendix 6).

Open Area 72 (Property 45): well and Structure 48
A large flint and brick lined well (*90006*, G9/123 part) was left unexcavated. Its position when compared to Cleer (Plate 10.1) suggests that it could have lain within a tenement building and when compared with Hochstetter suggests that it may have lain in a rear yard. Just to the north-west of the well was the corner of a flint and brick structure (Structure 48, *90188*) of uncertain function.

Open Area 73 (Property 46): wells
Two wells were recorded within this property. One (*90627*, G9/75 part) was flint lined and internally rendered with mortar. Another well lay at the rear of the ?northernmost part of the tenement (*90022*, G9/57 part) and was flint lined with occasional bricks. It was eventually back-filled with ?modern demolition debris suggesting that it fell into disuse at the date of the extension of the Cattle Market in 1862.

Block II: St John the Baptist, Timberhill
(Figs 8.1, 10.11 and 10.18; Plate 10.1)
Cleer's map of 1696 (and Kirkpatrick's later revision; Plate 10.1) shows three hummocky areas to the south of the castle; possibly the two northernmost are a schematic representation of the barbican ditch. The remainder of the surviving south bailey is shown as hilly. The Timberhill block appears to be largely open space with no buildings shown along the northern edge of the block. Kirkpatrick's revision shows this northern frontage as open space facing the castle, with a line of gardens/yards added just

to the south. Corbridge's map of 1727 depicts a similar situation to Cleer, with no buildings along the northern edge of the Timberhill block. On this plan, the division between the two hilly areas in the south bailey is clearly marked as the 'castle ditch' (*i.e.* the barbican).

Open Area 51: yard surface and pits (Property 47/h)

Sealing 16th-century fills of the south bailey ditch at the Golden Ball Street site was an area of compacted sand and gravel (*265, 340, 434, 574*; GBS Group 41). Although this appeared to extend between the ?18th-century buildings at the north and south ends of Golden Ball Street Area 1, the date of the finds recovered from it and subsequently indicate that it may have originated in the 17th century. The metalling had subsided slightly into the ditch, presumably because of subsequent settling of the backfill deposits above the earthwork. An important lead seal matrix (GBS SF1) was found residually at the surface of the metalling (although recorded as within pit *309*). Along the line of the castle ditch, where the metalling of the gravel yard surface had subsided, a very organic silty 'garden soil' had accumulated (*113*, GBS Group 7; *415* etc GBS Group 42). Cutting into the garden soil or in the same general area were numerous pits (*298, 333, 352, 371, 383 and 420,* GBS Group 46; *259*, GBS Group 36; *258*, GBS Group 35; *402*, GBS Group 39). Some were truncated by an 18th-century cellar to the north of No.18 Golden Ball Street.

One unusual pit (259) with a central wooden partition may have had a specific function, perhaps storage. The elongated rectangular pit had two posts, one of which was set on a roughly dressed sandstone pad, positioned on either side half-way along it, which were joined by a timber (represented by a soil stain). To the west of the partitioned area, the soil was noticeably more chalky. The pit was infilled with silty refuse containing a large quantity of pottery and clay pipe (detailed below).

Small Finds

The 13th-century lead seal matrix (GBS SF1, Fig.7.25) is attributable to a woman (see Part I, Chapter 7.III for further details). Garden soil *113* contained: copper alloy double looped buckle (GBS SF31); copper alloy sheet (GBS SF32); lead spillage (GBS SF56 and SF60); lead scrap (GBS SF65); lead strip, possible offcut (GBS SF66); two copper alloy rings (GBS SF206 and SF268) and another ring or annular brooch (SF261).

Pit *298* contained a two-part lead cloth seal from Augsburg (Egan 1994 106 fig. 41), dating to between the 16th and early 17th century (GBS SF58). Pit *352* contained window glass (GBS SF44); iron nails x 3 (GBS SF258); copper alloy rectangular mount (GBS SF159); window glass (GBS SF164); bottle glass (GBS SF166); copper alloy sheet (GBS SF238); copper alloy Nuremberg jetton of late 16th- to 17th-century type (GBS SF239). Pit *383* contained iron nail fragments x7 (GBS SF138); iron artefact (GBS SF139); copper alloy ?lace-tag (GBS SF176); copper alloy barrel padlock (GBS SF105); copper alloy lace-tag (GBS SF108); iron nails x 5 (GBS SF162); iron implement socket, large round-sectioned tapering socket (GBS SF163); iron strap with a rounded terminal (GBS SF182). Pit *416* contained lead shot (GBS SF57 and SF64); iron nail (GBS SF131); possible narrow iron knife blade (GBS SF132).

Despite the large quantities of other finds recovered from it, pit *259* contained 3 nails (GBS/SF118), an iron angle strap (GBS/SF117) and two pieces of vessel glass (GBS/SF227). Pit *258* contained a copper alloy dress or furniture fitting (GBS SF209), copper alloy strip (GBS SF208), iron implement, with a wide strap-like blade (GBS SF129), nail (GBS SF130) and window glass (GBS SF43).

Pottery

(Fig.10.44 on CD)

A total of 8.521kg of pottery was recovered, of which 5.439kg came from mid to late 17th-century pit *259* (Fig.10.44 on CD). In addition to locally produced pottery (GRE, Fig.10.44 nos 1 and 2), a significant number of imported and non-regional wares were present in the assemblage. These included Westerwald, North Italian slipware, Yellow Border ware and TGE (?Bristol or Low Countries: see Appendix 6).

Pottery from the remaining pits, garden soils and the ?17th-century yard surface is detailed in Appendix 6 and includes GRE, Speckled Glazed ware, ?English stoneware, Staffordshire slipware, Staffordshire manganese glazed ware, Yellow Border ware, Tin-glazed polychrome ware, Frechen and Raeren stoneware and TGE. Although several late 17th- to 18th-century pottery types are present, there is also a substantial quantity of pottery dating to the early to middle part of the 17th century.

Clay Pipe

by Richenda Goffin

The remains of 53 individual tobacco pipes were found in pit *259*, with a further 90 stem fragments. All the bowls were uniformly of one particular type, having nearly straight sides, with a lip line which is at an angle to the horizontal, and a shallow foot. The pipes were undecorated, although a large proportion had rouletting around the inside of the bowl rim. Such a general shape can be dated to the second half to the end of the 17th century (Oswald 1975, 39). A total of 24 stem fragments were present, and a further two bowls, both of which were rouletted around the rim. The smaller bowl can be dated to a date range spanning the period *c*.1640-60, and the second bowl has a slightly later date, *c*.1660–80. The large quantity of tobacco pipe bowls from pit *259* shows a uniformity of date range to the second half of the 16th century, whilst the two bowls of clay pipes recovered from pit *258* can be dated *c*.1640–1680. Nine fragments of clay tobacco pipe were found in fill 353 (pit 352). The two bowl fragments are of different dates. The most complete bowl can be dated to *c*.1640–60, but a second fragment with damaged rim is of a slightly later date, towards the end of the 17th century.

Open Area 38 (Property 49): pit

An isolated pit (*11073,* G1/29), infilled with domestic waste, presumably lying in a yard/open space above the remnants of the south bailey rampart.

Small Finds

The pit contained window glass (SF7488 and 5391), glass phial fragments of 17th- to 18th-century date (SF5389) and iron sheet vessel (x2 SF5387) including one with wood attached.

Pottery

A total of 0.152kg was recovered. Contemporary pottery comprises GRE, TGE and Westerwald stoneware. The infilling of this pit appears to date to the mid to late 17th century. See Appendix 6.

Clay Pipe

A group of 4 bowls, 14 stems and 4 mouthpieces was found in pit *11073*, three of the bowls dating to 1680–1710.

Open Area 57 (Property 50): well

Just to the north of the projected line of the pre-existing garden wall (G8/22, Period 5.2) was an undated well (*80306,* G8/31) which probably lay at the rear of the northernmost property fronting Rochester Lane to the west.

Open Area 39 (?Property b): pits and well

To the south of the garden wall were more pits within an earlier garden/yard area (*80257 and 80259,* G8/29), all cutting into earlier pits and presumably representing the continued use of the area for refuse/cess disposal. They contained large amounts of animal bone, brick/tile, charcoal, clay pipe, daub, plaster/mortar, wood. The refuse fills included a high proportion of ash and cinders as if from a domestic fireplace. The upper fills of an earlier pit (*80188,* Fig.10.8) appeared to date to the mid to late 17th century (fills of early 17th-century date are described in Period 6.1). This fill of organic loam was again mixed with ashes and cinder and also contained a large quantity

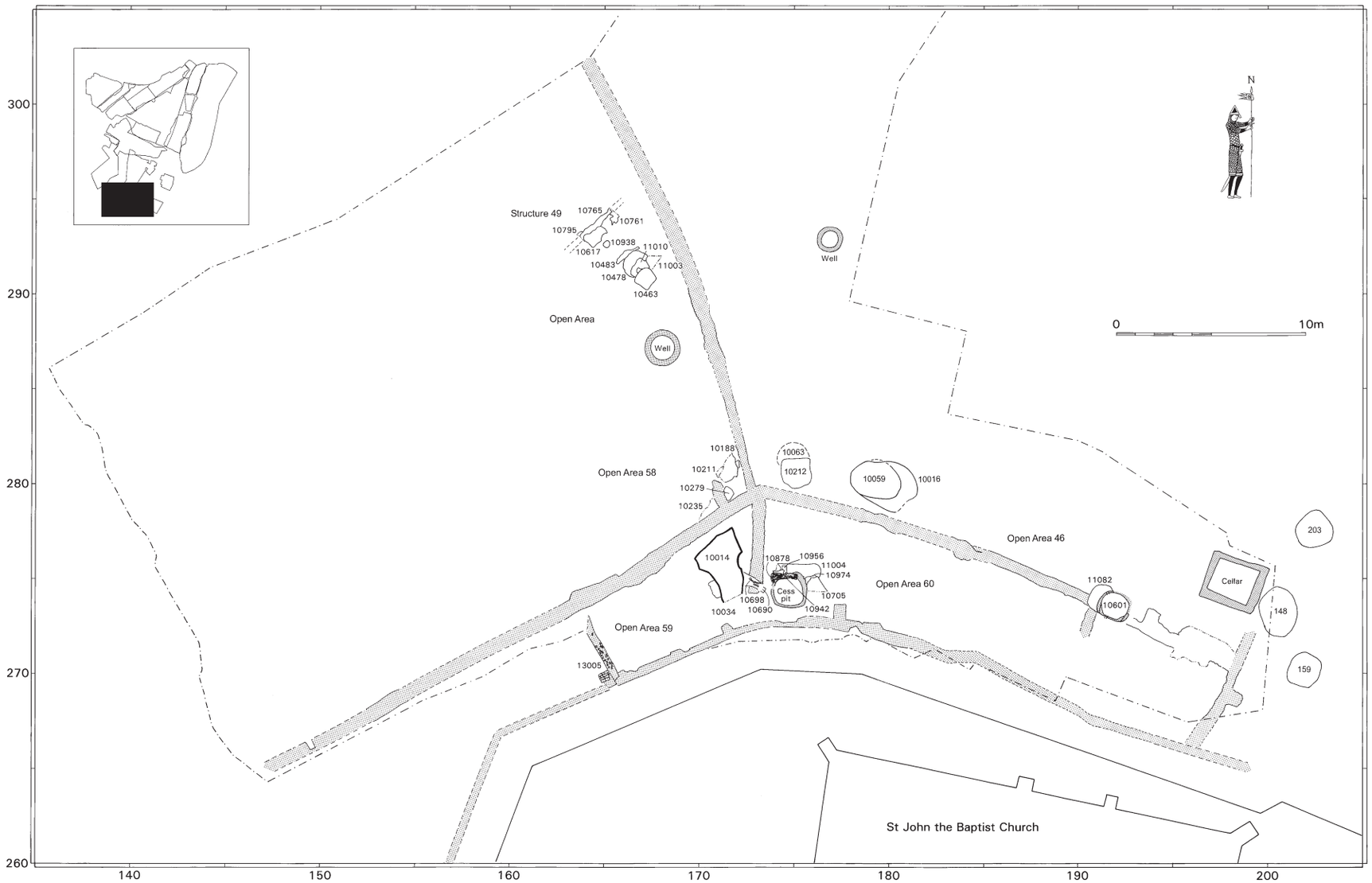


Figure 10.18 Period 6.2: Properties in the Timberhill block (Areas 1 & 13) (City Properties c–g). Scale 1.300

of finds, including nearly 9kg of animal bone including bones from a parrot (see below).

Just to the north-east of these pits was a well (*80083,* G8/30), inserted on the southern face of the former garden wall. It had a square construction cut with an inner circular well shaft, only the uppermost 6–8 courses were recorded. The upper part was of brick construction, with the lower part of uncoursed flint, all bonded with loose sandy mortar. They were lain in single brick width in stretcher bond, with some in header bond. A flint and brick rim was also recorded, forming a wall around the top of the well. There was some indication of a surviving cellar wall, possibly forming a repair to the south-west corner of the well.

Small Finds
Pit *80257* contained numerous copper alloy objects (pins SF5964, Fig.10.22, 5851 and 5994; strip SF5903; sheet x 13 SF5794.02; 5 lace-tags SF5851.01 and 5794.01, types 1 and 2) and included fragments of a Royal farthing token of James I/Charles I (1613–34, SF7591). Other finds were of vessel and window glass (SF5951 and 7490), iron objects (4 nails SF5883, object SF6127 and table knife SF5888), an iron bolstered knife with an ivory handle (SF6148, Fig.10.55).

Small Finds (x 42) from the upper fills of pit *80188* are summarised in Table 10.19 on CD. Of note is the quantity of facetted bone (x 13, *e.g.*SF7612, Fig.10.64; Huddle, Chapter 10.III). Other finds include vessel glass of 16th- to early 17th-century date (SF5856, SF7473, 5951, Fig.10.45 and 10.46; Shepherd, Chapter 10.III).

Pottery
A total of 15.521kg of pottery was recovered, indicating mid to late 17th-century infill dates. Most of the pottery (12.418kg) came from pit *80188*. LEPM and Raeren Aachen stoneware may be residual. Contemporary fabrics consist of GRE, IGBW, Rhenish stonewares (Cologne and Frechen), Westerwald, Martincamp, North Italian slipware, Low Countries slipware and Anglo-Netherlands TGE. See Appendix 6.

Clay Pipe
by Susanne Atkin
A group of 73 clay pipe fragments came from pit *80257*. Two bowls were marked IS, suggesting a date of 1660–80 for deposition familiar on other sites. There is no recorded Norwich pipemaker with these initials (see Chapter 10.III). The group comprised 25 bowls, 39 stems (some long), 8 mouthpieces and a base. Bowl dates are of 1620–40, 1650–70 and 1660–80. The upper fills of pit *80188* contained a large group of 178 clay pipe fragments, comprising 34 bases, 127 stems, 14 mouthpieces, 2 bases and a spur (1640–60). Several of the bowls are waisted and dates are 1640–60, 1640–70, 1650–70 and 1660–80.

Bird Bone
The presence of parrot bones in pit *80188* is extremely important, attesting to the contact of Norwich with the southern hemisphere at this time. Full details of its significance are given by Albarella *et al* in Part III, with summary comments in Chapter 10.IV.

Structure 49 (?Property a/b): well and walls
A number of walls and deposits probably relating to post-medieval or later tenements were recorded in a watching brief to the west of the main site (T118/7), at the western end of what may have been the same property as is detailed above. Cutting into earlier pits was a possible construction cut for a wall (Structure 49, *12265*), which may have pre-dated a flint wall perhaps running on a similar alignment. Above were possible floor remnants lying between two walls, one brick and the other flint (*12257 and 12256*).

A flint-lined feature, perhaps a well, coal hole or oven (*12297,* T118/8) lay at the rear of the *Gardener's Arms/ Murderer's* public house and may have been integral with it. It was constructed of flint nodules (100 x 120mm) bonded with pinkish lime mortar, rendered with similar mortar on its internal face. It was subsequently capped with poorly-made brick (110 x 220 x 40mm) and slightly pink mortar. The feature had two openings, one in the top, suggesting that it may have been a well with a pump set into it. Above the capping were dumps of redeposited natural.

Open Area 41 (?Property b): well
An isolated circular well had survived truncation and lay roughly in the centre of the Timberhill frontage (G8/32). It was of flint and brick construction, bonded with light yellow/cream mortar. The bricks measured 120 x 55 x 220mm. It was filled with demolition debris from which no finds were recovered. Its construction date could range from late medieval to post-medieval.

Structure 50 and Open Area 74 (Property c/d)
At the rear of a property towards the south-east of the Timberhill block were patches of deposit with a slot and post-built structure and a pit (G1/103). An earlier well (12044, G1/104, Period 6.1) may have remained in use. To the north-west was a fragment of pit/post, (*10795*), a slot and related post at its southern end (*10765 and 10759*). These elements may have been part of a structure (Structure 50), perhaps a temporary building against — but not quite at right angles to — a pre-existing wall to the east. To the south-east were patches of trample, pebble surfaces and two post-holes (*10617, 10761, 10478, 10483, 10493, 10010, 11003 and 10938*). These were cut by a roughly square pit (*10463)*, possibly barrel-lined, which had been backfilled with building rubble.

Small Finds
Pit *10961* contained sawn bone (SF5480) and a nail (SF5482). Layer *10478* contained an iron needle/wire (SF5175). Pit *10463* contained an iron plate (SF5051) and 3 nails (SF5051.01). Another nail (SF5234) came from dump *10483,* while dump *10493* contained copper alloy strip (SF5379), 7 pieces of nailed binding (SF5420.01 and 5226), nails (SF5420 and 5152) and a horseshoe nail (SF5152.01) Slot *10765* contained two clay pipe stems and 5 nails (SF5255 and 5385).

Pottery
A total of 1.686kg of pottery was recovered, with feature dates ranging from the late 16th to 17th century, early to mid 17th century and 17th century (see Appendix 6). Contemporary pottery comprises GRE, IGBW and TGE.

Open Area 58 (Property e): features
In the south-east corner of the junction of earlier walls were pits and deposits (G1/110) apparently associated with the destruction/robbing of surrounding walls and foundations. Three small pits were dug (*10279 etc.*), while a robber cut (*10211*) removed the east-west length of an earlier wall. A compacted clay surface (*10439,* G1/132) lay above the latest infill of the earlier malting oven (Period 6.1).

Small Finds
These include an iron buckle plate (SF5145) and nails (SF5145.01 and 5380).

Pottery
The pottery from these deposits comprised only residual material (0.642kg). See Appendix 6.

Repair to earlier wall (Property e/f)
At some point during the post-medieval/modern periods, wall G1/107 was repaired, as a result of slumping due to

the presence of an underlying pre-Conquest ditch (Ditch 1, Period 1.4). The repair was apparently unsuccessful (G1/108). The wall rebuild (*10829=10954*) was *c*.4m in length and the foundation cut (*10955*) sloped down at its western end to form a deeper foundation above ditch fills. It was filled with compacted dark grey yellow clay loam with frequent brick and alternating bands of loam and mortar. The foundation was solidly built of flint with some brick, bonded with mortar/cement. A section of the rebuild subsequently cracked and shifted out of line, again as a result of the underlying ditch. No ceramic building material was kept from the foundation itself. It seems likely that this was a 17th- to 18th-century or later rebuild.

Bulk Finds
Foundation cut *10955* contained redeposited human bone and EBA (610g).

Pottery
Only a small quantity of residual pottery was recovered from the wall repair (80g). See Appendix 6.

Open Area 59 (Property f): walls and pits
A new wall was built, running from north-west to south-east between walls G1/107 and 1/121, presumably defining a yard/outbuilding area for pits/cess pits. The new wall (*13005*, G1/123) between pre-existing walls described (G1/107 and G1/1121, Period 6.1) and was recorded in both Area 1 and Area 13. The foundation (*10133*) was *c*.0.80m wide and was of flint and brick (10–20%), bonded with highly compacted light grey yellow sandy mortar containing frequent gravel and chalk. The flints were random coursed and rough faced.

Within the area now defined was a large pit (*10014*, G1/127) which cut through drains leading through another wall to the east. The pit was irregular in plan, reflecting the position of surrounding walls. It showed traces of wooden shuttering and was filled with a mixture of building rubble and refuse. It was not bottomed at a depth of 1.58m and had done considerable damage to burials in this area (Cemetery 4, Part I, Chapter 4). A flattish platform lay at its base in the north-east corner, perhaps for access.

Small Finds
Associated with wall *13005* was a single copper alloy pin (SF5114.01).

Pottery
A total of 0.646kg of pottery was recovered from pit 10014. Contemporary ceramics include GRE, Surrey White ware IGBW and Frechen stoneware. This domestic assemblage dates to the mid to late 17th century. See Appendix 6.

Open Areas 59 and 60 (Property e/g): drain replacement
The former drain through the dividing wall between Properties (e) and (g) (G1/112) was replaced at a higher level, probably as a result of subsidence into an underlying pit. Above two dumps of building material, the drain (*10960*) which included 17th-century pantile was inserted into an cess pit lining, sloping down into it and possibly contemporary with the original build. The drain was unlined. A burnt plank may have related to it, possibly acting to revet the surrounding deposits or acting as a sluice. This wooden beam was curved in shape to fit the lining. The opening into the cess pit was subsequently bricked up (G1/119) with brick/tile and flint, bonded with soft pink grey mortar.

Small Finds
Drain *10960* contained lead sheet (SF5281) and a nail (SF6773). Finds associated with cess pit *10557* were window glass (SF5282), vessel glass (SF7493) and nails (SF5260, 5353 and 5327).

Pottery
A total of 1.340kg of pottery was recovered. The drain fill is dated late 16th- to 17th-century, while the surrounding deposits date to the late 17th to early 18th century and the rebuild of the wall dates to the mid to late 17th century (see Appendix 6). Contemporary pottery consists of GRE, IGBW, TGE (probably English rather than Dutch), Staffordshire slipware and Rhenish stonewares from Cologne and Frechen

Clay Pipe
by Susanne Atkin
Clay pipe from the rebuilt cess pit (*10557*) consisted of 1 bowl stamped IM (*c*.1680–1730), 1 mouthpiece and 4 stems. IM could refer to Jane Morgan, recorded as being master of an apprentice in 1693 in Norwich (Karshner 1979, 337).

Structure 37 and Open Area 46 (Property g): well and cellar

Well
A well (*11082,* G1/88), cut into an earlier wall (G1/84) at the point at which another wall ran southwards from it. This well was of flint and brick construction and was apparently out of use and capped in the 18th century (see Period 6.3). The construction cut bulged out from the side of the lining, which was constructed of flint and brick, the flints being rough hewn with some roughly squared. The masonry was random coursed and was bonded with off-white gritty mortar with occasional flint. The flints decreased in size towards the top, the upper 6 courses being exclusively flint. The well was not fully circular, with the sides to the south and west being flattened. The north and south lining walls contained drainage channels, lying at 0.68m below the top of the masonry. A granite block formed the top of the southernmost channel and both channels had bricks on either side and flints at the base.

Bricks within the fills, evidently indicating the disposal of building rubble, generally increased in frequency towards the top where a lens of large brick fragments lay. This was made up of roof tile (Type 4), late brick and floor tile. The southern side of the well eventually collapsed, before the structure was finally infilled with soil and ash. The upper fill was destruction rubble probably derived from the collapse of subsequent well capping and suggested gradual decay rather than dismantling.

The well was finally capped with a brick and flint construction bonded with pale yellow/off white sandy/gritty flint tempered mortar. Two brick types were apparent, one dull red the other pale orange yellow. The capping was finished off with a thick layer of mortar embedded with small flint cobbles. The capping was presumably placed when the well had gone out of use, perhaps as part of the same process as the construction of an overlying wall (see Period 6.3). Given that this feature cut into an earlier (16th-century ?) wall, it seems probable that this was a 17th-century well/cess pit, probably serving a tenement fronting onto a road to the east. It was apparently out of use by the 18th century.

Small Finds
The lowest recorded well fill contained glass beaker fragments of 16th- to early 17th-century date (no.2, SF5236, Fig.10.45 and 5272), window glass (SF5316), 12 nails (SF5274, 5230, 5349 and 5213.02), a horseshoe (SF5213). The upper fill contained window glass (SF5198), iron knife (SF5303), pierced iron plate (SF5303.02), nails (SF5303.01) and four clay pipe stems.

Pottery
A total of 0.888kg of pottery was recovered, indicating a mid 17th-century date for infilling of the well. Contemporary fabrics consist of GRE, Speckled Glazed ware, Metropolitan slipware, Rhenish stonwares (Raeren-Aachen and Frechen), DWE and TGE (Dutch or English. See Appendix 6.

Structure 37: Cellar

A cellar described in Period 6.1 (G1/92) was evidently much-used with the walls being repeatedly whitewashed, trapping a sooty layer between each repainting. Overlying the base of the cellar walls was a deposit of dark grey black sand clay silt (*10639*), apparently a mixture of soot and charcoal.

Small and Bulk Finds
The cellar fill contained a Mesolithic/Neolithic micro-blade (SF5254).

Pottery
Only 0.047kg of pottery was recovered (47g). Contemporary fabrics comprise GRE and IGBW, as well as stonewares. See Appendix 6.

Open Area 46 (Property g): pits

Further to the west, at the ?rear of the property, were four refuse pits (G1/93) in two intercutting pairs, containing large finds assemblages and up to 1.50m deep (*10016, 10059, 10063 and 10212*). Fills, which contained a large quantity of clay pipe, included domestic organic waste and ash, with upper fills having a high proportion of building rubble. Pit *10063* contained a lense of burnt ash, clay, burnt bone and shale at its base.

Small and Bulk Finds
Pit *10016* contained an intrusive Queen Victoria medallion (SF5012) and 3 nails (SF5015). The lowest fill of pit *10059* contained window glass (SF5018), nails (SF5005, 5011 and 5031), an ivory handle (SF5002), animal bone (1170g), clay pipe, roof tile, English and Flemish floor tile (2960g total) and mid 17th–18th-century pottery (3258g). Later fills contained a residual late medieval/early post-medieval copper alloy thimble (SF5032, Fig.8.59), window glass (SF5013 and 7487), ?intrusive spectacle lenses (SF5361), vessel glass of mid 17th-century date (SF5019), iron key (SF5014) and iron scissors (SF5033, Fig.10.65).

Pit *10063* contained lead came (SF5028), iron nailed binding (SF5029) and 2 nails (SF5034). Pit *10212* contained a knife with a bolster (SF5046, Fig.10.54), ivory handled knife (SF7614, Fig.10.55), nails (SF5406 and 5092.01), iron strip (SF5098), 3 pieces of iron sheet (SF5087) and iron binding (SF5092).

Pottery
by Irena Lentowicz
(Fig.10.43)
These four pits contained a wide range of mid 17th-century pottery (G1/93; 10.695kg; Fig.10.43). Pit *10016* (4.582kg) contained late medieval/ transitional wares and post-medieval fabrics. The former was represented by sherds of an LMT base and DUTR cauldron and handled bowl. The post-medieval assemblage was dominated by GRE and vessels represented by rims included butter jars and dishes (Fig.10.43, nos 1 and 2). Other vessels represented by rims included a Speckled Glazed ware chamber pot, three Metropolitan slipware dishes (Fig.10.43, no.4) and an IGBW mug. IGBW was also represented by two mug and two tyg bases; other drinking vessels included a Westerwald mug base and a Cologne-Frechen jug base. TGE was also represented by body sherds only.

Pit *10059* (4.305kg) contained residual medieval wares as well as late medieval/transitional fabrics. The range of post-medieval fabrics was similar with GRE represented by rims form dishes (two rims), jars (three rims), a pancheon, a bowl, a chamber pot and dripping pan, as well as by a skillet base (Fig.10.43, no.3). IGBW was also represented by rims and bases from drinking vessels, including a tyg profile and mug rim, and jars (two bases). Interestingly, no Rhenish stoneware drinking or pouring vessels were recorded. Speckled Glazed ware also included two jar bases and a cup rim. Table wares were represented by a Surrey White ware bowl and TGE plate, as well as body sherds of imported North Holland slipware. A rather fine Saintonge Polychrome dish fragment was also recovered, decorated with a seated figure of St John the Baptist (Fig.10.43, no.6). A quantity of possibly intrusive China was also recorded; the character of the assemblage is more commonly mid 17th-century rather than later.

Pit *10063* (0.262kg) included residual medieval and late medieval/transitional pottery. However, the only post-medieval fabric recovered was GRE. This was represented by rims from a jar, bowl and dish. Pit *10212* (1.556kg) contained a ceramic assemblage again limited to only late medieval/transitional and post-medieval wares, with no earlier material recorded. The post-medieval fabrics were dominated by GRE with rims from a jug, mug and pancheon noted. Other local wares included body shreds of IGBW and West Norfolk Bichrome ware, with imports represented by North Holland slipware sherds including the rim from a collared bowl (Fig.10.43, no.5), and Rhenish stonewares. These latter vessels included two Cologne-Frechen jug rims and Frechen body sherds.

Clay Pipe
by Susanne Atkin
The large group of clay pipes from these pits consists of 84 bowls, 163 stems, 16 mouthpieces and 6 bases, most of which came from pit *10016*. There is one bowl of 1640–60, although the long stem lengths and cess stains on some of the bowls and stems, particularly within pit *10016* on bowls dating to *c.*1660–80, imply that the material was not disturbed very much after deposition; bowls of 1680–1720 are fewer in number.

Structure 51 and Open Area 52 (Property g)

by Elizabeth Shepherd Popescu and David Whitmore
Adjacent to the road frontage (modern Golden Ball Street) a solitary 1.20m deep post-hole (*493*, GBS Group 10) lay approximately 1.60m to the north of the former ?Castle Fee ditch. A pit dug around it (*467*) may have been used to facilitate its easy removal. The pointed post within would have measured approximately 0.40m in diameter and clearly and its size suggests that the post was structural, possibly forming part of a building related to one of the adjacent small cellars. No other similar post-holes were found, although an oval pit (*235*, GBS Group 18), some 4.80m to the north, contained the decayed fragments of a wooden post and may represent part of the same structure, as may two adjacent slots (aligned north-to-south and east-to-west; *177 and 153*, GBS Groups 15 and 16) which perhaps formed wall footings.

A small flint and brick walled cellar or cess pit (*249*, GBS Group 4), aligned approximately east-to-west and measuring 3.90m by 1.43m, ran parallel to and 3.80m to the south of the substantial brick cellar of No.14 Golden Ball Street. The small size and absence of a floor may indicate use as a cess pit although it was relatively shallow (0.7m). The lowest fill was a dark brown to black sandy silt (*247*), overlain by dark grey sand clay silt with mortar and brick inclusions (*130*). The south-east edge of this structure was truncated by a later cellar (Period 6.3).

Pits surrounding the possible building could be divided into two broad categories. Examples to the west and south (GBS Group 8, *148, 159, 203, 430*) were circular and relatively deep. To the east they appeared to be sub-rectangular in shape and contained organic refuse (GBS Group 14, *188, 233, 394*) and lay in the immediate vicinity of Structure 51. The differences between the two groupings may reflect their position in relation to the earliest of the two small cellars noted to the south of

No.14 Golden Ball Street although it is quite possible that all of these pits pre-date the construction of the earliest cellar. The circular pits would have probably lain to the rear of the property (adjacent to a small cellar recorded at the Castle Mall site; Structure 37) whilst the rectangular examples lay at the front, close to the road frontage. Both forms of pit appear to have been backfilled soon after they were dug; with the exception of circular pit (*203*) which had been open for dumping over a period of time and may have served as a well.

Small Finds
Slot *153* contained nails (SF127), primary antlerworking waste (SF249), lead sheet (SF45) and a residual coin of Edward I–II, 1279–1327 (SF23). Pit *467* contained iron nails x2 (SF140); copper alloy artefact or metalworking debris (SF161). Infills of the cellar contained a flat-headed iron nail (SF178). Pit *159* contained encrusted iron strap (SF124); spirally-twisted iron rod (SF134); copper alloy letter plate 'N' of probable 16th-century date (SF231, Fig.10.58) and a copper alloy double hooked fastener (SF266). Pit *203* contained an incomplete cylindrical whetstone (SF113) of Norwegian Ragstone and probable 16th-century date. This was much used with one side worn flat and of similar form to SF7187 from the barbican well (see Chapter 9.III). Pit 188 contained a Charles I Royal farthing token, 'Richmond Round', 1625–34 (SF172), copper alloy dress-making pins (SF267 and 175), iron nails (SF10, 217, 220, 152, 160, 149, 199, 189, 180), metalworking debris (SF11 and 189), iron screw with ring terminal (SF9). Pit 233 contained lead sheet (SF62) and 2 nails (SF215). Pit 394 (SF240) contained an iron artefact or metalworking debris.

Pottery
A total of 3.014kg of pottery was recovered, indicating infilling between the 16th and 18th centuries, although the cellar may have been infilled in the late 17th century (see Appendix 6). Contemporary fabrics consist of GRE, IGBW, Dutch slipware, Westerwald stoneware and Frechen stoneware.

Open Area 75 (?Property g): infilling of quarries and south bailey ditch
In the central part of Block II, which appears to have remained open ground, a series of thick dumps infilled earlier quarries (Period 5.1) and the remnants of the south bailey ditch (overlying Period 4.2 fills). Fills included redeposited natural and mixed building rubble (G1/38) and could span late medieval to post-medieval periods, when the area would still have been substantially open ground/gardens, but before it became sealed by tenement buildings in the early modern/modern period.

Pottery
Only 20g of residual earlier pottery was recovered.

Period 6.3: The Unified Cattle Market and Contemporary Activity (c.1738–c.1800)

Summary
(Fig.10.19)
The early 18th century saw a major change in use of the area surrounding the barbican ditch, when Norwich's first unified Cattle Market was created in 1738. This largely curtailed the former piecemeal use of the northern part of the excavation site. Preparations for the construction of the Cattle Market entailed the infilling of parts of the castle ditches and levelling of the ramparts, although some areas of the earthworks remained visible. The large area of quarrying in front of the castle bridge was also infilled with the remains of the barbican rampart, as well as refuse and building materials from elsewhere. The archaeological evidence demonstrates much more regular tips into the ditches than was evident at earlier dates. Tenement development continued on the fringes of the former baileys, although only 19 pits of 18th-century date were recorded.

The Motte and its Ditch

Ditch 11, Phase 5
by Elizabeth Shepherd Popescu and Andy Shelley
(Fig.10.2)
In the late 18th century, the sides of the motte and its ditch were transformed into allotments (Chapter 10.I; Plate 10.3). Although the excavation remit did not extend to investigation of the ditch, garden deposits were encountered on several occasions (*e.g.* watching briefs T95/5 and T7/41). A deliberate dump of landscaping material (T100/14, part) was seen within the motte ditch near to its junction with the western arm of the barbican ditch. This sealed an earlier fill (Period 6.1) and seemed to have been intended to create a level surface on which to base the new gardens. The uppermost recorded fill was of mottled brown loam sand (*12190*, S.188) with frequent gravel and occasional fragments of brick and tile, acting as a sealing dump 0.45m thick. This layer also contained fragments of architectural limestone and occasional flints with medieval mortar attached.

During development work for a fire escape from the shopping centre into the Castle Gardens, four sections were recorded (T95), revealing evidence for undated landscaping soils (*12162, 12163, 12160, 12165)*. Each layer tipped down from west to east. Above these deposits was a very thin band of humic black 'peat' (*12159*), overlain by garden topsoil (*12158*).

Barbican Ditch: Infilling
by Elizabeth Shepherd Popescu, Andy Shelley
and Niall Donald
The barbican ditch was subjected to wholesale landscaping and it appears that by 1738 the only undisturbed part of its rampart lay to the east of the castle mound bridge, although this must have been levelled sufficiently to permit a road to be constructed across it by the late 18th century. The remains of the rampart seem to have acted as the western boundary to the tenement plots of Common Pump Street (see Period 6.2).

Ditch 13: barbican, Phase 8

Barbican ditch west (Watching Briefs T35 and T58)
(Figs 8.8)
To the west, final backfilling of the barbican ditch comprised alternating layers of demolition rubble, clinker and loam. There was no indication of the demolition of the rampart into this section of the ditch. In these observations, a series of trenches was dug by the developers beneath modern Castle Meadow road and sections across them were drawn (T35 and 58). In the first watching brief (T35/26) two trenches were dug by machine and the sections recorded. Beneath modern tarmac and concrete were horizontal fills, similar to those recorded in Areas 4 and 9. Fills of the ditch here, which had been capped by concrete at a level of 19.90m OD, were thin bands of

building material and loam (*12908 and 12906*). The two trenches were later extended to reveal similar ditch fills.

A series of inter-connecting trenches were subsequently machined beneath the Castle Hotel (T58) in order to construct a framework for the eastern side of a bridge to carry the new Castle Meadow road over part of the development. The westernmost sections were cut through rubbly, banded upper fills. Those to the north were notably different and recorded dark loam fills, some organic. Additional sections were recorded later. Above earlier refuse-type fills (Period 5.2) were alternating layers of brick, tile and flint rubble, coal and loam (T58/26; the upper part of *12758* and uncontexted fills in adjacent sections).

Barbican ditch south (Watching Brief T19)
(Fig.10.4)
Slightly further east (T19/39) similar fills were recorded, overlying earlier post-medieval deposits (T19/40, Period 6.2). Within a rectangular cut dug against the northern face of the pile line revetting Farmers Avenue, immediately to the south of the castle approach (allowing the insertion of king posts and ground anchors), a number of sections was recorded (S.1286, 1287 and 1288). Fills were recorded at a lower level to the south (S.1287), with a lower limit of 22.31m OD (*12872, 12871, 12869, 12880, 12879, 12877, 12876, 12874, 12875, 12872, 12871 and 12870*). These were of alternate layers of building waste (such as chalk, brick and tile) some with high proportions of charcoal. They may have been tipped into the ditch from the north and the later fills were slightly thicker. The uppermost section (S.1286) recorded ditch fills between a level of 24.40 and 23.20m OD. These *(12863, 12862, 12865, 12864, 12861 and 12860)* again included layers of building material such as mortar and tile, often in thin bands. Here, however, they were broadly horizontal.

Barbican ditch south (Area 6)
Other fills recorded in Area 6 (*60696, 60697, 60698, 60699, 60700 and 60701,* G6/35, S.604) may have been of 18th-century date and consisted of dark grey clay loam with some chalk and brick, with layers of redeposited natural sand and gravel.

Barbican ditch south (Area 47)
A series of building material layers (G47/25) lay above earlier ditch fills (Period 6.2, G47/26) in the stepped sections recorded in Area 47, which in turn sealed fills of the quarry to the north of the ditch. All of the pottery recovered from these fills (which was residual material of late 16th- to 17th-century date) came from the fills recorded in east-facing sections.

Late fills in the south-west facing sections (S.4721 and 4719) consisted of redeposited natural clay and sand with some silt and building material including tile, brick and chalk (*47339, 47271/47280, 47340, 47279 and 47281*). Two of the earliest (*47339 and 47340*) were dark grey/black and contained large amounts of window glass (a small sample of which was collected), similar to that recovered in large quantities around the fragments of masonry to the north-east.

More late fills recorded in the east-facing sections consisted of thin tip lines into the ditch. On the lower two sections (S.4728 and 4725), the earliest fill (*47447*) was a compact and horizontal layer of charcoal, followed by a sequence of fills, often consisting of building materials such as mortar, chalk, brick and tile (*47446, 47445, 47444, 47438, 47436, 47435 and 47434*). Layers of light brown clay sand followed (*47431 and 47429*), capped by more layers of building waste, loam and charcoal (*47428, 47425, 47424 and 47428*). A sequence of thin fills on the next machine step (S.4722) indicate deposition of similar characteristics. Any fills on the next step (S.4720) had been removed in this area by a later air raid shelter. The final, upper sequence of fills (S.4718) were again of clay and sandy loams with some gravel, incorporating building waste (*47371, 47381, 47370, 47366, 47368, 47365, 47362, 47364, 47353, 47351, 47350 and 47344*). One of the earliest fills (*47381a*) also filled the upper part of the quarry, but also lay partially within the ditch. About half way up this sequence was a layer of dark grey clay silt loam (*47365*) which may indicate a pause in infilling.

Barbican ditch south (Areas 2 and 4)
(Figs 8.26–27)
The effect of the landscaping dramatically demonstrated in the west-facing sections across this part of the ditch. Here fills were tipped at a steep angle from the northern edge of the ditch and consisted of many small lenses of material. The fills were recorded in the upper two machine steps (G2/37, S.431 and 432) and filled the remaining hollow left by the ditch, the centre of which had now moved to the north of its former position. The earlier infilling, which included large amounts of refuse (see Period 6.2) had been tipped into the ditch from the south, while this later infilling clearly came from the north. The thinnest fills (such as those represented by *40682*) lay to the north, the depth of deposits increasing notably in thickness to the south. The thin fills consisted of alternating bands of orange, black, grey and brown deposits of sandy loam often with frequent pebbles, the latter being larger to the north.

Fills recorded in the second step (S.431) were narrow bands of brown/reddish brown silty loam or cleaner light brown/yellow silts, most containing frequent pebbles usually denser towards the base where they had presumably rolled during tipping. Only one fill contained frequent charcoal and there was none of the building waste noted in such quantities elsewhere along the ditch at this date. The relatively small amounts tipped at each stage suggest that they were transported by cart/barrow and the varied nature suggests a number of sources, rather than simply the remains of the rampart (*40712, 40711, 40710, 40709, 40708, 40707, 40706, 40705, 40704, 40703, 40702, 40701, 40700 and 40699*). These fills were concentrated along the northern side of the ditch and were followed by thicker dumps. The latter were generally thicker and cleaner, with some major dumps included. They often had a high clay and pebble content, some containing up to 40% pebbles. Again, the pebbles had settled towards the base of each fill (*40716, 40698, 40697, 40696, 40695, 40694, 40693, 40692, 40691 and 40428*).

A similar infill sequence was recorded in the uppermost step (S.433). Here a multitude of very thin tips were apparent, consisting of alternate layers of orange, black and dark grey/brown sandy loam with some clay, often with large quantities of pebbles (*40682, 40681 and 40680*). A total of 68 such tips were recorded, all dipping down dramatically into the ditch. Again, these were

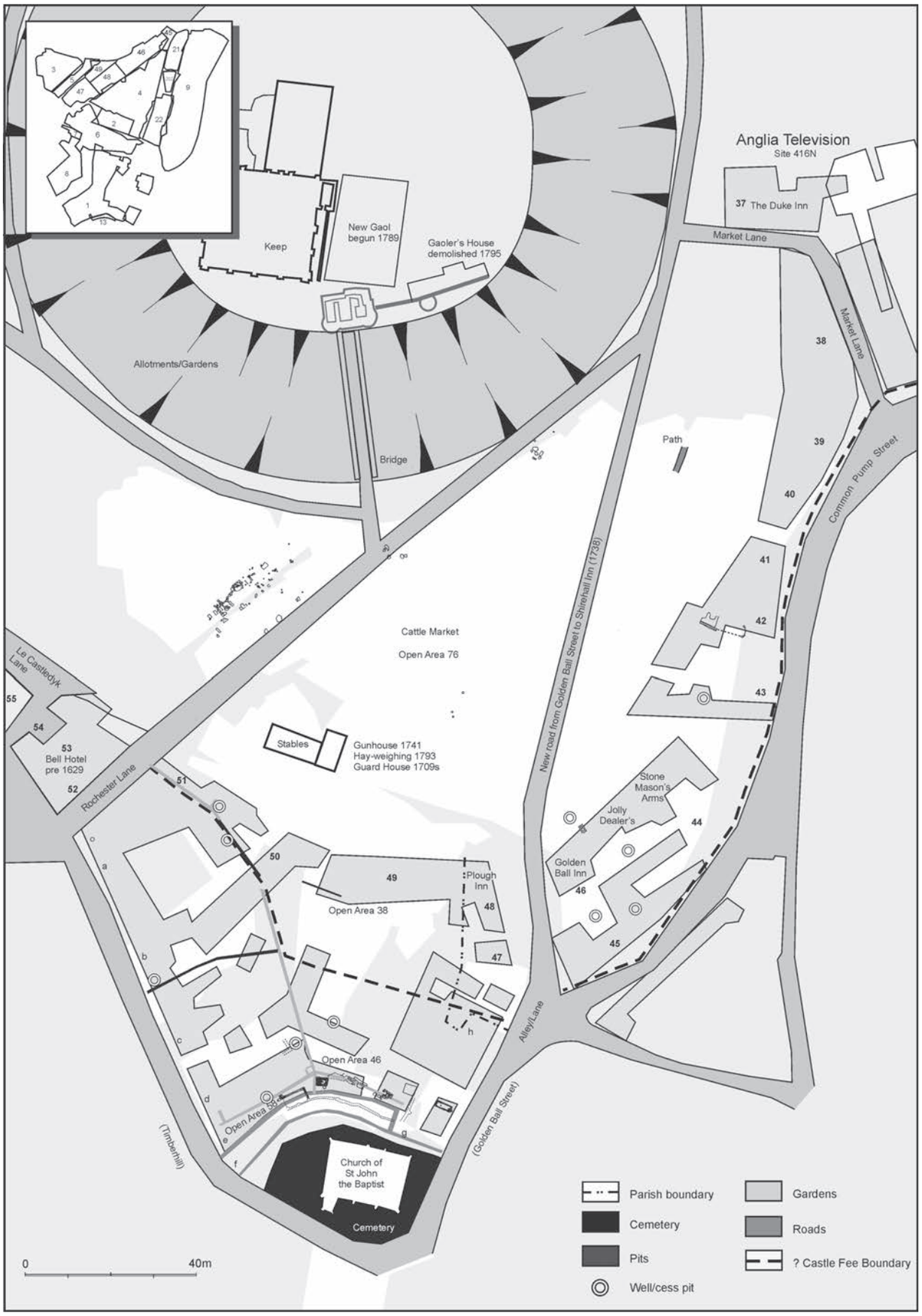


Figure 10.19 Period 6.3: Phase plan (18th century). Scale 1:1250

followed by thicker deposits into the remaining hollow to the south. These were of brown or grey sandy loam with some clay, again with large amounts of pebbles (*40679, 40668, 40669, 40667, 40444 and 40666*). One contained occasional fragments of mortar. Finds included animal bone, brick/tile, clay pipe, plaster/mortar, pottery and other objects.

Another sequence of late fills was recorded in the east-facing sections (Fig.8.27, S.440–443) and consisted of very dark loamy layers (*40625 and 40633*), followed by redeposited natural loam clay (*40634*), then thin tip lines of clay loam (*40635 40636, 40637, 40638, 40239*). A final dump of loam clay (*40640*) infilled the ditch in this area to its surviving top. Some of the fills here contained brick and other building material, but not in as large amounts as previous fills (see 2/33, Period 6.3).

A number of slots were placed along the edge of the ditch (not illustrated), which also recorded thick upper fills of the ditch including refuse disposal (slots *40341, 40364, 40345, 20015and 40363*). These recorded more tip lines of clay sand, sandy loam with a high proportion of charcoal, gravel, and building materials.

Barbican ditch east (Area 9)

The eastern arm of the ditch, which was substantially full as a result of earlier refuse deposition (G9/41, Period 6.2) was not subjected to infilling at this date, presumably as this part of the ditch appears to have been in lease or ownership by the residents of the Common Pump Street tenements. A few fills (*92031, 91750 and 91784,* G9/44 part) which lay beneath a possible path (see below) may indicate rampart remnants, although the bank in this area was probably used as make-up for areas further to the west. It was not until the 19th century that the upper part of the ditch here was infilled (see Chapter 11).

Small Finds

The assemblage of Small Finds (x 29) from these ditch fills is summarised in Table 10.20 on CD. Illustrated material consists of an iron spade shoe (SF5739, Fig.10.66; Mould, Chapter 10.III), a decorated handle (SF7561, Fig.10.55; Goodall, Chapter 10.III) and an antler whittle tang handle (SF6767, Fig.10.54; Huddle, Chapter 10.III).

Pottery

A total of over 1.920kg of pottery was recovered (see Appendix 6). Fills of the ditch in Area 47 (G47/25) contained GRE, TGE (?English) and Cologne and Frechen stonewares. A late 17th- to 18th-century date is indicated. Less than two kilogrammes of pottery (1.904kg) came from ditch fills recorded in Area 4 (G2/37), contemporary wares comprising GRE, IGBW, Metropolitan slipwares and Cologne-Frechen stoneware. Ceramically these fills are dated to the mid 17th century (based on the IGBW tyg base), but the general condition of the post-medieval pottery indicates an element of residuality. A small quantity of residual pottery was recovered from ditch fills in T19/39 (16g) and T35 (4g).

Clay Pipe

by Susanne Atkin

Clay pipe from barbican ditch fills in Area 2 (G2/37) consists of 5 stems, 7 bowls and a base, with dates of 1640–80, 1670–90 and 1680–1720. Material from barbican ditch fills recorded in T35/26 consisted of 3 bowls and 5 stems, along with a possible kiln spacer or wig curler (SF6890). Datable bowls were of 1620–40 and 1660–80. Amongst the small group from Area 47 were two bowls of 1660–80.

Infilling of the Quarry within the Barbican

by Elizabeth Shepherd Popescu and Andy Shelley

The earlier massive quarry at the base of the castle bridge was finally backfilled in or around 1738, with surrounding hummocks including piles of quarry waste and rampart remnants also levelled. The quarrying had created a large irregular hollow, within which the large blocks of gatehouse masonry had become embedded (see Period 6.2). Fills relating to Cattle Market landscaping lapped over it, demonstrating that the gatehouse had been demolished before the area was landscaped. The deposits which spread across the area (G47/39) appear to have been a mixture of quarried natural, disturbed soils and layers and the remains of the rampart. A series of what may have been robber cuts (G48/14) was recorded, the structure thus removed perhaps being associated with the gatehouse or a possible passage south of the gatehouse, through the rampart, to an associated bridge across the barbican ditch.

Levelling of the area was represented archaeologically by a series of quarry fills (G48/4 and G48/10) which probably followed swiftly after the demolition and/or collapse of what remained of the gatehouse (see Period 3.1 for its construction and Period 6.2 for its collapse). The quarry may have been levelled by pushing what remained of the rampart into it, adding layers of refuse and building material from elsewhere as part of a municipal effort to level an irregular surface. The pottery from the refuse deposits was of 17th- and early 18th-century date, whilst that from the building material lenses (probably providing a better indication of date of deposition) was from the early 18th century.

Quarry, Phase 5

Trial Hole 4 and Area 4

Thick dumps recorded during Trial Hole 4 lay between and above the masonry blocks (G48/10). Along the western side (Fig.8.27) these filled the upper part of the quarry and eventually extended above fills of the barbican ditch. The initial fill covering the northern block of masonry was of very dark brown loam with frequent chalk, mortar and tile fragments (*40912=40880*) containing many finds and clearly dipping down into the remnants of the quarry within which the masonry lay. A sequence of fills followed (*40911, 40902, 40905, 40898, 40901, 40897, 40891 and 40884*), consisting of dark silty loams and with finds suggesting refuse disposal. Only one (40897) was of redeposited natural sands and gravels.

Further south, earlier fills of both the quarry and the barbican ditch were sealed by deposits (*40864 and 40865=40888*) which also sealed the tops of the masonry fragments. These were mixed layers of yellow brown and dark brown clay sand and loam, containing building waste as well as other refuse such as shell and fish bone and many artefacts. This sequence was up to 0.72m deep. The level of and position of fills recorded in sections to the east suggests that they equate with these more extensive fills of the quarry and ditch (*40867, 40871 and 40872*). These were of dark yellow brown sandy loam and gravel.

Additional fills of the quarry (*40859, 40855 and 40856*) were recorded in the northernmost of the east-facing machine sections across the barbican ditch in Area 4 (S.444, G48/10, part, not illustrated).

Main excavation: Area 47

A section (G47/39, S.4707) recording the baulk along the south-eastern boundary of Area 47 noted modern tarmac and associated road surfaces, beneath which were post-medieval surfaces consisting of silty clay sand. Another,

parallel, section (S.4736) recorded similar deposits, one of which was widespread and infilled the upper parts of many earlier pits. No finds were recovered and these layers remain open to interpretation. They lay in the area of the barbican rampart and may have been the remnants of it. Alternatively, they may have been related to post-medieval landscaping and were similar to layers recorded in the upper parts of quarries and the barbican ditch.

Main excavation: Area 48

Dumps into the quarry, surrounding the collapsed masonry blocks, were recorded in several small sections in Area 48 (G48/10, not illustrated). Earlier fills were sealed by a layer of rubbish (*48243*) which contained large amounts of window glass (not collected), more of which was found above the large masonry block (*48002*). To the north of the same block (S.4805), two fills of mid brown sand clay silt with moderate gravel (*48011 and 48012*) tipped down to the south. To the west of the block (S.4807) were layers of light grey, orange mid grey brown sand/clay and silt (*48019*), ginger brown silt sand with frequent brick and flint (*48018*) and mid grey brown sand silt with frequent chalk lumps and mortar (*48017*). Similar deposits recorded in sections to the south (S.4801, 4802, 4803 and 4804, *48009, 48008, 48006, 48007, 48016 and 48010*) were more rubbly in nature and one (*48009*) contained frequent pieces of glass. Some lay beneath masonry block *48004* and others against block *48002*. Similar fills were recorded to the north-west (*48302*, *48346 and 48345*), although these lay outside the main quarry area and may indicate general levelling activities.

The most detailed record of fills of the quarry was made in the north-west facing machine steps in Area 48 (S.4814 and 4806), where late fills surrounded the large masonry block (48002). To the west (S.4814) were layers of dark grey loam clay (*48084 and 48062*), one with 50% mortar lumps and flecks. Above were further clay-rich layers and mortar (*48061, 48060, 48086 and 48082*). These were sealed by dark grey clay loam (*48085*) with frequent tile and other finds including a coin of 1674 (SF6859). Three layers of mortar and chalk followed (*48076, 48058 and 48064*), then a fill of dark grey sand silt and ash (*48059*) with frequent chalk flecks and lumps was overlain by more white chalk lumps and flecks (*48057*). The uppermost fills were thicker and consisted of mid brown sand clay loam (*48063 and 48056*) and building rubble.

Rubbish and rubble fills further east (S.4806) broadly equated (*48361, 48360, 48359, 48358, 48356, 48355*), overlain by a final layer of orange brown mortar sand loam, frequent pebbles and charcoal (*48354*).

More quarry fills were recorded in a section to the west of the masonry blocks (S.4808). Again these were of mixed dumps of building material rubble, including crushed chalk with ash and charcoal (*48366, 48365, 48364, 48363 and 48362*).

A patch of loose dark grey silt sand with frequent mortar flecks and tile was recorded around masonry 48229 (*48232*), one area of which was rich in clay pipe. This number was also used for finds collection immediately below the masonry. Another number was used for finds collection (*48001*) during cleaning around masonry block 48002 (subsequently recorded in more detail in section). Finds included notable quantities of shell (oyster, cockle and mussel, as well as helices in the cavities of masonry). Many small finds were collected including quantities of window glass (as noted in many surrounding deposits).

Small Finds

The large assemblage of Small Finds (x 220) from the quarry is summarised in Table 10.21 on CD. A late 17th- to early 18th-century date is confirmed by a Charles II farthing of 1674 (SF6859; Davies Chapter 10.III), supplementing other datable objects. The window glass recovered from fills of the quarry provides evidence for glazing activity in the vicinity, a total of over 100 fragments coming from fill *48001* alone. Smaller amounts came from other fills. This evidence is fully discussed by King in Chapter 10.III. The ironwork includes a small assemblage of scrap iron (minimum 11 items) including objects such as a cylinder SF6661 (*48001*) and fragments of sheet vessel with a rolled rim SF656 (*40901*) which appear modern. The fragments of wire SF814.01 (*40884*), SF6723.01 (*48001*) and bar iron, possibly broken sets SF6661.01 and SF6700 (*48001*) are suggestive of metalworking; smithing slag and fragments of hearth bottom were also recovered from the same context.

Illustrated finds include a copper alloy openwork hinge plate from a book or casket (SF298, Fig.10.56; Goodall, Chapter 10.III), a type 2 lace-tag (SF692, Fig.10.23) and a glass jar/bottle of 17th- to 18th-century date (SF6888, Fig.10.48; Shepherd, Chapter 10.III).

Pottery

A total of 8.956kg of pottery was recovered and is detailed in Appendix 6. Contemporary pottery from the thick dumps between and above the masonry (G2and48/10; 2.495kg) comprised GRE, IGBW, Rhenish stonewares and Staffordshire slipware. The date of this group was derived from the presence of sherds of Nottingham Salt-glazed stonewares, which were produced from the late 17th century throughout the 18th century. In addition, stoneware and China sherds attribute an 18th-century *tpq*.

Further fills of the quarry recorded during the main excavation in Area 4 (G48/10; 6.461kg) contained a range of contemporary pottery comprising GRE, Surrey White ware, Staffordshire slipware, IGBW and Rhenish stonewares from Cologne and Frechen and Westerwald stoneware recorded. Other imports included TGE (some of which may be of English production but are termed Anglo-Netherlands) and DWE.

Clay Pipe

by Susanne Atkin

A large group of 250 clay pipes came from Trial Hole 4 deposits (G48/10), consisting of 40 bowls/fragments, 8 bases, 198 stems and 4 mouthpieces. Of note are 2 examples stamped WA, possibly William Adamson in 1763–9 (or perhaps more likely an earlier unrecorded maker), both from fill *40901* and a pedestal base stamped WS, William Symonds a recorded pipemaker in 1693 (1720–40?) from fill *40911*. Other datable examples were of 1640–60, 1660–80 and 1680–1720. A scattering of narrow bored stems indicates activity in the 18th century, consistent with the later bowl dates. Further comments are given in Chapter 10.III.

Clay pipe from fill *48001* included 58 stems, several long, as well as 28 bowls (1680–1720), 6 mouthpieces (2 long), 6 bases one of which was burnished and two base fragments. Other pipes included a 5-leaf base stamp (1620–50) and other examples consistently dating to 1680–1700/20 with one example of 1640–60. Smaller amounts of similar date came from other fills. Fill *48232* contained 3 bowls (including an unsmoked spur of 1650–70 and two bowls of 1670–90), a base, a mouthpiece and 56 stems including hardfired examples, possibly waste material from a kiln. One was unusual in that it had apparently been twisted before firing.

Removal of Barbican Rampart and Insertion of ?Path

by Elizabeth Shepherd Popescu and Niall Donald

Open Area 77: ?path

An area of surfacing was identified to the east of the new market, possibly forming a path along the inner side of the ditch. Undated layers were thrown down after the barbican ditch rampart had been removed (G9/40) and probably occurred in the latter part of the 18th century. A series of dump layers recorded during the first phase of

machining above the barbican ditch in Area 9 may relate to the demolition of the barbican ditch rampart, creating a level surface. This involved the truncation of earlier deposits and the partial backfilling of part of the western side of the ditch (with layers *91586, 91587, 91748, 91746, 91749, 91743, 91750 and 92031*). The truncation occurred at a level of 19.00m OD. After levelling, the ground was metalled with pebbles and flints set in grey brown loam (*91780 and 91757*) and at least two post-holes were inserted (*91814 and 91821*). Subsequently, this surface was made-up and another surface laid, of grey brown clay loam with frequent pebbles (*91779 and 91785*). This was again made-up (*91426*) and at this point the sequence was truncated by the stripping of car park surfaces. Most of these deposits were recorded in a small area (7.2 by 1.4m) immediately to the west of S.9131 (located in Fig.10.19). Also included was a wide, shallow pit (*92422, 92420, 92424, 92421* and others) which could have been dumping activity. Although it appears that the eastern edge of these surfaces aligned with a tenement wall (91712, G9/43 Property 39, Period 6.2) the former has an artificial edge created by machining.

Small Finds
Finds included a lead rod (SF6416) and a Late Saxon penannular ?earring (SF6326; see Chapter 4.III, Fig.4.69, from *91787*). Presumably these finds were redeposited from pre-Conquest features which were disturbed by Cattle Market activities. Building materials (brick and tile) were also included.

Pottery
The pottery recovered from these deposits (0.114kg) was all residual.

Tenements along Eastern Edge of Barbican Ditch

It appears that the development of tenements over the barbican ditch in the eastern part of the site only ceased when the land was reclaimed by the city for the revised market in the 19th century (see following chapter). No archaeological evidence for this period was recorded, although a number of the features detailed in Period 6.2 may date to the 18th century.

The Cattle Market (1738)

by Elizabeth Shepherd Popescu and Andy Shelley
(Fig.10.19)

Open Area 76: Cattle Market
Although extremely difficult to date and therefore to attribute to a particular period, a number of post-holes and pits may relate to the 18th-century market (G2/18, G46/5 (part), G46/18 (part), G47/4, G47/5, G47/43, G47/20, G47/45, G47/47, G48/18 and G48/20). Some cut into the infilled quarry (detailed above), while others pre-dated features which appear to relate to the 1862 alterations (Period 7.1, Chapter 11). Although less regular in layout than their successors, these may be the remnants of animal enclosures.

Small Finds
Features assigned to G47/5 contained window glass (SF6820), nails (SF6825) and formless iron fragments (SF6802 and 6808).

Pottery
A small quantity of contemporary pottery was recovered, alongside residual material, from a number of post-holes, indicating an 18th-century date. See Appendix 6.

Block I: St Michael at Thorn (formerly St Martin-in-Balliva)

(Fig.10.19)

Structure 52 (Property ?42): cellars
The remnants of two cellars of unknown date (G9/119) may have been built in the 18th century, being destroyed in 1862 at the latest.

Open Area 73 (?Property 46): cistern/cess pit
An undated rectangular masonry lined cistern or cess pit measuring 2 by 1.2m (*90642*, G9/57) lay between two earlier wells and was not bottomed at a depth of 1.2m. It clearly post-dated the construction of an earlier well (90627, Period 6.2), since it cut into constructional deposits associated with it. It was lined with rough-hewn flint, and reused bricks bonded with soft off-white mortar. An iron pipe had been set within it western wall and a number of drainage holes were set within its sides, indicating a possible function as a cistern. Infilling included cess and silting resulting from water action, along with demolition debris. It had clearly been infilled by the time of the 1862 Cattle Market improvements. Although an association with the earlier Cattle Market could be postulated from its position, it is more likely to be associated with one of the contemporary tenements.

Block II: St John the Baptist, Timberhill

(Fig.10.20–10.21)

?Garden/Terrace Wall (Property 49)
A garden wall may have originated in the 18th century (*10975*, G1/39) cutting into fills of earlier quarries (Period 5.1) and the remnants of the south bailey rampart. It was recorded over a length of 9m and was *c.*0.40m wide, surviving to a height of 1.55m, and was constructed of flint, brick ('Norfolk Red', 9 x 4.5 x 3ins), chalk and knapped flint facers, bonded with white mortar. The presence of a few late brick types in unsurprising as the wall survived in use into the late 19th century and was no doubt altered and repaired. Comparison with the 1883 OS map suggests that the wall lay at the rear of what was later to become the *Jolly Farmer's Inn*. The build and mortar used here were quite different to another garden wall of earlier date to the west (see Chapter 8, Period 5.2). Both walls apparently acted to retain the remnants of the south bailey rampart and perhaps quarry waste to the north, the insertion of the wall (and perhaps an associated terrace) having created two flat areas from a previously sloping landscape.

Structure 53: cellar (Property b)
A cellar (G8/33) was added to the south face of an earlier well and was filled with organic matter, building rubble, charcoal and coal (*80084*). The well may still have been in use.

Small Finds
The organic layer in the cellar contained vessel glass (SF5845).

Pottery
A total of 1.641kg of pottery was recovered, dating the fills of the cellar to the late 17th to early 18th century (see Appendix 6). Fabrics consist of GRE, Metropolitan slipware, Staffordshire slipware, TGE and Rhenish stonewares (Frechen and Westerwald).

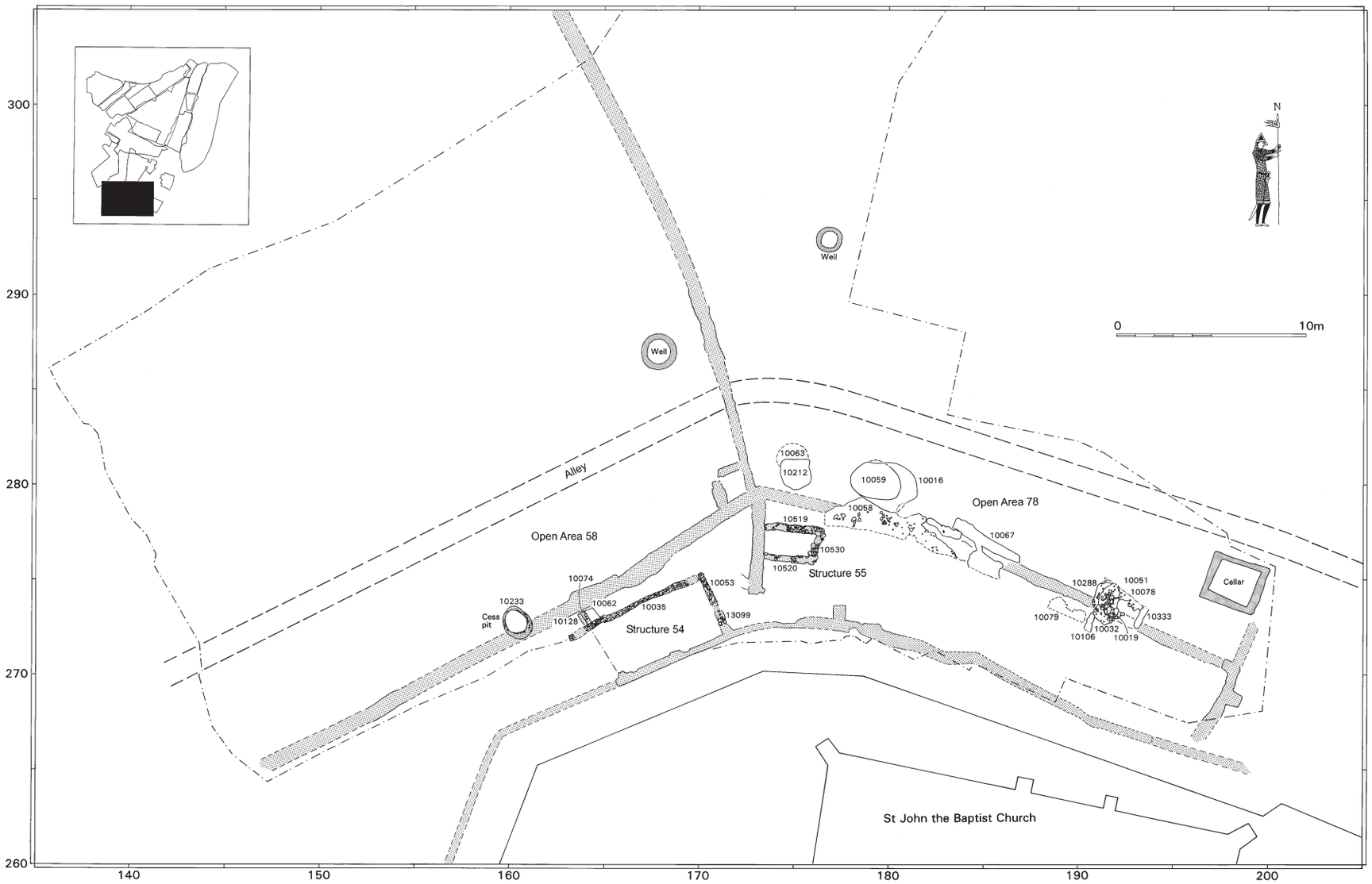


Figure 10.20 Period 6.3: Properties in the Timberhill block (Open Areas 58 and 78, City Properties e and g) and Structures 54 and 55 (City Properties f and g) (Areas 1 & 13). Scale 1:300

Clay Pipe
by Susanne Atkin
A total of 5 bowls, 25 stems and 1 mouthpiece was retrieved, the bowls dating to 1680–1720. The initials IO on one bowl (Fig.10.24, SF7616, no.17) cannot be matched to any Norwich maker. A date of 1720–70 is indicated.

Open Area 58 (Property e)
A circular/oval cut for a well or cess pit (*10716*, G1/135) was cut into the northern part of the projected line of the wall between Properties (e) and (f) (G1/107). It was lined with mortared flint, brick and both peg tile (*10223*). The earliest recorded fill was of natural sand. The feature may have served a property fronting onto Timberhill to the west.

Small Finds
The cut number was assigned to a pin (SF5091), nail (SF5095.01), copper alloy strip (SF5091.01) and riveted iron sheet (SF5093.02). The earliest fill contained a flint which had been used as an anvil (SF5123).

Pottery
A small quantity of pottery was recovered (0.321kg) from fills of the well. Contemporary pottery comprises GRE, Staffordshire slipware and stonewares. The fills date to the late 17th to early 18th century. See Appendix 6.

Clay Pipe
Three stems and a bowl with a long, untrimmed spur (unsmoked) were recovered.

Structure 54 (Property f): walls and pits
(Fig.10.20)
A second phase of walls was inserted within this property, to form a small room or outbuilding, possibly with a narrow corridor to the north (*cf.* location of washouses in 1844 plan, Chapter 11). Two small pits (G1/124, not illustrated) pre-dated the construction of the wall, cutting into an earlier wall (G1/123). Both were filled with mortar/rubble and yielded no finds. Two construction cuts (G1/126) were dug for the new walls, at right angles to each other, the eastern element abutting the wall along the side of the alley to the south and the western element continuing westwards above earlier foundations. The north-to-south element was of flint, bonded with light brown/cream/white very sandy mortar (*10053=13099*). The flint was rough hewn, random coursed and only the lower part survived. It was bonded to the east-to-west element to the north and may have been built at the same time. This second wall (*10035*) was of flint and brick (40%, 0.10m x 0.05m x 0.18m) with light orange/creamy white mortar again with a high sand content. The flints were rough hewn and random uncoursed. Different types of brick had apparently been used and the wall was quite roughly built. Perhaps constructed at the same time was a narrow stretch of brick and flint cross wall (*10074 etc*), reusing the foundation of the earlier wall. The bricks were 0.11m x 0.23m x 0.04m and the wall bonded with very pale yellow cream sandy mortar with gravel and chalk inclusions. This wall appeared to have had an internal face to the west and an external face to the east. Adjacent to it was a patch of rubble and mortar (*10062*).

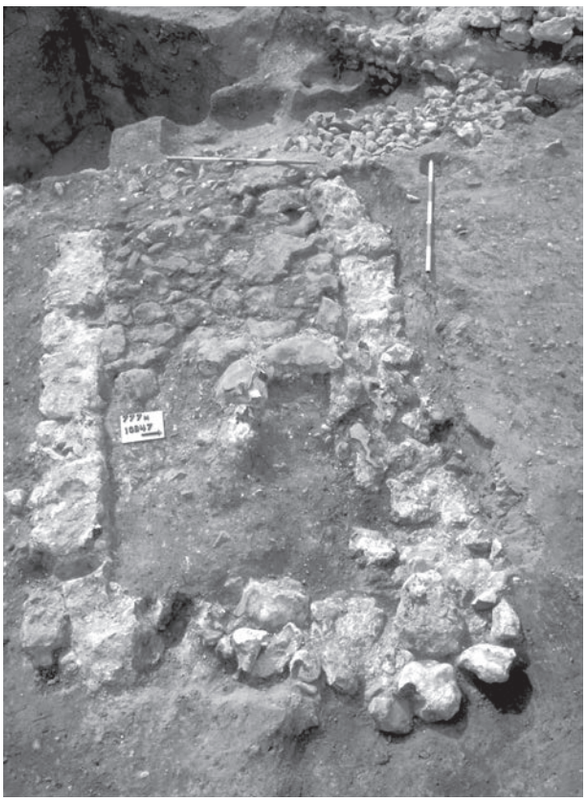


Plate 10.11 ?Eighteenth-century outbuilding Structure 55, Property (f) (Area 1, Period 6.3)

Pottery
A very small quantity of residual pottery was recovered from external dump *10062*.

Structure 55 (Property g)
(Figs 10.20–10.21, Plate 10.11)
A small building of possible 18th-century origin, possibly an outhouse or storeroom (G1/117), was added against the eastern face of the dividing wall between Properties (e) and (f). It had a cobbled floor overlain by occupation deposits and measured *c.*3m east-to-west and 2m north-to-south. A tenement plan of the 1840s shows the Grout's Thoroughfare block in detail, with this area filled with small properties and their related porches, bathhouses and other outbuildings (see Chapter 11).

A rectangular construction cut was dug (0.37m deep) with a roughly flat base and square corners. Walls were inserted along the inner northern and southern sides (*10519 and 10520*), built of large irregular fragments bonded with pure lime mortar with no other inclusions. These walls acted both as foundations and lower wall courses. The eastern wall was slightly different and may have been a later addition (*10530*), perhaps blocking an earlier entrance. This stretch of wall was of rougher build than the other two and lay not quite at right angles to them. Again, it was constructed of flint, unbonded and with the flints unfinished.

Preparation for a floor was made with a makeup dump of clay loam containing some redeposited human bone. A cobbled surface was then laid, comprising large flint nodules with some brick. The flints were close fitting forming a rough surface. Above the floor was a layer of occupation debris/trample or dark red iron-stained loam, the red colour from which had leached into the underlying cobbles.

Just to the south of the building was a ?threshold (G1/120) formed of broken brick and tile, compacted into

Figure 10.21 Period 6.3: Detail of Structure 55 (City Property g). Scale 1:50

the underlying soil, overlain by a surface of compacted chalk.

Small Finds
The makeup dump contained two iron formless fragments (SF5232). The occupation debris contained a bone bowl/pipe? (SF5368), ceramic marble (SF5341), 10 copper alloy dress-making pins (SF5144 and 5378), vessel and window glass (SF7492 and 5142). The chalk surface contained 'English' wine bottle fragments, late 17th- to 18th-century (SF5209) and a nail (SF5202).

Pottery
Less than 100g of pottery was recovered from the dumps associated with the structure. Contemporary fabrics (Staffordshire slipware and Surrey White ware) suggest a mid to late 17th-century (or later) date. See Appendix 6.

Clay Pipe
Three stems were found, one late example encrusted with slag and two others with mortar adhering to them.

Open Area 78 (Property g)
An earlier well (G1/88, Period 6.2) was filled with destruction debris and was eventually capped with flint and brick. The earlier wall was rebuilt above the capped well, suggesting that it continued in use. Above, however, was evidence for the robbing/destruction of the walls in the 18th century or later.

A patch of building rubble from the collapse of the well capping, together with the capping itself, acted as the foundation for the rebuilt wall (*10019*). This consisted mostly of flint and broken brick fragments, bonded with hard off-white/pale yellow sandy mortar with a fine gravel temper. The flint was rough hewn with occasional roughly squared blocks and was random uncoursed.

A sequence of dumps/destruction deposits (*e.g. 10058*, G1/91) from earlier walls (G1/84) provides some evidence for robbing of building materials, both above the cross-wall and main wall and well (G1/88 and G1/89). The deposits were spread along and above the length of the wall. The main act of robbing (*10068*) occurred above the well where an oval cut was made to take out part of the underlying wall. This cut was 0.53m deep and was filled with building rubble. At the top was rubble which had probably collapsed from a later rebuilding of the wall; the bricks here were noted to be relatively modern and the mortar was very hard and pale grey in colour.

Small and Bulk Finds
Finds included a copper alloy sheet (SF5063), vessel glass (SF5100), 'English' wine bottle, late 17th- to 18th-century (SF5362 and 5100), glass goblet of the 16th to early 17th century (no.29, SF5139, Fig.10.47), an iron nail (SF5140) and a residual Late Saxon copper alloy ear/finger ring (SF5053; see Chapter 4.III, Fig.4.69).

Pottery
Almost a kilogram (0.946kg) of pottery was recovered from deposits associated with this robbing. Contemporary material (GRE, Staffordshire slipware, TGE, White Salt-glazed stoneware and Nottinghamshire stoneware) dates the group to the early to mid 18th century. See Appendix 6.

Clay Pipe
by Susanne Atkin
A group of 9 stems and a single bowl was recovered, the latter an unsmoked fragment of pedestal base stamped with IO and the remains of the royal arms. The initials IO occur on bowls found within a kiln muffle (see Chapter 10.III) and probably date to *c.*1720–80, but there are no recorded makers with these initials.

Structure 56 (Property g): cellar
by Elizabeth Shepherd Popescu and David Whitmore
At the Golden Ball Street site, cutting through the edge of an earlier cellar was the remnants of another east-to-west oriented rectangular brick-lined cellar (*509*, GBS Group 3) which measured 4.5m by 1.6m. It had been infilled with a very dark brown silty sand containing coal and brick inclusions (*178*) that in turn overlay a light grey compacted mortar floor (*179*). It is likely that this cellar was a replacement for the earlier example, possibly entailing the demolition of a related above ground structure and the construction of another. The presence of so much coal within the primary fill may lead to an interpretation as a coal storage cellar. Pottery from the backfilling of the cellar suggests that it was in use during the 18th century and was backfilled in the later 18th or 19th century.

Small Finds
Fills of this cellar contained iron slag (SF18) and a copper alloy diamond-shaped ?mount (SF24).

Pottery
by Richenda Goffin
(Fig.8.52)
A total of 0.075kg of pottery was recovered. Contemporary pottery comprises English stoneware, GRE and IGBW. An 18th- to 19th-century date is suggested. See Appendix 6. Residual material includes a fragment of the base of a dish or bowl, with a small hole pierced through the footring for suspension (Fig.8.52, no.1). This dish was made in a biscuit fabric which appears not to have been tin-glazed, and it may therefore be of some significance. Although it is possible that it was a finished product when it was discarded, and had originally been fully glazed, it seems more likely that the fragment represents a waster sherd from a production site, from Norwich itself. The sherd is large, and no trace of any tin-glaze is present. See further comments in Chapter 10.III and Chapter 13 'Pottery Production'.

Buildings 57 and 58
by Elizabeth Shepherd Popescu and David Whitmore
Two cellared buildings bounded the northern and southern edges of the area to the north of No.18 Golden Ball Street (GBS Group 30). The northern building (*369*) had been constructed over and through the infilled south bailey ditch. The building to the south had utilised the remnants of an earlier flint and mortar wall (*272*). The dating of these structures suggests that they were constructed later than No.18 which may have been constructed at the beginning of the 17th century (Robert Smith, pers. comm.). The later addition of drainage features, soakaways and a small cellared outbuilding to the northern structure occurred in the 19th and 20th centuries.

Structure 59: cellar of No.14 Golden Ball Street
by Elizabeth Shepherd Popescu and David Whitmore
The northern end of the southern excavation area at Golden Ball Street was truncated by the brick cellar of No.14. This had been infilled with brick rubble probably in the 20th century. Archaeological evidence indicates that this structure was probably constructed in the latter part of the 18th century.

III. FINDS

Introduction

A total of 2,849 Small Finds was recovered from post-medieval deposits at Castle Mall (27% of the total site assemblage; Table 10.22), with a further 177 from Golden Ball Street (Table 10.23). Many other diagnostic post-medieval objects were found residually or intrusively. Further items were unstratified, those illustrated being described further below.

The bulk of the post-medieval assemblage from the Castle Mall site came from large quantities of refuse dumped into the barbican ditch (a total of 1,368 objects; 48% of the period total). The finds are shown by material in Table 10.24 and by object type in Table 10.25. Additionally, large groups of 'unstratified' material are also known to have come from the ditch (not included in the tables). Although fills of late 16th- to early 17th-century date were present (Period 6.1), most of the infilling occurred in the mid to late 17th century (Period 6.2) with a documented cut-off date of 1738, when much of the ditch was finally infilled as a precursor to the construction of the Cattle Market. This date is well-attested by the artefactual evidence, in particular by the clay pipes from the ditch, the majority of which pre-date 1740. The upper part of the eastern stretch of the ditch (Area 9) was only completely infilled later, certainly by the extension of the Cattle Market into this area in 1862 (see Period 7, Chapter 11).

Post-medieval dumping into the eastern part of the barbican ditch in Trial Hole 1 and Area 9 (G9/41) spanning the late 16th to mid/late 17th centuries yielded the largest individual finds assemblages, including animal bone (see Chapter 4.IV and Part III) and pottery (over 265kg). Small Finds from these fills are summarised by assemblage in Chapter 10.II and include some significant individual objects, such as the decorated bone powder horn, pocket compass sundial and horse jaw-bone sledge.

Period	*Small Finds (no. objects)*	*Pottery (no. sherds)*	*Post-Medieval Pottery (kg)*	*CBM (kg)*
Period 6.1	683	1,905	17.442	35.118
Period 6.2	1,808	11,561	302.572	59.992
Period 6.3	358	1,036	12.281	8.058
Total	**2,849**	**14,502**	**332.295***	**103.168**

* a total of 384.402kg of pottery was recovered, including residual and intrusive material

Table 10.22 Selected Period 6 finds by sub-period at Castle Mall

Period	*Small Finds (no. objects)*	*Pottery (no. sherds)*	*CBM (kg)*
Period 6.1	33	68	3.246
Period 6.2	116	421	5.582
Period 6.3	2	24	0.054
Total	**177**	**513**	**8.882**

Table 10.23 Selected Period 6 finds by sub-period at Golden Ball Street

Material	*Total*
amber	1
antler	11
bone	18
ceramic	45
copper alloy	86
fabric	8
flint	1
glass	499
horn	3
iron	361
ivory	6
lava	2
lead	11
leather	302
plaster	6
silver	1
stone	1
tin	1
unknown	3
wood	2
Total	**1,368**

Table 10.24 Small Finds from post-medieval fills of the barbican ditch (all areas), by material

The ironwork comprised a minimum of 100 objects, consisting principally of broken domestic items with a small number of craft tools, horse-related objects and ironworking debris. Another notable group is the shoes and associated evidence for leatherworking. Norwich's whole social range is indicated in the assemblage, as is discussed in Chapter 10.VI.

Dress Accessories and Personal Possessions

Dress Fittings

Copper alloy finger ring
by Alison Goodall
(Fig.10.22)
A gilded ring (SF6390) in the form of clasped hands holding a heart, is an example of a 'fede' ring, signifying love and affection. This was recovered from fills of the barbican ditch. Such rings were popular from the 13th century onwards, continuing into the post-medieval period. A similar example was found in a 15th-century context at Alms Lane, Norwich (Margeson 1993, 5, fig. 1.4), and two rings from Amsterdam showing clasped hands holding a heart, one of tin and the other of copper alloy, are dated to the later 16th century (Baart *et al.* 1977, 213–214, nos 390–1).

A simple ring from the Golden Ball Street site (SF268, not illustrated) with a ridged profile was probably a finger ring.

SF6390 **Ring.** Finger ring, gilded on all surfaces, with hand-in-hand bezel. Both hands wear gloves with flared wrists, and there are two pellets above the hands which may represent a clasped heart. The inside of the D-section hoop bears the inscription 'thine f r' followed by a heart and a cross.
91650, fill of barbican ditch, Period 6.2, G9/41

Beads
by Julia Huddle
(Fig.10.22)

Two bone beads (SF5285 and 6488) and one amber bead (SF6192, not illustrated) came from late 16th- to early 17th-century deposits and, unless residual, are likely to have come from necklaces since rosaries were banned during the Tudor period (Margeson 1993, 5).

SF5285 Globular **bone or ivory bead**. Diameter of hole = 2.5mm.
10850, external dump, Period 6.1, G1/98

SF6488 Discoidal **bone bead**. Diameter of hole = 2.8mm.
91612, fill of barbican ditch 91295, Period 6.1, G9/41

Copper alloy head-dress pin/bodkin
by Alison Goodall
(Fig.10.22)
A head-dress pin or 'bodkin' (a term used to refer to a hair pin until 1714 by which time it changed to its current meaning) was found in fills of the barbican ditch (SF53). It is paralleled at other sites in Norwich (Margeson 1993, 8–9, fig. 4.21–3) and Amsterdam (Baart *et al.* 1977, 214–9, nos 401–2). A silver example came from Aslacton, Norfolk (Helen Geake, pers. comm.). Similar pins are shown in paintings of the 17th century and were worn by women at the side of the head, pushed into the hair and under the cap with the decorated end projecting, from which a pendant or pearl may have hung. The fashion seems to have been particularly popular in the Netherlands in the first half of the 17th century. This object is one of a number from the site that may indicate the presence of Dutch immigrants in the Norwich area during the post-medieval period.

SF53 **Head-dress pin**. Incomplete head-dress pin or bodkin with rectangular slot. Above this is a lobed terminal, decorated with five perforations with a row of punched dots on both faces between the perforations. The rectangular-sectioned shaft is bent and the tip is missing.
92745, fill of barbican ditch 91295, Period 6.2, G9/41

Copper alloy dress and shroud pins
by Alison Goodall
(Fig.10.22)
A group of 157 pins of varying type (including the bodkin described above) was recovered. Of these, 16 were classifiable as dress pins the remainder being smaller and perhaps associated with dress-making (see below). Of note amongst the assemblage are those found associated with the prison burials at the top of the Castle Mound (see Chapter 10.II, Period 6.2). These include four pins with heads of coiled wire, some with white metal plating. One example is almost 60mm long. It is probable that the pins were shroud pins and the form of the heads is consistent with a date in the 17th century, as suggested for the burials. A number of other copper alloy objects were found within the trench in which the bodies had been buried, including a lace-end. The fact that there were no other finds suggests that the bodies were not clothed, although textile was found around the foot of one individual. A further eight pins were found in associated contexts, but not directly associated with the skeletons.

SF5624 **Pin**. Dress pin with spherical spiral-wound head and white-metal coating. L: *c.* 52mm.
12351, fill of pit 12350, Period 6.2, T47/2

Object Type	*Total*
artefact	14
bar	4
bead	2
beaker	5
bell	1
bone	1
bottle	184
bottle seal	1
bowl	1
buckle	11
building material	1
button	2
came	1
cap	1
cauldron	4
clay pipe	16
coin	2
comb	4
crucible	2
cylinder	2
disc	3
door furniture	1
drinking vessel	14
facetted bone	1
fastener	1
fitting	1
floor tile	2
formless fragment	10
goblet	4
handle	5
harness strap	9
head dress pin	1
heckle tooth	1
hinge pivot	3
hook	1
horseshoe	2
implement	3
industrial debris	1
jetton	1
key	3
kiln furniture	1
knife	12
knife handle	4
knocker	1
lace-tag	9
lava	1
leather	6
leather-working debris	70
lock	2
flowmetal working debris	2
nail	222
nailed binding	3
padlock	1
phial	18
pin	45
plaster	4
plate	7
powder horn	1
purse	3
purse frame	1
quern	1
ring	2
rod	3
roofing tile	1
sawn antler	4
sawn horn core	3
sawn ivory	3
sawn-off waste	4
scissors	5
scoop	1
scrap	9
screw	1
sheet	8
shoe (a total of 319 items)	202
shoe heel	1
skate	1
sledge runners	2
socket	1
spillage	1
spoon	2
spur	3
spur leather	4
staple	1
staple hasp	1
stem	2
strap	4
strip	12
stud	1
tack	2
textile	6
tile	1
token	5
tool	1
vessel	55
wall plaster	1
wall tile	17
wedge	2
whetstone	1
window glass	240
wine glass	1
wire	11
witch's bottle	2
worked flint	1
Total	**1,368**

Table 10.25 Small Finds from post-medieval fills of the barbican ditch (all areas), by object type

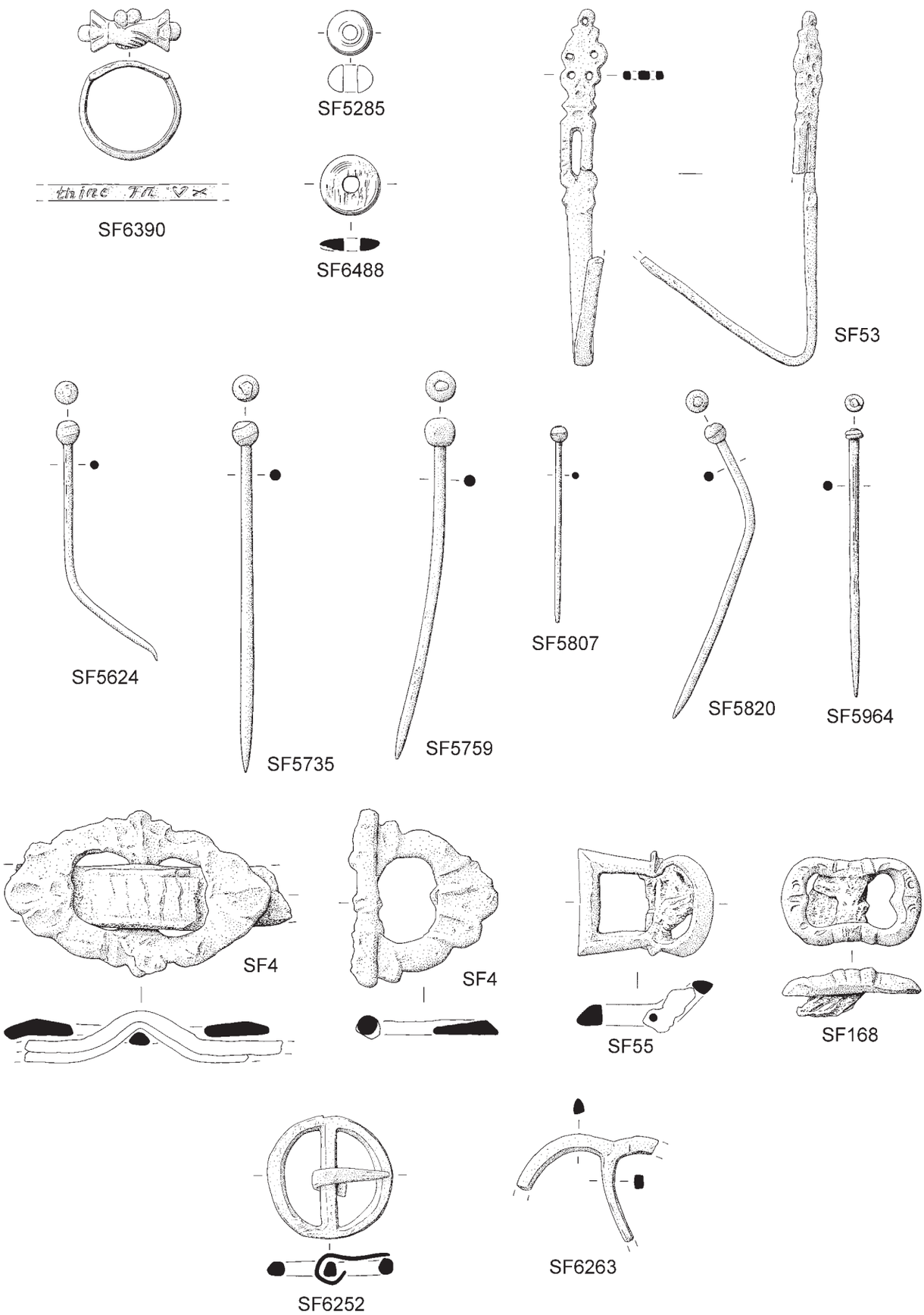


Figure 10.22 Copper alloy finger-ring (SF6390); bone beads (SF5285 & 6488); copper alloy head-dress pin (SF53); copper alloy dress & shroud pins (SF5624, 5735, 5759, 5807, 5820 & 5964); copper alloy buckles (SF4 (pair), 55, 168, 6252 & 6263). Scale 1:1

SF5735 **Pin**. Dress pin with spiral-wound head. Well-made. L: 64mm.
60057, fill of barbican ditch 60190, Period 6.2, G6/33

SF5759 **Pin** with spherical wire wound head (large, sturdy type). L: 63mm.
40000, unstratified

SF5807 **Pin**. Dress pin with spherical spiral-wound head. L: 36mm.
80134, fill of pit 812/2, Period 6.1, G8/29

SF5820 **Pin**. Dress pin with spherical spiral-wound head. L: 39mm.
80184, fill of pit 80185, Period 6.1, G8/29

SF5964 **Pin**. Dress pin with remains of spiral-wound head made from fine wire. L: 60mm.
80196, fill of pit 80257, Period 6.2, G8/29

Copper alloy buckles
by Alison Goodall
(Fig.10.22)

The copper alloy finds from the barbican ditch are consistent with the dumping of refuse during the late medieval and post-medieval periods. The buckles include a fragment of a figure-eight of post-medieval type (SF6263): a similar buckle was found attached to the belt of a fully clothed man's body found buried in peat at Gunnister, Shetland. Coins in the man's purse date him to the end of the 17th century and, although the coins are from the Netherlands and Sweden, do not necessarily indicate that he was a foreigner (Henshall and Maxwell 1951–2, 30–42). Another buckle of this type, from Amsterdam, was dated to the late 16th/first half of the 17th century (Baart *et al* 1977, 170, fig. 214) and it would therefore appear that such a simple form has a long period of currency. SF55 is an asymmetrical double-looped buckle with a pin-bar which projects beyond the edge of the frame. A similar asymmetrical buckle from Amsterdam is dated to the second half of the 15th century (Baart *et al.* 1977, 169, no. 213) but the type may be later. A double-looped buckle from the Golden Ball Street site (GBS SF218, not illustrated) is of similar type to SF6263 from Castle Mall and is likely to date from the 16th or 17th century.

An annular buckle with central pin-bar was also recovered at Castle Mall (SF6252), while other fills of the barbican ditch produced several buckles. SF4 (two examples) and SF168 are 17th-century forms. The pair of decorated buckles (SF4) may be compared with buckles from Basing House for which a date was suggested in the first half of the 17th century (Moorhouse 1971, 60, fig. 25.169–70). The leather fragments found with these buckles indicate that they were still attached to leather straps when they were discarded.

SF4 **Buckle**. Two double-looped buckles with triple-lobed pin rests and triple lobes at junction of pin-bar and frame, with leather belt fragments. Part of one of the buckles is missing.
92739, fill of barbican ditch, Period 6.2, G9/41

SF55 **Buckle.** Asymmetric double-looped buckle, one loop rectangular and the other D-shaped, with lobes at the junction of pin-bar frame. fragment of iron pin survives.
92761, fill of barbican ditch 91295, Period 6.2, G9/41

SF168 **Buckle.** Sub-rectangular double-looped buckle with incurved sides. Ribbed decoration on the frame at its junction with the pin-bar. iron pin and attachment plate. Grooved pin-rest on one loop.
92750, fill of barbican ditch, Period 6.2, G9/41

SF6252 **Buckle**. Circular buckle frame with copper alloy pin wrapped around central bar. W: 23mm.
91450, fill of barbican ditch 91295, Period 6.1, G9/41

SF6263 **Buckle**. Double-looped buckle fragment with part of central bar.
91717, fill of barbican ditch 91295, Period 6.2, G9/41

Copper alloy hooked fasteners
by Alison Goodall
(Fig.10.23)

A hooked dress fastener (SF5812) dates from the post-medieval period and is probably therefore later than its late 14th- to 15th-century context. Examples of hooked fasteners from Norwich showing a variety of designs and dated to the 17th century are illustrated in Margeson 1993 (17, fig. 8.71–5).

A simple double-hooked fastener (GBS SF266, not illustrated) is elaborated by the addition of a circular plate riveted on to it. It is similar to the hooked fasteners (SF6952 and SF7550) from the barbican well at Castle Mall (Chapter 9.III).

SF5812 **Hooked tag**. Openwork hooked tag with tall narrow rectangular attachment loop above and hook below a double moulding. Plate bears a shield with double-lined border and openwork animal head, perhaps a cat with long whiskers; around the shield is a lobed border, solid along the sides and openwork above. L: 35.5mm.
80199, fill of pit 80214, Period 5.2, G8/26

Copper alloy buttons
by Alison Goodall
(Fig.10.23)

A cast button (SF66, not illustrated) with a hollow openwork head and integral loop, from fills of the barbican ditch may be paralleled at Amsterdam (Baart *et al.* 1977, 184, no 235), where it is dated to the 16th century. Another parallel from Norwich (Margeson 1993, 20–22, fig. 11.102) comes from a context dated 1700–1885. Globular buttons made from two hemispheres with a loop inserted into one of them were found at The Hamel, Oxford in contexts ranging from the late 13th to the late 15th century (A.R. Goodall 1980, 24, nos 45–8), so it is possible that the similar example from the Castle Mall excavations (SF23, not illustrated) may be residual. Such a simple type could, however, have been current over a long period and a post-medieval origin is possible. An unstratified cast button (SF7555) is paralleled at Haccombe, Devon (Read 1995, 146, no. 984) and is of 17th-century type. Another unstratified button (SF6139) is gilded but crudely made and appears to be of post-medieval date.

A button (SF28) with a plain discoid top and a loop at the back was found unstratified at the Golden Ball Street site (not illustrated). It is likely to be of post-medieval date.

SF6139 **Button**. Gilded flat circular button or stud with scar of attachment shank on reverse. The front has crudely engraved decoration of a crowned S, with two vertical lines either side.
90000, unstratified

SF7555 **Button**. Flat circular button, with engraved decoration of a border around a design of curved lines radiating out from a slightly off-centre ring-and-dot. The spaces between the lines are alternately filled with an engraved crescent and hatched lines. Broken attachment loop on reverse.
10000b, unstratified

Copper alloy lace-tags
by Alison Goodall
(Fig.10.23)

A total of 44 lace-tags came from post-medieval contexts at Castle Mall, with an additional 21 found unstratified or intrusively in earlier periods (although the few in Period

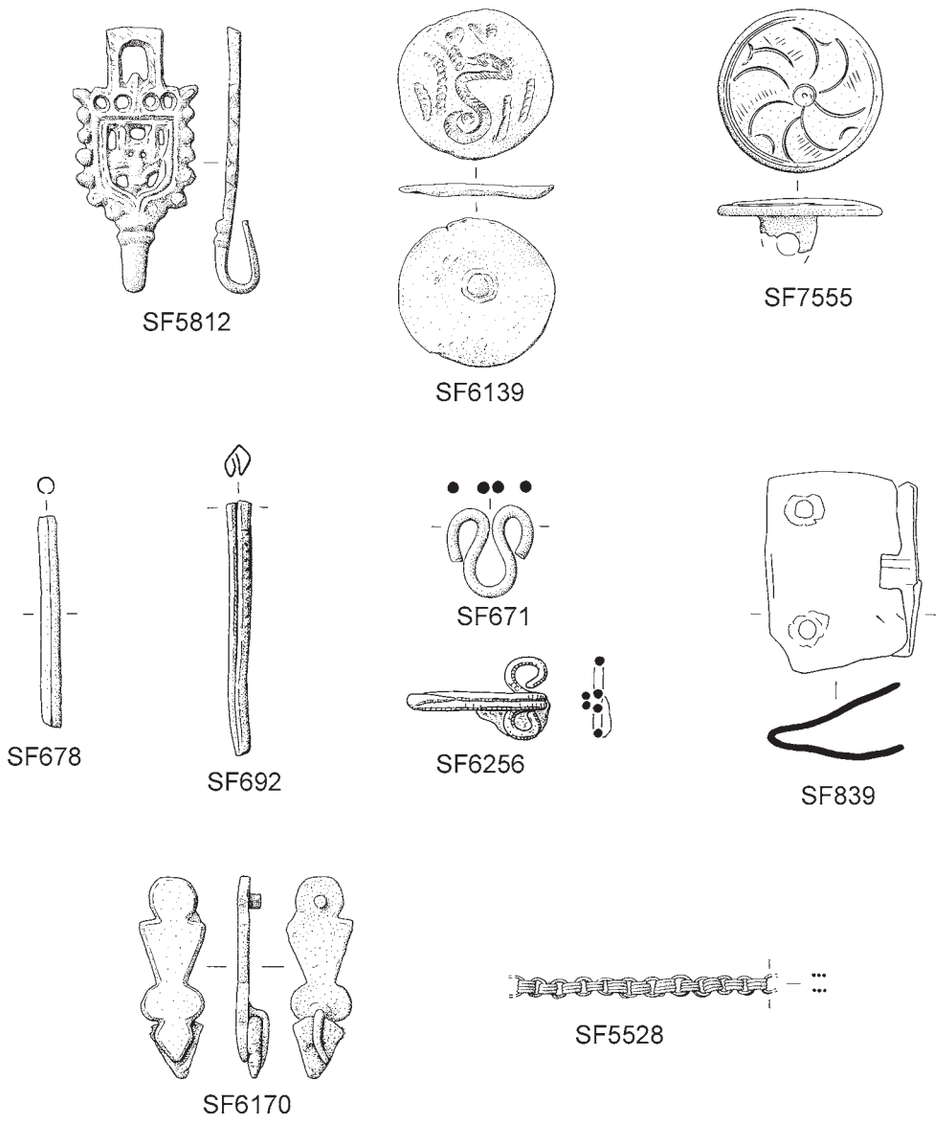


Figure 10.23 Copper alloy hooked-tag (SF5812); copper alloy buttons (SF6139 & 7555); copper alloy lace-tags (SF678 & 692), copper alloy eyelet (SF671); iron buckle plate (SF839); iron hook fastener (SF6256); copper alloy mount (SF6170); copper alloy chain (SF5528). Scale 1:1; SF839 at 1:2

5 may be contemporary). The examples recovered are typical of the many lace-ends found on late medieval and post-medieval sites, when they were used on clothing in large numbers. Type 2 examples (*cf.* SF692; Margeson 1993, 22–24) are thought to be generally later than Type 1 (*cf.* SF678).

Four Type 2 lace-ends (not illustrated) were recovered from pits at the Golden Ball Street site dating to Period 6 and from unstratified contexts.

SF678 **Lace-tag**. Type 1 lace-tag, rivet visible on x-ray.
40916, external dump Period 6.2, G48/12

SF692 **Lace-tag**. Type 2 lace-tag. Decorated with a zone of stamped cross-hatching between two transverse lines. L: 34mm.
40912, fill of barbican ditch 40406, Period 6.3, G48/10

Copper alloy eyelet
by Alison Goodall
(Fig.10.23)
A copper alloy eyelet (SF671) resembles modern hooks and eyes and is probably related to the more common twisted wire loops. Examples of both types were found at Amsterdam and date from the 16th to 17th centuries (Baart *et al.* 1977, 158, nos 177–9).

SF671 **Eyelet**. Eyelet, neatly made of wire, with two attachment loops. L: 12mm.
40907, fill of pit 40906, Period 6.2, G48/12

Iron dress fittings
by Quita Mould
(Fig.10.23)
A small number of iron dress fittings were found, comprising principally of buckles, buckle pins (x 2) and buckle plates (x 2 *e.g.* SF839). The buckles included a

complete D-shaped example (SF90, not illustrated), a small annular buckle (SF5279, not illustrated) of a type found in quantity in the upper backfills of the barbican well (Chapter 9.III) and a small fragment from a shoe buckle. A single wire hook fastener (SF6256) with a non-ferrous metal plating would have been used with simple eyelets like the copper alloy example detailed above (SF671). This is comparable with a copper alloy wire hook from a possible 14th-century context in Exeter (A.R. Goodall 1984, fig. 191, m121).

SF839 **Buckle plate.**
40899, fill of barbican ditch 40406, Period 6.2, G48/4

SF6256 **Fastener**. Hook of bent wire with pair of looped rings for sewing to the garment, non-ferrous metal coated. L: 40mm.
91438, fill of barbican ditch 91295, Period 6.2, G9/41

Copper alloy belt-mounts/strap-end
(Figs 7.25 and 10.23)
Three mounts and a strap-end came from post-medieval deposits. The strap-end is of medieval type (SF5945) and is detailed in Chapter 7.III (Fig.7.24). Two dumbbell-shaped mounts (SF667 and 5985, not illustrated) may have served as harness or belt-mounts. The third example may be a belt- or harness-mount (SF6170).

SF6170 **Mount**, with two shanks for attachment, some leather *in situ* on reverse (see Crowfoot, this chapter). Mount consists of a triangular plate expanded at the pointed end to form a trefoil and at the other end a circular terminal.
80134, fill of pit 812/2, Period 6.1, G8/29

Personal Possessions

Copper alloy chains
by Alison Goodall
(Fig.10.23)
A copper alloy chain (SF5528) is fine and well made and may be from a necklace. Examples of necklaces and bracelets made from similar chains are illustrated from Amsterdam, where they are dated to the first half of the 17th century (Baart *et al.* 1977, 206–10, nos 379b and 385). Another chain (SF701, not illustrated, *40918*, from a post-hole within the barbican quarry, G48/5, Period 6.2) is of elongated links which have been folded and looped through each other to make an elaborate cable.

SF5528 **Chain.** Delicate chain, probably a necklace. The links are formed by winding fine wire into a three- or four-spiral cylinder.
40000, unstratified

Clay pipes
by Susanne Atkin
(Fig.10.24)

The bowls
Of the 1,159 clay pipe bowls and bowl fragments recovered from the site, the majority date to the 17th century, and fall into a number of date ranges: 1620–50, 1640–60, 1660–80 and 1680–1720. These ranges tend to overlap and should not be seen as compact, discrete date guides. All the types can be paralleled on other Norwich sites and there is very little in the way of makers' marks to help provide evidence for dating — Norwich makers tended not to mark their products in the way that, for example, Bristol makers did. The bowl types, albeit a fairly limited range of shapes, found in large numbers on the Castle Mall site are undoubtedly locally made. There are no bowls from elsewhere in the country, with the exception of a few Dutch examples (see below). Shape and size are the factors that suggest date, and the Norwich types have been compared to the typology published by Atkinson and Oswald (1969) and Oswald (1975).

There are several examples of burnished bowls, many of them dating to 1660–80, and although in some places they may represent pipes bought by wealthier customers, burnishing appears to have been used on pipes made in Norwich throughout the 17th century, and especially in the mid century. As an indicator of economic status, the burnished bowls cannot be proved to be significant.

The marks and decoration
The earliest bowls on the site (from Areas 4 and 6), are invariably base-stamped, using AB crowned, five-heart-shaped leaves, four leaves and pellets, wheel and pellets, or a clover (nos 1–6). The size of the bowls and the use of such marks suggests a 1620–50 date (two of the AB crowned bowls are the smallest yet found in Norwich), and are paralleled most notably on the Shirehall car park (Site 150N), but their origins are not easy to determine. If made in London there are no exact published parallels, although initials in relief and other designs are found from *c*.1610; if made in Holland their form is unfamiliar to Dutch researchers. It has been suggested that some early 17th-century base stamps were used by makers outside London on locally-produced pipes between *c*.1625 and 1650 (*e.g.* by Plymouth or Boston makers: Oswald 1969; White 1979). The possibility that the pipes from Area 6 were made in Norwich is a very tentative one and implies that an early, and unrecorded, maker(s) produced good quality pipes, and in succeeding decades the use of base stamps by subsequent Norwich makers was abandoned; the question of origin should, perhaps, remain an open one. Base stamps of AB crowned and four leaves with and without pellets have also been found on the Greyfriars site in Great Yarmouth, apparently as a 'batch', and interestingly the bowls exhibit the same mould flaw, suggesting they were produced by the same maker from one mould. It is likely that pipes imported from, or exported to, the Low Countries would have gone through Yarmouth. The group found in Area 6 are mostly unsmoked, and it can be suggested that they were bought as a batch. At this early 17th-century date, tobacco would still have been fairly expensive, and a batch of marked, burnished bowls suggests a wealthy customer. Records exist of pipes being ordered in batches for members of the gentry; records of tobacco shipments also suggest small-scale imports and re-exports, possibly on behalf of wealthier customers (S. Atkin 1985a, 118–19). Taken together with the evidence from the Shirehall car park site, it can be surmised that these pipes were being used as a batch by a particular customer or customers somewhere in the vicinity of the castle ditches.

The next group of marks includes those found on bowls of 1650–80 date and consists of initials on the sides of the base or on the bowl sides. They form a style of marking, with large, often 'untidy' initials, sometimes retrograde, found mainly on the eastern side of Norfolk reaching as far as the Waveney border with Suffolk (S. Atkin 1988). The bowl marked TB (B retrograde) on the bowl sides in context *92758* (Area 9, Trial Hole 1) is

identical to one found in Metfield, Suffolk (S. Atkin 1988, fig.3, no.12). Thomas Browne is recorded as working as a pipemaker in Bungay prior to 1686, and his name is the only 'local' one that fits the dates of the bowl. IS (in Areas 8, 9 and 47; no.12) and TS (Area 4) are the most usual initials of their type found in Norwich, and have been found on other city sites, often on burnished bowls (S. Atkin 1985b). They form a group distinct from that discussed above, but both styles are the only significant forms of marking to be found on mid 17th-century pipes in Norwich. Unfortunately there are no records of makers with these initials.

From *c*.1680 to 1720 bowl sizes increased, and makers put their initials on the sides of the bases. The bases are invariably shaped like a 'pointed' oval and are usually large. IM (Areas 1 and 4; Area 9, Trial Holes 1 and 3) and NS (Area 9, Trial Hole 1) are commonly found in the city, often together in the same contexts. IM is usually identified with Jane Morgan, master of an apprentice in 1693. IR/RI (from Area 9, Trial Hole 1) is unusual in that it is vertical on the sides of the base, and these examples, like others found in Norwich, are quite crude; in fact they may not be mould-imparted at all (nos 14–15).

From 1700–40 base shapes underwent another change, from large 'pointed' oval shapes to rounded ones, which would eventually become the pedestal bases. RS (Area 4 and Area 48) may refer to Richard Skipper who was apprenticed in 1699, but there is no record of him becoming a master. TP (*40000*, Area 4) occurs on flat bases and on pedestal bases, and probably refers to Thomas Parsley, recorded as a pipemaker in Redenhall-with-Harleston between 1692–3 and 1736 (several TP pipes have been recovered from that area, apparently confirming the attribution: S. Atkin 1985a, 135).

The pedestal base appeared on bowls of *c*.1720–70, and often had the maker's initials mould-imparted on either side. All the following marks have been found elsewhere in Norwich. IO (no.17; Area 47), maker unknown; pipes with this mark were found in the kiln muffle (see Peacey below). WS (Area 4, *40911*; Area 9, Trial Hole 3; Area 49), a William Symonds was recorded as a pipemaker in 1693. WA (*12200*, watching brief; Area 4, *40000*, *40890*, *40901*; Area 5 (11 examples); Area 49), is possibly William Adamson, recorded in the Freemen's Books in 1763–9, although an earlier date for the pipes, similar to the others, by an unrecorded maker, cannot be ruled out.

The site produced very few bowls of a date recognisably later than 1740, confirming the closure of the remaining ditchwork in 1738. Fragments with a long spur suggest a date 1780–1840 (Area 1, *10176*; *12305*, watching brief). Pipe fragments in Area 5 and Area 22 may be late 18th/early 19th-century. The 19th century is represented by a fluted bowl marked IS (*12508*, watching brief T36), an acorn bowl (Area 1 unstratified) and pipes in Area 9 (unstratified). The general paucity of later 18th- and 19th-century pipes suggests a lack of opportunity for deposition, compared with the area in the 17th century. General rubbish from the market would presumably have been taken to dumps outside the city; it is from the river banks on the outskirts of the city that the majority of later 18th- and 19th-century pipes have been found.

Marks on stems

A stem marked SV was found in Area 4 (no.9). SV marks are found in London, *c*.1620–40, and later examples are found in Lincolnshire; however, the maker is unknown. An SV stem was found at Heydon, Norfolk (S. Atkin 1985a, fig.3, no.37), and the attached bowl is dated 1620–40. The Castle Mall example has no associated bowl.

Two stem fragments bear unusual impressed decoration: one stem has 2 three-leaved clovers (no.7) which in all probability joined one of the bowls with the same clover design on the base, and the other stem has four circles (no.8). Both stems probably date to *c*.1620–50.

Stem fragments with crude rouletting form a recognisably local style of marking; some are rouletted at the stem/bowl junction (no.13). Where a bowl is present, the dating is usually in the mid and third quarter of the 17th century.

Dutch material

by Susanne Atkin with Richenda Goffin

The origins of the early 17th-century bowls with heart-shaped leaves/petals and AB crowned as base stamps have been discussed above. Dutch examples of the five-heart-shaped leaves have been published, but the bowl forms are not typical of Dutch makers. It has been pointed out that the links between English pipemakers and the emergent Dutch pipemaking industry are quite complicated, and the place of origin of early 17th-century bowls and marks is therefore difficult to determine (Don Duco, pers. comm.).

Several Norwich sites have produced recognisable Dutch bowls and stems, most notably the Alms Lane site (302N), where it is suggested that immigrants from the Low Countries occupied one of the tenements. Only two items from the Castle Mall site may be Dutch: a base stamp of a *fleur de lys* in Area 4 (no.11); and a stem fragment with three diamonds in a line, each containing a design derived from a fleur-de-lys, joins a bowl from the same layer (Area 8, *80134*). The bowl leans back, which is uncharacteristic of English pipes, and has typically 17th-century rouletting under the rim but, less typically, has four 'petals', one on each seam and one on each side (cat.no.16). Such an unusual bowl/stem is unlikely to be local, and a Dutch origin is suggested, though no published parallels can be cited. A stem with four bands of rouletting in Area 9, Trial Hole 1 (*92768*) may also be Dutch. Several stems with crude rouletting were found on the site (see above), but the neatness of this example sets it apart.

A group of tobacco bowls from the Golden Ball Street site (pit *146,* Open Area 53, Property (g), Period 6.1) were all of the same type. They were all small with pedestal feet with fine rouletting around the rims. Three of the bowls have the same mark stamped in relief on their feet, that is a five-heart-shaped leaved rose (Fig.10.24, no.18). Such a stamp has been recovered elsewhere and has been dated 1640–1660 (fig. 3, nos 29–30, Unprov, Yarmouth (GYM P58) (S. Atkin 1985a, 129). The attribution of the stamp is unclear, as it may have a London origin or otherwise (S. Atkin 1985a, 129). Stamped relief decorations of this type are also associated with the Dutch pipe making industry in the early 17th century, and it is possible that these bowls were imported (*ibid*.). In view of the influx

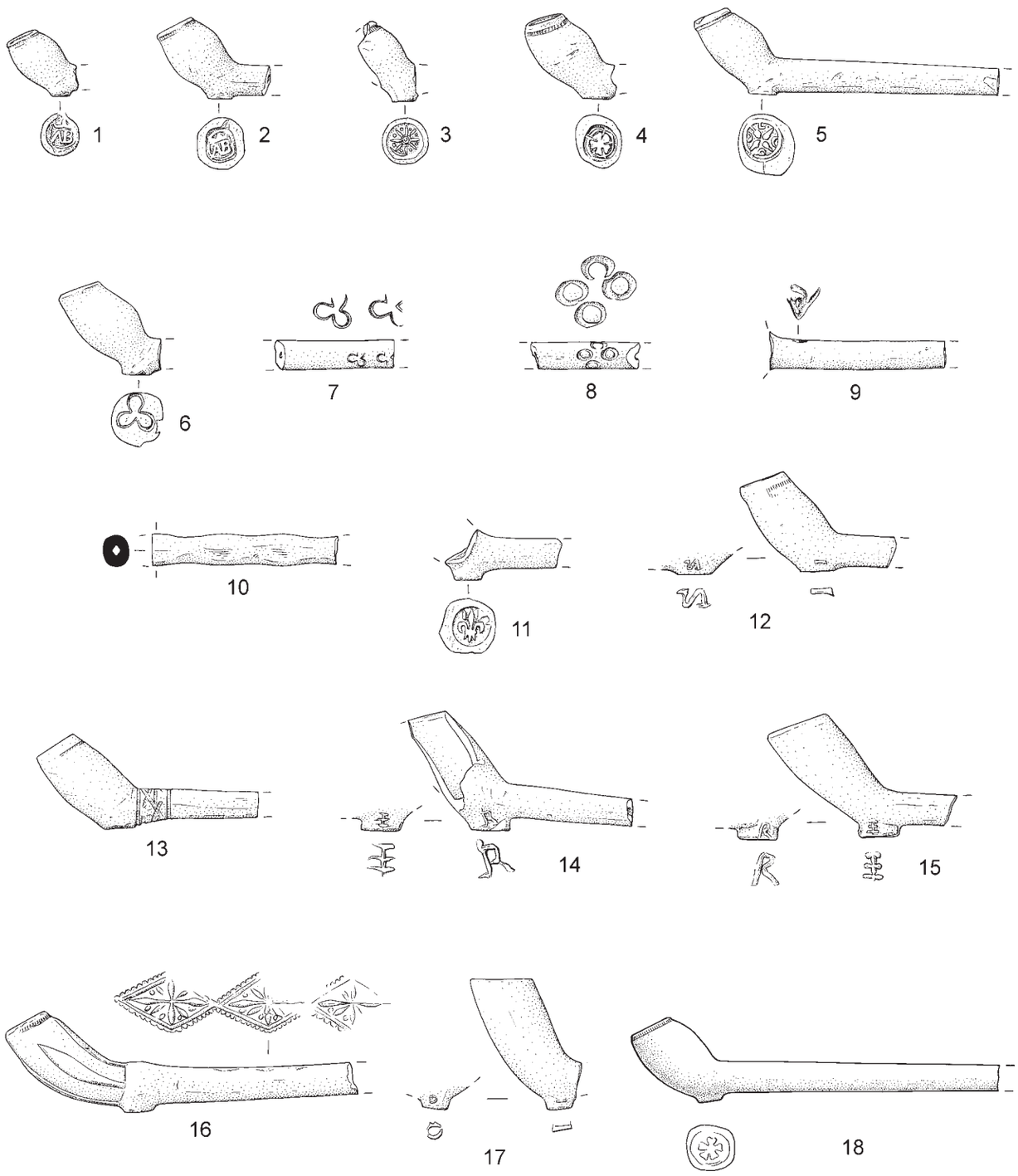


Figure 10.24 Clay pipes. Scale 1:1

of Dutch and Flemish immigrants into Norwich during this period, this is perhaps likely.

Finding Dutch material on this site does not suggest any unusual 'immigrant' activity in the close locality, but does fit into a general pattern of Dutch pipes being found on sites in the city.

The pipes

The finds exhibit many of the characteristics of pipe material found on other Norwich sites: a majority of 17th-century groups, all locally made; the occurrence of a minority of mid 17th-century spurred types amongst a majority of flat-based examples; several burnished bowls in the 1650–80 groups; no recognisable English 'imports'; and a scattering of Dutch material. The relative paucity of later 18th and early 19th-century bowls probably reflects the use of the site during later periods; however, only a few sites in Norwich have produced such bowls, notably an excavation on Pottergate (Site 149N) which had material from a nearby kiln site owned

by the Browne family. The paucity of later material can be attributed to the general removal of pipes in rubbish clearance to areas beyond the city walls.

A scattering of Dutch pieces is also typical, as is the absence of pipes from manufacturing areas outside Norfolk. Dutch pipes are more likely to be the result of immigrants from the Low Countries bringing the pipes with them rather than any 'export trade' being practised. The large numbers of 17th-century groups suggests that local manufacturers kept the city supplied with pipes; any 'stray' finds are likely to have been brought in with visitors.

The pipe-kiln material described by Peacey below (see 'Craft' below) is tantalising, for there is only a small amount of direct evidence for kilns in Norwich, and very little documentary evidence for the actual locations of the kilns in the 19th-century, and none at all before that. The fact that the Castle Mall kiln material is very heavy is not enough to suggest that the kiln was close to the site of deposition. If it had been sold as hard-core then one would expect a greater quantity to have been found. Its occurrence on the site may simply have been due to the convenience of finding a dump site within the city walls. To find pipes marked IO in the muffle, and not to be able to link them to a documented maker, or to a kiln location, is very frustrating.

Only a limited number of clay pipes were assigned SF numbers on the Castle Mall site. Those illustrated are referenced using the specialist catalogue number, with SF no. indicated in addition where appropriate.

no.1 One of three of the smallest **bowls** on the site (one of the others is carefully burnished); all three have AB crowned stamped on the base; all have neat rims and all are unsmoked; sb6–7. Bowl size suggests *c*.1610–40. Cf. S. Atkin 1985, fig.3, no.31, found at ?Yarmouth (occurs in London *c*.1610).
60000, unstratified

no.2 One of seven similar **bowls**, all with AB crowned stamped on the base; all except one are unsmoked; burnished (plus three others in the group); all neatly finished; sb7+. Size suggests *c*.1630–50.
60000, unstratified
Nos 1 and 2 could have been part of the same 'batch' of pipes supplied to the user, although there is a significant difference in size. The mark is also found on bowls from Site 150N and from Greyfriars, Yarmouth (S. Atkin 1985a, fig.3, nos 35–36). The latter group had the same mould flaw as bowls stamped with the four-leaved 'rose', suggesting the maker used different stamps on bowls from the same mould; see No.5, below.

no.3 Small, burnished **bowl**, neat milling, lightly smoked; clear 8-spoked wheel and pellets stamped on base. 1630–50.
60057, fill of barbican ditch 60190, Period 6.2, G6/33

no.4 Burnished **bowl**; m4; 5-heart-shaped leaves/petals stamped on base; lightly smoked; sb7; one of two similar bowls. *c*.1630–50.
60057, fill of barbican ditch 60190, Period 6.2, G6/33

no.5 Burnished, waisted **bowl**; four leaves or 'rose' with half-pellets on base; m4; lightly smoked; one of two similar marked bowls. *c*.1630–60. Cf. S. Atkin 1985a, fig.3, nos 33–34, 129 for a group of similarly marked bowls from Greyfriars, Yarmouth (see no..2, above).
60057, fill of barbican ditch 60190, Period 6.2, G6/33

no.6 Bulbous **bowl** with pronounced waist; burnished and highly 'polished'; 3-leafed 'clover' stamped on base; one of three bowls with similar mark on base; sb6. Unusual bowl shape and mark — possibly not local but origin uncertain. Size suggests *c*.1630–60.
60000, unstratified

no.7 3-leaved 'clovers' (or trefoil) impressed on **stem**; burnished; sb6. Stem does not fit bowls with similar marks, but the marks are identical enough to suggest a common origin. Early 17th century.
60000, unstratified

no.8 **Stem** with four impressed circles; sb7; unusual mark, although decoration of impressed circles has been found on Site 170N. Possibly local. 17th century.
60000, unstratified

no.9 **Stem** with what is probably an impressed SV; undatable without a bowl attached, but probably 1620–80 on the basis of bowls found elsewhere, including Norfolk and Lincolnshire. Origins unknown.
40000, unstratified

no.10 Pinched **stem**; sb7+. Possibly Dutch. 17th century.
60057, fill of barbican ditch 60190, Period 6.2, G6/33

no.11 **Base fragment**, stamped with fleur-de-lys. Possibly Dutch (British makers used fleur-de-lys marks but they do not usually occur in Norfolk). 17th century.
40000, unstratified

no.12 **SF394.** Straighter-sided **bowl**, with IS in relief on the sides of the base. Similar mark found on other Norwich sites and probably locally made; one of three bowls with this mark in the same layer; m3; sb6. *c*.1660–80.
92768, fill of barbican ditch 91295, Period 6.2, G9/41

no.13 **SF461.** Straighter-sided **bowl**; m3; sb7; criss-cross rouletting on the stem/bowl junction. Probably locally made. *c*.1660–80.
92766, fill of barbican ditch 91295, Period 6.2, G9/41

no.14 **SF333.** Burnished **bowl**; RI in crude lettering in relief on the sides of the oval base; milling on front; sb7 (and see No.15). *c*.1690/1700–1740.
92739, fill of barbican ditch 91295, Period 6.2, G9/41

no.15 **SF333. Bowl** with IR in crude lettering on the sides of the oval base (one of two); milled on front; sb7; see also No.14. Probably RI (No.14) and IR are by the same maker. *c*.1690/1700–1740.
92739, fill of barbican ditch 91295, Period 6.2, G9/41

no.16 **SF7615.** Unusual **bowl**; 4 'petals' on bowl; bulb in stem at stem/bowl junction, and three lozenges containing 'floral' motif; 'polished' exterior; bottered rim; m3; sb7. Origin and date uncertain, possibly Dutch but no published parallels; has characteristics of both 17th- and 19th-century pipes.
80134, fill of pit 812/2, Period 6.1, G8/29

no.17 **SF7616. Bowl**, mould-imparted IO on sides of the base; similarly marked fragments found in the pipe-kiln debris. Initials cannot be matched to any recorded Norwich pipe-maker. *c*.1720–70. Other IO pipes occur in Area 4, *47000*; and Area 1, *10305*, with the remains of what is probably the royal arms on the bowl, a type of decoration produced between 1740 and 1850.
80084, destruction debris, Period 6.3, G8/33

GBS

no.18 **Bowl** with mark stamped in relief on foot in the form of a five-heart-shaped leaved rose.
145, fill of pit 146, Period 6.1, GBS Group 9

Purse frames
by Alison Goodall and Quita Mould
(Fig.8.38)

An iron purse frame recovered from the barbican ditch (SF347) is apparently a type dating to the second half of the 15th century and therefore residual in its context. Similarly a copper alloy purse frame (SF1107) recovered from a late 16th-century pit may date from the mid 15th century. Both objects are detailed illustrated in Chapter 8.III.

Leather purses or powder flasks
by Quita Mould

A fragment of pleated leather with a curved edge (SF443.01, not illustrated) from the barbican ditch (fill *92761*) may come from a purse or powder flask, as could a fragment (SF858.01, not illustrated; barbican ditch fill *92758*) with a similar curved edge secured with copper alloy studs and with the beginnings of a pinked edge at right angles to it. A highly decorative bone powder flask was also recovered (see 'Hunting' below).

Copper alloy compass sundial
by Neil Brown, with a note by Steven Ashley (heraldry)
(Fig.10.25, Plate 10.12)

The origin of the compass sundial may go back to the end of the 13th century, when the magnetic compass was introduced into Europe, but the earliest surviving examples (in the Tiroler Landesmuseum Ferdinandeum in Innsbruck and in the British Museum in London) date from the middle of the 15th century. They are also the earliest known sundials designed to show time on the modern system of equal hours, instead of dividing the period of daylight into a fixed number of intervals the length of which varied according to the season of the year. The spread of mechanical clocks, which (in principle) ran at a constant rate, hastened the change from using unequal hours to using equal hours.

Compass sundials were widely used as portable timekeepers (a fixed dial did not need a compass) until at least the early 19th century, and are difficult to date because they were used for such a long period. Watches were an expensive alternative and, especially in the early days, unreliable. The earliest compass sundials had string gnomons but instruments with metal gnomons, usually folding, became the more common. Many examples can be seen in museum collections. Most of them are elaborately engraved and some are of precious metal, which suggests that high-quality instruments have survived preferentially. The compass sundial in a cylindrical brass box is the simplest to construct. It is likely that it was comparatively cheap, and was made in large numbers, but relatively few examples are now known.

The vast majority of compass sundials have a pivoted magnetic needle over a fixed compass card. Examples with the compass card attached to the needle and moving with it are rare but not unknown. A sundial with such a `floating' compass card in the Museum of the History of Science in Oxford (accession number 49,453) has sufficient similarities to the example found at Castle Mall (SF6729) to suggest a common origin. The case and cover are of ivory instead of metal, but the dimensions are comparable, the markings on the compass dial are similar, and there is a decorated paper disc inside the cover. The pierced disc which forms the top of the case, and the gnomon hinged to it, are of brass. The disc is of very similar shape with only slight differences in markings (the figure 4 is not rotated and a star replaces the two incised lines — see below). The shape of the gnomon and the engraved markings on one side of it appear identical. This dial at Oxford is said to be German and to date from about 1700. The instrument found at Castle Mall may be of similar date, although the arms suggest a Dutch origin. They are displayed on one of the paper disks found within the compass sundial and are those of Amsterdam. They can be blazoned: *[Gules] on a pale Sable three saltires Argent* the shield ensigned with an imperial crown and supported by *two lions rampant proper*. These arms were granted in the 15th century. Saltires are shown on other Dutch civic arms, such as those for Nieuwer-Amstel, and are considered to be either a variant on the arms of the house of Persijn, or to be symbolic of justice (Louda 1966, 92–3). The presence of the arms of Amsterdam on part of the sundial would appear to indicate the likely place of manufacture for this object.

SF6729 Simple **compass sundial** with a cylindrical copper alloy case and cover, and glass and paper fittings. A metallic point projects from the base of the case to act as a pivot. The cover is now in two parts, the slightly curved disc being detached from the ring, which has become permanently attached to the cylindrical base over which it originally fitted. Whether it screwed on to the base (as is often the case) or just slipped over cannot now be determined. A metal loop is provided on the ring of the cover, for attaching a cord or chain. Inside the cover is a paper disc (Fig.10.25E) on which a coat of arms has been drawn in black ink. The cover and the underside of the case are decorated with engraved concentric lines.

A pierced copper alloy disc is set just inside the case, and a triangular gnomon of similar material is hinged to it by means of two loops formed in the disc. The gnomon is decorated with engraved lines. The angle of the gnomon when raised is about 43º to the horizontal, indicating that the dial was designed for use at a latitude of about 43º — not in Britain. Around the edge of the pierced disc the Arabic numbers 4 to 11 and 1 to 8 are incised to indicate hours, the number 12 being omitted because one of the metal loops is positioned where it should be. In both cases the figure 4

Plate 10.12 Pocket compass sundial of *c*.1700 (SF6729) found in the barbican ditch. For scale, see Fig.10.26

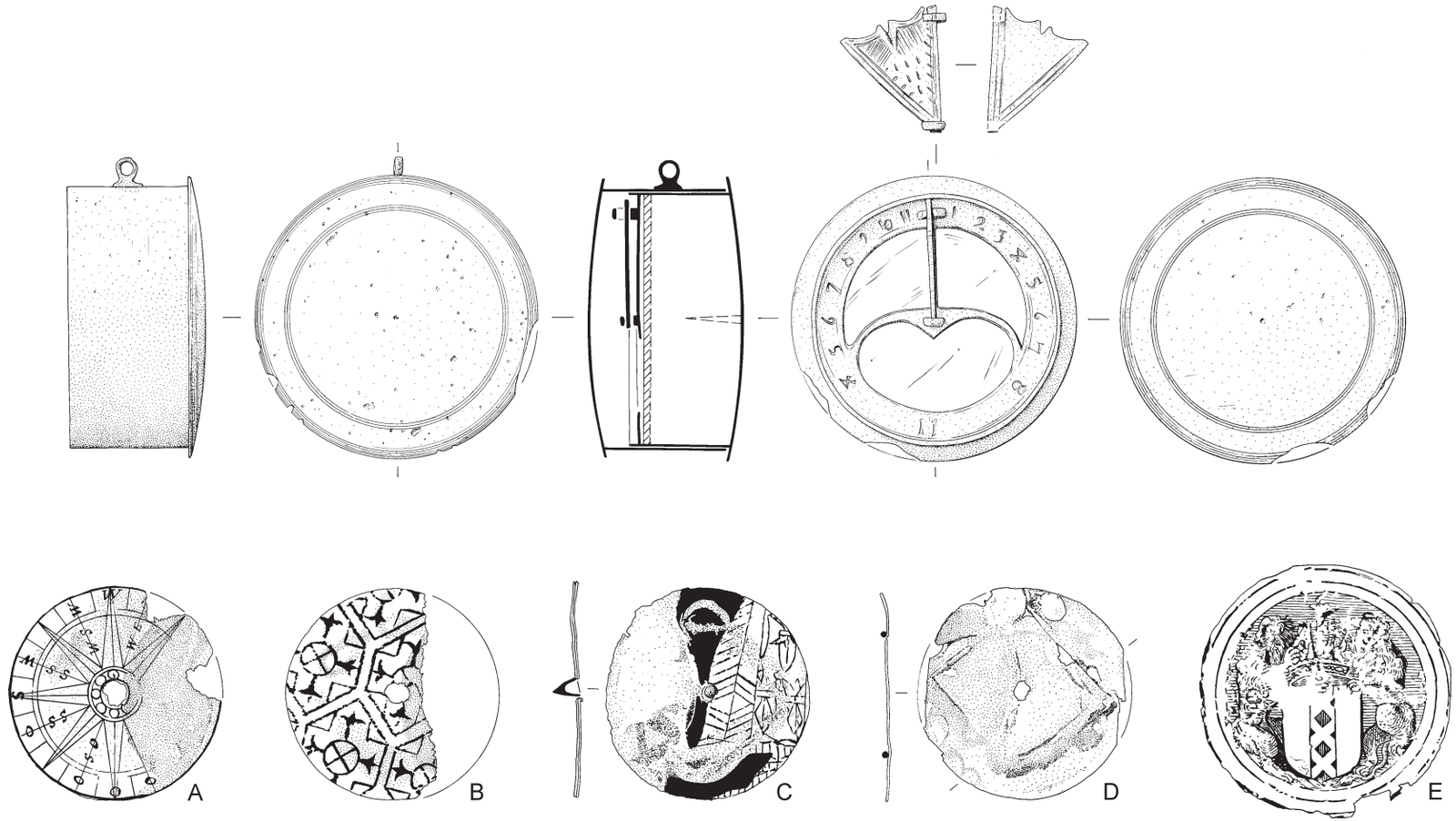


Figure 10.25 Copper alloy compass sundial (SF6729), with five surviving paper disks. Scale 1:1

is rotated from the usual orientation. The point on the disc opposite where the 12 should be is marked with two incised lines.

Below the pierced disc is a glass disc and below the glass are four paper discs, each with a central hole. The top disc (A) has a compass rose drawn on it, on which the letters O S and W indicate east, south and west and combinations of these letters mark intermediate points. The disc is incomplete and the northern part is missing. The second disc (B) has a geometric design. The third disc (C) has a geometric design, and a socket of non-ferrous metal set in the centre. The fourth disc (D) is attached to a wire of ferrous metal, originally bent into a diamond shape but now corroded and incomplete. All the inscriptions are in black ink. These parts must be the remains of a compass disc attached to a magnetic needle and turning with it. The metal socket of disc (C) would have pivoted on the metal point in the case. The other discs would have been the layers of a pasteboard disc, now delaminated, the compass disc being the top surface and the other markings having no significance. The diamond-shaped wire, when magnetised, would have functioned adequately as the compass needle.

47000, unstratified, but from fills of barbican ditch

Bone and ivory combs

by Ian Riddler and Julia Huddle

(Fig.10.26)

Four ivory double-sided simple combs can be compared with similar examples from earlier excavations in Norwich (Margeson 1993, 66–8 and figs 35–6), as well as with sequences from late medieval and post-medieval contexts at a number of sites, including Colchester, Dublin, Exeter, Ipswich, London, Northampton and Southampton (Crummy 1987, 23–4 and fig.26; Dunlevy 1988, 371; Allan 1984, 351 and fig. 195.9–15; Riddler forthcoming a; Kenyon 1959; Oakley 1979, 310, fig.137.44 and 45; Harman and Shaw 1985, 75 and fig.37.76; Platt and Coleman Smith 1975, nos 1646–7; MacGregor 1985, 81–2). Metrical details of the ivory combs from excavations at the Castle Mall site are provided in the following table, with the average number of teeth given per 10cm for each side of the comb as advocated by Galloway (1976, 154).

Simple, undecorated combs of this type are first encountered in late medieval contexts and became particularly common in the 16th and 17th centuries. Almost all are of a simple rectangular shape with rounded corners, having originally been cut transversely from the raw material as flat plates of slender section. Two of the Castle Mall combs (SF115 and 5581) show the distinctive lines of fracture and the curved concentric lines which most characterise combs of ivory (S. O'Connor 1987, 13). Most of the Norwich series are between 45 and 65mm in width but few survive in a complete form and it is diffi-

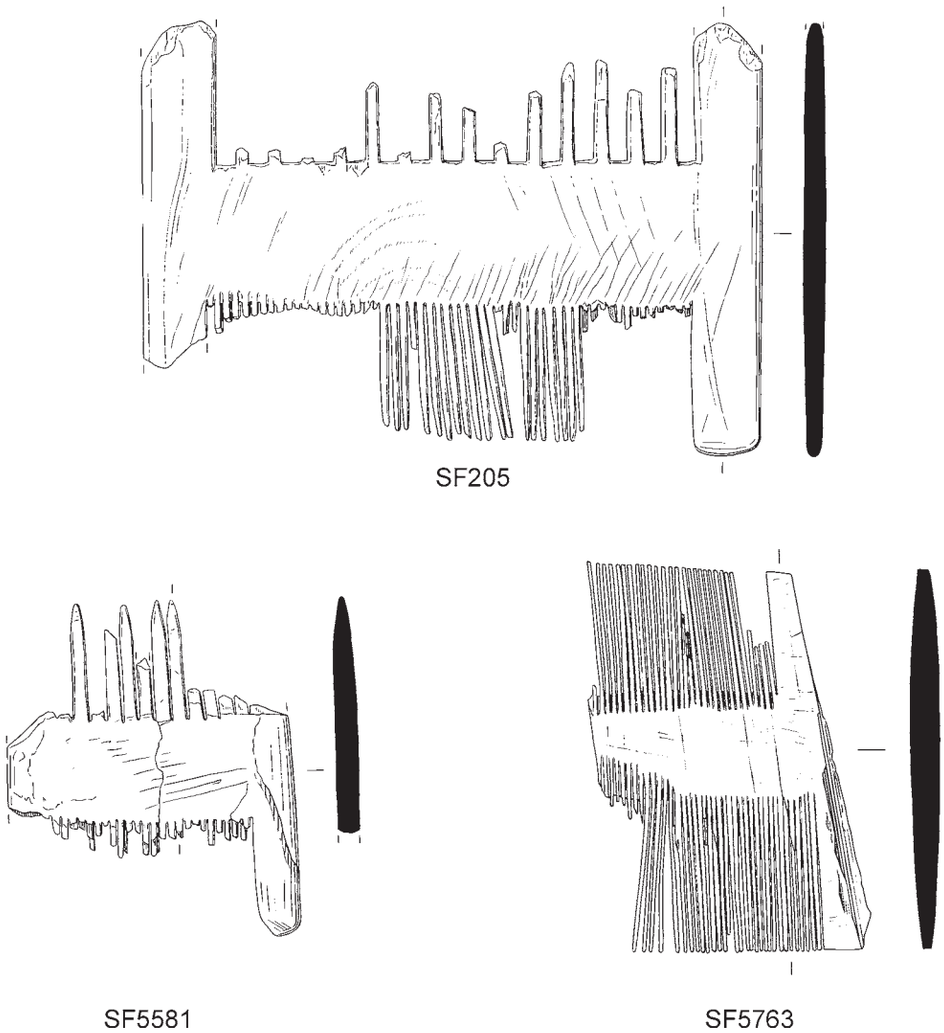


Figure 10.26 Ivory combs (SF205 & 5581); bone comb (SF5763). Scale 1:1

SF no.	*Context type*	*Material*	*Length*	*Width*	*Tooth values*		Wear
					1	*2*	
115	dump	ivory	-	47mm	-	10	none
205	barbican ditch fill	ivory	84mm	59mm	3	9	some
614	barbican ditch fill	ivory	-	51	3	10	slight
5581	unstrat.	ivory	-	47mm	4.5	9	slight
5763	quarry fill	bone	-	53 mm	13	13	none

Table 10.26 Double-sided simple ivory combs and one bone trial piece

cult, therefore, to assess their original lengths. Indeed, the majority of ivory combs retrieved from excavations are incomplete, although they customarily retain some of their teeth, as is the case here. It is possible that their ends were points of weakness and that the combs were often discarded when they fractured along the line of the ivory *lamellae*. Ivory combs were manufactured either to provide fine teeth on both sides, or to provide a series of fine teeth on one side and well-spaced, coarser teeth on the other.

As with combs of bone and antler, the teeth can be examined for traces of wear. This is evident in the form of lateral wear marks which develop into notched beads and eventually lead to the shortening of the teeth, a situation which is commonly encountered in the solid zone (Riddler forthcoming a). An ivory comb from earlier excavations in Norwich shows pronounced wear, clearly stemming from prolonged use (Margeson 1993, fig, 36.422). In contrast, the four combs considered here show only a few traces of use. However, all four combs are fragmentary and comparatively few of their teeth survive. A further index of wear may also be provided by the density of scratches across the solid zone (the central space between the teeth). These are particularly heavy beyond the fine teeth of the incomplete comb (SF205), whose teeth also show traces of lateral wear and beading. This beading can also be seen at the ends of the remaining teeth on comb SF614 (not illustrated).

The four ivory combs are well-produced with evenly-cut teeth to either side of a solid zone, where some of the marking out lines for the tooth-cutting can still be seen. They can be compared to a 'plate' of bone (SF5763) across which two sets of fine teeth have been cut without the use of marking-out lines. As a result, the teeth are of variable lengths, although they are reasonably well cut on either side. In effect, this is a trial piece of bone, of similar dimensions to an ivory comb, but with irregular edges. The teeth show no signs of use and are unfinished. The piece would never have been used as a comb and was intended merely for practice in tooth cutting. This may explain why it is fashioned from a piece of bone, which is a less costly material than ivory. A similar object, also cut from an irregular piece of osseous tissue and with unfinished teeth, came from a 17th-century context at Exeter (Allan 1984, fig.195.11).

SF205 **Comb.** An incomplete ivory double-sided simple comb which is now lacking some of its teeth and part of an end. It has fine teeth on one side and well-spaced, coarser teeth on the other, none of which now survive to their original length. A series of fine teeth which remain about the centre of the comb, show some traces of wear, and wear is apparent also in the form of a series of scratches across the solid zone on either side.
92775, fill of barbican ditch 91295, Period 6.2, G9/41

SF5581 **Comb.** A fragmentary ivory double-sided comb with the vestiges of a series of finely-cut teeth on one side and coarser teeth on the other. The marking-out lines for the teeth are still visible.
60000, unstratified

SF5763 **Comb.** A flat, rectangular section of bone with a trace of internal tissue along one edge. Groups of closely-spaced fine teeth are cut into each side. Their ends are bevelled, but they have not been finished, and they show no signs of wear.
40411, external dump, Period 6.2, G48/2

Textiles

by Elisabeth Crowfoot and Penelope Walton Rogers
(Fig.10.27)

A group of 25 textile fragments came from post-medieval deposits at Castle Mall, representing a range of animal, vegetable and silk fibres in a variety of textile forms.

Animal fibres

Wool weaves

Most of the recognisable woollen fragments are from garment fabrics, of variable quality, the usual remains from domestic and minor commercial activities, worn areas, and scraps from seams and hems (Fig.10.27; SF6924; SF1010 (a, c); SF1033 (a–d); SF3967; SF6781 (a, c); see Crowfoot, Chapter 9.III for further details).

A few other wool scraps illustrate the other important commercial weave of the district, worsted(SF1010(b), 7101 and 6078 (b, c); again, see Crowfoot, Chapter 9.III for further details). The rectangular squares cut along an edge of SF1010 (b) (Fig.10.27) at first suggested possible 'dagging', perhaps from the cape of a hood, as found at Baynard's Castle (Crowfoot *et al.* 1992, 194–198) but after relaxing, and detaching from tar, this is unlikely. The examples from Baynard's Castle were heavily fulled, and kept the cut shape without hemming or overstitching, but the rather delicate worsted twill of SF1010 (b) would have been unsuitable for this treatment. It may perhaps have been done by a child.

Knitting

Another textile craft for which Norwich was later well-known, knitting (Crowfoot 1993, 49–50) is only represented at Castle Mall by two groups of undecorated wool stocking-stitch, solid fragments probably from medium-grade hose, or possibly a knitted jerkin. Their clear surface and absence of shaping makes it unlikely that they come from caps, normally heavily fulled to render them waterproof (SF1033 (a–e) and 6283, not illustrated).

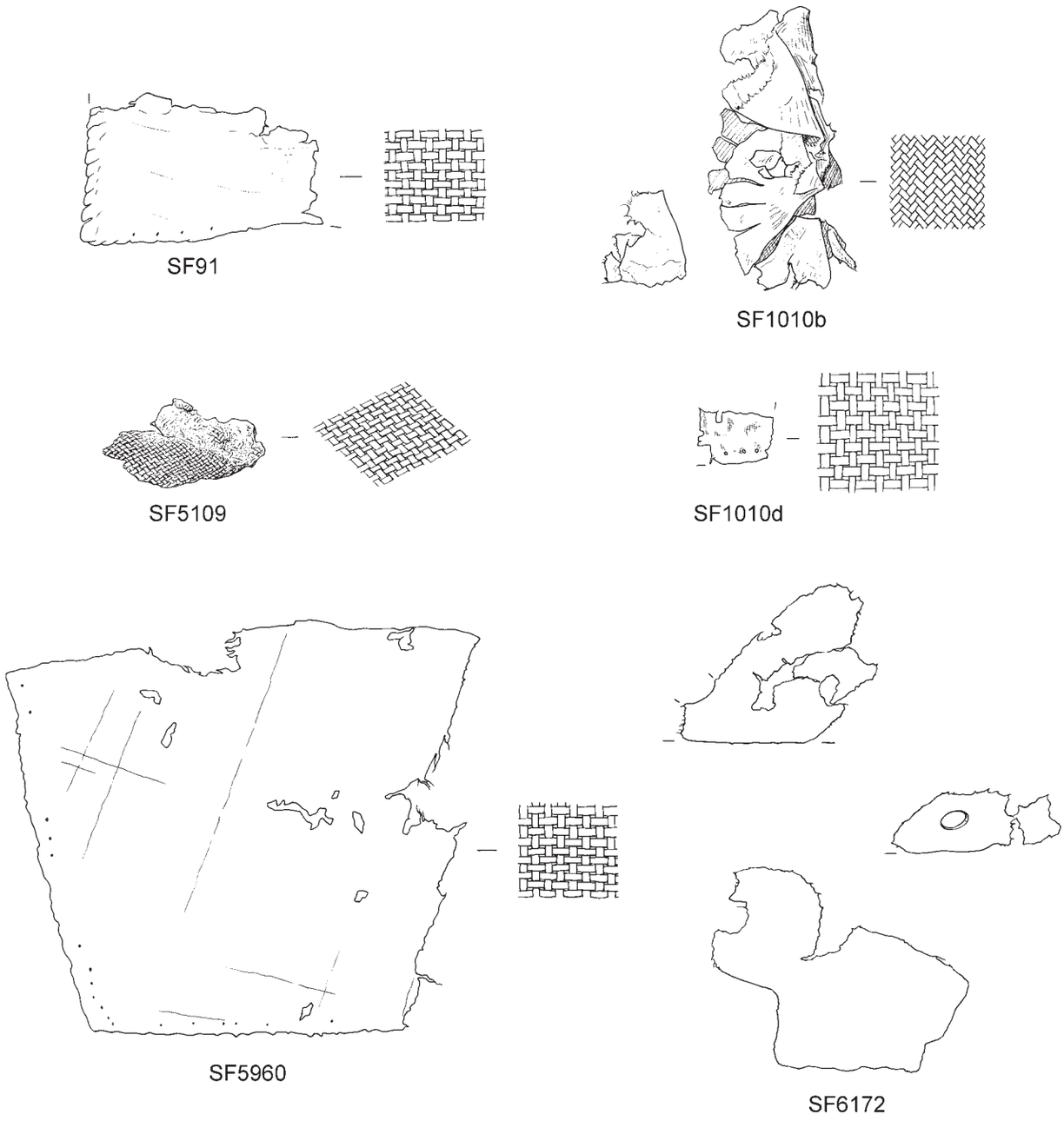


Figure 10.27 Textile (SF91, 1010b, 1010d, 5109 & 5960) and leather strap (SF6172). Textile fragments at Scale 1:2; details at Scale 2:1. Leather at Scale 1:2

Felt

The finishing of a good broadcloth completely hides the spun threads of the weave, and can sometimes be mistaken for felt, but a few pieces of true felt were also preserved (not illustrated; SF5110, 5792 and 6217 (a, b)). These are well made, without inclusion of spun thread-ends or wool rubbish. The solid pieces of SF5792 include figures of variable brown and natural colour, but these are well-blended to give a uniform light brown. This felt is inclined to split into layers, but could come from a good quality hat; layers are also visible in a carbonised fragment from SF5110. The rich dark brown fragments of SF6217 (a) were originally of excellent quality and were recovered from medieval fills of the barbican ditch (see Chapter 7.III).

Vegetable fibres

A few linen scraps from pit and ditch fills have traces of sewing, perhaps from shirts or caps (*e.g.* SF5109, Fig.10.27).

Silks

A clear fragment of silk preserved mineralised on a group of jettons (SF7080, unstratified) is dated by the jettons to the mid 16th century (see A.Popescu below), and perhaps comes from the lining of a purse in which they had been kept. The weave is a fine even tabby; the thread is thrown,

not spun. In two places very small areas of loose threads, slightly Z-spun, lying on the surface, suggest this may not have been a simple tabby, but a weave with weft pattern on a tabby ground, of a type found in torn fragments in the London excavations (Crowfoot *et al*. 1992, 98).

Another silk item (SF6760) from dumps of refuse into the barbican ditch, is a recognisable feature from the decoration of fashionable men's and women's garments of the late 16th century. This is a fragment of bobbin lace; very little survives, but it is clearly from the type of lace edging, built up of plaits of metal-covered silk threads, used to outline the seams shaping a tight bodice or doublet, or to edge the heavily embroidered panels (guards) down the front skirt-openings, or petticoats exposed below (Arnold 1985, 47, pls 332–338). The thread in this surviving fragment is silk, metal-covered, originally silver-gilt. Fragments from similar lace have recently been found in excavations at Grove Priory and Edlingham Castle (Crowfoot 1988 a and b), and in debris from a sewing room at Acton Court.

Further details of the Norwich silkworkers are given in Chapter 9.III in association with finds from the barbican well.

Microscopy of fibres

Samples from post-medieval (and earlier) textiles and other fibrous materials were examined with a transmitted-light microscope fitted with a polarising analyser, at x100 and x400 magnification. By this means it was possible to weed out modern contaminants and non-textile fibres. Thus, a thread adhering to a dress hook (SF6170) could be identified as a modern man-made fibre, from its smooth profile, speckled appearance and from the borders in contrasting colour which appeared when viewed with polarised light. Decayed leather was identified from the elongated mesh of collagen fibres in SF6170 and 6172.

The woven and knitted goods proved to be made from the typical range of medieval and post-medieval textile fibres, that is, wool, silk and flax or hemp. Wool was identified from scale patterns, which were generally 'irregular mosaic' with smooth near margins. Most samples consisted of fine and medium fibres, although there were coarser-fibred wools in SF1010b, 1010e, 1033a and 1033b. No pigment granules were observed, indicating that all the wool came from white sheep.

Silk was represented by long, fine, smooth fibres with no visible internal structure and by the blue coloration which appeared as the polariser was rotated.

Finally, plant-stem fibres (often known as 'bast') were observed in textiles SF6405a, 6405b, 5109a and 5109b. The fibres of SF5109 and 6405 were better preserved and showed, as well as dislocations, the fine central lumen and well-spaced cross-markings which typify flax. Some hemp fibres have a similar appearance and the 'drying-twist test' is the usual means of distinguishing between the two, but in this instance the fibres were too inflexible to allow the test to be carried out. Based on microscopy alone, however, flax seems the most likely identification.

Analysis of dyes

Samples from eighteen wool and four silk textiles (including several from the well shaft, Chapter 9.III) were tested for dye using standard procedures based on solvent extraction followed by absorption spectrophotometry and thin-layer chromatography (TLC) (Walton and Taylor 1991). Dye was detected in six wool and two silk textiles. A red madder-type dye was found in SF6078a, 6078b, 1010b and 1010c. In 1010b and 1010c, the principal constituents proved to be alizarin and purpurin, detected by TLC, which indicates that the dye source was almost certainly the roots of Dyers' Madder, *Rubia tinctorum* L., which was imported from The Netherlands in late medieval and post-medieval times. In the other madder-dyed textiles the dye was too weak to allow distinction between Dyers' Madder and other madder and bedstraw dyes. Further comments on the use of madder in Norwich are given in Chapter 9.III.

Leather Shoes and Clothing

by Quita Mould

(Fig.10.28–10.31)

A quantity of highly fragmentary shoe components, three spur leathers, six harness straps, purse fragments and a small quantity of waste leather were recovered from post-medieval dumping deposits within the barbican ditch. Items associated with personal possessions and horse harness are detailed elsewhere in this chapter.

Leather shoes from the barbican ditch

The fragmentary nature of much of the shoe parts makes dating difficult but those diagnostic features which do remain suggest that the majority date to the earlier to middle 17th century, compatible with a deposition date at the earliest part of the mid/late 17th- to early 18th-century date range derived from the other categories of material recovered from the deposits. The shoe assemblage is generally comparable with that from the backfill of the 17th-century bastion in the castle at Newcastle upon Tyne (Vaughan in Ellison and Harbottle 1983, 208–217)

Approximately 319 individual items of shoe components were recovered (see Table 10.28). No complete shoes were found and the number of complete individual shoe components was very limited. The highly fragmentary nature of the assemblage makes the minimum number of shoes represented difficult to calculate but it may be as low as fourteen. Shoes to fit both children and adults were present.

All the shoes represented were of welted construction, made straight; principally with a bottom unit comprising a sole, middle and insole with a rolled welt braced during construction (see Figs 10.28 i and Figs 10.30 and 10.31). This is a common welted construction found on shoes of 16th- to 18th-century date, comparable with Goubitz construction no. 7 (1984 fig. 5,7), but frequently with the addition of a middle between the insole and the sole (*ibid,* fig. 2,12). Only a single fragment of a 'flatter' welt was recovered from a shoe of unbraced construction, see Fig.10.28.ii. The soles had separate heels attached, the majority being stacked leather heels of D-shape, secured with wooden pegs or iron nails. Many individual lifts from stacked heels were found, and three complete stacked heels were recovered; a compacted example of four individual lifts measuring ½ inch (SF34, 92758), another four lift example of 1½ inches [36mm] (SF71.2, 92765) and, the tallest, 2¼ inches high (SF74, 92766). The highest heel (SF74) was painted red as was the edge of its accompanying sole. The fashion for red soles and heels is recorded as early as 1614 but became popular for aristocratic and court wear in the 1630s and more

SF No.	Context	Measurements	Fibres	Spinning	Twist	Weave	Thread Count	Colour	Comments
91	92770 (G9/41) barbican ditch (Period 6.2)	(i) knitting (aa) (Box 170) 80 x 170	wool	S, Zply	loose	stocking-stitch (20mm)	6 st, 11 rows	brown, blue staining	Many fragments, probably from hose
		(a) 110 x 40	wool	S, Zply	loose	stocking-stitch	7 st, 9 rows	no dye detected, rust marks	? shaped, but edges broken
		(b) 75 x 45	"	"	"	"	6 st, 10–11 rows		cut or torn, diagonal strip
		(c) 25 x 45	"	"	"	"	5 st, 10–11 rows		and smaller pieces (see below, 6283)
		(d) 60 x24	"	"	"	"	6 st, 11 rows		
		(e) 28 x 23	"	"	"	"	6 ½, 10 rows		
		(ii) Broadcloth	(all probably from same garment)					dark brown	originally napped, worn, cut fragments (Fig.10.27)
		(a) 70 x 46	wool	Z/S	m/m	tabby	10/10–11	no dye detected	curved edge, ? stitch-marks, 9mm
		(b) 110 x 55	"	"	"	"	"	stained	curved edge, stitch-holes 2.5–3 apart
		(c) 60 x 25	"	"	"	"	"	nap worn	cut edges
		(d) 28 x 15	"	"	"	"	"	"	
1010	10714 (G1/98) pit 10766 (Period 6.1)	5 fabrics							
		(a) 60 x 20	wool, animal coat fibres	S/Z	m/m	tabby	8–9/8	rich dark brown (no dye detected)	originally fulled, worn, ?tar on edges
		(b) 30 x 25 (double), 90 x 35	wool, animal coat fibres, no pigment	S/Z	l/l	2/2 twill	24–26/18–20	red, madder (alizarin, purpurin)	good worsted; tight folds, slit edges (Fig.10.27)
		(c) 72 x 30	wool	Z/S	m–l/m	tabby	9/9	red (as (b))	fulled but worn
		(d) 47 x 21, 23 x 15, 23 x 20, 20 x 18, 24 x 14	wool	S/S	l/l	tabby	6/8, 6/7	no dye detected	worn, ?shaped tab, stitch-holes? (Fig.10.27)
		(d) (vi) 20 x 12	wool	S/S	l/l	tabby	5/5	pale brown (no pigment, no dye detected)	bias folds, stuck, ?tar
396	92271 (G9/41) barbican ditch (Period 6.2)	? 35 x 30, 18 x 15, 37–38 x 20	wool	S/Z	m/m–l	tabby	12/12	golden-brown (no dye detected)	fulled, napped, good quality broadcloth
5109	10198 (G1/155) pit 10216 (Period 6.1)	(a) 25 x 20	?flax	Z/Z	l/l	tabby	14/14	undyed	?shirt or cap, hem stitches, Zply thread
		(b) 12 x 8 (double)	flax	Z/Z	l/v.l.	tabby	15/16 (8.5 mm)	undyed	?weft almost unspun, but possibly from (a)
		(c) 15 x 10, and smaller	flax	Z/Z	l/l	tabby	18/9.5 mm/14	undyed	seam, broken, ? (a)
		(d) 22 x 10	flax	Z/Z	m/l	tabby	12/11	undyed	even solid weave

SF No.	*Context*	*Measurements*	*Fibres*	*Spinning*	*Twist*	*Weave*	*Thread Count*	*Colour*	*Comments*
5110	10198 (as above)	6.5 x 4.5, 6 x 4 and smaller	carbonised	"	"	felt or tabby	"	(black)	with 5109
5792	40476 (G2/23) pit 40475 (Period 6.2)	63 x 40, 30 x 30, 45 x 24, 35 x 25, 40 x 30, 30 x 27 40 x 22	animal-coat fibres, probably wool; no spun thread threads	-	-	(felt)	-	mid-brown, (mixed browns under microscope)	solid felt in two layers, well blended
5960	80187 (G8/29) pit 80188 (Period 6.1)	130 x 150	wool, no pigment	S/S	m/m–l	tabby	10–11/10	dark brown (no dye detected	fulled, matting; no selvedge, medium broadcloth, stitch-holes, two sides for 10 cm (Fig.10.27)
(6170)	80134	8 x 7	nylon	S	-	-	-	(intrusive	folded triangle, caught by dress-hook)
6172	12360 (T47/2) prison burial (Period 6.2)	21 x 16, 22 x 13, 14 x 5, 11 x 4	collagen ?leather (PWR)	S, Z	-	traces threads adhering	7/6–7	black	leather; ?belt or strap fragments, holes edge, solidified (from skeletons on mound) (Fig.10.27)
6760	47447 (G47/25) barbican ditch (Period 6.2)	L.4.5, wid. 5 mm	silk, covered Ag strip	S	-	lace band, base 4-plait	-	silver, tarnished	braid, from skirt or bodice
6781	10714 (G1/98) pit 10766 (Period 6.1)	(a) 33 x 6	wool	S/Z	m–l/m	tabby	8/7–8	mid-dark brown	unfulled (matted)
		(b) 19 x 15, 8 x 9 1.3 x 4.5, 9 x 4.5	?wool	S/S	m–l/m–l	tabby	8/9	mid-dark brown	unfulled
		(c) 20 x 18	wool	S/Z	l–m/l–m	tabby	8/8–9	mid-dark brown	triangle cut, fulled
7080	22222 (unstrafitied, barbican ditch)	(i) 15 x 10 (ii) 12 x 124 (iii) 13 x 13	?silk (mineralised)	reeled ?pattern threads, Z	-	tabby (patches) loose surface threads	c.20/20 (5 mm)	metal stain close threads ?pattern, tabby ground; from purse? (on three jettons; see A.Popescu below)	tight folds; loose

Table 10.27 Post-medieval textiles

Type	*Quantity*
Sole	10
Sole fragment	62
Sole, 2-part fragment	6
Insole	3
Insole fragments	32
Middle	7
Middle fragments	18
Edge packing	9
Welt fragment	23
Heel, stacked	3
Heel, lift	28
Heel, wooden	1
Heel cover	2
Top piece	3
Clump repair	10
Bottom unit fragment	32
Vamp fragment	9
Toe puff	3
Quarters	5
Quarters fragment	4
Latchet	2
Heel stiffener fragment	1
Upper fragment	28
Scrap from uppers	18
Total	**319**

Table 10.28 Welted shoe parts from post-medieval dumping in the barbican ditch

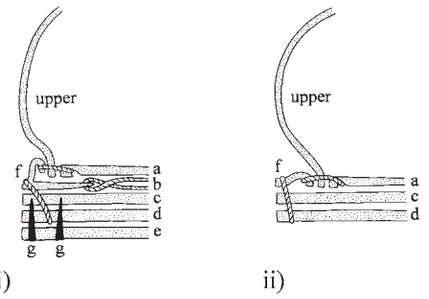


Figure 10.28 Diagram showing welted shoe constructions: i) braced and ii) unbraced shoe construction. a – insole, b – bracing, c – middle, d – sole, e – clump, f – welt stiching, g – wooden peg. Not to scale.

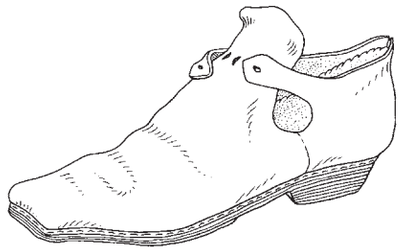


Figure 10.29 Reconstruction of welted shoe style (after Goubitz 1984, figs 2 & 5). Not to scale

common wear in the second half of the 17th century, continuing into the 18th century (Swann 1982, 7,15). A single wooden heel with a leather cover occurred (SF88, 92770).

One and two-part shoe soles were found. Several soles, including that associated with the wooden heel (SF88), were moulded at the waist to extend down the breast of the heel and continue along the bottom of the heel as a top piece. This practice was the continuation of an earlier tradition of construction when shoes were heel-less (prior to the beginning of the 17th century), and is found during the earlier 17th century but was eventually replaced by the adoption of the more economical separate top piece at the bottom of the heel.

The remaining upper components found indicate that the majority of the shoes had square-toed vamps with high tongues fastening over the instep to narrow latchets on the two-part quarters, see Fig.10.29. Uppers of leather used flesh side outward, popular in the 17th century, as well as the normal grain side outward were noted. Three examples were found to have the square toe of the vamp strengthened internally by a toe puff (SF383, 92765; SF397, 92774, SF443, 92761). Of the four examples of vamp fastenings preserved, one (SF206) had a single pair of fastening holes (Fig.10.31), while the three others had two pairs of fastening holes (SF97, 92774; SF63, 92765; SF465, 92766; none illustrated); one pair to fasten the latchets, the other to hold a separate decorative rose of ribbon and, sometimes, lace. This, together with the red painted heel and sole edge and the occurrence of the butterfly spur leather (see below) suggest the presence of a wealthier sector of the population. Practical, working shoes were also well represented, see the extent of wear and repair below. The occurrence of a small number of iron hobnails on fragmentary bottom units (*e.g.* SF24, SF213, SF858) indicates shoes subjected to heavy use. Insufficient remained for their upper styles to be distinguished but they are likely to belong the 18th century.

Three of the square toes were long, extending beyond the end of the big toe by, in one case an inch/30mm (SF88, 92770), and in another by 2 inches/*c*.50mm (SF35, 92758). These are likely to date to later in the 17th century. Occasional examples with oval rather than square toes were noted (SF35.2, 92758; SF43, 92758) which may be of similar date. A single sole with a 'needlepoint' toe and narrow waist was found (SF47, 92761 associated with pottery of late 17th- to 18th-century date), a style worn by women from as early as the 1660s and remaining popular until 1760s (Swann 1982, 20).

Further discussion on the evidence for shoe manufacture is given below ('Leatherworking').

Three iron boot heels were also recovered (SF573, fill of barbican ditch; SF6618.1, unstratified) and a D-shaped leather heel heavily hob-nailed with a large central nail holding the individual lifts together (SF442, also from post-medieval fills of the barbican ditch). None of these items are illustrated.

Leather shoes from other features

In addition a small quantity of welted shoe fragments (SF5, SF314, SF468) were found in a pit cutting into fills of the barbican ditch. These are comparable with those found in

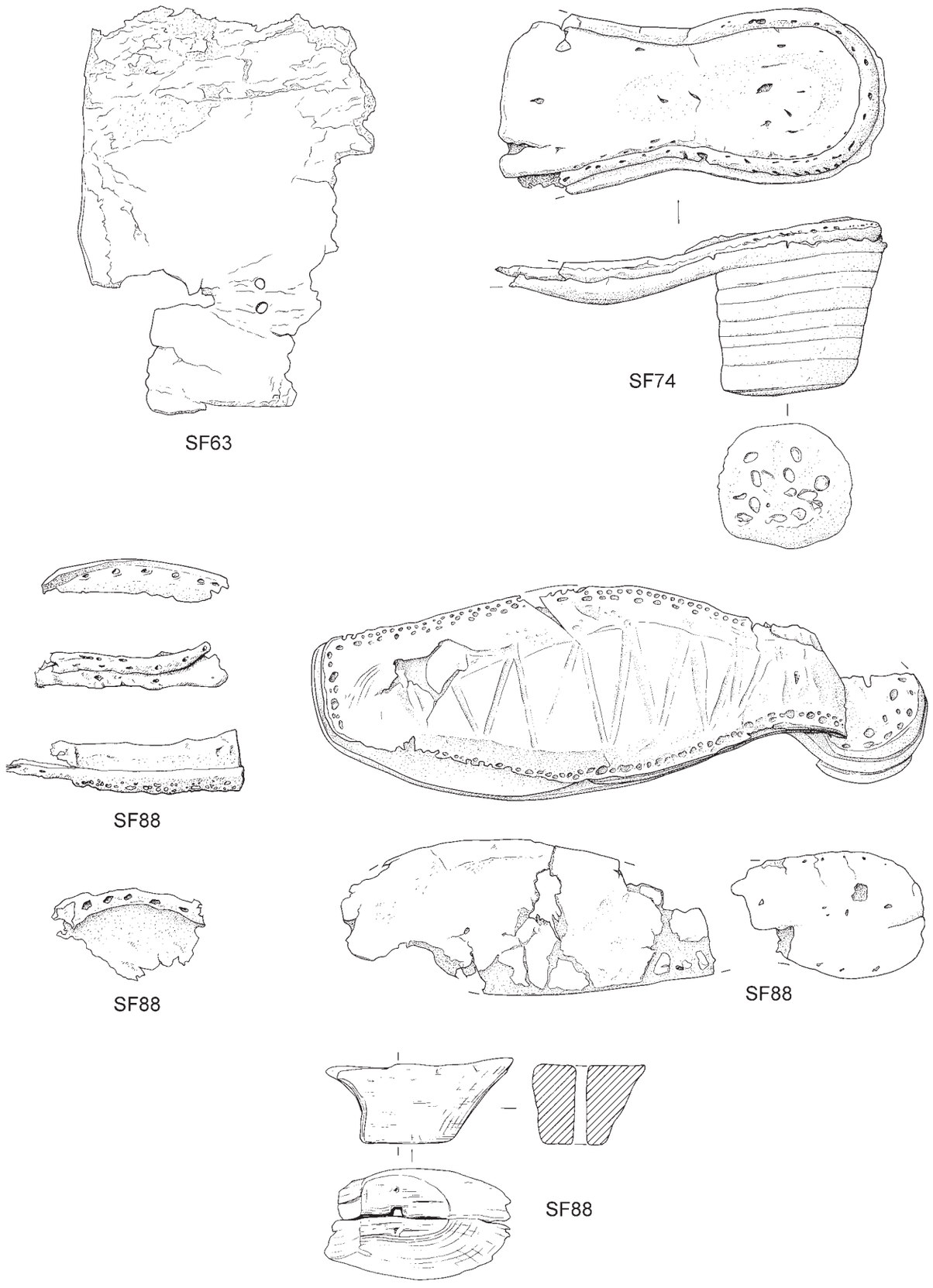


Figure 10.30 Leather shoes (SF63, 74 & 88). Scale 1:2

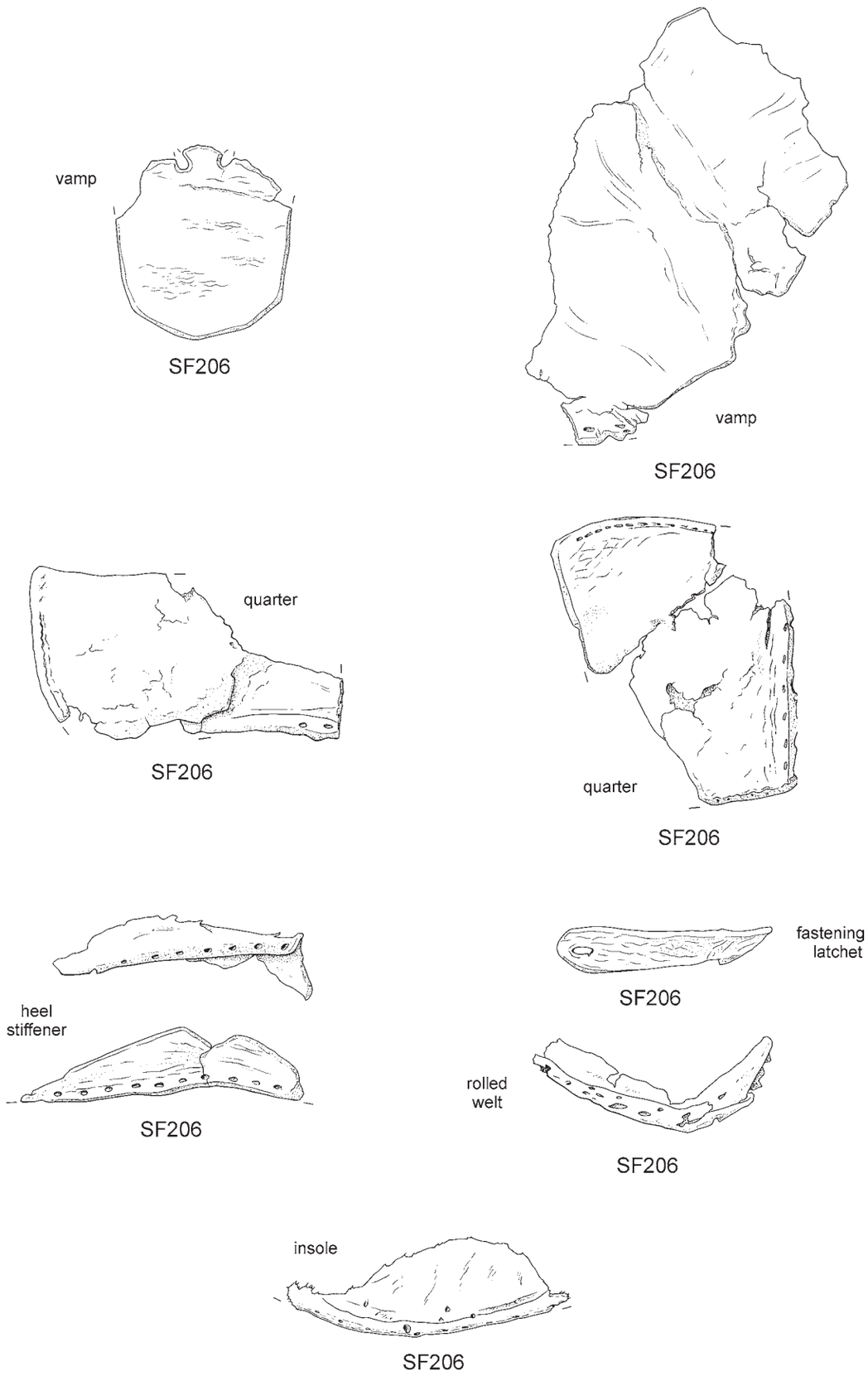


Figure 10.31 Leather shoe (SF206). Scale 1:2

the post-medieval dumping in the ditch. Fragments from two welted shoes (SF5793, not illustrated), each for the left foot, were found in a post-medieval pit (G8/29, Period 6.1). Insufficient of the uppers survived for their styles to be distinguished. A small fragment from the bottom unit of a welted shoe (SF113) was found associated with pottery of late 17th/18th-century date (G9/43).

SF63 **Left side of welted shoe vamp** with lasting margin cut off, other edges torn. Remains of a large tongue and double pair of fastening holes. Leather heavily worn. Length 148mm.
92765, post-medieval dumping into barbican ditch, Period 6.2, G9/41

SF74 **Welted bottom unit** comprising insole and sole torn away across the lower tread. Insole with edge/flesh seam, sole with grain/flesh seam in a stitching channel and impression from bracing thread visible. Length of rolled welt from around the seat. Stacked heel of eight lifts held together by wooden pegs and iron nails. Heel and edge of sole with red pigment. Heel height 55mm, insole length 130mm.
92766, post-medieval dumping into barbican ditch, Period 6.2, G9/41

SF88 **Welted bottom unit** worn on right foot with square toe with 30mm extension, medium tread, waist and seat. Sole with grain/flesh seam in stitching channel, moulded down heel breast to continue as top piece of heel. Middle with grain/flesh seam and edge packing. Fragments of heavily worn insole with edge/flesh seam, rolled welt and heel cover. Separate wooden heel and clump repair pieces secured by wooden pegs. Heel height 30mm, sole length 220mm.
92770, post-medieval dumping into barbican ditch, Period 6.2, G9/41

SF206 **Fragmentary welted shoe**. Fragment of insole with edge/flesh seam and bracing impression. Fragment of rolled welt. Pair of quarters with straight butted edge/flesh back seam sl 3mm, remains of front seam and top edge but much torn away. Separate quarters latchet with rounded terminal and butted edge/flesh seam. Fragment of vamp with rounded tongue with paired fastening holes. Fragment of lasting margin from heel stiffener. Leather heavily worn.
92775, post-medieval dumping into barbican ditch, Period 6.2, G9/41

Leather clothing
A fragment of calfskin (SF358.2, not illustrated) with stamped decoration of short bars and triple dot motifs may have been torn from a garment or shoe upper.

Furnishings and Household Equipment

Pottery
by Irena Lentowicz, with Anthony Thwaite (stonewares)
(Figs 10.32–10.44)

Introduction and quantification
A total of 14,507 sherds of pottery weighing 384.402kg was recovered from contexts assigned to this period, accounting for 40.2% of the ceramic assemblage. An additional 660 sherds (15.332kg) came from the excavations at Golden Ball Street and are not included in the analysis below, although comments on intrinsically interesting vessels are made by Goffin below. This period was characterised by the introduction of post-medieval wares which dominated the assemblage. Residual medieval and earlier pottery accounted for only 3.5% of the material, while late medieval/ transitional wares made up 8.1%.

Some of the late medieval/transitional pottery recovered may not have been residual, especially the material recovered from Period 6.1 which may have been contemporary or long-lived. However, this is difficult to ascertain with any accuracy. The most common ware recorded was, of course, LMT (26.127kg) with only DUTR (3.338kg) and Rhenish stonewares from Langerwehe (0.755kg) and Raeren-Aachen (0.801kg) contributing a sizeable proportion to the assemblage. Other late medieval/transitional wares were represented by a small number of body sherds only.

The period assemblage was dominated by post-medieval fabrics and over a third of the pottery recovered from the entire excavation was post-medieval (372.735kg; 38.9%). Much of this consisted of locally produced coarse wares. The majority of pottery recovered in any quantity was made up of Glazed Red Earthenware (GRE) kitchen and domestic wares, with drinking and pouring vessels provided by Iron Glazed Black ware (IGBW) and Speckled Glazed ware. Other local wares included West Norfolk Bichrome ware, Local Slipware and East Norfolk White ware but these were recovered in small quantities. The local products were supplemented by imported regional or English wares; the most common were Metropolitan slipwares and Surrey White ware, and by the end of the period by products from the pottery industry in Staffordshire including slipwares and stonewares. Imports were again dominated by products from the Low Countries and Rhineland, with Tin-glazed Earthenwares (TGE) most common. These were not provenanced and are termed Anglo-Dutch as some of the later material recovered could have come from English kilns as well as from the continent. Other Dutch wares included slipwares and earthenwares, but again these are not recovered in large quantities though they are a significant presence in the assemblage. Products from the Rhineland were dominated by stonewares from Cologne and Frechen and the introduction of vessels from Westerwald, but also included a small quantity of slipware from the Weser and Werra industries. Other imports included slipwares from North Italy and coarseware from Spain, as well as French wares represented by Martincamp flasks and a particularly fine Saintonge Polychrome slipware dish. Such imports were not, however, recovered in any quantity.

Fabrics and forms

Glazed Red Earthenware
By far the most common post-medieval fabric was GRE (212.618kg) accounting for 22.5% of all pottery recovered and 57% of post-medieval fabrics. GRE is the name given to vessels of oxidised fabric with a clear lead glaze which was widely produced in a number of centres around Norwich and in the county. One production centre has been located near Wroxham, and recently wasters have been identified from Cringleford near Norwich (pers. obs.). This ware supplied the basic kitchen and household vessels from the late 16th century and continued to be made through to the 19th–20th century. It constitutes a large proportion of any ceramic assemblage recovered from the city.

A large number of rims were recorded (1566 examples); these were allocated to a broad vessel category and not further sub-divided to a rim or profile type as this was not required under the original research design. Analysis of the forms is basic and presented in tabular

Fabric	*Quantity*	*Weight (kg)*	*% Quantity*	*% Weight*
Residual	*1,004*	*8.343*	*6.9*	*2.2*
Residual medieval	*745*	*5.953*	*5.1*	*1.5*
Residual LMT	*1,148*	*31.199*	*7.9*	*8.1*
EPM	188	5.953	1.3	1.5
GRE	6,623	194.838	45.6	50.68
IGBW	1,167	42.510	8.0	11.0
Speckled Glazed ware	400	10.297	2.7	2.7
West Norfolk Bichrome ware	29	0.241	0.2	<0.1
Local Slipware	2	0.049	<0.1	<0.1
East Norfolk white ware	1	0.104	<0.1	<0.1
Metropolitan Slipware	306	13.565	2.1	3.5
Staffordshire Slipware	87	1.177	0.6	0.3
Surrey White ware	187	4.834	1.3	1.2
Bourne ware	1	0.023	<0.1	<0.1
TGE	1,364	25.346	9.4	6.6
Low Countries Earthenware	4	0.073	<0.1	<0.1
North Holland Slipware	19	0.312	0.1	<0.1
Dutch White Earthenware	50	0.599	0.3	0.1
Low Countries Slipware	5	0.121	<0.1	<0.1
Martincamp Flask	23	0.467	0.1	0.1
Spanish Amphora/coarseware	4	0.096	<0.1	<0.1
Werra ware	5	0.023	<0.1	<0.1
Weser ware	1	0.020	<0.1	<0.1
Cologne-Frechen Stoneware	342	16.711	2.3	4.3
Frechen Stoneware	404	14.236	2.8	3.7
Westerwald Stoneware	190	4.402	1.3	1.1
North Italian Slipware	2	0.012	<0.1	<0.1
Pisa Marbled ware	9	0.528	<0.1	0.1
Misc. imports	2	0.068	<0.1	<0.1
Total post-medieval	**12,903**	**335.734**	**88.9**	**87.3**
Stoneware	114	2.476	0.8	0.6
China	40	0.263	0.3	<0.1
Whieldon-type ware	26	0.213	0.2	<0.1
Creamware	2	0.013	<0.1	<0.1
Misc. unidentified	15	0.208	0.1	<0.1

Table 10.29 Total quantity and weight of Period 6 pottery by fabric

format, sub-divided by sub-period, based on the number of rims recorded. A brief synopsis is included below, with assemblages detailed in Chapter 10.II and Appendix 6.

A wide range of kitchen and domestic vessels was recorded. The most numerous individual vessel represented by rims came from jars which were used for a multitude of functions; other categories of jars included ginger jars, storage jars and handled jars, though these were not recorded in great number. Other hollow wares used specifically for cooking included cauldrons and cooking vessels, but were mostly represented by pipkins. Other specific kitchen wares included skillets, dripping pans, Dutch ovens and chafing dishes, as well as colanders.

Flatwares accounted for the majority of the rest of the rim forms; bowls and dishes/plates accounted for most of these with variations such as large bowls/dishes and spouted dishes or bowls also recorded. Handled jars and bowls were also present, and the diagnostic mid 17th-century form of small handled jar/bowl (hjb) was also evident in some quantity.

Other forms included jugs and drinking vessels; these were not common as this function was catered for not only by other local industries (IGBW and Speckled Glazed wares) but more commonly by Rhenish stonewares. Other domestic vessels included bedwarmers and chamber pots, as well as some vessels which were represented by bases and other diagnostic sherds such as lid knobs, and bases from candlesticks, a cheese press and sprinkler jugs.

Iron-Glazed Black wares

Other locally produced earthenwares were dominated by Iron-Glazed Black ware (IGBW) vessels. The fabric was similar to GRE glazed with a thick opaque black glazed (produced by adding iron and manganese to a clear lead glaze). These IGBW accounted for 4.8% of the entire excavated assemblage, and 12.1% of the post-medieval

Vessel type	*Periods 1–5*	*Period 6.1*	*Period 6.2*	*Period 6.3*	*Period 7*	***Total***
cauldron	1	1	-	1	-	**3**
cooking vessel	-	-	4	-	-	**4**
pipkin	8	12	42	3	1	**66 (73)**
skillet	-	-	1	-	-	**1**
dripping pan	1	1	2	-	-	**4**
Dutch oven	5	-	5			**5**
bowls	14	43	107	16	1	**181**
large bowl	10	-	-	-	-	**10**
pancheon	6	1	80	1	1	**89**
spouted bowl	-	-	6	-	-	**6**
handled jar/bowl	18	-	173	2	1	**197**
handled bowl	7	-	37	-	-	**44**
large handled bowl	-	-	1	-	-	**1**
dish/plate	58	14	334	10	3	**399**
large dish/plate	-	-	1	-		**1**
oval dish/plate	-	2	-	-		**2**
spouted dish/plate	-	-	10	-		**10**
jug	3	2	13	1	1	**20**
drinking vessels	-	-	1	-	-	**1**
cup	-	-	2	-	-	**2**
mug	-	-	2	-	-	**2**
jar	20	11	311	8	3	**353**
handled jar	4	-	33	-	-	**37**
ginger jar	-	1	1	-	-	**2**
storage jar	2	-	52	1	-	**55**
chafing dish	-	-	1	-	-	**1**
collander	-	6	5	-	-	**11**
warmer	1	-	-	-	2	**3**
chamber pot	10	-	10	1	-	**21**
misc. rims	-	-	-	-	-	**35**

Table 10.30 Glazed Red Earthenware vessel form rims, by sub-period

fabrics (45.202kg). They were both locally produced with kilns sites known at Wroxham and Fulmodeston (the glaze on these latter products was greeny-black rather than dark black), as well as produced at Harlow, Essex and some of the vessels recovered in Norwich were probably imported along with Metropolitan slipwares, which were also produced there. Forms were dominated by drinking vessels and, less commonly, by jugs; of the eighty-one rims recorded all but three came from two forms. The other rims came from handled jars (two examples) and a finial. Three jug rims were recorded and the remaining seventy-nine came from drinking vessels (sixty rims), tygs (fourteen rims), mugs (four rims) and a cup (one rim). However, these vessels are better represented by bases which were sturdier and better preserved (see Table 10.31 below).

Speckled Glazed wares

Speckled Glazed wares were introduced into the ceramic assemblage in the mid 17th century. These wares were glazed with an even translucent rich brown glaze with added particles of iron oxide which melted during firing to produce dark brown streaks. Just over 10kg came from the site (10.509kg), accounting for 1.1% of the post-medieval fabrics. Forms were similar to IGBW and the vessels recovered were all hollow wares, and jugs and drinking vessels the most common forms recorded. However, Speckled Glazed ware drinking vessels were squatter with rounded bases and have a mug rather than tyg-shape. Drinking vessels were represented by six rims and eight bases, while cups were represented by one rim and nineteen bases and mugs by eighteen rims and one base. Jugs were less common but sixteen rims and two bases (one of which came from a miniature vessel) were recorded. Other forms represented included a handled jar, a small handled jar/bowl (hjb), jars (five rims and twenty bases), chamber pots (one rim and five bases) and pipkins (in addition to a base, eleven rims were recorded which probably came from the same vessel).

West Norfolk Bichrome ware

The other locally produced coarseware recovered in any quantity was West Norfolk Bichrome ware, and only 0.533kg was recovered (0.1% of post-medieval pottery). The fabric was similar to GRE, but the distinctive feature was the two tones of glaze: copper green was used on the exterior (varying from a light speckled to a lustrous dark green) and a clear lead-glazed orange on the interior. The

	Period 1–5		*Period 6.1*		*Period 6.2*		*Period 6.3*		*Period 7*		*Total*	
	rims	*bases*	*rims*	*bases*	*rims*	*bases*	*rims*	*bases*	*rims*	*bases*	*rims*	*bases*
DV	7	4	-	1	50	92	-	-	-	1	57	98
Tyg	1	9	1	1	9	145	3	6	-	1	14	162
Mug	1	2	-	-	3	9	-	1	-	-	4	12
Tankard	-	2	-	-	-	5	-	1	-	-	-	8
Jug	-	-	-	-	3	1	-	1	-	-	3	2
Jar	-	-	-	-	-	19	-	-	-	-	-	19
Cup	-	-	-	-	-	8	-	-	-	-	-	8
Other	-	-	-	2	-	4	3	-	-	-	3	6
Total	**9**	**17**	**1**	**4**	**65**	**283**	**6**	**9**	**-**	**2**	**81**	**315**

Table 10.31 IGBW vessel forms by rim and base, by period

range of forms produced was limited and vessels recovered in Norwich tended to be pipkins and jars, although some bowls were also recovered. From this site, only pipkins (four rims and one base) and dishes (one rim) were represented.

Other local earthenwares

Other locally produced earthenwares were represented in much smaller quantity. Both East Norfolk White ware and Local Slipwares were represented by five sherds apiece, most of which came from other periods. Local Slipware is found in small quantities on a number of Norwich sites, though as yet it has not been recovered from other Norfolk sites indicating a very limited and localised production. The fabric is light orange/brown red with a contrasting clay and coloured slips overlain in thick bands; the surface is then removed to give a faceted effect. Forms are restricted to hollow wares, and here two drinking vessel bases were recorded along with an upright rim and a handle. East Norfolk White ware is a white sandy fabric glazed with a yellow-green glaze. As yet unprovenanced it also appears on sites in King's Lynn. Most of the material from Castle Mall was recovered from Period 5.1.

Regional and non-local imports

The local products discussed above dominated the assemblage, but were supplemented by regional English wares and foreign imports. The majority of these were retrieved in small quantities with the exception of certain key fabrics which were recovered in larger proportion. Non-local or regional imports came from Essex, Surrey and Staffordshire, as well as TGE which was produced in both the Netherlands and various centres in England.

The most common regional import recovered was Metropolitan slipware (14.317kg, 3.8% of post-medieval wares). This pottery was produced in Harlow, Essex during the 17th century. This was a highly decorated ware, with white pipe clay trailed over a red-orange fabric, and glazed with a clear lead glaze. The forms were mostly flatwares, although hollow wares were known (including mugs, candlesticks and chamber pots) these are more unusual. However, the most common forms were plates and shallow dishes decorated with geometric designs in the centre framed by a border pattern, and indeed these account for the majority of the rims recorded (fourteen profiles and 107 rims). In addition two pancheon rims and one small dish (recorded as a saucer) were recovered. Hollow wares were not as common, and included mugs (two rims and one base), as well as a handled bowl (one rim) and jars, probably from chamber pots (three rims).

Surrey White ware accounted for 1.6% of all post-medieval fabrics (5.975kg). This fine, off-white/pale cream fabric with a semi-transparent lead glaze coloured either yellow or green, was produced at a number of sites in Surrey and Hampshire. The vessels recovered in Norwich appear to be mostly from the first half of the 17th century. The most common forms included plates, bowls, cups and pipkins, as well as bowls with horizontal handles. These handled bowls were common in Norwich and in addition to three profiles, thirteen rims with handles were also recorded. Other hollow wares recovered included bowl (sixteen rims), jars (one rim and six bases) and a chamber pot. Kitchen wares were represented by pipkins with tripod feet and tubular handles (nine rims) as well and four bases and two handles. Drinking vessels were also common and seven cup/mug rims were recorded. More unusually a jug rim was also recovered; these were uncommon. Flatwares were also common, and dishes were more common (sixteen rims) than plates (nine rims and nine bases); a small dish or saucer was also present. Other more unusual forms represented included a colander base, a candlestick base and knobs from three lids.

The only other English import of any significance was Staffordshire slipware; 1.465kg was recovered making up 0.4% of the post-medieval assemblage. Only small quantities came from Periods 6.1 (where it was probably intrusive) and 6.2, and it only forms a significant part of the post-medieval assemblage in Period 6.3. Flatwares were dominant and the cream/buff fabric was flat-moulded and decorated with trailed slip, either dark brown over a light background or vice versa, and left plain or further decorated by marbling, combing or feathering. These were covered with a clear glaze on the inner part of the vessel, while the base was left unglazed. Dishes of various sizes with pie-crust rims and feathered decoration were most common here, with twelve rims recorded. Hollow wares are also recorded; these were wheel-thrown and entirely glazed, often decorated with brown slip-trailed dots though combing is also known. Both mugs and posset pots were recorded; ten mug rims and fifteen bases were present and five posset rims.

Continental imports

The largest non-local fabric recovered was Tin-glazed Earthenware (TGE) which accounted for 7.2% of the post-medieval fabrics, and 2.8% of the total assemblage (26.841kg). This was a large group of pottery from a number of sources, not only continental vessels from the Netherlands but also from English potteries in London and Bristol, and even possibly from Norwich itself. A putative kiln has been suggested from wasters recovered from a watching brief on Ber Street (see Goffin below).

A wide range of vessels was represented by rims and bases (see Table 10.32 below). Plates, bowls and drug jars were the most common form, other vessel forms included dishes, handled bowls, porringers, chargers, jugs, drinking vessels, chamber pots, soup plates, *etc*. As mentioned above, the TGE recovered was not examined or recorded in enough detail to determine provenance. Undoubtedly some came from the Netherlands, though most vessels would be classed as Anglo-Netherlands. It may be possible that some of the TGE recovered from earlier phases was contemporary rather than intrusive; this included two plate rims and two footing bases from Period 4.2, and body sherds from Period 5.2. The majority of the TGE came from Period 6.

Other imports from the Low Countries/Netherlands made up a small proportion of the assemblage. The most prolific of these was Low Countries Red Earthenware, which has already been discussed in the late medieval/transitional section as this fabric made its first appearance in Norwich assemblages in the late 14th century (see Period 5; Chapter 8.III).

Dutch White Earthenware (DWE) was much less common; only 0.649kg was recovered, 0.2% of post-medieval fabrics. This ware was imported during the 16th and early 17th century, and varied in colour from pink/buff to white with a clear yellow or translucent copper green glaze; some vessels were Bichrome with green glaze on the exterior of the vessel and yellow on the interior. Forms recovered on Norwich sites included cauldrons, jars, collar-rimmed bowls and handled bowls. From Castle Mall forms represented by rims were restricted to handled bowls (twenty-seven rims, though at least seventeen of these came from only two vessels) with the only other rim recorded coming from a jar. Pipkins were represented by three bases; however, these may be mis-identified Surrey White ware vessels as these do not appear to be part of the range of forms produced by the industry.

The remaining Low Countries imports were slipwares or slip-decorated wares, and were represented by rims from bowls and dishes, including distinctive cockerel bowls. These latter vessels were collared bowls with two horizontal handles and slip decorated. Central motifs on the bowl bases were either animals and birds, geometric patterns or botanical motifs, while the collared rims were adorned with linear decoration. North Holland slipwares were more common (0.757kg, 0.2% of post-medieval fabrics), and mostly represented by cockerel bowls (ten rims, four bases) as well as by a dish and bowl rim. A smaller quantity of Low Countries slipware was recovered, (0.133kg, less than 0.1% of the post-medieval assemblage), represented by rims from a handled bowl and from a dish. Cockerel bowls were represented by body sherds only.

The largest proportion of imported wares were represented by products from the Rhineland, and these were overwhelmingly dominated by stonewares from Cologne, Frechen and Westerwald. Products from Cologne-Frechen accounted for 17.815kg (4.8% of post-medieval fabrics); production expanded in the 16th century to produce a range of vessels with elaborate decoration. These were mainly small globular jugs with applied decorative motifs of roses and rose leaves or acorns and oak leaves, which appear to be early 16th-century in date. Larger jugs with narrow neck and a turned base were decorated with two zones of motifs, usually acanthus leaves and a medallion of a human head separated by a central band with either an inscription or a running scroll. These appear to be made slightly later in the second and third quarters of the 16th century.

Vessels from Cologne-Frechen were common in Period 6.1 where it was represented by two jug rims and two bases. The majority of the assemblage came from Period 6.2, where jugs (eight rims and six bases) and *bartmann* flasks (twenty nine rims and thirty bases) were the most common forms. Other vessels included mugs

	Periods 1–5		*Period 6.1*		*Period 6.2*		*Period 6.3*		*Period 7*		*Total*	
	rims	*bases*	*rims*	*bases*	*rims*	*bases*	*rims*	*bases*	*rims*	*bases*	*rims*	*bases*
Drug jar	-	4	2	-	44	59	-	2	-	-	46	65
Plate	9	4	16	1	178	51	5	1	-	1	208	58
Dish	-	-	-	-	29	2	2	-	-	-	31	2
Charger	-	-	1	-	5	1	-	-	-	-	6	1
Bowl	3	-	9	3	49	60	8	-	-	-	69	63
Handled bowl	-	-	-	-	12	-	-	-	-	-	12	-
Porringer	-	-	Handle		19	-	-	-	-	-	19	-
Jar	-	-	1	-	1	-	-	-	-	-	2	-
Mug	-	-	2	-	9	-	-	-	-	-	11	-
Jug	-	-	1	-	14	14	-	-	-	-	1	14
Saucer	-	-	1	-	5	-	-	-	-	-	6	-
Chamber pot	-	-	-	-	-	-	2	-	-	-	2	-
Other	-	-	1	-	8	-	-	-	-	-	9	-
Total	**12**	**8**	**34**	**4**	**359**	**187**	**17**	**3**	**-**	**1**	**422**	**205**

Table 10.32 Tin-glazed Earthenware forms represented by rims and bases, by sub-period

(two rims) and a jar (one rim). Mugs were more common in Period 6.3 (seven rims and one base), while jugs were represented by at least fifteen bases and one rim.

Frechen stonewares began to dominate the English market in the middle of the 16th century. The quantity of the fabric recovered was virtually the same as Cologne-Frechen stoneware, with 18.237kg recovered (4.9% of the post-medieval fabrics). This fabric was as common in Periods 6.1 and 6.2, and only more dominant in the assemblage in Period 6.3. Forms most commonly found in Norwich were globular mugs with straight necks, a flat base and a cordon at the neck/body junction, and *bartmann* flasks which were squat and globular often decorated with a facemask on the neck and medallions on the body. Both vessels were recovered at Castle Mall, with *bartmann* flasks most numerous represented by at least forty four rims and forty-six bases, as well as two witch's bottles (SF116 from fill 92750 and SF866 from fill 92753; both from the barbican ditch; see Chapter 10.VI). The majority came from Period 6.2, though the fabric was present in small quantities in Periods 6.1 and 6.3. Mugs were less common with sixteen rims and fifteen bases recorded.

Westerwald stoneware is a very distinctive grey stoneware decorated with applied decoration with painted cobalt blue and purple manganese colour; the latter colour appears to be used later. The pottery was imported in large quantities in the early 17th century and continues to be made today. The range of forms recovered from Norwich is limited and confined to jugs, tankards and chamber pots; some vessels were elaborately decorated such as panelled jugs. The fabric was recovered in small quantities in Period 6.1, with slightly larger assemblages from Periods 6.2 and 6.3 but never really dominates. This suggests that by the time the ware becomes common in Norwich methods of rubbish disposal had changed and households no longer disposed of their waste on site. A number of rims and bases were recorded, represented by jugs (five rims and five bases) and mugs/drinking vessels (thirty-seven rims and fifteen bases). Other common vessels such as chamber pots were present, though only four bases were recorded. Three jar rims were also noted.

Stonewares were not the only Rhenish products represented, and a small quantity of German slipware was recovered. Both Werra ware and Weser ware are very distinctive and occur in small number on many Norwich sites. Werra ware was more common (0.127kg) and was produced in the late 16th–early 17th century in the vicinity of the Werra River in Germany. The fabric is oxidised red and decorated with white slip designs which are then outlined with scraffito defining parts of the motif; the vessel is then decorated with a clear lead glaze and on the finished surface the applied design looks green. Forms were mostly dishes and bowls decorated with slashes on the rim and a continuous spiral around the edge of a decorative central panel. Three dish rims were recorded and a plate rim.

Weser ware tends to be recovered in association with Werra ware, and is usually more common. However, only two sherds weighing 0.036kg were recovered from Castle Mall. Again the fabric is oxidised with an applied white slip over the interior surface which is then decorated with orange-brown and green slip; a clear lead glaze covers the surface. Also again there is a central motif surrounded by concentric zones of thick and thin lines often with vertical zigzags in between. A single dish rim was recorded from Period 6.1.

Only very small quantities of other continental imports form Italy, France and Spain were recorded. Italian wares were restricted to North Italian slipwares (0.543kg), including a particularly fine bowl of North Italian marbled slipware probably made in Po valley during the first half of the 17th century (Fig.10.36, no.13). This very fine oxidised fabric was decorated with a white slip, marbled with an orange slip and glazed with a clear lead glaze. French products included the necks and body sherds from Martincamp flasks (0.478kg); though three types with three slightly divergent date ranges are known, this material was not recorded systematically, although a note was made that these sherds appear to be type III and 17th-century in date. A rather fine Saintonge Polychrome sweetmeat dish was also recorded; this depicts the figure of St John the Evangelist (see Goffin below). Spanish wares were represented by a small number of coarse ware sherds which probably came from olive jars. These were produced in southern Spain to transport olives and oil all over the world. A single sherd of Spanish lustreware was also recorded.

Stratigraphic distribution

Assemblages are detailed by group in Chapter 10.II and Appendix 6, where details of illustrated items can also be found.

Period 6.1

(Fig. 10.33; Figs.10.32, 10.34 and 10.35 on CD)

A total of 1905 sherds of pottery weighing 31.510kg was recovered from contexts assigned to this sub-period, 8.2% of the period assemblage. Residual earlier fabrics made up a proportion of the assemblage, while late medieval/transitional wares constituted a further 27.8%. Some of the vessels recovered in these wares were undoubtedly residual, but probably a large proportion were still in use at the end of the 16th century. They mostly comprised kitchen wares LMT, DUTR and Low Countries Earthenware with smaller quantities of drinking vessels of Tudor Green-type ware and Rhenish stonewares from Langerwehe and Raeren-Aachen. A small quantity of Early Post-medieval ware (EPM) was also recovered; largely body sherds transitional between LMT and GRE.

It was the introduction of post-medieval wares alongside the continued use of late medieval/ transitional vessels which characterised this sub-period. Late 16th- to 17th-century ceramics were dominated by local products, and supplemented by English and continental imports. Locally produced GRE and West Norfolk Bichrome ware supplied kitchen wares, which were supplemented by small number of imports such as Surrey White ware and DWE. Although some drinking and pouring vessels were provided by locally produced IGBW and Speckled Glazed ware, this function was dominated by Rhenish products from Cologne-Frechen and Frechen. Tablewares provided the most varied assemblage with Metropolitan slipwares and Surrey White wares providing English imports, while TGE was supplied from both the Netherlands and English production centres. Continental imports were varied and included North Holland slipwares as well as small quantities of German slipwares from Werra and Weser.

Fabric	*Quantity*	*Weight (kg)*	*% Quantity*	*% Weight*
Residual	*313*	*1.955*	*16.4*	*6.1*
Residual medieval	*435*	*3.080*	*22.8*	*9.8*
Residual LMT	*444*	*8.756*	*23.3*	*27.8*
EPM	62	1.033	3.2	3.3
GRE	351	10.290	18.4	32.6
IGBW	49	0.688	2.5	2.1
Speckled Glazed ware	3	0.084	0.1	0.2
West Norfolk Bichrome ware	14	0.084	0.7	0.2
Metropolitan Slipware	17	1.010	0.9	3.2
Surrey White ware	17	0.343	0.9	1.1
Staffordshire Slipware	1	0.001	<0.1	<0.1
TGE	63	1.330	3.3	4.2
North Holland Slipware	4	0.050	0.1	0.1
Dutch White Earthenware	3	0.040	0.1	0.1
Low Countries Slipware	2	0.044	0.1	0.1
Martincamp Flask	21	0.311	1.1	1.0
Werra ware	1	0.007	<0.1	<0.1
Weser ware	1	0.020	<0.1	<0.1
Cologne-Frechen Stoneware	47	1.028	2.5	3.2
Frechen Stoneware	36	0.986	1.9	3.1
Westerwald Stoneware	2	0.093	0.1	0.3
Total Post-medieval	**694**	**17.442**	**36.4**	**55.3**
Stoneware	9	0.225	0.5	0.7
China	7	0.011	0.4	<0.1
Misc. unidentified	3	0.041	0.1	0.1

Table 10.33 Total quantity and weight of pottery by fabric in Period 6.1

Toward the latter end of the sub-period a number of later 17th-century fabrics were introduced and it was unclear whether these were intrusive or simply early examples of these wares. This was not strictly the case with either Westerwald stoneware or Martincamp flasks which were produced from the early 17th century but appear in Norwich towards the end of the century. However, it is probable that the sherd of Staffordshire slipware recovered was intrusive.

Period 6.2
(Figs.10.36 and 10.38–10.43; Figs 10.37 and 10.44 on CD)
By far the largest proportion of the Period 6 assemblage came from this sub-period and 11561 sherds weighing 334.835kg were recorded, 87.1% of the period assemblage. This sub-period was characterised by a number of differences. The proportion of late medieval/transitional wares has declined, and was now considered residual. GRE and other post-medieval wares catered for all ceramic requirements, and specific features and fabrics indicated a mid 17th-century date. This included an increased range of GRE vessels, and specifically the introduction of small handled jars/bowls. Other wares introduced in Period 6.1 continued to be used, and simply form a larger proportion of the assemblage. Few new wares were introduced but did include Speckled Glazed ware and Westerwald stoneware; though these were present in Period 6.1 contexts, it was not until this sub-period that they provided a substantial assemblage. This is also the case with the introduction of Staffodshire slipware in the latter stages of this sub-period. Other fabrics not recorded from the previous sub-period were imported exotica, and included Spanish coarse ware and fine wares from Spain and North Italy.

An extremely large assemblage of pottery was recovered from fills of the barbican ditch recorded in Area 9 and Trial Hole 1, accounting for over 95% of the total assemblage from the ditch (8801 sherds weighing 265.227kg). Not only did this assemblage account for 79.2% of the period assemblage, but also the group made up 27.7% of the entire ceramic assemblage. Almost all of the assemblage (98%) came from the trialwork, a figure which relates directly to the hand-collection of material here, as opposed to the sampling strategy adopted for the later machine-excavation in Area 9. Most of the Trial Hole assemblage (177.822kg, 67%) came from refuse fills pre-dating the construction of a timber revetment within the ditch: the group as a whole contained numerous cross-context joins and a large number of complete or near-complete vessels. Taken as a whole it provides an insight into the character of local households of the period (see Goffin below), particularly when considered alongside the large quantities of other artefacts and ecofacts recovered (see Chapter 10.VI).

Period 6.3
A much smaller assemblage was recovered from contexts assigned to this sub-period, 1036 sherds weighing 18.039kg which accounted for only 4.7% of the period

Fabric	*Quantity*	*Weight (kg)*	*% Quantity*	*% Weight*
Residual	*584*	*8.366*	*5.0*	*2.5*
Residual medieval	*222*	*1.458*	*1.9*	*0.4*
Residual LMT	*627*	*20.800*	*5.4*	*6.2*
EPM	98	4.080	0.8	1.2
GRE	5,953	177.624	51.5	53.0
IGBW	1,075	40.789	9.3	12.2
Speckled Glazed ware	393	10.165	3.4	3.0
West Norfolk Bichrome ware	15	0.157	0.1	<0.1
Local Slipware	2	0.049	<0.1	<0.1
East Norfolk white ware	1	0.104	<0.1	<0.1
Metropolitan Slipware	285	0.947	2.5	3.7
Surrey White ware	156	4.196	1.3	1.2
Staffordshire Slipware	68	1.518	0.5	0.5
Bourne ware	1	0.023	<0.1	<0.1
TGE	1,228	23.353	10.6	6.9
Low Countries Earthenware	2	0.018	<0.1	<0.1
North Holland Slipware	15	0.253	0.1	0.1
Dutch White Earthenware	36	0.348	0.3	0.1
Low Countries Slipware	2	0.065	<0.1	<0.1
Martincamp Flask	2	0.156	<0.1	<0.1
Spanish Amphora/coarseware	4	0.096	<0.1	<0.1
Spanish Lustreware	1	0.005	<0.1	<0.1
Werra ware	3	0.006	<0.1	<0.1
Cologne-Frechen Stoneware	259	14.920	2.2	4.4
Frechen Stoneware	334	12.135	2.9	3.6
Westerwald Stoneware	173	3.472	1.5	1.0
North Italian Slipware	2	0.012	<0.1	<0.1
Pisa Marbled ware	9	0.528	0.1	0.1
Misc. imports	6	0.123	<0.1	<0.1
Total Post-medieval	**10,025**	**302.572**	**86.7**	**90.4**
Stoneware	73	1.373	0.6	0.4
China	3	0.043	<0.1	<0.1
Whieldon-type ware	25	0.210	0.2	<0.1
Creamware	2	0.013	<0.1	<0.1

Table 10.34 Total quantity and weight of pottery by fabric in Period 6.2

assemblage. The range of fabrics recovered was similar but not as extensive as from the previous sub-period. The proportion of residual material has increased to form 28.9% of the sub-period assemblage. Of post-medieval fabrics GRE was the most common, with only IGBW, TGE and Rhenish stonewares producing assemblages of any size. Products from Westerwald made up a larger part of the stoneware material, although Frechen vessels were still more common. Later post-medieval fabrics such as Whieldon-type ware, English stonewares and china were recovered but not in large quantities and indicated that by this period domestic rubbish was no longer being deposited on site but probably being transported elsewhere.

Discussion and conclusions
by Richenda Goffin

This period, covering the late 16th century to the 18th century, is subdivided into three chronological parts, the final two being separated by the construction of the unified Cattle Market in the south bailey in 1738. In total, 40.2% of the ceramic assemblage at the Castle Mall came from Period 6, of which 11.8% by weight was residual. The general pattern of the Period 6 pottery shows the dominance of GRE, an increase in the quantity of ceramics from other regions of the country, and in addition, a wider range of imported wares. As has been detailed in earlier text, the original research design meant that analysis of post-medieval pottery was a limited exercise, targeted towards dating and selected vessels and assemblages. Forms were not recorded in detail.

Much of the pottery assigned to the Period 6.1, which spans the late 16th to the middle of the 17th centuries, was derived from refuse pits and features associated with the growing number of tenements along the eastern side of the barbican ditch and along street frontages elsewhere. A high percentage of this material is probably residual (43.7% by weight overall, which includes 27.8% of late medieval and transitional wares).

Period 6.1 contains some interesting ceramic groups, not least the assemblage from a cess pit or well

Site Area	*Period 6.1 (kg)*	*Period 6.2 (kg)*	*Period 6.3 (kg)*	*Total (kg)*	*% Total*
Area 3 (west)	0	1.569	0	*1.569*	*0.5*
Area 6 (south)	0	1.483	0	*1.483*	*0.5*
Area 47 (south)	0	0.323	0.352	*0.675*	*0.2*
Areas 2 and 4 (south)	0	3.867	1.904	*5.771*	*2*
Trial Hole 4 (south)	0	3.893	0	*3.893*	*1.4*
Area 9 and Trial Hole 1(east)	1.286	265.227	0	*266.513*	*95.2*
Total (kg)	**1.286**	**276.362**	**2.256**	**279.904**	

Table 10.35 Weight of Period 6 pottery from the barbican ditch by site area and sub-period (excludes watching briefs)

Fabric	*Quantity*	*Weight (kg)*	*% Quantity*	*% Weight*
Residual	*228*	*2.924*	*22.0*	*16.2*
Residual medieval	*88*	*0.670*	*8.5*	*3.7*
Residual LMT	*77*	*1.634*	*7.4*	*9.0*
EPM	28	0.840	2.7	4.6
GRE	319	6.924	30.8	38.4
IGBW	43	1.033	4.1	5.7
Speckled Glazed ware	4	0.048	0.4	0.2
Metropolitan Slipware	4	0.105	0.4	0.6
Surrey White ware	14	0.295	1.3	1.6
Staffordshire Slipware	21	0.229	2.0	1.2
Staffordshire Stoneware	2	0.030	0.2	0.1
TGE	72	0.658	6.9	3.6
North Holland Slipware	1	0.021	0.1	0.1
Dutch White Earthenware	11	0.211	1.0	1.1
Werra ware	1	0.010	0.1	<0.1
Cologne-Frechen Stoneware	36	0.763	2.5	4.2
Frechen Stoneware	34	1.115	3.3	6.2
Westerwald Stoneware	15	0.837	1.4	4.6
Misc. imports	1	0.002	0.1	<0.1
Total Post-medieval	**578**	**12.281**	**55.8**	**68.1**
Stoneware	27	0.270	2.6	1.5
China	30	0.209	0.1	1.1
Whieldon-type ware	1	0.003	2.9	<0.1
Misc. unidentified	7	0.048	0.7	0.2

Table 10.36 Total quantity and weight of pottery by fabric in Period 6.3

10557 (Open Area 60, City Property g). This feature contained over 2.5kg of pottery including a range of GRE vessels, some abraded Metropolitan slipware and a Border ware bowl. The imported wares comprised Frechen *bartmanner* and Dutch whitewares. A fine fluted Anglo-Netherlandish bowl was amongst the tin-glazed earthenwares (Fig.10.35). The vessel is decorated with a ?dark blue repeating motif around the inside a central decoration which is missing. The exterior is undecorated apart from the blue line which runs around the edge of the rim. It is likely to date to the second half of the 17th century. A fluted bowl with a similar type of decoration was present in the ceramic assemblage recovered from Building VII Phase 3 at Aldgate which is phased to the period *c*.1700–1720 (Orton and Pearce 1984, 59, fig.28, no.129). Other tin-glazed plates were also present in this feature, together with part of the rim of a Staffordshire slipware mug. As noted in Chapter 10.II, the presence of late 17th- to 18th-century wine bottles and clay pipes indicate contamination or may suggest that this is the date of the deposition of this fill, although many of the ceramics may be earlier.

The large assemblage of TGE from the site came from a number of sources, not only continental vessels from the Netherlands but also from English potteries in London and Bristol, possibly even from Norwich itself. A large possible waster sherd of biscuit-type ware (Fig.8.52) found residually in an 18th- to 19th-century cellar fill at Golden Ball Street (Period 6.3) provides direct linkage to the local kilns, evidence for which is attested by the occupations of the Strangers in the parish of St John Timberhill detailed by Ives in Part IV, Chapter 3 (see also note in Chapter 10.I). Two potters from Antwerp, Jasper Andries and Jacob Jansen, came to Norwich in *c*.1567 and began to make tin-glazed wares, before moving to London three years later (Britton 1986, 19–20). Although biscuit ware

Plate 10.13 Palissy-type polychrome dish of c.1550–1650, depicting St John the Evangelist. For scale see Fig.10.43, no.6

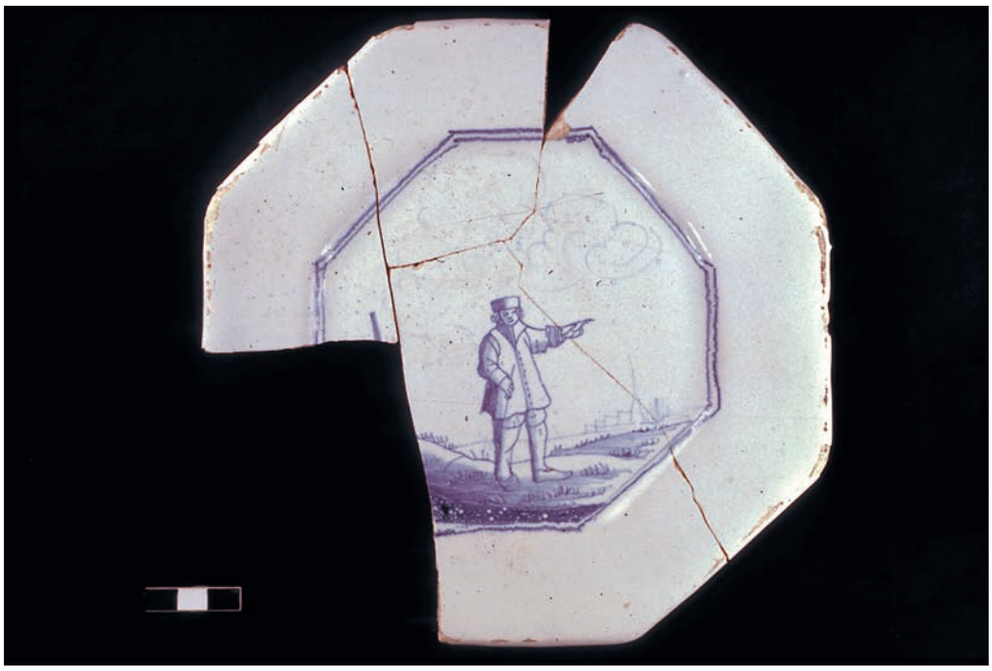


Plate 10.14 Tin-glazed earthenware octagonal plate with central Dutch motif, one of a minimum of six such late 17th- to early 18th-century plates recovered from fill *47190* in quarry *57136*, Open Area 62 (Period 6.2)

sherds have been recovered from sites in Norwich, most notably from Ber Street, no kiln site has been identified in the city. Recent neutron activation analyses on some of the fragments from Ber Street has concluded that the fabric has a chemical composition distinctive from both Holy Trinity Priory, Aldgate in the City of London, and all Low Countries samples (Hughes and Gaimster 1999, 65–75). Future analysis of the fragment from Golden Ball Street may confirm that it belongs to this group, or otherwise.

Leaving aside the tin-glazed earthenwares, 8.1% by weight of the Period 6.1 pottery is imported. A wide range of fabrics is represented, including North Holland and other continental slipwares, German stonewares and Martincamp flasks. Comparison with other sites is difficult, but at Dragon Hall Period 7 (late 16th to mid 17th century), 67.2% by weight of the period assemblage

is Glazed Red Earthenware, 8.22% by weight Dutch-type redwares and 10.3% Cologne/Frechen stonewares (Anderson 2005). Overall the post-medieval imports from Period 7 make up 11% by weight of the assemblage.

At Castle Mall, a larger quantity of ceramics was recovered from features assigned to Period 6.2 (11561 sherds weighing 334.835kg). By this date, 9.1% by weight of the pottery was residual. Glazed red earthenwares still continue to dominate, and are supplemented by the related fabric of Speckled glazed ware. Much of the pottery was recovered from fills and features within the barbican ditch (Ditch 13). Several phases of dumping occurred here, creating a complex sequence containing ceramics which date from the mid to late 17th century, quantified by excavation area in Table 10.35 and fully detailed by Lentowicz in Chapter 10.II and Appendix 6.

A very large assemblage of ceramics was recovered from the refuse dumps into the eastern part of the barbican ditch (1.286kg in Period 6.1 and 56.19kg in Period 6.2). The comparatively small group of pottery from Period 6.1 (Phase 6d) included a small percentage of residual fabrics, as well as ceramics which date to the 14th–15th centuries such as Langerwehe stonewares. In addition to 16th-century Glazed red earthenwares, several locally made fabrics make an appearance, notably West Norfolk Bichrome, and Local Slipware. West Norfolk Bichrome, a glazed red earthenware, has a copper green glaze on the exterior of the vessel and an orange glaze on the interior (Jennings 1981, 148). Although commonly associated with deposits dating to the 17th century, it is likely that this fabric may be in circulation earlier, in the second half of the 16th century. The Period III cesspit 1332 from the excavations at Pottergate which contained West Norfolk Bichrome, Dutch redwares and fragments of Frechen stoneware dating to post 1550 may be dated overall to *c.*1550–1590 (Evans 2002, 42). Recent analysis of a post-dissolution deposit at Whitefriars, Norwich has also suggested that this fabric may be present in deposits dating from the second half of the 16th century (Goffin in Shelley 2004). Local Slipware drinking vessels are found in small quantities on Norwich sites but not beyond the city, suggesting thoroughly localised production and distribution. These slipwares, which are often mugs, are also considered to be 17th-century in date, but once again, may also be in distribution slightly earlier (Jennings 1981, 103). A Local Slipware mug recovered from a deposit at the Forum is associated with LMT, GRE and IGBW (Site 26437N, Goffin in prep.a). At Castle Mall, a small but interesting group of tin-glazed earthenware was present in two of the barbican ditch fills. The pedestal base of a drug jar or ointment pot was present in *92761* (Fig.10.39, no. 11). In addition a very flat fragment has script on one of the faces (Fig.10.39, no.12). A third fragment from *92765* bears the last two numbers of the date [16]61 (Fig.10.39, no.13).

The very large assemblage (over 56kg) attributed to the later phase of infilling of the barbican ditch is dated from the second half of the 17th century and into the middle of the 18th century (Phase 7; Phase 7a–d where recorded in more detail in Trial Hole 1). Considered as an entity, this huge group represents in microcosm Norwich post-medieval pottery groups of this period. Glazed Red earthenwares form the staple utilitarian ware, used for storage, food preparation and presentation, and sanitary ware. In addition a candlestick and a Dutch oven were also made in this fabric. Towards the later part of the 17th century into the 18th century Speckle-glazed redwares are present in small quantities. Imported wares from the Period 7a assemblage include some from the Low Countries consisting of North Holland slipware, DWE and a tin-glazed earthenware jug of Malling type. A single fragment of degraded Spanish lustreware was also recorded as well as a fragment from a Spanish olive jar. Both these imports are unusual although not unknown from Norwich sites. A lustreware dish was recovered from Period IV levels at St Benedict's Street, for example (Evans 2002, 89). Two fragments of a lustreware bowl were present in the 17th-century well group at St Stephens (Jennings and Atkin 1984, 19). A fragment of Spanish olive jar was also found from the Period 5B assemblage (*c.*1650–60) in the barbican ditch at Site 150N (Atkin 2002a, 73). At Castle Mall, barbican dich Phase 7c GRE still forms the vast majority of household pottery. The regional wares are represented by Metropolitan slipwares and Surrey whitewares, but also by greater amounts of Staffordshire slipware mugs, indicative of a later 17th-century date or even later. The imported fabrics comprise substantial amounts of Frechen stonewares, especially *bartmanner*, and Westerwald drinking vessels. In addition a small fragment from a Spanish olive jar is present. The tin-glazed vessels comprise a wide range of dishes, bowls and plates, as well as chamberpots. The latest pottery recovered from this feature are three fragments of Whieldon-type ware which date to the first half of the 18th century.

Across the site, the range of imported wares expands to include small quantities of Spanish coarsewares, Spanish lustreware, and North Italian marbled slipware. An unusual Palissy-type polychrome dish (Fig.10.43, no.6, Plate 10.13) made in an off-white micaceous fabric, probably Saintonge, was recovered from pit *10059* (Open Area 46, City Property g). Although fragments of such wares are not unknown in excavations in Britain, it is rare to find such a well preserved example from an archaeological context. The bowl has a scalloped rim and a background of blue with white raised ribs radiating around the central part of the decoration. This consists of the seated figure of St John the Evangelist at work. Such biblical themes form part of the repertoire of this type of elaborately decorated pottery, along with mythological and allegorical subject matters (Hurst *et al* 1986, 88). The bowl is likely to date to *c.*1550–1650, although the rest of the pottery and other types of artefacts from the same fill are mixed in date. The decoration of the bowl is comparatively crudely executed, relatively uncomplicated and lacking in fine detail, unlike the extremely complex and elaborate exotic wares which survive as museum pieces. It is suggested that such relatively inferior wares may have been made by potters in the tradition of Palissy working in the Saintonge (Hurst *et al* 1986, 86). Even so, such a rare object is likely to have been curated carefully perhaps for several generations before its final deposition. Further work is needed to place this vessel in the wider context for this much-studied type of pottery.

Examples of other Palissy types identified from excavations in Britain include a group from Plymouth and elsewhere (Clark 1979). A highly decorated polychrome Palissy-type tazza found in the backfill of a well on the former site of Blackfriars, London, is the most complete example of this type of pottery from an excava-

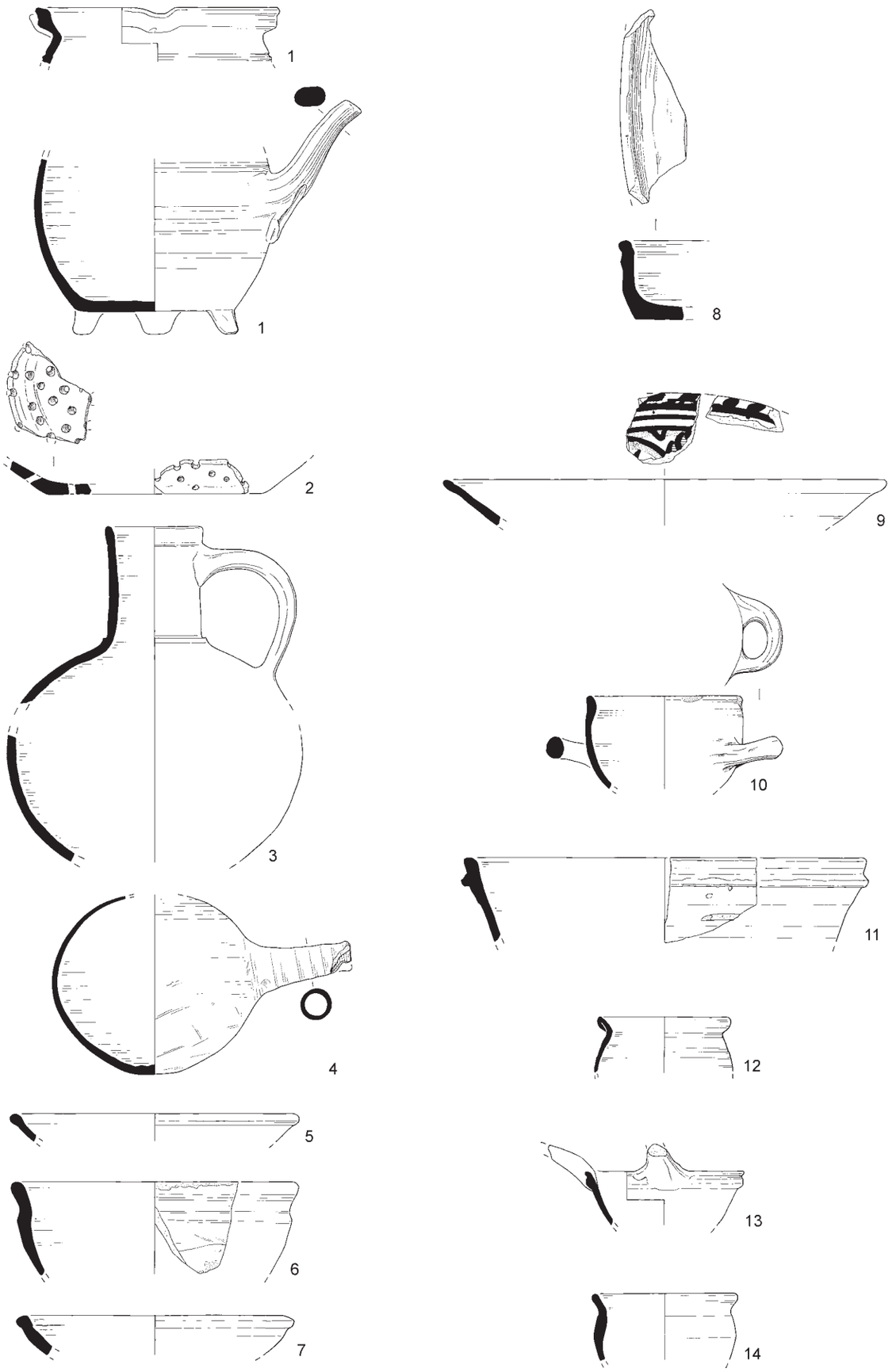


Figure 10.33 Pottery from intercutting pits in former barbican, Open Area 29 (G45/5) . Scale 1:4

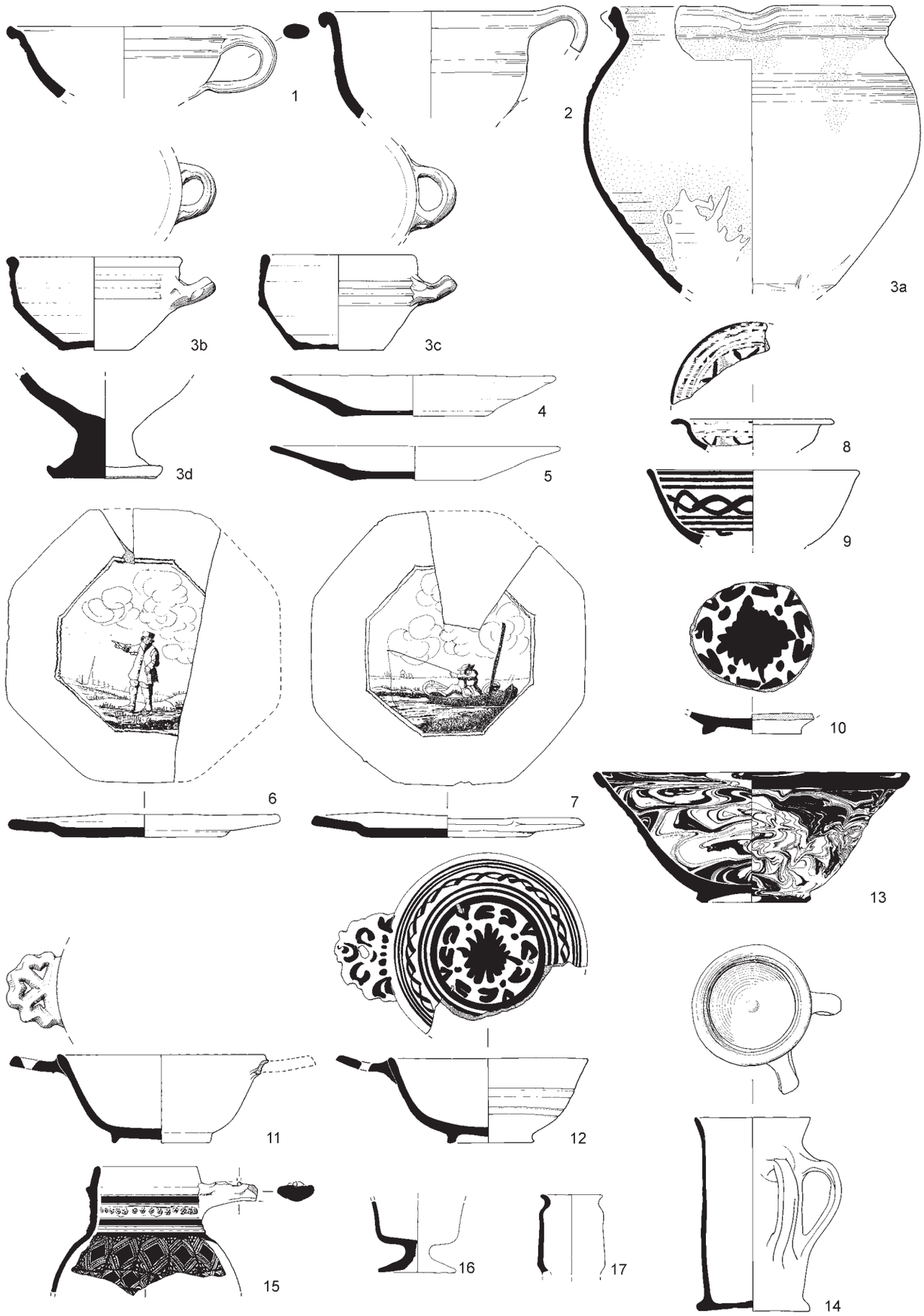


Figure 10.36 Pottery from quarry, Open Area 62, phase 3 (G47/28) . Scale 1:4

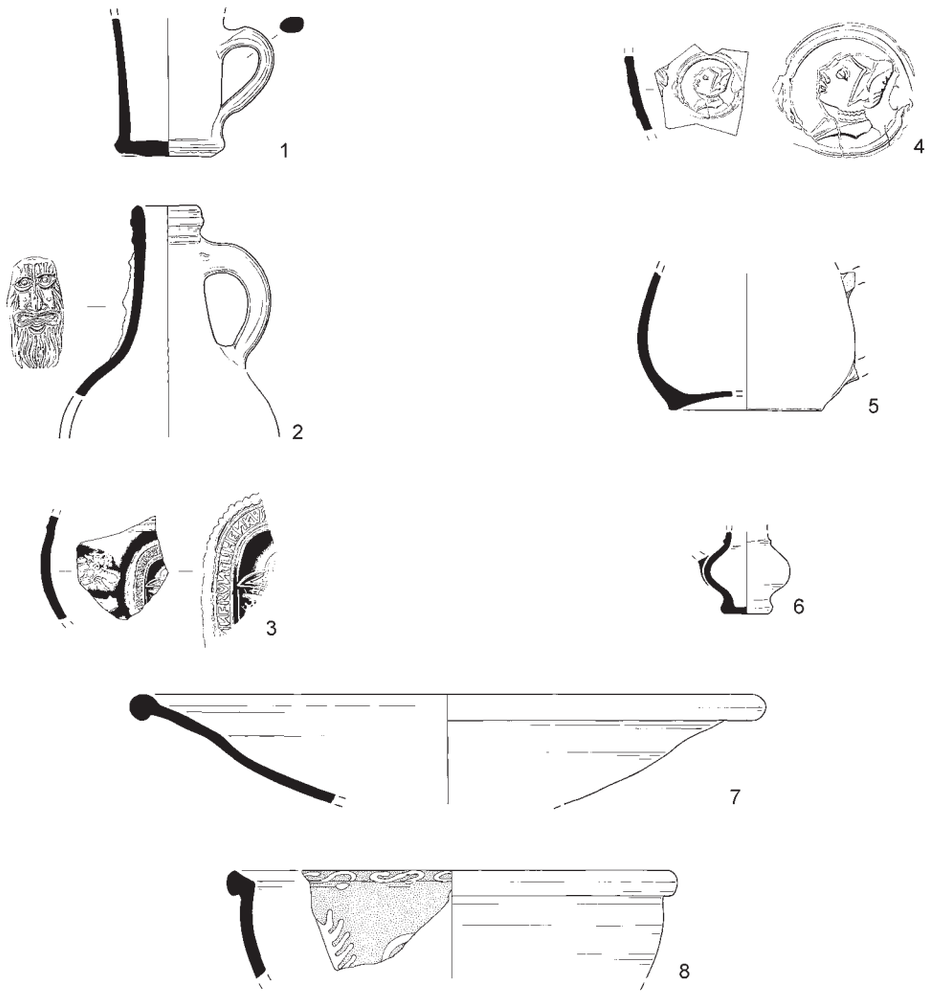


Figure 10.38 Pottery from infilling of barbican ditch, phase 7a, Trial Hole 1 (G9/41) . Scale 1:4

tion in England, as well as being the most exotic to date (Blackmore 1992, 371). The centrepiece of this vessel is decorated with an allegorical scene of Minerva, with a cupid and other figures in the background. The tazza, which is made in a creamy-white micaceous fabric of French origin, was found with a range of other fabrics, and its dating is uncertain. It was no doubt a treasured possession which may have been old when it was finally discarded.

Other features at the Castle Mall site contained particularly well-preserved groups of ceramics of 17th-century date. A good example comes from a quarry (*57136*, fill *47190*) in Open Area 62, on the northern edge of the barbican ditch. The group included a minimum of six different tin-glazed earthenware octagonal shaped plates decorated with pastoral scenes, as well as a range of glazed red earthenware, tin-glazed and Border ware handled bowls or porringers (Fig.10.36 and Plate 10.14). A Westerwald jug and North Italian marbled slipware bowl were also present in this assemblage, which appears to reflect the contents of a household which was well-off and perhaps well-travelled. This suggestion is perhaps upheld by the presence in the same fill of marrow/pumpkin seeds from the New World (Murphy, this volume). The dating is confirmed by a group of well-made clay tobacco pipes of the period 1650–1680 (Atkin, this volume).

A much smaller assemblage of pottery was attributed to features of 18th-century date (Period 6.3, 1036 fragments weighing 18039kg). The deposits were associated with the preparation of the ground surface for the new Cattle Market in the area surrounding the barbican ditch in 1738. Not unexpectedly a considerable quantity of the ceramics is residual (28.9% by weight). Glazed red earthenwares still form the majority of the assemblage, and the quantity of Frechen and Westerwald stoneware has increased. In addition Staffordshire slipware, Staffordshire stoneware and Nottinghamshire stoneware is present.

Despite the fact that much of the pottery from this period came from rubbish disposal on a large scale, either in pits at the rear of documented properties or as dumping into the barbican ditch, there were no identifiable trends in terms of the spatial distribution of local, regional and Continental products, which were recovered across the whole site. This demonstrates the extensive range of ceramics available to much of the local populace, although as other evidence discussed in these volumes indicates, this ranged from the impoverished to the aristocratic. Implications drawn from the character of the

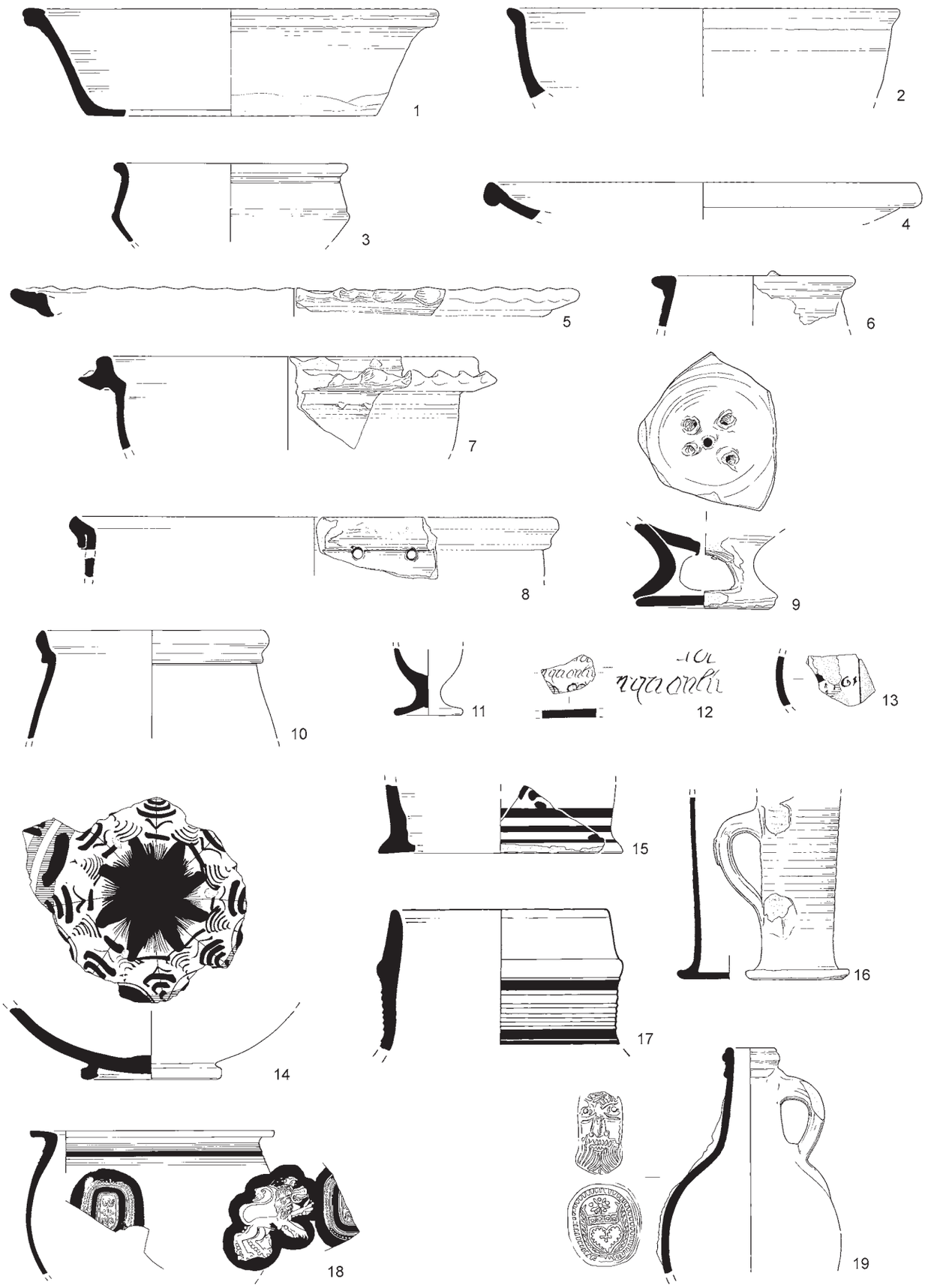


Figure 10.39 Pottery from infilling of barbican ditch, Phase 7a, Trial Hole 1 (G9/41) . Scale 1:4

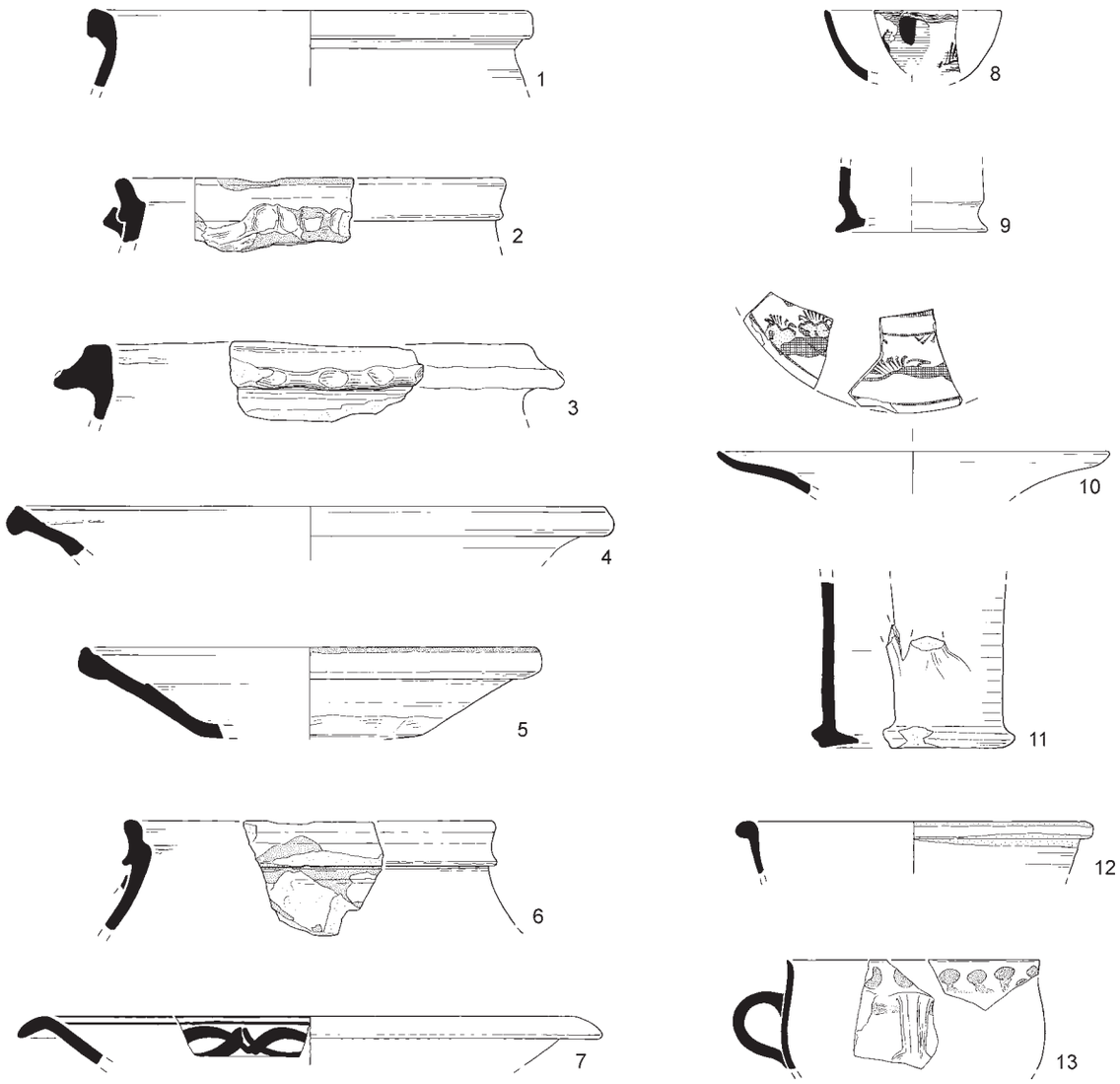


Figure 10.40 Pottery from infilling of barbican ditch, Phase 7a, Trial Hole 1 (G9/41) . Scale 1:4

wide-ranging post-medieval pottery assemblage from the site are discussed in a wider social and economic context in Chapter 10.VI, including early evidence for tea or coffee drinking, ceramic groups probably associated with public houses and evidence for local apothocaries.

Illustration Catalogue

Period 6.1

Fig.10.32 on CD: Demolition rubble around barbican well, Open Area 21 (G5/52)
no.1 Grimston Glazed ware, thumbed jug base, layer 50083
no.2 Local EPM, cauldron profile, layer 50077
no.3 GRE, dish rim, layer 50077
no.4 TGE, plate rim, layer 50077

Fig.10.33: Intercutting pits in former barbican, Open Area 29 (G45/5)
no.1 LMT, pipkin rim, handle and base, Pit 45097
no.2 Surrey White ware, colander base, Pit 45097
no.3 Frechen stoneware, almost complete jug profile, Pit 45097
no.4 Martincamp Flask, rim and neck of flask, Pit 45097
no.5 GRE, bowl, Pit 45218, fill 45217
no.6 LMT, bowl rim, Pit 45186, fill 45187
no.7 GRE, shallow bowl, Pit 45230, fill 45123
no.8 GRE, dripping pan rim, Pit 45230, fill 45123
no.9 TGE, dish rim, Pit 45230, fill 45123
no.10 Tudor Green-type ware, handled bowl, Pit 45134, fill 45052
no.11 GRE, jar rim, Pit 45134, fill 45052
no.12 Surrey White ware, jar with folded rim, Pit 45134, fill 45052
no.13 GRE, small pipkin rim and handle, Pit 45100, fill 45021
no.14 GRE, pipkin rim, Pit 45100, fill 45021

Fig.10.34 on CD: Pitting, Open Area 39, Properties (a) and (b) (G8/29)
no.1 Metropolitan slipware, dish profile, Pit 80102, fill 80101
no.2 IGBW tankard profile, Pit 80188, fill 80187

Fig.10.35 on CD: Cess pit 10557, Open Area 60, Property (g) (G1/116)
no.1 TGE, fluted bowl, fill 13013

Period 6.2

Fig.10.36: Quarry, Open Area 62, Phase 3 (G47/28)
no.1 GRE, handled bowl, fill 47190
no.2 GRE, handled bowl, fill 47190
no.3a GRE, pipkin, fill 47190
no.3b Surrey White ware, handled bowl, fill 47190
no.3c Surrey White ware, handled bowl, fill 47190

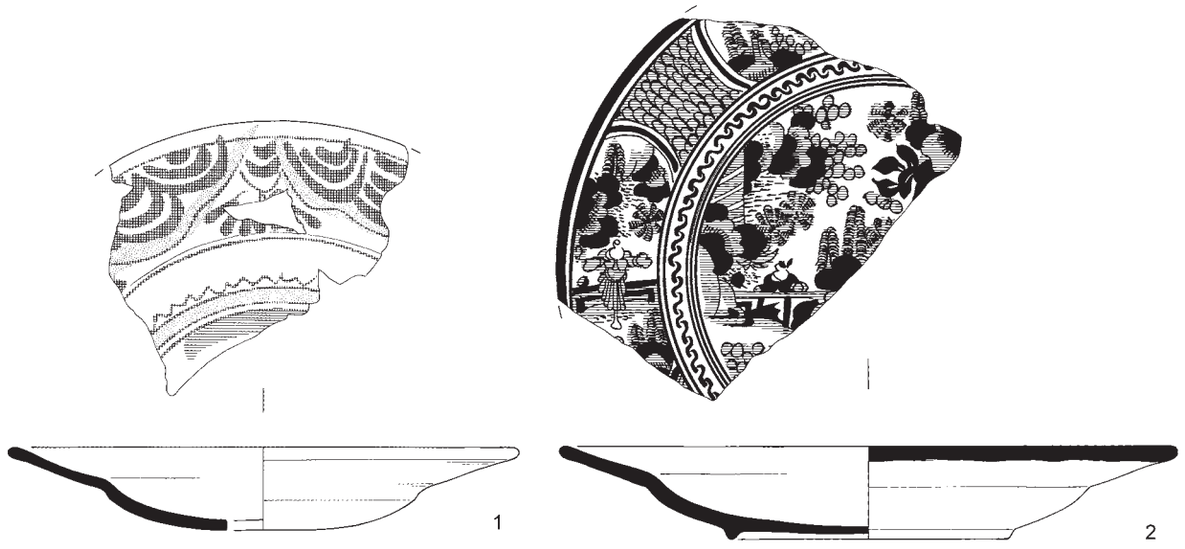


Figure 10.41 Pottery from infilling of barbican ditch, Phase 7c, Trial Hole 1 (G9/41) . Scale 1:4

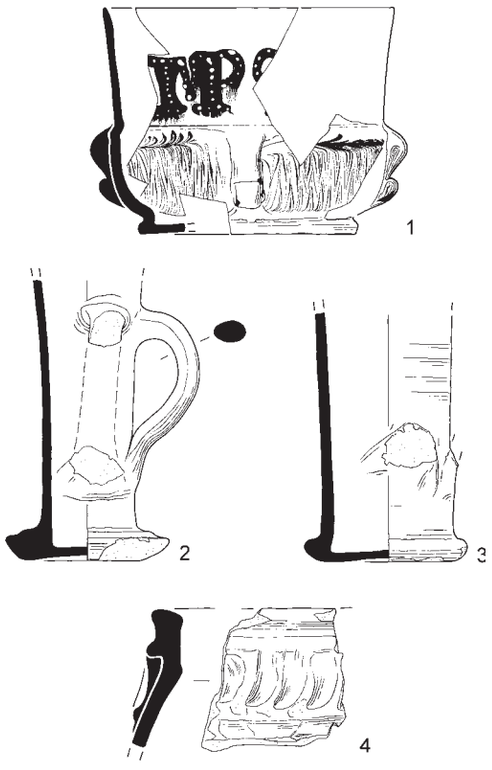


Figure 10.42 Pottery from infilling of barbican ditch, Phase 7c, Trial Hole 1 (G9/41) . Scale 1:4

no.3d GRE, chafing dish base, fill 47190
no.4 TGE, plate, fill 47190
no.5 TGE, plate, fill 47190
no.6 TGE, octagonal plate with central Dutch motif, fill 47190 (Plate 10.14)
no.7 TGE, octagonal plate with central Dutch motif, fill 47190
no.8 TGE, bowl rim, fill 47190
no.9 TGE, bowl rim, fill 47190
no.10 TGE, bowl base, fill 47190
no.11 TGE, plain porringer rim and handle, fill 47190
no.12 TGE, decorated porringer rim and handle, fill 47190
no.13 North Italian Marbled slipware, bowl profile, fill 47190
no.14 IGBW, tyg profile, fill 47190
no.15 Westerwald stoneware, decorated mug rim and handle, fill 47190
no.16 TGE, eggcup/eyebath, fill 47190
no.17 TGE, small drug jar rim and body, fill 47190

Fig.10.37 on CD: Demolished gatehouse (G48/2)
no.1 GRE, dripping pan base with thumbed lip, layer 40923

Fig.10.38: Infilling of barbican ditch, Phase 7a, Trial Hole 1 (G9/41)
no.1 IGBW, tankard base, fill 92768
no.2 Frechen stoneware, bartmann flask rim and handle with applied facemask, fill 92768
no.3 Westerwald stoneware, drinking vessel body sherd decorated with applied medallion with text, fill 92770
no.4 Raeren-Aachen stoneware, decorated body sherd with applied medallion of profile of woman's head, probably from a jug, fill 92768
no.5 TGE, mug base, fill 92776
no.6 Grimston Glazed ware/miniature jug base, fill 92777
no.7 GRE dish/plate, fill 92776
no.8 Metropolitan slipware bowl, fill 92766

Fig.10.39: Infilling of barbican ditch, Phase 7a, Trial Hole 1 (G9/41)
no.1 GRE, deep bowl profile, fill 92741
no.2 GRE, deep bowl rim, fill 92741
no.3 GRE, rim from a small handled jar/bowl, fill 92741
no.4 GRE, small dish rim, fill 92741
no.5 GRE, platter or charger with 'pie-crust'/thumbed rim, fill 92741
no.6 GRE, rim from a small jar, fill 92741
no.7 GRE, bowl or jar with a frilled rim handle, fill 92741
no.8 GRE, large jar rim, pierced for suspension, fill 92741
no.9 GRE, base from a chafing dish, fill 92758
no.10 GRE jar, fill 92701
no.11 TGE, pedestal base of drug jar or ointment pot, fill 92761
no.12 TGE, body sherd with script, fill 92761
no.13 TGE, body sherd with date [16]61, fill 92765
no.14 TGE bowl base, fill 92761
no.15 TGE drug jar, decorated, fill 92761
no.16 IGBW tankard base, fill 92761
no.17 Westerwald stoneware jug with ribbed neck, fill 92761
no.18 Westerwald stoneware chamberpot with lion and medallion on applied pads, fill 92741
no.19 Cologne-Frechen stoneware jug with applied mask and medallion, fill 92758

Fig.10.40: Infilling of barbican ditch, Phase 7a, Trial Hole 1 (G9/41)
no.1 GRE storage jar, fill 92764
no.2 GRE butter jar/storage jar, fill 92764

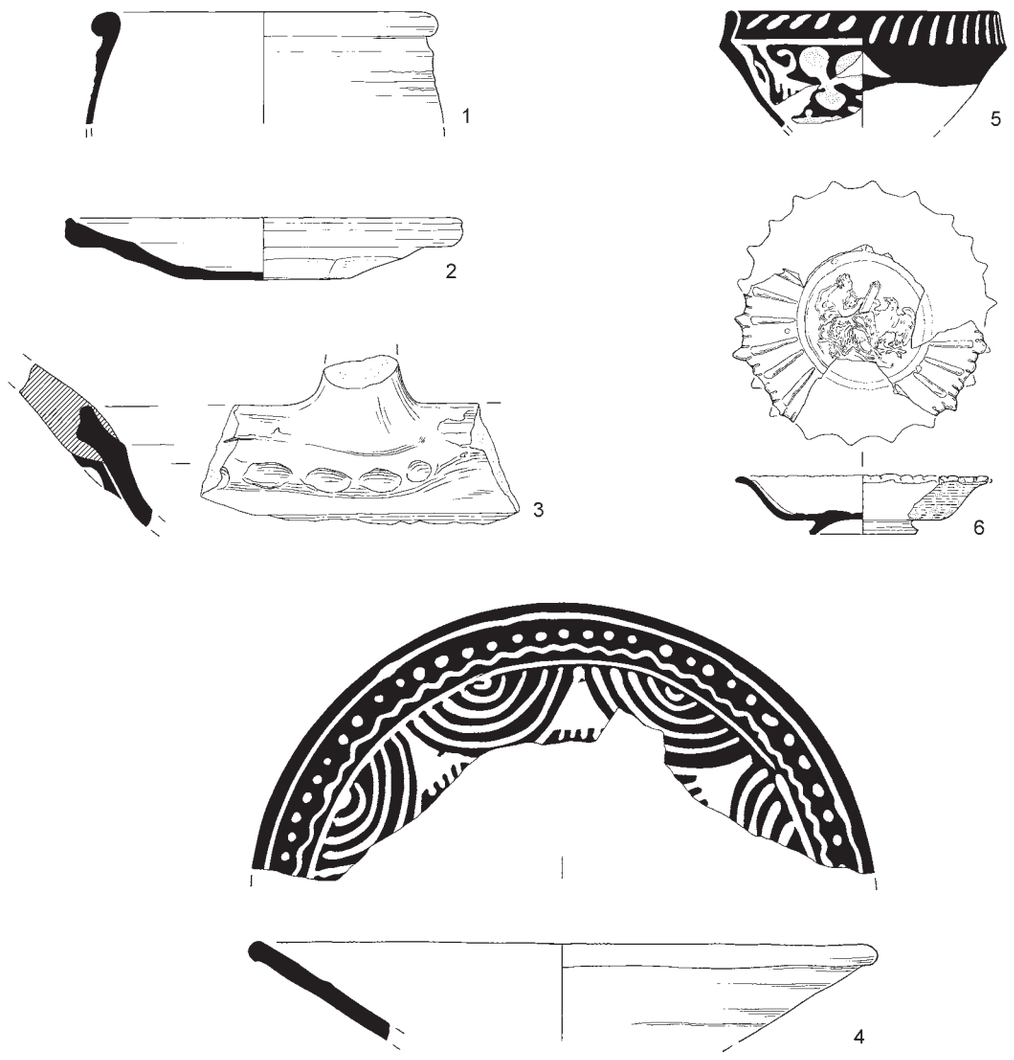


Figure 10.43 Pottery from pits, Open Area 46, (City Property g) (G1/93) . Scale 1:4

no.3 GRE butter jar/storage jar, fill 92764
no.4 GRE dish/plate, fill 92764
no.5 GRE bowl profile, fill 92764
no.6 ?GRE jar, fill 92764
no.7 TGE bowl fill 92764
no.8 TGE ?teacup, fill 92764
no.9 TGE plain drug jar, fill 92764
no.10 TGE plate, fill 92764
no.11 IGBW tankard, fill 92764
no.12 Surrey White ware bowl, fill 92764
no.13 Staffordshire slipware mug, fill 92764

Fig.10.41: Infilling of barbican ditch, Phase 7c, Trial Hole 1 (G9/41)
no.1 TGE, plate profile, fill 92750
no.2 TGE, plate profile, fill 92750

Fig.10.42: Infilling of barbican ditch, Phase 7c, Trial Hole 1 (G9/41)
no.1 Staffordshire slipware, posset pot profile, with applied decoration, fill 92739
no.2 IGBW, tyg base, fill 92739
no.3 IGBW, tyg base, fill 92739
no.4 GRE butter jar, fill 92739

Fig.10.43: Pits, Open Area 46, Property (g) (G1/93)
no.1 GRE, rim from a butter jar, Pit 10016, 10002
no.2 GRE, dish rim, Pit 10016, fill 10002
no.3 GRE, handle and rim from a dripping pan, Pit 10059, fill 10005
no.4 Metropolitan slipware, bow rim, Pit 10016, fill 10002
no.5 North Holland slipware, bowl rim, Pit 10212, fill 10100
no.6 Saintonge Polychrome ware, dish profile with St John the Evangelist motif on inner base, Pit 10059, fill 10005 (Plate 10.13)

Golden Ball Street (Period 6.2)

Fig.10.44 on CD: Pottery from pit *259* Open Area 51, Property 47 (GBS Group 36)
no.1 GRE storage jar, fill 277
no.2 GRE storage jar, fill 277

Glass Vessels
by John Shepherd
(Fig.10.45–10.50)

The assemblage of vessel glass from the Castle Mall excavations reveals a cross-section of the types in use in this country from the late middle ages to the 18th century. Unfortunately, however, individual types are represented by only a few fragments and the greater majority of these are very small making precise identifications difficult. As a result of the fact that numerous sherds of glass were Small Found together, a separate allocation of catalogue

numbers was made, both numbers being referenced below for clarity. The earliest drinking vessels from the site, dating to the 14th and 15th centuries, are detailed in Chapter 8.III.

The rim fragment with applied white trails (SF5236, no. 2), probably a spiral trail, comes from a vessel of similar date but is made in a metal which suggests that it is northern European in origin. A late 15th-century example came from Goldsmith Street, Exeter (Charleston 1984b, 265, no. G.30). Charleston suggests that this vessel was a lamp (Charleston 1984b, 258). A vessel of similar form also in a degraded metal but decorated with a spiral trail that has been broken in a mould into individual dots came from the Garlands store site (Site 215N Haslam 1993, 109, no 697). This type of decoration appears to have been introduced during the early 16th century (Charleston 1992, 134).

The identification of the tall drinking glass, or flute (SF6493, no. 5), is a little more certain. The fine form and quality of the glass indicates a continental origin, probably north Italy or the Netherlands. Similar biconical beakers and goblets, however, appear in large numbers in French assemblages of the 15th and 16th centuries. See, for example, the assemblage from the excavations in la cour Napoléon at the Louvre, Paris (Barrera 1989, 381–391, fig. 4, nos 65–70, 72–83 and 86–8), Orleans (Barrera 1987, pl. 16) and Tours (Motteau 1985, 30, nos 191–3). An example in colourless glass with a yellowish-grey tint comes from 9 Davey Place, Norwich (Site 54N, Haslam 1993, 104, no 672).

Nos 6–14 (SF7277, 6495, 5856, 5791, 6984, 7473, 7285, 7481 and 5791) come from tall beakers with pushed-in pedestal bases which can be regarded as type fossils of the end of the 16th and beginning of the 17th centuries (Charleston 1981, 88). Both plain and optic-blown examples are present here. They have been found on many sites in England including glassmaking sites such as Rosedale and Hutton (Charleston 1972, fig. 61, nos 23–6; fig. 64, nos 64–82; fig. 65, nos 83–4 and 87–92), Woodchester (Daniels 1950, pl.VII, nos 48–53) and many Wealden sites (Kenyon 1967 *passim*). Associated with these pedestalled base beakers are simple squat drinking vessels decorated with designs produced by optic-blowing (SF390, 160 and 6282, nos 15–17).

Of particular interest among this assemblage is a large number of beakers decorated with spiral threading that has been broken by being blown into a vertically ribbed mould (SF5841, 6276, 5856, 180 and 5951, nos 18–23) producing a decorative effect known as 'chequered-spiral'. Nos 18–19 (SF5841 and 6276) have thin trails whereas nos 20–23 (SF5856, 180 and 5951) have the thicker trails more normal to this type of vessel. The gilding on SF5841 (no. 18) is rare and may indicate that the vessel is an import from north Italy or, perhaps, south Germany. Chequered-spiral vessels are well-known among assemblages of the first half of the 17th century and appear also in the Gracechurch Street hoard of glass from the City of London (Oswald and Phillips 1949, figs XV–XVI). This hoard of glass represents the stock of a glass-seller lost during the Great Fire of 1666 and illustrates well the long life of vessels in the 17th century. It is probable that, as a result of the hiatus in glass production during the Civil War and Commonwealth, glasses from the first half of the century were still in demand. The London hoard also included large numbers of lion-mask and cigar stems such as SF5584, 78 and 6639 (nos 30–2) which are typical of the English glasshouses of the late 16th and early 17th century, the cigar stem in particular.

This is not the place to discuss in detail the history of glassmaking during this long period but it should be noted that it saw the rise of the English industry. The desire for good quality glassware in the Venetian style (*façon de Venise*) led to the establishment in the 16th century of many glasshouses throughout northern Europe capable of producing such material, arriving in England during the late 16th century. As suggested above, it is probable that the Civil War caused major disruptions to this industry (Charleston 1992, 135) and, even though a slight revival followed during the Restoration, the supply of finer quality glasssware during the third quarter of the 17th century came from Venice itself. The English craving for good quality clear glass led to experimentation to produce an indigenous metal. By June 1676 George Ravenscroft had achieved such a glass by adding ever increasing quantities of lead oxide to his experimental batches. By 1680, this glass contained about thirty per cent lead and, by 1690, it would appear that English lead glass had 'in essence achieved its characteristic quality — heavy, lustrous and resonant' (Charleston 1992, 135). Two lead glasses are represented here. The striated acorn-knopped stem (SF148, no. 34) probably comes from a glass with a wrythen bowl, the wrythen decoration terminating up the side of the bowl in a flammiform or spiked gadroon fringe such as SF365 (no.33) (Bickerton 1971, fig. 27). This form dates to *c*.AD 1700. A vessel with spiked gadroons came from the Marlowe site, Canterbury (J.D. Shepherd 1995, 1254, no. 548) and Orford Place/Red Lion St, Norwich (Site 94N, Haslam 1993, 104, no. 685). A stem similar to SF148 (no. 34) but without the spiral striations came from Broad St, Oxford (Leeds 1938, 161, fig. 17, I).

The small bottle bases (SF5596, 5626 and 5664, nos 48–50) are similar to the bases of two complete examples from London (St Swithin's House, Walbrook, dated *c*.AD 1500, see Charleston 1984a, 35–6, pl. 7d and an unpublished bottle from 28–34 Bishopsgate, BOP82 [241] <319> associated with early 17th-century material). A large number of such vessels have recently been discovered on a late 15th- and 16th-century glassmaking site at Wolseley, Staffordshire (J.D. Shepherd forthcoming b). It is probable that they were among the products of this glasshouse suggesting that the Weald area, where it is generally assumed that such vessels came from, may not have been the only source.

Nos 51–2 (SF6153 and 5786) come from the bases of thin-walled urinals used in the medical science of uroscopy. These vessels are well-known among assemblages dating from the late medieval period into the 17th century.

Nos 53–5 (SF5791 and 160) come from free-blown bulbous bottles which originate during the late medieval period and continue until the early 17th century. Both plain and decorated (with 'wrythen' mould-blown decoration) are known throughout this period (Charleston 1984a, 33–5).

Only one example of a case bottle (SF5951, no. 56) was recorded here. As their name suggests these vessels were specifically designed as containers which could be crated or stored in cases with others. They were in use especially during the late 16th and early 17th centuries

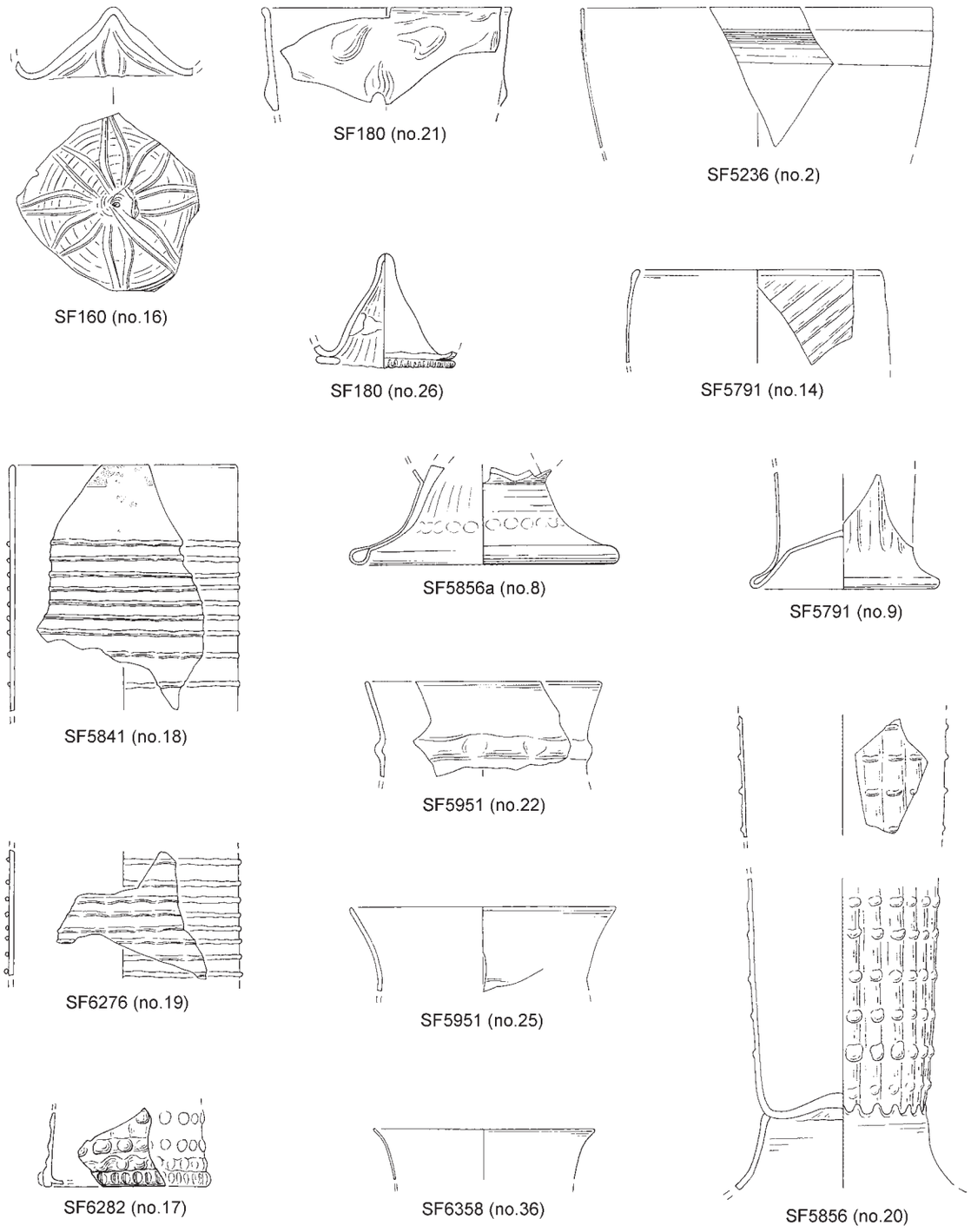


Figure 10.45 Glass beakers (SF160 (no.16), 180 (nos 21 & 26), 5236 (no.2), 5791 (nos 9 & 14), 5841 (no.18), 5856 (no.20), 5951 (nos 22 & 25), 6270 (no.19), 6282 (no.17), 6358 (no.36). Scale 1:2

as numerous assemblages throughout England show. For example, see Basing House (Charleston 1971, 70, nos 53–8 and 65) and Linacre Gardens, Canterbury (J.D. Shepherd 1990, 211, nos 251 and 273–83). A case bottle from Great St Thomas Apostle, City of London had the name of the owner, M SAMUELL DAVIS, and the date 1642 scratched onto the side (Unpublished, Museum of London, GTA89, [94] <3>).

Pharmaceutical phials (nos 57–83; see archive for SF listing) are a very common feature of 17th- and 18th-century assemblages being used for a variety of pharmaceutical and cosmetic preparations. More elaborate containers of this period, decorated with low relief mould-blown ribbing, are represented by just a few fragments (jars, nos 84–5 and bottles, nos 86–7).

Not surprisingly, the common 'English' wine bottle is very well represented here (nos 88–332; see archive for

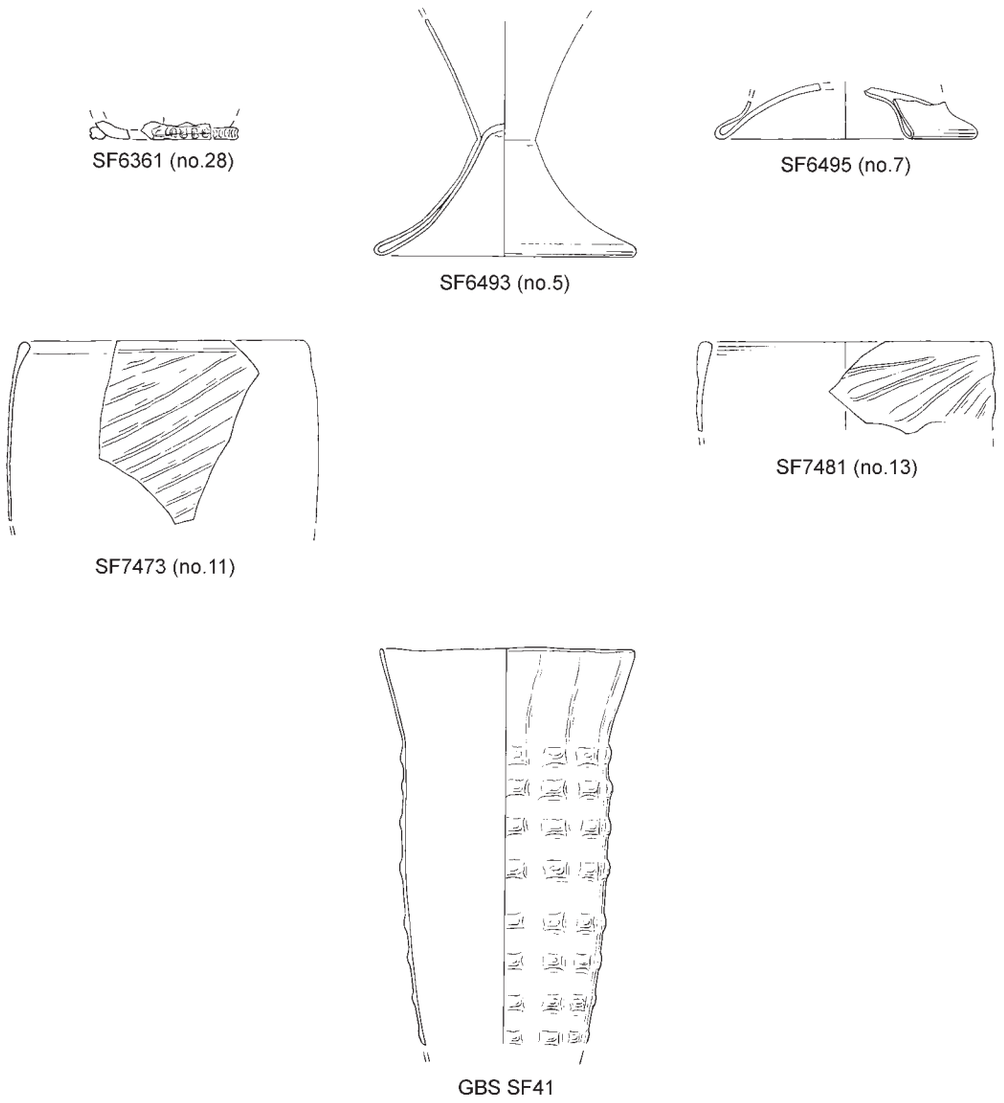


Figure 10.46 Glass beakers (SF6361 (no.28), 6493 (no.5), 6495 (no.7), 7473 (no.11), 7481 (no.13)) & GBS SF41). Scale 1:2

SF listing). These bottles first appear in large quantities during the third quarter of the 17th century having taken over the function of the less robust vessels represented by nos 53–4 (SF5791 and 160) above. They continue to be made throughout the 18th century. Towards the end of the century the bulbous form evolved into a cylindrical shape which, in the 19th century, was machine-made, heralding the mass-produced bottle industry which continues today. One of the Castle Mall vessels bears a seal which, unfortunately, cannot be closely identified (SF587, no. 101).

Addendum: Another mould blown beaker was subsequently discovered at Golden Ball Street (GBS SF41).

Conclusion

It is evident that the Castle Mall assemblage contains a wide cross-section of vessels dating from the late medieval period to the 18th century. However, the very fragmentary state of so many of the vessels described above, the largest surviving part of a vessel other than a pharmaceutical phial or bottle is the gilded chequered-spiral beaker (SF5841, no. 18), might suggest that much of this glassware was introduced onto the site sometime after it had been broken. The relatively few fragments for such a large area of excavation might also suggest that little glass was deposited as refuse by the occupants or that disposal of rubbish was being carried out in adjacent areas and/or removed from the site. It may be of interest to note here that at the site of St Gregory's in Canterbury, vessel glass and ceramics are conspicuously absent during the late medieval phase, a monastic phase, of the site although an adjacent site contains large dumps of late medieval rubbish, including glass and ceramics (J. Cotter, pers. com.).

The following catalogue of illustrated items shows individual fragments by SF no., annotated with the specialist catalogue number for ease of identification. More than one fragment may be assigned to a single SF no.

Beakers

SF160 **Beaker**. (no.16) Fragment from the base of a beaker. Mould-blown and slightly re-inflated; colourless glass with a green

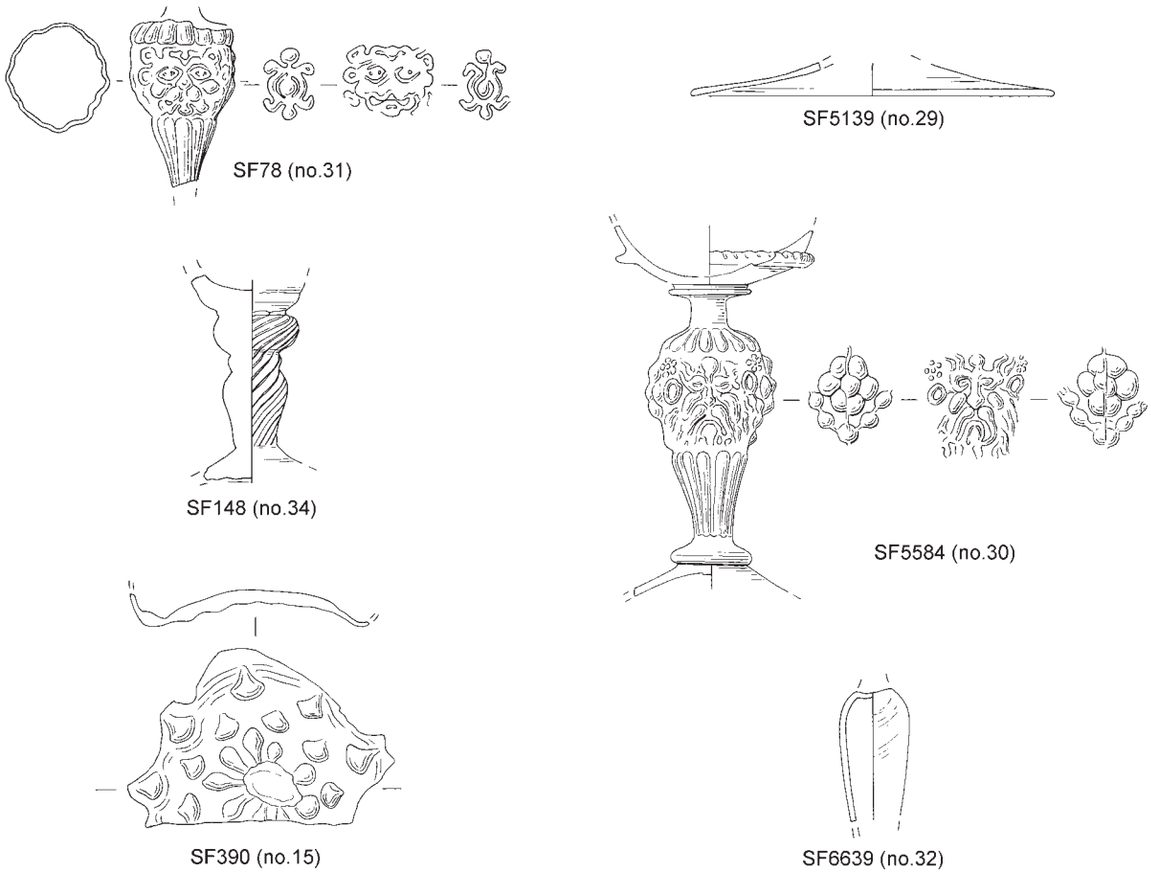


Figure 10.47 Glasses & goblets (SF78 (no.31), 148 (no.34), 390 (no.15), 5139 (no.29), 5584 (no.30), 6639 (no.32). Scale 1:2

tint. Push-in base with a high pointed kick, body decorated with an eight-leafed petal design which is the lower part of a pattern which, when inflated, would appear as low relief 'nipt diamond waies'. 16th or early 17th century.
92750, fill of barbican ditch, Period 6.2, G9/41

SF180 **Beakers**. (no.21) fragment from the rim and side of a chequered spiral beaker. Decorated with a large widely-spaced chequered pattern. Mould-blown in a vertically-ribbed optic mould and re-inflated; colourless glass with a grey tint. Applied pedestal base, foot-ring missing. 16th or early 17th century. (no. 26) the base of a narrow beaker or flute. Mould blown and re-inflated; colourless glass with a grey tint. Pushed-in base with a very high, pointed kick and an applied, rigareed base-ring. 16th or early 17th century.
92758, fill of barbican ditch 91295, Period 6.2, G9/41

SF5236 **Beaker**. (no.2) Fragment from the rim of a beaker. Free-blown; natural green glass with a surface decomposition layer. Upright fire-rounded rim; body of vessel decorated with many-times wound spiral trail of opaque white glass. 16th or early 17th century.
10678, fill of well 11082, Period 6.2, G1/88

SF5791 **Beakers**. (no.14) Fragment from the rim of a beaker. Mould-blown and reinflated; natural green glass. Rim fire-rounded and sloping slightly inwards. Body decorated with low relief spiral ribs. 16th or early 17th century. (no.9) Part of the base of a beaker. Mould-blown and reinflated; natural green glass. One-piece, pushed-in pedestal base with hollow tubular base-ring. 16th or early 17th century.
80187, fill of pit 80188, Period 6.1, G8/29

SF5841 **Beaker**. (no.18) Fragment from the base and part of the side of a beaker decorated with a thin chequered-spiral design. Mould-blown after the spiral thread was applied ; colourless glass with a grey tint. Upright, fire-rounded rim, decorated with a band of gold leaf immediately below the lip and the top of the chequered-spiral design suggesting that the decoration consisted of more than just the narrow band around the lip. 16th or early 17th century.
80187, fill of pit 80188, Period 6.1, G8/29

SF5856 **Beakers**. (no.8) Part of the base of a beaker. Mould-blown and reinflated; natural green glass. One piece pushed-in pedestal base with a hollow tubular base-ring. Body decorated with faint vertical ribs. 16th early 17th century. (no.20) The lower part of a chequered-spiral beaker. Decorated with a spiral trail on the paraison, mould-blown in a vertically-ribbed optic mould and re-inflated; colourless glass with a grey tint. Applied pedestal base, foot-ring missing. 16th or early 17th century.
80186, fill of pit 80188, Period 6.2, G8/29

SF5951 **Beakers**. (no.22) two fragments one from the rim and one from the body of a chequered-spiral beaker. Decorated with a spiral trail on the paraison, mould-blown in a vertically-ribbed optic mould and re-inflated; colourless glass with a grey tint. 16th or early 17th century. (no.25) fragment from the rim of a beaker. Free-blown; natural green glass. Rim fire-rounded and outsplayed. 16th or early 17th century.
80196, fill of pit 80257, Period 6.2, G8/29

SF6276 **Beaker**. (no.19) Fragment from the body of a colourless beaker decorated with a thin mould-blown broken spiral trail of the same metal. 16th or early 17th century.
80187, fill of pit 80188, Period 6.1, G8/29

SF6282 **Beaker**. (no.17) Fragment from the base of a beaker. Mould-blown and re-inflated; natural blue glass. Decorated with low relief oval bosses with an applied rigareed base ring. 16th or early 17th century.
91222, fill of pit 91226, Period 6.1, G9/45

SF6358 **Vessel**. (no.36) fragment of colourless glass from the body of a free-blown vessel of indeterminate form. Fragment from the rim of a beaker. Free-blown good quality colourless glass. Outsplayed, fire-rounded rim. Late 17 or 18th century.
91225, fill of pit 91226, Period 6.1, G9/45

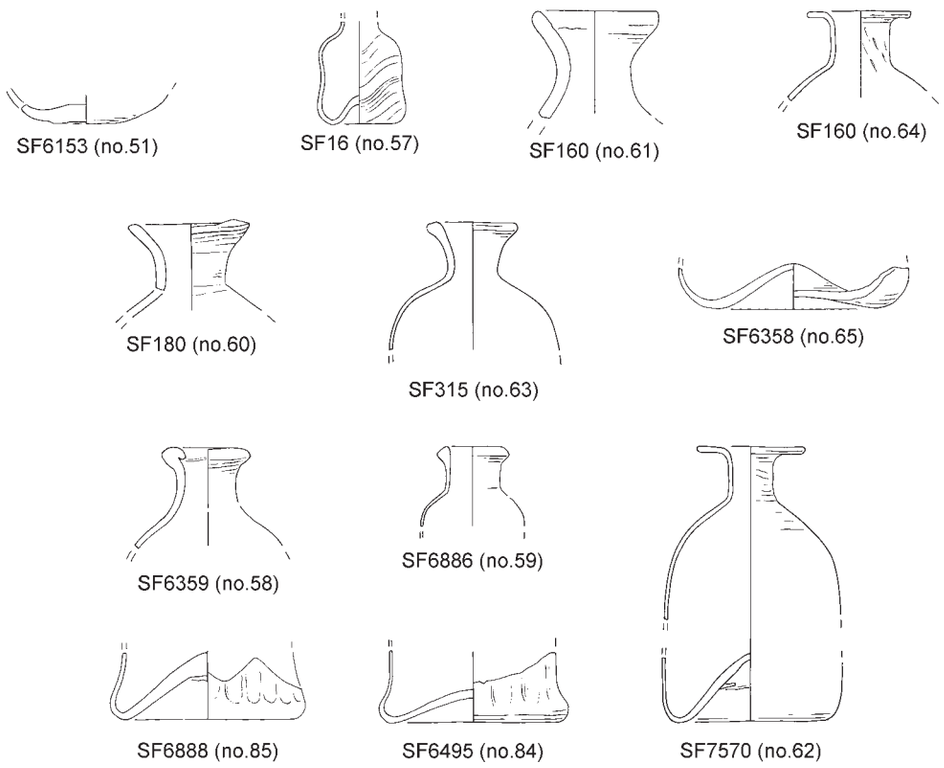


Figure 10.48 Glass urinal (SF6153, no.51). Glass phials (SF16 (no.57), 160 (nos 61 & 64), 180 (no.60), 315 (no.63), 6358 (no.65), 6359 (no.58), 6888 (no.59), 7570 (no.62). Glass jars/bottles (SF6495 (no.84) & 8666 (no.85). Scale 1:2

SF6361 **Beaker**. (no.28) Small fragment from the base of a beaker. Free-blown natural blue glass with an applied rigareed base ring. 16th or early 17th century.
91608, fill of barbican ditch, Period 6.1, G9/41

SF6493 **Beaker**. (no.5) The lower part of a tall beaker (flute). Free-blown; good quality colourless glass with a faint pink tint. One-piece, pushed-in pedestal base with a hollow tubular foot-ring. Late 15th to early 17th century.
92038, unstratified

SF6495 **Beaker**. (no.7) Fragment from the base of a beaker. Free-blown; natural green glass. Pushed-in domed base with a hollow tubular base-ring. 16th or early 17th century.
91601, fill of pit 91602, Period 6.2, G9/45

SF7473 **Beaker**. (no.11) Fragment from the rim of a beaker. Mould-blown and reinflated; natural green glass. Rim fire-rounded and sloping slightly inwards. Body decorated with low relief spiral ribs. 16th or early 17th century.
80186, fill of pit 80188, Period 6.2, G8/29

SF7481 **Beaker**. (no.13) Fragment from the rim of a beaker. Mould-blown and reinflated; natural green glass. Rim fire-rounded and sloping slightly inwards. Body decorated with low relief spiral ribs. 16th or early 17th century.
80187, fill of pit 80188, Period 6.1, G8/29

GBS SF41 **Beaker**. Incomplete mould blown glass beaker and several fragments.
145, fill of pit 146, Period 6.1, GBS Group 9

Glasses and Goblets

SF78 **Wine glass**. (no.31) A mould-blown lion-headed stem similar to SF5584, but with low relief decoration. Colourless glass with a green tint. Late 16th or early 17th century.
92766, fill of barbican ditch 91295, Period 6.2, G9/41

SF148 **Wine glass**. (no.34) The stem of a wine glass. Thick, colourless glass. The stem consists of an acorn knop on an inverted baluster. The whole has been serrated and twisted. Early 18th century.
92744, fill of ditch 92743, Period 6.2, G9/43

SF390 **Goblet**. (no.15). Colourless glass from the bowls of a goblet. The base of a small, wide beaker. Mould-blown and slightly reinflated; colourless glass. Decoration with high relief triangular bosses. 16th or early 17th century.
92768, fill of barbican ditch 91295, Period 6.2, G9/41

SF5139 **Goblet**. (no.29) Fragment from the base of a stemmed goblet. Free-blown applied foot; blut glass. Plain rim of foot. 16th or early 17th century.
10388, fill of pit 10068, Period 6.3, G1/91

SF5584 **Wine glass**. (no.30) Part of the bowl, the stem and foot of a wine glass. Colourless glass with a grey tint. Free-blown bucket-shaped bowl decorated with a rigareed trails at its angle; mould-blown lion-headed stem, with rosettes between the two heads, between two merises; plain foot. Rim of foot missing. Late 16th or early 17th century.
60000, unstratified

SF6639 **Wine glass**. (no.32) The upper part of a free-blown cigar-shaped stem. Colourless glass with a grey tint. Late 16th or early 17th century.
45021, fill of pit 45100, Period 6.1, G45/5

Urinals

SF6153 **Urinal**. (no.51) The convex base of a urinal. Free-blown; natural green glass with a deep surface decomposition layer. Ring pontil visible. 14th to early 17th century.
80106, fill of pit 80107, Period 6.1, G8/29

Phials

SF16 **Phial**. (no.57) Small, squat square-sectioned pharmaceutical phial. Free-blown; natural green glass. Rim missing. Late 16th or 17th century.
92750, fill of barbican ditch, Period 6.2, G9/41

SF160 **Phials** (no.61) The rim and neck of a large pharmaceutical phial. Free-blown; natural blue glass with a slight surface decomposition layer. Rim fire-rounded and out-splayed. 17th or early 18th century. (no.64) Fragment from the rim and neck of a pharmaceutical phial with a rounded shoulder. Free-blown; natural green glass. Rim fire-rounded and horizontally out-splayed. Base pushed in to form a pointed kick. 17th or early 18th century.
92750, fill of barbican ditch, Period 6.2, G9/41

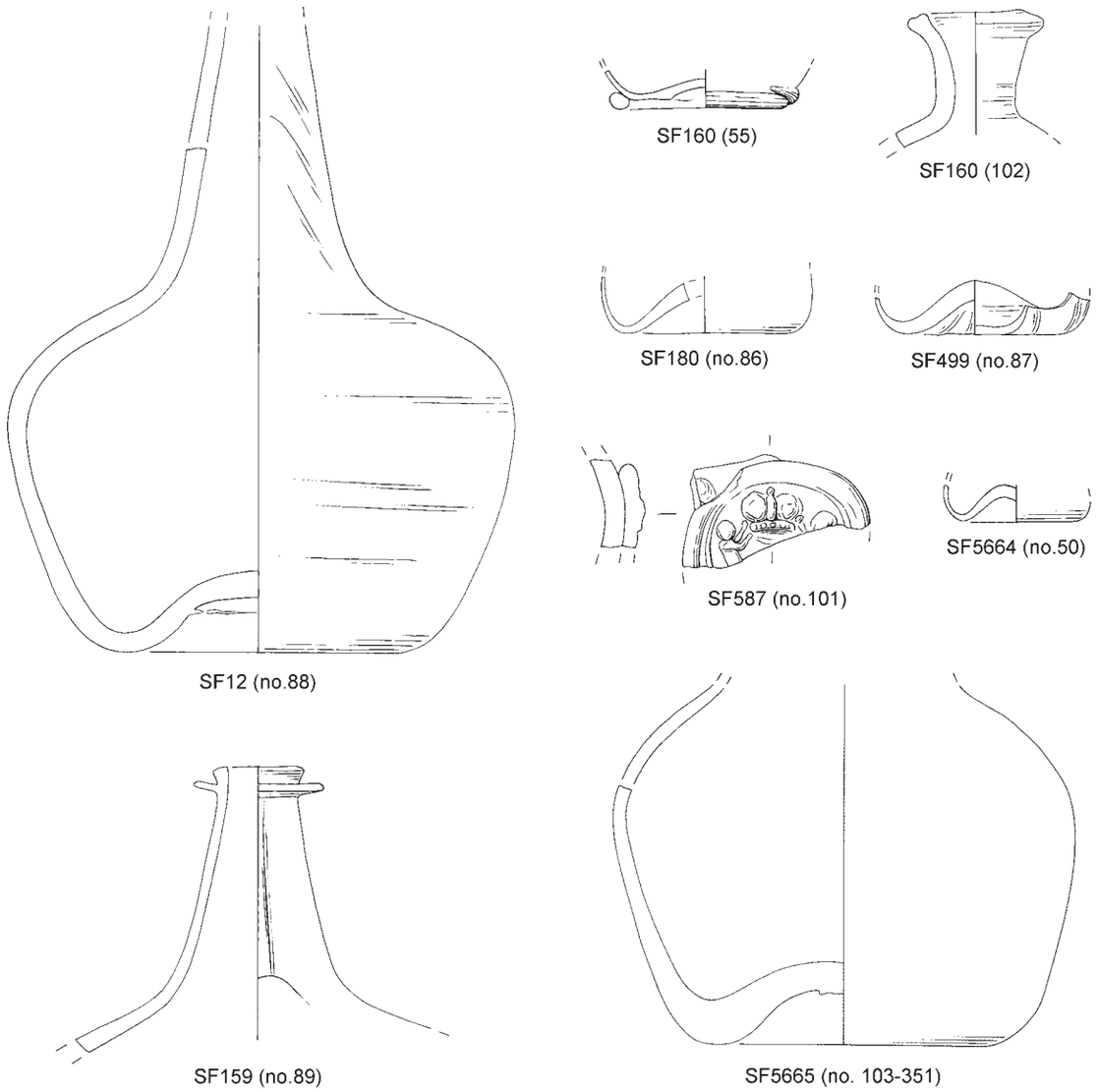


Figure 10.49 Glass bottles (SF12 (no.88), 159 (no.89), 160 (nos 55 & 102), 180 (no.86), 499 (no.87), 587 (no.101), 5664 (no.50) & 5665 (no.103–351)). Scale 1:2

SF180 **Phial**. (no.60). The rim and neck of a large pharmaceutical phial. Free-blown; natural blue glass with a slight surface decomposition layer. Rim fire-rounded and outsplayed. 17th or early 18th century.
92758, fill of barbican ditch 91295, Period 6.2, G9/41

SF315 **Phial**. (no.63) Fragment from the upper part of a pharmaceutical phial of cylindrical form with a rounded shoulder. Free-blown; natural green glass. Rim fire-rounded and horizontally outsplayed. 17th or early 18th century.
92774, fill of barbican ditch 91295, Period 6.2, G9/41

SF6358 **Phial**. (no.65). Fragment from the base of a pharmaceutical phial. Free-blown; thick natural green blue glass with a surface decomposition. Pushed-in base. 17th or 18th century.
91225, fill of pit 91226, Period 6.1, G9/45

SF6359 **Phial**. (no.58) The rim and neck of a pharmaceutical phial. Free-blown; thick olive green glass. Lip of rim folded slightly inwards. 17th century.
91383, fill of barbican ditch 91295, Period 6.2, G9/41

SF6886 **Phial**. (no.59) The rim and neck of a pharmaceutical phial. Free-blown; thick olive green glass. Lip of rim folded slightly inwards. 17th century.
48118, fill of quarry, Period 6.2, G48/12

SF7570 **Phial**. (no.62) A cylindrical pharmaceutical phial with rounded shoulder. Free-blown; natural green glass. Rim fire-rounded and horizontally outsplayed. Base pushed-in to form a pointed kick. 17th or early 18th century.
49273, unstratified

Jars

SF6495 Jar/bottle (no.84) the base of a jar or small bottle. Mould-blown and reinflated; natural green glass. Decorated with faint low relief vertical ribs. 17th or 18th century.
91601, fill of pit 91602, Period 6.2, G9/45

SF6888 **Jar**. (no.85) The base of a jar or small bottle. Mould-blown and reinflated; dark natural green glass. Decorated with faint low relief vertical ribs. 17th or 18th century.
48063, fill of pit 48107, Period 6.3, G48/10

Bottles

SF12 **Bottle**. (no.88) 'English' wine bottle, rim missing. Free-blown; olive-green coloured glass. Late 17th or 18th century.
9275, fill of barbican ditch, Period 6.2, G9/41

SF159 **Bottle**. (no.89–97) Rims and neck of 'English' wine bottles (1 of 9), associated with numerous fragments from their bodies and bases. Free-blown; thick olive green glass. Late 17th or 18th century.
92750, fill of barbican ditch, Period 6.2, G9/41

SF160 **Flask/bottle**. (no.55) The base of a flask or bottle. Free-blown; blue glass. Irregular applied base-ring. 16th or 17th century. Fragment from the base of a goblet. Free-blown; colourless glass with a flattened hollow tubular foot. Late 17th or early 18th century.
92750, fill of barbican ditch, Period 6.2, G9/41

SF160 **Bottle**. (no.102) The rim and neck of a bulbous-bodied bottle. Free-blown; thick olive green glass. Rim fire-rounded and folded over to form a triangular section. Late 17th or 18th century.
92750, fill of barbican ditch, Period 6.2, G9/41

SF180 **Bottle**. (no.86). Fragment from the base of a small flask or bottle. Mould-blown and slightly reinflated; colourless glass with a grey tint. Decorated with vertical relief ribs. 17th or 18th century.
92758, fill of barbican ditch 91295, Period 6.2, G9/41

SF499 **Bottle**. (no.87) Fragment from the base of a small flask or bottle. Mould-blown and slightly reinflated; colourless glass with a pink/grey tint. Decorated with vertical relief ribs. 17th or 18th century.
92751, fill of barbican ditch, Period 6.2, G9/41

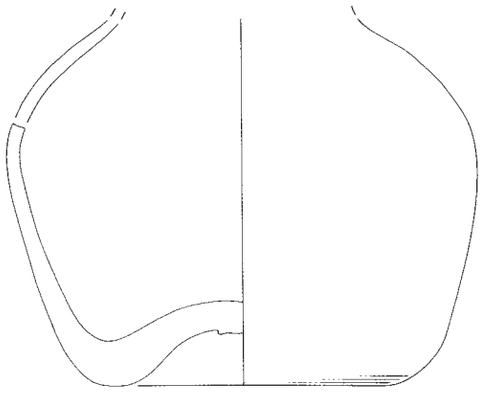
SF587 **Bottle seal**. (no.101) Fragment from a bottle seal. Thick olive green glass with slight surface decomposition. The extant design on the seal depicts two /cherubs supporting a baronets crown. Late 17th or 18th century.
40868, external dump, Period 6.2, G48/6

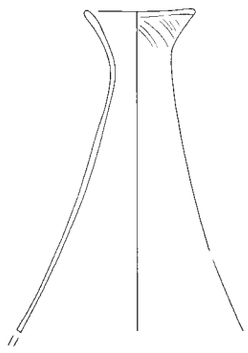
SF5664 **Bottle or phial**. (no.50) Free-blown; thick natural green glass with a deep surface decomposition layer. Pushed-in base with a low domed kick. 16th or early 17th century.
12343, makeup dump, Period 6.2, GT47/2

SF5665 **Bottle**. (no.103–351) Fragment from the body of an 'English' wine bottle. Late 17th or 18th century.
13013, fill of pit 10577 Period 6.1, G1/116

SF5685 **Wine bottle**. (no.98) Two examples of 'English' wine bottles (one illustrated). Rims and necks missing. Late 17th or 18th century.
13013, fill of pit 10577, Period 6.1, G1/116

SF5791 **Bottle**. (no.53) The upper part of a bottle. Free-blown; natural green glass. Conical neck with flared, fire-rounded rim. 16th or early 17th century. (no.54) The base of a bulbous-bodied flask or bottle. Free-blown; natural green glass. Pushed-in, low domed base with a broad, flattened hollow tubular base-ring. 16th or early 17th century.
80187, fill of pit 80188, Period 6.1, G8/29


SF5685 (no.98)


SF5791 (no.53)

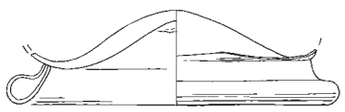

SF5791 (no.54)

Figure 10.50 Glass bottles (SF5685 (no.98–99), 5791 (nos 53–54)). Scale 1:2

Copper Alloy Vessels
by Alison Goodall

Several rim fragments from cast vessels were found at the Golden Ball Street site (GBS SF93 and SF243, not illustrated). The small diameter of the former fragments suggests that they came from a ewer rather than a cooking vessel. The diameter of the latter, together with the sooting on the outer surface, suggest a cooking vessel such as a skillet. A fragment from the leg of a skillet (GBS SF221, not illustrated) was also found. Two small unstratified fragments may also have come from vessels, but their form cannot be determined.

Iron Vessels
by Quita Mould
(Fig.10.51)

Four fragments from cast iron cauldrons (SF208, 374, 414 and 505, latter three not illustrated) were recovered from post-medieval dumping into the barbican ditch along with the fragmentary remains of sheet iron vessels. Numerous small fragments came from sheet vessels with simple rolled rims and, though estimation of the number of vessels was not possible, individual characteristics were identifiable on a minimum of six vessels. Vessel types recognised included a shallow, flat-bottomed vessel like a frying pan (SF462, not illustrated) with an approximate diameter of 240mm and a height of 50mm. A spouted vessel (SF359, not illustrated) with a small ring handle was probably a funnel and bucket fragments (SF51 and 130, not illustrated) were also found. Four sheet iron cylinders found may be simple sockets for wooden handles, spouts or nozzles from bellows.

SF208 **Cauldron**. Fragment of large cast iron cauldron with simple plain rim with slightly flaring mouth, rounded shoulder and angular handle with straight elbow. Ht: 150mm, min diam: 160mm.
92775, fill of barbican ditch 91295, Period 6.2, G9/41

Wooden Vessels
by Julia Huddle and Quita Mould

Part of the base of a turned wooden bowl (SF50, not illustrated) was recovered from fills of the barbican ditch, while the iron hoops from a wooden barrel (SF27, not illustrated) came from a feature encroaching above the ditch.

Pewter Vessels
by Julia Huddle
(Fig.10.51)
Two pewter handles were recovered from the excavation, both from the barbican ditch in Area 9 (although not assigned to a specific fill). One is from a porringer (SF101). These small dishes or bowls have a variety of ears or handles and this rather ornate form can be compared to two 17th-century porringer handles in the Museum of London's catalogue (Hornsby *et al* 1989, 78–9, nos 75 and 77). Similarly shaped handles can be seen on tin-glazed Dutch and Netherlands 17th-century porringers (Jennings 1981, 198–201, fig.89, nos 1413, 1415 and 1417) and from Castle Mall context *47190* (Lentowicz, above).

SF101 **Handle**. Handle from porringer, cast openwork trefoil top with opposed tear-shaped lobes enclosing oval plaque flanked by two circular discs.
91201, unstratified

Implements

Iron knives
by Quita Mould
(Fig.10.52)
A range of knives was recovered from post-medieval deposits, comprising the remains of scale-tang knives (x 9), whittle-tanged knives (x 5) and blade fragments (x 13). The majority were table knives, those with bone, antler or ivory handles are described separately below. Five of the knives had the blade separated from the handle by a bolster (*e.g.* SF209). Two long knives with substantial scale-tanged handles (SF5321 and 5815, latter not illustrated) were sufficiently large to have been used in butchery. A whittle-tanged knife from post-medieval dumping into the barbican ditch had a stamped mark on the blade (SF46). A second knife (SF84, not illustrated) had its blade broken in the same manner suggesting that they had been used for a similar function.

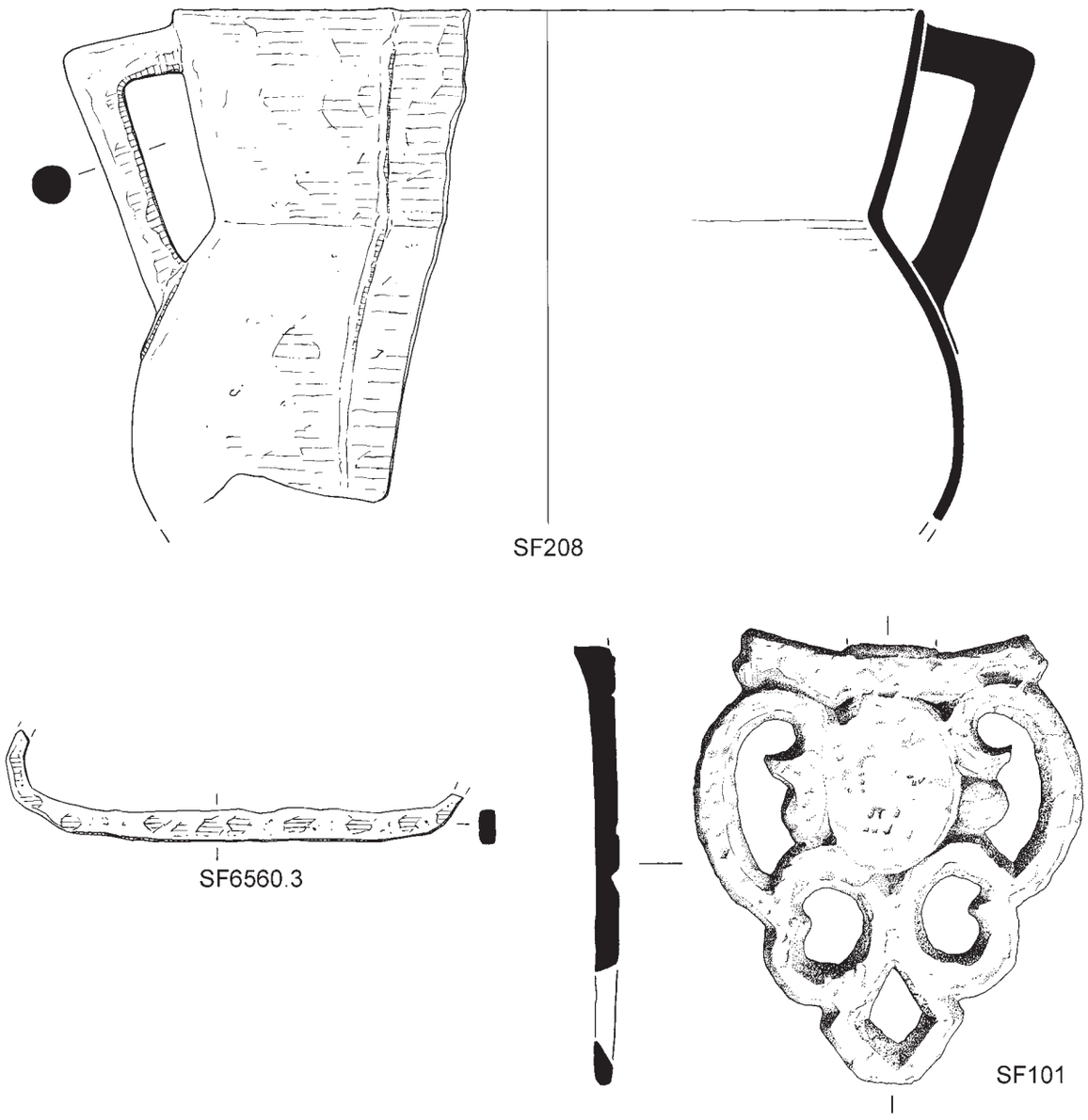


Figure 10.51 Iron cauldron (SF208); iron handle (SF6560.3); Scale 1:2. Pewter porringer handle (SF101), scale 1:1

The scales of knife SF5658 (not illustrated, 50083, Period 6.1, G5/52) are wooden, but proved too degraded to identify (SEM B808). The two rivets visible on the handle are iron. There is also a shoulder plate with traces of green corrosion products, that analysis showed to be brass.

Catalogue entries for SF6148, 5046 and 7614 are given under 'antler handles ' and 'ivory handles' below.

SF46 **Knife** with tang on line with the back, distorted blade has stamped maker's mark comprising an anchor and the letters IG or SJ . L: 107mm, w: 32mm.
92758, fill of barbican ditch 91295, Period 6.2, G9/41

SF209 **Knife** with broken blade with straight back and edge, round-sectioned bolster and centrally placed tang. L: 84mm, w; 13mm.
92775, fill of barbican ditch 91295, Period 6.2, G9/41

SF5321 **Knife** with scale tang with straight back and edge, back curving downward to meet edge at blunt tip, scale tang broken. L; 174mm, W: 22mm.
10747, fill of pit 10766, Period 6.1, G1/98

Bone knife handles
by Julia Huddle
(Fig.10.53)
One incomplete knife and three probable bone knife handles were recovered from the 16th–17th-century fills of the barbican ditch. Three are bone whittle-tang handles, in which part or all of the handle has been hollowed out to receive an iron tang. Only one handle retains an iron tang although they are all likely to be knife handles. The decoration of two of these handles (SF107 and SF437) is so similar as to suggest that they were probably carved by the same person. Both have separate bone plugs at the top of the handle. A similar bone handle with separate bone plug and carved with deeply-incised decoration was recovered from Winchester and is dated to the ?16th/17th century (Hinton 1990, 868, fig. 261 no. 2916).

The other knife recovered from the ditch fills at Castle Mall is a scale tang knife (SF6251). Scale tang knives with flat iron tangs attached by rivets to two scales forming the handles, were introduced in the 13th or 14th century (I.H. Goodall 1993b, 128). This could be residual here although, as with some whittle-tang knives, scale-tang knives are likely to have continued in use into the post-medieval period (I.H. Goodall 1993b, 128).

One other decorated knife scale (SF1036) came from deposits overlying the infilled barbican well which appeared to have an association with the manufacture of knife handles (see below). A plain bone knife scale fragment (SF6119, not illustrated), is possibly medieval although it was found in a ?15th–19th-century pit. SF5800 (not illustrated) came from the same post-medieval pit as a medieval handle in the form of a bird (see Chapter 7.III). It may be an implement handle for a tanged tool, probably a knife, although there is no iron staining either end. There are many small scratches and it has a slightly polished surface indicative of use rather than an unfinished item. The transverse hole at the end may be for suspension.

SF107 Whittle-tang **knife handle** with iron tang. Handle tapering of roughly circular section. Decorated with two deeply incised spiral lines forming two bands, one filled with cross-hatching, the other with parallel lines. The top of the handle has a separate bone plug, blade missing. L: 65mm (complete). Probably sheep metatarsus.
92756, fill of barbican ditch 91295, Period 6.2, G9/41

SF437 Whittle-tang ?knife **handle**, broken at hilt. The handle is hollow, tapering of roughly circular section and is decorated with two deeply incised spiral lines forming two bands. One band filled with spiral hatching, the other with parallel lines. The top of the handle has a separate bone plug. L: 74mm (?complete). Probably sheep metatarsus.
92758, fill of barbican ditch 91295, Period 6.2, G9/41

SF1036 Decorated **knife scale** with 3 rivet holes; front slightly convex in section and decorated with incised wavy-line and dots. L: 81mm.
50077, makeup dump, Period 6.1, G5/52

SF6251 Incomplete **scale-tang knife** with an incomplete bone handle comprising of one broken bone scale, four copper alloy tubular rivets and end-cap. Incomplete iron blade.
91450, fill of barbican ditch 91295, Period 6.1, G9/41

Antler knife handles
by Julia Huddle
(Fig.10.54)
One antler-handled knife (SF1095, unstratified) is post-medieval, since knives with bolsters are found from

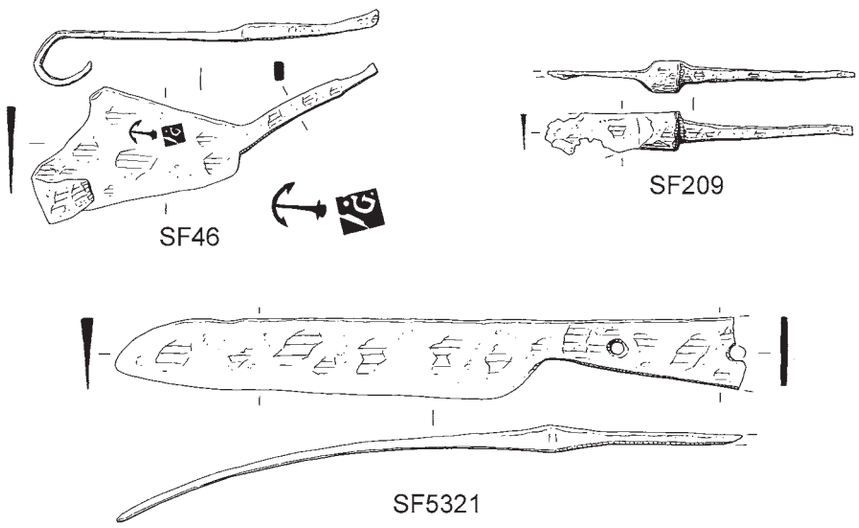


Figure 10.52 Iron knives (SF46, 209 & 5321). Scale 1:2

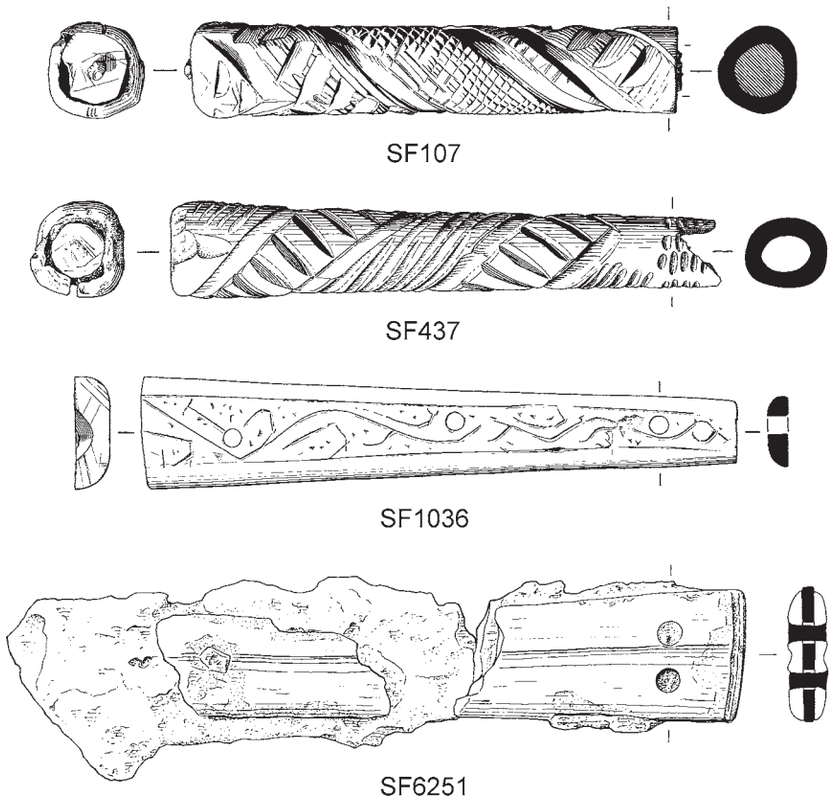


Figure 10.53 Bone knife handles (SF107, 437, 1036 & 6251). Scale 1:1

around the second half of the 16th century and were popular by the 17th century (Hayward 1957, 4). SF5046 is from a 17th/(18th) century deposit and is almost identical to one from Denny Abbey (Christy and Coad 1980, 261, fig. 56, no. 2) and an early 16th-century knife from London (Victoria and Albert Museum 1979, 4, illustration 1 no. 11). SF6767 from fills of the barbican ditch (Area 47) is a possible implement handle. There is no iron staining at the base to suggest the socket contained an iron tang, although it may have been plugged here (for example with wood), in order to hold an iron tang firmly in place. Part of an antler-handled knife scraper (SF5656) was also found.

SF1095 Incomplete scale tang **knife** with plain bolster and handle with antler scales and three iron rivets; incomplete blade. L: 68mm.
90000, unstratified

SF5046 **Knife** with wide blade fragment with scale tang held by three solid iron rivets; handle with antler scales, decorated with linear incised panels with ring-and-dot motif between, appears to have a possible bolster. L: 109mm, handle length = 60mm, w: 21mm.
10100, fill of pit 10212, Period 6.2, G1/93

SF5649 Incomplete **scale** with three rivet holes (one on broken end), two iron rivets. Surface of the handle is gutted. Probable knife scale. Handle length = 79mm (incomplete). Fallow deer antler.
50077, makeup dump, Period 6.1, G5/52

SF6767 Whittle-tang **handle** with plugged top. The upper end is decorated with grooves and mouldings; around the lower half are six cut-out lens shaped depressions. The open end is partially fractured. L: 56mm.
47376, fill of barbican ditch 47667, Period 6.3, G47/25

SF5656 Two incomplete sub-triangular **strips**, riveted through similar shaped iron plate, also incomplete. Part of an antler handled ?knife scraper. Length of piece (incomplete) = 79mm. Fallow deer antler.
50083, makeup dump, Period 6.1, G5/52

Ivory knife handles
by Ian Riddler
(Fig.10.55)

The site produced a series of nine ivory whittle tang handles, six of which are undecorated and enhance earlier discoveries from Norwich and other East Anglian sites (Margeson 1993, 123 and fig.87.768 and 770; Crummy 1987, 73–6; Riddler forthcoming a). They are generally of oval or circular section and the pattern formed by their dentine tubules indicates that they were shaped from longitudinal sections of elephant ivory. Most are probably knife handles, although several are now detached from their original iron counterparts. As with the combs described above, handles of ivory are comparatively rare before the post-medieval period. In general, ivory was restricted to whittle tang knives whilst scale tang knife handles were manufactured either from bone or antler.

The undecorated handles include two short, delicate examples for small implements (SF5817 and 6339, neither illustrated), as well as a longer series, some of which are lightly shaped (SF5848, 6210 and 5002, none

illustrated). An ivory handle with a bulbous terminal ending in a small knop (SF6214) can be compared with an example from Exeter which stems from a context of *c*.1660 (Allan 1984, 351 and fig.197.33).

Three handles are more elaborately modelled. The earliest example is an ornate ivory pistol-grip handle of heptagonal section with circular indentations within its expanded terminal which carry small silver rosettes (SF6902; see Chapter 9.III). Two short handles are accompanied by bolsters and should belong, therefore, to the 17th century or later (Margeson 1993, 130). An elegant handle with modelled barley-twist decoration has been shaped from a piece of ivory of rounded rectangular section (SF6148). A piece of ivory of similar dimensions also formed the raw material for a small handle with a sinuous, S-shaped finial (SF7614).

SF6148 **Whittle tang handle**. Broken round-sectioned bolster with central tang fitting into short round-ended ivory handle with spiral twisting. L: 66mm.
80196, fill of pit 80257, Period 6.2, G8/29

SF6214 A fragmentary **whittle tang handle** of oval section with a rounded bulge towards the end of the grip, leading to a pointed knop.
91201, unstratified

SF7614 **Knife with whittle tang handle** of rounded rectangular section with a sinuous s-shaped finial beyond a trapezoidal bolster. Broken blade with straight back and edge and long bolster. L: 103mm, w: 13mm.
10100, fill of pit 10212, Period 6.2, G1/93

Iron handles
by Quita Mould
(Fig.10.51)
Three strap handles from domestic items were found in post-medieval deposits, with another found unstratified. The latter was a furniture handle (SF6560.03).

SF6560.03 Furniture **handle**. L: 134mm.
22222, unstratified from barbican ditch

Copper alloy handles
by Alison Goodall
(Fig.10.55)
SF7561 appears to be the handle of an iron implement, possibly a small knife. It is very slender and decorated with incised fern-leaf motifs.

SF7561 **Handle**. Cast object consisting of a long tapering rectangular plate with circular ring terminal with projecting pin. Each slightly dished face is decorated with three engraved leaf motifs, made up of double-line 'stem' with obliquely hatched 'branches' on either side. The pin which projects from the ring terminal is very slightly burred-over at the end, and may originally have held a decorative collar. The other end is split, with traces of iron held by an iron rivet. It may be the handle of an iron object, possibly a fruit knife or sewing implement.
40345, fill of barbican ditch 40364, Period 6.3, G2/37

Bone and ivory scoops
by Julia Huddle and Ian Riddler
(Fig.10.56)
Two bone scoops or apple-corers (SF117 and 5682, latter not illustrated) were recovered from post-medieval deposits. These tools, produced easily from sheep metapodials, are well known in post-medieval deposits from Norwich and elsewhere and Sue Margeson discusses their various possible functions (Margeson 1993, 120). One other unstratified scoop is made of ivory (SF5753, not illustrated). This has no surviving handle, but there is an internal screw-thread at one end which would have secured a wooden handle.

SF117 **Scoop**; the proximal end has been cut off and nearly all the length of the shaft exposed by removing the anterior wall. The shaft is polished smooth and the end of the scoop is rounded off to produce a cutting edge. L: 133mm. Sheep distal metatarsal (fused) left.
92766, fill of barbican ditch 91295, Period 6.2, G9/41

Bone spoon
by Julia Huddle
(Fig.10.56)
The shape of this small bone spoon (SF1039), in particular the twisted handle, reflects the post-medieval metal prototypes; see for example two 17th-century spoons of which the lower portions of the stems are twisted (Emery 1976, 128, fig. 78). The Castle Mall spoon was found residually in modern deposits and is similar to a late 18th- or 19th-century spoon from Leafield, Oxfordshire (MacGregor 1985, 181, fig. 98, s).

SF1039 **Spoon** with oval-shaped shallow bowl, stem expands to the top with small twists towards the bowl. Bone unidentifiable. L: 80mm.
60012, fill of modern trench 60015, Period 7.2, G6/45

Wooden spoon and brush
by Julia Huddle and Maisie Taylor
(Fig.10.56)
Only three wooden artefacts were recovered from the entire excavation. As with other sites in Norwich, such artefacts rarely survive the soil conditions and preserved items such as those found at Castle Mall cannot be a true reflection of the original assemblage from any period. All of the Castle Mall objects came from post-medieval contexts. A bowl (see 'Wooden Vessels') and a spoon (SF1097) came from fills of the barbican ditch. A brush (SF5940) came from pit *90402*, (Period 6.2, G9/114).

Examples of medieval and post-medieval wooden spoons are very rare in this country, although spoons made of wood are likely to have been the main cooking and eating implement after the knife (Morris and Margeson 1993, 136). A similar wooden spoon was recovered from a 14th/mid 15th-century context on Bishopsgate (Margeson, 1993, 136 fig. 102, no. 928). The Castle Mall example may have been used by someone left-handed.

Although now very fragile, the wooden brush (SF5940, not illustrated) retains the remains of ?bristles and copper alloy wiring. It was carved from a radially split plank of ?oak (*quercus sp*.) with a thin 'plate' of oak on the back to, perhaps, hold the bristles in place or protect the hands of the user. No parallels of the period have been traced, although in shape and size it is similar to contemporary scrubbing brushes. MacGregor discusses a variety of

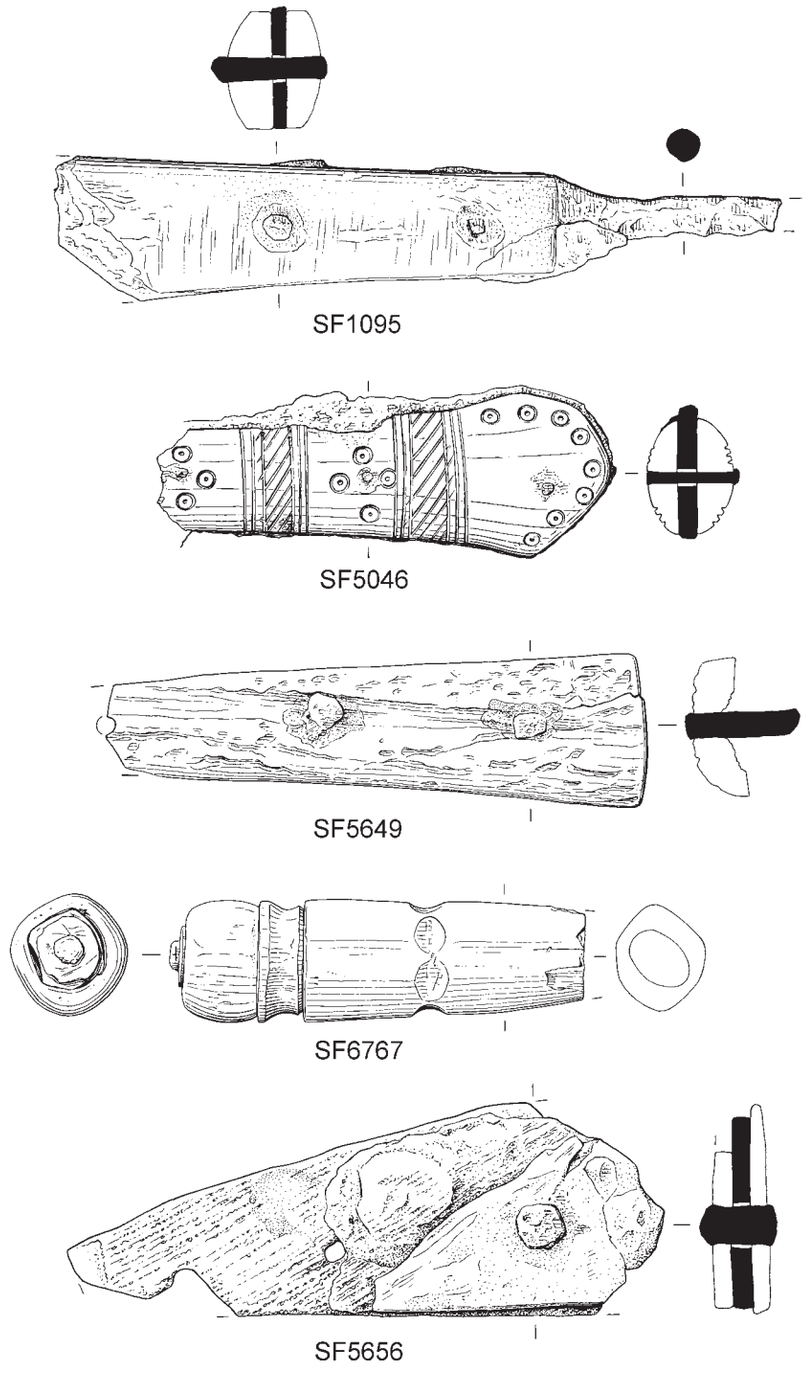


Figure 10.54 Antler knife handles (SF1095, 5046, 5649, 6767 & 5656). Scale 1:1

bone brushes from the 17th century onwards, several of which are stained green from copper salts, indicating that copper alloy wire was used to secure the tufts of bristles into position (MacGregor 1985, 183).

SF1097 **Spoon** with dished, round oval bowl; broken on all edges and handle broken at the top. Carved from a radially split plank of oak (*Quercus* sp.). The bowl has sheared from the handle along a medullary ray. The damage to the bowl is clean and sharp but aligned across the grain. This would suggest that either the bowl was cut away by a very sharp implement, perhaps in a way connected with function, or that the bowl has worn in use (by someone who was strongly left-handed).
91527, fill of barbican ditch 91295, Period 6.2, G9/41

Iron colander or skimmer
by Quita Mould
(Fig.10.56)
Fragments of a colander or large skimmer (SF865) were recovered from fills of the barbican ditch.

SF865 **Implement**. Fragments of colander or large skimmer.
92756, fill of barbican ditch 91295, Period 6.2, G9/41

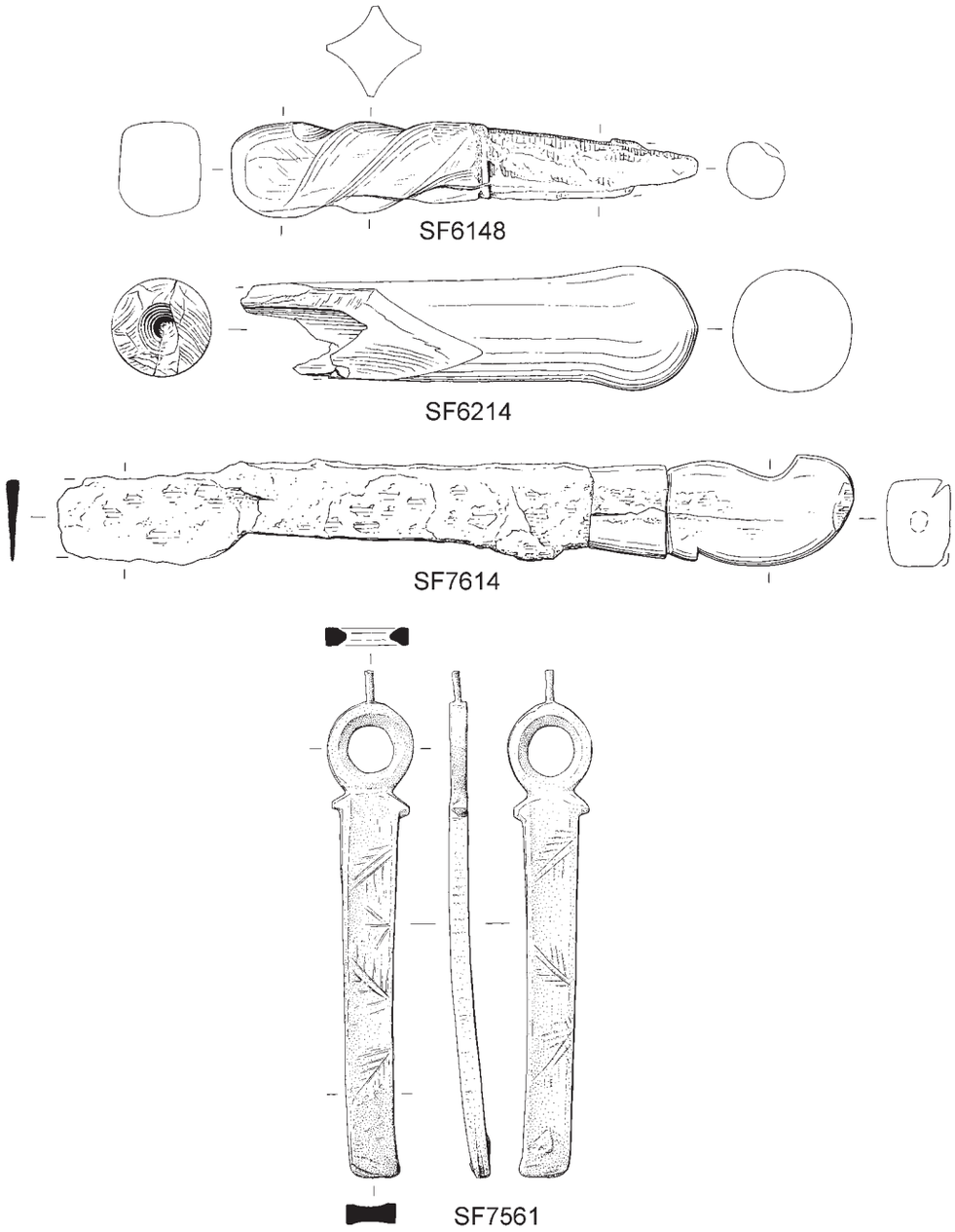


Figure 10.55 Ivory knife handles (SF6148, 6214 & 7614). Copper alloy handle (SF7561). Scale 1:1

Hearth Equipment
by Quita Mould
(Fig.10.56)

Iron pot hooks and hangers
Although no unequivocal items of hearth equipment were found, a square sectioned bar (SF305, not illustrated) from dumps into the barbican ditch may be broken from a pot hook or spit bar. An unusual object recovered from the same deposit may have been part of a pot hanging mechanism (SF214). It is reminiscent of a chain fitting dating to the late 15th–early 16th century found in the north-west range of Wolvesey Palace, Winchester (Goodall in Biddle 1990, fig.246, no. 2590). A spirally-twisted stem (SF9, not illustrated) is likely to be the broken handle from a tool associated with the hearth.

SF214 **Fitting**. Circular seating or collar connected by four rods to a pair of pierced plates with broken hooks, possibly a suspension loop. L: 135mm, diam: 42mm.
92766, fill of barbican ditch 91295, Period 6.2, G9/41

Book Fittings

Copper alloy book fittings
by Alison Goodall
(Fig.10.56)
An ornamental hinge (SF298) may have been used on a book binding or on a small casket. A decorative fitting (SF5530.01) is part of a book clasp of early post-medieval type, which would have been riveted onto the closing strap of a book cover (*cf.* Margeson 1993, fig.40).

A book clasp from excavations at Golden Ball Street (GBS SF211) is decorated with the typical concentric ring motif and incised lines seen on other clasps, such as from Exeter (A.R. Goodall 1984, 341, M142–3). The Golden Ball Street example forms the opposite part of the clasp from the hooked end, more commonly identified. Book clasps of this type probably date from the early post-medieval period. A small plate (GBS SF13, not illustrated) is probably also from a book binding.

SF298 **Hinge**. Openwork hinge-plate, with ends folded over to take iron pin. Three trefoil openings, with one attachment hole by each.
40864, fill of pit 48224, Period 6.3, G48/10

SF5530.01 Part of a **book clasp**. Hook at one end, other end incomplete. Decorated with stamped concentric circles. Adhesions on reverse side with ferrous staining, possibly from an iron rivet.
11363, fill of pit 11367, Period 6.1, G1/125

GBS SF211 **Book clasp** with flaring end. The other end is folded over a rod or pivot. Decoration of concentric rings round a perforation and incised linear decoration nearer the head. Two pins for attachment.
275, cellared building, Period 7, G28

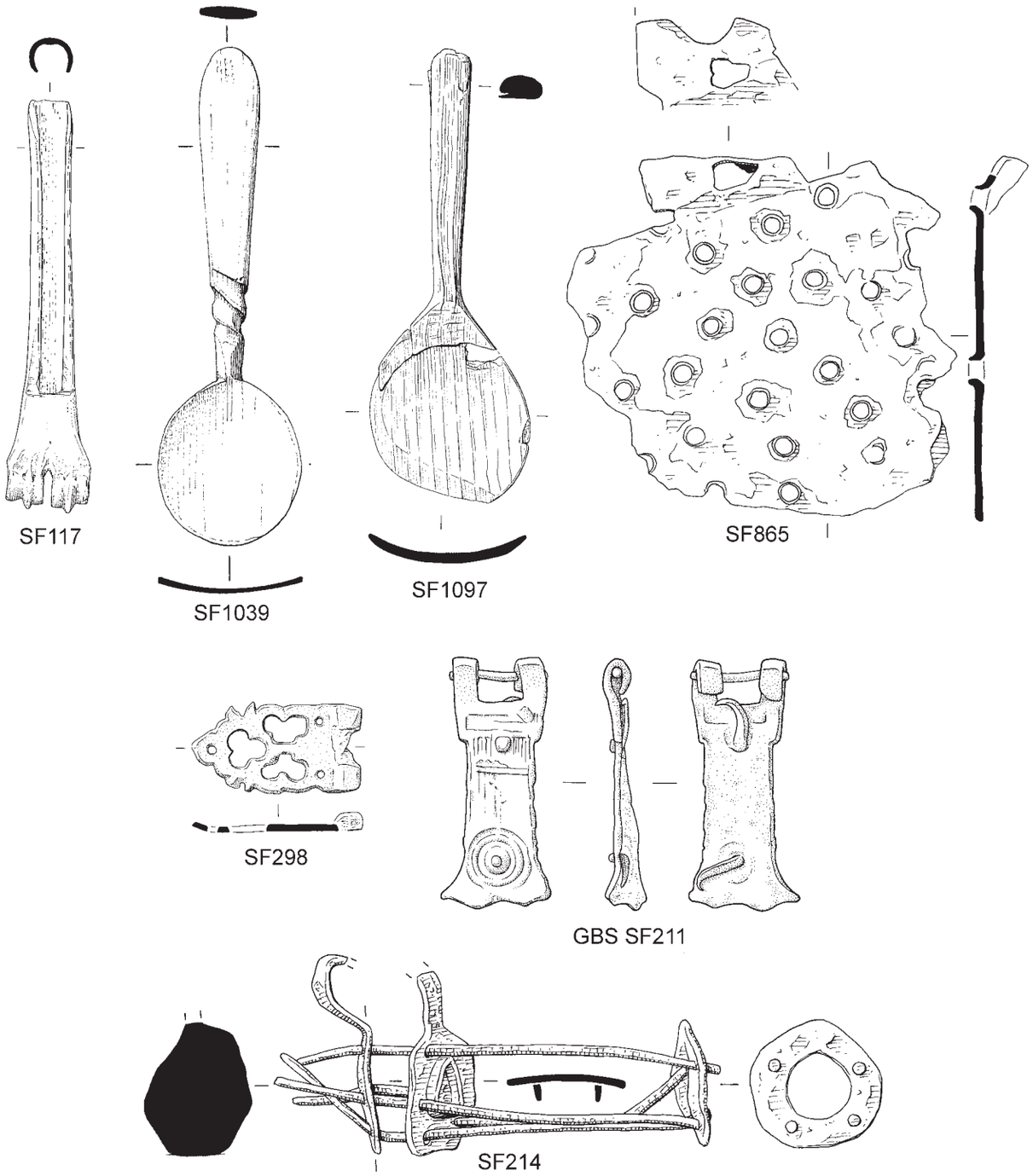


Figure 10.56 Bone scoop (SF117); bone spoon (SF1039); wooden spoon (SF1097); iron colander or skimmer (SF865); copper alloy ?book hinge (SF298); copper alloy book clasps (SF5530.01; GBS SF211); iron pot hanger (SF214). Scale 1:1, ironwork at 1:2

Miscellaneous Equipment

Antler object
by Julia Huddle
An incomplete turned antler conical object (SF272, not illustrated; barbican ditch fill *40868*, G48/6, Period 6.2) with a screw thread at its wider end may have been used as a finial or stopper.

Copper alloy rings
by Alison Goodall
Rings of various diameters were found in post-medieval and unstratified contexts at the Golden Ball Street site (not illustrated). While it is possible that some of them may have been used as simple annular buckles, they could have had a great many functional uses, such as suspension rings.

Buildings

Structural Ironwork
by Quita Mould
A limited range of structural ironwork deriving from the demolition of buildings was recovered from post-medieval deposits. Numerically the structural ironwork was dominated by the large quantity of timber nails and their broken shanks (x 629). Other structural items included wallhooks (SF641, 5739.1, not illustrated), a holdfast (SF6025.1, not illustrated) and two clench bolts.

Door and Window Fittings

Iron door knocker
by Quita Mould
(Fig.10.57)
A door knocker (SF29) comparable with a coffin handle from the graveyard of St. Benedict's Church, Norwich thought to be of 18th- or 19th-century date (Goodall in Margeson 1993 fig. 46,521), was found associated with 17th-century pottery in post-medieval dumping into the barbican ditch.

SF29 **Door knocker** with large 'bag-shaped' handle with central collar and angular neck which articulates with a split spiked loop by which it was attached to the timber. Non-ferrous metal coated L 135mm max w 110mm.
92741, fill of barbican ditch 91295, Period 6.2, G9/41

Copper alloy door knob
by Alison Goodall
A bun-shaped object, found unstratified at the Golden Ball Street site, is probably a brass door knob (SF29, not illustrated).

Iron hinges
by Quita Mould
(Fig.10.57)
Various hinges were found. A ring-headed hinge strap (SF70, not illustrated) and two split-spiked loops (SF5266.02, not illustrated) came from simple hinges used on furniture such as chest lids. A pinned hinge strap (SF6431) had been used on an item of furniture or a door. It occurred residually in the fill of a burial pit at the top of the Castle Mound. Strap hinges articulating with separate hinge pivots were used to hang shutters, doors and gates. Eight pivots were found in post-medieval deposits ranging in size from 38–120mm in length. Fragments of broken strap binding (x 93) derived from such hinges or strapping on furniture.

SF6431 Nailed **arm strap** from large pinned hinge. L: 92mm, w: 34mm.
12358, skeleton 12362, Period 6.2, G47/2

Lead panel
by Julia Huddle
(Fig.10.57)
A decorative lead panel (SF120) was found unstratified. Such panels were used as ventilator panels in windows and examples have been found on monastic sites dating from the 13th to 15th centuries. They are also known

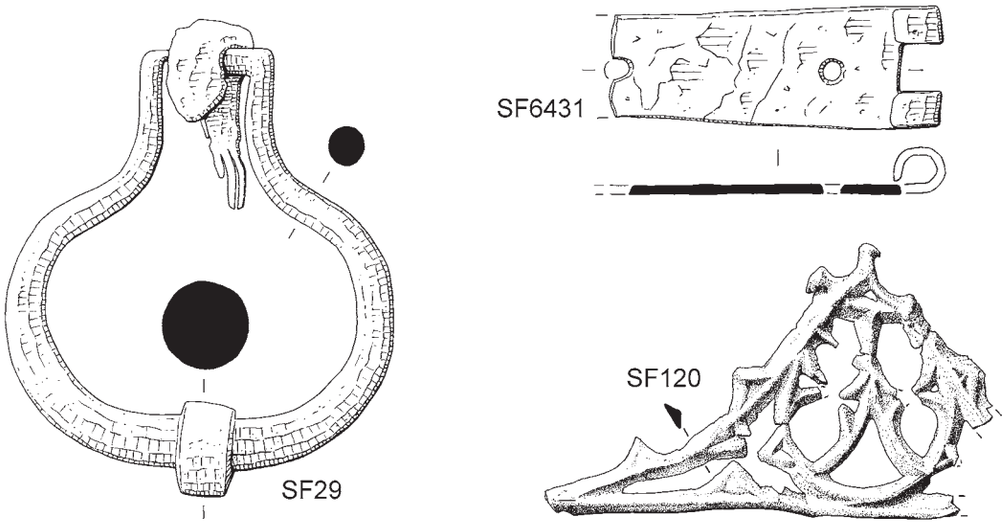


Figure 10.57 Iron door knocker (SF29); iron hinge (SF6431); lead panel (SF120). Scale 1:2, lead at 1:1

from royal archiepiscopal palaces and continued in use in farm houses, particularly in Essex and Surrey, until the 17th century (Cherry 1985).

SF120 Incomplete cast openwork **lead panel** with tracery pattern. Oval three-arched openwork motif and part of border.
91201, unstratified

Locks and Keys

by Quita Mould
(Fig.10.58)

Locks

A barrel padlock case (SF41), a shield-shaped mounted lock (SF31, not illustrated) and a mounted lock with a rectangular case (SF93) came from post-medieval dumping into the barbican ditch. The barrel padlock (SF41), found associated with 17th-century pottery, is of a very long-lived type (Goodall's type D, in Biddle 1990,1002) used from before the Conquest through to the post-medieval period to secure the limbs of both men and animals.

Fragmentary mounted locks included lockplates and parts of the internal mechanisms of stock-locks (tumbler x 1, ward plates x 6, bolts x 3). Insufficient of the individual mechanisms survives of the mounted locks to distinguish them from a plate or plate stock-lock (SF131). The mounted lock (SF93) appears to be of a modern type. Fragments of a locking mechanism (SF448.1, 6342/6342.1, not illustrated), including ward lock plates (SF844.1 and 5370, not illustrated) and casings (SF5190, 5280 and 5354.2, not illustrated) were also recovered.

Other finds from fills of the barbican ditch include a stapled hasp (SF39) used to secure a box or chest lid.

An incomplete case from an iron barrel padlock (GBS SF105, not illustrated) was found in a pit cutting the south bailey ditch at the Golden Ball Street site. Cuprous staining on the padlock case may have come from applied strips of copper alloy although X-radiography suggests that it is more likely to have come from brazing metal.

SF41 Barrel **padlock** with undecorated cylindrical case and p-shaped shackle. L: 90mm, case diam: 30mm.
92758, fill of barbican ditch 91295, Period 6.2, G9/41

SF93 **Lock**. Rectangular flanged lockplate with offset keyhole, sinuous pivoting bolt and simple spring within a shallow case. L: 69mm, w: 42mm, depth 10mm.
92773, fill of barbican ditch, Period 6.2, G9/41

SF131 **Lock**. Shield-shaped lock case with lock bolt held by two staples visible. L: 54mm, w: 70mm.
92739, fill of barbican ditch, Period 6.2, G9/41

SF39 **Stapled hasp**, two hinged straps with an angular hasp and scrolled terminal. L: 69/40mm, w: 20mm.
92758, fill of barbican ditch 91295, Period 6.2, G9/41

Iron keys

Six key and key fragments were found in post-medieval deposits. The keys included a fragmentary padlock key (SF5941) and a collection of broken keys of post-medieval types. These post-medieval types included a key bit with a solid stem projecting below the bit (SF6296). Other broken keys had no bits remaining but had kidney-shaped bows (SF73, 5014, neither illustrated and 6737.1), one with a notched central finial and decorative moulded stem (SF6737.01). Two of the keys had a non-ferrous metal coating (SF73 and 6737.01).

Two broken door keys with kidney-shaped bows (SF6296 and SF73, latter not illustrated) came from fills of the barbican ditch.

SF5941 **Padlock key** with strip handle and cut-out bit. L: 74mm, max w: 24mm.
80101, fill of posthole 80102, Period 6.1, G8/29

SF6296 Large **key** with kidney-shaped bow and round-sectioned stem tapering to a pointed tip, broken bit. L: 138mm.
91626, fill of barbican ditch 91295, Period 6.2, G9/41

SF6737.01 **Key** with ornate moulded stem with notched finial and broken bow, non-ferrous metal plated. L: 32mm.
47280, fill of barbican ditch 47667, Period 6.2, G47/26

Copper alloy key

by Alison Goodall

A small key from Golden Ball Street (GBS SF188, not illustrated) was probably used to lock a casket. A fragment (no SF number) from an unstratified context resembles the lozenge-shaped heads of some keys: examples from Exeter date to the 13th–14th century.

Monumental brass

by Alison Goodall
(Fig.10.58)

A letter from a monumental slab (GBS SF231) was found in a pit at the Golden Ball Street site. Such letters would have been set into a stone slab and would probably have formed an inscription running round the edge of the slab, possibly surrounding the figure of the commemorated person. The date is probably *c*.16th-century.

GBS SF231 Brass letter. Lombardic letter 'N' from a monumental brass.
158, pit 159, Period 6.2, G62

Window Glass and Cames

by David King
(Fig.10.62)

Much of the post-medieval glass found at Castle Mall appears to have come from plain quarry glazing, most coming from the area of a quarry within which large fragments of a castle gatehouse had collapsed (see Period 6.2, Chapter 10.II). Only 44 coloured fragments were found, but more importantly 70 fragments have two adjacent original edges forming an angle which could be from a quarry. Only thirteen of these are grozed and do not have diamond cut edges; some have a combination of grozing, muff edge and diamond cutting, and most are cut with a diamond alone. These observations indicate that the bulk of this quarry glazing was made post-1600. In three cases enough survives to reconstruct a whole quarry and the resulting sizes are 70 x 58mm (SF6695), 97 x 54mm (SF6817; see below) and 51 x 36mm (SF6821). These are rather small, perhaps suggesting that the fragments concerned may be misleading. Fifty-one of the sixty-two quarry points have an angle divisible by 5 or 10 degrees, suggesting some standardisation, although of course the angles of quarries were varied to ensure that each light of a window contains a whole number of quarries across the width. The standard quarry angles appear to have been 60°, 65°, 70°, 80° (by far the most common), 85° and, possibly, 90°.

See 'Window glazing' below for catalogue entry; further illustrations are available in the project archive.

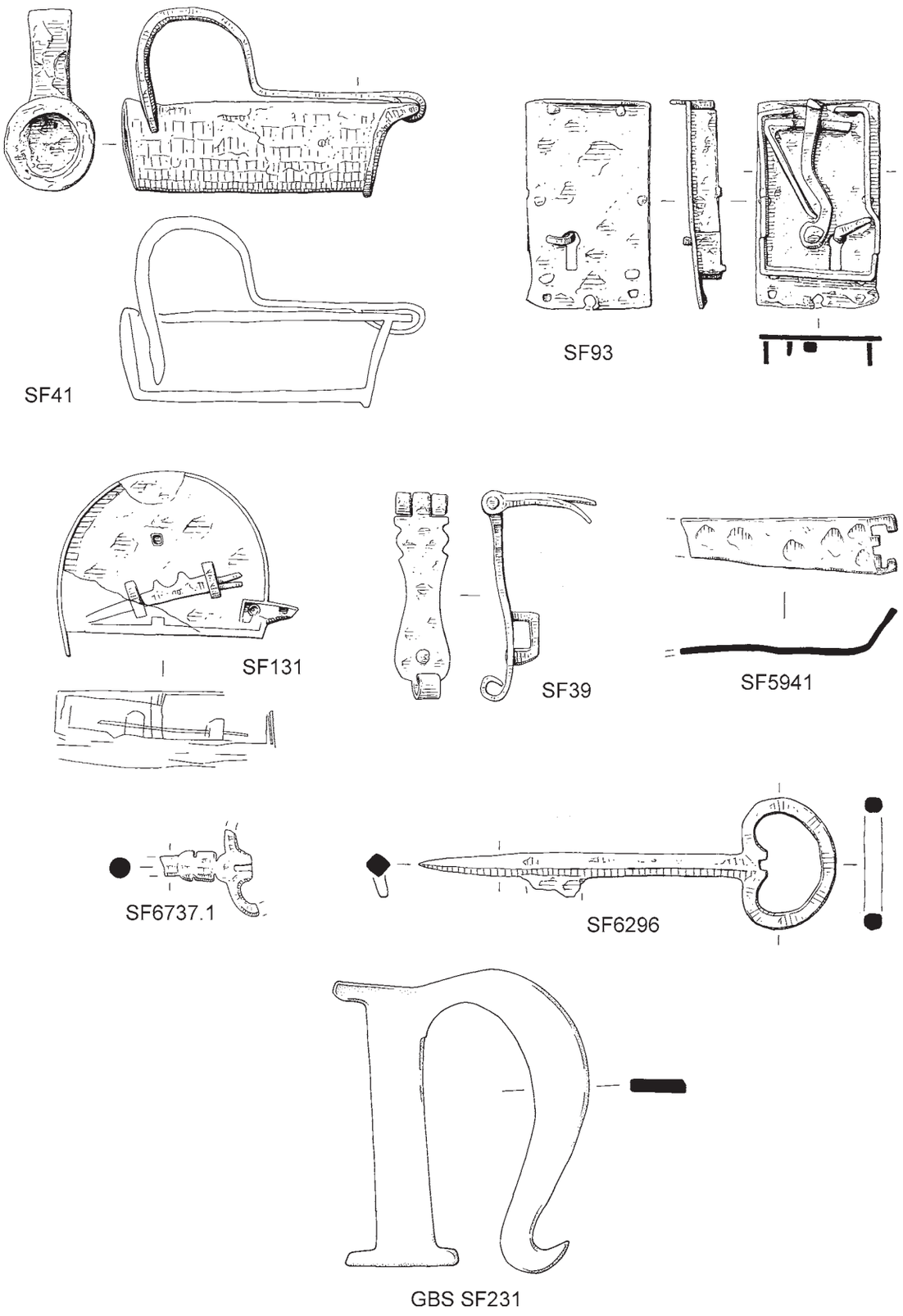


Figure 10.58 Iron locks (SF41, 93 & 131); iron staple hasp (SF39); iron keys (SF5941, 6296, 6737.1). Copper alloy letter plate (GBS SF231). Scale 1:1, ironwork at 1:2

Lead came

Seven pieces of lead came were recovered from post-medieval deposits, none of which are of particular interest.

Ceramic Building Materials

by Irena Lentowicz, with Richard Kemp (identification)

The largest period assemblage of CBM was recovered from Period 6, over two thousand fragments weighing 103.068kg and comprising 45.1% of the entire CBM assemblage. Residual medieval material made up almost 63% of this group (64.817kg, 64.8%). Of the contemporary post-medieval CBM, brick made up the largest proportion by both weight and number of fragments recorded. In addition to types LB1 to LB5, later brick types LB102 and LB103 were introduced into the repertoire. Post-medieval roof tiles were in the main pan tiles in fabrics RT141 and RT142, with the latter being more common. Roof tile type RT108 was recovered in smaller quantity. Floor tile was represented by type FT22 and FT26. Tin-glazed earthenware wall tiles were also recovered, a number of which were Small Found (see Goffin below).

Period 6.1

A total of 957 fragments of CBM weighing 35.118kg were recovered from contexts associated with this sub-period, 34% of the period assemblage. Much of this material was residual earlier medieval roof tile and bricks. Contemporary post-medieval material was dominated by brick fragments; types LB1 to LB5 continued to be used and type LB102 was introduced. Pan tile types RT141 and RT142 dominated the roof tile recovered, with a small quantity of RT108 also recovered.

A small proportion of the sub-period assemblage was related to structural activity, although much was residual. Material from pitting made up nearly 70% of the sub-period assemblage (*c* 24.154kg; 68.8%), with the largest assemblages deriving from early to mid 17th-century pit fills.

Period 6.2

Almost one thousand fragments of CBM weighing 59.992kg was recovered from contexts assigned to this sub-period, 58.1% of the Period 6 assemblage. Much was made up of residual medieval material (37.030kg; 61.7%), and some Roman tile was also recorded. The post-medieval assemblage was dominated by later bricks including types LB4 and LB5, with smaller quantities of types LB3, LB2 and LB102 and lesser quantities of types LB1 and LB2. Roof tile continued to be represented by pan tile types RT141 and RT142, with small amounts of RT108 continuing to be recovered. Floor tile was represented by examples of two types FT22 and FT26. Miscellaneous fragments were made up of mortar and plaster, but also included a number of tin-glazed earthenware wall tiles.

The largest group of material was recovered from dumping into the barbican ditch (G9/41, part; 32.485kg), 54.1% of the sub-period assemblage. The information from this large group is detailed below in tabular form. Residual material accounted for over three-quarters of this large assemblage, while miscellaneous fragments were dominated by mortar with a small quantity of plaster also recovered (decorative plaster is detailed by Kirkham below). Also introduced in this group were a number of tin-glazed earthenware wall tiles some with blue painted decoration (see Goffin below). Other post-medieval CBM was recovered in similar proportions. Roof tile was dominated by pan tile type RT142 with a small quantity of RT108 also recorded. Floor tiles were also recovered. Brick included types LB1, LB2, LB3 and LB4 but type LB102 was the most common type recovered. Floor tile was represented by types FT26 and FT22.

Period 6.3

A much smaller quantity of CBM was recovered from this sub-period, 117 fragments weighing 8.058kg, only 7.8% of the sub-period assemblage. Again medieval material made up the proportion of the assemblage (4.930kg, 61%), and a small amount of earlier Roman material was also recorded. Post-medieval brick and roof tile were again recovered in similar proportions. As well as pan tile type RT142, which was most common, type RT141 was also noted. Later bricks were restricted to a smaller range including LB2, LB3 and LB4. A single floor tile fragment type FT22 was also present.

Fabric	*No. frags*	*Weight (kg)*	*% Weight*
Misc frags	257	4.040	3.9
Roman	3	0.275	0.3
Fired clay	38	0.210	0.2
Fabric 200	270	0.496	0.5
Medieval roof tile	830	40.406	39.2
Medieval brick	413	21.750	21.1
Medieval floor tile	15	2.315	2.2
Post-medieval tile	45	6.195	6.6
Post-medieval brick	195	25.101	24.3
Post-medieval floor tile	6	1.995	1.9
Modern	1	0.385	0.4
Total	**2,073**	**103.068**	

Table 10.37 Total number of fragments and weight of CBM at Castle Mall by fabric in Period 6

Fabric	*No. frags*	*Weight (kg)*	*% Weight*
Misc frags	120	2.463	7.0
Fired clay	21	0.125	0.3
Medieval roof tile	441	11.782	33.5
Medieval brick	54	0.935	2.6
Brick type EBA	122	3.955	11.2
Brick type EBB	76	6.535	18.6
Medieval floor tile	1	0.010	<0.1
RT108	2	0.065	0.2
RT141	8	0.240	0.7
RT142	8	1.960	5.6
LB1	18	1.830	2.6
LB2	22	0.896	2.5
LB3	12	0.370	1.0
LB4	31	2.675	7.6
LB5	10	0.630	1.8
LB102	10	0.262	0.7
Modern brick	1	0.385	1.1
Total	**957**	**35.118**	

Table 10.38 Total number of fragments and weight of CBM at Castle Mall by fabric in Period 6.1

Golden Ball Street

Over 20kg (minimum 20.132kg, 210 fragments) of ceramic building material and fired clay came from post-medieval deposits at the Golden Ball Street site. Most derived from pit fills and from cellars and walls constructed across the site. It included a range of brick, floor tile (including medieval Flemish green-glazed examples) and roof tiles.

Discussion

Unsurprisingly, Period 6 produced the largest period assemblage, a large proportion of which was recovered from refuse dumping into the barbican ditch. Where structural evidence for tenement development occurs, earlier fabrics are used alongside contemporary fabrics. Other evidence for building materials (including deco-

Fabric	*No. frags*	*Weight (kg)*	*% Weight*
Misc frags	105	1.294	2.1
Roman	2	0.085	0.1
Fired clay	11	0.075	0.1
Medieval roof tile	605	25.870	43.1
Medieval brick	28	3.085	5.1
Brick type EBA	56	2.370	3.9
Brick type EBB	68	3.615	6.0
Medieval floor tile	11	1.930	3.2
RT108	3	0.065	0.1
RT142	20	2.840	4.7
LB1	4	0.630	1.0
LB2	14	1.765	2.9
LB3	17	2.645	4.4
LB4	29	4.743	7.9
LB5	4	5.965	9.9
LB102	16	1.300	2.2
LB103	1	0.020	0.3
FT22	1	0.090	0.1
FT26	4	1.605	2.7
Total	**999**	**59.992**	

Table 10.39 Total number of fragments and weight of CBM at Castle Mall by fabric in Period 6.2

Fabric	*No. frags*	*Weight (kg)*	*% Weight*
Misc frags	21	0.164	0.5
Medieval	519	25.013	77.1
RT108	3	0.065	0.2
RT142	18	2.370	7.3
LB1	1	0.220	0.7
LB2	10	0.705	2.2
LB3	11	0.470	1.4
LB4	11	0.198	0.6
LB102	16	1.300	4.0
Floor tile	5	1.695	5.2
Wall tile	6	0.285	0.9
Total	**621**	**32.458**	

Table 10.40 Total number of fragments and weight of CBM recovered from refuse dumping into the barbican ditch (G9/41) during Period 6.2

rative wall tiles, plaster and decorative wall fittings and window glazing) is detailed throughout this chapter, attesting to changing styles and, on occasion, to relatively high status buildings in the vicinity of the castle. Further comments relating to post-medieval building materials in general are given in Chapter 13.

Glazed ceramic tiles
by Richenda Goffin
(Fig.10.59)
A total of 28 fragments of ceramic tiles were recovered from post-medieval deposits, of which 20 have been included in the catalogue below. The remaining frag-

Fabric	*No. frags*	*Weight (kg)*	*% Weight*
Misc frags	32	0.283	3.5
Roman	1	0.190	2.3
Fired clay	6	0.010	0.1
Medieval roof tile	47	3.040	37.7
Medieval brick	10	1.315	16.3
Medieval floor tile	3	0.375	4.6
RT141	1	0.015	0.2
RT142	8	1.140	14.1
LB2	3	1.235	15.3
LB3	3	0.060	0.7
LB4	2	0.095	1.2
Floor tile FT22	1	0.300	3.7
Total	**117**	**8.058**	

Table 10.41 Total number of fragments and weight of CBM at Castle Mall by fabric in Period 6.3

ments were either very fragmentary, or had a plain white tin-glaze.

The majority of fragments were wall tiles, but there is one example of a tin-glazed polychrome floor tile, which was faded and abraded, and probably the earliest in the sequence (SF7629, not illustrated). It is likely to be a product of the Netherlands, although it is very probable that Flemish potters in England such as those working along the South bank of the Thames were making similar tiles in the early 17th century (Britton 1986, 172–73). In addition it is interesting to note that the Flemish potters who came to Norwich in the second half of the 16th century made tin-glazed or '*Galley pavinge tyles*' as well as ordinary ceramics, according to their petition to Queen Elizabeth in 1570 (Britton 1986, 20). One tile believed to be a possible product of the early industry in Norwich is in the Victoria and Albert Museum (Horne 1989, 13). A second tile with a possible Norwich attribution was found on the site of Limpsfield New Hall, a house built by William Gresham between 1558 and 1579 (Horne 1989, 14, no.1). The decoration includes the initials WG and the grasshopper, the device of the Gresham family (Horne 1989, 13).

The tin-glazed wall tiles recovered from the excavations demonstrate a wide range of different designs. Several polychrome tiles made in the Netherlands are present, including most of a star tulip tile dating to the early decades of the 17th century (SF7630). Such elaborately decorated tiles are characterised by a combination of an arrangement of stylised fruits and flowers and a geometric motif, which is designed to work when the tile is laid together with three other tiles to make up an eight-pointed star. The star motif encases an eight petalled rosette, which is surrounded by pomegranates interspersed with orange tulips. These are bordered by bunches of blue grapes, tendrils and green leaves.

In addition to such highly decorated tiles, many monochrome blue tile fragments were also recovered from the excavation. These more soberly decorated tiles were produced in the Netherlands after the first quarter of the 17th century. The dramatic change in the decoration of such tiles was due to several factors, one of which was the shift in taste created by the importation in large

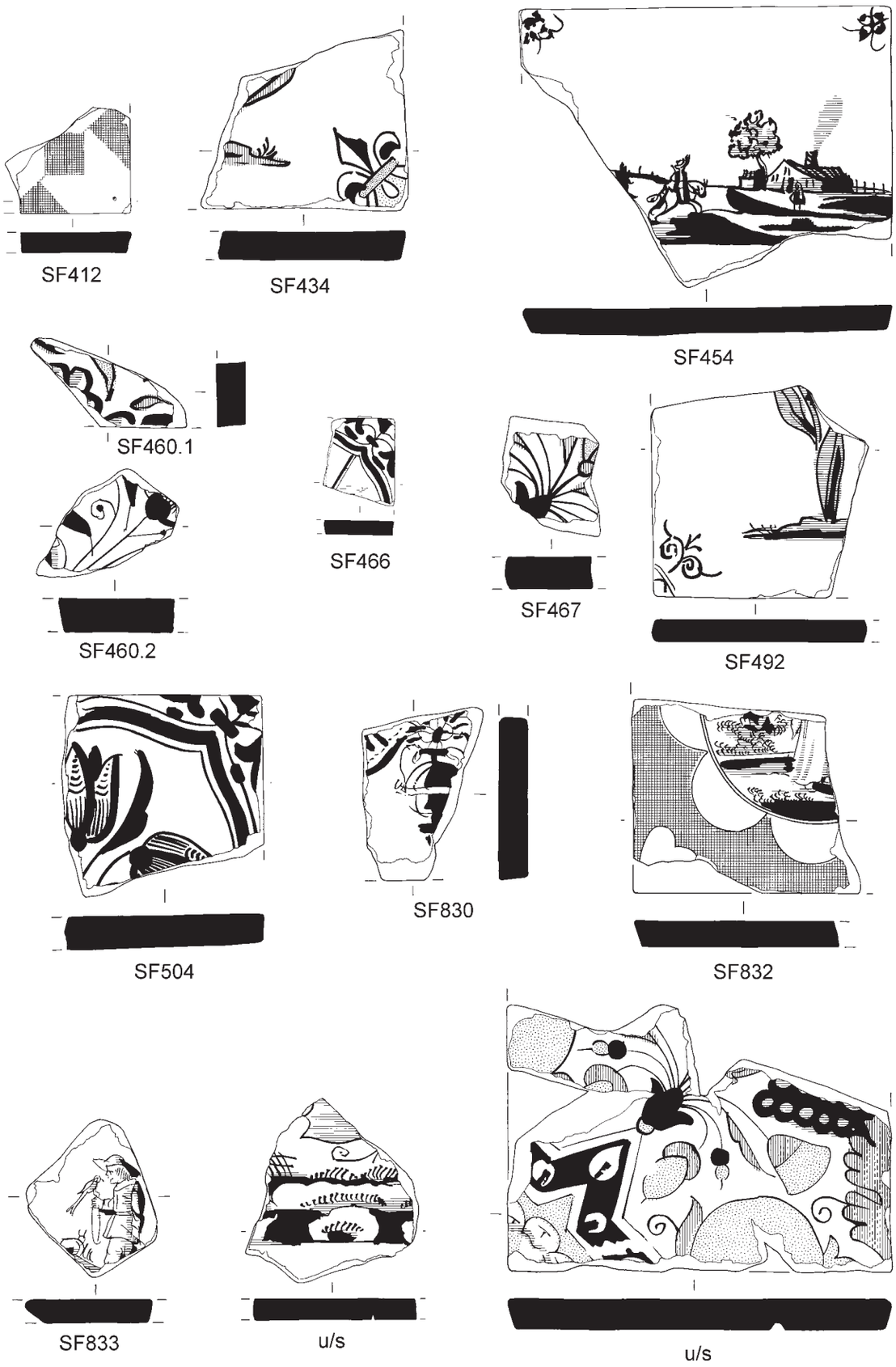


Figure 10.59 Tin-glazed earthenware wall tiles (SF412, 434, 454, 460 (x 2), 466, 467, 492, 504, 830, 832, 833, unstratified (x 2). Scale 1:2

quantities of blue and white porcelain from the East (Van Dam 1991, 26). A further decorative variant emerged *c*.1660, and became increasingly popular *c*.1680. These tiles were characterised by a central decorated roundel with the space beyond covered in purple spatter (Van Dam 1991, 29).

Many tin-glazed wall tiles decorated with plain blue or blue and purple are very hard to attribute, since the production of English delftware tiles took off in the early 18th century, with the main centres of the industry being London, Bristol, and Liverpool. The English potters made direct copies of the Dutch designs, although some general differences in the overall appearance of the decoration may point towards a particular attribution (Horne 1989, 9). It may also not be easy to determine from an examination of the fabrics whether the tiles are Dutch or English (Ian Betts, pers comm). The fragmentary nature of many excavated tiles is an additional factor limiting precise identification. For many of the tiles listed below, it has therefore not been possible to identify their place of manufacture with any certainty.

The majority of the tiles were stratified examples; all came from dumps into the barbican ditch recorded during trial excavations.

Supplementing the Castle Mall assemblage, a well recently recorded at Ber Street contained a considerable quantity of biscuit ware, waster type material and kiln furniture relating to the tin-glazed kiln established by Andries and Janson (Goffin, in prep. d and see further discussion on related pottery manufacture, this volume). Amongst the material were three examples of biscuit ware floor tiles or the 'galley pavinge tyles', noted above.

Where two different tiles have been given one small find number, they have been differentiated by the suffix 01 or 02.

SF412 **Wall tile fragment, tin-glazed**. Corner fragment with manganese purple spatter and plain tin-glazed squares. Part of a tile which would have had a central decorated roundel. The corner decoration would have made up the pattern of a star when laid with three other tiles in a square formation (Pluis 1997, 119). Thickness 7mm. Buff fabric. Dutch or English, late 17th/18th century.
92739, barbican ditch, Period 6.2, G9/41

SF434 **Wall tile fragment, tin-glazed**. Fleur-de-lys corner motif in blue, orange and yellow, with fragmentary central decoration in green and blue, likely to be tulips. Thickness 11mm. Silty buff and pale pink fabric. Dutch, *c*.1620–1650 (Pluis 1997, cat. no C.02.00.02 A.05.08 and C.02.00.03. A.05.01).
92758, barbican ditch, Period 6.2, G9/41

SF454.01 **Wall tile fragment, tin-glazed**. Plain blue landscape with cottage, horse and rider, with spider's head corner motif (Van Dam 1991, no. 61). Length 127mm, thickness 8mm. Buff fabric. Nail imprint in one corner. Dutch, late 17th/18th century.
92764, barbican ditch, Period 6.2, G9/41

SF454.02 **Wall tile fragment, tin-glazed** (not illustrated). Plain blue decoration of a sailing vessel, with ox-head corner motif. Abraded. Thickness 11mm. Silty buff fabric. Dutch, ?late 17th century.
92764, barbican ditch, Period 6.2, G9/41

SF460.01 **Wall tile fragment, tin-glazed**. Fragment with blue, green and orange, probably star and tulip decoration with pomegranate and grapes. Thickness 10mm. Silty buff/pink fabric. Dutch, 1610–1630 (Van Dam 1991, cat. no. 82).
92766, barbican ditch, Period 6.2, G9/41

SF460.02 **Wall tile fragment, tin-glazed**. Plain blue floral/foliate design, probably part of a flower vase decoration. Thickness 11mm. Silty pink fabric. Dutch, 17th century.
92766, barbican ditch, Period 6.2, G9/41

SF466 **Wall tile fragment, tin-glazed**. Corner fragment in plain blue with bracketed frame and partial decoration in centre. Spear and tendril corner motif (Van Dam 1991, motif no. 37). Thickness 10mm. Silty buff fabric. Dutch, *c*.1640–70.
92768, barbican ditch, Period 6.2, G9/41

SF467 **Wall tile fragment, tin-glazed**. Fragment of tulip decoration in blue, green and orange, part of a star tulip tile (see SF460.01). Thickness 11mm. Silty buff/pink fabric. Dutch, first half of 17th century.
92770, barbican ditch, Period 6.2, G9/41

SF492 **Wall tile fragment, tin-glazed**. Plain blue decoration of tulip stem with ox-head corner motif (Van Dam 1991, motif no 50). Thickness 7mm. Buff yellow fabric. Probably Dutch, second half of 17th century.
92741, barbican ditch, Period 6.2, G9/41

SF504 **Wall tile fragment, tin-glazed**. Corner fragment in plain blue of triple tulip in bracketed frame, with spear and tendril corner motif (Van Dam, motif No 37). Thickness 10mm. Silty buff fabric. Dutch, 1630–70 (Van Dam 1991, cat. no. 82).
92751, barbican ditch, Period 6.2, G9/41

SF830 **Wall tile fragment, tin-glazed**. Fragment in plain blue of ornamental flower vase. Thickness 11mm. Buff/pink silty fabric. Abraded. Probably Dutch, 17th century. Similar to Van Dam 1991, cat. no. 98 dated 1670–1700.
92770, barbican ditch, Period 6.2, G9/41

SF832 **Wall tile fragment, tin-glazed**. Plain blue decoration within a lobed roundel with spattered manganese purple ground. ?Heart corner motif or ?Tudor rose. Central decoration shows part of a pastoral scene with a figure, possibly a shepherdess. Thickness 10mm. Silty buff fabric. Dutch or English, late 17th/18th century. For a Dutch example decorated only in purple, dated 1680–1725 see Van Dam, cat.no. 165 (Van Dam 1991, 29).
92756, barbican ditch, Period 6.2, G9/41

SF833 **Wall tile fragment, tin-glazed**. Plain blue decoration of hawking/falconry scene. Thickness 8mm. Silty buff fabric. Dutch or English, late 17th to first half of 18th century.
92758, barbican ditch, Period 6.2, G9/41

SF7629 **Floor tile fragment, tin-glazed** (not illustrated). Fragment of medallion tile decorated in blue and yellow ochre with rosette motif in one corner. Length 100mm, thickness 15mm. Buff/pale pink silty fabric with calcareous inclusions. Probably Dutch, late 16th–early 17th century, although possibly an early 17th-century tile produced in London (Horne 1989, 15, nos 6–9). See introduction for a discussion of such tiles.
92750, barbican ditch, Period 6.2, G9/41

SF7630 **Wall tile fragments, tin-glazed**. Star tulip decoration with pomegranate and grapes in blue, orange and green. Length 132mm, thickness 11mm. Pale pink silty fabric. Dutch, 1600–1630 (Van Dam 1991, cat. no. 27).
92738/92739, barbican ditch, Period 6.2, G9/41

SF7631 **Wall tile fragment, tin-glazed**. Plain blue decoration of Chinese style landscape. Thickness 7mm. Buff silty fabric with deep vertical score on the reverse. Dutch or English *c*.1680–1750.
Unstratified.

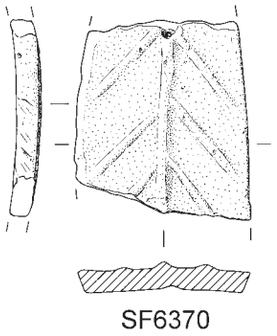
SF7632 **Wall tiles fragments** (not illustrated). Three fragments decorated with a dark purple and cream combed slip. Thickness 8mm. Buff silty fabric. Dutch. Probably 19th century but possibly earlier (Pluis 1997, 574, cat. no. D.08.00.03).
92750, barbican ditch, Period 6.2, G9/41

Decorative Wall Plaster

by Andrea Kirkham

(Fig.10.60)

Three fragments of decorative plaster shapes[60] were recovered from fills of the barbican ditch (SF139, fill 92740 and SF863, fill 92730, both G9/41, Period 6.2, neither illustrated; SF6370 unstratified). The decoration, in low relief, probably a leaf motif, is finely executed. It is difficult to know whether the undulation is accidental distortion or deliberate. If deliberate, then the plaster would have been taken out of the mould when green and formed over a surface until dry. When viewed from the front, SF6370 has a convex shape and the edges appear



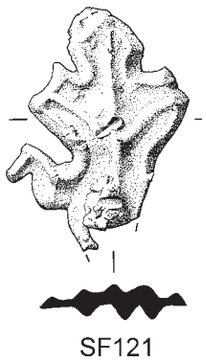


Figure 10.60 Decorative plaster (SF6370); lead wall mount (SF121). Scale 1:1

trimmed back. There is a hole at one end, probably for a fixing.

The reverse of the fragments appear to have been worked or rubbed down, as though formed in a thin mould. Fragment SF139 has a lip, probably resulting from an excess of plaster not fully removed from the back of the mould, but on SF6370 the edges appear trimmed back.

Materials consist of a lime binder and finely graded aggregate, with some larger inclusions and kiln fuel ash. Little evidence of shrinkage cracks suggests a high chalk aggregate content. The plaster may also contain gypsum, but chemical testing to establish its presence has not been carried out. The samples contain very fine hair, much of the evidence for which it now the 'negative' image.

The fragments are difficult to place into a context and to date accurately, but could have formed a running frieze or a decorative panel and would probably have been associated with other plasterwork. There is no obvious evidence of any form of adhesive on the backs of the fragments. The small hole in SF6370 may be an indication of a mechanical fixing.

The presence of hair (although not a resolved issue) suggests a date post-1550s and the stratigraphic position of the contexts within which the fragments were found suggests that they pre-date the construction of the Cattle Market in 1738.

SF6370 Moulded plaster plates in shape of leaf.
91201, unstratified

Lead Mount
by Julia Huddle

A lead mount (SF121) was found unstratified. Part of a double-sided limestone mould for a similar oak-leaf motif was found at Botolph Street, Norwich from a 17th/18th-century context and is thought to be late medieval in date (Margeson 1993, 177, fig. 127, no. 1376). Margeson discusses their function as wall or roof decorations in high status houses (*ibid*).

SF121 Cast oak-leaf **mount** with veining and raised border on both sides, one lower lobe damaged, incomplete stem which was probably perforated or formed a loop for attachment.
91201, unstratified

Occupations, Industry and Crafts

Pipe Kiln Material
by Alan Peacey
(Fig.10.61)

Tobacco-pipe kiln material was recovered from three separate contexts: there are isolated fragments from fills of the barbican ditch in Area 9 (SF196 and SF867) and a larger assemblage in Area 4 (SF7468; although unstratified, this is known to come from fills of the barbican ditch). Waste material was also recovered from other parts of the site. As the whole area was levelled by 1738 for a new Cattle Market, all the material is likely to pre-date this. The material derives from the muffle[61] or muffles of a pipe kiln or kilns.

Whilst the isolated fragments are of a darker colour and markedly vitrified, their recognizable constituents appear similar to the main group. The small fragment SF196 is well worn with a total lack of definition on its broken edges consistent with use as road metal or yard surfacing. All the material included as SF7468 is clean as if freshly broken and very friable. Transportation or removal from its packaging naturally results in a multiplication of the fragment count. The possibility that all the material derives from the same structure cannot be ruled out.

The fabrics all contain liberal amounts of well-rounded quartz sand up to 1mm, with occasional larger opaque quartz chips up to 4mm. The fragments from SF7468 display evidence, in the form of voids, striations and casts of seed husks, of liberal stuffing with organic material. All the fragments are reinforced with pre-fired pipe stems. These types of fabric adjustment are typical of muffle material recovered from other sites in the British Isles (Peacey 1996, 179–80).

Where it is possible to allocate the material to a specific part of the muffle, it is from the base. Of the 25 fragments recovered as SF7468, 15 are base fragments and the remaining 10, being core fragments, could be from any part of the muffle including the base. The judgement is made on the evidence of relative thickness, flatness, white clay luting on the inner surface and multiple layers of pipe-stem reinforcing. Two of the fragments are particularly informative. These both have the remains of pipe bowls protruding from one edge. Base reinforcement with pipes radiating from the centre with bowls at the base periphery was an established feature of British pipe-kiln muffles (Peacey 1996, 14–37). By projecting the lines of the pipe stems to their point of intersection, it is possible to establish the probable centre

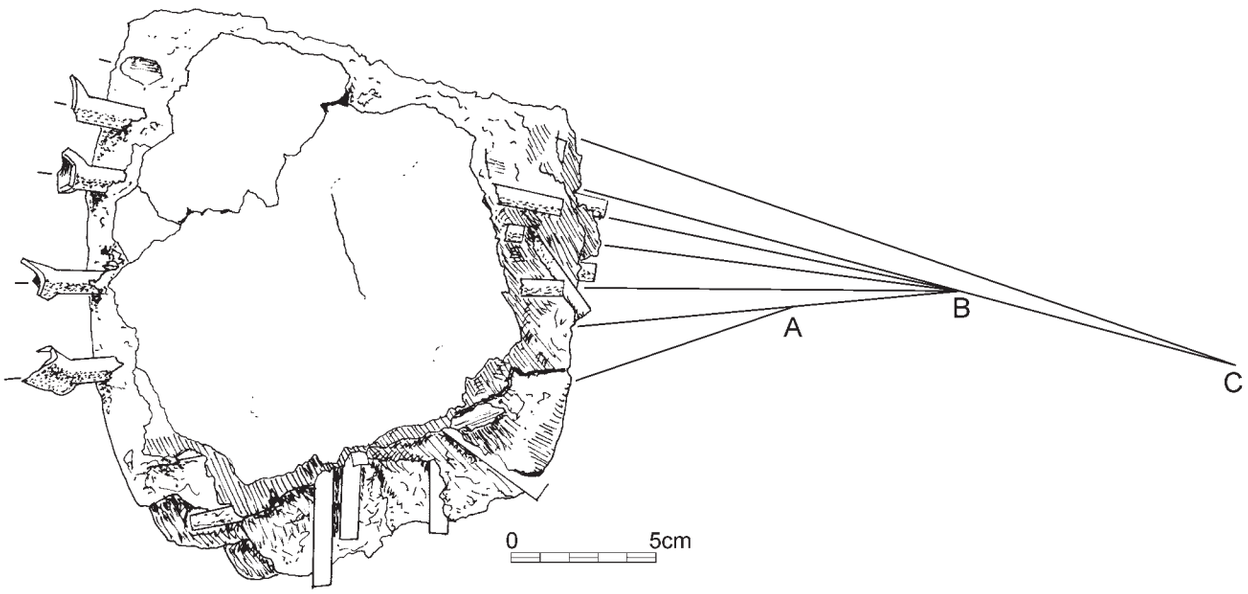


Figure 10.61 Pipe kiln waste. Not to scale

of the complete base and from this its probable diameter. The alignment of seven pipes can be ascertained either from their remaining presence or from partial voids where they had been (Fig.10.61). Distances are measured from the stem/bowl junction to the point of intersection. The greatest distance (C) is 420mm, the least (A) being 247mm. Five share one point of intersection (B) of 320mm. The average is 324mm. A wall thickness of 35mm would be required to cover the encapsulated bowls. This is consistent with the thinnest recorded measurement for this point in the last quarter of the 17th century (no data is available for the first quarter of the 18th century). Taking the average measure of 324mm plus 35mm for the wall, gives a radius of 359mm; a diameter of 718mm. The muffle base recovered from Arcadia Buildings, Southwark, dated 1660–80, measures 650mm (Peacey 1996, 25–8). Ground-plan evidence, which is more abundant, suggests that muffles are unlikely to have exceeded 900mm (Peacey 1996, 95–107). The two base edge fragments yield measurements of 85mm and 96mm for the floor thickness.

The protruding pipe bowls offer potentially the most reliable means of dating the muffle. They are of a pedestal base type current at the end of the 17th and beginning of the 18th centuries, and they are marked with the initials of their maker: IO (see Atkin above).

The main assemblage (SF7468) represents part of the base of a pipekiln muffle dumped probably as part of levelling for the new Cattle Market. What little can be inferred from the assemblage is consistent with the emerging national picture of tobacco pipe-kiln development. The best evidence for dating the muffle is in the form and marking of the tobacco pipes used in its construction. These are not inconsistent with the proposed latest date for deposition. Although the two other stray fragments from separate contexts could be from the same structure this need not necessarily be the case.

Window Glazing

by David King

(Fig.10.62)

A total assemblage of 505 pieces of window glass came from post-medieval deposits at Castle Mall, of which 119 were associated with quarrying within the barbican (G48/2, 48/10 and 48/2). While it is probable that some of the glass found on the site came from broken windows, there is evidence that a proportion of it was generated as part of the process of glazing. Where it is possible to tell, it would seem that the glass here was produced by the muff method, in which a bubble of glass was elongated into a tube, the ends cut off, and the tube split down one side and opened out to make a flat sheet of glass on average 610 x 380mm. The edges of these sheets were rounded and slightly thicker than the rest. When the resulting sheet was cut into pieces for use, these muff edges were sometimes used and sometimes discarded if too distorted. The collection of fragments from the Castle Mall site has a high proportion of fragments with muff edges, representing over 6% of the total number of fragments. On some of them it is possible to see the indentation made by the pincers when the glass was being handled while still hot.

A number of these edge pieces are thin strips of glass and the edge opposite the rounded edge is cut with a diamond. This suggests strongly that they were not intended for use, but were being cut off the muff to make a viable working edge. Other pieces are very thin but have opposing long sides cut by a diamond, suggesting that they are off-cuts rather than usable pieces. Still others have diamond cuts on the surface of the glass where a cutter has been tested; one piece has a series of parallel scratches on both sides of the glass. All these details are indicative of fragments which come as a by-product of the glazing process, rather than as part of a completed window. Whether they were dumped after *in situ* glazing repairs or came from the debris of a glazier's workshop

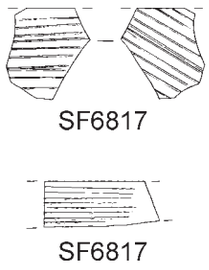


Figure 10.62 Window glass (SF6817, x 2). Scale 1:2

it is not easy to say, but the present writer would incline towards the latter possibility.

Although the craft of glass-painting suffered a severe setback as a result of the iconoclasm of the Reformation, it did continue in Norwich, as is shown by the drawing up in 1618 of a new set of statutes for the regulation of the craft (Norfolk Record Office, Norwich Glazier's By-Laws 1618, case 10). These statutes specifically mention heraldic glass painting, which continued to be produced. Plain glazing was always needed, of course, both for churches, in which area there was a temporary boom at the Reformation to replace the painted windows which were destroyed, but also for domestic glazing, which would have been painted in the houses of the very rich but plain in most dwellings. The renewed iconoclasm of the 17th century Parliamentary period would have provided further work, such as the gunpowder explosion in Bethel Street in 1648 which badly damaged the churches of St Peter Mancroft and St Stephen and, presumably, many lesser buildings (Blomefield 1806, III, 395).

The freemen's rolls for Norwich provide evidence for a flourishing glazing craft in the post-medieval period. Between 1548 and 1752 they list 118 names of glaziers and a further eight who were plumbers and glaziers (Millican 1934 and 1952). The effect of the 1648 explosion, perhaps combined with that of Parliamentary iconoclasm, is reflected in the fact that in 1656 seven glaziers obtained their freedom. One was recorded as not apprenticed, but the others would have been taken on as apprentices for seven years in 1648 to help with the extra work caused by the explosion, taking up the freedom after the completion of their indentures in 1656. The normal number of enrolments for one year varied between one and four, with several years having no new freemen in this craft. Judging solely from the freemen's rolls, the normal size of workshop was a master glazier with three or four apprentices. It is not possible, however, to say how many of the latter stayed to work for their master after they had become free. Many glaziers who took on apprentices had been free for at least ten years or often more before doing so.

Other items illustrated in the project archive show the range of cut shapes.

SF6817 **Window glass**. Clear glass, ten with diamond-cut edges, one also with a muff edge, and another also with a grozed edge — post-medieval; one fragment with muff edge — medieval/post-medieval.
48227, unstratified

Metalworking

Introduction

During the post-medieval period, new technologies removed the metalworking industry outside the city. Despite the decline in intramural activity, evidence was still recovered at Castle Mall for both ferrous (including smithing) and non-ferrous metalworking throughout this period (19.916kg; 15% of the total site assemblage). Of this period assemblage, 2.970kg (15%) came from deposits assigned to Period 6.1, 13.300kg (66.7%) from Period 6.2 and 3.646kg (18.3%) from Period 6.3. Although much of the waste may have been residual within the quarry, pit and ditch fills in which it was found, the presence of contemporary crucibles, tools (including a flint anvil; Wymer, below) and metal scrap for both blacksmithing and needle/pin-making does confirm on-site activity. Three pinner's bones were also recovered (Huddle, below).

Chronological and spatial distribution of metalworking debris

by Irena Lentowicz and Justine Bayley (identification)

Period 6.1

To the east of the site, smithing slag and cinder were recovered from late 16th- to mid 17th-century dumping into the barbican ditch (Ditch 13, G9/41 and 47/30). Cinder and smithing slag was also found in association with the demolition of the upper part of the barbican well (G5/24), while metalworking debris also came from a pit near the rear edge of the barbican rampart (pit *45230*, G45/5).

Fuel ash slag was recovered from several pits relating to tenements across the former south bailey (pit *91221*, G9/4, Open Area 54, Property 40; pit *60612*, G6/43, Open Area 56; pit *11013*, G1/24, Open Area 38, ?Property 49). A stone-lined well or cess pit (*10557*, G1/116, Open Area 60, Property g) had apparently served a secondary use for the disposal of 17th-century domestic/industrial waste which included cinder and smithing slag as well as unidentified metalworking debris. Further south, a dump (*10732,* G1/86, Open Area 46, Property g) to the north of a wall (G1/84) contained metalworking debris including copper alloy spillage. Another pit (*10766=10791*, G1/98, Open Area 47, Property g) contained a wide range of refuse, as well as smithing slag, fuel ash slag and hearth bottoms. An adjacent well in the same property (*10012*, G1/99) contained two crucibles, analysis of which indicated the presence of a zinc-rich copper alloy (see Mortimer below). The fills of a pit adjacent to Beaumont Lane (Common Pump Street/Cattlemarket Street; pit *22141,* G22/156, Open Area 55, at the rear of Properties 44–46) contained fuel ash slag.

Period 6.2

Extensive quarrying continued within the barbican area during the 17th and early 18th centuries and a large quantity of ferrous metalworking debris was recorded from a number of fills, dumps and landscaping (G47/34. 47/37, 47/26, 47/25, 47/40, 47/41 and 47/28). These included smithing slag, cindery hearth bottom, tap slag and coppery slag. Similar waste came from the very large quarry pit dug in front of the motte bridge (G48/12). This material included fuel ash slag, cinder and cindery hearth bottom. Post-medieval dumping into the barbican ditch itself (Ditch 13) produced a smaller quantity of metalworking debris. Refuse fills being tipped into the ditch from the east (G9/41) contained cinder and smithing slag. Further south, refuse and quarry waste within the ditch (G2/32 and 6/33) yielded smithing slag, hearth bottom and iron objects as well as coal. Tenement encroachment provided a small quantity of metalworking debris (pit *91448* (G9/43, Property 39) to the east of the barbican ditch; deposit *10493* (G1/103, Property c/d) and wall repair (G1/108, Property e/f), both within the Berstete/Timberhill block).

Period 6.3

Cinder and smithing slag came from 18th-century levelling of the barbican ditch (Ditch 13, G2/37, G2/33, G47/20), immediately prior to the construction of the new Cattle Market in 1738. The quarries within the barbican were also backfilled (G48/10) and metalworking waste found within them included cinder, smithing slag and hearth bottom. The presence of a small assemblage of scrap iron from these

fills indicates metalworking in the vicinity (see Mould below). A range of materials came from features associated with Cattle Market itself: iron pan, tap slag, hearth bottom, cinder and smithing slag (G47/4, 47/5 and 47/47). In the Berstete/Timberhill block a second phase of walls were added to existing buildings to create a small room or outbuilding (Structure 54, G1/126) which contained fuel ash slag and copper alloy. This may well have been disturbed from earlier deposits.

XRF analysis
by Catherine Mortimer
Two crucibles of post-medieval form were analysed (both SF5006, fill of well 10012, Period 6.1) and proved to have been used to melt a zinc-rich copper alloy, possibly a brass or quaternary alloy (Cu-Zn-Pb-Sn). These examples have thick (more than 10mm), straight-sided walls, similar to late- and post-medieval forms recorded elsewhere (*e.g.* Bayley 1992, fig.5).

Tools and ferrous scrap
by Quita Mould
A range of finds associated with ironworking was recovered from post-medieval contexts, principally the dumping into the large quarry (G48/10; minimum 11 items; none is illustrated). A round-sectioned ironworking punch (SF5557) was found in a pit fill and a possible rectangular-sectioned punch (SF6464) was recovered from deposits associated with tenement encroachment.

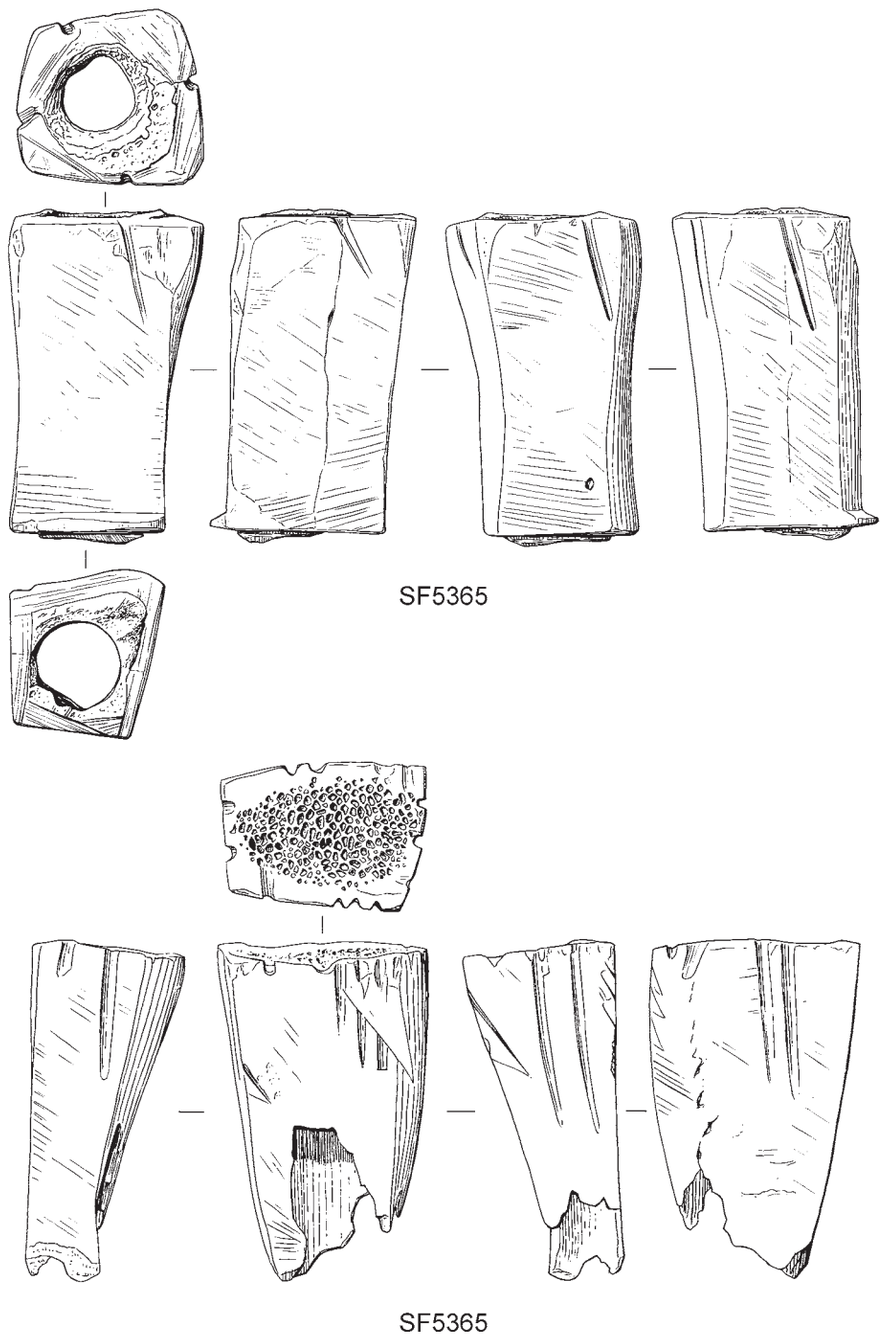


Figure 10.63 Pinner's bones (SF5365, x 2). Scale 1:1

Two heavy, tapering shanks (SF6666.01 and 6700, 48001) found in post-medieval fills of the barbican ditch, though sufficiently large to be broken ironworking sets or wood-splitting wedges, are more likely to be partially worked bar from the manufacturing process. Nine other pieces of bar iron were found including two bars partially welded together (SF352) which can be identified as blacksmithing scrap. Lengths of strap/strip (x 34), broken sheet and various formless fragments are also likely to be debris from ironworking. Two hearth bottoms (SF42 and 5739.2) were noted amongst the iron finds. Seventeen lengths of iron wire were found; all were sufficiently fine (diameter 1–3mm) to have been used in the manufacture of needles and pins.

Some of the group of copper alloy wire (including 1 gilded example), sheet, plate and strip fragments (*c.*89 items) from post-medieval deposits across the site may relate to manufacture or repair activities.

Leadworking
by Elizabeth Shepherd Popescu
A small assemblage of 14 pieces of leadworking waste came from post-medieval deposits, the majority being attributed to Period 6.2. As well as the usual sheet offcuts and spillage, three lead rods were recovered, one of which may have been a bar ingot (SF6416, 91779, G9/40, not illustrated). Most of the material came from Area 9 (x 8), the majority coming from fills of the barbican ditch.

Flint ?anvil
by John Wymer
An interesting flint object, possibly used as an anvil (SF5123, not illustrated; fill of well 10176, G1/135, Period 6.3), may be contemporary within its post-medieval well fill. It has traces of iron staining and may have been used in an industrial process.

Pinner's bones
by Julia Huddle
(Fig.10.63)
Pinner's bones, used to hold copper alloy pins in position whilst the points were filed on, are well known from post-medieval contexts in Norwich and elsewhere. This method of filing the points on pins was used up until the 18th century (MacGregor 1985, 171). Of the three examples from Castle Mall, only one is stratified (SF5165, not illustrated, pit *10716*, G1/133, Period 6.1, Property (c)/(d)) and dates to the early 17th century. Another, unstratified, example is socketed, presumably for the attachment of a handle (SF5365).

SF5365 **Pinner's bones** x 2, one incomplete. Two sections of sawn bone, each squared with four flat facets. Each piece has one or more grooves cut into each facet with a saw blade in the long axis; file marks visible on all sides and copper alloy staining present on one piece. The complete example is hollowed out to form a socket with parts of the inside polished smooth. Medium sized mammal bones.
10000b, unstratified

Discussion and conclusions
by Elizabeth Shepherd Popescu
A large number of post-medieval stables are documented in the vicinity of Norwich Castle (Tillyard, Chapter 10.I) and associated trades, including farriers and harness makers, were working in the Cattle Market area. Their presence may account for some of the metalworking debris recovered from the Castle Mall site. Local harness making continued in Norwich well into the 19th century (see Chapter 13). Blacksmiths would in part have operated as farriers, as well as in manufacturing other items (I.H. Goodall 1993c, 176), although only nine post-medieval horseshoes were recovered from the Castle Mall excavations. Evidence for blacksmithing during the 16th–17th centuries has been recorded at several Norwich sites (I.H. Goodall 1993c, 176) and a 17th-century blacksmith's workshop, complete with a range of tools and a quenching barrel, has recently been found to the south of the castle, at Dragon Hall on King Street (Shelley 2005). In terms of the lesser post-medieval metalworking trades, pinning was common until the early 19th century and evidence for it has been recovered at many Norwich sites, including Greyfriars (Emery, 2007).

Woodworking
by Quita Mould
A tanged chisel (SF5641, not illustrated; unstratified), having a shoulder and collar ferrule above it, is of a type unlikely to date much before the industrial revolution (Blandford 1974, 77).

Textile Manufacture and Needlework

Iron heckle teeth, scissors and shears
by Quita Mould
(Fig.10.65)
Six pairs of scissors were recovered from post-medieval fills of the barbican ditch. Two (SF89 and 6331) had cranked handles set at an angle to the blade suggesting a specific craft use, possibly the trimming of fibres on textiles. Another came from a 17th-century pit fill (SF5033). A textile processing spike (SF134, not illustrated) occurred residually. The single small example of shears from a post-medieval well (SF5008, not illustrated) is likely to have served as a general purpose, domestic cutting tool.

SF89 **Scissors**, right blade with eccentrically-placed finger loop and handle set at an angle to the blade. L: 154mm, blade w: 12mm.
92766, fill of barbican ditch 91295, Period 6.2, G9/41

SF5033 **Scissors** with oval-sectioned, centrally-placed finger loops, both blades snapped off close to the pivot in the open position. L: 86mm, w: 15mm.
10003, fill of pit 10059, Period 6.2, G1/93

Copper alloy dress-making pins
by Alison Goodall
(Fig.10.65)
A total of 141 small pins probably associated with sewing came from post-medieval deposits and the presence of pinner's bones and iron and copper alloy wire fragments indicates the manufacture of drawn wire pins (see 'Metalworking'). A range of head sizes and types is represented including spherical (*e.g.* SF5624) and solid flattish heads (*e.g.* SF5993) (*cf.* Margeson 1993, fig.5). Some are relatively large but have the coiled wire heads typical of late and post-medieval copper alloy pins. These larger examples may have been used as dress-making pins but are equally likely to have been used to secure items of clothing or head-dress. SF5624 came from a pit associated with prison burials, where other examples probably

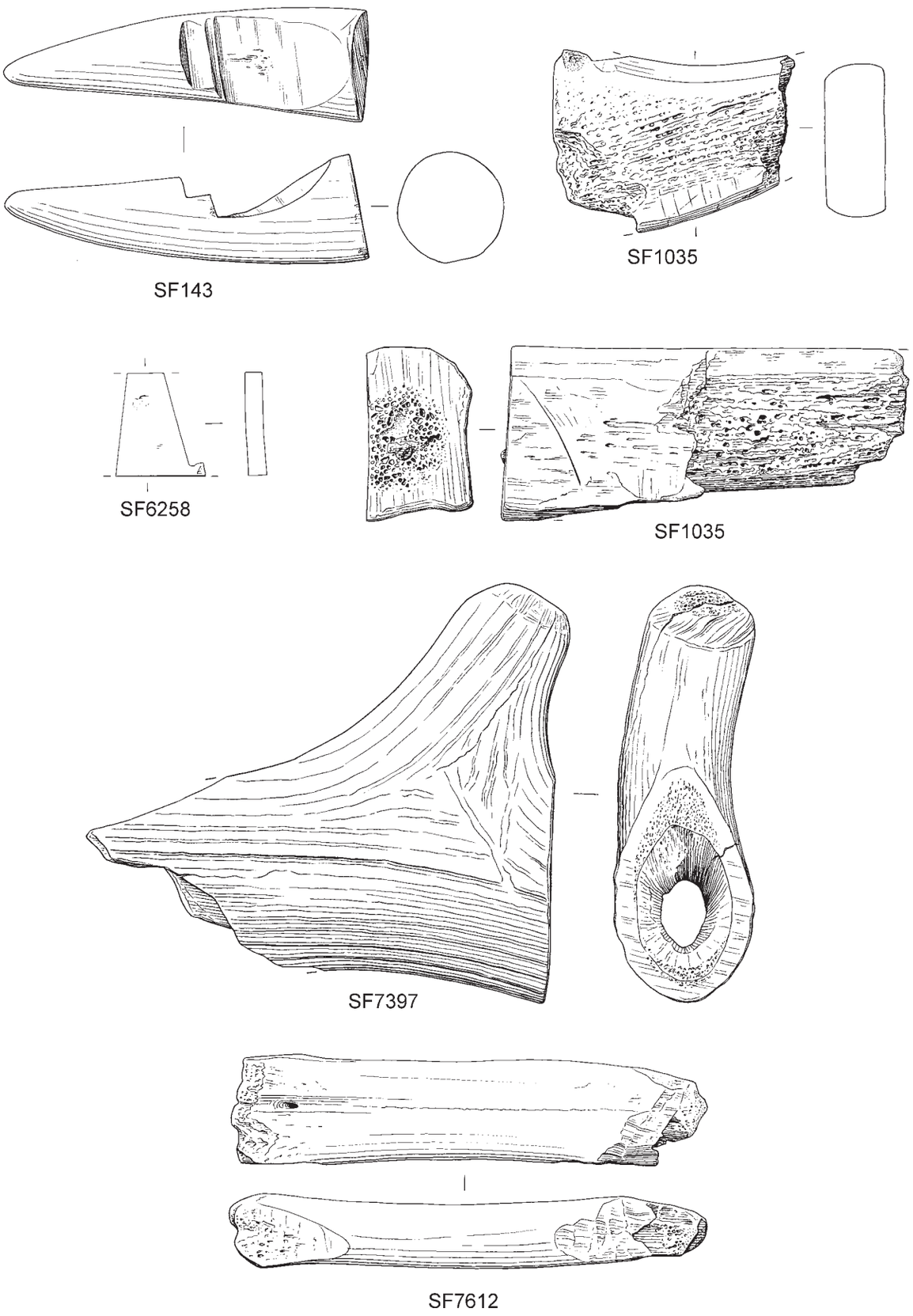


Figure 10.64 Antlerworking waste (SF143, 1035 x 2 & 6258); antler hammer (SF7397); faceted bone (SF7612). Scale 1:1

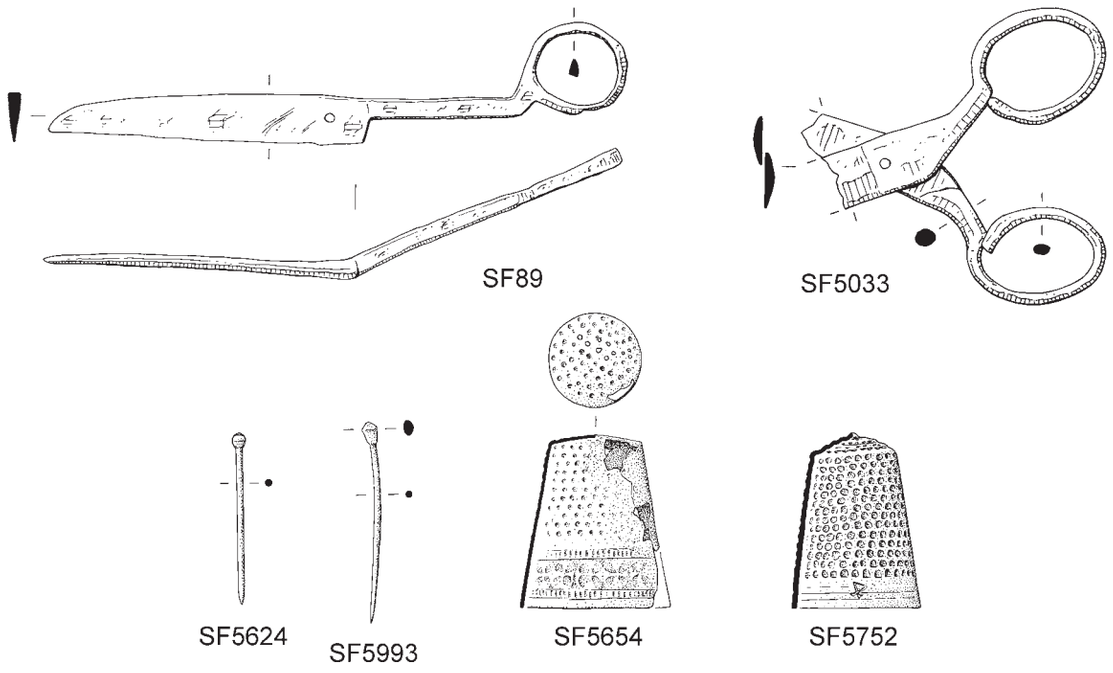


Figure 10.65 Iron scissors (SF89 & 5033); copper alloy dress-making pins (SF5624 & 5993); copper alloy thimbles (SF5654 & 5752). Scale 1:1, ironwork at 1:2

served as shroud pins (see 'Dress Pins' above).

Two pins with coiled wire heads were found in pits at the Golden Ball Street site. Both were relatively long at 34mm and 37mm in length (not illustrated).

SF5624 Small dress-making **pin** with spherical head. L: 23mm.
12351, fill of pit 12350, Period 6.2, T47/2

SF5993 Small dress-making **pin** with solid flattish head and white-metal coating. L: 27.5mm.
90251, fill of posthole 90296, Period 7.2, G9/76

Copper alloy thimbles
by Alison Goodall
(Fig.10.65)

Three thimbles came from post-medieval deposits, with another two of similar date found unstratified. The two illustrated examples (SF5654 and SF5752) may date to the late 16th to 17th century. The others are earlier types and one is detailed in Chapter 8.III. The two illustrated examples are both hand-made, machine-made types being introduced in the 17th century (Margeson 1993, 187).

SF5654 Tall **thimble** of thin sheet with straight sides and rim. The rim is decorated with a band of stamped cross-in-circles between billeted and grooved borders. The sides and top are covered with a spiral of small circular hand-made indentations.
10000b, unstratified

SF5752 **Thimble** with straight sides, double-stepped rim, and spiral of sub-rectangular hand-made indentations covering sides and top. The indentations on the top for alternate whorls of closely-spaced and more widely-spaced marks. A maker's mark is placed at the beginning of the spiral.
80000, unstratified

Leatherworking
by Quita Mould

The shoe parts recovered from fills of the barbican ditch (G9/41; see further details above) were heavily worn and several repairs were noted secured by wooden pegs. Occasional repair clumps made from reused shoe soles were found (*e.g.* SF6184.2, not illustrated). Some 15% of the bottom unit components and 4% of the surviving uppers had been deliberately cut up before being discarded which, together with the lack of complete shoes recovered, suggests that the shoe parts found are debris from a cobbler's workshop. A relatively modest quantity of waste leather was recovered from the same deposits, chiefly secondary waste (64 fragments) with a small number of primary waste pieces from the cutting away of hide edges (3 pieces). This leather waste may also be cobbling debris, the trimmings *etc.* coming from the cutting of clump repair pieces to shape, and is likely to be associated with the shoe parts recovered. An iron awl (SF5638.1, not illustrated) which may have been associated with leatherworking was recovered from a 17th-century context. Further comments on leatherworking are given in Chapter 13 and Part III.

Antlerworking
by Julia Huddle, with Umberto Albarella, Mark Beech and Jacqui Mulville
(Fig.10.64)

Antler was regarded as a good working material and many pieces recovered from the Castle Mall site are chopped or sawn (Plate 10.15). It was probably imported to the site as part of a general antler trade. A total of 24 pieces of antlerworking waste were recovered from post-medieval deposits, along with four strip fragments and two, probably residual, wedges (see Chapter 4.III). The majority of

the primary waste, in the form of sawn tine (*e.g.* SF1035), was concentrated around the top of the barbican well (18 pieces; Period 6.1, G5/52) and was recovered alongside late 16th- to early 17th-century pottery. A strip fragment came from the same deposits along with a possible unfinished knife scale (SF5683), antler knife scale (SF5649), antler-handled knife scraper (SF5656), whittle tang handle (SF5660) and an unidentified antler tool (SF7223). These items are detailed elsewhere in this chapter and the concentration of both primary and secondary waste in the same context as completed objects may indicate the manufacture of antler knife handles in the vicinity. Most identifiable pieces of were from red deer, although fallow deer was also represented.

Another concentration of both waste material and completed objects, at least some being residual, came from post-medieval fills of the barbican ditch in Area 9 (G9/41) which also contained evidence for ivoryworking (see Riddler below). The group included sawn antler (x 3), a strip, two wedges of Late Saxon type (see Chapter 4.II), two combs and a sawn and further worked section of antler (SF7397) which may have been used as a hammer. Unlike the example from Castle Mall, previous hammers found on British excavations have a transverse perforation running through the severed brow tine into which a narrow handle would have been inserted whilst the head of the hammers were formed at the face of the sawn-off burr (MacGregor 1985, 172, fig. 90. no a). Apart from one from a 13th- or 14th-century context, previous examples are mostly from undated contexts.

Further comments on antlerworking on the site at all periods are given in Chapter 13 and Part III.

SF143 **Sawn antler** tine end, with cut-out 'notch' at wider end, possible wedge.
92741, fill of barbican ditch 91295, Period 6.2, G9/41

SF1035 **Sawn antler**. Sawn sections of antler tine x 4 pieces, with the cancellous tissue on two sides removed on each piece. Red deer antler.
50077, makeup dump, Period 6.1, G5/52

SF6258 Trapezoidal **strip** with small projection at base, tooth plate trimming.
91408, makeup dump, Period 6.2, G9/43

SF7397 **Artefact**, ?hammer. Sawn section of antler beam and tine with the tip of the tine removed and the end filed down to form a smooth rounded end; incomplete section of beam is hollowed out (? for insertion of a wooden shaft). Red deer antler.
92762, fill of barbican ditch, Period 6.2, G9/41

Hornworking

by Umberto Albarella, Mark Beech and Jacqui Mulville, with Julia Huddle

(Plates 10.17–10.18)

Although there was limited evidence from the site to suggest the use of cattle hooves as a raw material (see Part III), the keratinous material that its post-medieval inhabitants mainly utilised was horn. The assemblage of 185 cattle horncores, 69 of which bear chop or cut marks, found at Castle Mall is distributed throughout all periods although major concentrations were found in Periods 2 (see Chapter 5.III) and 6, sheep/goat horncores having dominated the Period 5 assemblage (Chapters 8.III and

Plate 10.15 Red/fallow deer antler, sawn tine

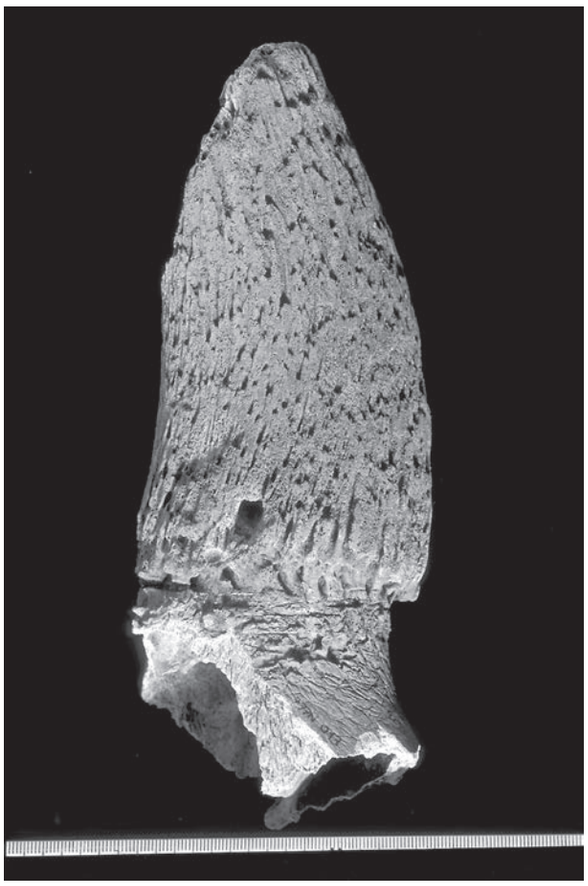


Plate 10.16 Cattle horncore, sawn near base

Species	*G5/52*	*G9/41*	*G48/10*	*G1/116*	***Total***
Sheep/goat	0	4	2	1	**7**
Cattle	3	31	2	0	**36**
Total	**3**	**35**	**4**	**1**	**43**

Table 10.42 Horncores from Period 6 deposits

9.III). Most chop and cut marks are located at the base of the horncore (Plate 10.16) and were presumably made to separate the horncores from the skull and to remove the horn sheath from its bony core. This was generally done after soaking the horncore in water for some weeks (MacGregor 1985), but it could also be done through desiccation (Keith Dobney pers. comm.). Strangely, two of the Period 6 horncores had been sawn rather close to their tips (Plates 10.17 and 10.18), perhaps to help the separation of the horn sheath or because there was some specific interest in the horn tip or, more likely, in producing a flat sheet of horn (thanks are extended to Keith Dobney for this suggestion).

The horncores were notably concentrated in barbican ditch fills (G9/41, Period 6.2), although given the scale of deposition here this is hardly surprising. The presence of other bone-, antler- and ivoryworking waste within the deposits around the well and fills of the barbican ditch may attest to the use of several parts of various animals for the manufacture of a range of objects in the vicinity. One of the cattle horncores from the large quarry (G48/10) was clearly of a large long horn type, although metrical data indicates the presence of many others (see Chapter 10.IV). Further comments on hornworking in general are given in Chapter 13.

Boneworking

by Julia Huddle, Umberto Albarella, Mark Beech and Jacqui Mulville

(Fig.10.64; Plates 10.19–10.21)

Sawn cattle bones, mainly metapodia (Plate 10.19), illustrate the use of the robust metapodium shaft to make tools. Evidence of boneworking was less common for sheep than for cattle, although a few cases were noted, including the faceting of sheep metapodia. The presence of a hole in the proximal end of another metatarsus from Period 6 (Plate 10.20) indicates that this bone had been used as a handle.

In addition to the items identified during analysis of the faunal assemblage, ten sawn-off articular ends of long bones were Small Found, of which six are cattle-sized, one is a deer bone, one a horse bone and one sheep/goat. The assemblage came from deposits ranging in date from the 12th to the 18th century, although most are from post-medieval deposits (x 7). Whilst sawn-off articular ends of longbones are evidence of boneworking, found on their own they are not enough to determine precisely what the missing shafts were used for. Although some of the bones found at Castle Mall may have been redeposited, it is perfectly possible that they indicate post-medieval activity (*e.g.* handle or comb manufacture), comple-

Plate 10.17 Cattle horncore, sawn near tip, from late 17th-century barbican ditch fill *92750* (Period 6.2)

Plate 10.18 Cattle horncore, sawn near tip

menting other evidence relating to the use of antler and ivory.

A few horse bones from post-medieval deposits at Castle Mall had been worked or sawn. Horse bones are very robust and, like cattle bones, make very good tools. Amongst the worked specimens were two quite remarkable right mandibles found together in one of the barbican ditch contexts (Period 6, SF421). Both mandibles are polished at the bottom as a consequence of severe and continuous wear. Their probable use as a sledge is detailed by Huddle under 'Diversions', this chapter.

Other chopping marks were also probably associated with boneworking. A group of cattle and sheep metapodia from Period 6 had been subject to some faceting, including 16 chopped cattle metapodia which were Small Found (pits G1/24 x 2, barbican ditch fill

Plate 10.19 Cattle metatarsus, sawn

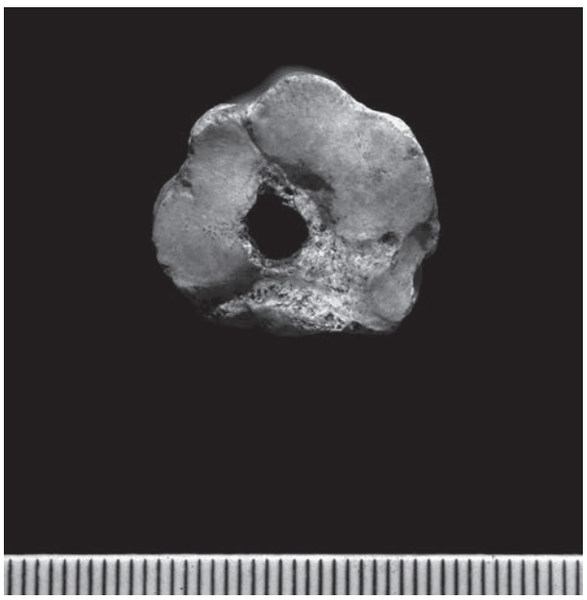


Plate 10.20 Sheep metatarsus with hole in proximal end

Plate 10.21 Boneworking: cattle and sheep metapodia

G6/33 x 1, pits G8/29 x 13). Although these pieces are recovered from different areas of the site, they all bear remarkably similar chop marks (*e.g.* SF7612 and Plate 10.21). Similar evidence has been found on another metatarsus and a series of metacarpi from Period 6. All of the pieces are trimmed off at the proximal ends with several (?knife) chops forming blunt points. Several of the pieces have their distal epiphysis unfused and absent and apart from two examples where the distal epiphysis are missing, each piece has some slight lateral trimming to the distal ends.

The function of these objects remains a mystery, although they may result from a preliminary stage in bone tool/artefact production which was subsequently abandoned. It is possible that these are blanks or rough-outs for items such as handles or skates. No attempt has been made, however, to trim the anterior or posterior epiphysis at the distal ends, which would have been required for skates to form a smooth contact with the ice. This interpretation therefore seems doubtful, particularly as different stages in production are not represented. An alternative suggestion is the production of socketed bone points which are also manufactured from the metapodials of cattle. The 'point' is formed at the distal end of the bone by chopping obliquely across the diaphysis (see MacGregor 1985, 174–5). Although socketed bone points are unidentified in terms of function, MacGregor notes that the tips are often smoothed from use in a manner which would indicate they were used with a thrusting or stabbing motion. No such wear is evident on any of the Castle Mall pieces.

Other boneworking waste includes a sawn section of cattle-sized long-bone (SF308, not illustrated) recovered from barbican ditch fills (an almost identical piece was recovered from Period 5.1; SF5833; Chapter 8.III). Three other bone fragments show evidence of having been cut using a saw, although it is impossible to identify these offcuts as coming from any particular boneworking activity. A sawn sheep pelvis from post-medieval fills of the barbican ditch (G9/41) demonstrates that saws were being used as butchery tools by this period, and not just for boneworking. An incomplete section of worked bone (SF252, not illustrated, from modern deposit) as been lightly incised with lines. This piece may have been used by a bone worker as a practice piece.

SF7612 **Faceted bone**. Cattle metacarpals x 7 pieces; trimmed off at proximal ends with several chops, forming blunt points; slight lateral and medial trimming at distal ends; distal ephysis unfused and absent.
80186, fill of pit 80188, Period 6.2, G8/29

Ivoryworking
by Ian Riddler
Two sections of ivory waste (0.140kg) came from separate contexts within related dumps into the barbican ditch (G9/41). Each piece has been sawn laterally across the tusk at one end and chopped irregularly at the other by a knife. In each case, only the outer 8–10mm of tissue remains, whilst the inner core is absent. It appears, therefore, that this outer part of the tusk was discarded at an early stage of the working process. This small quantity of waste can be related to a series of post-medieval ivory objects from the site which include implement handles, combs and a single example of a scoop. In addition, a flat segment of bone can be identified as a 'trial piece' for ivory comb manufacture (see 'Combs' above).

Horticultural and Agricultural Tools
by Quita Mould
(Fig.10.66)
A small range of agricultural and horticultural tools was recovered, including the remains of iron shoes from wooden spades (SF1040 and SF5739) and a pruning hook (SF6354). Animal husbandry was represented by a

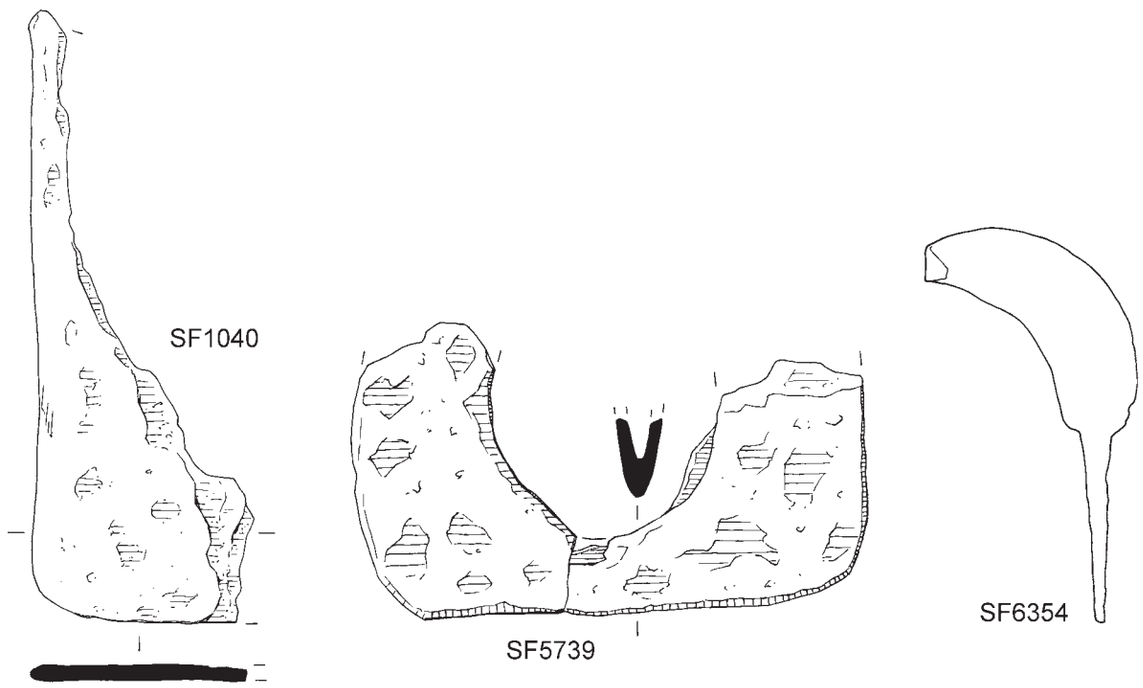


Figure 10.66 Spade shoes (SF1040 & 5739); iron pruning hook (SF6354). Scale1:2

fleam, a blood letting knife (SF5, not illustrated), with the remains of a folding iron blade and a copper alloy handle which was found in a gully within the barbican ditch (Period 6.2).

SF1040 Angular **spadeshoe** with shouldered v-shaped blade at right angle to the rectangular-sectioned strap handle. L: blade 150mm, 37mm, handle ht: 170mm.
12351, fill of pit 12350, Period 6.2, GT47/2

SF5739 **Spadeshoe**. Two fragments with angular blade and rectangular, upstanding arm with a small v-shaped socket along its interior edge. Arm ht: 86mm, blade w: 43mm.
40341, fill of barbican ditch, Period 6.3, G2/37

SF6354 Small **pruning hook** with crescentric curving blade with bent tip and straight tang. L; 118mm, blade w; 25mm.
91439, fill of barbican ditch 91295, Period 6.1, G9/41

Mortars

The single mortar recovered from post-medieval deposits (SF6175) was of medieval type and is described in Chapter 7.III.

Whetstones

by J.M. Mills and D.T. Moore

Four whetstones came from post-medieval deposits. Of the three Coal Measures Sandstone hones from the site, two are shaped and derive from 16th-century or later deposits. It is impossible to base any firm conclusions on these observations, but it is possible that the earliest sandstone hones are not deliberately shaped products and it is only in the post-medieval period that deliberately shaped sandstone hones are imported. The absence of Coal Measures Sandstone from the barbican well (Chapter 9.III) adds weight to this suggestion.

The Coal Measures Sandstones are more coarse-grained than the other types and are perhaps better suited to initial sharpening. One example (SF5922, not illustrated; pit 90402, G9/114, Period 6.2) is broken in two; the broken ends are covered in a red substance which remains unidentified. This may represent a paste used in an attempt to mend the stone, or these ends may have been used to grind pigment.

It has been suggested in the context of querns study (Smith and Margeson 1993, 202) that European stone may have been cheaper to transport (by sea) to Norwich than stone from less distant sources such as Yorkshire. The prevalence of non-British stone in the Castle Mall assemblage adds weight to this suggestion. This stone with a British source, the Coal Measures Sandstone, probably came from the Midlands or from south Yorkshire. It is interesting to note that only a small percentage of all the Norwich hone assemblages are from this source and that equally small quantities of pottery from Yorkshire and the Midlands have been found in Norwich (Jennings 1981, 37 and 147), whilst a wealth of ceramics were imported from Germany and Holland.

Querns

by David Buckley

Of the three querns recovered from post-medieval deposits one (SF5911, not illustrated, pit 80188, Period 6.2, G8/29) may be the end product of reworking of a lava quernstone to produce a small circular disk. Such evidence is not unusual in an area noted for its limited supply of local building stone. Margeson (1993, 239) noted the reuse of lava querns for hearths or as building material from elsewhere in Norwich.

Commercial Activity

Coins

by John Davies

A total of nineteen coins span the period late 16th- to 18th (/19th) century, of which only five came from post-medieval deposits. The only silver issues are sixpences of James I (1607) and two of William III (1694–1702 issues). The remainder are pennies, halfpennies and farthings of the period from Charles II onwards (from 1672). Later coins continue the sequence to Victoria. A single further coin came from the Golden Ball Street site. Those from the barbican ditch and contemporary post-medieval features are catalogued below; details of the remainder are held in the project archive.

SF18 **William III sixpence**
AD 1694–1702
Wt: 2.52g
92750, fill of barbican ditch, Period 6.2, G9/ 41

SF650 **William III farthing**
AD 1699
Wt: 5.69g
40866, fill of barbican ditch, Period 6.2, G48/4

SF1037 **William III halfpenny**
AD 1694–1702
Wt: 7.19g
50079, fill of post-hole 50080, Period 6.3, G5/2

SF1057 **William III halfpenny**
AD 1694–1702
40411, external dump, Period 6.2, G48/2

SF6859 **Charles II farthing**
AD 1674
Wt: 5.54g
48085, fill of quarry, Period 6.3, G48/10

Jettons

by John Davies

A group of thirty-four jettons came from the Castle Mall excavations, with a further two from Golden Ball Street. Of the former group, seven came from the barbican well (see Chapter 9). Only five of the remainder were found stratified in post-medieval deposits, although a small group was found within a possible purse from the barbican ditch (see A. Popescu below).

The most numerous group here are the twenty Nuremberg jettons, which all date from between 1500–1651. The types of jetton present contrast with those from the adjacent Greyfriars site, where German jettons were less common than the earlier English and French examples (Davies 2007). However, that situation is unusual and Nuremberg jettons are the most common types found in the city generally, as reflected in the finds accumulated during the Norwich Survey (Margeson 1993, 206–9).

Jettons in ?purse

by Adrian Popescu

During the excavations, six German brass jettons were found within the remains of a possible mineralised silk purse lining (the silk, SF7080, was unstratified, but known to be from fills of the barbican ditch; see Crowfoot above). All six of them are of the well-known 'Rose/orb' type, the commonest of the Nuremberg counters that reached England in huge quantities in the second half of the 16th century. Jettons were used as counters but their presence in large numbers even in the countryside raises the possibility that they were used as small change (Palmer and Mayhew 1977, 88) or in board games (Dyer

1997, 40; see also Allen 2004, 35). It is useful to mention in this context that an English issuer modelled his tokens, produced between 1648 and 1672, on the Nuremberg jettons of the above type (Williamson 1891, 1423, nos 36–38). An example of these very rare tokens, the only one to the author's knowledge with a find spot, was excavated on the site of Norwich Cathedral refectory (Popescu 2006, 48).

The Castle Mall group is very important, since it was probably lost with its purse. It is documented that the counters were usually sold or presented in leather or textile bags of fifty or one hundred pieces (Barnard 1916, 83–84; Grierson 1975, 163). The fact that two of the jettons (SF6558 and SF6558.02) were struck with the same pair of dies and were found still together indicates that the bag and its contents were lost not long after the jetton's distribution. The precise date at which this occurred is very difficult to establish, as such artefacts are notoriously difficult to date, their production spanning a long period. As most of the jettons from this group, except for one (SF6558.01), have randomly orientated die axis, it is very probable that they were lost before or around the introduction of the minting reforms (Mitchiner 1988, 312) of the early 1580s.

Only those jettons associated with the possible purse are catalogued below. Others (see Davies above) are detailed in the project archive. Catalogue entries are presented in broad chronological order:

Nuremberg

Hans Schultes I (fl. 1553–1584)

SF6558.03 **Jetton**. Rose/orb type. Obverse: ▼HANS▼SHVLTES […]POR[…], three crowns alternate with three *fleurs de lis* around six-petal rose. Reverse: ▼HANS▼SCHVTES▼RGFHLI; imperial orb surmounted by cross patty (*Reichsapfel*) within trefoil. *Cf.* Mitchiner 1988, 1357. Æ II 1.82g, 24mm. AD 1550s. Very finely woven textile (silk) underlying bottom jetton in stack. This is given a separate number — SF7080 (see Crowfoot above).
22222, unstratified from barbican ditch

SF6558.04 **Jetton**. Rose/orb type. Obverse: ▼HANS▼SHVT▼FGGRNVIF, three crowns as above. Reverse: ▼HANS▼SCHVLT[E]S▼RGFGI, imperial orb as above. *Cf.* Mitchiner 1988, 1357. AD 1550s. Æ I 1.35g, 25mm.
22222, unstratified from barbican ditch

SF6558.05 **Jetton**. Rose/orb type. Obverse: ▼HANS[▼]SHVLTES[▼]GIN, three crowns as above. Reverse: ▼HANS[▼]SCHVTES[…]GIF, imperial orb as above. *Cf.* Mitchiner 1988, 1357. AD 1550s. Æ VII 1.28g, 25mm.
22222, unstratified from barbican ditch

Egidius Krauwinckel (fl. 1570–1613)

SF6558.01 **Jetton**. Rose/orb type. Obverse: DNGCV KVNGKV DGDK, three crowns as above. Reverse: (Lis) DKCVBθBCKVθDCθGCKW, imperial orb as above. *Cf.* Mitchiner 1988, 1440. Æ XII 1.86g, 25mm.
22222, unstratified from barbican ditch

SF6558 **Jetton**. Rose/orb type. Obverse:+KVNCVNBVG (Four annulets) DNCGGBVN, three crowns as above. Reverse: (Lis) DNKCGЄACЄCGCЄGNCIG, imperial orb as above but outside of trefoil, three pairs of annulets. *Cf.* Mitchiner 1988, 1441. Æ III 1.27g, 25mm.
22222, unstratified

SF6558.02 **Jetton**. Rose/orb type. Obverse:+KVNCV[.]BVG (Four annulets) DN[..]GKBVN, three crowns as above. Reverse: [Lis] DNKCGЄACЄCGCЄGNCIG, imperial orb as above. *Cf.* Mitchiner 1988, 1441. Æ III 2.29g, 25mm. Struck from the same dies as the previous one.
22222, unstratified from barbican ditch

Tokens

by John Davies

(Fig.10.67)

Tokens comprise a major component of the numismatic assemblage, twelve coming from post-medieval deposits, although a total of thirty-seven came from the site as a whole, of which three are medieval types (the remainder being intrusive in earlier periods or unstratified). A single additional example came from the Golden Ball Street site. Four tokens came from fills of the barbican ditch (G9/41): of note amongst the group is SF6506, for which no parallel has been found. The lettering may relate to a street or ward within the city.

The most numerous component of the whole group is that of royal farthing tokens. Four are types of James I; one Harrington and three Lennox rounds. Sixteen are types of Charles I; twelve Richmond rounds and four Rose farthings. Other examples include seven Norwich farthings, one of Yarmouth and one of Wisbech (Cambridgeshire).

Only the illustrated token is catalogued below. Details of the remainder of the assemblage are available in the project archive.

SF6506 **Lead token**
16th or 17th century
Obv: ---AWS---STWARD; monogram in centre: S over A or V over S
Rev: ---TI…ST---D… ; crown in centre
91453, fill of barbican ditch 91295, Period 6.1, G9/41

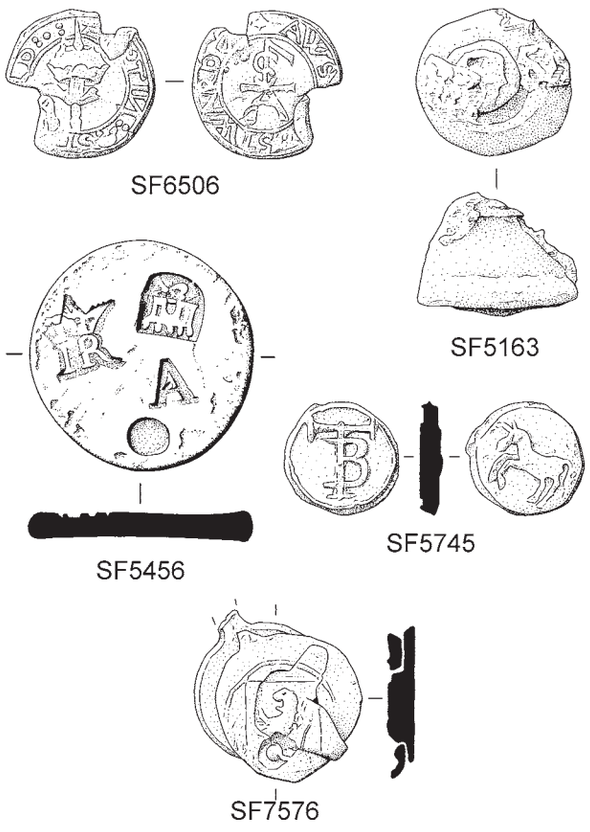


Figure 10.67 Lead token (SF6506); copper alloy weight (SF5163); lead weights (SF5456 & 5745); lead cloth seal (SF7576). Scale 1:1

Lead weights
by Julia Huddle
(Fig.10.67)
Few official weights, similar to SF5456, seem to have been in existence during the post-medieval period and most of these were made in the City of London (Le Chaimant 1979). Three are known with the stamp of the Norwich 'Arms', one is a Charles I weight from Oak Street, Norwich (Margeson 1993, 206, fig.157, no.1584) and one from Jarrolds Print works, Norwich (Emery and Ayers, 1997). The third is an Elizabeth I weight from a garden in Wymondham (Le Chaimant 1979).

A further six cast circular lead discs and one conical lead object were recovered at Castle Mall. These bear no official stamps and are probably unofficial merchant's weights or domestic weights. Lead discs incorporating initials and probable merchant's marks (such as SF5745) may have been used to pay labourers, or to signify units of merchandise. A similar lead disc was found from a late 17th- to mid 18th-century context at Pottergate, and may be a token (Margeson 1993, 210, fig. 158, no. 1755). SF5163 is irregular in shape and cannot be compared with the official weights.

SF5163 Slightly irregular hemispherical **lead weight** with possible copper alloy loop at top, and iron corrosion adhering. H: 18mm. Wt: 23.7gm.
10527, fill of trench 10528, Period 7.2, G1/159

SF5456 Official merchant's **lead weight** stamped with crowned IR, for James I, A for 'Avoirdupois', the castle and lion of the Norwich 'Arms', and one circle indicating one ounce. Actual weight is 25.7gm (0.91oz).
11012, fill of pit 11013, Period 6.1, G1/24

SF5745 Cast **lead disc**; Obv:. Initials T.B., Reverse: a stylised figure of a horse. Wt: 4.50g.
40000, unstratified

Lead cloth seal
by Geoff Egan
(Fig.10.67)
An unstratified cloth seal was recovered from Area 47. No parallel for the stamp is known. Single incuse letters sometimes occur on the 16th/17th-century official alnage seals; pairs and groups of three letters (presumably indicating individual artisans working for a wealthy capital owner) are not infrequently found in clothier's/weaver's seals, though usually on the otherwise blank disc opposite the one with the main stamp. A more complete example of the present stamp (perhaps initials ?) will be needed to take the interpretation further.

A two part cloth seal (GBS SF58, not illustrated) came from the Golden Ball Street site (pit *298*, Open Area 51, Property 47/h, Period 6.2). It is from Augsburg (*cf.* Egan 1994 106 fig. 41) and dates between the 16th and early 17th century.

SF7576 **Cloth seal**. Two-disc seal, for a textile; both discs 20mm, connecting strip broken off. Scratches (probably random),// shield with lion rampant (illegible at base), in beaded border; incuse c. Probably a clothier's or weaver's seal to indicate the person in whose name the textile was marketed.
47000, unstratified

Diversions

Games and Pastimes

Ceramic whistle
by Irena Lentowicz
(Fig.10.68, Plate 10.22)
A ceramic bird whistle recovered from fills of the barbican ditch (SF7514) probably dates to the late 16th or early 17th century. Bird whistles are common throughout north-west Europe in the medieval and post-medieval periods, although they are rare in Britain. Such objects would have been filled with water to produce a warbling noise, serving as a child's toy. The Norwich example joins a handful found elsewhere, including London, Southampton and Warwick (Hurst *et al* 1986, 236). They were made in a number of places including south-west France, central Germany and the Low Countries. The Castle Mall example is of German whiteware.

SF7514 Polychrome **bird-whistle** moulded from fine buff-coloured clay with glossy multi-coloured glazed decoration. The eyes

Plate 10.22 Late 16th- to early 17th-century German whiteware bird whistle from the barbican ditch

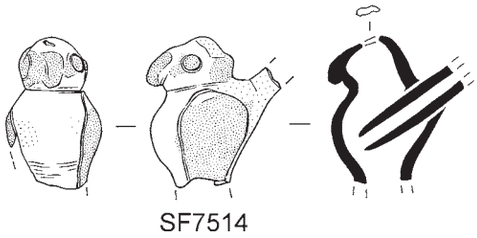


Figure 10.68 Ceramic bird whistle (SF7514). Scale 1:2

and wings are picked out with incised lines and these, along with the beak and ears, are coloured brown. The breast is yellow and the back and whistle apple green. The top of the head is pierced to allow for the whistle outlet. H: *c.*50mm. unspecified fill of barbican ditch 91295

Bone sledge runners

by Julia Huddle, with anatomical description by Umberto Albarella, Mark Beech and Jacqui Mulville

(Figs 10.69–10.70, Plates 10.23–10.24)

The runners of a child's sledge, consisting of a pair of horse jaw-bones, were recovered from the post-medieval fills of the barbican ditch. Such sledges are constructed from the mandibles of horse or cattle, with a plank seat fitted over the teeth. Both of the Castle Mall mandibles are polished at the bottom (Plates 10.23 and 10.24) as a consequence of severe and continuous wear. The sledge comes from a deposit firmly dated to the late 17th century, both by pottery and a coin of William III (1694–1702).

Few parallels are known from archaeological sites. An example from Dordrecht, Holland came from a ?14th- or 15th-century context, while an unpublished example is from a medieval deposit excavated at Ebor Brewery, York (MacGregor 1985, 146). Further evidence comes from ethnographical sources and paintings, particularly during the 16th and 17th centuries (Fig.10.70A and B). The earliest illustration known is in the margins of an early 14th-century Flemish manuscript, held in the Bodleian library, Oxford (MS Douce 5, f. 1a; reproduced by Ijzereef 1974). Other jaw-bone sledges are depicted in paintings by Pieter Bruegel the Elder, including one in the painting of *St George Gate* at Antwerp (dated to 1555) and another in the *Adoration of the Magi* in 1557 (also reproduced in Ijzereef 1974). These depictions all show a young child sitting between two jaw-bones, each facing the front of the jaw. Later paintings (17th century) by other Dutch artists such as E. Van de Velde and A. Van der Neer, report the same subject. One illustration by Hendrik Avercamp of *c.*1620, shows a child sitting the opposite way so that it is facing the back of the jaw (reproduced by Ijzereef). In each case the child is shown holding two poles used to propel themselves along the ice.

Although none of the paintings mentioned above show more than two jaw-bone runners, Ijzereef has suggested that the fragment from Dordrecht was an inner runner, one of initially four runners making a catamaran-like sledge. This idea is based on calculations he made on the angle of wear marks visible on the sliding edge of the runner and the removal of the vertical ramus of the jaw-bone.

It is not clear from the paintings, or from any of the excavated material, how the seating plank was attached to the runners. The painting by Avercamp shows a (?wooden) dowel through the side of the jaw. As with the two previously excavated examples noted above there are no attachment holes present on the Castle Mall runners. Similarly there are no grooves or highly polished areas, which might suggest a plank had rested or had been attached to a particular part of the jaw-bone. If a plank had merely rested on the top of the jaw over the teeth, it seems highly likely that the runners might have flipped over, or have come away from the plank entirely. The seating plank may have been tied on with rope at the front and back, making the whole sledge more robust.

Smaller jaw-bones were also used as skates and a bone skate was recovered from the same ditch fill (see below). Henry Balfour discusses the use of lower jaw-bones of horses or oxen as sledge runners and sheep jaw-bones as skates (Balfour 1898). The jaw-bone skate consists of a piece of wood shaped for the foot to rest upon, with three leather loops to attach it to the foot to (Fig.10.70. c). The wooden foot rest is itself fixed to the lower sheep mandible.

Balfour gives a rather lovely reference for horse jaw-bone sledges in use in southern Germany where 'These provided a regular winter amusement for the boys of the town, who used to toboggan down the sides of the moat under the old town wall' (Harnmann 1882). It is pleasing to imagine also the children of Norwich sledging down

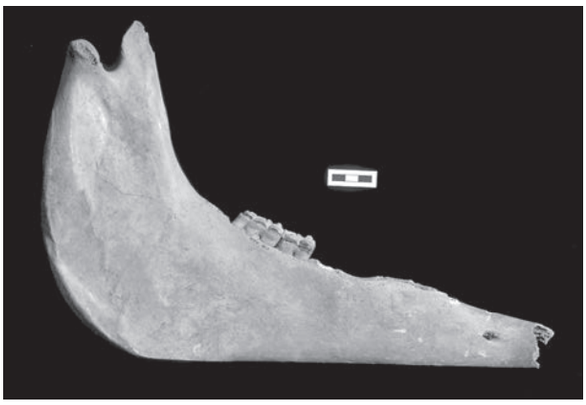


Plate 10.23 Horse mandible forming part of a child's sledge (SF421) found in the barbican ditch (fill *92750*, Period 6.2)

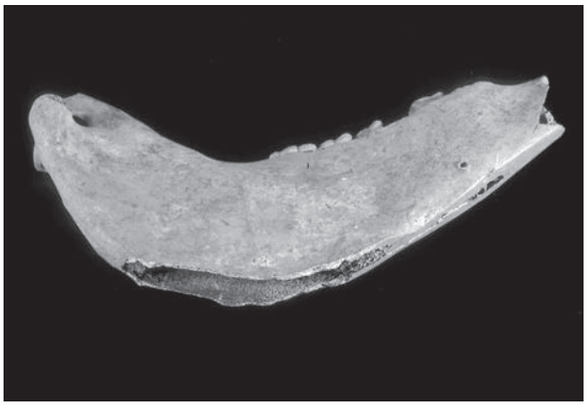


Plate 10.24 Horse mandible forming part of a child's sledge (SF421) found in the barbican ditch (fill *92750*, Period 6.2)

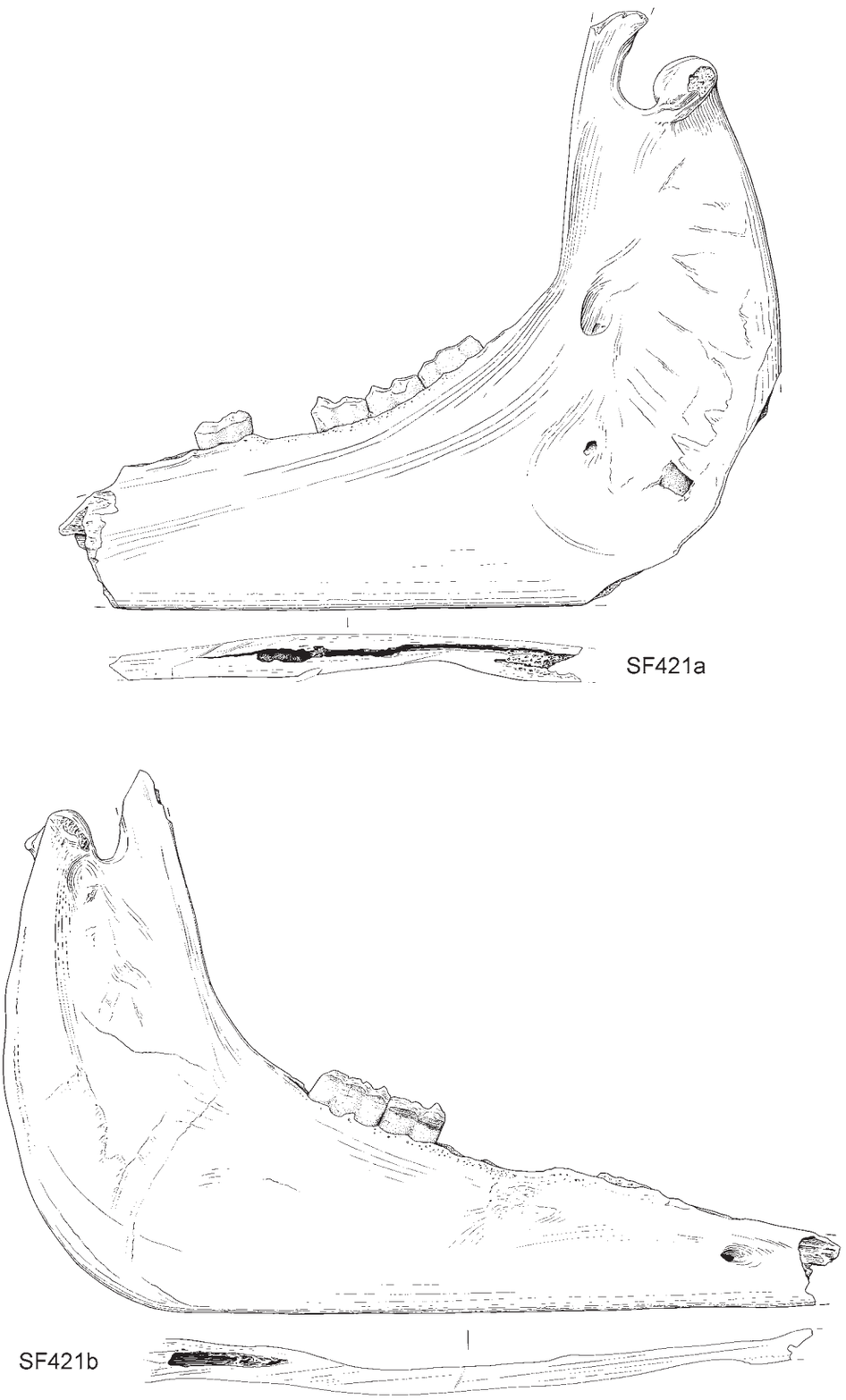


Figure 10.69 Bone sledge runners (SF421 x 2). Scale 1:3

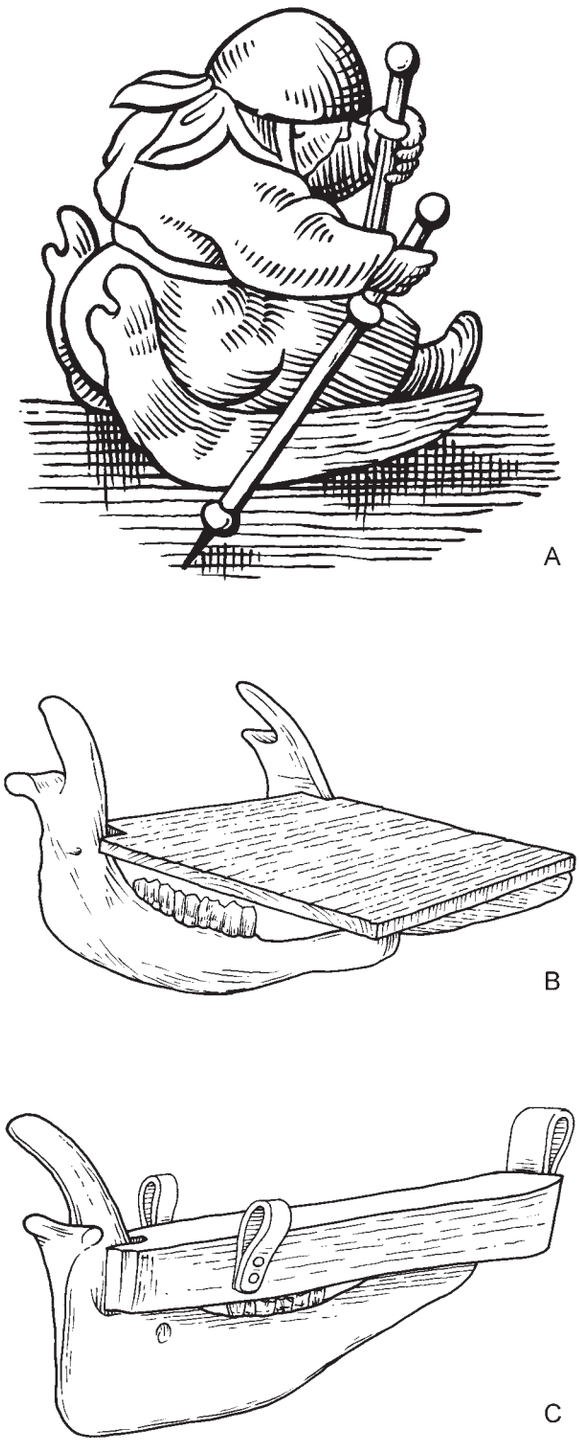


Figure 10.70 Jaw-bone sledges and skates (after Balfour 1898, fig.8–10). A – child on a jaw-bone sledge, taken from a Dutch engraving representing sports on the ice in the town ditch at Antwerp, 1594 (Chambers 1869, Vol.II, 787); B – jaw-bone sledge from Pomerania (Virchow 1887, 362); C – jaw-bone skate from Pomerania (Virchow 1887, 362)

the sides of the barbican ditch. Given the attested presence of these jaw-bone sledges in Holland, it is possible that the Castle Mall sledge runners were made by a Dutch immigrant (or 'Stranger') in Norwich during the late 16th or 17th century. Other finds from the site, such as a copper alloy head-dress pin recovered from the barbican ditch, are thought to have been brought over by the Dutch immigrants and the jaw-bone sledges may also reflect their presence in Norwich (see further discussion in Chapter 10.VI).

SF421 Two **sledge runners** each made from a lower right horse mandible. Runner a) lower right horse mandible, length 340mm. Front part of jaw broken, two premolars missing (lp2 and lp3). Top vertical ramus and back ?lower curving edge broken. Polished flat bottom surface 220mm long, worn at back and centre to expose medullary cavity. Runner b) lower right horse mandible, length 385mm. Front part of jaw broken, four teeth missing (lp2, lp3, lp4 and lm1). Very top of the vertical ramus broken. Polished flat bottom surface 300mm long, worn at rear to expose part of medullary cavity.
92750, fill of barbican ditch, Period 6.2, G9/41

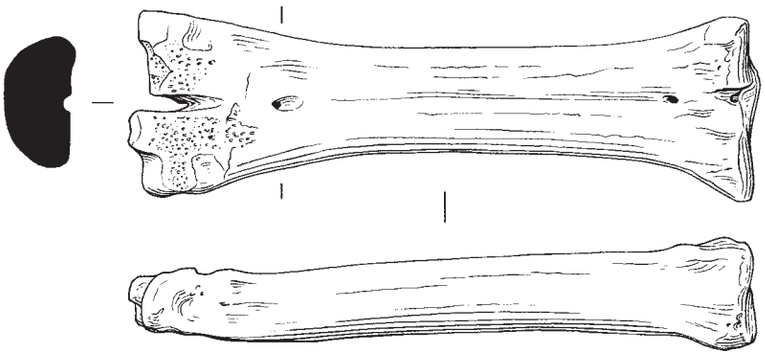
Bone skates
by Julia Huddle
(Fig.10.71)
A post-medieval bone skate (SF166, not illustrated) and a possible unfinished skate (SF5746) were recovered from fills of the barbican ditch and from a modern dump on the Castle Mound respectively. There are accounts of the use of bone skates in various parts of Europe into the 20th century (Parrington 1979, 1–25). They were in use in London until the 18th century and could still be found in the Fens at the turn of the last century (Smith 1848; Layard 1908, 43).

SF5746 would have been of little use as a skate, since neither side of it is sufficiently flat to form a smooth contact with the ice. Despite the fact that the articular surfaces at the proximal end on the anterior surface have not been trimmed, there are faint wear marks on its surface. This may have been an unfinished skate which was put briefly to some other use, such as smoothing or rubbing.

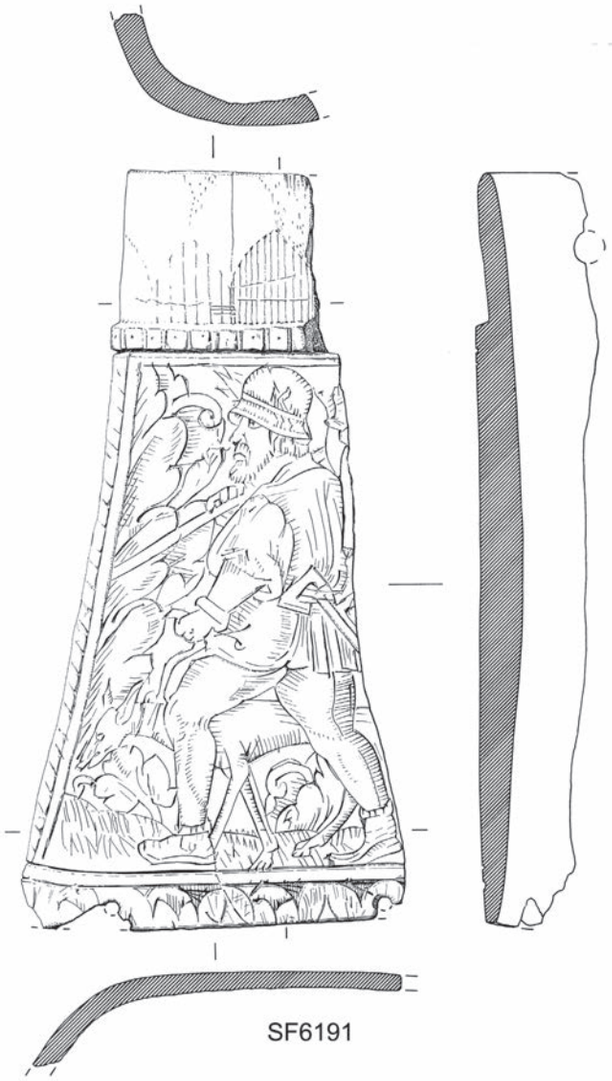
SF5746 **Faceted bone**. Cow metacarpal trimmed at distal end on the anterior and posterior sides with one or two oblique chops. Some faint wear marks on anterior side which appear to stop short of the proximal end. ?unfinished skate. L: 170mm. Cow distal metacarpal (left).
12330, makeup dump, Period 7.1, GT47/1

Hunting

Bone powder horn
by Julia Huddle, who is grateful to the late Sue Margeson for her comments on this object
(Fig.10.71)
A highly decorative bone powder horn or powder-flask, (SF6191) was retrieved from fills of the barbican ditch, dated on the basis of coin and ceramic evidence to the first half of the 17th century. The style of carving, the costume and the subject indicate a date for the object in the middle or second half of the 16th century (Sue Margeson, pers. comm.), suggesting that it was of some age at the time of deposition.



SF5746



SF6191

Figure 10.71 Bone skate (SF5746); bone powder horn (SF6191). Scale 1:2

A similar hunting scene is incised in ivory on one side of a 16th-century cross-bow on display at Norwich Castle Museum. Powder horns made of bone, antler, leather, wood, ivory or metal were used from around 1500. A great number of these were made in the second half of the 16th century in Germany, though some were undoubtedly made by Germans living in England. They are often decorated with biblical or mythological scenes. Two examples from Amsterdam date to the third quarter of the 16th century; one depicts a scene of David and Bathsheba and the other a courting couple, possibly a scene from the Judgement of Paris (Baart *et al* 1977, cat. nos 828 and 829). Most of these decorated powder horns were used for hunting rather than military purposes. Hunting was pursued by the upper classes and the makers of the powder horns were often inspired by the iconography and style of German prints of around 1525 to 1550 (Baart *et al* 1977, 441).

SF6191 Part of a **powder horn**, carved with incised decoration showing a figure of a man with a dog on a leash and a staff over his shoulder. Large mammal bone, either cattle or horse ?proximal tibia. H: 119mm.
91600, fill of barbican ditch 91295, Period 6.1, G9/41

Horse Equipment

Iron and copper alloy spurs and spur buckles
by Blanche Ellis
(Fig.10.72)
The two copper alloy spurs from the site (SF49 and SF54) and a single iron example (SF33) were found within post-medieval dumping into the barbican ditch. These all have straight sides and short necks. The copper alloy spurs, having unusual broad necks and prominent conical rowel bosses are likely to have been made in the same workshop and date typologically from the end of the 17th century to *c.*1750. Despite their similarities, they were not a pair. The smaller (SF54) is likely to have been made for a child: boys were taught to ride from an early age and small spurs were sometimes made for them. A single iron hook attachment (SF5408.1, not illustrated) was found in a late 16th- to 17th-century pit fill.

SF33 Iron **rowel spur** fragment. The D-sectioned sides arc around the back of the wearer's heel. The front ends are missing but the longer appears to have been horizontally straight. The short neck is gently down-curved and the rowel pin and traces of the rowel are present in the rowel box. L: 64mm neck l *c.*23mm.
92758, fill of barbican ditch 91295, Period 6.2, G9/41

SF49 Copper alloy **rowel spur** with remains of iron moving parts. Straight sides of rounded-triangular section, complete side tapering to become extremely slender next to the figure-eight terminal. The terminal rings project equally above and below the end of the side, a post-medieval feature, and small fragments of iron attachments for the leathers are present. Short neck is slightly down-curved with an unusual broad,

lozenge section, spreading towards prominent conical rowel bosses. Remains of an iron rowel in the box. L: 87mm, neck l: 22mm.
92761, fill of barbican ditch 91295, Period 6.2, G9/41

SF54 Copper alloy **rowel spur** with iron rowel, both terminals missing. This is a smaller version of SF49, differing only in its sides having a more d-shaped section and the complete one descends into a slight curve under the wearer's ankle. Comparison with SF49 strongly suggests that this delicately proportioned spur was probably made for a child. SF49 and 54 with their somewhat unusual necks are likely to have been made in the same workshop.
92761, fill of barbican ditch 91295, Period 6.2, G9/41

Spur leathers
by Quita Mould
(Fig.10.72)

A complete butterfly spur leather (SF398) was of a type worn by the aristocracy to attach the spur to the boot and to protect the leather at the front of the ankle from wear by the stirrup. Similar butterfly leathers are worn by Henry Rich in a portrait painted by the studio of Daniel Mytens in 1632–3 (Swann 1982, 14 and fig. 2). Two possible top spur leathers (SF320) with a divided strap, not a matching pair, were found in the same context. The straight terminal of one example has an iron nail passing through it suggesting they could be patten straps, rather than spur leathers, originally nailed to a wooden sole.

SF320 **Spur leathers/patten straps** split into a double strap in the centre with straight, centrally-pierced terminals. The smaller has an iron nail remaining in one terminal and tooled edges. Leather cattlehide. L: 245mm, max W: 25mm; L:100mm, max W: 18mm.
92776, post-medieval dumping in the barbican ditch, Period 6.2, G9/41

SF398 **Butterfly spur leather** with central waist expanding into double-lobed terminals at each end with fastening strap between, the longer with five buckle pin holes, the shorter with a central slot. Leather cattlehide. Length 170mm, max width 68mm.
92775, post-medieval dumping into Barbican ditch, Period 6.2, G9/41

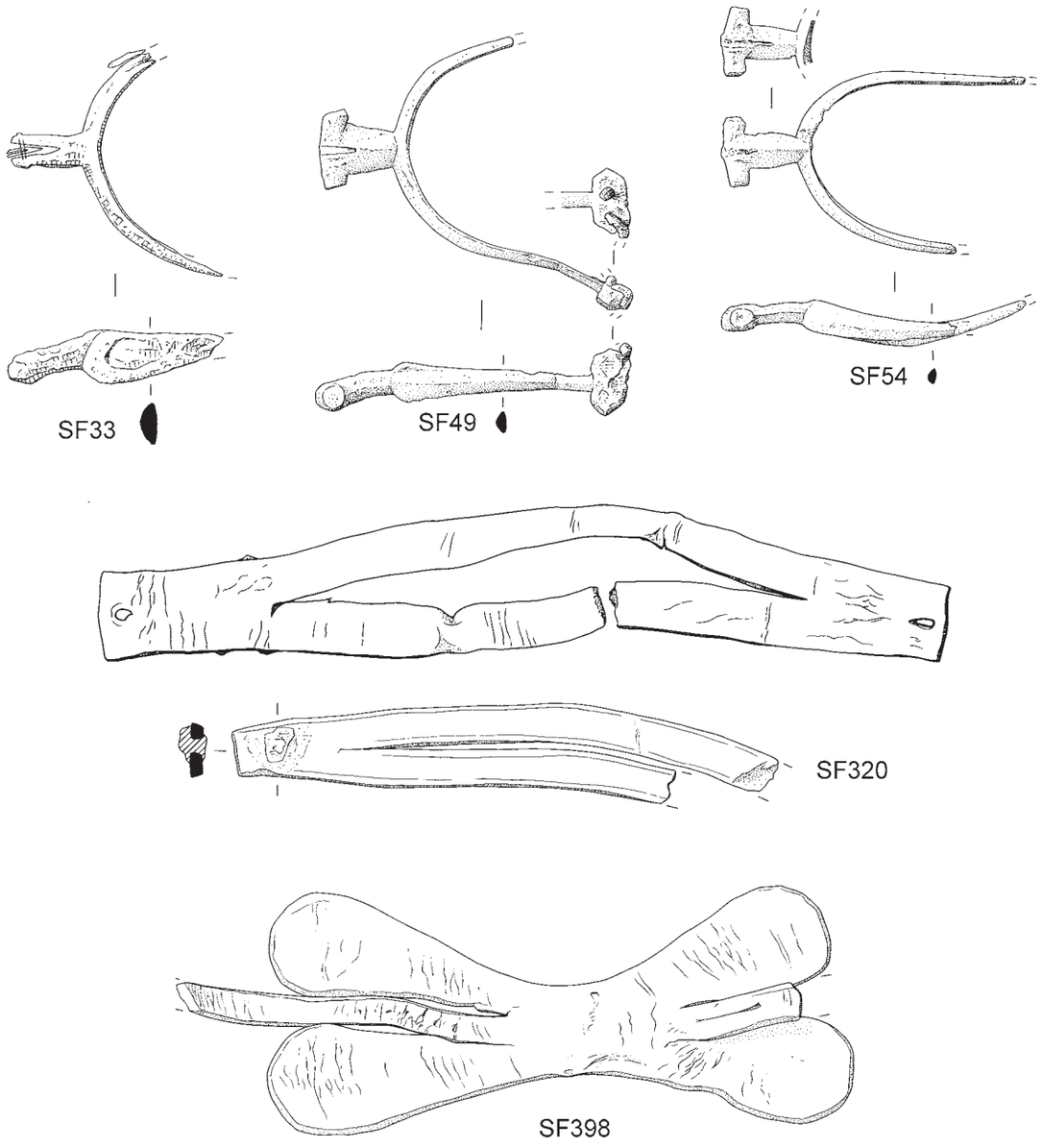


Figure 10.72 Iron spur (SF33); copper alloy spurs (SF49 & 54); spur leathers (SF320x 2 & 398). Scale 1:2

Horse harness leather and iron fittings
by Quita Mould
(Fig.10.73)
Fragments of six straps of varying width from horse harness were found in the dumping into the barbican ditch (SF95; SF399, 92766; SF182, 92761; SF395, 92768; SF96, 92774; latter illustrated). One (SF96) has a rectangular iron buckle attached. Three other harness buckles were also found (SF2, SF62 and SF163.2, latter not illustrated) in post-medieval fills of the barbican ditch.

A fragment of harness strap (SF92, not illustrated) came from a pit (*92773*) dug into the barbican ditch associated with pottery of early 17th-century date. The line of stamped dots in imitation of stitching along each edge of the strap has a decidedly modern look suggesting recent contamination. A considerable number of stables surrounded the site during the modern period, a situation demonstrated by the discovery of plough harness (see Chapter 11).

SF2 **Harness buckle** with large rectangular frame of convex profile with sheet roller. Ht: 76mm.
92748, fill of barbican ditch, Period 6.2, G9/41

SF62 **Harness buckle** with rectangular frame of round section with sheet roller. Ht: 38mm.
92764, fill of barbican ditch 91295, Period 6.2, G9/41

SF96 Iron **buckle** with leather strap. Strap knotted at one end, passing through an iron buckle of round section. A second strap is looped through the central pin bar of the buckle and joined with a series of irregular grain/flesh stitches. Leather cattlehide. Total length 230mm, width 15mm; buckle height 23mm, length 45mm.
92774, post-medieval dumping into Barbican ditch, Period 6.2, G9/41

Copper alloy ?harness mount
by Alison Goodall
(Fig.10.73)
A gilded circular copper alloy mount decorated in low relief has a shank for attachment as well as at least two peripheral attachment holes. It may have been attached to harness although the length of the shank indicates that it was fastened to something thicker than leather. Despite its Period 2 context, decoration is suggestive of a post-medieval rather than a Norman date.

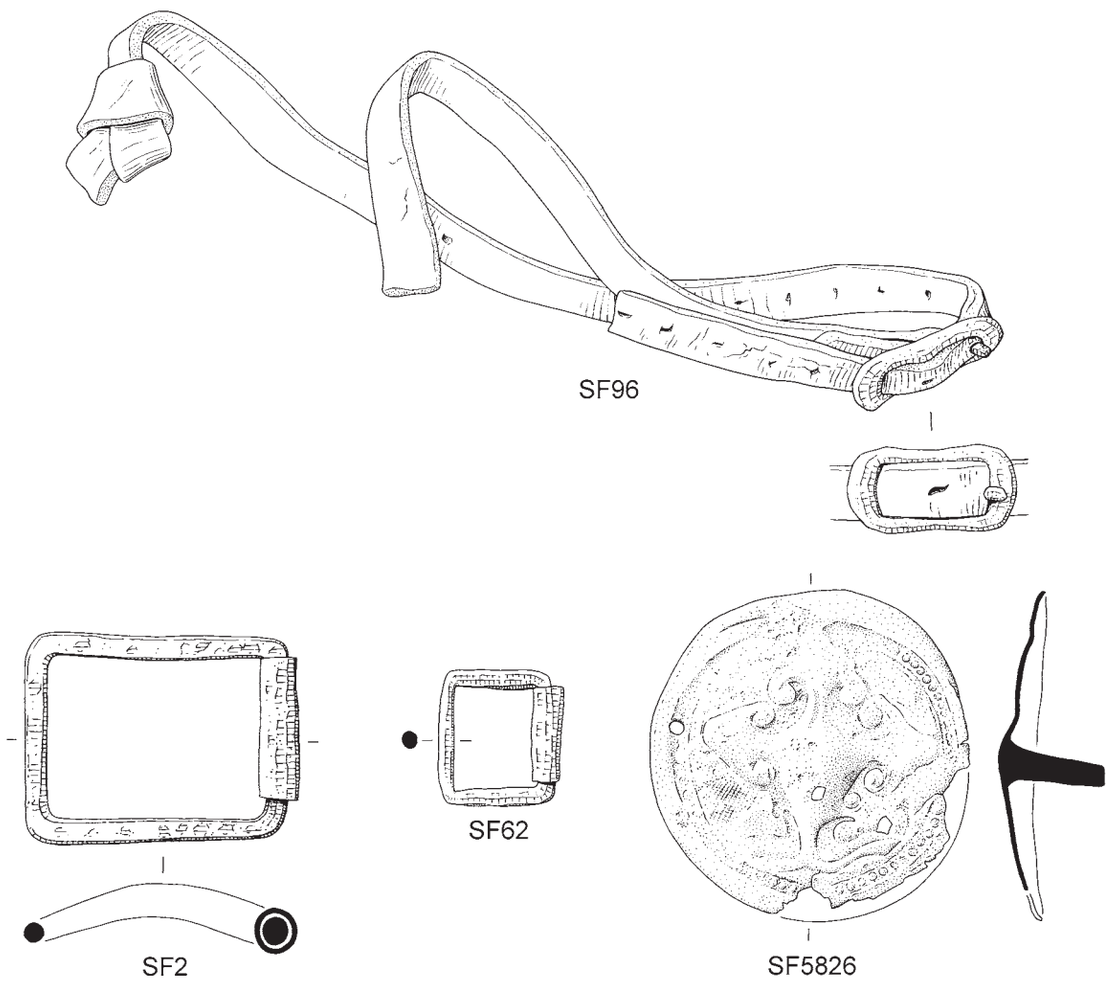


Figure 10.73 Iron harness buckles (SF2 & 62); leather strap (SF96); copper alloy harness boss (SF5826). Scale 1:1, ironwork and leather at 1:2

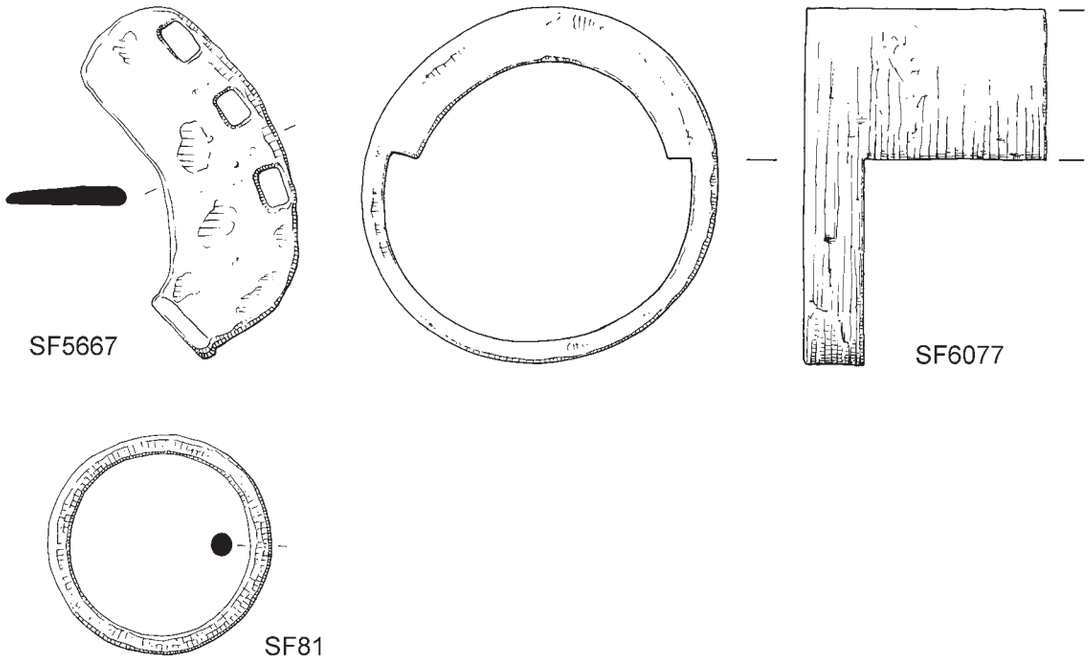


Figure 10.74 Iron oxshoe (SF5667); iron axle guard (SF9185); iron ring (SF81). Scale 1:2

SF5826 Gilded circular **mount**, with double border of plain relief band and an inner sunken pelleted band. Within these is a central boss from which radiate four stalks with triangular leaves with scrolled lower corners, all in low relief; one of the leaves has become damaged and distorted with a hole broken through it. One attachment hole has been neatly made through the border; another hole within the relief field may be accidental damage. Integral attachment shank on reverse.
70026, fill of pit 70030, Period 2.2, G7/8

Harness bells

Three cast copper alloy rumbler bells of post-medieval type (SF702 Period 6.2; SF6270 and SF104 both unstratified, not illustrated) are likely to have been harness bells.

Iron horseshoes and oxshoes

by Quita Mould

(Fig.10.74)

Nine horseshoe fragments dating to the post-medieval period were found, comprising broken branches with smooth sides and the remains of rectangular nail holes. No distinctly modern examples were collected. Two shoes dating to the pre-Conquest and immediately post-Conquest period occurred residually and are detailed in earlier chapters. An oxshoe came from a post-medieval pit. The cloven hooves of oxen were shod when the animals spent much time on hard surfaces when pulling carts *etc.*

SF5667 **Oxshoe**, semi-circular plate with three rectangular nail holes along the exterior edge. L: 90mm, w: 42mm.
13003, fill of pit 13004, Period 6.1, G1/125

Iron cart fittings

An axle guard (SF6077) from a cart was recovered from a modern context. Two rings (SF81 and 5704.01, latter not illustrated), a small swivel hook (SF5557.1, not illustrated) and chain links (SF5667.2, not illustrated) may have served a number of functions on harness or cart fittings or in the domestic setting.

SF81 **Ring** with round section. Diam: 62mm.
92768, fill of barbican ditch 91295, Period 6.2, G9/41

SF6077 **Axle guard**. Heavy collar with rectangular plate projecting from one side. Diam: 110mm.
90744, fill of modern trench 90745, Period 7.1, G9/85

Weapons and Armour

Dagger

(Fig.8.60)

A dagger grip (SF5712.2) of 15th-century type found residually in late 16th- to 17th-century refuse and demolition deposits overlying the dismantling of the barbican well superstructure. It is detailed in Chapter 8.III.

Musket balls

Only two lead musket balls were recovered from the Castle Mall site (SF119, 5060 and 91201, none illustrated), with a further three from the Golden Ball Street site, ranging in diameter from 12 to 18mm.

Unclassified

Antler object
by Julia Huddle
(Fig.10.75)
A fragmentary piece of antler pierced by two holes, one of which has an iron rivet in *situ* (SF7223), may have been used as a crude wall hook.

SF7223 **Antler** pedicle and part of burr and fragmentary piece of calvaria, which is pierced by two holes, one of which has an iron rivet. Probably fallow deer antler.
50077, makeup dump, Period 6.1, G5/52

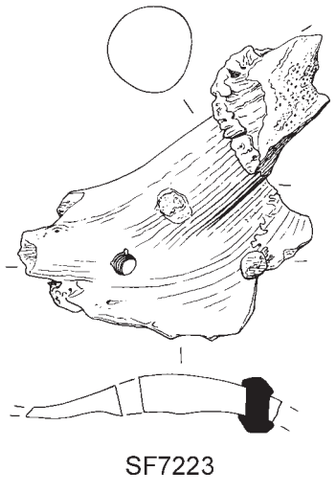


Figure 10.75 Antler object (SF7223). Scale 1:1

IV. ZOOLOGICAL AND BOTANICAL EVIDENCE

Mammal and Bird Bone

by Umberto Albarella, Mark Beech and Jacqui Mulville
(Plates 10.15–10.21, 10.23–10.32)

Assemblage Summary

A total assemblage of 1,829 mammal, bird and amphibian bones and teeth (NISP) was hand collected from post-medieval deposits at the Castle Mall site, with an additional 135.5 bones from Soil Riddled Samples (SRS) and 30 from Bulk Samples (BS). A further 185 NISP were identified at the Golden Ball Street site (see Curl, Part III, Chapter 6). The range of taxa recorded at Castle Mall is indicated in Table 10.43. Full details of the mammal and avian bone assemblages from both sites, including metrical and other data by species, are given in Part III, Chapter 3.

Refuse Disposal

Partial skeletons of the period are indicated in Table 10.44, although more are known from site records and photographs (*e.g.* the carcass of a large dog indicated in Plate 10.25). More bones than indicated in Table 10.44 presumably derive from complete, rather than butchered and dismembered skeletons. This is probably the case for many of the bones found in the barbican ditch fills (Period 6, Part III, Fig.9). A substantial number of complete horse, dog and cat bones was found in these contexts. Whilst not found in articulation it is probable that these bones derive from complete skeletons discarded in the ditch and subsequently reworked. Thus the archaeological evidence suggests that the illegal disposal of animal corpses (mainly horses) continued to be practised in spite of all prohibitions (see Chapter 10.I). Equids are rare in any period at Castle Mall, with the remarkable exception of the post-medieval period (Part III, Table 4). It is doubtful, however, that this is connected with changes in the economic system. The high number of horse bones in the late fills of the castle ditches (mainly the barbican ditch) is probably the consequence of the different disposal practises carried out in post-medieval times.

Plate 10.25 Dog skeleton *40046* of greyhound/deerhound-type found within upper fills of the barbican ditch, Area 4

Taxa	*Hand collected*	*SRS*	*BS*	*TOTAL*
Cattle (*Bos taurus)*	676.5	36	6	718.5
Sheep/goat (*Ovis/Capra)*	530.5	25.5	5.5	561.5
sheep (Ovis aries)	*(135)*	*(1)*	-	*(136)*
sheep?	*(2)*	-	-	*(2)*
goat (Capra hircus)	*(1)*	-	-	*(1)*
goat?	(2)	-	-	*(2)*
Pig (*Sus domesticus)*	148.5*	18.5	5.5	172.5
Equid (*Equus* sp.)	161.5	2	-	163.5
Dog (*Canis familiaris*)	82.5*	2.5	-	85
Cat (*Felis catus)*	84	4.5	-	88.5
Red deer (*Cervus elaphus)*	+	-	-	+
Fallow deer (*Dama dama*)	1	-	-	1
Hare (*Lepus* sp.)	1	0.5	-	1.5
Rabbit (*Oryctolagus cuniculus)*	16.5*	11*	3	30.5
Domestic fowl (*Gallus gallus*)	82*	21	8	111
Goose (*Anser anser*)	25	1	1	27
Duck (*Anas* sp.)	9	7	-	16
Turkey (*Meleagris gallopavo*)	1	-	-	1
Cormorant (*Phalacrocorax carbo*)	1	-	-	1
Grey partridge (*Perdix perdix*)	+	-	-	+
Woodcock (*Scolopax rusticola*)	-	1	-	1
Moorhen (*Gallinula chloropus*)	1	-	-	1
Snipe (*Gallinago gallinago*)	-	1	-	1
Black headed gull? (*Larus ?ridibundus*)	+	-	-	+
Parrot (*Psitaccinae*)	2	-	-	2
Pigeon (*Columba* sp.)	1	-	-	1
Rook/Crow (*Corvus frugilegus/corone*)	1	-	-	1
Small corvid	1	-	-	1
Passeriform	-	1	-	1
Bird	3	2	-	5
Amphibian	+	1	1	2
Total	**1,829**	**135.5**	**30**	**1,994.5**

Sheep/Goat also includes the specimens identified to species. Cases where only 'non-countable' bones were present are denoted by a '+'. Pig metapodii and ruminant half distal metapodii have been divided by two, while carnivore and lagomorph metapodii have been divided by four. Due to the difficulty in distinguishing between upper and lower incisors in equids and upper and lower canines in carnivores, all have been recorded and then divided by two. All totals which include material from partial skeletons are denoted by '*': this material is described in further detail in Table 10.44.

Table 10.43 Numbers of mammal, bird and amphibian bones and teeth in Period 6 by collection category (NISP)

Period	*Area/Group*	*Context*	*Related feature*	*Collection method*	*Species*	*Notes*
6.1	1/87	10023	dog burial	hand	dog	10.5 bones + teeth
6.1	1/98	10521	pit 10766	hand	dog	3 bones
6.1	1/98	10850	dump	hand	dom. fowl	4 bones
6.2	1/103	10095	pit 10463	SRS sieve	rabbit	6 bones
6.2	9/41	91387	barbican ditch 91295	hand	pig	3 bones

The number of bones and teeth given is the number of countable specimens from each skeleton

Table 10.44 Summary of partial animal skeletons found within Period 6 features

Plate 10.26 Horse mandible, bit wear from mid 17th-century barbican ditch fill *92776* (Period 6.2)

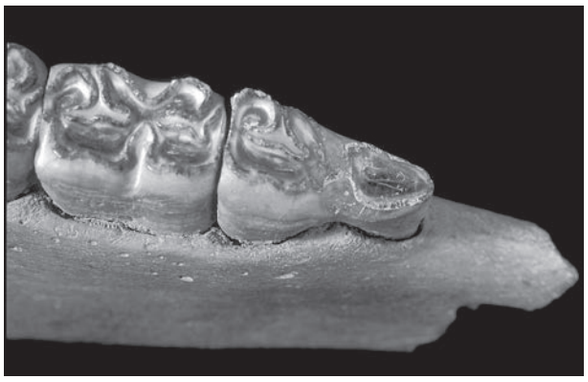


Plate 10.27 Horse mandible, bit wear from mid 17th-century barbican ditch fill *92776* (Period 6.2)

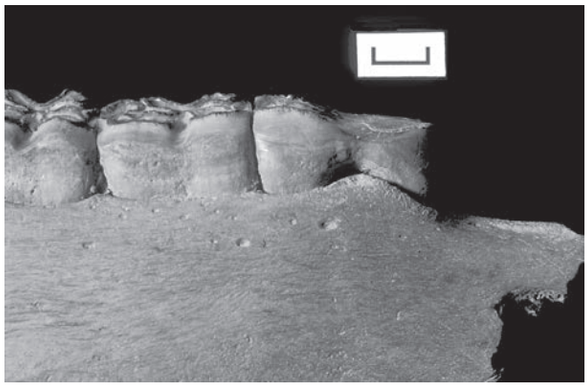


Plate 10.28 Horse mandible, bit wear from mid 17th-century barbican ditch fill *92776* (Period 6.2)

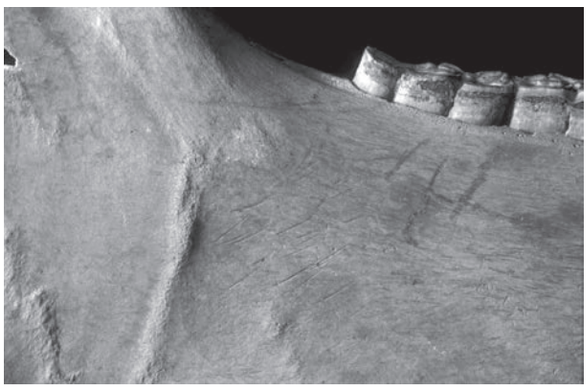


Plate 10.29 Horse mandible, bit wear from mid 17th-century barbican ditch fill *92776* (Period 6.2)

Plate 10.30 Dog skull, poodle-like

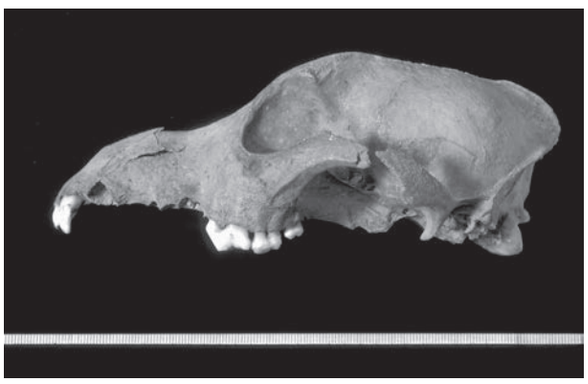


Plate 10.31 Dog skull, terrier-like

Most interesting was the presence of a peculiar pattern of wear on the anterior part of a second premolar in a post-medieval mandible from the barbican ditch (Plates 10.26–10.29) which, as is fully argued in Part III, may be attributable to bit wear.

Craft Waste

Evidence for bone, antler, horn and ivoryworking during the post-medieval period is detailed in Chapter 10.III. For comments on skinning and butchery practices of the period, see Part III.

Dogs

A notable number of dog burials were recorded in this period and the bones recovered are notably different from those of earlier periods. A similar quantity of cats was also found. The dog skeletons include at least two deliberate interments, one at the top of the Castle Mound

Plate 10.32 Parrot coracoid and carpometacarpus from mid to late 17th-century fills of pit 80188, Open Area 39, ?Property (b) (Period 6.2)

associated with a group of 17th-century prison burials (Cemetery 5, Period 6.2) and the other with tenements in the southern part of the site (sk.*10023*, Period 6.1, noted in Table 10.44). Most dog bones of Period 6 belong to very small animals, although there are a few medium, large and very large specimens also present (Part III, Fig.42). The shape of the complete skulls found in Period 6 also confirms the wide variety of dog types. Comparison of these skulls with those in the reference collection of the Ancient Monuments Laboratory (London) indicates that one small rounded skull (Plate 10.30) was very similar to a poodle, whereas another small skull was similar to a beagle. A small–medium size skull was remarkably similar to a terrier (Plate 10.31) whilst a larger specimen resembled a robust version of a Labrador.

Foreign Contacts

The most unusual finds from the Castle Mall assemblage were two parrot bones (Plate 10.32), which probably belong to the same individual. Parrot bones have never been found before on an archaeological site in England. The Norwich Castle bones derive from the fills of a pit dated to the mid–late 17th century (pit *80188*, Period 6.2). No other exotic finds were found in this pit, although seeds of pumpkin, a fruit of American origin, were found in a nearby pit of the same date (Murphy, below). Despite careful analysis of the bird bone collection of the Natural History Museum in Tring, it has not been possible to identify these bones to species or even genus level. These bones belong to a middle–large sized parrot, of about the same dimensions as an African grey parrot (*Psittacus*). Parrots are tropical and sub-tropical birds with some 200 species found on four continents (see further discussion in Part III). Although its place of origin remains unknown, the parrot demonstrates a connection between Norwich and exotic countries. The 17th century was certainly a period of intense travelling and trade and the fact that valuable exotic goods arrived in Norwich suggests that the city had not lost its importance as a centre of exchange and market. The presence of turkey bones from both Period 5 and Period 6 indicates that the species reached Norwich soon after their first recorded presence in England in 1541.

Diet, Economy and the Agricultual Revolution

One of the major contributions of the Castle Mall faunal research project is its contribution to the debate on changes in livestock (including the introduction of new breeds), diet and the economy during the post-medieval period. These are fully detailed in Part III, Chapter 3, with a summary presented in Chapter 13.

Fish Bone

by Alison Locker

Post-medieval deposits at Castle Mall produced a comparatively small fish assemblage mostly from Period 6.1 (late 16th century), with most of the hand collected and bulk sieved fish coming from this phase. The site riddled fish were of approximately the same number (40) from all three sub-periods. Twenty-one taxa were identified, the absence of those species commonly present but in low numbers was notable. Sea breams, gurnards, wrasse, grey mullets were among those missing. Table 10.45 shows the number of fish identified for the whole period.

The Bulk Sieved fish were 67.3% of all fish retrieved, Hand Collected 15.4% and Site Riddled 17.1%. By percentage of bony fishes in the BS material herring was 49.1%, cod and large gadid are 19.6%, eel 9.7%, whiting 3.3%, haddock and ling both 0.6%. The small flatfishes (plaice/founder and sole) are higher than earlier periods at 11.6%, while mackerel, which has featured consistently, though in small numbers, is at the higher end of its range at 1.5%

By 'portion' cod has increased from Period 5 to 77%, herring is 19%, whiting 3%, haddock and ling are 1%. This shows an increase of cod as the dominant food fish in this period as represented by these deposits. The size range of cod was between 65 to 125cm in length, but the sample was small (8) with 6 between 85 and 105cm.

Freshwater fish were few. Only tench is exclusively found in freshwater, eel, salmon and smelt migrate between fresh and salt water as part of their life cycles.

The barbican ditch produced a large quantity of mammal bones but few fish. These have been discussed in the full report (Part III), but Albarella has commented on the complete skeletons found in this feature and the lack of fish may reflect a different type of disposal, not typically household waste.

Taxa	*H C*	*S R S*	*B S*	*Total*
Elasmobranch	0	2	7	9
Roker	0	0	15	15
Eel	1	1	44	46
Herring	12	4	222	238
Sprat	0	0	2	2
Salmonid	2	0	2	4
Smelt	0	0	2	2
Tench	0	1	0	1
Cyprinid	0	0	6	6
Cod	85	65	56	206
Large gadid	3	20	33	56
Haddock	1	5	3	9
Whiting	3	5	15	23
Ling	0	2	3	5
Mackerel	0	2	7	9
Turbot	0	0	4	4
Plaice	1	2	6	9
Plaice/flound	0	4	37	41
Halibut	1	0	1	2
Sole	0	0	3	3
Flatfish indet	0	8	6	14
Total	**109**	**121**	**474**	**704**

Table 10.45 The fish from Period 6 by collection category (see Part 3, Tables 81–83)

Plant Macrofossils

by Peter Murphy
(Plate 10.33)

Features of the latest site periods were not extensively sampled, principally because it was considered that limited time and resources were best expended on earlier contexts, but also because post-medieval features frequently cut earlier ones, with the consequent risk of residuality. For example, the pit fill *60480* (Group 6/43, BS 554) produced a relatively large assemblage of well-preserved charred cereals (mainly oats and barley), with an associated weed flora. However, the close similarity of this assemblage to those from contexts of Periods 1 and 2 in Area 6 strongly suggests that these charred cereals were re-worked from earlier deposits. Two categories of deposit, however, seemed unlikely to include residual material: the fills of ovens/kilns and latrine fills including much mineral-replaced material.

Malting Oven/Kiln (G1/130 and 131)
Charred macrofossils from these two context groups are listed in Table 10.46 on CD. The assemblages were essentially similar in composition. Cereal grains were common, but very poorly preserved, due to germination before charring. The better-preserved grains were mainly of short hexaploid-type wheat (*Triticum aestivum* s.l.) and barley (*Hordeum* sp.). The barley grains had almost all germinated, with 'sprouts' extending for more than half the length of the grain. Charred cereal chaff was not common, but 'silica skeletons' including wheat glume tips and awns were: there was also much amorphous fused silica, of probable plant origin. Weed seeds were associated, including very large numbers of seeds of *Stellaria media*-type (chickweed). Charred macrofossils of ling (*Calluna vulgaris*) and bracken (*Pteridium aquilinum*) were present, as well as charcoal.

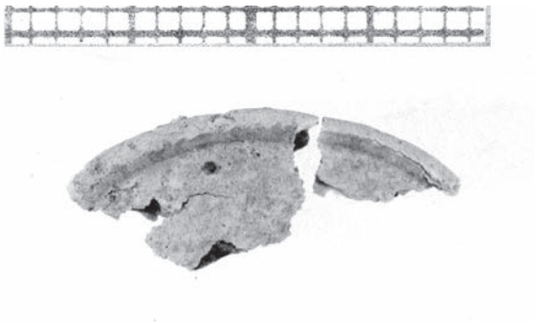


Plate 10.33 Marrow/pumpkin seed from fill *47190* of quarry *57136*, Open Area 62 (Period 6.2)

These assemblages are interpreted as fuel residues (crop processing waste, heather, bracken, wood/charcoal), mixed with sprouted grains accidentally charred due to poor temperature control during malt-drying or roasting. As for earlier periods, malt-drying is a very 'archaeobotanically visible' activity, resulting in the production of very characteristic charred assemblages.

Latrine/Sewage Deposits
These comprised latrine pit fills (pit *10766*, fill *10714*, BS 67 (early 17th century); pit *80188*, fill *80187*, BS 865 and *80270*, BS 908 (late 16th–17th century) and a fill of a disused quarry (*47190*, BS 1755 (mid 17th century): see Table 10.47 on CD. Mineral-replaced macrofossils were common, but often very fragmentary (due to chewing and/or comminution in the human gut) so that quantification was impossible. The range of taxa noted comprised cereals (whole grains and pericarp fragments); a herb, fennel (*Foeniculum vulgare*); a wide range of fruits (marrow/pumpkin, fig, strawberry, apple, cherry, bullace, plum, bramble, raspberry, elder and grape); weed seed testa fragments (representing contaminants of whole-grain foods); intact weed seeds; and monocotyledonous stem fragments, presumably waste litter of flooring, discarded in the features. Other food residues included fish bones, bone fragments and avian eggshell, and mineral-replaced arthropods (mostly fly puparia) were extremely common.

These plant macrofossil assemblages differ little from medieval latrine pit assemblages at the site (see previous chapters). The only notable new record is of *Cucurbita* sp. seed fragments (marrow or pumpkin) from quarry fill *47190*, well-dated to the late 17th to early 18th century (Period 6.2, Plate 10.33). These crops, of New World origin, have been reported from a few sites in Britain and mainland Europe, mostly of 16th–18th-century date (Moffett 1995).

Invertebrates

by Mark Robinson

Arthropods from pit fill *80187* (the lower fill of pit *80188*, Period 6.1) are shown in Table 10.47 on CD. The undecayed insect remains included many puparia of *Thoracochaeta zosterae* and calcium phosphate-replaced

puparia of this fly were also present. The pit had clearly been used as a latrine. The undecayed insect remains included a distinctive group of beetles comprising *Trechus micros*, *Quedius* sp and *Rhizophagus parallelocollis* which tend to occur in voids underground. They probably entered the deposit after the liquid material from the sewage drained away and some shrinkage had begun to occur.

V. HUMAN BONE

by Sue Anderson
(Fig.10.12, Plates 10.7 and 10.34)

Cemetery 5: Prison Burials (mid to late 17th century)

Summary
Two watching brief trenches (T47 and T51) were excavated on the south side of the Castle Mound in advance of construction of a temporary bridge during construction work (Fig.10.12). Thirteen articulated 'skeletons' were identified on site together with nine contexts of disarticulated bone. One of these skeletons (12348) was not submitted for analysis. The remains were excavated in two trenches at different times, and it proved possible to match some contexts, thus reducing the number of individuals considerably. The skeletons (forming Cemetery 5) have been dated to the mid to late 17th century and relate to the documented burial ground of Norwich gaol.

Method
Measurements were taken using the methods described by Brothwell (1981), together with a few from Bass (1971) and Krogman (1978). Sexing and ageing techniques follow Brothwell (1981), and the Workshop of European Anthropologists (1980), with the exception of adult tooth wear scoring which follows Bouts and Pot (1989). Stature was estimated according to the regression formulae of Trotter and Gleser (Trotter 1970). All systematically scored non-metric traits are listed in Brothwell (1981), and grades of cribra orbitalia and osteoarthritis can also be found there. Pathological conditions were identified with the aid of Ortner and Putschar (1981) and Cotta (1978).

Supplementing the analyses published here, selected elements of the related research archive are available on line at http://ads.ahds.ac.uk (see Part I, Chapter 1.VI).

Number of Individuals
From the photographs (*e.g.* Plate 10.7) and analysis of the bones it has been possible to reunite parts of skeletons which were placed in different contexts. Seven individuals have been identified in the 22 contexts submitted for analysis. It is likely that the few fragmentary disarticulated bones also belong to these seven people, and the missing sk.*12348* could also be part of one of the less complete individuals.

Condition
All bones from this area were in fair or good condition, presumably reflecting their recent date. Once reunited, the skeletons were fairly complete, although two lacked skulls, one lacked the pelvis and one lacked the lower legs. One individual consisted of fragments of upper torso only.

Skeleton No.	*Sex*	*Age*
12344/12357	Male	Young
12345/12358/12359	Male	Young/middle-aged
12354	Unsexed	Mature
12355	Male	Young/middle-aged
12356/12346	Male	Young/middle-aged
12361	Male	Young/middle-aged

Table 10.48 Cemetery 5 (prison burials) — demographic analysis

Demographic Analysis
Six individuals were adults. Five were male and one was unsexable. Owing to the small size of this group no statistical analysis was possible, so the results of the demographic analysis are presented in the following table.

The results suggest that all these individuals were of a similar age at death, and that none had reached old age. The seventh individual was represented by a fragment of juvenile humerus.

Metrical and Morphological Analysis
Tables of measurements are provided in the archive report.

Stature
Stature could be calculated for the five males. Mean stature was 165.8cm or 5ft 5ins, with a range of 158.7–169.1cm (5ft 2ins–5ft 6½ins). This is comparable with another small post-medieval group of males at Launceston Castle, Cornwall (Mays 1990), where the mean stature was 166.0cm. An estimate of stature for post-medieval male skeletons from London (Huber 1968, quoted in Mays 1990) is slightly greater at 169.2cm. The results suggest a slight reduction in average height in this small group of post-medieval men in comparison with medieval and pre-Conquest groups in Norwich.

Cranial indices
Only three skulls were available for study. The cranial breadth/length indices of these ranged from 67.2 to 80.3, with a mean of 74.8. As one individual was dolichocranial, one mesocranial and one brachycranial, there was no pattern to the results.

Post-cranial indices
Robusticity was calculated for one right femur (12.0) and three left (mean 12.5). These individuals were generally less robust than the Saxon and medieval groups from Norwich. Limb proportionality could only be calculated for one individual, at 71.2. This suggests that the individual's arms were relatively long in comparison with his legs.

Non-metric traits
Non-metric traits were scored for three skulls and four post-cranial skeletons. One individual had an inca bone but otherwise nothing particularly unusual was found

in the crania. There was no suggestion of any relationship between these individuals. Interestingly, all three individuals scored for Poirier's facet of the femoral head had the trait. It is possible that this facet is related to prolonged stress at the hip joint rather than being a heritable trait. Various authors have suggested that it is caused by habitual use of a very low seat, causing the knees to be flexed upwards (Kennedy 1989).

Dental analysis

Only three dentitions were available for study. In view of the post-medieval date of these skeletons it is perhaps surprising that only one showed signs of caries (sk.*12361*). However, the other two individuals were both relatively young. One abscess was found, under the same tooth which was affected with caries, and there was one example of ante-mortem loss in the same jaw. All examples of pathology were confined to the lower left molar area of this individual. Calculus was present in varying amounts in all three dentitions, as was enamel hypoplasia which occurred between the ages of 2 and 6 years. There was no evidence for non-eruption or congenital absence of any tooth.

Pathology

This small group presented a remarkably wide range of pathological changes.

A single congenital anomaly was found, in the form of a perforation of the body of the sternum in a young male, sk.*12344/12357*.

Osteophytosis occurred in the spines and a few other joints of three individuals (sk.*12354, 12355, 12361*). Two of these, sk.*12355* and *12361*, also had small amounts of arthritic change. The articular facets of the lumbar spine, the left first metacarpal and metatarsal, and the left patella were affected in *12355*, whilst the costal foveae of the twelfth thoracic vertebra were affected in sk.*12361*. All lesions were scored at Grade II level or less.

Schmorl's nodes were present in all five individuals with lower thoracic and/or lumbar vertebrae. In all cases they were particularly large, suggesting that these men had been involved in heavy work involving stress to their lower backs for some time before their deaths. In one case this may have resulted in kyphosis of the spine, as there was slight wedging of the anterior bodies of the eighth to eleventh thoracic vertebrae of a young/middle-aged male, sk.*12355*.

Two examples of cribra orbitalia were found, both bilateral and both of the mildest porotic type. One of these was associated with slight pitting on the parietals, which could represent healed porotic hyperostosis, or possibly a scalp infection. No other evidence for nutritional or metabolic disorders was found, suggesting that these men were not particularly undernourished.

An osteochondritic lesion was present on the left humerus capitate (joint with the radius) of sk.*12361*. The lesion appeared to be partly healed.

Inflammatory changes to the shins were found in two of the four individuals with bones of the lower leg. In both cases the lesions consisted of slight graining only. The lesions may be related to infections either of the shins or in other parts of the body, or they could be the result of minor trauma to the lower legs. One man, sk.*12345/12358/12359*, had slight bilateral sinusitis.

The most interesting discovery in the analysis of this small group was that all three available skulls showed head wounds, all with signs of subsequent healing. The young male, sk.*12344/12357*, had a healed cut on the left parietal running diagonally from just above the squamous suture towards the lambda. The edges were rounded and there was no sign of inflammation, but the cut had left an open area 52mm long and up to 11mm wide (Plate 10.34). The injury was probably caused by an axe or sword, and would probably have caused some localised brain damage. A young/middle-aged male, sk.*12345/12358/12359*, had a depressed fracture to the left side of the frontal bone

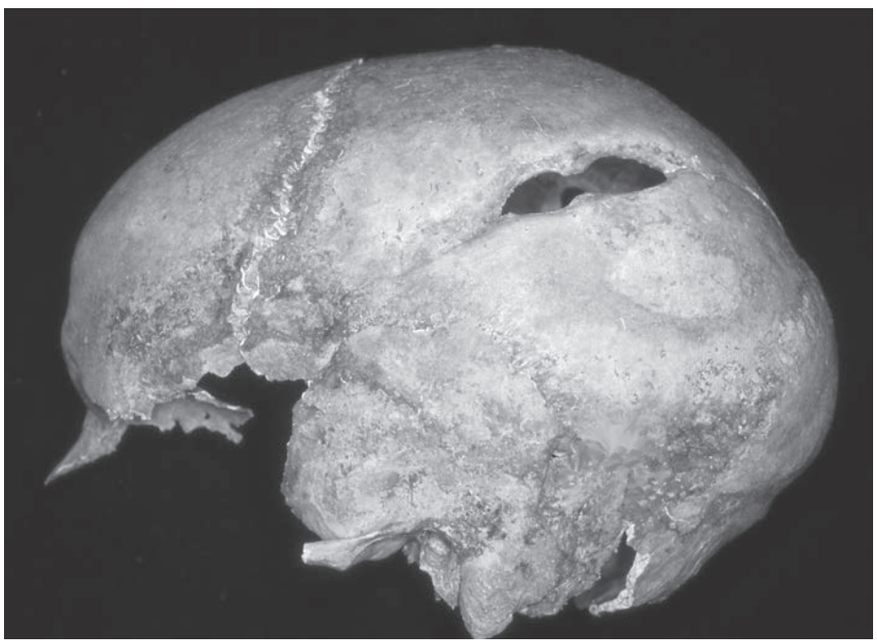


Plate 10.34 Skull of young male (sk.*12344/12357*) amongst 17th-century prison burials (Cemetery 5, Period 6.2), exhibiting a healed axe or sword cut on the left parietal

just above the brow ridge. There was slight pitting, but the wound was probably quite old at the time of death. A smaller depressed fracture to the frontal bone, this time on the right side, was seen in another young/middle-aged male, sk.*12361*. This individual also had a possible trauma to the right shoulder, based on the enlarged inferior edge of the scapula glenoid.

No evidence was found in the bones of these men for the cause of their death. Only one hyoid bone was preserved, and the central part of it was intact, suggesting that this individual at least was probably not hanged. They may have been executed but they could just as easily have been the victims of an epidemic, particularly if they had lived in a confined area such as the prison.

Discussion

Six adult individuals and one child were identified in the 17 contexts of bone from the Castle Mound. All six adults were probably male, although the few remains from one made determination of sex difficult. All were either young or in early middle-age. On average, these men were relatively short in comparison with earlier groups from Norwich, but no other patterns could be discerned from metrical or morphological analysis. Only one individual showed signs of dental pathology, confined to a small area of his jaw.

The pathological changes found were unusually abundant for such a small group. On the whole, the group showed little evidence for malnourishment or infectious disease, but there was a high level of stress-related disorders. Changes to the spine indicate a greater than average physical load placed on the vertebral discs of all these men, whilst inflammation of the tibiae could suggest traumatic changes to the shins. Arthritic changes were common in the spine, but were also found in the thumb, the big toe and the knee of one individual. Another change probably related to physical stress was the osteochondritic lesion of the elbow found in another man. However, the most unusual aspect of this group was the concentration of head wounds, and it is unfortunate that the skulls of two other individuals had to be left in section.

The place of burial and the pathological changes to these skeletons appear to confirm that they were prisoners. Documentary evidence suggests that executed prisoners were often taken away for burial in local churchyards, such as St John Timberhill, where suspected felon Richard Ingham was buried in 1566. Alternatively they may have been buried at the Castle, as for example murderer James Blomefield Rush, hanged in 1849, who was buried within the prison walls (Green 1970). There are other possibilities, however. During the Civil War a number of riots took place in Norwich and many people were executed. For example, a disturbance in April 1648 was followed by the prosecution of 108 people and the execution of seven of these by firing squad in the castle ditches (Atkin 1993, 80). Although it would be attractive to equate these unfortunate people with the six excavated skeletons, the evidence suggests that the men from Castle Mound were subjected to considerable heavy labour, perhaps in a chain gang in view of the lesions to their shin bones, and the most likely explanation of their presence and high rates of trauma is that they lived for some time as prisoners in the Castle. More detailed discussion appears in the Chapter 10.VI, 'Norwich Prison and Prisoners'.

VI. DISCUSSION

Introduction

Norwich Castle Keep was ruinous by the late 16th century: repair work throughout the 18th century saw the structure in much better condition than at its outset. The 17th and early 18th centuries witnessed the final demise of many of the castle's medieval masonry structures and earthwork defences. The difficult times of the 17th century gave way to the 18th-century transformation of the dilapidated castle grounds into the city's livestock market and the Castle Mound as pleasure gardens and allotments. An increasing emphasis on confinement and control is clear, both of the environment and the populace. Minor prisons were present in the south bailey during the late 16th and 17th centuries, supplementing the great Gaol in the Castle Keep which, along with the new Shirehouse, was extended and altered during the period.

The project's research programme has sought to trace the development of the area to permit a full understanding of the evolution of the site to its modern form. Important elements of the analysis are the documentary and historical aspects, as well as the artefactual and ecofactual assemblages which provide significant contributions towards a more detailed perspective of England's Second City. Of particular significance is the evidence for changes in the animal economy summarised in Chapter 13 and fully detailed in Part III, Chapter 3.

This period saw the start of the long sequence of antiquarian observations and a growing quantity of cartographic evidence, as has been outlined earlier in this report. Previous archaeological knowledge of the site during the post-medieval period was piecemeal and included limited observations of late fills of the barbican (Site 150N) and motte ditches (adjacent to the Shirehall; Site 135N). Post-medieval features had been recorded at a number of sites within and around the castle precinct, including the remains of cellared buildings.

Norwich Prisons and Prisoners

(Fig.10.12; Plates 10.7 and 10.35)

Although evidence for 17th-century felons at Norwich Prison has yet to receive detailed academic study, those of the 18th and 19th centuries are currently under scrutiny by Nick Arber[62] (Arber, in prep.), while considerable further work has been conducted by Barbara Green. Until the mid 16th century, most prisoners from the county gaol within Norwich Castle Keep were buried at the church of St Martin-in-Balliva, however: 'In 1562, the parish church of St Martin in the Bailwick [*i.e.* St Martin-in-Balliva], was totally demolished, by which such as died in the castle, were deprived of their right of burial in that church-yard, but how long they remained without a burial place is uncertain: but at the restoration a piece of ground was inclosed and consecrated, adjoining to the west side of the castle, in which were formerly several Headstones, andc. all which, together with the paling which inclosed it were some years since taken away' (Browne 1785, 10–11).

It is to this cemetery that the small group of burials found at the top of the Castle Mound during the Castle Mall

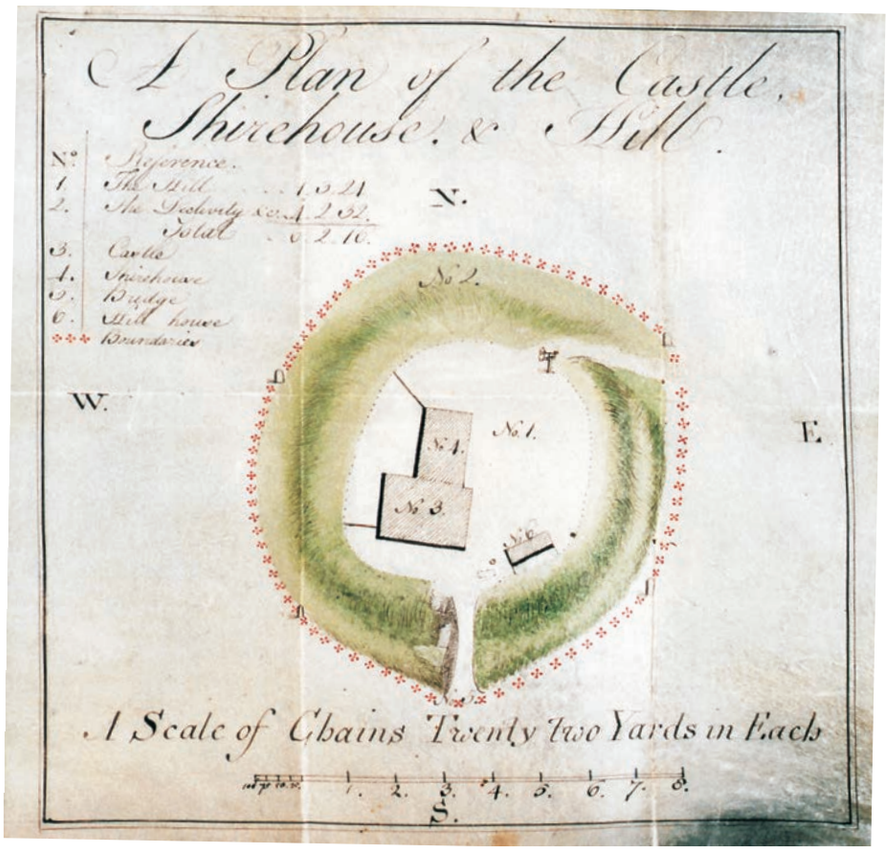


Plate 10.35 'A plan of the Castle, Shirehouse & Hill', *c.*1780, showing the demarcation of the Castle Fee, the four stone pillars and the area demarcated for burial to the west of the Keep (NRO C/Saa2/7)

excavations relate (Period 6.2). The group comprised the remains of five young to middle aged men, an unsexed adult and a child (represented by a single bone) who had been buried with little ceremony in the mid to late 17th century (a few additional disarticulated bones came from works at the top of the mound in 1999–2001; Wallis in prep.). The group provides important new evidence for 17th-century prison life, at which time the prison would have been unregulated, with inmates sleeping where they could. Limited exercise at this time was taken around the top of the mound. The 19th-century prison cemetery on the mound, the burial place of murderers, is known to have lain further to the north (to the north-west of the new gaol of the 1820s) and contains burials dating to 1836–1886, gravestones of some of which survive within the modern wall. Non-murderers who died in the prison would have been returned to their parishes for burial, except for those whom the parish would have rejected (*cf.* a suicide at Colchester; Nick Arber, pers. comm.). The southerly location of the 17th-century burials found by the Castle Mall excavations suggests that 18th-century burials lie between the two known groups, demonstrating the chronological development of the graveyard. The limit of the 18th century burials is demarcated on a plan of *c.*1780 (NRO C/Saa2/7; Plate 10.35).[63]

The excavated burials appear to have been buried naked wrapped in shrouds. The adults exhibit a slightly shorter stature than those buried in earlier cemeteries at the site (detailed in by Anderson in Chapter 4.V and in Chapter 10.V). The group as a whole indicates a remarkably wide range of pathologies indicating heavy work, although no particular evidence for undernourishment. The bones of three individuals demonstrated stress conditions indicative of habitual use of low seats, while trauma to the lower legs may indicate participation in a ?chain gang (see below). Numerous head wounds were evident and include blows from a sword or axe, one of which was severe enough to have caused localised brain damage (Plate 10.34).

It was common during the 18th and 19th centuries for felons to spend up to 6 months awaiting trial, a situation that was probably also the case in the 17th century. Those awaiting trial might have been fed by friends or family, or by other prisoners if they were lucky. Prison rations of the 18th and 19th centuries consisted of bread and water with an allowance of cheese. Other provisions could be bought. No green vegetables were provided until well into the 19th century, the first vegetables introduced being an unpleasant mix of radishes and onions. Scurvy was common, although some of those entering the prison (such as demobbed soldiers and vagrants) may already have been afflicted before their incarceration. The lack of evidence for malnourishment in the excavated group, suggests that they had not been imprisoned long enough for the effects of the poor diet to have manifested themselves on their bones.

During the 18th century, prisoners would have been held permanently in leg irons, which were 'day wear' until *c.*1810, the gaol at this time not being particularly secure. New 'chains' for the prison, presumably including

Figure 10.76 Reconstruction of the Norwich Castle area *c*.1650–1738, showing the decline of the defences and the encroachment of the city before the area was levelled

Figure 10.77 Reconstruction of the Norwich Castle area *c*.1792, showing the impact of levelling and the creation of new roads across the Cattle Market

leg irons, were ordered in 1714 (Barbara Green, pers. comm.). Such irons would have comprised a ring around each ankle, from which chains extended to a central ring. This point of attachment would have been roped up to the prisoners' waist for much of the time, to avoid it dragging along the ground. This could have caused the lesions apparent on the excavated felons (noted above; see Anderson, Chapter 10.V). Another possible explanation for the lesions, given the rough life evidently led by the prisoners, is the rural sport of 'hacking', popular in Norfolk during the late 18th and early 19th century (and possibly earlier), which entailed the repeated kicking of the player's shins by their opponent (Nick Arber pers. comm. 2003).

The presence of a leather strap around one excavated ankle is perhaps suggestive of some form of padding or perhaps the result of hanging, when the feet would have been tied together (although see below). It does not appear likely that leather straps alone would have been sufficiently secure, although close-fitting leather straps with flat metal bindings are known from 1763 (Nick Arber pers. comm 2003).

Executions within Norwich Castle and its ditches are well documented throughout the post-medieval period. Seven men were condemned on Christmas Day 1648 for riots in April and were executed in the Castle Ditches on 2 January 1649. They were Christopher Hill, a brasier; Anthony Wilson, a blacksmith; William True, a dyer; brothers Thomas and John Bidwell, both labourers; Henry Goward, a sadler and Gray, an oatmeal maker (Blomefield 1806, I, 396). There was no evidence to indicate the cause of death of the excavated group, although one at least had not been hanged. Their pathologies indicate that they are more likely to have been long-term prisoners than victims of the Civil War riots, although the lack of evidence for malnourishment should be noted. The fact that they were all buried together so swiftly may indicate an epidemic within the gaol, perhaps the plague of 1666 or an outbreak of gaol fever. Outbreaks of the latter occurred at Swaffham and Wymondham prisons until the early 19th century. Periods of unrest such as the Civil War may have been one of the contributory factors to the known overcrowding of Norwich Prison which led to its rebuilding in 1793 and again in the 1820s (see Chapter 11.I).

Elsewhere on the site, a padlock of the type used to secure both men and animals was recovered from the barbican ditch. The south bailey housed a number of minor prisons, including the old Shirehouse, which continued to be used well into the 17th century. Others lay on either side of the lane leading into the bailey (now Golden Ball Street). In 1614 a prisoner drowned in a well at one prison, perhaps amongst those excavated in the vicinity during the Castle Mall project. By Kirkpatrick's time, this prison had become the *Golden Ball* public house (see Chapter 10.I).

The Decline of the Castle Defences

'Digging' within the Barbican

(Figs.10.76–10.78)

A notable group of early to mid 17th-century refuse pits of domestic character (dated both by jettons and good ceramic assemblages) lay within the eastern part of the former barbican, presumably isolated from tenements along the nearest road frontage by the substantial remnants of the bank and ditch. Their isolated position is unexpected and they lay along a known route leading from the Castle Meadow into the barbican area (later to become Market Avenue). Presumably, these relate to an episode(s) of the documented encroachments of unlicensed 'digging' within the castle ditches. Such digging clearly did not just relate to quarrying, but also to the disposal of waste. In the early 17th century a basketmaker repeatedly had to face the mayor's court for such offences, making his servant do the dirty work when he was forbidden to do so (see Chapter 10.I). Some individuals were, however, clearly licensed to bury rubbish within area of the ditches, apparently an acceptable practice as long as the ground was left in good order afterwards.

Quarrying

(Figs.10.11, 10.13, 10.76–10.78; Plate 10.1)

Quarrying may have begun on a small scale in the western part of the barbican in the late 16th to early 17th century (Period 6.1), increasing dramatically in scale and extent during the mid to late 17th century (Period 6.2) when the south-western corner of the Castle Mound was also being exploited for aggregate.

The extensive quarrying into the barbican rampart and underlying natural deposits recorded at the Castle Mall site radiated out westwards from the southern end of the castle bridge, immediately adjacent to a Norman gatehouse which collapsed into a very large quarry pit as a result of undermining, directly confirming antiquarian observations of the time (see below). Around 7,000m^3 of sand and gravel would have been extracted in this operation. The extent of quarrying was delineated to the north by the position of the barbican gate, to the west by the pre-existing routeway (see Chapter 8) and to the south by the remains of the barbican ditch. The relationship of this activity to contemporary parish boundaries is of some interest. Just to the east of the castle bridge, the parishes of St Peter Mancroft and St John Timberhill met, the line between the two appearing to be reflected in the eastern limit of quarrying (ultimately reflecting the routeway). The eastern extent of the quarrying broadly mirrored the boundary between the parish of St John to the west and St Michael at Thorn to the east, seeming to imply the presence of another routeway here for which no archaeological evidence was found, but which may have run from the southern end of the castle bridge towards the Shirehouse Gap to the south-east. Such pathways appear schematically on Cleer's map of 1696 (Plate 10.1; see further discussion on paths below).

Although the quarrying was extensive, the archaeological evidence suggests that much of the extraction came from a series of small interconnected quarry pits. Some sorting and redeposition of residue is likely to have occurred, leading to the residue presumably being thrown back into the quarry and ultimately producing the hummocks evident on contemporary maps. A large quantity of waste including sewage residues was found within quarry fills, including some significant ceramic assemblages. One mid/late 17th- to early 18th-century quarry contained seeds of marrow/pumpkin attesting to contacts with the New World (see below). Taken overall, the scale of the quarrying suggests that those responsible may have been some of the men committed to the

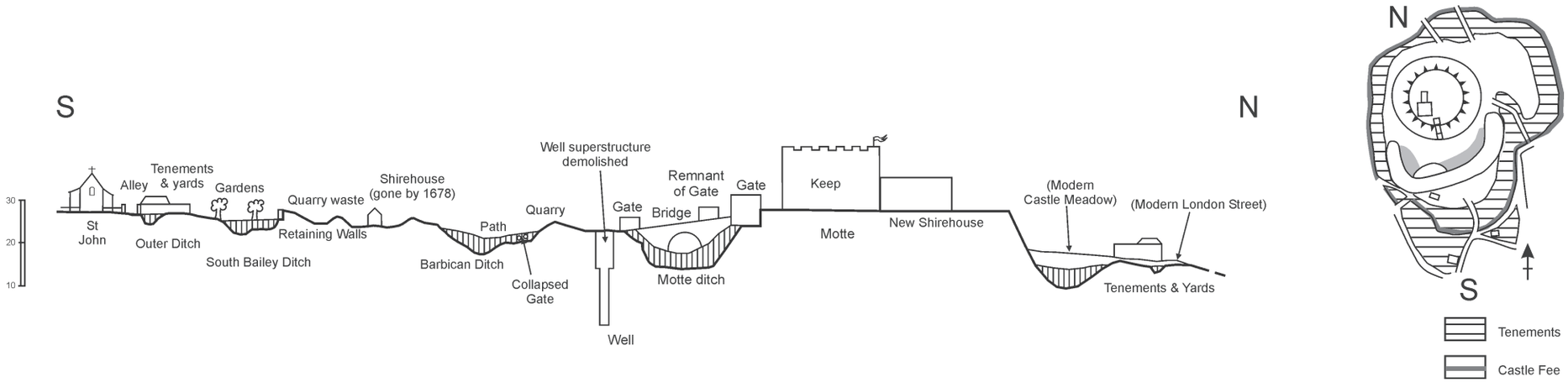


Figure 10.78 Schematic section across the south bailey in the post-medieval period. Not to scale

Bridewell prison for such offences (see Chapter 10.I). No documentary evidence for licensed quarrying on this scale has been found. The quarrying appears to have been finally infilled above the collapsed gatehouse in association with the construction of the 1738 Cattle Market (Period 6.3). Although partially the result of levelling of the rampart, the quarry infills contained a large quantity of waste, including evidence for plain quarry glazing and ferrous metalworking in the vicinity (see 'Crafts and Occupations' below).

Robbing, Demolition and Collapse of Masonry Structures

The collapse of the gatehouse
(Figs 8.27 and 10.13; Plates 10.2.B, 10.8 and 10.9)
Kirkpatrick, who died in 1728, described the barbican gatehouse after its collapse, having speculated that the large pieces of old walls which lay in the barbican ditch fell into it as a result of the ground settling or undermining by quarrying for sand and gravel (see Chapter 10.I). Although Bucks' sketch of 1738 (Plate 10.2.B) depicts the remnants of what may have been the gatehouse as still standing, it now appears to be confirmed that it had already collapsed by this date. The wall remnants shown (which notably seem to lie on the *outer* side of the barbican ditch) may either have been resurrected in the incorrect position for the sake of artistic impact or may relate to another structure (such as the Shirehouse; antiquarian arguments on the subject are summarised in Chapter 7.I).

The Castle Mall excavation demonstrates that the quarry into which the gatehouse collapsed, originated in the 17th century. Fills of the quarry lying beneath the masonry (Period 6.2) date ceramically to the 17th century; the date is confirmed by the presence of a farthing token of Charles I (1635–44) and clay pipe forms indicating dates in the range 1660–80 and 1680–1720. A William III halfpenny (1694–1702) was found in direct association with the masonry blocks, with clay pipes spanning the period 1670–1720. A Charles II farthing of 1674 came from fills associated with the 1738 levelling above the quarry and masonry blocks, along with late 17th- to 18th-century pottery and clay pipes attributable to the period 1680–1720 (Period 6.3). A collapse before *c*.1720 is therefore suggested, some time before landscaping for the Cattle Market began in 1738, when it has previously been suggested that the gate may have been deliberately demolished (Reeve 1992, 27).

None of the masonry fragments seem to have landed actually in the barbican ditch but lay rather within the huge quarry responsible for their collapse (Fig.10.13); the southernmost block lay on the northern lip of the ditch. Surrounding fills may have been partly the residue from quarrying, filling both the quarry and the upper part of the ditch.

Some areas of gatehouse facing remained, although most may have been robbed (constructional details are considered in Chapter 6). The excavated remains were clearly not the original total. Wilkins (in the late 18th century) noted that 'workmen were employed some years since to destroy these foundations. Their progress was so slow, from the materials being so strongly cemented together, that their employers desisted from the undertaking, and they still appear, in some places, a few inches above the surface of the ground' (Wilkins 1796, 148, fn. f). Alterations made to the area in 1862 removed more of the masonry. Hotblack's plan of 1909 makes comments on the masonry including the fact that 'a mass of masonry was lowered' and that it originally extended further north, across the whole width of Bell Avenue (Fig.6.3).

Demolition of the barbican well
Although some evidence for robbing of part of the upper reaches of the barbican well shaft or an associated structure occurred in the mid 15th century (Period 5.1, Chapter 8.II), the surviving superstructure appears only to have been reduced to contemporary ground level in the late 16th to early 17th century (Period 6.1), before being completely overlain by the first in a sequence of metalled surfaces dated on coin evidence to 1665 (Period 6.2). Building rubble dumped above the reduced well was mixed with other waste including the residue and end products from the production of antler knife handles (see below). Subsidence above the infilled well was a continual problem well into the modern period (late consolidation of the subsided area contained late 19th- and early 20th-century pottery; Period 7.2, Chapter 11).

Levelling of the Barbican Rampart
Late 17th- and early 18th-century maps demonstrate the undulating ground within the south bailey resulting from quarrying of the barbican rampart. Kirkpatrick's observations demonstrate that, although the eastern stretch of the bank survived into the early 18th century, the western part had already been made level before the 1720s with cartways driven through it. His reference suggests that this may have occurred in the latter part of the 17th century, a fact confirmed archaeologically by the extensive evidence for its removal by quarrying. As was noted in Chapter 10.I, the surviving south-eastern part of the rampart was levelled in the early 18th century when 'a large outer ditch opposite to the bridge foot leading onto Castle Hill was filled up by cutting down a ridge of hill ranging along by the side of the said ditch and the whole space of ground between the Golden Ball Lane and the bridge was completely levelled, which made a fine spot of ground' (*Norwich Gazette* 1739). Limited archaeological evidence for the removal of the eastern part of the rampart was recorded, although is difficult to date. A pathway was subsequently inserted along the inner side of the surviving ditch (Period 6.3).

As well as the evident quarrying, archaeological evidence for the removal of the rampart is provided by fills of the barbican ditch which indicate the pushing of the bank into the ditch concomitant with the disposal of refuse. The inclusion of large quantities of building debris may have been an attempt to consolidate earlier fills. Along the southern stretch of the ditch (in the vicinity of the later quarry), this process appears to have begun in the first half of the 17th century (Period 6.1). In the mid to late 17th century (Period 6.2), evidence for the demolition of the rampart was recorded to the west (beneath modern Castle Meadow) and the south where the ditch became infilled at the same time as the large quarry to its north; these fills again provide evidence for plain quarry glazing. This part of the ditch was substantially infilled by the late 17th century, followed by deliberate and regular dumping associated with the landscaping activities of 1738 (Period 6.3). The eastern stretch of the ditch

appears to have been taken into use as rear yards/gardens and was subjected to massive refuse dumping during the second half of the 17th century, indicating that the adjacent rampart may have survived later than elsewhere along its length. Most of its remnants must have been removed, however, by the late 18th century when a new carriageway was driven across the area. This part of the rampart, which does not appear to have found its way into this stretch of the ditch (see final levelling detailed in Chapter 11), may have provided aggregate for infilling of other parts of the ditch associated with the 1738 landscaping.

The City

Street Pattern and Paths

(Figs 10.76–10.77; Plates 10.1–10.3)

Alterations to many of the streets and lanes surrounding the castle and leading into the ditches have been detailed in the introductory section to this chapter. In the early part of the period, the roads, alleys and passages leading towards the castle were still subject to the dumping of rubbish and the local minor routes developed in piecemeal fashion. Many lanes and alleys (such as the Back of the Inns) remained constrained by the physical presence of the castle earthworks and several of the pedestrian routes were stepped: a few survive and have never been widened. Back of the Inns itself survives in virtually its original form. Numerous small paths and cartways ran within and along the sides of the castle ditches. Such criss-crossing routes are indicated by Cleer in 1696 (Plate 10.1). Archaeological evidence for their presence was found both running along the base of the barbican ditch, perhaps leading to the area of concentrated quarrying (Period 6.2; Fig.10.13), and along the inner edge of the eastern stretch of the ditch (Period 6.3). The paths consisted of numerous resurfacings of rubble, mortar, flint and pebbles. A timber revetment of mid to late 17th-century date found within the barbican ditch may indicate the position of a routeway across it, or perhaps served as a boundary marker (Figs 10.16–10.17).

To the south of the castle baileys, the earlier path running along the northern side of the cemetery of St John Timberhill (later Grout's Thoroughfare) was provided with a new buttressed flint and brick wall (Period 6.1; Fig.10.9), curving round to reflect the position of a Late Saxon/Norman cemetery boundary and cutting through burials (see Chapter 4; *cf*. Fig.4.57). As with other walls in the area, part of it had subsided into a pre-Conquest ditch. A few metres to the north, another alley (a previous version of Grout's Thoroughfare) is known from map evidence, although there was suprisingly little archaeological evidence for its presence. An earlier entranceway between two properties in the eastern part of the site was retained.

Dramatic changes in the local street pattern occurred in the 18th century, many of which were engendered by the levelling of much of the barbican earthworks and the construction of the Cattle Market in 1738. In 1721, a new road permitted the access of carriages to the top of the Castle Mound from the Castle Meadow. In the last decade of the 18th century, many of the small paths, passages and alleys, around the ditches were made into cartways or proper roads, often above infilled ditches (specifically the motte and barbican ditches). A road was made all the way round the western side of the motte, replacing a former 'perilous path'. The path had been defined by posts on Property 5, St Peter Mancroft, perhaps the origin of the posts recorded in an observation in the vicinity (Site 28N; Chapter 2).

The Cattle Market

(Figs 10.76–10.77; Plate 10.3)

During the 17th century, Norwich's great market place was becoming increasingly congested. In 1616 the City Assembly had rejected a plan for cattle pens on Hog Hill and decided that henceforth cattle should be sold only in the 'castle dykes'. Part of the hog-market was itself moved into the ditches in 1637. By the end of the century, the requirement for open ground to hold the large numbers of livestock being driven into the city for sale had become critical and action was taken in 1738 with the establishment of a new market in the former south bailey which was to remain in service for the weekly livestock market until the 1960s. The market was extended eastwards in 1862 to include the Castle Meadow, although this bailey had long been used for fairs, as well as the grazing and sale of livestock. Animals are known to have come from as far as Scotland.

No archaeological evidence for the 17th-century phases of the Cattle Market was recorded at the Castle Mall site, although clear evidence for the landscaping associated with the formalised Cattle Market of 1738 was provided by the regular infilling and consolidation of areas of the barbican ditch and quarries (Period 6.3, *e.g.* Fig.8.26), contrasting with the earlier dumping of the city's refuse. This landfill utilised in part the adjacent bank and piles of quarry waste, as well as large dumps of building rubble which were probably deliberately imported to the site for the purpose. A considerable quantity of refuse was, however, deposited during this process. Clay pipes confirm a cut-off date of *c.*1740 for this activity. The result of the landscaping and landfilling was that by 1738 a flat piece of ground was available for the new market. There appears, however, to have been little ordered division within it until 1809 (see Chapter 11.I). King's plan of 1766 (Plate 10.3.A) indicates only that the newly created area was a 'market for horses, cows, sheep, swine etc'. Horses were tied to the gable end of one of the buildings adjacent to the Hayhouse (Tillyard, Chapter 10.I), the site of the original Shirehouse. The landfilling was not without problems; in both 1738 and 1739 deficiencies in the work had to be made good, presumably because the underlying barbican ditch fill was continuing to settle.

Perhaps unsurprisingly, it has proved difficult to identify specific features relating to the various phases of the Cattle Market. A few pits and post-holes may indicate the remnants of early animal pens, although their dating and attribution is tentative. A cistern, infilled during the extension of the Cattle Market in 1862, was recorded at the edge of one tenement in the eastern part of the former south bailey and may have been associated with the 18th-century market, or with the tenement (?Property 46, Period 6.3). Part of a sandstone trough was found unstratified and may relate to this or a later phase of the Cattle Market.

Tenement Development

(Figs 8.1 and 10.76–10.77; Plates 10.1 and 10.3)

During the post-medieval period, Castle Fee rents continued to be paid, although they were increasingly being bought off in a process which continued well into the 18th century. It appears to have taken a long time for properties surrounding the castle to have formed a complete circuit: open spaces and gardens survived between buildings until the early 19th century (Part IV, Chapter 2). Tenements along the eastern side of the barbican ditch which had been established during the preceding phase developed during the latter part of the 17th century. They apparently survived until demolition for the extended Cattle Market in 1862. Building plots set between the road and the barbican ditch could not have been very deep, although some evidently utilised the ground above the ditch. Wells were recorded in most tenements (see below).

Kirkpatrick noted in the 1720s that 'Castle Meadow was encompassed on the north-east and south sides with houses'. This is clearly indicated in the late 18th century by Hochstetter's map of 1789 (Plate 10.3), on which he annotated the words 'Castle Ditches' in the area immediately to the west of the contemporary buildings. A similar situation is presented on Corbridge's map of 1727.

Buildings, cellars and building materials

As was noted in Chapter 8, the period following the early 16th century fires saw considerable changes in the built character of the city. Attempts were made by the City Authorities to outlaw the use of thatch during the 16th century (Carter, Evans and Margeson 1985, 78), although it apparently continued in some buildings well into the 17th century (Pound 1988, 26). More fire-resistant buildings, utilising flint, flint and brick rubble and plain brick walls set in foundation trenches, were constructed in the city between in 16th and 19th centuries (M. Atkin 1985a, 251). Celia Fiennes, detailing her Norwich visit of 1698, reported that the houses were 'of the old form, mostly in deep points and much tiling … their building timber and their plaster of laths … but none of bricks except some few beyond the river' (Morris 1947, 148).

Documentary evidence attests to the growing complexity of the built environment surrounding the castle, with an increasing formalisation of the landscape in the latter part of the period. Many of the tenements, often surrounded by walls, now contained numerous buildings, outbuildings (such as stables, haylofts and woodhouses), latrines, wells, gateways, yards and gardens. The public houses were particularly complex, as is witnessed by the imaginatively named rooms, chambers and garrets to be found at the *Signe of the Castle* (later the *Castle Inn*) in 1685 (see Part IV, Chapter 2.II, Property 2, St Peter Mancroft).

Both Cleer's map of 1696 (Plate 10.1) and Corbridge's plan of 1727 show schematically a single row of buildings with rear gardens uniformly surrounding the Timberhill block. King's 1766 map is, however, probably closer to the real situation at an earlier period and indicates that the circuit of buildings on the west, south and east sides was not complete, with some isolated buildings and gaps between buildings present (Plate 10.3.A). Although a few wall remnants relating to these properties survived at the Castle Mall and Golden Ball Street sites, most of the buildings that fringed the castle baileys were represented by cellars, wells and pit groups. Many of the tenements were provided with cess pits and wells, while other sanitary arrangements are attested by the presence of drains and chamber pots (see further comments below). Earlier walls across the southern part of the site were retained or rebuilt, an earlier gateway between two of them (Property g) also being retained. This gate appears on Hochstetter's map of 1789 and possibly on King's 1766 map (Plate 10.3). King's map indicates a small building at the eastern end and to the south of early Grout's Thoroughfare: this would broadly equate with the possible timber structure (Structure 51) and associated pitting recorded at Golden Ball Street. Infilling of the 18th century (Period 6.3) in the central part of the Timberhill block is indicated both on map evidence (Hochstetter 1789; Plate 10.3) and by the presence of a garden/boundary brick wall retaining a terrace.

Wall foundations included an example near Timberhill with banded cobbles, clay and sand. A small building with flint and brick walls adjacent to the malting kiln may have been an outbuilding relating to the malting process (see 'Malting' below) and was floored with beaten earth (Property e, Fig.10.9). Organic binders, such as straw and twigs, were evident in both flooring and mortar. Several of the tenement boundary walls in the southern part of the site were rebuilt with flint and brick during the post-medieval period, with a brick drain inserted through one of them (Figs 10.9, 10.18 and 10.20). Building stone such as granite and sandstone was used on rare occasions. The repairs appear to have related to subsidence caused by the presence of underlying ditchwork of both Late Saxon and Norman origin.

Numerous buildings of the period survive along the western side of modern Timberhill. On its eastern side, however, most earlier buildings were removed during the Castle Mall development, the surviving structures at the southern end of the road including the *Gardener's Arms/ Murderer's* public house (Property a/b). Two buildings survive on Golden Ball Street; *Le Rouen* public house (formerly the *Plough Inn* at Property 48; Site 222N; Plate 11.7) and a building dating to *c*.1600 at No. 18 (part of medieval Property g) which was preserved within the new development (see Chapter 1 and Plate 11.8): despite its small size, this timber-framed flint and brick building evidently had a rather complex architectural history (detailed by Smith 1997). In its earliest form, it consisted of a simple rectangular block with one room on either side of a central chimney stack: an early sub-division of the building within the 17th century may relate to the increasing pressure for housing within the city (Smith 1997, 3). Alterations to the structure occurred again in the late 18th and 19th/20th centuries. Lean-to structures were evident at its rear. The building bears a parish boundary plaque inscribed 'St J.T.H. 1826'. A later watching brief at the site recorded a domed brick oven extending beneath the south wall of the building , while a well was found beneath its south-west corner. At the rear of the property just to the south of the surviving building (*i.e.* at No. 16; Open Area 53) was a notable early to mid 17th-century pit (*146*), containing a complete 15th- to 16th-century money-box (GBS SF38, Fig.8.51) and three Dutch-type tobacco pipe bowls (Goffin, Chapter 10.II and III and see below).

Just to the south of No.14 Golden Ball Street (part of former Property g), the remnants of a possible timber-

framed building were recorded, along with a number of late 17th- to early 18th-century pits (Open Area 52) and two small cellars (the latter a probable 18th-century coal cellar). Of note amongst the finds was a possible waster associated with Dutch-based pottery production in the vicinity (see below).

Immediately to the west of the Golden Ball Street site (again, Property g) a small square cellar of probable 16th-century origin was recorded at Castle Mall (Structure 37, Period 6.1; Plate 10.6), floored with medieval Flemish tiles with its walls repeatedly whitewashed. A cellar of similar proportions, attributable to the 17th century, was recorded at Site 150N (Atkin 2002a, 72 and fig.2) relating to Property 38. Infilling of the area between the long tenement boundary walls, that had existed since medieval times in the southern part of the Castle Mall site, continued with the addition of flint and brick cross-walls and the insertion of small buildings, perhaps serving as outhouses. By the mid 19th century, the area was infilled with small houses, wash-houses, other minor structures and yards (see Chapter 11). The curve of the long-forgotten cemetery boundary ditch (see Ditch 2, Chapter 4) remained fossilised in the developing pattern of paths and property boundaries in the area.

The remnants of several other cellared buildings and yards survived along the road frontage to the north-east, representing the buildings destroyed in 1862 and their forerunners. Of note were those which contained niches, some at floor level (Period 6.2, Structure 41 (Property 39) and Structure 45 (opposite Property 39; Fig.10.17)). These were similar to the lamp niches in 15th- to mid 16th-century cellars recorded by the Norwich Survey at Site 149N, 31–51 Pottergate (Atkin, Carter and Evans, 1985, plate II). The Castle Mall cellars were undated although pottery from adjacent pits dates to the 17th century. Internal floors were of tile, brick and mortar with external surfaces metalled or cobbled. One of the cellars lay beneath the course of a road: such placement was common in the city and such cellars were gradually acquired by the city authorities and infilled during the late 18th and early 19th centuries. On such occasions the provision of builder's rubble for the purpose of infilling was welcomed (see Chapter 10.I). Earlier infills of the barbican ditch at Site 150N (see below) were overlain by a sequence of yard surfaces and cellars of 17th- and 18th-century date, themselves backfilled with rubble at the time of the late 19th-century Cattle Market reorganisation (Atkin 2002a, 72).

Although a large quantity of building materials was recovered from deposits attributable to this period, the assemblage was dominated by residual types as a result of the importation of hardcore to consolidate the barbican ditch prior to redevelopment for the Cattle Market in 1738. Post-medieval types include brick (some moulded), roof, floor and wall tiles (Lentowicz and Kemp, Chapter 10.III). Large quantities of building materials (over 32kg of brick and tile) came from mid 17th- to early 18th-century refuse dumps into the barbican ditch in the eastern part of the site. Amongst the tiles was a notable decorative group, some closely datable, many of which had been imported from the Netherlands (Goffin, Chapter 10.III; Fig.10.59). Where recovered from structures, earlier brick types were often re-used in association with later forms. Decorative wall plaster comprised elements of a leaf motif from a running frieze or decorative panel (SF6370, Fig.10.60; Kirkham, Chapter 10.III), while an oak-leaf wall mount was also found (SF121, Fig.10.60; Huddle, Chapter 10.III). Structural metalwork includes a large quantity of timber nails, hinges for furniture/doors, a door knob and knocker. Window fittings include a decorative lead panel and a large quantity of window glass (including evidence for plain quarry glazing; see below). A range of locks and keys includes padlock and door keys.

Wells, water supply and drainage

The first plumber was noted in the Castle Fee as early as the mid 14th century. In her visit to Norwich in 1698, Celia Fiennes noted the existence of a piped water supply for some of its houses (Morris 1947, 148–9). Possible lead water pipe was recovered from the group of 17th-century burials on the Castle Mound. Part of a brick-built drain was recorded in association with buildings in the southern part of the site, running through a 'party' wall into a cess pit which appears to have acted as a sump. To the north-west of the castle, householders were fined in 1681 for allowing their drains and cess pit overflows to run into 'a deep ditch' (presumably the motte ditch; see Chapter 10.I). Part of a system of late 18th- to 19th-century brick culverts was recorded in association with buildings at Site 150N (Atkin 2002a, 72).

A total of 22 domestic late medieval and post-medieval wells were recorded at the Castle Mall site, of which 15 are possibly attributable to the post-medieval period. Most appear to have been infilled in the mid 17th century. Further wells were recorded part way up the Castle Mound and probably relate to use of the mound as pleasure gardens from the late 18th century. One well appears to have been associated with an 18th-century hostelry (*The Murderer's* at Property a/b) and was provided with a hand pump on its top.

Tenements in the north-eastern part of the site were supplied with water largely by wells ranged along Common Pump Street (first documented as such in 1720; Kirkpatrick 1889, 12). Seven wells were recorded here, although others may have been removed by machining. Only one of these lay above fills of the barbican ditch, the others stretching along the outer edge of the ditch (Fig.10.11). These would presumably have been incorporated within the tenements or their yards. Other wells further south related to more properties (now lost) aligned along Common Pump Street. The regular distribution of wells indicates that most households were supplied by them until the latter part of the 17th and 18th centuries. Inclusion of wells within buildings/courtyards was common at this date; during a watching brief at the Bell Hotel (314N) to the west, two wells were recorded, one within a room and the other beneath a wall in the old courtyard. Another was found beneath the surviving 17th-century building at Golden Ball Street. Elsewhere on the site, wells were placed adjacent to or cutting into property boundary walls. Shared wells have been discussed in Chapter 8.V.

Other notable features include an ?18th-century cistern, lying at the edge of the Cattle Market (see above) which contained a system of pipes and inlets/outlets.

Pitting and refuse disposal

From the late 16th century, changes took place in the disposal of Norwich's waste, with increasing efforts to keep its streets clear of muck. Prior to *c*.1670 night-soil

Period	*Indeterminate*	*Latrine*	*Industrial*	*Quarry*	*Refuse*	*Fire*	*Storage*	*Well*	***Total***
6.1	72	3	6	5	19	1	0	6	**112**
6.2	76	4	0	20	14	0	0	9	**123**
6.3	17	0	0	2	0	0	0	0	**19**
Total	**165**	**7**	**6**	**27**	**33**	**1**	**0**	**15**	**254**

Table 10.49 Period 6 pit types, Castle Mall

and other detritus was allowed to accumulate within cess pits and other open features (such as quarries and ditches); after this date most refuse appears to have been removed from the city, a process which became a legal requirement in 1710 (see references in Carter, Evans and Margeson 1985, 78). Celia Fiennes noted in 1698 that Norwich's streets were broad and 'all well pitched with small stones and very clean' (Morris 1947, 148–9). At Norwich Castle, most of the former ditches had been infilled in earlier centuries, although the barbican and motte ditches served as major dumping grounds until *c*.1738 when much of the barbican ditch was levelled and consolidated.

Pitting

The sanitary provision of lined cess pits evident from the late medieval period (Chapter 8) continued into the post-medieval period, with an increasing use of brick. As at sites recorded by the Norwich Survey (Atkin and Evans 2002, 242) many of these features were presumably dug within buildings or attached to their rear walls, although little evidence for associated buildings survived at Castle Mall. Those found adjacent to roads are, however, likely to have lain within buildings. The increasing concern with sanitation, particularly in relation to recurring outbreaks of plague, led to the removal of such features to more distant parts of properties and, at many other sites excavated in Norwich, pit digging in any form appears to have virtually ceased by the late 17th century (Atkin and Evans 2002, 242). The same pattern is evident at the Castle Mall site, with the number of pits dropping dramatically in the latter part of the period considered here. The number of pits of all types had dropped by around 50% from the late 14th to 15th century (from over 200 in Period 5.1), maintaining a similar proportion from the mid 15th to late 17th century (Periods 5.2–6.2), until declining to only a handful by the 18th century (Period 6.3). The 16th to 17th centuries did, however, see a notable increase in the number of wells, although these are notoriously difficult to date (see above). A further 17 pits of the period were recorded at the Golden Ball Street site.

Of the total of 254 post-medieval pits recorded at Castle Mall, only 9 (3.5%) were lined, one of the timber lined examples perhaps utilising a barrel. As in the previous period, a significant proportion of the pits were identified as quarries, many of which clearly became receptacles for rubbish. Many of the pits provided good finds assemblages, including some fine ceramic groups. A group of early to mid 17th-century pits within the barbican has been discussed above. A handful of late 16th- to mid 17th-century pits were found surrounding the former Shirehouse, during the period in which it remained in use as a prison. Of note amongst the features both here and in an adjacent garden (Property a/b) were two T-shaped features, one of which was interpreted on

Lining type	*Period 6.1*	*Period 6.2*	*Period 6.3*	***Total***
timber	1	1	0	**2**
cobble	0	0	0	**0**
wattle	0	0	0	**0**
clay	1	0	0	**1**
masonry/brick	1	4	1	**6**
Total	**3**	**5**	**1**	**9**

Table 10.50 Period 6 pit linings, Castle Mall site

site as a possible gallows or flag-pole. Of note amongst the finds recovered from pits in a property just south of the Shirehouse (Property 49) was an official lead weight of James I, few of which are known (see below and SF5456, Fig.10.67; Huddle, Chapter 10.III). A few other pits lay scattered in open ground in the eastern part of the former south bailey.

A large number of cess and refuse pits were recorded within a yard/garden (Open Area 39, Property b; Plate 10.4) to the south of a pre-existing garden wall (Chapter 8), the property having early connections with public houses (see Chapter 10.I and further details under 'Public Houses and Inns' below). Other groups of pits were recorded within tenements in the southern part of the site and at Golden Ball Street, some of them clearly lying within buildings or small courtyards (one of the latter lying above the infilled terminus of the south bailey ditch). Again, some good artefactual assemblages were present, attesting to wide continental contacts. The function of an unusual pit with an internal wooden partition remains uncertain (pit *259*, Period 6.2, Open Area 51, Property 47/h).

Although a few pits of late 16th- to 17th-century date were present in the north-eastern part of the site, it is in the mid 17th century that pitting activity here is concentrated. Groups of pits and wells here were associated with the buildings that were swept away in 1862, the buildings represented by a few wall remnants and a number of cellars (detailed above).

Use of Castle Ditches

That a vast quantity of Norwich's waste found its way into the remnants of the castle ditches is attested both from documentary evidence and archaeologically. The multitude of documentary references to late 16th- and 17th-century dumping offences are fully detailed in Chapter 10.I. Dumping of animal carcasses took place both officially during plague and by stealth at other times. Clearly, the disposal of large carcasses such as horses (see below) within an urban environment was a problem and the castle baileys provided an attractive open space in which to dump them: such disposal, however, was extremely conspicuous and there are

numerous complaints in the documentary record from as early as the late 14th century (see Chapter 8) attesting to local objections to their presence. As in the castle ditch at Newcastle (Harbottle and Ellison 1981, 93), much of the waste that found its way into the barbican ditch at Norwich probably derived from the great provisions market, indicated both by its proximity and the higher status of many of the artefacts recovered from it.

The Barbican Ditch

The Castle Mall excavations demonstrate that infilling of the barbican ditch (Ditch 13) was not a simple continuous process and the earthwork was clearly used for a range of purposes. Paths and cartways ran within and across it, pits and other features were placed within it including a post-and-plank revetment and subsequent gullies, while drains are known to have led into it. It may also have served as a playground for local children.

Deposition into the ditch began in the late 16th and 17th centuries (Period 6.1), the majority of infills being dumped in the mid to late 17th century (Period 6.2). Around 5m of fill was deposited during this period (Figs 8.8, 8.9, 8.26 and 8.27). Little infilling attributable to the period late 16th to mid 17th century was recorded at Castle Mall along the western and southern stretches of the ditch. Further east, however, sustained refuse dumping began at this time, although without the huge quantities of domestic/craft waste and organic matter that were dumped into the ditch in the second half of the 17th century. Along with pottery, diagnostic objects from the first stage of infilling include a fine bone powder horn of mid to late 16th-century date (SF6191, Fig.10.71; Huddle, Chapter 10.III) and two early 17th-century tokens. Around 280kg of pottery (*c*.29% of the total site assemblage) came from mid to late 17th-century fills of this ditch and included a range of local post-medieval wares as well as regional, English and continental imports (Lentowicz and Goffin, Chapters 10.II and 10.III). A large number of complete or near-complete vessels was recovered, along with fragments of two witch's bottles (see 'Illness and Witchcraft' below). A group of tin-glazed wall tiles is also closely datable within the 17th century and the first few decades of the 18th century (Goffin, Chapter 10.III, Fig.10.59). The large assemblage of clay pipes spans the period 1600–1740, the earliest examples coming from the southern stretch of the ditch (Atkin, Chapter 10.III; Fig.10.24). The clear cut-off date of 1740 tallies neatly with the construction of the Cattle Market in 1738, when deliberate landscaping took place. Phases within the eastern part of the infill sequence are also datable from the changing forms of the clay pipes; those below the timber revetment date to 1640–80 and those above it to 1680–1720. The small group of numismatic items from these fills begins with a Nuremberg jetton of 1500–85 in the same part of the ditch as the early clay pipes and ends with a William III coin of 1697–1702 above the revetment in the eastern part of the ditch (Davies, Chapter 10.III).

A range of sources is indicated for the material that found its way into the ditch. Demolition of the barbican rampart into the ditch has been noted above. Most of the material appears to have been the general refuse from the city, although a number of craftsmen were also using the ditch to dump waste (including cobblers, see below). Animal carcasses, particularly horses, were also dumped (see above). Several dead horses were thrown unlawfully into the ditch in 1673, while lawful depositions (including horses, dogs, cats, pigs and stray animals) occurred during the 1666 plague. Occasional pieces of human bone were recovered. The ditch fills contained a huge assemblage of animal bones, offering the opportunity to examine aspects of animal husbandry during the agrarian revolution of the 18th century (see summary in Chapter 13 and details in Part III, Chapter 3.XI).

The reduction of the rampart to the west of the bridge prior to the 1720s (noted by Kirkpatrick, see Chapter 10.I) may be represented archaeologically by the substantial fills deposited into much of the southern stretch of the ditch (Areas 6, 47, 2 and 4) during the later 17th century, although these were mixed with dumps of refuse and building materials. In actuality, quarrying of the same period had removed the relevant part of the rampart.

In 1738 came concerted landfill, most of the remaining areas of the ditch being filled with building rubble and redeposited rampart. In one area (Areas 2 and 4; Fig.8.26) infilling was clearly made from the north with regular tips by cart/barrow load, although some mixing or rampart debris/quarry waste with waste from other sources was evident (the former massive quarry on northern side of ditch infilled at same time; Fig.8.27). The eastern stretch of the ditch (Area 9) remained open and in use by tenements, whose yards/gardens extended across it. Wilkins described the vestiges of the barbican ditch in the area adjacent to Beaumont's Hill in 1796 (147 and pl.XXIII; see Fig.12.5.A).

Part of what was interpreted as the south bailey ditch but was actually probably the barbican ditch (see Chapter 7), was recorded in 1973 at Site 150N, just to the north-east of the area excavated at Castle Mall (immediately opposite observations of upper ditch fills made in watching brief T28). Here, the bulk of the infilling dated to the mid 17th century and comprised thick dumps of very ashy refuse (Atkin 2002a, 72).

Motte Ditch

Little of the motte ditch has yet been investigated archaeologically, although observations at the Castle Mall site indicate dumping of household refuse and building rubble in the late 16th to 17th centuries, sealed by landscaping material probably associated with the conversion of the area into gardens in the late 18th century. Earlier observations of post-medieval infilling include those made at the rear of the Shirehall (Tench 1910; Wallis in prep.) and to a more limited extent in front of the Keep (Wallis in prep.). Tench noted that the infills he observed were very heavily compacted and contained numerous coins of a range of dates, pottery, 'Dutch' tiles and many bones (Tench 1910, 43).

The South Bailey Ditch

The uppermost fills of the central stretch of the south bailey ditch recorded at Castle Mall (Area 1) appear to indicate deliberate levelling of both the ditch and adjacent quarries (Fig.8.14). These fills were undated but overlay fills of late 14th- to 15th-century date (Period 5.1) and are probably attributable to the post-medieval period. At the Golden Ball Street site, the terminus of the ditch was infilled during the 16th century (see Chapter 8.II), before being cut into by pits which were overlain by a yard surface and subsequent garden (Open Area 51, Property 47/h); Fig.8.31).

People and Possessions

People and their status

At the beginning of this period, the Castle Fee property rental records demonstrate a lack of indigenous population movement, with the grandchildren of some of the former owners of Castle Fee properties still present. Changes in the economy, however, signalled new arrivals, both from the surrounding countryside and the Continent. A major new cultural minority — the Strangers — arrived in Norwich in the latter part of the 16th century, the majority settling in the central and northern part of the city (Atkin and Evans 2002, figs 1 and 2). Details of those individuals who settled in the parish of St John Timberhill are given in Part IV, Chapter 3. Information relating to these individuals provides some insights into their daily lives, particularly to differences in their treatment from the English population and regulations ordering their lives. They were not, for example, permitted to display their goods outside shops and were only allowed to sell to other Strangers or to the city at wholesale prices; they were free, however, to deal in London or abroad. The archaeological evidence for the presence and/or influence of the Dutch is given below.

Although the majority of the objects recovered from deposits of this period represent the middle and lower sectors of Norwich society, evidence of the upper tier of society was also present. A degree of status is indicated by an unsmoked batch of early clay pipes (dating to the early 17th century) which indicate the local presence of a wealthy customer as tobacco was still an expensive commodity at this date (see below). Similar evidence from Site 150N corroborates the presence of at least one wealthy client in the vicinity of the castle ditches. Some of the styles of leather shoes found in fills of the barbican ditch also indicate the presence of wealthier sections of the community, while one spur leather is of

a type worn by the aristocracy during the 17th century (SF398, Fig.10.72; Mould, Chapter 10.III). A parrot may have been owned by a wealthy merchant or publican and must have been a talking point of its time (see 'Foreign Contacts' below).

Fine pottery and glasswares were also present. The pottery includes a wide range of fine wares, many of them highly decorated and many imported from the continent. These include examples from the Low Countries, Germany, Italy, France and Spain (see below), including a particularly fine bowl of marbled Pisa ware and a highly decorative Saintonge sweetmeat dish which may have been a treasured possession (Lentowicz and Goffin, Chapters 10.II and 10.III). Glasswares again include good quality and finely decorated examples, including a rare gilded beaker from northern Italy or southern Germany and wine glasses with lion's head masks (Shepherd, Chapter 10.III). There are also hints at the highly decorative interiors of some of the higher status houses that surrounded the castle ditches. These include the painted wall tiles and other wall decorations noted above.

At the other end of society, the most poignant evidence for poverty and hardship comes from the group of buried felons described above. Other hardships are indicated by the evidence of the *Census of the Poor* of 1570 detailed in Part IV, Chapter 3. Textiles from the site indicate the repair and remaking of garments (Crowfoot, Chapter 10.III). Amongst the very personal objects recovered from the site is a simple wooden spoon, which may have been used by someone who was left-handed (SF1097, Fig.10.56; Huddle and Taylor, Chapter 10.III).

Alongside the juvenile included amongst the prison burials, children are well represented by the presence of a piece of sewing that may have been done by a child, numerous small shoes and a boy's spur (Chapter 10.III). Toys include a sledge (see 'Games and Pastimes' below).

The notable number of dogs found at this period may include both domestic pets and strays, with some deliberate burials apparent. Although most of the animals appear to have been small, a range of types and sizes was evident including examples of poodle, beagle, terrier and labrador type (Plates 10.30–10.31; see summary in Chapter 10.IV and Albarella *et al*, Part III, Chapter 3, 'Dog'). Cats were also common and were evidently still subjected to occasional skinning.

Dress and personal possessions

Pictorial evidence for dress fashions of the period comes from the decorated powder horn showing a ?German hunting outfit of the mid to late 16th century (SF6191, Fig.10.71) and a male figure on a painted ?Dutch wall tile of the late 17th to early 18th century (SF833, Fig.10.59). Motifs on the pottery include a Raeren-Aachen stoneware vessel depicting a mid 17th-century woman's head-dress (Fig.10.38, no.4) and two mid 17th-century octagonal plates, both showing Dutch-type male figures of the period (Fig.10.36, nos 6 and 7). Local clothing is amply demonstrated by a local household inventory of a Stranger saye/serge weaver in 1603 which details shirts and smocks for men, women and children, neckerchiefs, hats, petticoats, doublets, jerkins and waistcoats, breeches, hose, aprons, cloaks and gowns (see Ives Part IV, Chapter 3.IV). The quantity and range present indicates that the material he wove was made up into garments which he sold.

Amongst the textile assemblage from the Castle Mall site are fragments of clothing including knitted hose/jerkin, felt hats, linen shirts or caps and silver-gilt covered silk made into bobbin lace, such as would have been fashionable in the late 16th century on a bodice or doublet (Crowfoot, Chapter 10.III). The manufacture of lace, felt for hats, buttons, strings and draperies in the parish of St John Timberhill is noted in the 1570 *Census of the Poor* (see Part IV, Chapter 3 and below). Excavated dress fasteners include a range of buckles, tags, buttons, lace-ends and mounts (Goodall and Mould, Chapter 10.III). A few pieces of jewellery were recovered and include an inscribed ring, beads, an ornate head-dress pin and fine chain which may have been part of a necklace.

Footwear recovered from the barbican ditch includes a range of leather shoes for both children and adults, as well as possible patten straps (Mould, Chapter 10.III). Of note amongst the shoes is a red-heeled example, a fashion recorded as early as 1614 that was popular amongst the aristocracy and at court by the 1630s and became more common thereafter (SF74, Fig.10.30). Other shoes had square toes and/or toe puffs and one was of a style worn by women from as early as the 1660s, remaining popular for the next century. Heavy duty footwear includes iron boot heels and hobnailed examples. The waste from shoe-making was also found in ditch fills and is detailed further below.

Purses included a silk purse lining containing 16th-century jettons (Crowfoot; A. Popescu, Chapter 10.III) and scraps of leather from purses or powder flasks (Mould, Chapter 10.III). Iron and leather purse frames both appeared to be residual from the 15th century. A complete money-box of 15th- to 16th-century date was recovered from an early to mid 17th-century pit at the Golden Ball Street site, having possibly been curated over a considerable period (GBS SF38, Fig.8.51). The slit opening had been enlarged with a chisel, perhaps to release the contents without breaking the vessel open completely.

Other notable personal possessions include a complete pocket compass sundial of *c.*1700, possibly from Amsterdam, which must have been a sad loss to its owner (SF6729, Fig.10.25, Plate 10.12; Brown and Ashley, Chapter 10.III). Clay tobacco pipes are numerous and provide useful dating evidence as well as information on objects of probable Dutch origin (see 'Foreign Contacts' below). Toilet articles include combs of both bone and ivory, such objects probably being manufactured nearby (see 'Crafts and Occupations' below).

Writing appears on a piece of pottery, along with another fragment dated [16]61 (Fig.10.39, nos 12 and 13). Decorative book fittings were also found, supplemented by documentary evidence for locally-owned books of the period: in his will of 1626, the owner of the *Blue* (or '*Blew*') *Bell* public house left two bibles, two other religious works and an abridged book of statutes (Property 52/53, St John and St Peter Mancroft; see Tillyard, Part IV, Chapter 2). A local inventory of 1603 notes the presence of bibles and a 'marter' (martyr) book (see Ives, Part IV, Chapter 3.IV).

Food, drink and kitchen equipment

A vivid depiction of the range of foodstuffs available in Norwich market is given in 1681: 'A little way from this [Norwich] castle on the opposite side of a hill is the chief market place of this city, and this being the only place where all things are brought to be sold for the food of this great city, they not as in London allowing markets in several places, make it vastly full of provisions, especially on Saturdays, where I saw the greatest shambles for butcher's meat I had ever yet seen' (Baskerville 1893, 269–70; quoted in full in Pound 1988, 26–27). Baskerville's subsequent list of the provisions available refers to veal, pork and hogmeat, poultry and diary products such as butter and cheese, marine and freshwater fish (including crabs, flounders, mackerel, lobster, pike and oysters), oatmeal, gingerbread and a wide range of cereals (wheat, rye, oats, malt, French wheat and barley). In the 17th and 18th centuries, new shops ranged along the eastern side of the market place were catering for wealthier clientele. These included milliners, booksellers, vintners, confectioners, wigmakers and gunsmiths (Priestley 1987, 17).

As in previous periods, animal bone from the excavations again demonstrates the predominance of the main domesticates in the diet, supplemented by rabbit, although changes in patterns of consumption are evident and are fully detailed by Albarella *et al* in Part III, Chapter 3. Beef remained the dominant meat. The on-site breeding of cattle and sheep evident in earlier periods appears to have gradually reduced or ceased. Pig breeding, however, evidently continued. The distribution of body parts from fills of the barbican ditch indicates that selected parts of animals, such as sheep, were acquired by local householders, perhaps from butchers working within the city. Milk and other dairy products would have been sold within the urban environment and the production of cheese is indicated archaeologically by the presence of ceramic cheese presses.

Domestic fowl, consumption of which appears to have increased, was well represented in post-medieval pit fills. Geese, ducks, turkey (see 'Foreign Imports' below) and a range of wild birds were also consumed, the latter in low numbers. Avian eggshell was found in cess pit fills.

Fish bones demonstrate the increase in cod as the dominant food fish during the post-medieval period, with few freshwater species apparent (Locker, Chapter 10.III and Part III). The lack of fish bones from fills of the barbican ditch is notable, possibly indicating that this was not typical household waste.

Pottery vessel forms (see below) indicate a range of cooking practices and food types, while Spanish wares include olive/olive oil jars (Lentowicz and Goffin, Chapter 10.III). Such 'fine oyl' was for sale at Mrs Jayne Pyecrofts, near the Red Well to the north of the Castle, in 1708 (Priestley and Fenner 1985, 9). Norwich was renowned for its orchards and gardens and a number of its plantsmen specialised in growing a wide range of fruit, a practice well established by the early 18th century (Priestley and Fenner 1985, 29–30). Plant remains from cess pits at the Castle Mall site include a wide range of fruits comprising marrow/pumpkin, fig, strawberry, apple, cherry, bullace, plum, bramble, raspberry, elder and grape (Murphy, Chapter 10.III). The consumption of fruits is also indicated by the discovery of a possible fruit knife (SF7561, Fig.10.55) and apple corers/scoops (SF117, Fig.10.56). Fruit was to be found for sale adjacent to the Market Cross.

A range of beverages are represented during this period, including beer, wine and tea. Ceramic drinking vessels include tygs, mugs, tankards, cups, saucers and posset pots. Glasswares include notable groups of drinking vessels such as flutes, goblets and beakers some of which came from northern Italy, the Netherlands and France. Other evidence for drinks comes from the large number of 'English' wine bottles. Amongst the glass bottles was a case bottle designed to be crated with others (Shepherd, Chapter 10.III).

The consumption of an increasing range of alcohol reflects the growing number of public houses in the area and at least two beerbrewers owned property within the former Castle Fee area. Although there is no documentary evidence for a beerbrewer at Property (e) to the south of the site, a malting kiln lay in its backyard (see 'Malting' and 'Public Houses' below).

A possible teapot spout in tin-glazed earthenware came from a late 17th- to early 18th-century fill of a gully within the barbican ditch, while a ?teabowl and part of a Wieldon teapot came from fills of the barbican ditch (Lentowicz, Chapter 10.II). Tea became a popular if expensive drink during the second half of the 17th century, the leaves being imported from China and India (Priestley and Fenner 1985, 7–8). Initially it was consumed medicinally and by the wealthier classes, although by the early 18th century its decreasing price made it more widely available for social drinking. Tea, coffee and chocolate (some of the latter imported from Spain) were available for purchase in shops adjacent to the castle by the early 18th century (Priestley and Fenner 1985, 9). Although the earliest teapots were imported from China, English potters were manufacturing them by the early 18th century: at Norwich cups, saucers and teapots were available from the city's shops as early as 1715 (Priestley and Fenner 1985, 26).

Kitchenwares noted in the inventory of William Moons (1603) — a former resident of St John Timberhill parish — include a trivet, frying pans, tongs, a skillet, great pewter plates, dishes, salt pots, spoons and kettles (Ives, Part IV, Chapter 3.IV). As well as the finewares noted above, the pottery assemblage from the castle site includes a wide range of basic kitchen, serving and tablewares such as jars serving many functions, cooking vessels (cauldrons, pipkins), skillets (shallow bowls/frying pans), dripping pans (used over the fire to cook meat and fish), Dutch ovens, chafing dishes (used to keep food warm), colanders (the latter also in also metal) and porringers (again, also found in pewter). Flatwares included dishes, plates (including soup plates), bowls (handled examples and cockerel bowls), cheese presses and sprinkler jugs. Iron vessels include cauldrons and a possible frying pan. A wooden bowl was also found, along with the hoops from a barrel.

A range of knives includes examples for use at table and in butchery (Mould, Chapter 10.III). Some had elegantly decorated handles, while others had plain bone, antler and ivory knife handles (Huddle and Riddler, Chapter 10.III). Amongst the decorated handles were two bone examples which had apparently been carved by the same person (evidence for manufacture on site is discussed below). Other implements include small handles in ivory and copper alloy. Bone and wooden

spoons were also present (the latter a rare find; Huddle and Taylor, Chapter 10.III)). More utilitarian objects include a wooden scrubbing brush. Evidence for hearths takes the form of possible hearth waste dumped into pits, along with pot hooks/hangers.

Illness and witchcraft

Illness and injury of the period is evident in the 17th-century prison burials discovered at the top of the Castle Mound, perhaps the victims of plague or other infectious disease. The bodies displayed fractures and a high number of head wounds (noted under 'Prisons and Prisoners' above). Many of the evident ailments were stress or work related, although arthritis and possible scalp infection were noted.

Continuing earlier traditions, two barber-surgeons still owned property within the Castle Fee at this time: a father (d.1603) and son (see Property 13, St Andrew; see Part IV). Numerous pottery drug jars (over 100 fragments), ointment pots and glass pharmaceutical/cosmetic phials were found within pits, quarries and the barbican ditch. Such drug containers would have been used by both apothecaries and barber-surgeons. Glass urinals, such as that found in a pit fill, would have been used in the medical science of uroscopy (Shepherd, Chapter 10.III). A pair of spectacle lenses came from a mid 17th-century pit: although spectacles were in use by this date, these particular examples may have been intrusive in their context. A possible eye-bath (or egg-cup) came from a well-dated mid/late 17th- to early 18th-century quarry fill (Open Area 62, Period 6.2).

Superstition and fear of witchcraft was widespread during the second half of the 17th century, during which period individuals accused of witchcraft were executed at Norwich Castle (two women in 1649 for example; Blomefield 1806, I, 396). Fragments of two witch's bottles were retrieved from the Castle Mall site, both from late 17th-century fills of the barbican ditch adjacent to tenements, with a third complete example coming from the former site of the church of St Martin-in-Balliva (Site 113/569N, see Chapter 2). The latter contained approximately 63 nails, 38 pins and human hair. Other complete or near complete *Bartmann* flasks recovered from the barbican ditch at Castle Mall are illustrated in Chapter 10.III. The two fragments definitely identified as witch's bottles contained iron nails and copper alloy pins. Clearly, they were not in primary context when found and may have been disturbed from adjacent ditch fills or from beneath buildings in the vicinity.

Such bottles served as a 'white magic' counterspell against witchcraft and illness and were widely used during the second half of the 17th century. The last recorded example occurred in Norfolk as late as 1939 (Simpson and Roud 2000, 394) and witch's bottles are particularly common in the east of England, where they are often found beneath thresholds or hearths within buildings (Merrifield 1987, 167; *e.g.* Norwich Whitefriars, Site 36N, Atkin and Evans 2002, 196). To perform the charm a *Bartmann* bottle was filled with a range of items such as urine (either animal or human), hair, nail clippings, cloth hearts, nails, pins (often bent), coal, wood, glass and threads and was corked and either set to heat by the fire or buried (Merrifield 1987, 163–175; Simpson and Roud 2000, 394). Several published examples from London all come from the outskirts of the City, often adjacent to a stream or river or in open ground. One bottle from Duke's Place, Aldgate, London was found buried in fills of the medieval city ditch (Maloney 1980, 157; Merrifield 1987, 164). Contemporary accounts demonstrate the belief that the spell was transferred back to the witch (Gaimster 1997, 139), represented anthropomorphologically by the face on the jug (Maloney 1980, 157; Merrifield 1987, 173). The use of urine in the charm may relate to the large number of urinary complaints of the period.

Furnishings

The character and status of local households evidently varied considerably. Household furnishings of the poor are poignantly outlined in an inventory of a Norwich Stranger's goods in 1603 which describes benches, tables, stools and cupboards — all apparently in a disreputable state — along with drab soft furnishings including an old feather bed, bolsters, cushions, coverlets, blankets and linens (the full inventory is transcribed by Ives in Part IV, Chapter 3.III).

In addition to the excavated household objects noted earlier in this section, a number of other artefactual categories provide limited evidence for furnishings. As in the previous period, textiles include a type of hard-wearing worsted used in curtains and other household furnishings. Evidence for furniture comes from metalwork such as strapping for chests, keys which may have been used on chests or caskets and furniture handles. Lighting is represented both by ceramic candlesticks and lamp niches provided within cellars. Welcome comfort would have been provided by the numerous bedwarmers found.

Military items, hunting and horse equipment

The first ceremonial use of the city guns within the south bailey is documented in 1638, with a gun platform added at the top of the mound during the Civil War of 1640–45 (Chapter 10.I). During the latter conflict, in which the city saw a number of riots, the majority of the least parliamentary-Puritan parishes in the city were in the wards of Mancroft and Conesford: amongst them was St John Timberhill in the latter ward (J.T. Evans 1979, 146 n.). Despite the occasional disturbances of the period and the presence of the city Gun House within the south bailey from 1741, little archaeological evidence for military activity was found. A few musket balls were retrieved, while a finely decorated 16th-century powder horn (SF6191, Fig.10.71) and scraps of powder flasks may well have been used in hunting. Gunpowder, for use both in firearms and home-made fireworks, would have been available from the city's grocers (Priestley and Fenner 1985, 7).

The presence of horses at the site is particularly evident during this period, not least from the deposition of horse carcasses into the castle ditches. Amongst the equid bones is an example showing bit wear, either as a result of riding or traction (see Chapter 10.IV, Plates 10.26–10.29 and Albarella *et al*, Part III). Horse equipment includes harness leathers, a gilded horse mount, harness bells and horseshoes, while an oxshoe and a cart axle guard were also found. Spurs include two which probably came from the same workshop, including one for a child (Ellis, Chapter 10.III and see below). The presence of stables and farriers in and around the castle baileys is discussed under 'Crafts and Occupations' below.

Games and pastimes

In archaeological terms, the most visible evidence for post-medieval pastimes is of course smoking represented by the assemblage of over 1,000 clay pipe fragments (Atkin, Chapter 10.III). During the 17th century, smoking proliferated as a popular occupation despite the high price of tobacco. Norwich's authorities viewed it with extreme disfavour and the first legislation against the habit in public was passed as early as 1677 (Priestley and Fenner 1985, 11). Tobacco was initially imported from the Caribbean, its presence in Norwich witnessed by early clay pipes found at excavations around the castle (see above), but lower cost goods were imported to the city from Virginia in the late 17th century. By the 1670s clay tobacco pipes were being sold in Norwich for as little as 2s the gross (Priestley and Fenner 1985, 11).

Adult diversions such as hunting and horse riding have been discussed above, although riding equipment notably includes a boy's spur (SF54, Fig10.72; Ellis, Chapter 10.III). Boys of the period would have been taught to ride at an early age. Toys and games were available for purchase in Norwich's haberdashery shops during the 17th century and may have been the source of the ceramic bird whistle found in the barbican ditch (SF7514, Fig.10.68; Lentowicz, Chapter 10.III). Other less sophisticated objects, such as the horse jaw-bone sledge (SF421, Fig.10.69–10.70; Huddle, Chapter 10.III), for which few parallels have been found archaeologically, and skates (SF5746, Fig.10.71; Huddle *et al*, Chapter 10.III), are perhaps more likely to have been manufactured in a domestic setting. The sledge may well have been used locally, the children benefiting from the surviving slopes of the castle ditches, while skating was a common pursuit throughout the period.

A possible bicycle bell (of probable 19th-century date), if correctly identified, was intrusive in a mid 17th-century fill of the barbican ditch.

Crafts and Occupations

Documented trades of Castle Fee property owners (although not necessarily occupiers) in the period *c*.1559 to *c*.1700 (see Part IV, Chapter 2) are not as plentiful as in previous periods, with a total of 23 different occupations being evident (Table 10.51). The analysis presented in Part IV, however, by no means includes the whole gamut of evidence which could have been collated from other sources had time and costs allowed. Other documented occupations, for example, include the gaolers working within the local prisons.

A broad breakdown by trade group (as defined in Chapter 8) is given in Fig.10.79 and can be compared with that from Period 5 presented in Fig.8.63 (although with a considerably smaller data set; only 50 individuals of this period compared with 195 in the period *c*.1397 to *c*.1530; Chapter 9). As in previous centuries, some of the waste from these activities found its way into castle-related features, in particular the barbican ditch and adjacent quarries.

Strangers living and working in the parish of St John Timberhill between 1576 and 1624 are detailed by Ives in Part IV, Chapter 3. Named occupations include a hatter (along with the manufacture of felt for hats), woolcombers, weavers (including a master weaver) and cloth shearers. A range of cloth types is evident and includes saye/serge[64] and bay. A turner may have been making looms. Other trades include potters, a currier, cordwainers and a comb maker. The 1570 *Census of the Poor* also indicates the presence of a tailor, furrier (rabbits), cobbler, cordwainer, hatmaker, blacksmith, bow maker, carpenter and weaver. Wifely occupations were often linked to those of the husband and include spinning, making buttons and string, as well as wool carding. The English inhabitants of the same parish include a brewer, a currier, butchers, a ?roper, a smith and grocers.

Between 1590 and 1609, the most heavily recruited trades to the freedom in Norwich were the tailors, worsted weavers, cordwainers, grocers and carpenters, while between 1670 and 1689, the five dominant trades were the worsted weavers, tailors, cordwainers, bakers and carpenters (Pound 1988, 19, n.3).

Metal trades

The dramatic decrease in those documented as working in the metal trades at this period is notable and reflects the gradual removal of such activities from the urban setting. Only two smiths are recorded within the Castle Fee parishes (both at Properties 52–53, St John Timberhill, now the Bell Hotel), although others were evidently working within the farriers premises and stables in the immediate vicinity (detailed in Chapter 10.I). Excavations at the Royal Arcade (Site 758N, see Chapter 2) immediately to the west of the castle revealed a series of post-medieval and early modern stable floors relating to the 19th-century stables and outhouses of the Royal Hotel (replacing the Angel which had stood on the site since the 15th century). These buildings were demolished and converted into the Royal Arcade at the turn of

Occupation	*Total*
alderman	3
barber-surgeon	2
beerbrewer	4
brasier	1
carpenter/builder	1
coverlightwever	1
draper	1
glazier	1
graver (?carver/joiner)	2
grocer	6
haberdasher	1
hosier	1
husbondman	2
mercer	4
public notary	2
skinner	4
smith	2
tailor	4
tiler	1
woolcomber	1
woolen weaver	1
worsted weaver	3
yeoman	2
Total	**50**

Table 10.51 Summary of trades of owners paying Castle Fee rent in the late 16th to 17th centuries

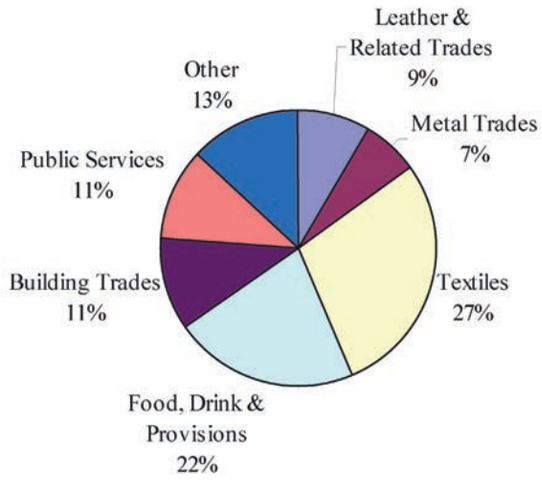


Figure 10.79 Documented Castle Fee owners' trades (*c.*1559–*c.*1700), by no. of individuals (excludes unspecific 'merchants')

the century, when the hotel moved to Bank Plain. As well as the stables associated with the burgeoning number of hostelries surrounding the castle ditches, a stable and coach house lay isolated within the western part of the former south bailey by the mid 18th century, while a blacksmith's shop and stables within the Castle Meadow were demolished in 1760. Harness makers were also at work in the surrounding area. Late 16th-century smiths were also operating elsewhere in the parish of St John Timberhill (Ives, Part IV).

Both ferrous and non-ferrous working were in evidence at the Castle Mall site, although on a vastly reduced scale from the preceding period (Shepherd Popescu *et al*, Chapter 10.III). Ironworking was focused around the large quarry responsible for the collapse of the barbican gate, from which an assemblage of late 17th- to early 18th-century blacksmithing scrap and tools came (Open Area 62, Period 6.3; Mould, Chapter 10.III). A link with the immediately adjacent stables of butcher Nicholas Lane, built in 1735, seems possible.

Non-ferrous working (lead and copper alloy) was indicated by waste materials and crucibles, while pin-making was represented both by lengths of wire and pinner's bones. A small group of Coal Measures Sandstone whetstones may have been imported ready-shaped from the Midlands or South Yorkshire (Mills and Moore, Chapter 10.III).

Butchery, skinning, leatherworking and allied trades

Norwich's butchers maintained their presence along Ber Street while in the great market the stalls of the butchers and fishmongers eventually became separated from the main market area (Priestley 1987, 19–20). The size and shape of cattle, sheep and pigs at Castle Mall altered and such changes are fully detailed by Albarella *et al* in Part III, Chapter 3 (see summry in Chapter 13). Cattle of the period indicate a contrast between the short-horned varieties of earlier times and the longer horned animals of the post-medieval period. The Castle Mall animals seem to represent an intermediate form between the *long-horned* late medieval/early Tudor animals and the *longhorn* types of the 17th and early 18th century (the forerunners of the improved modern *Longhorn*).

The continued presence of livestock in the castle baileys has been noted above. Evidence for butchery includes a blood-letting knife and other butchery knives. Butchery practices are demonstrated by the faunal assemblage and are fully detailed in Part III. Chopping marks are notably more common on post-medieval cattle bones than those of earlier periods. A sawn sheep pelvis from a mid 17th- to early 18th-century fill of the barbican ditch indicates that saws were in use as butchery tools by this period. Changes in kill-off patterns at this time, partly associated with the introduction of new breeds, are detailed in Part III. Of note is the slaughter of pigs, domestic fowl and geese at a younger age.

A notable omission from the occupations listed in Table 10.51 (other than the skinners) are the cobblers and other leatherworkers. The city's dominance in leather products regained its former medieval level in the mid 19th century with the decline of the textile industry. Animal bones from the excavations demonstrate that skinning of the main domesticates continued. A dealer in rabbit skins was operating within the parish of St John Timberhill in 1570, while leatherworking is represented archaeologically by shoe repairs evident in the assemblage from the barbican ditch which indicate the local presence of a cobbler's workshop (Mould, Chapter 10.III). Primary and secondary waste was found in association, along with a leatherworking awl. The excavated leather was all bovine and included calfskin. As well as shoes, the final products of leatherworkers found at the site include powder flasks, clothing, belts/straps and horse harness.

Allied trades include bone-, antler-, horn- and ivoryworking, workers in such materials being known throughout the post-medieval period (Crossley 1994, 221). Boneworking is evident on the remains of a range of animals from Castle Mall, including cattle, sheep/goat, horse and deer, the function of some of the final objects remaining obscure. As well as finished objects, the remains include blanks or rough-outs for unknown objects and possibly a practice piece. Hornworking waste is dominated by cattle horns, again concentrated in fills of the barbican ditch. One example from a quarry fill came from a large long-horn type animal (see comments

on breed changes in Part III, Chapter 3). The residue from antlerworking includes a concentration of primary and secondary waste around the top of the barbican well in the late 16th to early 17th century, clearly associated with the manufacture of handles (Huddle, Chapter 10.III). Another cluster came from the barbican ditch and included an antler hammer from fills of mid to late 17th-century date. These ditch fills also contained evidence for elephant ivoryworking, including a comb trial piece and raw material in the form of the outer part of a tusk (Riddler, Chapter 10.III).

Malting

The presence of publicans and brewers on the castle site is discussed elsewhere in this section and in Chapter 10.I. Direct evidence for their presence is a malting kiln of probable late 16th- to 17th-century date (Period 6.1). A sequence of 15th- to 17th-century malthouses excavated by the Norwich Survey at Botolph Street (Site 281N; Davison and Evans 1985, 119–121) were provided with kilns of quite different form, as were the larger complexes found at other urban centres (Crossley 1994, 221–2). The Castle Mall kiln may have been for small-scale production and its plan compares well with a 13th- to 14th-century example found at Redcastle Furze, Thetford (Andrews 1995, 79, fig.61). The Castle Mall example had a clay lined stoke-hole rather than the clay lined drying chamber evident in the Thetford example. A malting floor may be represented by the beaten earth surface which survived just to the east. This layer of compacted clay was noted to be laminated and contained the impressions of straw/grass. Adjacent to the kiln was a small building, similar to the small 'rooms' evident in the structure housing the malting kilns at Thetford (Andrews 1995, fig.60).

Plant remains from the Castle Mall oven indicate a combination of fuel residues (crop processing waste, heather, bracken and wood/charcoal) with wheat and barley grains accidentally charred during malt-drying or roasting (Murphy, Chapter 10.III and Chapter 13). The processes involved are usefully summarised by Andrews (1995, 85) as follows. The grain would have been steeped in water, then spread out on a malting floor to germinate, before being dried in the oven or kiln for between one and four days, depending on the type of malt required. Drying burnt off the shoots, arrested growth and converted the barley into malt. It had the additional effect of hardening the grain, thereby making it easier to grind. After grinding, the malt could have been made into ale in an adjacent building or taken/sold elsewhere for brewing. The absence of hearths adjacent to the Castle Mall kiln, over which the malt could have been boiled, suggests that ale was not brewed here, or that any such features had been truncated by later activity.

?Horticulture

The Castle Mound was in use as allotments during the late 18th century, with areas of the former baileys used as gardens and orchards from the late 16th century until 1800 and beyond. The production and consumption of fruit within the city has already been noted. Such activity is indicated archaeologically by the presence of spade shoes and a pruning hook (Mould, Chapter 10.III), while wells recorded on the side of the Mound may have provided a source of water. Garden soils of possible 17th-century date were recorded both on the side of the Castle Mound and above a metalled yard at Golden Ball Street, just to the south of one of the minor prisons (Open Area 51, Property 47/(h), formerly St Martin at Bale).

Textiles and needlework

As has been discussed in Chapter 10.I, the textile industries remained a significant part of the Norwich economy during much of the post-medieval period: after 1650 more worsted weavers were admitted to the freedom than any other trade (J.T. Evans 1979, 19). Thomas Baskerville noted in 1681 that 'the chief trade of this famous town consists mostly in making stuffs, and worsted stockings, they in these sorts of manufactures excelling all other places' (quoted in J.T. Evans 1979, 19). The activities of the Strangers working in a range of textiles and allied trades within St John's parish has been noted above. The 1603 inventory of weaver William Moons provides a detailed picture of the contents of his workshop, which contained spinning wheels, a loom, benches, stools and weaving equipment, as well as its products (see Part IV, Chapter 3.III).

The textiles from the excavations include worsted, felt for hats, lace, knitting and linen (Crowfoot, Chapter 10.III). A single cloth seal was recovered from the Castle Mall site, while a 16th- to early 17th-century example from Augsburg (Germany) was found at Golden Ball Street (Egan, Chapter 10.III). Other equipment includes scissors (some for use in trimming fibres on textiles), a heckle tooth, shears, dress-making pins (the manufacture of drawn wire pins being noted above) and thimbles (Mould and Goodall, Chapter 10.III). Although the acquisition of wool remained significant, the animal bones indicate an increasing focus on mutton consumption during the late medieval and post-medieval periods (see Part III, Chapter 3).

Window glazing

Glaziers, glasswrights and stainers are well represented amongst those working in the building trades in Norwich during the period 1501–1675 (Pound 1988, appendix II) and had been present within the Castle Fee for a considerable part of the medieval period (see earlier chapters). Amongst the named Norwich glaziers is the Gogell family at Property 6, St Andrew in 1607–8 (see Part IV). A large assemblage of post-medieval window glass dumped into the central part of the barbican ditch and the adjacent quarry between the mid 17th and early 18th centuries represents a by-product from the glazing process, using the muff method (detailed by King in Chapter 10.III; see also Chapter 13). Much re-glazing took place after the Reformation, when earlier stained/decorative schemes were replaced with plain glass, as well as in the renewed iconoclasm of the 17th century.

Tobacco pipe kilns

Pipe kiln debris previously found in Norwich includes material from Pipemakers' Yard on Pottergate (S. Atkin 1985b, 52). The notable clay pipe assemblage from both the Castle Mall and Golden Ball Street sites provides useful connections with documented manufacturers, production being attested by the presence of pipe kiln muffles and wasters (Peacey, Chapter 10.III). A number of maker's marks were present on the pipes in the kiln muffle, including a previously unknown mark

'IO'. Manufacture in the immediate vicinity is possible, although the kiln waste may have been brought to site as hardcore.

Pottery
The large assemblage of tin-glazed earthenware from the site came from a number of sources, not only continental vessels from the Netherlands but also from English potteries in London and Bristol, possibly even from Norwich itself. A large possible waster sherd of biscuit-type ware found residually in an 18th- to 19th-century cellar fill at the Golden Ball Street site (Fig.8.52, Period 6.3; Goffin, Chapter 10.II and III) provides direct linkage to the local kilns, evidence for which is attested by the occupations of the Strangers in the parish of St John Timberhill detailed by Ives in Part IV, Chapter 3 (see also note in Chapter 10.I).

Trade and commerce
A suprisingly limited number of coins was recovered from the site, the small assemblage including English, French and Nuremberg jettons. Of note was a group of 16th-century jettons found within a possible silk purse lining (A. Popescu, Chapter 10.III). Tokens form a major component of the assemblage and include an unparalleled example (Davies, Chapter 10.III). The group of lead weights includes a rare official example, while others were probably used by merchants or in a domestic setting (Huddle, Chapter 10.III).

Local Environment
The reduced footprint of the former south bailey survives to the present day much as it existed in the late 16th century, with remarkably little later encroachment although the extension of the Cattle Market in 1862 removed earlier properties along its eastern side. The post-medieval period, however, saw a halt in the green character of much of the south bailey and barbican, which was not reinstated until construction of the modern park in the late 20th century. Prior to 1738, both the south bailey and Castle Meadow maintained their overgrown and untidy character, amply illustrated in the south bailey by Cleer in 1696 (Plate 10.1). It was not until the levelling within the barbican of 1738 that the whole of the southern part of the castle defences was cleansed and formalised with carriageways and roads replacing the earlier cartways, tracks and paths. Throughout the 18th and 19th centuries, the Cattle Market was repeatedly resurfaced with a range of materials including pebbles, gravel, granite, stone, bricks and asphalt, due both to subsidence and slipperiness (see Chapter 11.I).

Foreign Contacts
Supplementing earlier studies, the Castle Mall and Golden Ball Street projects have provided considerable evidence for the presence of Strangers within the parishes concerned, drawn both from artefactual and documentary evidence (for the latter see Ives, Part IV, Chapter 3). Many of the Dutch or Dutch-type objects are likely to be personal possessions of immigrants rather than indicating trade. Although the discovery of such material does not demonstrate any unusual 'immigrant' activity in the close locality, it does mirror the general pattern of Dutch finds within the city. Such finds notably include the pair of sledge runners made from horse jaw-bones noted above; only two other fragments of such sledge runners are known from archaeological sites, one in Dordrecht, Holland and the other in York. This sledge is paralleled in 16th-century Dutch and Flemish paintings, such as those by Pieter Breugel the Elder (SF421, Figs 10.69–70, Plates 10.23–24; Huddle *et al*, Chapter 10.III).

Many of the artefacts recovered from the site are paralleled in assemblages from Amsterdam, including some of the dress fittings and jewellery such as a head-dress pin or bodkin which reflects a fashion particularly popular in the Netherlands during the 17th century (SF53, Fig.10.22; Goodall, Chapter 10.III). Dyer's Madder identified in some of the textiles was also imported from the Netherlands (Walton Rogers, Chapter 10.III). A pocket compass sundial dating to *c.*1700 bears the Arms of Amsterdam which is its likely place of manufacture (SF6729, Fig.10.25; Brown and Ashley, Chapter 10.III). A number of the clay pipes from both the Castle Mall and Golden Ball Street sites are of probable Dutch origin (Goffin, Chapter 10.II; Atkin, Chapter 10.III) and would have been imported to Norwich from the Low Countries via Great Yarmouth.

Dutch-type pottery was also well represented by tin-glazed earthenware, with a waster sherd noted above indicating the possible proximity of a kiln. Some of this large assemblage would have been imported and some English or locally made. Of note are those decorated with Dutch motifs, including a group of octagonal plates (Fig.10.36, nos 6 and 7; Plate 10.14). Other Dutch-type pottery includes slipwares and earthenwares. Tin-glazed decorative wall and floor tiles in the Dutch style were also found, at least some of which were imported from the Low Countries (Goffin, Chapter 10.III, Fig.10.59). Porringers in both pottery and pewter are similar to Dutch/Netherland examples.

Pottery also demonstrates contact with Germany, Italy, Spain and France. Imitations of Venetian glass may indicate local products in response to the disruption of supply engendered by the Civil War. Other German objects include the bird whistle and fine bone powder horn decorated with a hunting scene, which have both been noted above.

Contacts with the New World evidently began early in Norwich, with turkeys reaching the city soon after their introduction to England in 1541 (examples from at Castle Mall came from both Period 5.2 and Period 6.2). The presence of pumpkin/marrow seeds is also significant, providing the first example of the species in Norwich (Murphy, Chapters 10.IV and 13).

Elephant ivory was evident as both raw material and finished objects, and exotica notably includes parrot bones (Chapter 10.IV, Chapter 13 and Albarella *et al*, Part III), perhaps the remains of a bird brought to Norwich from the tropics/sub-tropics by a local merchant. Many exotic animals were brought to the city during the 17th century, including lions, camels, dancing bears, elephants, a monkey, tigers and jackals (Priestley 1987, 16). Such animals were put on public view in the market place and adjacent hostelries. The *Bear Inn*, for example, just to the west of the castle, famously had wild animals on show during the 18th century (Riddington Young 1975, 39). Caged birds were for sale at the same hostelry, including German canaries in unlikely colours (Priestley and Fenner 1985, 30). A cage noted in the 1603 inventory

of William Moons, weaver, was probably for such a bird (see Part IV, Chapter 3.III).

Public Houses and Inns

(Fig. 8.1 and 11.8; Plate 11.7)

The city gaoler ran a tavern in his house on top of the castle mound until the early 19th century (see Chapter 10.I). Other publicans in the castle area, detailed fully by Tillyard in Part IV, include those who ran the *Blew Bell* (in existence before 1629 at Properties 52–53, St John Timberhill, later the *Bell Inn*), the *Signe of the Castle* (later the *Castle Inn*, present before 1685 at Property 2, St Peter Mancroft) and the stables of the *Bear Inn* (at Property 3, St Peter Mancroft). The *Golden Ball Inn*, on the site of a minor prison (Property 46, formerly St Martin at Bale), was a public house before 1625. Others within the castle ditches included the *Old Lion* and *Castle* (named after the city's arms), the *Jesus Inn* (present by 1584 at Property 36, St Peter Parmentergate, later the *Holy Lamb*) and the mid 18th-century *Duke's Tavern* (later the *Shirehall*) on a site previously occupied by a beerbrewer (Property 37, St Peter Parmentergate). The *Signe of the Griffin* was present at Property 28 (formerly St Cuthbert). By the 18th century, then, a large number of taverns surrounded the Cattle Market and continued to multiply in the 19th century (Chapter 10.I and Chapter 11.I). A number of these hostelries survive, notably *Le/La Rouen* at Property 48 (formerly the *Plough Inn*; Site 222N) which lies immediately adjacent to the Castle Mall development (Plate 11.7). The Cattle Market brought a great deal of trade to the large number of public houses surrounding it, all of which would have been busy during market days and on the occasions of public hangings, when upper floors might be hired to provide a good view (Riddington Young 1975, 84).

The remnants of a number of the public houses (and their forerunners) that were demolished in 1862 were recorded in the eastern part of the Castle Mall site; generally consisting of cellars, wells and cess pits. These include surviving structures forming, ultimately, parts of the *Holkham Arms* (cellars at Site 150N), *Norwich A Port* (Structure 44), and cellars relating to the *White Horse* (Property 42, formerly St Martin at Bale, Structure 52). Structural details indicate that some of the cellars may have been of considerable age prior to their incorporation into the 19th-century buildings.

Public houses along Timberhill were notorious as hotbeds of prostitution. They included the double-named the *Gardener's Arms/*the *Murderer's* (part of former Property a/b), now in extended form at Nos 4–8 Timberhill; see Chapter 10.I). Archaeological evidence for drinking and smoking comes from the contents of pits in its backyard (Open Area 39, Period 6.2). A large number of cess and refuse pits were recorded within the yard/garden (Chapter 8) of a property having early connections with public houses (see Chapter 10.I). These features, which contained a wide range of domestic objects and clothing, provide notable assemblages including parrot bones (see above), Dutch and other clay pipe and a significant group of glass drinking vessels (see above). Ceramics included a range of kitchen and serving vessels as well as flasks, jugs and drinking vessels.

Parishes, Churches and Cemeteries

Alterations to the displacement of local parishes following the Reformation have been detailed in Chapter 10.I. The poverty of a number of the late 16th-century residents of the parish of St John Timberhill has been noted throughout this chapter. Considerable differences in the wealth *per capita* are evident within the city during the first half of the 17th century, although the imbalance had lessened towards the end of the century with increasing wealth reaching the relatively undeveloped parishes to the south of the castle (J.T. Evans 1979, 16 and fig.3).

Properties around much of the Castle Meadow were acquired by the Suffragan Bishop in the early 16th century (Part IV). The freehold of the houses built along the southern frontage of Property 43 (formerly St Martin at Bale) were left to the Churchwardens of St John's Madder-market in 1712 to provide for the preaching of sermons.

Evidence for contemporary burials relating to the prison is discussed under 'Prisons and Prisoners' above, while a copper alloy letter plate 'N' of probable 16th-century date was found in a pit at the Golden Ball Street site, probably from a burial monument in the adjacent cemetery of St John Timberhill (GBS SF231, Fig.10.58; Goodall, Chapter 10.III). Two 18th-century grave-slabs in unidentified black stone were found unstratified at Castle Mall, along with an inscription on marble of 17th- to 19th-century date.

This period saw the beginning of antiquarian references to the disturbance of former burial grounds during construction work in the castle ditches. Kirkpatrick, for instance, noted on 10 September 1716 that 'a Mr Peter Woodsale, the plumber, says that upon digging cellars for some houses of his which he built on the north side of the Lane leading from Castle Bridge past the Common Pump into Coneford Street (King Street) there were found the bones of several bodies which had been buried there lying in order and large bones.' (Rye, Ms.9 (2) f.135; quoted in Ayers 1985, 6). These burials were associated with the Late Saxon cemetery excavated in 1979 (Site 416N; Ayers 1985).

Conclusions

Although at the beginning of the period the castle was recognisable as a heavily defended medieval stronghold, the final levelling of most of the castle earthworks and the demolition or collapse of masonry structures during this period changed the character of the area forever. By the late 18th century, the castle earthworks had largely disappeared and the Castle Mound and Keep were left stranded incongruously in their urban setting. Similarly isolated are the few 17th- and 18th-century buildings which survive within the new development. The use of the baileys for the firing of ceremonial guns is a somewhat ironic echo of their former purpose. The ever increasing formalisation of the area of the castle baileys saw changes and improvements to the cattle market, the surrounding tenements, the prison and the road system.

The recent excavations have not only considerably increased understanding of the development of the environs of Norwich Castle at this period, but have provided some very personal information about the city's inhabitants and their daily lives. The character of the area is

vividly brought to life by the evidence for local felons, the prostitutes and drinkers along Timberhill, those working long hours in a range of trades and those evidently living around the castle in some luxury.

Endnotes

1. Todd Collection Vol III Box 7 pictures 75–98 Castle Museum Art Department. Print collection in Norfolk and Norwich Local Studies Library. Cleer's four-sheet map of Norwich (1696) in Castle Museum Archaeology Department.
2. Norfolk Record Office C/Saa 2/5 and see 'Remarks and orders of the justices re. works on or near the Hill 1822–1827', Castle Museum Archaeology Department Library. It cost over £100 and was occupied by the Deputy Gaoler. Seen from south-east in Todd collection as above, picture 103, pub. 1784. For earlier view see Buck 1738 (Plate 10.2) and Kirkpatrick's Prospect of 1716.
3. NRO Case 4g. Private Deed St John Timberhill 21, Indenture: Davison and Sunman to Henry Fulcis, July 1631
4. Cleer's map of 1696 shows empty land here.
5. NRO Case 22 b)
6. NRO Case 18a) 1580–89 f 161
7. NRO Case 16 a) 16 Mayors Court Book 1624–34, 82d, 84
8. NRO Case 5 d) 9 Castle Fee Leet 1673
9. NRO Case 5 d) 22 Castle Fee Leet 1692
10. See note 9
11. NRO Case 19 c) Tonnage Committee Minutes 1726–1801, 27 October 1759
12. NRO Case 5 d) 15 Castle Fee Leet 1681
13. NRO Case 19 c) Tonnage Committee, 27 October 1757
14. NRO Case 18 b) Chamberlain's Accounts 1738/9 and Case 16 d) Assembly Book 9, 198 d)
15. NRO Case 19 e) City Committee II 59 d)
16. NRO Case 19 c) Tonnage Committee 22 February 1741 and Case 19 e) City Committee II, 1 March 1741
17. NRO Case 19 e) city Committee, 28 June 1742 and Case 16 a) Book 1737–46, 36 d) 4 November 1738
18. NRO Case 16 d) 11 Book of Proceedings, 3 March 1790
19. and see NRO Case 16 c) 47/10
20. NRO Case 16 d) 11 Book of Proceedings 27 April and 17 June 1793. A new hay-engine had been installed on Hay Hill in 1729. From 1767 the market for corn, grain and other small seeds was also held there (*Norfolk and Norwich Remembrancer*)
21. NRO N/TC 62/1
22. NRO Case 16 c) Assembly Minute Book 11, 24 February 1796
23. NRO Case 19 e) city Committee, 3 September 1795
24. See note 5
25. NRO Case 19 c) Tonnage Committee Minutes 1726–1801, 4 July 1739
26. NRO COL/5/19,77, transcribed by Dr V. Morgan. It was perhaps because of road-works in the south bailey that the city guns were fired on 5 November that year in Castle Meadow. See NRO Case 16 c) Mayors Court Book 1737–46, 36d.
27. NRO map N/TC 62/1
28. NRO Case 19 e) city Committee I 29 December 1721, 4 August 1732
29. NRO Case 19 e) Tonnage Committee I, 21 November 1744, 8 April 1737
30. *ibid* 27 October 1757
31. NRO Case 22 (T77 C–D) Lease Book C, 420 d
32. *Norfolk Chronicle*, 24 April 1790, transcribed by D. Cubitt whose help is gratefully acknowledged
33. NRO Case 5 d) 22, Castle Fee Leet, April 1692
34. In 1763 the steps, pavement and its rails opposite White Lion Lane were repaired (These may correspond with those now opposite the *Bell Hotel*). There were also 'steppings' outside the *Bell* itself: the owner was charged with failure to repair them in 1681 (NRO Case 5 d), 15, Castle Fee Leet 1681)
35. NRO Case 5 d) 9 Castle Fee Leet 1673
36. NRO Case 5 d) Castle Fee Leet 1681
37. NRO Case 22 (T77 C–D) Lease Book B, 167
38. NRO Case 19 e) city Committee II 15 July 1760 and Case 16 e) Corporation Map 28
39. NRO Case 16 d) 8 Assembly Book 169 d
40. NRO Case 19 e) city Committee I, 34
41. NRO Case 19 e) city Committee II, 186
42. *ibid* 24 July 1788
43. *ibid* 211
44. NRO Case 19 e) city Committee III 23 January 1791
45. NRO Lease Book B (T77 C–D) 150–156 d
46. NRO Case 16 d) 8 Assembly Book 246
47. *ibid*, 114 d
48. *ibid,* 159
49. NRO Case 19 e) city Committee II, 73
50. NRO Case 19 e) city Committee III, 21 September 1826
51. *ibid* 21 May 1810
52. NRO Case 19 e) city Committee II, 47
53. NRO Case 19 3) city Committee III 5 February 1790 and 3 January 1820
54. The timber-framed building at No.18 Golden Ball Street (lying on former Property g/h) is shown at http://www.the-plunketts.freeserve.co.uk.
55. NRO Case 22 (T77 C–D) Lease Book B, 277
56. NRO Case 19 e) city Committee 1787–1829, 5 February 1790 and 23 February 1791
57. NRO Lease Book B (T77 C–D), 63 d
58. *ibid* 143
59. NRO Case 16d) Assembly Book 8, 245
60. Thanks are extended to Simon Swann for his comments on these objects.
61. A muffle, often formed from tiles or refractory bricks, forms the kiln lining and protects the contents from the fire.
62. Warmest thanks are extended to Nick Arber for information relating to Norwich Prison, much of which is included in this discussion.
63. Many thanks are offered to Barbara Green for drawing the author's attention to this plan.
64. Say (or saye) was a distinct two/two twill with a single weft and a warp twisted from two or three threads, while serge was the same but had a single warp.

11. Cattle Market to Castle Mall (19th to 20th century)

'the grandest military spectacle ever witnessed [in the city] … Upwards of seventeen hundred men … assembled on the Castle-hill, and fired a *feu de joie* with admirable effect'

4 June 1804

'the recent suggestion that the Cattle Market should be removed to Trowse and the time honoured Fair set in some other obscure corner, and the Hill made into a glorious Plaza … Neither County nor City would be likely to subscribe to any such scheme.'

Local Studies Library, Tillett Scrapbook, vol 36, 1897, 137

'In the long and rather distant view of history, there is nothing very new in Norwich being the subject of armed attack. The walls of the Castle have looked down at least three times during the centuries upon burning houses and streets full of fugitives.'

R.H. Mottram, *Assault Upon Norwich: the official account of the air raids on the city*, 1944, 13

I. ARCHAEOLOGICAL, HISTORICAL AND DOCUMENTARY BACKGROUND

Modern Norwich

(Fig.11.1; Plates 1.1–1.6 and 11.1–11.4)

The early 19th century saw the end of much of the medieval character of Norwich, with the removal of its ancient city gates between 1790 and 1810 and the concomitant decline of the remaining walls. This period also saw the beginnings of settlement outside the historic boundary. A growing number of maps and plans were produced, many of the latter in relation to building and road-widening schemes such as those which had already begun in the castle area at the end of the previous century. The first Ordnance Survey map was produced in 1883 and published two years later (Plate 11.6). The Castle Mound and busy Cattle Market provided a continual source of local interest for artists and photographers and a large number of images of the area exist for the period (*e.g.* Plates 11.1–4).[1]

Norwich's population continued to increase during the first half of the 19th century, reaching 68,000 by the time of the first census in 1851 (Ayers 1994a, 107). Earlier building traditions (detailed in previous chapters) led to the development of the typical Norwich 'court' with the subdivision of larger buildings around a central yard: many of these have now been studied by the Norwich Survey and latterly the NAU (*e.g.* along King Street). Such courts were often insanitary and resulted in outbreaks of disease such as cholera. The city began to be provided with mains sewerage from 1869, while gas had been provided since the 1820s (Ayers 1994a, 112, 114). Water supply improved after the mid 19th century with the provision of a new waterworks. Slum conditions within the centre of the city began to be addressed after the First World War and continued into the 1930s.

The city's continuing importance as a centre for the sale of foodstuffs is amply demonstrated by the demands placed upon its Cattle Market. As in earlier centuries, occupations of the 19th-century inhabitants included those relating to specialised textiles, although these gradually declined. The leather industry flourished and local shoemaking continues to this day: Startrite is a well-known local company and was founded before 1816 (Ayers 1994a, 109). Breweries were numerous by the mid 19th century and included the Eagle and Child brewery at Golden Ball Street (see below). By the late 19th century, industries within the expanded city represented on the first OS map also included Colman's mustard, Caley's water works (which later adapted to produce chocolate and has only recently ceased manufacture), malt houses (including a vinegar works), textile manufactories, timberyards, and brick, iron and gas works.

New streets were constructed and earlier ones widened and straightened. Those relating to the castle area are discussed further below. The city's first railway was provided in 1845 (Ayers 1994a, 111) and the tram system was installed in *c.*1899 to be removed before the Second World War. Notable buildings were constructed within the former castle precinct.

Areas of the city were destroyed by enemy action in 1942, while post-war redevelopment saw the loss of further historic buildings and the adaptation of others. The prison moved to new premises in the late 19th century and the interior of the Castle Keep was subsequently gutted, prior to its conversion (along with former prison buildings) into Norwich Castle Museum.

The economy of the 20th-century city was dominated by great institutions such as Norwich Union, whose headquarters were founded in 1903–4. Private

Date	*Event*
to1804	Muster of 1,700 men of the Norwich Regiment on the castle hill to celebrate George III's birthday
1808	Passage to top of Castle Mound on north-east side blocked up; new descent towards Gurney's Bank by a flight of steps
1809	Reorganisation of the Cattle Market and imposition of new regulations: panorama from Castle Mound
1813	Polito's menageries exhibited in castle ditches
1814	Vast bonfire lit in the castle ditches to celebrate end of Napoleonic Wars
1815	Rioting against the Corn Bill began in the Cattle Market
1818	Whole of Tombland Fair held in Castle Meadow from this date
1822	Scaffold in use near weighing machine (in Castle Meadow?)
1823–24	New Shirehall by William Wilkins at foot of Castle Mound (jnr)
1824	New prison built on top of Castle Mound; sides of mound enclosed and planted with trees and shrubs
1826	Stone's survey of Castle Keep (after Wilkins' 1796); Castle Mound reopened to public
1830	Brick vault inserted between arches of castle bridge
1831	Cattle dealers requested to pay towards repair of roads in castle ditches
1833	Constable of Cattle Market appointed
1850s–1860s	Plans developed for 'lowering' of the castle baileys and improvement of the Cattle Market
1862	Cattle Market extended and buildings in eastern part of site demolished
1863–1869	Demolition of Golden Ball block; Golden Ball Inn moved further south
1867	Last public execution at Norwich Castle
1880s	New monumental buildings constructed in the former Castle Meadow
1886–1894	Gaol moved to Mousehold Heath and Keep became the city museum (opened in 1894 along with Castle Gardens and its bandstand which moved to Mousehold Heath in 1908)
1907–09	Extension of new Shirehall
1930s	Work undertaken to improve gardens and Castle Mound
1934	Slum clearance in Grout's Thoroughfare area
1939	Construction of air raid shelters across northern part of Cattle Market (in the former barbican and south bailey)
1942	Baedecker raids destroy buildings along Timberhill and Ber Street
1949–53	Improvements to Castle Gardens
1960	Removal of Cattle Market; area used as bus station, car park and for fairs
1987	Trial work for Castle Mall excavations

Particular thanks are offered to Barbara Green for access to her informative notes on the development of the Castle Gardens and surrounding area

Table 11.1 Key events: 19th to 20th century

enterprises also included a growing number of shopping arcades, beginning with the Arts and Crafts style Royal Arcade to the west of the castle in 1899 and ending with the Castle Mall centre a century later (Plates 1.1–1.6). The current population (*i.e.* in 2002) of the Norwich area is *c.*300,000, with a resident population registered in the city of *c.*120,000.

The presence of the Great Cockey stream influenced the development of the castle area for many centuries, as has been discussed throughout this report. Very recently (2003) the outflow of the culverted stream was diverted as part of a new riverside development and is no longer visible.

The Modern Castle

The Keep, Castle Mound and Bridge

by Margot Tillyard and Elizabeth Shepherd Popescu
(Plates 6.6.B, 10.2.C, 11.1, 11.2 and 11.6)

Prior to refacing, details of the arcading were shown in a series of watercolours of the elevations when the Castle Keep was surveyed by Francis Stone from 1826 (see endnote), based on William Wilkins' engraving of *c.*1795 (Wilkins 1796, Plate 10.2.C; see cautionary notes in Chapter 2). By then all the walls had cracks (see 18th-century evidence in the previous chapter) visible from inside as well as outside, and only the east wall was perpendicular, or nearly so. What was probably an old crack near the north corner of the west side had opened up and above it a large area of the facing was missing. On the south side towards the east the wall was cracked from top to bottom, and on both north and east walls there were two further cracks.

Two years before this, during the building of the new prison, the architect had suggested the removal of Bigod's tower (the forebuilding) as an aid to security. Instead it was rebuilt and security assured by extending the east wall of the new 'radiating wing' to abut it. It is probable that the whole of the eastern side of the Keep was refaced at this time. The other three sides had to wait until 1833–4, the work not being completed until 1839. By then the battlements had been rebuilt and their number reduced from the original thirteen to nine. Iron ties had had to be inserted about one third of the way down through the south-west and north-west corners.[2] The pole pivoting on a post on the south west corner of the battlement walk, depicted first on a print of 1805, was a telegraph, part of

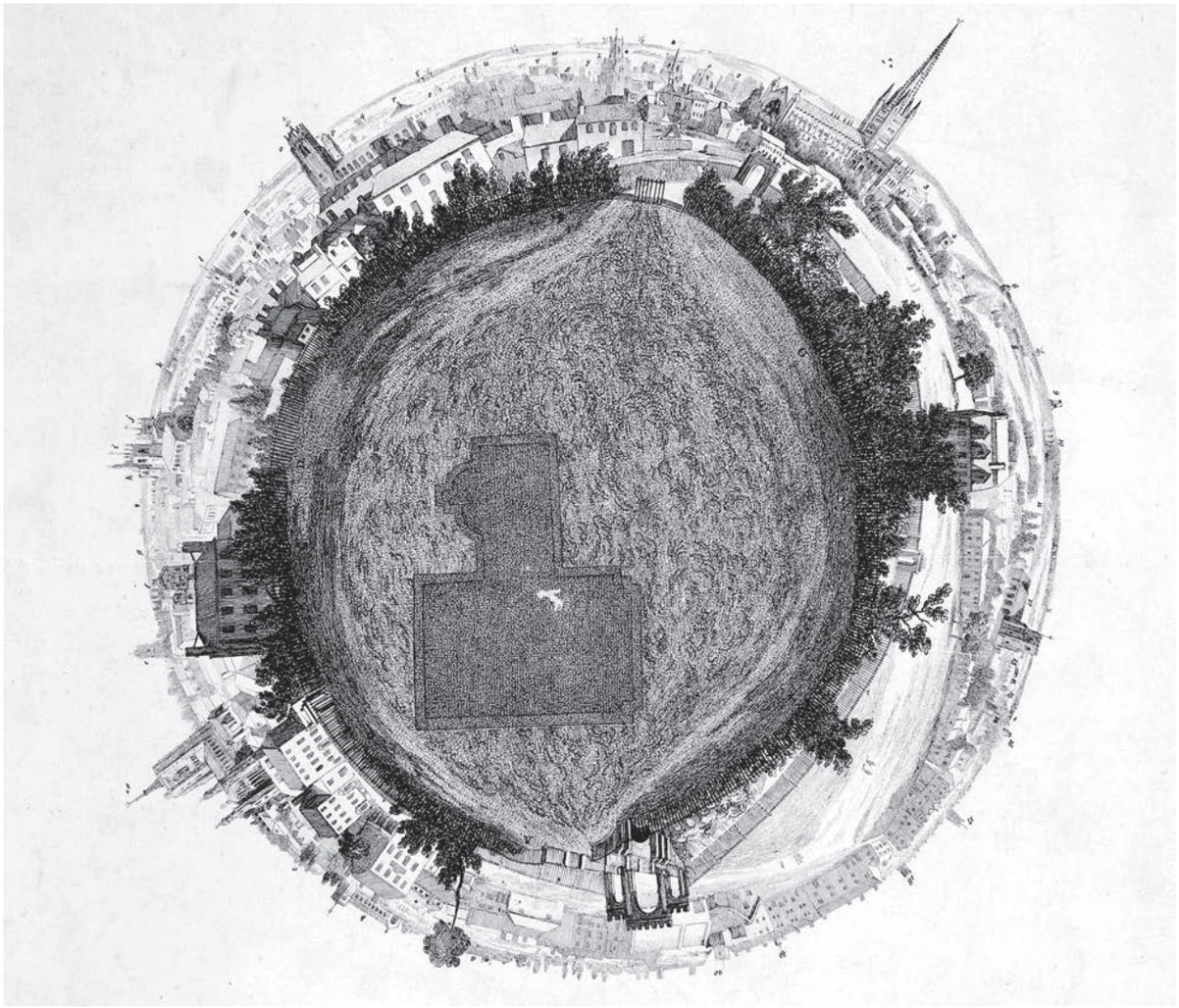


Plate 11.1 Panorama from the Castle Mound, engraved by Williams after J.A. Barker (1809: NWHCM: Todd 7, Conesford 74)

a chain connecting Yarmouth and London (*Norfolk and Norwich Remembrancer*).

The new gaol occupied the whole of the upper bailey (*i.e.* the top of the Castle Mound) and was surrounded by a castellated wall of Aberdeen granite twenty feet high, leaving a space about twenty feet wide for a public promenade round the edge of the mound (Mackie 1901, 28 October 1821). For the first time the gaol was provided with mains water, piped from Golden Ball Lane.

In 1805 the 'fee of the liberty of the Castle' was passed to the justices for the County of Norfolk by George III ending over seven hundred years of Crown ownership. During the next thirty years many changes took place 'on or near the Hill'. First the old pointed close-paled wooden fences were removed and by 1809 iron railings on a stone base had been erected round the ditch and on the parapet of the newly repaired bridge. The outward slope of the ditch was still divided into allotment gardens, reached through six iron gates and there was a second porter's lodge 'at the back declivity of the Hill'. This way up now became a footpath only with stone steps at the top of the slope (Wright 1821, 5; Mackie 1901, September 1808).

Cotman drew the Castle Bridge from the west when it was under restoration in 1807–8 (Plate 6.6.B). Buttressing at the upper end can be seen and the old wooden paling had been removed prior to its replacement with an iron railing.[3] When the new prison was built in 1824, square lodges flanking iron gates were built to replace the open triple archway at the lower end of the bridge, the footway on the north side of the mound was removed and the iron railing continued all round. In 1830 when the interior arch of the bridge was removed and rebuilt, the flint-faced walls at the ends of the drawbridge gap were temporarily exposed (Woodward 1847, 11).

The 19th-century prison is currently under academic examination (Arber, in prep.). The city purchased the Keep and prison buildings in 1887 and they were opened as the Castle Museum in 1894.

The Shirehall and Shirehall Chambers
(Plates 11.6 and 11.14)

The courts in the Shirehouse beside the Keep were enlarged, but both they and the gaol, which had been built in 1793, soon proved inadequate. A new Shirehall

was built near where the old civil war platform had been at the foot of the north-east part of the Hill (Plate 11.6). The neo-Tudor building by William Wilkins junior (built 1822–23) was constructed just before the main entrance and perimeter wall of the gaol (*c.*1825). It was first used in 1823. Two new wings were added in 1846 and it was enlarged again in 1886. The building was refaced in 1913 and survives in use as the Norfolk Regimental Museum (Site 26141N; Plate 11.14). The County Police Station was built immediately to the north of the mound.

After 1889 the Shirehall was also home to the newly created Norfolk County Council, necessitating the exten-

Figure 11.1 Plan of modern Norwich, showing the impact of the Castle Mall development. Scale 1:12,500

Plate 11.2 View of Norwich Castle Keep, by E. Bell after Robert Ladbrooke (1805; NWHCM: Todd 7, Conesford 89)

sion to the south which opened in 1910. Though the council offices were moved to Martineau Lane in 1968 the County Court continued to sit here for another 20 years until a new Crown Court was built near Whitefriars Bridge.[4] The extension southwards to form the Shirehall Chambers entailed excavations into the eastern side of the Castle Mound and its encircling ditch (Site 135N; Tench 1910). The Shirehall Chambers housed the Castle Mall post-excavation team during the early stages of analysis and have now been converted to form offices for the Norfolk Museums and Archaeology Service.

The Modern City

Streets and Lanes

by Elizabeth Shepherd Popescu and Margot Tillyard
(Figs 1.1, 1.2, 11.1–11.8 and 11.12; Plates 11.1, 11.5, 11.6 and 11.9)

The widening and re-routing of roads, as well as the closure of earlier passages and pathways, was one of the major preoccupations of the modern period and saw the loss of many medieval routes. The section 'Lowering of the Hill' below contains details of many of the local road widening schemes relating to the Cattle Market. There were also several improvement schemes relating to the roads to the west and north of the castle in the early 19th century though it is difficult to be precise about several of them until the whereabouts of the Judge's Lodgings at that time is established. After 1748 the Lodgings were in the Stranger's Hall, Charing Cross where the dining room had been rebuilt for the purpose. Two orders point to somewhere west or north-west of the Castle. The first in 1816 was for the repair of the road between the Lodgings and Orford Street and the removal of the 'Kennell' or gutter by the lodgings higher up the hill towards Golden Ball Lane.[5] The second followed a report in 1822 that the road across the Castle Ditches leading from Gurney's bank (*i.e.* from a point north-east of the Castle) to the Judge's Lodgings was in a bad state[6] and was for the building of a wall near the *Castle Inn*. At the same time the Tonnage Committee sanctioned 'the Alteration now making near the House on the Ditches in which the Judges' were 'to reside'.[7] However, if the new wall had no connection with the other work, it is possible that the Lodgings were near the new Shirehall which was then being built, perhaps in the former *Duke's Inn*, or nearby.

As to the wall, it was only two years earlier that 'to prevent accidents' posts and chains had been placed on the earth bank which until then had reached to within five feet of the buildings there (Woodward 1847, 41). Judging by the expenditure in road improvements and wall-building between 1822 and 1824 it seems probable that these were the years when the triangle between the *Bell*, the *Castle Inn* and the Castle Bridge was levelled and enclosed (Fig. 11.8).

Some widening was carried out to the road round the west and perhaps also the north sides of the castle at the same time. A surviving plan of 1824 shows a short length of the road opposite a 'wall under iron railings' below the Castle Gardens. West of the road were five properties. The old road appears to have become the new footway and a new road twenty feet wide was envisaged.[8] A new road had also been constructed in 1805 which probably ran along the west side of Castle Meadow and another in 1811 from Rose Lane to the north-west corner (Fig.11.3).[9]

Roads surrounding the castle
(Fig.11.2)

1. Ber Street

This road maintains its ancient name into the modern period and many timber-framed buildings survived along it until the 1930s. Arguments at this time about the preservation of a 16th-century building at its northern end (No.1) between Golden Ball Street and All Saints Green, were ended when the building was destroyed by enemy action in 1942 (Plunkett 1987, 95). The site now houses the John Lewis department store (formerly Bonds).

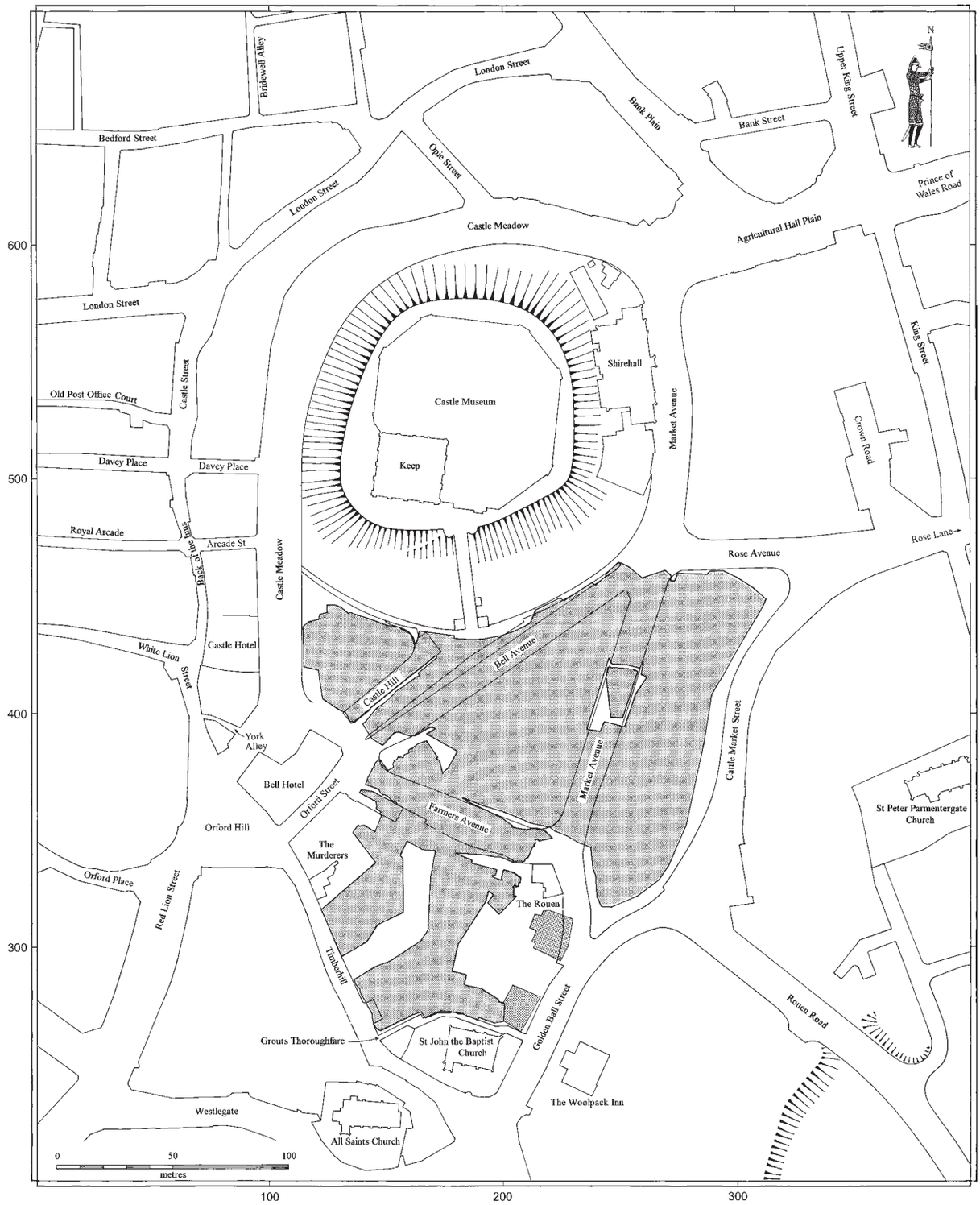


Figure 11.2 Plan of excavated areas at Castle Mall and Golden Ball Street, showing modern street names (pre-1989). Scale 1:2500

2. Timberhill

Modern Timberhill retains a shortened form of post-medieval Timbermarket Hill (Sandred and Lindström 1989, 147). Victorian and earlier road surfaces were recorded in 1993 during the insertion of a new pipeline (Site 26401N, see Chapter 2). Buildings along it suffered damage during bombing raids in 1942 (see below).

3. Orford Hill

Buildings adjacent to the north-west side of the *Bell Hotel* between Orford Hill and modern Castle Meadow (the site of former Castle Fee Property 54) were demolished to provide a wider route from Red Lion Street to permit the insertion of a tramway in the late 19th century, leaving

Property 55 isolated to the west, on the southern side of York Alley (*cf.* Figs 8.2 and 11.2).

4. Castle Meadow
Since the late 19th century, this name has been used for the road running from Orford Place to Agricultural Hall Plain. The original Castle Meadow lay to the north-east, on the other side of the Castle Mound. The modern road, which lies above the infilled motte ditch, was widened in 1926 at which time the western and northern sides of the mound were cut back.

5. White Lion Street/Lane
This route retains virtually its original form within the modern city, now linking Red Lion Street with the market place.

6. Back of the Inns/Castle Street
Since *c.*1850, the name 'Back of the Inns' has been restricted to the southern stretch of this alley, the remainder being known as Castle Street (Sandred and Lindström 1989, 85). The narrow and sinuous modern course of what is now a pedestrian route ultimately reflects the contours of the Great Cockey stream valley to the west and the limit of the Castle Fee to the east (see previous chapters).

7. London Lane/Street
London Lane (a name originating in the early 18th century) became known as London Street during the 19th century (Sandred and Lindström 1989, 116).

8. Bank Street and Bank Plain (former Blue Boar Lane)
Bank Street is documented from 1819 (Sandred and Lindström 1989, 85–86). The monumental bank that currently stands on the western side of Bank Plain (a 'new' street of the 1850s, although in fact a partial reworking of a pre-existing street) was constructed in 1929–30 (Site 26001N; see further comments elsewhere in this section).

9. Prince of Wales Road
Construction of this major route leading to the city centre from the railway station began in 1860 (Sandred and Lindström 1989, 128). It cut a swathe across the earlier street pattern in the area to the north-east of the castle, ending at its junction with King Street, immediately to the west of the medieval Castle Meadow (not to be confused with the modern road further west).

10. King Street (former Conesford)
By the 19th century, the name King Street had firmly replaced its medieval forerunner of Conesford. In its modern form, the road no longer serves as a major route along its whole length, being effectively cut into sections by the current traffic system.

11. Cattle Market Street (former Beaumont's Hill/ Common Pump Street/Buff Coat Lane)
The name Cattle Market Street was given to the widened course of this thoroughfare in the second half of the 19th century.

12. Rising Sun Lane
This route was lost as a result of the insertion of Rouen Road in the 1960s (*cf*. Plate 11.6 and Fig.11.2). Its name probably came from a local public house (possibly even the *Golden Ball* which had moved from its original position opposite the castle's south gate to one on the corner of the western end of this street; Sandred and Lindström 1989, 131 and see below).

13. Golden Ball Street
(See 'Ways into the Ditches' below.)

Ways into the Ditches
Woodward, writing in the 1820s lists a number of passages into the ditches which were closed in his lifetime (Table 11.2). These, like the road-widening schemes of the period, were mainly in the Castle Meadow area.

Comments on the main routes leading into the former baileys are given below, moving around the castle clockwise from Golden Ball Street.

1. Golden Ball Street
This alley remained very narrow until about 1810 when it was 'opened and made a good street' (Browne 1814, 143). Buildings on its north-eastern side were removed in the 1860s. By modern standards it remained quite narrow in the early 1930s and, in 1936, increasing traffic pressures led to the widening of both Golden Ball Street and Westlegate, linked by All Saints Street. This provided an improved route into the Cattle Market. The new road was not completed until 1940.

2. Rochester Lane/Orford Street
Orford Street survives as a steep modern pedestrian route running between Orford Hill and Farmer's Avenue (in its reinstated form). Earlier road surfaces were recorded in 1993 as part of Site 26401N (see Chapter 2).

3. Bell Inn Yard
The remnants of this yard survive within the refurbished buildings of the *Bell Hotel* (Castle Fee Properties 52–53) which now house a Building Society beneath the modern public house (Site 314N).

4. York Alley
The western side of this little alley survives to connect White Lion Street with Castle Meadow. It was named after the 19th-century *York Tavern* and *Hotel* which stood at its eastern end. The major north-to-south route at its eastern end was widened again for the insertion of a tramway and yet again in the 1960s (see further comments on the *York Tavern* below).

5. Castle Inn Yard
This was closed between 1812 and 1820.

6.–8. King's Head Yard/Davey Place
This passage of 1812–13 leads from the market place towards modern Castle Meadow via a flight of steps and was named after Alderman Jonathan Davey. In 1813, he was responsible for removing the *King's Head* public house, which was moved to new premises at the Castle Street end of the alleyway (Sandred and Lindström 1989, 101).

Ref. No. (see text,'Ways into the ditches')	*Description (clockwise from Golden Ball Street)*
1	Golden Ball Lane
-	Passages between houses; the passages from Timberhill ran through Star and Crown Yard and through another yard further west which emerged west of the Jolly Farmer's public house.
2	Rochester Lane (Orford Street)
3	Bell Inn Yard
4	Passage from White Lion Street (York Alley)
5	Castle Inn Yard
6–8	Rose Tavern, Angel Passage, King's Head Yard
-	Via a doorway on London Lane east of Swan Lane on which was St Andrew's Cross
-	Via a similar doorway on which was the Goldsmith's Arms
-	Via another doorway just east of St Andrew's Steps
10	Bank Lane, previously King's Arms Lane/ Passage
12	The Griffin Passage
-	Three passages from King Street, one half way along, two with steps
13	Opening opposite Rose Lane
-	Passage from Pump Street, 'east of the Veterinary forge'
14	Cartway — Holkham's Lane
-	Two small passages between houses
15	Cartway called Sherrod's Gap (Shirehouse Gap, later Pig Lane)

Table 11.2 Ways into the ditches (from Woodward 1847, 41)

9. Opie Street
This steep little route, one of the earliest leading into the castle ditches from London Street, survives in widened form and now leads up towards modern Castle Meadow.

10. King's Arms Lane (/Berningham's Stile)
King's Arms Lane was widened by 3ft 6ins to 14ft in 1801 by Bartlett Gurney whose bank faced Redwell Plain on the east side of the lane, lying within the former Castle Fee to the north of the Castle Mound (in broad terms, Castle Fee Property 20). To facilitate the turn towards the west at the south end of the lane the *Peacock Ale House* gave up a small portion of its ground.[10] The late 19th-century incarnation of Gurney's Bank, which straddled the line of the former lane (*cf*. Fig.8.1 and Plate 11.6), was eventually replaced by modern Barclay's Bank on the western side of Bank Plain (Site 723N/26003N). The site reputedly housed a foxhound kennels for its own hunt until the 1960s, although this has not been confirmed.

11. Agricultural Hall Plain
This wide plain lies to the north of the Agricultural Hall, constructed in 1882, at the northern end of Prince of Wales Road. It removed part of former Blue Boar Lane (as shown on Hochstetter's map of 1789; Plate 10.3) and overlies a substantial part of the former Castle Meadow. It now houses a War Memorial erected in 1927 (Site 26003N; see Chapter 2).

12. Griffin Passage
The Griffin Passage, which still appears on the 1880s OS map (Plate 11.6), was lost with the extension of the General Post Office building (Hardwick House, constructed 1866).

13.–14. Rose Lane and Holkham Lane
Rose Corner was widened in 1811, when Foundry Bridge was built and Rose Lane improved (Fig.11.2). A straight diagonal road was made into Castle Meadow, involving the demolition of the building on the corner (Property 34, St Peter Parmentergate) and what appear to be sheds or stables behind. Included in the plan was a widening of Holkham's Lane by the setting back of the fronts of the buildings on the west side, in order to make a new way to the Cattle Market, but this was not done[11] (Woodward 1847, 41). In 1832 the 'pavement' was continued from the *Shirehall* public house at the northern end of Holkham Lane to Rose Corner.[12]

15. Pig Lane (former Shirehouse Gap)
This minor route, which originally led into the south bailey, was lost in the reworking of the Cattle Market in 1862. Its renaming derived from the pig pens sited at its western end (Fig.11.8).[13]

Routes within the Cattle Market
A number of the improved routes within the Cattle Market were renamed as avenues after 1862 and were subsequently lined with trees (Fig.11.2; Plate 11.6).

1. Bell Avenue
The late 18th-century route in this position, joining Orford Street with Market Avenue, was improved during the 19th century. Major work, including some lowering, took place to the south of the castle bridge and buried gatehouse masonry had to be removed to bring the road to the desired level (Woodward 1847, 11; see discussion below). The Avenue was completely removed during construction of the Castle Mall complex.

2. Castle Hill
A contract for a pathway 'across the Cattle Market' from the corner of the Bell stable to the foot of the Castle Bridge was agreed in 1834.[14] This was reflected in the later line of Castle Hill which lay to the north-west of Bell Avenue until its removal in 1989. By the 1960s, Castle Hill housed shops for agricultural machinery.[15] The same name is now used for the southern approach route to the castle in a new route above the shopping centre, leading from Farmer's Avenue towards the Castle Mound.

3. Market Avenue
This route, established in the late 18th century, linked Golden Ball Street with the road named Castle Meadow. Alterations were made to the northern part of its route, across the former Castle Meadow (*i.e.* the north-east bailey), throughout the 19th century. Its southern course was destroyed in advance of the 1980s redevelopment, although the northern part of the route survives to link Rose Avenue with Agricultural Hall Plain.

4. Farmer's Avenue
This route around the southern edge of the Cattle Market (reflecting the curve of the south bailey) had apparently existed for some considerable time (see Kirkpatrick's 'hollow road' of the early 18th century noted in Chapter 10.I) although does not appear to have been formally named on maps until the 19th century. It took its name from the adjacent *Jolly Farmer's Inn* (Sandred and Lindström 1989, 104). The route was removed during the Castle Mall excavations but has been reinstated in approximately its original position above the new underground complex.

5. Crown Road
This route probably began as a path or lane at the rear of medieval tenements fronting onto King Street. It appears on a map of the area in 1836 by which time a number of buildings backed onto it (including the *Imperial Arms* and the *Cock Inn*), although at this time did not apparently run as far as Rose Lane.[16] It had become a road by the 1860s, leading from Rose Lane towards Blue Boar Lane/Bank Street. The Crown Bank was later constructed at its north-western end.

Activities in the Baileys
by Margot Tillyard
(Plate 11.1)

The Gun House and the hay-weighing machine
In the 1809 prospect taken from the Castle Mound (Plate 11.1) a substantial group of buildings can be seen high on the hill to the south of a line between the bridge and Orford Street (*cf.* Sillet's drawing of 1821–1824). Further comments on these buildings, which included the Gun House, guard room, stables and a coach house, are given in Chapter 10.I. In 1803 the City's Ordinance was proved and 'the room at the back of the Guard House' was vacated for the use of a company of Artillery. The Corporation subscribed £500 towards the cost of the volunteers and agreed that the City arms and ordnance (see 'Ordnance' below) be lent to them.[17] The last lease of the coach house and stable building to the west (to William Lane who had taken over) being about to expire in 1805, the City Committee ordered the 'premises on the Castle Ditches near the Guardhouse to be surveyed and valued', the normal preliminary to purchase.[18]

In 1823 the Committee recommended a package of measures: that 'rooms on the Castle Ditches occupied by Mr Cann and his tenants and the Stable adjoining be taken down, that the Hay House and all the Houses and Buildings adjacent shall also be removed; and that the Hay Engine shall be placed on the Lower Ditches or any other Spot which the Assembly may approve.'[19] Over the next three years this was all accomplished. First Mr Cann's buildings were cleared away.[20] They occupied a piece of Corporation land to the south-west of the guard-house first leased in 1769 for the erection of a shed or stable. It measured thirty six by ten feet and lay outside the wall of a property there.[21] A new house for the Hayweigher, now the Clerk of the market was built on this spot and a new pit for the weighing-machine dug next to it.[22] Once the move had taken place, the old property higher up the hill, whose tenants had already been given notice and left, was advertised for sale and demolition. The description read 'all that brick and tile building situated on the Castle Ditches, part in the occupation of Mr Hubbard Collector of the Cattle Market and the remainder occupied by — Tice as livery stables' the whole forming 'a very extensive range of buildings'.[23] The whole operation cost £465.

It was probably the same Mr Cann who caused trouble in 1834. Either he 'or the Proprietor of the public house near the Hay house' was requested 'to fill up the Tank made in the ground in front of his stable and to stop up the doors opening towards the Castle Ditches being encroachments on the soil of the Corporation'.[24]

Gatherings in the Castle Ditches
The Castle Ditches was an obvious place for any large gathering, which could be military, celebratory or rebellious. The City's Arrays and musters were traditionally marshalled there. During the Napoleonic Wars these were more serious matters. On 18 January 1804 the City of Norwich Regiment of Volunteer Infantry received their colours and the occasion was marked by the firing of salutes by both the foot soldiers and the artillery. On 4 June the same year 'the grandest military spectacle ever witnessed' in the City celebrated the King's birthday. 'Upwards of seventeen hundred men … assembled on the Castle-hill, and fired a *feu de joie* with admirable effect'.

Some of the City Ordnance may have been very old. It had all been 'proved' in 1803. The iron nine-pounders had stood the test. Four of the brass cannon had burst and the metal was later sold, but Kett's brass gun, used in 1549 was kept as a relic. Tombland may have been the place commonly used for joyful firings as in 1668 the mayor ordered the 'Great Guns' to be fired in the Castle Ditches instead. In 1683 on a day of thanksgiving for the discovery of a plot against the Duke of York, 'the whole number of the guns both iron and brass' were employed, though when he was crowned James II the small guns were deemed sufficient. They were fired in the 'meadow of the Castle Dikes' with their 'muzels' pointing towards the Hill.

When peace was declared in 1814 the mayor and Corporation preceded by a band of music walked from the Guildhall to the Castle Ditches, where an immense bonfire was made between the foot of the Bridge and the

Hay House. It blazed 'for many hours amidst the shouts of a vast multitude' (Mackie 1901, under year).

A poster advertising the Norwich Reform Festival on 5 July 1832 announced that a 'Procession' was 'to form on the Castle Ditches … and proceed from Hence over Orford Hill, through Little Orford Street to the Market Place'. The day was to end with a 'Display of Fireworks suited to the occasion on the Castle Ditches'. Earlier the Reform Bill had occasioned riots. During the worst of these six thousand operatives assembled on Castle Hill before marching to St Andrew's Hall (Jewson 1979 vi and 75).

Another notable riot occurred in 1815. Lord Coke of Holkham and other officials of the Agricultural Society were examining stock near the *Jolly Farmer's* public house when rough elements among the crowd, assuming they supported the Corn Bill, began stoning them. They took refuge in the *Angel Inn*, followed by the mob, who, thwarted in their attempts to pursue them there went round to the front gate facing the market. The mayor was eventually forced to read the Riot Act whereupon the Brunswick Hussars rode down from the County Barracks. Coke and his party galloped out of the back gate of the inn, seizing by minutes the departing mail coach paused under the front archway and the crowd was eventually dispersed with no loss of life (*Norfolk Chronicle* 18 and 25 March 1815). Colonel Von Temsky was afterwards congratulated by the Assembly on the behaviour of his troops.[25]

Digging, dumping and drainage

Dumping within the former castle baileys continued well into the 19th century. In 1816 the City Committee decreed that 'bricklayers no longer be permitted to lay colder on the Castle Ditches without first obtaining permission' and ordered the removal of unauthorised deposits.[26] A workman was employed in 1815 to level the colder (hardcore) on the north-east side of the road in Castle Meadow and to remove 'scrapings' from beside the former *Duke* public house and the City Scavenger was informed that he must cease laying muck in the Castle Meadow in future.[27] Finally in 1822 the Tonnage Committee published a notice in the press forbidding 'all Bricklayers, Carters, Scavengers, etc.' from laying 'any Colder, Stone, Rubbish, Muck or filth on any part of the Castle Ditches and Meadows to the great injury of the roads and the nuisance of the Public'.[28] This of course drove the problem elsewhere and the following year there were several prosecutions for dumping of muck and colder between Pump Street and Golden Ball Lane.[29]

The Cattle Market

by Margot Tillyard

(Figs 11.3, 11.6–11.8; Plates 11.3–11.6 and 11.10)

As has already been noted, a large number of images of the 19th- and 20th-century Cattle Market survive, many of which are held by the Art Department at Norwich Castle Museum. A view of the market as it appeared in 1871 is given in Plate 11.3 and its appearance in 1882–1900 in Plate 11.4. Considerable use has been made during this research of the available maps and plans of the area, three of which have proved particularly useful: those of the Cattle Market in 1836 (NRO Map N/EN 20/184; information from which has been used in Fig.11.8), the 1885 Ordnance Survey (Plate 11.6) and the air raid shelter plan of 1938 (Archive Plan 1795; N/EN 4/241/34, Plate 11.10).

After 1818 the whole of Tombland Fair was held in the Meadow and from 1820 auctions of goods took place there so as not to impede the movement of stock in the Cattle Market.[30] Tolls were fixed though not often changed. One such occasion was in 1809 when the market was reorganised and the different kinds of animals assigned to specific areas. Previously, for instance, horses were 'tied to the gable end of one of the buildings adjacent to the Hayhouse'. Numbers averaged over twenty-two weeks, were; 'Sheep 2,740, Pigs 435, Beasts 555 and Horses 42' and with tolls similar to those levied at Smithfield, the Assembly looked forward to a profit of £400 per annum.[31] The Clerk of the Haymarket, who already lived on the spot in the Hayhouse, was appointed Clerk of the Market.[32]

The revised charges provoked a meeting of landowners, farmers and Scottish drovers who challenged the right of the Corporation to levy tolls on cattle sold on the Hill (Mackie 1901, 24 March 1810). This right, as far as it applied to bullocks, was only acquired under the Norwich Markets Act of 1860.[33]

After 1809 sheep were placed in a line of pens between Orford Street and Golden Ball Street, a layout which persisted in 1836 (Fig.11.8).[34] Pigs occupied roughly the southern half of the area east of the road between

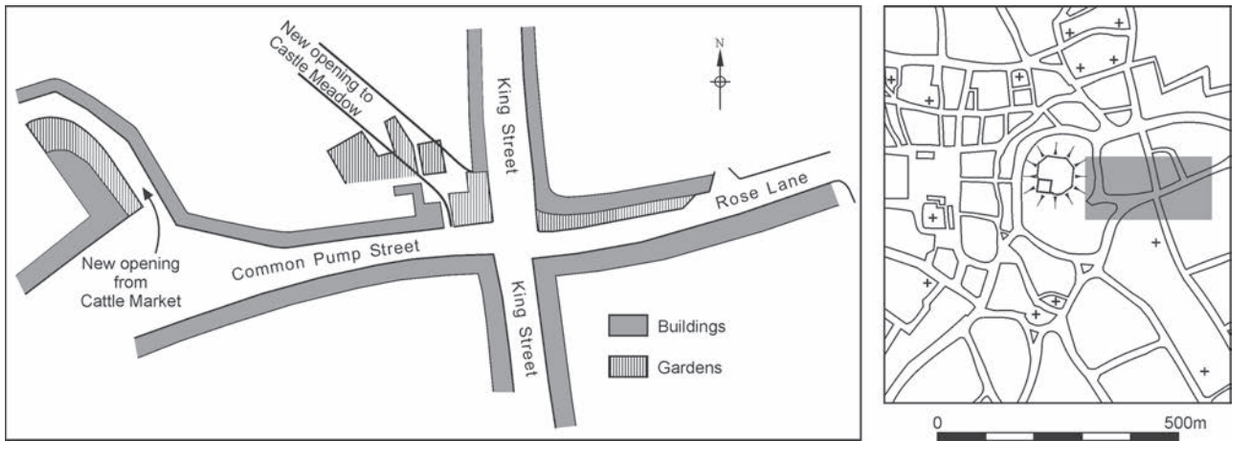


Figure 11.3 Rose Lane Corner, 1811 (after NRO Case 16 e) Corporation Map 30)

Plate 11.3 The Hill at Norwich on Market Day, by Frederick Bacon Barwell (1871; Norwich Castle Museum). The impact of Victorian truncation is evident in the relative positions of the two gentlemen in conversation in the left foreground

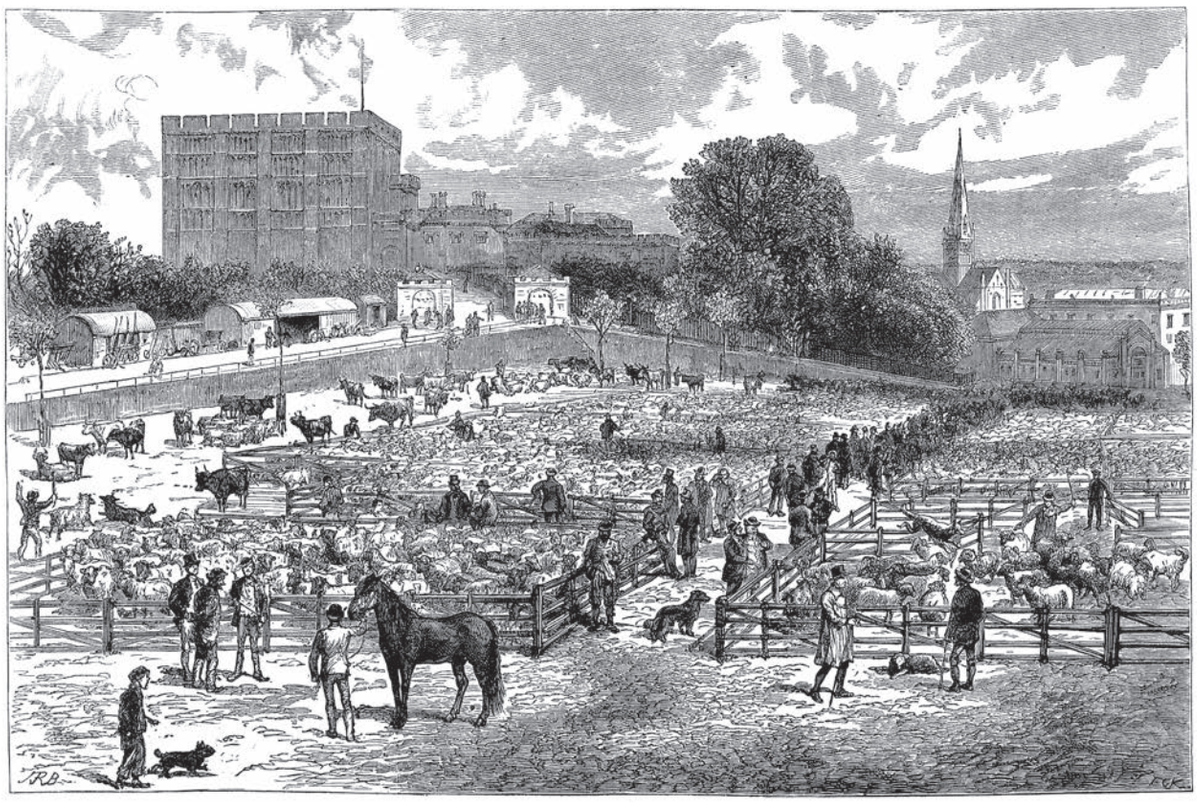


Plate 11.4 Cattle Market, looking north (unknown artist, 1882–1900; NWHCM Todd 7, Conesford, 92A)

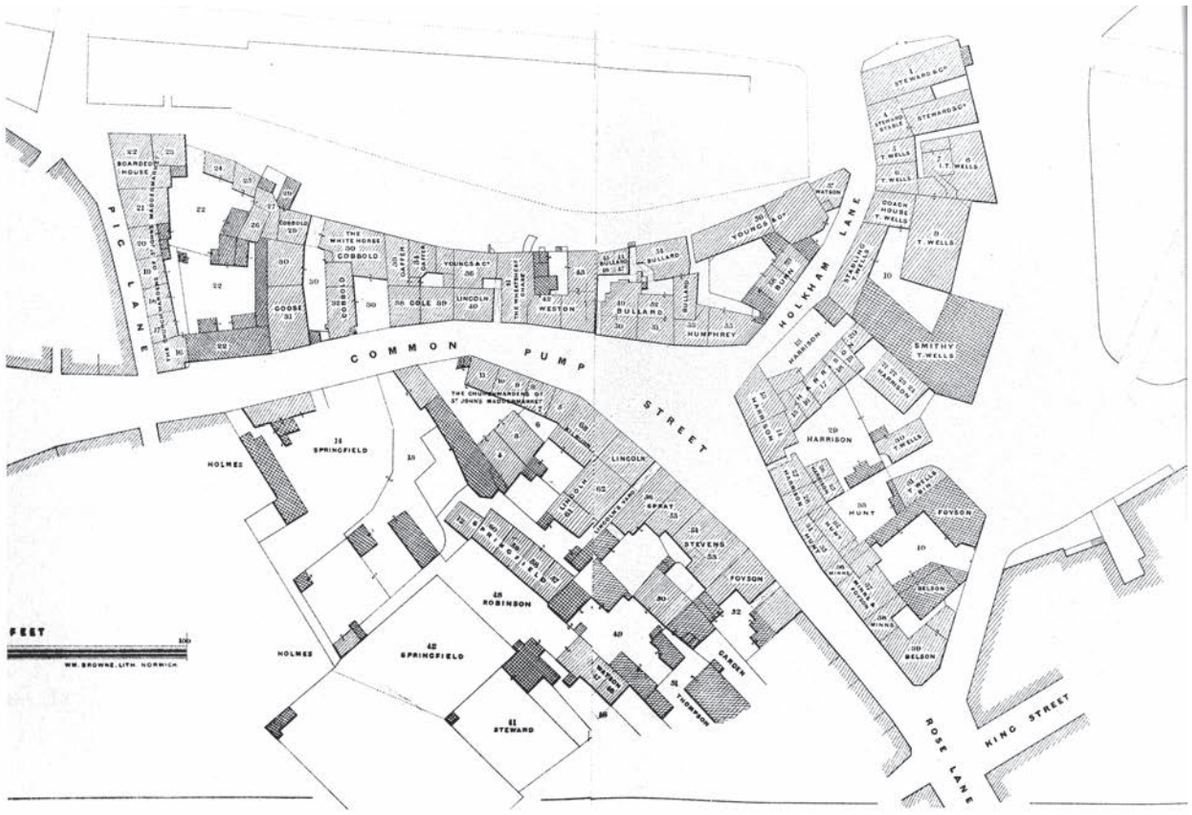


Plate 11.5 Properties along Common Pump Street, 1861 (N/EN/20, 187)

the *Golden Ball* and the *Duke Inn*. Horses were tied to stands along the western side of this road, with cows and bullocks taking up all the remaining space.

Undoubtedly, there were occasions when market traders and farmers came into conflict, their spirits perhaps raised by the burgeoning number of surrounding hostelries (see 'Public Houses' below). A constable of the market was appointed in 1833, his duties to attend every Saturday and preserve order. His annual salary was £10.

A series of decorative cast iron urinals were placed at strategic points around the new market (located on the 1880s OS map, Plate 11.6), one of which survived until the 1960s.[35]

Before the lowering of the Hill (*i.e.* the Cattle Market), detailed below, a large square drinking fountain stood opposite the weighing machine. Adjacent to the machine was the Market Collector's house and office on the roof of which was fixed a bell to signal the end of trading. It had come from the former clock tower of St Andrew's Hall and was put up in the Cattle Market in 1864.[36]

The lowering of the Hill
(Figs 11.6–11.7; Plate 11.5)

During the decade after 1850 mounting problems beset the Market Committee. Access roads, particularly to the Castle Meadow, were inadequate and space on the Hill was very limited. Dealers complained and began to move to other towns so rents fell. In 1850 for instance, the sale of the lease of the hay-weighing engine raised £370, in 1859 £190 and the enclosed land opposite the *Castle Inn* was let for three years for £63 in 1850, but only £50 six years later.[37] The Market Committee closed the roads across the Castle Meadow on Saturdays, removed a building opposite the *Castle Inn* and restricted the number of booths, but more radical action was needed.

The approach to Castle Meadow from the north was improved by the cutting of a new street (modern Bank Plain) east of Gurney's bank. In June 1859 a Bill was passed permitting the construction of a new road from the station to King Street (Prince of Wales Road) and plans were made the following year for further widening of the original approach to the south end of the meadow via Rose Lane (Mackie 1901, 28 June 1859). A Norwich Corporation Markets Act received the Royal Assent on 15 May 1860. This permitted the extension of the eastern part of the market by demolishing buildings, using powers of compulsory purchase of necessary, by altering levels and by closing streets temporarily or permanently. Certain new streets were provided for. Borrowing was to be limited to £40,000 and new maximum tolls were laid down. This Act was modified by another of May 1862 under which the compulsory powers were given for four more years, the Corporation was permitted to deviate in some degree from the lines of the new streets and to sell or exchange property acquired.[38]

After some months of discussion the Market Committee decided in February 1861 to undertake a large scheme (Figs 11.6 and 11.7). At this date this consisted of i) improving the road through Buff Coat Lane and Pump Street, ii) the removal of buildings between Pig Lane and Holkham Lane as well as parts of buildings on the south side of Pump Street and iii) the removal of the *Shirehall Tavern* and properties on both sides of Holkham Lane as far south as the *Chequers* public house (see Fig.11.8).[39]

Figure 11.4 Golden Ball Lane 1855 (artist unknown)

Figure 11.5 Buff Coat Lane 1857 (artist unknown)

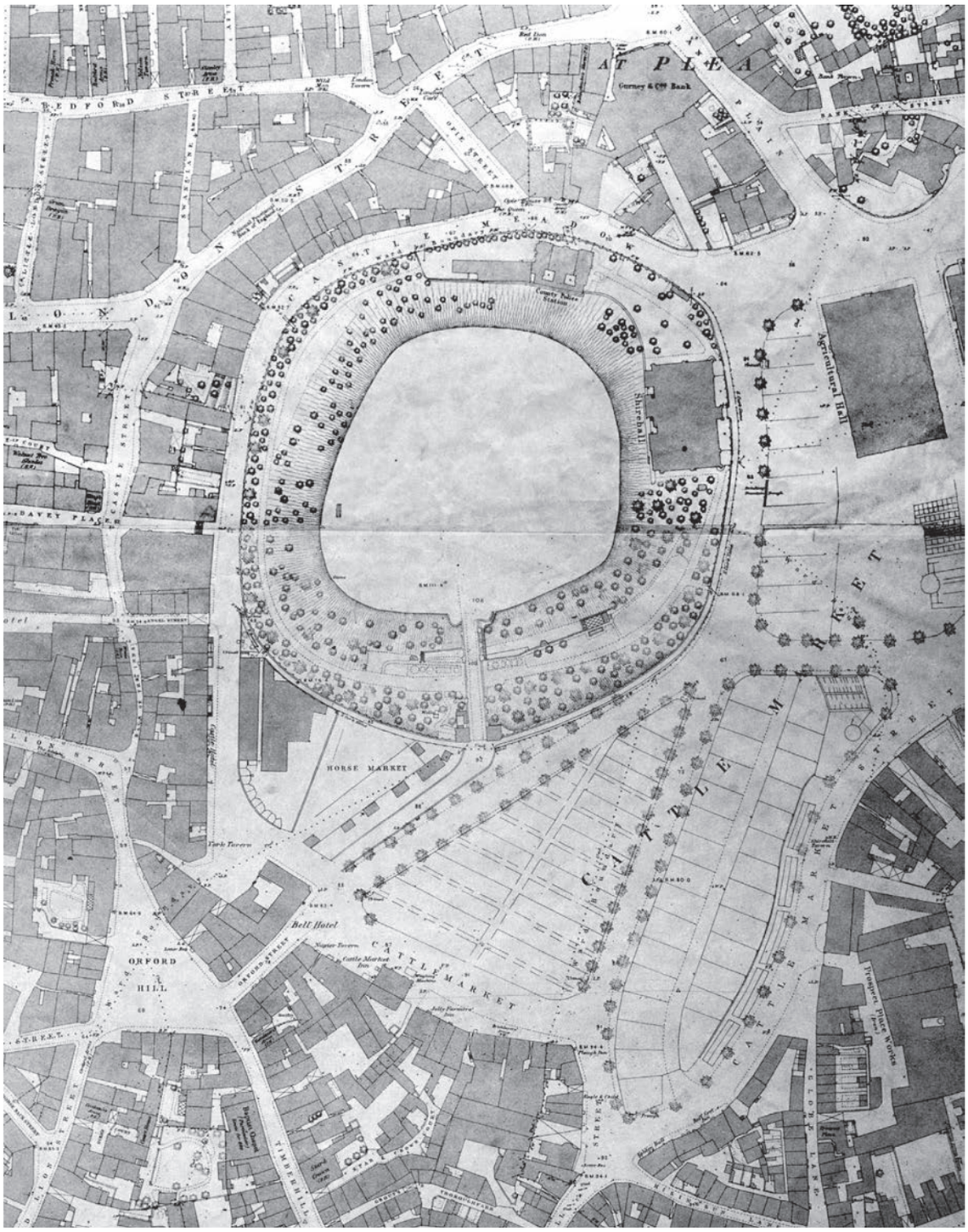


Plate 11.6 Detail from the 1885 Ordnance Survey map (courtesy of Norwich Central Library)

A special meeting of the Town Council was called for 22 June to consider the Market Committee's proposals, which were reinforced by a letter signed by 798 users of the Cattle Market. The chairman spoke in favour of a comprehensive operation. The property to be removed was very poor, moreover 'Pump Street and Holcham Lane were places that were productive of all the evil that could be uttered', 'enough reason in itself for the Committee to demolish it'. Income from market dues might be expected to increase, especially as under the new act bullocks could be charged for. One hundred thousand of these at 1d each would bring in an extra £400 a year. Sheep numbers had increased to perhaps 200,000 a year and separate areas for each group of animals were desirable.

The banker, Mr Harvey, said that the dealers all spoke of the exceedingly bad conditions on the Hill and they preferred to put cattle in other spots such as All Saints Green, such was the difficulty in getting them on and off

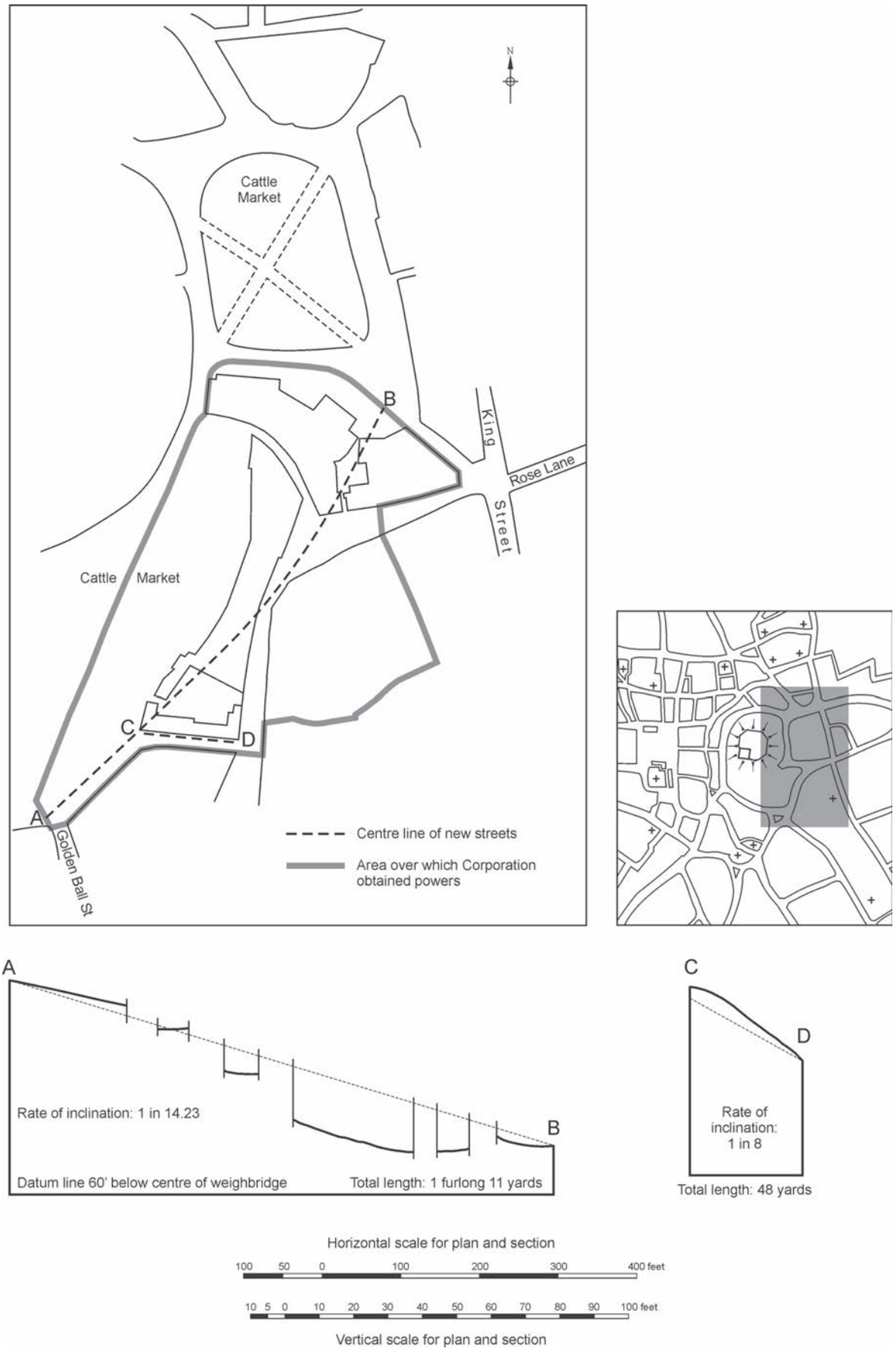


Figure 11.6 Norwich Corporation plans for alterations to Cattle Market 1859–60 (between Golden Ball Street and Rose Lane) (after Norwich Quarter Sessions Deposited Plan N/S 17/41: Norwich Corporation Markets, Fairs and New Streets, Cattle Market Improvement dated 1860)

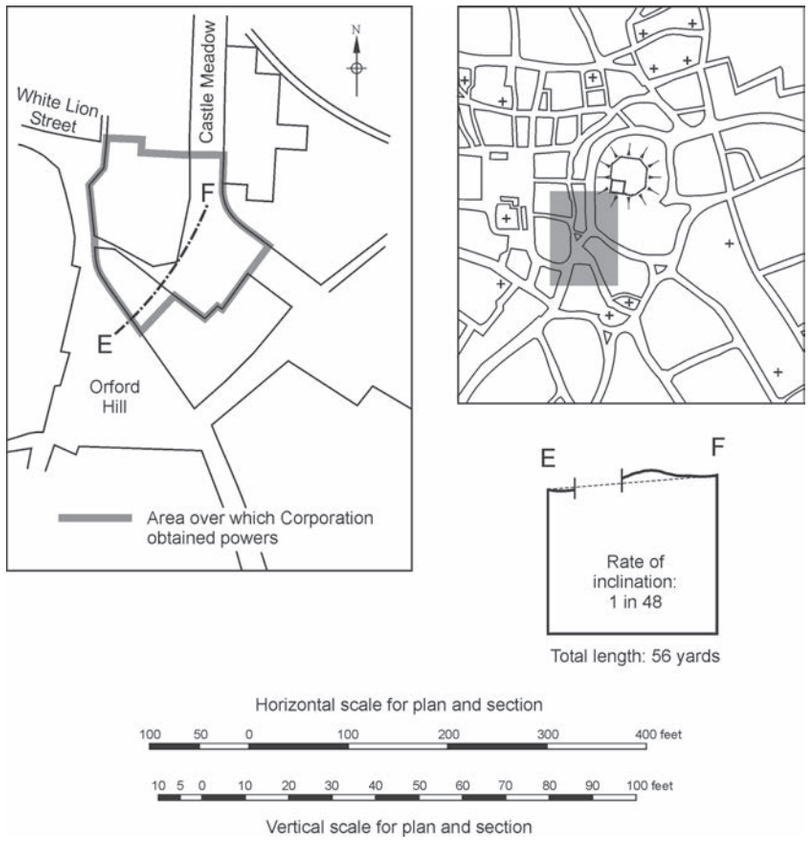


Figure 11.7 Norwich Corporation plans for alterations to Cattle Market 1859–60 (near Orford Hill) (after Norwich Quarter Sessions Deposited Plan N/S 17/41: Norwich Corporation Markets, Fairs and New Streets, Cattle Market Improvement dated 1860)

the Hill and such was the uncertainty of finding space when they got there.

One dealer said plainly that the Hill was filthy and sheep caught disease 'Until you purify that Hill, which can only be done by renewing it pretty nearly' and 'saturating it with lime on Saturdays' he would never come and buy any sheep there.[40]

The Council was left with no choice and the Market Committee immediately sought permission for a loan of £20,000 for the purchase of properties. The east side of Pump Street was estimated to be worth £4,000 to £4,200, *Shirehall Tavern* to Rose Lane £10,000 to £10,500 and the property between the ditches and Pump Street £7,000 to £7,200. By this time the road from the *Bell* to the *Shirehall Tavern* had to be kept closed on Saturdays and it was realised that the roads and the market on the south-western area should also be tackled. It was then that the Amending Act was applied for.[41]

Five thousand pounds had already been spent on purchasing properties and plans for draining the area were in hand so at the beginning of 1862 a start was made in clearing away the buildings between Pump Street and the ditches. The most significant of these was the *Holkham Arms* (see 'Public Houses' below).

In May 1862 the City Surveyor, Mr Berry, submitted a plan to the Market Committee for levelling the Hill and making new roads which was adopted. The levelling costs were alarming and after a site inspection the Committee decided to reduce the proposed depth of the excavation by a third. This would leave the market gradually sloping down to the raised level of Pump Street. A new approach to the castle was also considered and immediate purchase of the *Griffin* public house urged, so that access to the new Prince of Wales road could be improved.[42]

Another special Town Council meeting was held in June. The Surveyor proposed diverting Pump Street to the south by about 40ft to improve the line of the road from Rose Lane to Golden Ball Street. The altered street would be 36ft wide, rising on an even gradient from Rose Lane, being raised in parts nearly 5ft. The surface of the market would be brought down in a gradual slope to the new street. The surveyor emphasised that the principal difficulty lay in the great elevation of the road leading to the gates of the castle, so he intended to provide a new roadway in the position of the footpath from the *Bell Tap* to the Castle. Then the whole surface of the hill near the castle would be lowered from the footpath to the *Boarded House* public house as well as downward between the castle gate and the Shirehall. This would involve the movement of a great deal of soil, the excavation alone amounting to 14,000 (cubic) yards, much of which, as was partly known from recent excavations, being old foundations of buildings once belonging to the castle. Four thousand yards would be used for filling. The digging would be difficult and expensive, particularly as the whole surface of the Hill was hard and consolidated ground. He considered the Market Committee fortunate to have received a tender of £700 from the firm already

working on Pump Street who could use 10,000 yard of the soil to build up the levels there.[43] He was also able to report that now that collection of market tolls was no longer leased out, income was higher. The tender was accepted and steps were taken to purchase the *Boarded House* and the *White Horse* as well as property on the south-east side of Pump Street.[44]

Next the Market Committee turned to the problem of Bell Corner and agreement was reached in August with the County Justices for a road 24ft wide from there to the castle gates (*i.e.* Castle Hill) with a turning space of 40ft at the top (later reduced to 18 and 30ft).[45]

September 1862 saw all initial purchases completed and the work of levelling proceeding fast. Surfacing was completed at the earliest opportunity. Further levelling was ordered between the *Jolly Farmers* and the nearby weighbridge and two months later from there to the *Plough Inn*. This involved the underpinning of the buildings affected 'by the lowering of the ground there'. In the end the Market Committee decided not to proceed with the underpinning of the Plough, but to offer the owners the cost of it if they pulled the building down and rebuilt it within 6 months.[46]

The raising of Pump Street brought contrary problems to Holmes Ironfounders. In November 1862 the Market Committee undertook to raise their gates and later to remove some of the soil deposited there.[47]

More lowering was ordered in the north-east corner of Castle Meadow between Bank Chambers and the new Prince of Wales Road.[48] The large house to the north had lost much of its garden, some by compulsory purchase and now a brick wall with iron paling was built round it.[49]

With provision made for an 18ft roadway to Corporation land adjacent to St Peter Parmentergate churchyard, the building plots on the south-east side of Pump Street were offered for sale in April 1863. The levelling and stoning of the new road surface from King Street as far as Holmes foundry was to go ahead in June once the pavements and drains were complete. Messrs. Holmes had requested 200 square yards of the new land.[50] Mr Wells, the veterinary surgeon who had large premises including a smithy and several stables next to *Shirehall Inn*, acquired the big rounded-off corner site. He had probably moved by the beginning of August when the sale of the materials of his old buildings was arranged.[51] On the understanding that nothing would be built opposite to it, the next but one site to the south was taken for a new *Shirehall Inn*.[52] East of Wells' the *Lion Inn* was built and beyond that there were to be four new shops and a house.[53]

Once the sales of the materials of Mr Wells' former property and of Minn's and Foyson's builders, to the east, had been completed, and the last buildings on the south east corner of Pump Street bought, it was possible to extend the new road from the Bell Corner across the lower part of the Hill to Rose Lane (forming Bell Avenue). The line was staked out in the first week of October 1863, with an increased width of 40ft.[54] Pumps on the site were restored.[55] Two weeks later the contractor was urged to employ more labour as progress on the levelling and clearance of the 'colder' from the old buildings was slow.

The Saturday market seems never to have been suspended, but as the various improved areas came back into use there were complaints about allocation of standings. However, by midsummer 1863 horses were offered for sale in the higher untouched area west of the road up to the castle, second-hand goods such as implements and harness on the narrow space below that road[56], the sheep were in permanent iron pens in the triangle south of the castle and bullocks on the east side of the Hill and on Castle Meadow opposite the Shirehall. The bull-ring was also near the Shirehall, while pigs were temporarily on ground near St Peter Parmentergate church.[57] Hay and loads of root vegetables were sold along the street between the *Bell Inn* and the *Plough* (this area becoming known as the Haymarket) and the weighbridge remained just to the west of the *Jolly Farmer's Inn*.[58]

Also in 1863 the gradient of Opie Street was evened out and part of Castle Meadow widened to improve the connection between London Street and Prince of Wales Road. The County Police station opposite the top of Opie Street lost land in front, which necessitated a new stable entrance to the west.[59] The upper part of London Street had itself been widened rather earlier. The fronts of the houses on the north side (and probably those on the south) were set back and rebuilt in 1848.[60] Work was going on to the west of this in 1855. There were complaints that year that though £20,000 had by then been spent the street was still only 14ft wide (Mackie 1901, 8 December 1855).

Once all work on Prince of Wales Road was finished surplus land was auctioned. Robert Harvey who already owned the adjacent site, bought a substantial plot on King Street and a small strip of Castle Meadow to enable him to build a large new bank (Crown Bank).[61] Unsuccessful speculation with clients' funds led to his suicide in 1870. Gurney's bank acquired the goodwill of the business and the building, but this eventually became the General Post Office (and later Hardwick House).

Despite all the road widening the ways across the hill continued to be 'stopped' on Saturdays. The Corporation were sued for £250 damages in 1871 when the chain across the road at 'Plough's Corner' fell on a passer-by.[62]

Complete clearance of the Golden Ball block took ten years. At first only the widening of Golden Ball Lane was envisaged. At the beginning of 1863 the estate of which the *Golden Ball* public house was a part was bought for £2,500 and shortly afterwards the neighbouring property.[63] Steward and Pateson moved the *Golden Ball* to a new site a few yards to the south[64] at the corner of Buff Coat Lane and Rising Sun Lane in November, whereupon the Market Committee invited tenders for taking down parts of the buildings and setting back the fronts.[65]

The next property to the south belonged to John Barnard and consisted of stables, with granaries over the gateway to the street and the next door house and shop.[66] A small part was requested for road-widening but Barnard refused to sell. It was now that the Market Committee realised the desirability of owning the whole of the block and in addition the triangle bounded by Rising Sun Lane, Globe Lane and Pump Street, but they decided to buy nothing more for the present.[67]

The earth was lowered in front of the cottages east of the old *Golden Ball*. A 'boarded Bumble ten feet high' was erected to fence in the corner of the site and the cottages were underpinned and steps made to the doors. All the properties were then let at three months notice.[68] The Market Committee seem to have been uncertain what

to do with the rest of the block. Youngs and Crawshay complained about the state of the *Jolly Butchers* at the north-eastern end in 1865 but repairs were postponed then and again in August the following year.[69] In May 1868 the old *Golden Ball* premises and adjacent buildings were taken down and the site cleared.[70]

Still Barnard the hay merchant refused to move. However, a cash offer of £2,000 made in 1869 persuaded him to exchange his property for one known as the Crystal Palace on the other side of the street (see Holme's Foundry below).[71] Possession of Barnard's stables was finally obtained in December 1869 and all remaining buildings on the Golden Ball block were pulled down. The 'colder' was spread over the site which was then surfaced with shingle and marl. A plan for four bullock pens was being discussed in April.[72]

Once 'the crest of the ridge connecting the Castle Hill, properly so called, with the high ground of Ber Street had been cut down' (as a writer of 1897 put it[73]) and improvements completed, use of the market increased. Average numbers of animals offered for sale over a six week period in the summer of 1864 were beasts (*i.e*. bullocks) 802, cows 26, bulls 17, horses 92, donkeys 18, sheep 13,695 and pigs 1,012.[74] Except when closed because of disease, as it was for most of 1866 when rinderpest was virulent, the market was held every Saturday for almost another hundred years.

Surfacing in the Cattle Market (1862–72)
Surfacing within the market was a continual problem, as is evident from the following extracts from the Market Committee minutes (N/TC 8):

15.12.1862	Estimated cost of pebble-paving in sheep pens £209
5.1.1863	The ground round the weighing machine to be paved with new granite
16.2.1863	More pebbles needed
26.6.1863	Pump Street ready to be levelled and stoned
3.8.1863	'Forming and stoneing' of New Street discussed
23.10.1863	Complaint about the way in which the approach to *Cattle Market Inn* was left when the Hill was lowered
30.10.1863	Road to Pig Market (adj. St Peter Parmentergate churchyard) and the Fat Cattle and Bull Market (in Castle Meadow) to be levelled and regulated
17.11.1863	Mr Wells complained about the bad state of Hill opposite his new buildings at the bend in Pump Street. Surveyor estimated cost of £80 for laying 2 inches shingle with some marl and about 1 inch clean gravel on top to set it. Committee resolved that c.2,500 (cubic) yards of Mousehold or other good pebble paving stones be laid on Cattle enclosure opposite Mr Wells'. More complaints re surface in front of *Jolly Dealer's* (east of *Golden Ball* old site) where ground had not been levelled, resulting in loss of trade.
22.3.1864	Ordered that gravel be laid over the rough stone in the Bull enclosure for the convenience of the Fair (Castle Meadow)
11.6.1866	Asphalt surface tried in sheep pens
7.8.1866	Asphalt unsatisfactory: Brimstone lumps ordered
28.2.1867	Four more sheep pens to be paved
12.3.1867	Stones from sheep pens to be used on road from Hill to Slaughter Houses
6.5.1867	Experiments ordered in foundation of sheep pens as substitute for paving
17.2.1869	Dealers did not like pebbles — would be satisfied with bricks
6.3.1868	Experiment with macadamed surface for bullock and sheep pens
30.4.1868	Large stones and colder in front of Shirehall at the Bull Ring be 'relayed, broken and regulated'. Paving with 'lumps' considered
31.12.1868	White bricks from Slaughter Houses possible for 9 sheep pens
2.3.1870	Plan for levelling ground of *Golden Ball* block. Cost of spreading 'colder' of old buildings £170. Cost of shingle and marl over whole site £52 10s 0d
5.7.1871	54 loads of 'colder' from Fletcher's building in Davey Place had been deposited in the cattle pens. Disallowed in future.
5.3.1872	Resolved that when material is laid into any of the pens it should be well rolled down with the iron roller from the Gaol if it could be borrowed. Another experiment with asphalt.

Later developments
The open horse market and Spelman's Horse Sale, in the north-western part of the excavation site (Area 3) saw falling revenues during the 1920s. The Market Committee eventually recommended that the area be turned over to parking 'for public service vehicles which are being run by small operators providing services for a number of neighbouring villages. In addition omnibuses used on the long distance services shall use this public service station'. At this time 'unsightly buildings' were demolished, the area was levelled and new walls and footpaths were constructed. Waiting rooms and petrol pumps were a later addition. The Committee had already provided a waiting room for use by passengers on Bell Avenue (*Norwich Mercury*, 17 February 1932). Eastern Counties Omnibus, one of the major bus operators with offices on Castle Hill, was founded 1931 from a conglomeration of earlier companies.

Buildings Around the Cattle Market
by Elizabeth Shepherd Popescu and Margot Tillyard

Tenement development and monumental buildings
(Figs 8.1, 11.4–11.5, 11.8; Plates 11.1–11.9)
By the early 19th century, many public houses were established in the area surrounding the Cattle Market, as is detailed in the section 'Public Houses and Inns' below. The former Castle Fee and city properties examined in earlier chapters of this report were now densely settled with a warren of small buildings, between which ran narrow alleys and passages. Numerous yards survived. Several monumental buildings were constructed within the former Castle Meadow in the latter part of the 19th century. Notable Victorian buildings within or immediately adjacent to the former castle precinct include the splendid iron and glass structure on Cattle Market Street (see Site 26404N above) and the new Shirehall built in 1822–23 (see above). The Agricultural Hall was constructed within the former Castle Meadow in 1881–2 (Site 358N). The adjacent General Post Office (later Hardwick House) was originally constructed as Crown Bank in the 1880s (Site 418N; see above). Gurney's Bank, founded in the mid 18th century, lay further to the north-west in the northern part of what is now Barclay's Bank (Site 26011N; see also Chapter 10.I). At the north-east corner of the Castle Meadow lay the Royal Hotel, constructed in 1896–97 (Site 26002). During the construction works associated with some of these buildings, the earthworks of the Castle Meadow were encountered (see Chapter 2 and comments throughout earlier chapters).

Block I: St Martin at Bale (now Michael at Thorn)
All of the buildings within this block were swept away during the alterations to the Cattle Market of the 1860s, detailed above (Fig.11.8, Plate 11.5).

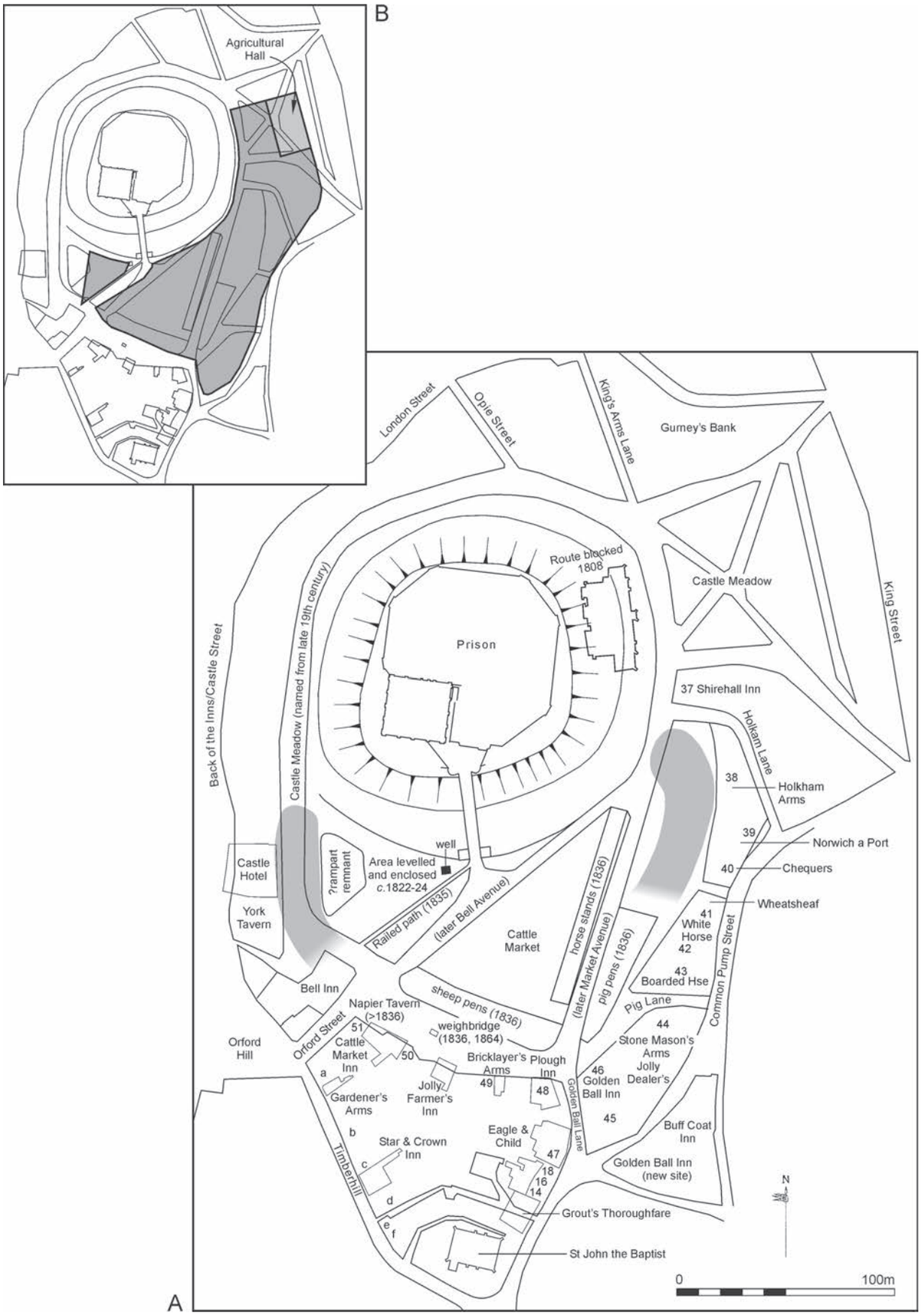


Figure 11.8 Period 7.1: A: phase plan (1800–c.1850), showing public houses surrounding the Cattle Market (details from N/EN 20, 184 (1836). B: shows area affected by 1860s alterations to the Market. Scale 1:2500

Plate 11.7 *Le Rouen* public house (formerly the *Plough*) at former Castle Fee Property 48. Its deeds go back to 1742

Property 38
The public house which became the *Holkham Arms* was on this property, facing west into the ditches. In 1860 the freehold was owned by Crawshay and Youngs the brewers. It was named as the *Holkham Arms* in 1810 and again in 1822 when its description read 'messuage or Public House formerly the Foundery now the *Holkham Arms* with a cellar, and with an adjacent stable at the south end, and a washhouse and privy at back or north east part and fronting the Castle Ditches or Castle Meadow'. A small property to the north-west (that is, on the top of the block) and one to the north-east facing Holkham Lane shared the yard, from which a passage led into the Castle Ditches. David Mansfield occupied the *Holkham Arms* in 1822 and was still there in 1830 according to the directory of that year.

Property 39
In the 19th century there were two public houses on what appears to be this property, the *Queen's Arms* on Pump Street and the *William Tell* facing the Castle Ditches. In the early part of the century this had been called the *Norwich A Port* when the city launched a campaign to revivify its river trade by cutting a canal from the Waveney to the Yare. This avoided the high transhipment charges levied at Yarmouth for cargoes brought up to Norwich. The last freeholder of Property 39 before the whole block was absorbed into the Cattle Market was Bullard's Brewery.

Property 40
In the 19th century the *Wheatsheaf* public house facing the castle ditches, and the *Chequers* public house facing Pump Street were on this property and there may have been a way through from one to the other. This was the narrowest part of the block, measuring about 35ft from west to east.

Property 41
It is possible that Property 41 corresponds with the only area of the block which bore no public house in 1860. If so it appears to have been divided by then into at least half a dozen dwellings.

Property 42
The *White Horse* public house may have been on this property in the 19th century. It faced the castle ditches and its freehold was held by Cobbald.

Property 43
Hochstetter (1789) shows large parts of Property 43 still not built on (Plate 10.3.C) a situation which continued as late as 1860 (Plate

Plate 11.8 No.18 Golden Ball Street, part of former Property (g), built *c*.1600

11.5). The *Boarded House* public house on the south-west corner had a very large yard. This hostelry was present at least as early as 1836 (N/EN/20/184), but probably earlier.

Properties 44–46
By 1836, Property 44 housed the *Stonemason's Arms* and, broadly, the *Jolly Dealers*, along with numerous other smaller buildings (N/EN 20 184). Property 46 housed the *Golden Ball Inn* until it was moved south to a new site. The original building appears in many old images and photographs, including sketches of the lane (and the adjacent Buff Coat Lane) in the mid 1850s (Figs 11.4–11.5). These demonstrate the cramped and untidy character of the area. Other buildings along this side of the lane, prior to their demolition, are known from photographs and included Barnard Stables and granary (noted above). A photograph of Nos 1–9 Golden Ball Street (former Castle Fee Properties 45–46) prior to its widening is given by Plunkett (1987, 93). The scheme drawn up for the demolition of the remaining part of the east side of the street was not completed until 1940. The buildings of the *Golden Ball* public house (on its new site) and those of the *Buff Coat* survived until 1964 when Rouen Road was made between the south end of King Street and the Castle Hill and the ECN building was constructed (Plunkett 1987, 93).

Block II: St Martin-in-Balliva (St Michael at Thorn) and St John the Baptist, Timberhill

Properties 47–51 and (a–g)
By the time of the 1880s OS map, much of the Timberhill block was infilled with buildings — too numerous to describe individually — separated by narrow alleys and yards, some of which housed smithies (Plate 11.6). Other open areas included a small horse market. As noted above, the appearance of properties on either side of Golden Ball Street and fringing the Cattle Market is indicated by sketches of the area made in the 1850s (Figs 11.4–11.5) and in photographic evidence for buildings dating from the 17th century onwards. These include the *Plough Inn* (now *Le Rouen*; former Property 48, Plate 11.7) which was sold by auction in 1853, the price realised being £490. The deeds handed over went back to 1742. At that date the three storey building was the public house, and the lower part with a 44 foot frontage on Golden Ball Lane was an unoccupied dwelling house which had lately been used as the off-licence for the Eagle and Child Brewery further down the lane (NRO BR 160/12/1). Formerly both parts together had been a public inn, also called the *Plough*.

Also positioned to face the Cattle Market in 1836 were the *Bricklayers Arms* and the *Jolly Farmer's Inn*, both broadly within former Properties 49–50. The *Cattle Market Inn* further west may have overlapped westwards onto former Property 51, the latter housing the *Napier Tavern* by the time of the 1883 Ordnance Survey map.

Although a number of early buildings survive along the western side of Timberhill, most of those along its eastern side were destroyed prior to or as a result of the construction of the Castle Mall shopping centre. Several gaps along the eastern side of the street had remained unfilled since the war, when an air raid of 1942 caused extensive damage (Plunkett 1987, 92; see below). Amongst the buildings lost was No.20 (effectively part of former Property c). Privately occupied since the 1930s, this building had previously been the *Star and Crown* public house. It had a front wall of knapped flints (Plunkett 1987, 93). Other buildings along Timberhill included the 18th-century *Gardener's Arms/Murderer's* public house at No.4 Timberhill (former Property a/b), behind which lay a smithy by the time of the 1883 OS map. The public house survives in use in extended form. Other buildings along the eastern side of the road (even numbers) are pictured at http://www.the-plunketts.freeserve.co.uk, along with surviving buildings on the other side of the road (odd numbers).

By 1844, former Properties (e) and (f) at the top of Timberhill (lost in later slum clearance) were densely packed with small buildings including wash-houses (Fig.11.9). A plan was drawn up in 1887 for the widening of the lower part of the west side of Golden Ball Street, including the setting back of the churchyard wall.[75] It seems that this was not carried out until the 1930s (see 'Streets and Lanes' above), though some time earlier the two buildings on the street between Grout's Thoroughfare and the churchyard had been removed.[76] The old buildings behind were revealed and to the north the entrance to Spelman's repository, a former horsemarket occupying what had probably always been an open space. Clearance of the crowded dwellings in the Thoroughfare (former Properties e, f and part of g) in 1934 was long overdue judging by the plan of them when sold about ninety years before (Fig.11.10).[77] Some of the yards opened onto Church Alley, which after the clearance was extended through to Golden Ball Street to become the realigned Thoroughfare.[78] Grout's Thoroughfare in its pre-1933 form appears in Plate 11.9.

The timber-framed buildings of the *Plough Inn* and No.18 Golden Ball Street (Plates 11.7 and 11.8) survived the road widening and slum clearance schemes and remain in use today.

Blocks III–VIII: St John, Timberhill, St Peter Mancroft, St Andrew, St Michael at Plea, fomer St Cuthbert and St Peter Parmentergate

The development of properties within these blocks is detailed in Part IV. The present Prince of Wales Road cuts across the corner of St Cuthbert's parish. North of the road now stands the former *Royal Hotel*, built in 1896, and to the south Anglia Television, formerly Harvey's 'New Bank' of 1866.

Public houses
(Figs.11.4 and 11.8; Plates 11.6 and 11.7)
The castle area continued to be a focus for hostelries, supplying both the needs of the market traders and, as in previous centuries, those witnessing events such as public executions. Many of the names, which changed frequently, attest to local occupations: the prefix 'Jolly' indicates the merriness caused by alcoholic indulgence (Riddington Young 1975, 66). By 1836, no less than seventeen public houses fringed the Cattle Market, from the *Castle Inn* in the west to the *Shirehall Inn/Tavern* (renamed from the *Duke* in 1823 after Wilkins' new building) to the east (Fig.11.8). Many others lay around the former Castle Meadow, with still more along streets around the castle including Timberhill and Golden Ball Street. A few of the original buildings survive, although most of those around

Plate 11.9 Grout's Thoroughfare, prior to slum clearance in 1933 (EDP/P1082; courtesy of Eastern Counties Newspapers)

the Cattle Market were lost during alterations in the 1860s (the purchase and demolition of which is detailed in 'The Lowering of the Hill' above). Others, such as the ancient *Golden Ball*, were moved to new locations. Those that survive today as hostelries are the recently refurbished *Bell Hotel* and *Le Rouen* (formerly the *Plough*), along with the *Murderer's/Gardener's Arms* on Timberhill. The histories of each of these, along with some of those that were lost, are detailed in earlier chapters. Summary information for developments during the 19th to 20th centuries is given below, moving round clockwise from the *Shirehall Inn* (former Property 37, Fig.11.8).

The *Shirehall Inn* on Holkham Lane (former Property 37), one of those demolished in 1862, was depicted in a painting by M.E. Cotman in 1828–34 which shows a tall, three-storey building with a double-pitched roof. By the 1860s, the property was occupied by Steward and Co. It was obvious to Harrod that the *Shirehall Inn* was actually built in the ditch (Harrod 1857, 139). It appears from the 1809 prospect (see below and Plate 11.1) to be lower than the building to the east. A flight of steps is shown on a map of 1836 at the centre of the western front (N/EN/20/184).

By 1836, along with other buildings, the northern part of former Castle Fee Block I (Properties 38–43) housed the *Holkham Arms Inn* at the north. In the early 19th century, this known by a succession of names: the *Queen's Head,* the *Prince of Wales,* the *Feathers,* the *Lord Nelson,* the *Foundary* (*sic*.).[79] By 1822 it had become the *Holkham Arms*. It abutted north onto a street leading into the Castle Ditches, to which Kirkpatrick gave no name, but which afterwards became Market Lane and then Holkham Lane. It was now no longer a public house but from 1858 leased to T.S. Howes who had converted it, with its nine-pin ground or stable into a dwelling-house, coachmakers' workrooms and show shop.[80] Further south in the same block by 1836 lay *Norwich A Port* (see above), the *Chequers Inn*, the *Wheatsheaf Inn*, the *White Horse Inn* and, furthest to the south, the *Boarded House Inn*.[81] By the 1860s, only three survived: the *Wheatsheaf Chase,* the *White Horse* and the *Boarded House.*

In 1836 to the south of Pig Lane (formerly The Shirehouse Gap) on the site of former Castle Fee Properties 44–46, lay the *Stonemason's Arms*, the *Jolly Dealers* and the *Golden Ball* (the latter present before 1625; see Chapter 10.I). The original *Golden Ball Inn*, at the north-eastern end of the lane (within the confines of Castle Fee Property 46) was demolished in the 1860s and moved further south (see above). In 1938, demolition of the old *Woolpack Inn* (a Tudor timber-framed building) at No.9 Golden Ball Street began, to be replaced by a newer building set further back which survives. Another Tudor building at No.7 was also demolished and may originally have formed part of the same property.[82]

The *Buff Coat Inn* (south of the *Golden Ball*, in the block previously housing the Church of St Martin-in- Balliva/at Bale) and adjacent premises to the north constituted a large property 'well adapted for an Inn, in connection with the Hay, Straw and Corn Chandling Business carried on for many years by the former Proprietor' as it was described in 1849 when it was auctioned. It contained 'a large Dining Room, Parlour, Kitchen, five good sized bedrooms, Scullery, Cellar, etc. Also the substantially Built stables, with Granaries over, near the said Public House fronting the Buff Coat Lane. Also the Capital Stables, Cart Lodge and Hay Chambers, next the Globe Lane, together with large and convenient enclosed Yard, in which are Gig Houses, Cart Lodges, Workshop, Straw Loft and Piggeries'. It fetched £470. The ground behind the public house was very high. Was this merely the lie of the land, or because it had once been part of St Martin at Bale Churchyard?[83] A late 19th- century writer deplored 'the mean frontages' of the *Golden Ball* (in its new position) and the *Buff Coat* public houses.[84] In fact they survived until 1964 when Rouen Road was constructed to connect the south end of King Street with the Castle Hill, and the ECN building was put up.[85]

The next group of hostelries lay along the northern side of the Cattle Market and in 1836 consisted of the *Plough,* the *Bricklayer's Arms,* the *Jolly Farmer's Inn* and the *Cattle Market Inn*. The *Napier Tavern* was a later insertion at the far western end of the block. The *Plough* public house on the site of Castle Fee Property 48 was sold by auction in 1853 (see details above under Property 48). The deeds handed over dated back to the mid 18th century (see Chapter 10.I).

Other hostelries within the same block included the *Star and Crown* and the *Murderer's/Gardener's Arms*, both of which fronted onto Timberhill. The former, at No.20, was lost during the war, but had a front wall of knapped flints.[86] The yard, the entrance to which lay to the right of the building, survived. Sale particulars of premises in the yard in 1835 indicate the presence of a house and a blacksmith's shop. Further down the hill at No.4, the *Murderer's/Gardener's Arms* survives in use in extended form (formerly part of Property a/b); see comments on the 18th-century history of this building in the previous chapter).

On the other side of Orford Street, the *Bell Inn* (formerly the *Blew Bell*, present before 1629) was sold by auction in December 1849 (see Castle Fee Properties 52–53). It was then described as having been built in great measure during the previous six years. It consisted of nine sitting rooms, twenty sleeping rooms, with wine vaults and stabling for fifty horses.[87] The stable, a separate building, which had been put up, partly on Corporation land, when Rochester Row to the south had been widened in 1791 and plainly to be seen on the panoramic view of 1809 (Plate 11.1), was by 1862 incorporated into the main building. Possibly also included in this alteration was the *Bell Tap*, which was in a dangerous state in May that year.[88]

York Buildings, incorporating the *York Tavern* and a stable to the north, were erected between 1885 and 1899 (see Castle Fee Property 1; Fig.11.8, Plate 11.6). In connection with the widening of St Stephen's Street and Red Lion Street (planned in 1954 and executed ten years later) the realignment of the fronts of both the *York Hotel* and the *Castle Inn/Hotel* were proposed, but the *York Hotel* remained unchanged.[89]

The early history of the *Castle Inn/Hotel* (originally the *Signe of the Castle*, at Castle Fee Property 2 from the 17th century or earlier) and the adjacent hostelry and stables known as the *Bear* has been detailed in previous chapters. Hochstetter's map of 1789 shows an alley at the south side of the *Castle Inn* in line with White Lion Street (Plate 10.3.C). It was much used, but was stopped up between 1812 and 1820 (Woodward 1847, 41). The eastern elevation of the building appears clearly in the

panoramic view drawn on the Castle Mound in 1809 (Plate 11.1). It is a four-bayed, three storied Georgian house bearing a large inn-sign. A tree grows between it and the next house to the north.[90] The road was widened in 1822, prior to which a bank of earth five feet high reached to within a few feet of the *Castle Inn* and other houses there (possibly a remnant of the barbican rampart). At some time during the next forty years the inn was doubled in size. The original building was retained and a similar one, but with an attic floor, built adjacent to the north.

An auction sale of the contents of the *Castle Hotel* in 1918 took four days. Sold on Day One were the contents of the Kitchens, Office, Bars, Boots Room (including China and Glass), Stock Room, Smoke Room and Coffee Room, on Day Two those of the Dining Room and sixteen bedrooms, and on Days Three and Four the wines and cigars in the former Billiard Room and the contents of twelve further bedrooms.[91]

Plans were drawn up in 1954 for a further extension to the north and new elevations to front and rear above and behind shops on Castle Meadow (*i.e.* the road) and running through to the Back of the Inns. The back of the hotel was damaged and had to be rebuilt when the house opposite at the corner of White Lion Lane was burnt down in the early 1960s.[92] The whole building was pulled down in 1990 for inclusion of the site in the Castle Mall development. An entrance on White Lion Street now leads to a tunnel under Castle Meadow into the lowest level of the shopping centre.

The Agricultural Hall

The Agricultural Hall was built on Castle Meadow adjacent to the General Post Office (in that area that had been Castle Fee Properties 25–27) in 1881–82. The promoters had been granted a lease of council land, 174ft by 103ft, for 75 years at an annual rent of £100, subject to their spending £7,000 on the building (Mackie 1901 21 June 1881, 16 November 1882). Both this hall and the former Post Offices now form part of the premises of Anglia Television. In 1980 the company built a hyphen between the two buildings on Bank Plain and added an office block south of the old Agricultural Hall (Ayers 1985, 10–17).

Holmes' Foundry and Showroom

After the realignment of Common Pump Street described above Messrs. Holmes (ironfounders) had put up the large showroom with the iron and glass front which, as has already been noted, survives (Site 26404N). Its frontage overlay the projected course of the infilled south bailey ditch, possibly at its junction with the Castle Fee ditch (see Fig.6.25). The premises were used for the sale of horses, cattle, sheep and pigs and consisted of two large exhibition rooms. The first measured 54ft by 25ft. Its facade and roof were built solely of glass and iron and there was a 'transept' containing a clock and a wind dial over the street entrance. A smaller room behind measured 42ft by 9ft. There was also a weighbridge bringing in £130 a year, a house with seven bedrooms and two cellars, a stable and a gig-house.[93] The Market Committee had bought this at auction early in 1863. The fronts of the buildings were set back to widen the road and the property was then let, the council retaining the weighbridge.[94]

A fire at Holmes' foundry (at the rear of the showroom) in 1873 did £10,000 worth of damage, but the company continued to operate on the site. In 1899 they commissioned a design for a new boiler house adjacent to St Peter Parmentergate churchyard but by 1908 they were succeeded by Messrs. Panks.[95] The glass fronted structure was damaged by bombing in 1942 and subsequently by falling trees from the Cattle Market. Since 1993, it has operated as a toy shop.

A similar building took the place of the former *Cattle Market Inn* between 1883 and 1896. The upper floors were occupied by Boston's, the furnishers of Orford Street and the ground floor by the agricultural implement manufacturer, Ransomes, Sims and Jefferies of Ipswich (Colman 1990, 39).

Second World War Air Raid Shelters

by Margot Tillyard

(Plates 11.10 and 11.11)

The open area of the castle bailey was an obvious choice for the site of public air raid shelters which had to be provided after the Munich crisis of 1938. In a letter to the press in February 1939 a proposal, reinforced by a plan, was put forward for four concentric tunnels under the mound, providing 3,000ft of shelter space 25ft wide, with all amenities including a tea-room. The entrances would have been on Castle Meadow, and it was estimated that there would have been room for 6,500 people or in peace time 170 cars. The plan was considered but discounted mainly on the grounds of cost due to the difficulty of supporting 10ft high tunnels in soft sand.

Surface shelters in the Cattle Market were decided upon, as long as they did not interfere with the trees and were placed if possible in the pen area, rather than in the streets. Trench shelters had already been dug in three of the City Parks and on 29 June the City Engineer proposed them for the Cattle Market producing a plan for the Committee on 3 July and drawings for the full council next day (Plate 11.10). Approval was finally given on 22 August. Immediate invitations to tender for the work result in the first contract being executed on 30 August.[96]

In the ditch there were to be five surface shelters, in Castle Meadow two, and one each in the Horsemarket and Farmers' Avenue. There was to be one trench in the Castle Meadow car park (*i.e.* opposite Bell Hotel) and four in the Cattle Market, which were to face Bell Avenue West and Market Avenue East. Together these were expected to hold five thousand people.[97] Plate 11.11 shows the shelters under construction.

Progress on the work was swift. By 16 October, from a total of 1181 yards of trench on the plan, 440 yards had been lined and 618 had concrete floors. A week later lined trenches totalled 924 yards and those with concrete floors 724 yards. By the end of the month the car park trench and those alongside Bell Avenue were practically complete and on 6 November the Engineer could report that the car park surface had been reinstated and it could be reopened as soon as fencing was in place.[98]

As noted above, the Baedeker raids of April 1942 damaged or destroyed areas of Norwich to the south and west of the castle, including many of the buildings along Timberhill and Ber Street and in the Rampant Horse Street and Orford Hill area (Banger 2003, 48–49, 63). Timberhill itself was hit by two 250kg bombs, damaging the *Gardener's Arms* (at former Property b). The Church of St Michael at Thorn was gutted by fire on 27 June 1942 (Banger 2003, 105). Around the Cattle Market, the

Shirehall (former Property 37) was damaged at the end of April and the *Jolly Farmer's Inn* (former Properties 49/50) was burnt out on 25 May 1942 (Banger 2003, 106–107). The Castle Mound and the buildings upon it were undamaged.

Endings and Beginnings
by Margot Tillyard
Executions took place at gallows erected on the castle bridge, though they provoked increasing criticism, particularly in 1854 when 'the lowest and most degraded classes … assembled on the Hill' to watch the criminal's final struggles. They lasted for five minutes despite the 'new drop' which had been employed since 1805. 'Disgraceful scenes of drunkenness and immorality were exhibited'. The last execution performed in public was in 1867 (Mackie 1901, 23 March 1854, 8 August 1867).

When the new gaol on Mousehold Heath came into use in 1887 it was suggested that the Castle Mound and its surroundings should be acquired by the City Corporation for the recreation of the people, and they eventually changed hands for £4,000. Mr John Gurney contributed £5,000 towards the conversion of the buildings into a museum, which opened in 1894.

The following year the County Justices leased to the city the ditch and bank north of the old boundary stone (possibly one of the post-1345 Castle Fee boundary markers; see Chapter 8) opposite Angel Street (later Arcade Street) to 12ft short of the entrance to the Police Stables. An entrance gate and double staircase up the inner bank was then built. The County Police Headquarters was pulled down in 1924 when Castle Meadow was widened and four years later all the remaining slopes of the ditch became city property.[99]

Increasing numbers of cars after the Second World War made movement of animals impossible and the last market was held in mid summer 1960. For thirty years, except at fair times, the site was used as a car park (Plates 1.2 and 1.3).

A writer of 1897[100] deplored 'the recent suggestion that the Cattle Market should be removed to Trowse and the time honoured Fair set in some other obscure corner, and the Hill made into a glorious Plaza … Neither County nor City would be likely to subscribe to any such scheme'. The recent 'Castle Mall' development has involved an amount of earth moving which makes even the vast medieval ditch-digging and Victorian 'lowering' seem puny. By it, Norwich has gained a huge commercial centre, with over a thousand cars hidden below ground and a 'glorious Plaza' of a seven acre park which overlooks not only the Castle Keep but the whole city.

II. ARCHAEOLOGICAL SEQUENCE

Period 7.1: Early Modern (1800–1862)

Summary
(Figs 11.8–11.9)
A Cattle Market reorganisation in 1809 saw animals allocated to designated areas, while after 1818 the Castle Meadow was used regularly for Tombland Fair. Various

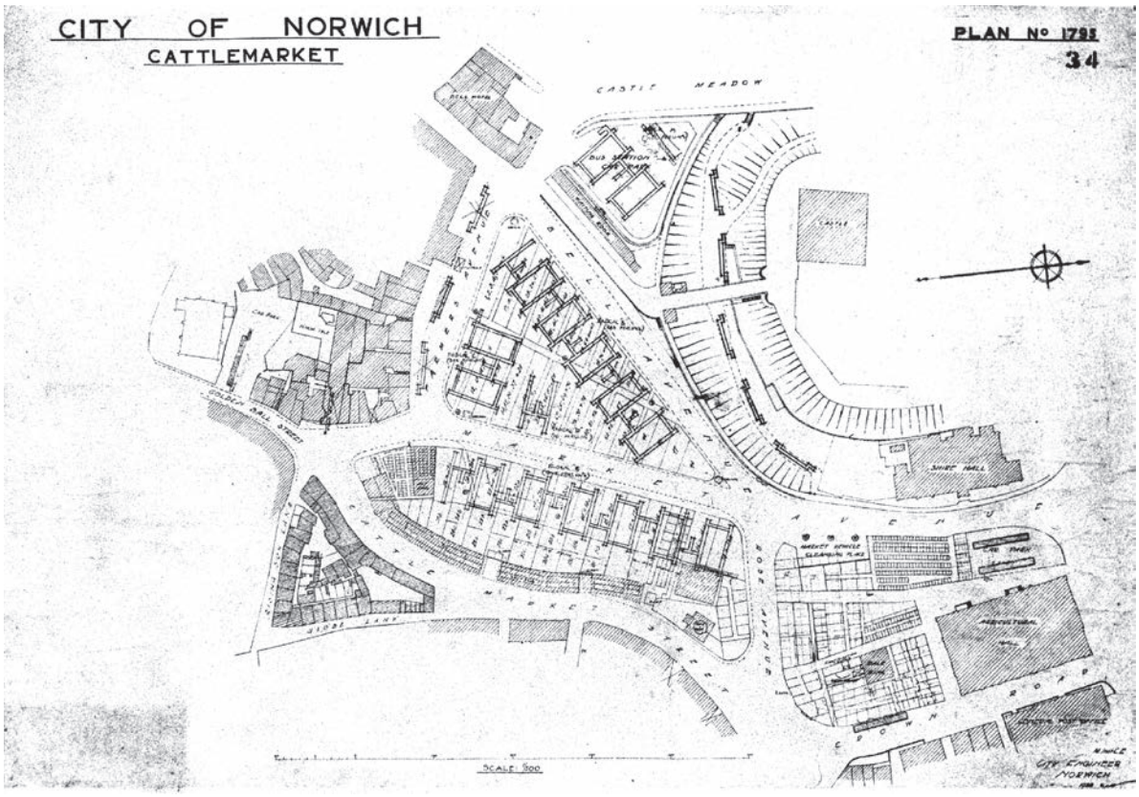


Plate 11.10 City of Norwich Cattle Market plan for the placement of air raid shelters in 1939 (archive plan 1795; N/EN 4/241/24)


A


B


C

Plate 11.11 Construction of air raid shelters, 1939 (photographs by G.A.F. Plunkett; courtesy of Jonathan Plunkett):
A – Work in progress at Cattle Market. Looking from Farmer's Avenue towards the apex of Bell Avenue and Market Avenue
B – Excavation of trenches, looking south-east towards Farmer's Avenue
C – Trenches excavated for air raid shelters, looking north-east from Market Avenue

improvements of the market continued to be made into the Victorian period (including alterations to the Castle Mound and the insertion of new cellared buildings) but the market remained cramped and badly laid out, with poor access. In 1861, the Market Committee therefore drew up extensive plans for a redevelopment and improvement of the area which entailed the demolition of the eastern tenements and the repositioning of roads. The final vestiges of the barbican ditch in the eastern part of the site were levelled with thick dumps of rubble and other materials used to raise the ground level in this area.

The Castle Mound and Bridge
by Elizabeth Shepherd Popescu and Andy Shelley
Many building, demolition and renovation episodes occurred upon the Castle Mound during the modern period, both within and outside the Keep. Surfaces and dumps observed during watching briefs at Castle Mall (T47 and 51/1) were of 18th-century (Period 6.3) and modern (Period 7.1 and 7.2) date.

The dwarf wall that ringed the southern part of the mound was observed in several watching briefs (T36/36, T24 and T25). The structure was probably associated with 19th-century efforts to improve the appearance of the front of the mound. It still exists today, having been renovated in the summer of 1995. A panoramic view from the castle mound in 1809 (see Chapter 11.I) shows further railings on either side of the base of the Castle Mound bridge. The related wall was observed in a series of watching briefs (T1, T9, T46 and T98). In one observation (T9) it had been superseded by the 1862 footpath which ringed the southern edge of the ditch. West of the castle bridge on the southern edge of the motte ditch, the wall (*12000*, T1/27) was constructed of irregular, rough hewn flint pieces (< 150mm) bonded with creamy yellow mortar (60% sand) with shell inclusions. A length of 0.50m was exposed, with a width of about 0.83m, at a level of around 25.00m OD.

Evidence for repair to the castle bridge was recorded, probably relating to the documented 19th-century works (T52, Fig.6.8). A brick and limestone renovation (*12709*) appears to have been earlier than a buttress of probable Victorian date (*12710*) immediately to its east, the two elements not having been tied into each other.

Block I: St Michael at Thorn (formerly St Martin-in-Balliva)
by Elizabeth Shepherd Popescu and Niall Donald
(Fig.11.8)

Properties 38–43
Earlier buildings in this area continued to develop, the remnants prior to their demolition being detailed in Period 6.2, Chapter 10 (Fig.10.17). The recorded elements largely consisted of cellars and walls which had been incorporated into later buildings, although some of the structures may date to the 19th century. The mapped properties prior to demolition in 1862 are indicated in Fig.11.8 and some of the excavated walls and cellars relate to the many buildings — including public houses and breweries — that stood in the area.

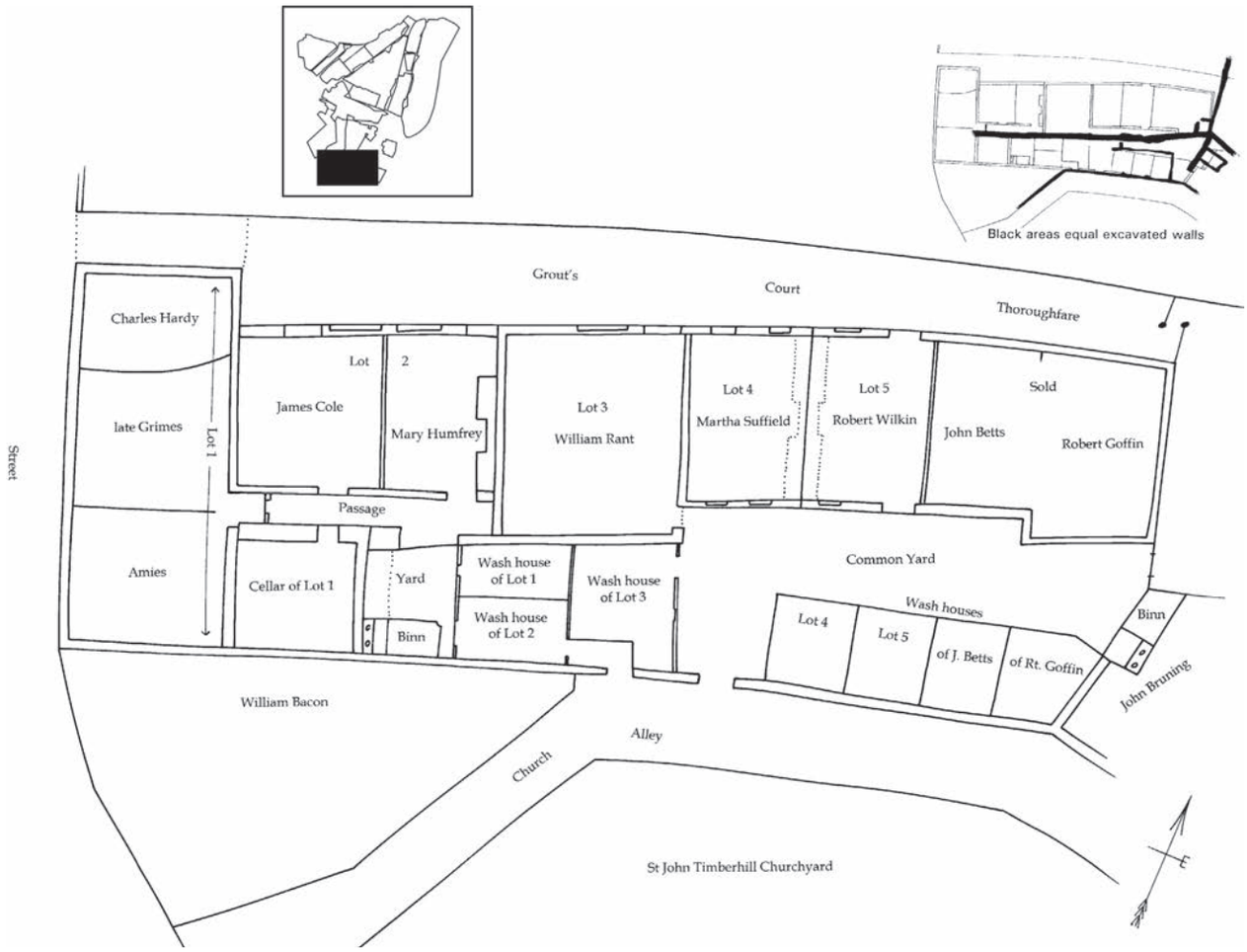


Figure 11.9 Grout's Thoroughfare in 1844, with overlay of archaeological evidence for walls recorded on Fig, 10.20 (after N/TC 479, T218C). Not to scale

Structure 60 (Property 44): cellar

A cellar recorded at the southern end of Area 9 had been adapted to serve a distinct function (G9/74). Finds from its initial makeup/floor suggest that it was built in the 19th century and comparison with map evidence indicates that this cellar may have been associated with *The Stonemason's Arms* which was present by 1836. The cellar was of flint and brick construction and was aligned north-east to south-west, measuring 12.5m by 5.5m. It had been heavily damaged by the construction of air raid shelters after its demolition, the latter occurring in 1862. Only the extreme south-western edge of the building was recorded in detail, although other parts of it were recorded during excavation of Trial Hole 3.

The original structure appears to have been built by sinking a brick and flint wall into the ground around the construction cut that formed the cellared area. This wall was *c*.0.32–0.36m wide and was bonded with creamy white sandy mortar. The brick floor, bonded with mortar overlain with a layer of chalk, lay a metre below the machined level. A secondary phase consisted of a repair or strengthening to the north-west corner where the build consisted of flint and brick bonded with white mortar, so hard that a brick sample could not be taken. Subsequent internal alterations took the form of an interior skim of brickwork bonded with creamy white sandy mortar, with two internal walls running longitudinally along the building. The northernmost wall was rendered on the inside face. This effectively created two alcoves, with a wider central section. Built into the new face of the south-eastern wall was a flue structure.

The floor of the central partitioned area was made from randomly coursed brick bonded with mortar and retained by a small wall of regularly coursed brick. Set slightly to the south of the centre point of the south-western wall was a semi-circular hearth (0.45 by 0.22m), filled with burnt clay and chalk. This was linked to the retaining wall by a disturbance in the floor — probably another flue — which together with that in the wall provided a complete system for the circulation of air through and then out of the hearth. It is evident that the central partition was raised above the general floor level of the building. Excavation in the north and south alcoves did not reach the floor level.

To the south-east of the cellar were two large rubble filled pits (G9/86), possibly the remnants of other cellars destroyed in the 1860s.

Finds

The (18th/)19th-century pottery recovered from the cellar (0.592kg) includes 66 sherds of China (some transfer printed) and 3 pieces of

Plate 11.12 Plough harness recovered from a cellar near Farmer's Avenue in Area 1. The four complete and one incomplete set of harness hames are unfortunately photographed upside-down (see Fig.11.10) with no scale (Period 7.1)

stoneware. Amongst the few other finds was a flat discoidal copper alloy button (SF580) of post-medieval type and a bone-handled toothbrush (SF575). Similar examples of the latter are known from late 17th-, 18th- and 19th-century deposits in Exeter (Allan 1984, 351).

Structure 61 (Property 45): cellar(s)
Multiple cellars recorded swiftly in Area 22 (G22/157) related to another building demolished in the 1860s, probably the old *Golden Ball Inn* (Figs 11.8).

Block II: St John the Baptist, Timberhill
(Fig.11.8)

Retained Walls (Properties 49 and 50)
Earlier garden/terrace walls (G8/22 and G1/39) constructed to retain elements of the south bailey rampart, survived into the modern period when they became incorporated within later buildings. The wall in Area 8 lay at the rear of the *Cattle Market Inn* by the 1880s, while that in Area 1 became the rear wall of the *Jolly Farmer's Inn*.

Structure 62 (Property c/d): cellar
On the Timberhill frontage were the remnants of a brick-built cellar (G1/160) of possible 19th-century date. Comparison with the 1880s Ordnance Survey map suggests that it lay beneath the *Star and Crown Inn*, which may suggest an earlier construction date.

Tenements along the northern side of the Timberhill Cemetery (Grout's Court; Properties e–g)
The south-western tenements in the Timberhill block were sold in *c.*1844 (or later) and the auction plan survives This shows the area between Grout's Court Thoroughfare to the north and Church Alley to the south. Tenement buildings along the western (*i.e.* Timberhill) and northern (*i.e.* Grout's Thoroughfare) sides, with a series of washhouses and a cellar to the south. The plans suggest that earlier tenement properties, which have been traced in earlier chapters from the medieval to post-medieval periods, had been sub-divided with buildings now lying in former yard and garden areas. An overlay of the 1844 plan with the excavated walls (Fig.11.9) shows broad similarities of alignment and position, suggests both the retention/reuse of earlier walls and foundations (assigned to Periods 5 and 6) and the construction of new minor walls. There was no archaeological evidence for the known early route of Grout's Thoroughfare. A Common Yard is shown in the north-eastern part of the plan, with an entrance onto Church Alley to the south and towards Grout's Court Thoroughfare to the east. These buildings were photographed, prior to their demolition in 1934 (Plate 11.9).

Finds
Four complete and another partial set of hames from plough harness were recovered from a cellar near Farmer's Avenue in Area 1, having presumably been abandoned there. The photograph (Plate 11.12) shows the items upside down and unfortunately without a scale. The surviving pieces are hames[101] and their fittings, which were used in pairs: these steel branches fitted closely into grooves in the roughly oval leather collar, one on either side (Fig.11.10; McBane 1992, 174–176). Similar hooked hame tugs are illustrated in Hartley-Edwards (1981, 182). This sort of harness would have been used for implements such as ploughs or harrows.

Deposits beneath alley
A dump of ashy loam including cobbles and other possible surfaces was recorded to the south of Area 13 (G1/122). This may in part have acted as makeup/surfacing for the alley which was known as Church Alley until the 1930s when, with the demolition of the earlier route in the 1930s, it became the new Grout's Thoroughfare.

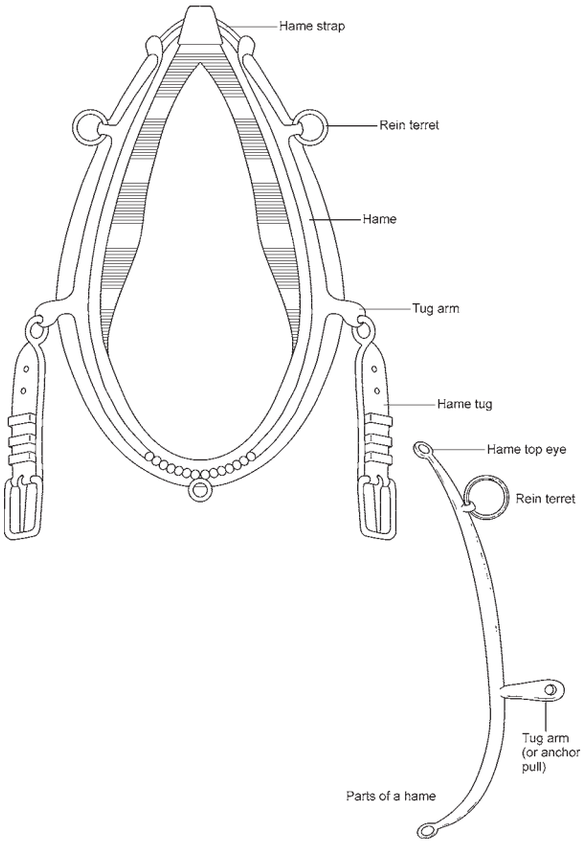


Figure 11.10 Plough harness (after Hartley-Edwards 1981, 182)

The Cattle Market

by Elizabeth Shepherd Popescu, Andy Shelley and Niall Donald

The evidence for the first formalised Cattle Market of 1738 has been detailed in the previous chapter. Large areas of the Market were not recorded as part of the Castle Mall project, a fact which partially resulted from the excavation of large machine holes (such as those through the barbican ditch in Areas 4 and 9) without surface recording beforehand. In other areas numerous post-holes were recorded. Those which most obviously related to animal pens, some of which retained the remnants of cast iron posts, appear in Fig.11.9.

The pre-1862 Market

Although no archaeological evidence specifically for the Cattle Market in the period 1800–1862 was recorded, much evidence having been removed in the ground reduction scheme of the 1860s, the map of 1836 indicates the position of animal pens. Documentary evidence outlined in Chapter 11.I demonstrates that in the early 19th century there was evidently still sufficient open area for dumping to have continued within and around the market. Again, no direct archaeological evidence for this was recorded and any such layers were probably removed during landscaping.

The land between the *Castle Hotel* and the Castle Mound ditch does not appear to have been subjected to extensive landscaping in 1738 (see Chapter 10), although landscaping (probably in the early 19th century) eventually led to the removal of almost all of the archaeological deposits in this area. Area 3 for example was at the time of excavation at least 2m lower than adjacent Area 5. It appears that the north-westernmost corner of Area 3 (G3/15) may never have been part of the open market. By the 1880s the western half of the area housed a covered horse market, owned by Messrs Spelman. The eastern half contained an open horse market (see also Period 7.2). In the decade after 1850 the Market Committee removed a building opposite *Castle Inn*, presumably to ease access to the market. By 1883 the land had been reduced in level and two large buildings (Spelmans?) were sited there.

The 1862 Market

Many of the features from the 1862 market survived until 1990, including a cattle trough at the eastern end of Bell Avenue and the cast iron railings lining the market, some of which have been replaced on top of the new development. The planting of trees within the market after 1862 is discussed in Period 7.2.

Demolition and landscaping

Documentary evidence for the reuse of spoil from landscaping and demolition rubble from the destruction of earlier buildings in the 1860s is amply demonstrated by the archaeological evidence, as is the raising of the ground level in the eastern part of the site. Demolition of the buildings fronting the western side of Common Pump Street (the remnants of some of which appear in Fig.10.17) commenced at the beginning of 1862. The sequence of demolition and subsequent landscaping was recorded archaeologically in Area 9 (G9/44) and to a lesser extent elsewhere. Initial fills of the barbican ditch comprised demolition rubble, much of which was also used to backfill the post-medieval cellars described in Period 6.2 (Fig.8.9, *91313, 91290 etc*). The infilled cellars were then overlaid by further dumps of building material above which was material which, from its composition, appears to have been the ground surface removed from in front of the Castle gatehouses. The buildings were covered with up to 1.75m of landfill, consisting of loam with abundant brick and tile fragments, alongside frequent chalk and mortar fragments (*e.g. 91564*, Fig.8.9).

The final infilling of the eastern stretch of the barbican ditch recorded in Area 9 appears to have occurred between 1789 and 1862, although most is probably attributable to the end of this range. The material dumped effectively raised the ground level to the east of the ditch and added as much as a metre of deposits above the ditch itself. Infilling fell into two distinctly different categories of material (G9/44). The first type is of demolition material and rubble derived from the destruction of tenements in the immediate vicinity in 1862 (see above). Much of this material was used to backfill cellars, although some was spread out over the barbican ditch to raise and consolidate the local ground surface (visible in the upper parts of the sections illustrated in Fig.8.9). The second element of the fills consisted of imported gravely soils, generally lighter in colour than those relating to earlier refuse deposition, detailed in the previous chapter. Many tons of such material appear to have been dumped. Tipping recorded in sections demonstrates deposition from west to east (*e.g. 91412*, Fig.8.9)., indicating levelling of areas of the Castle Mall site during this process (probably including

any remnants of ramparts). A total of over 2.5m of material was dumped, with earlier tenement buildings to the east (see above) being covered by up to 1.75m of soil.

Finds
Of the 0.758kg of pottery recovered from the levelling deposits above the barbican ditch, only 3 sherds (9g) of China were contemporary, the remainder being residual from earlier centuries. Other finds include iron nails, an iron buckle, clay pipe, slag and glass bottle fragments, many of which are also likely to be residual. The only item of note was an incomplete, long cross silver penny of 1272–1470 (SF6173).

Reduction of the barbican gatehouse
Despite being largely submerged by the landfill that made up the quarry in preparation for the 1738 Cattle Market (detailed in Chapter 10), the barbican gatehouse masonry at the foot of the castle bridge was continually exposed as the area was levelled during the 19th century to facilitate improvements to the Cattle Market and the eventual insertion of Bell Avenue (see Chapter 10 and Chapter 11.III). The plotted observations (*cf.* Hotblack's plan of 1909; Fig.6.3), when tallied with the location of surviving blocks recorded at Castle Mall indicate that substantial amounts of masonry had already been broken up and removed. Other masses were simply lowered and then left. The large block of masonry recorded by the NAU beneath Bell Avenue had been reduced in height, with a pipe trench and Cattle Market stanchions carefully cut through it (Plate 6.12).

Footpaths
The footpath from Rose Lane to the Castle Bridge, created in 1862 and removed in 1990, largely followed the contours of the motte and barbican. There was, however, some landscaping and landfilling of the area to create a steady incline (T20/9).

Period 7.2: Modern (1862–1987)

Summary
(Fig.11.12)
After the alterations of 1862, the Cattle Market continued to see alterations, as did the fringing buildings, hostelries and yards. Resurfacing of the market was a regular occurrence during the second half of the 19th century. In 1932 the area previously used for horse sales became a bus station and in 1939 a complex of air raid shelters was hurriedly constructed across the northern part of the excavated area as the war in Europe gathered pace. By 1960 access to the market had again become a problem and it moved out of the city, the area being given over to car parking. A perceived need for more retail space in Norwich led to the construction of the new shopping centre in 1989–91.

Road Improvements
(Plate 11.6)
Most of the other Victorian and later roads encountered during the excavations were formed from granite setts above hoggin. In a watching brief along Timberhill (T65), a number of small holes along the road immediately to the west of the abandoned building just to the north of the *Murderer's/Gardener's Arms* revealed timber setts lying immediately beneath the modern tarmac. These had been laid end on, with the end grain uppermost. Examples survived elsewhere on the site well into the 20th century (see Chapter 11.III). Part of the tramway which ran to the west of the castle (from Orford Hill along Castle Meadow) was encountered in a watching brief to the west of the site (T35).

The Post-1862 Cattle Market
by Elizabeth Shepherd Popescu and Andy Shelley
(Fig.11.9; Plates 11.6 and 11.13)
Documentary evidence indicates that ground consolidation within the market was a continual problem, along with the provision of non-slippery surfaces. The gravelled and cobbled surfaces already noted in the area above the barbican well (Period 6.2) were associated with attempts to consolidate its constantly shrinking fills. The area was finally infilled with rubble and gravel dumps in the late 19th to early 20th century (*50057 and 50054,* G5/57).

An extensive programme of late 19th-century tree plantation was undertaken which resulted in a dense line of trees alongside each of the new roads (see 1885 OS map). Over the years leading up to 1989 the trees were progressively felled, the last of them being removed as a prelude to the development. The exception was a rare Huntingdon elm which was moved from Bell Avenue to Castle Gardens in 1990 (T7, T13 and T14, Plate 11.13).

The documentary evidence for surfacing of the Cattle Market between 1862 and 1872 suggests that improvements were continual and the original post-holes cut for the new Cattle Market pens were probably re-cut several times. Many of the posts recorded in Areas 3, 5 and 47 (G3/9, 5/4 and 47/2) shared an identical alignment and measurements as the modern cattle pens shown on the 1880s OS map and indeed the city engineer's plan (plan 1795; Plate 11.9) produced in 1938. The projected lines were 6m apart with gangways of 1.50m width. The recorded posts may relate either to the 20th-century Cattle Market or its Victorian forerunner.

A sewer of probable late Victorian date ran across the site as a culvert. It was of brick construction and deeply set into the ground, being lower than the base of the development where it was seen in the north-east corner of the site. It apparently ran across the site from the *Bell Hotel* corner and had obviously been tunnelled, rather than constructed using the 'cut and shut' method.

Prior to the 1880s (OS map; Plate 11.6) a collection of small buildings was erected along the western side of Castle Approach, post-dating some of the features of the late 19th-century Cattle Market and probably related in some way to the horse market to the immediate west. These buildings were in turn replaced by waiting rooms and shops for a bus station, which were certainly in place by 1939 (Plate 11.10) and survived until 1989 when they were demolished. The footing (G2/43) for what must have been a fairly lightweight structure along the northern edge of Farmers Avenue was encountered, although it does not appear on OS maps. A number of features recorded in Area 5 (G5/55) probably related to the fence around the bus station car park.

Finds
Few of the modern finds are of note, although an iron axle guard from a cart (SF6077; Fig.10.74) was found within post-hole *90744* (G9/85). Included within the dumps above the barbican well was a fairly large quantity (almost 1kg) of late 19th- to early 20th-century pottery such as English Stoneware inkpots, marmalade jars and storage jars. Glazed Red Earthenware includes a profile of a warming pan. Other finds were a piece of cylindrical pharmaceutical glass phial (SF6041) and a residual copper alloy belt mount (SF5636, Fig.7.24).

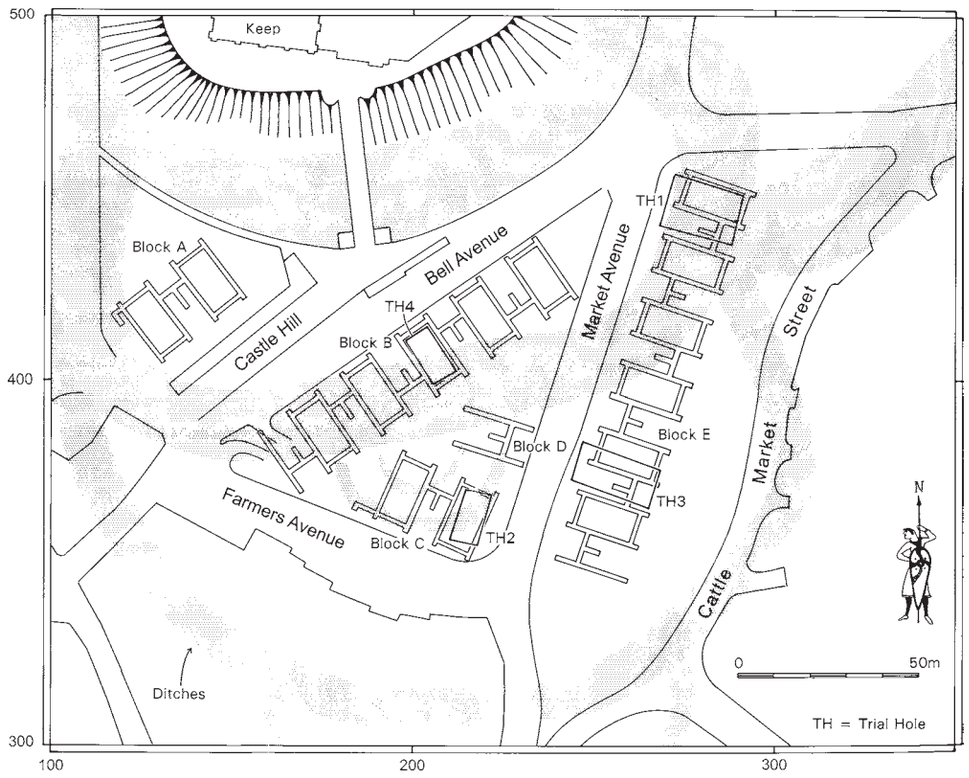


Figure 11.11 Period 7.2: Plan of air raid shelters. Scale 1:200

The Castle Gardens
Modern garden material was encountered within the Castle mound ditch (T24/29), now a municipal park. The foundations for a modern wall and concrete floor were also located which may have been connected with the air raid shelters.

The Air Raid Shelters
(Fig.11.11)
The concrete shelters located across the northern part of the Castle Mall site were planned and recorded in appropriate sections but were not investigated further. The position of each of the four Trial Holes (see Part I, Chapter 1) was dictated by the position of chambers within the shelters (see Fig.11.11). Plan evidence indicates discrepancies between the envisaged location and the actual excavation of the structures, which may result from planning errors either in the 1930s or during the archaeological excavation. During construction of the shelters, observations of castle-related features were noted (and are discussed at appropriate points throughout this report).

Modern Buildings and Services
(Plate 1.2)
Other modern structures, buildings, roads, paths, service trenches, stanchion bases, *etc.* encountered are detailed in the project archive. A number of small buildings ranged along either side of Castle Hill (immediately adjacent to Bell Avenue) were demolished to make way for the new development and included a sweet shop, a pet shop and the offices of the Eastern Counties Omnibus. The Timberhill block was cleared of more substantial buildings (including public houses), warehouses and a tyre depot (Plate 1.2).

III. DISCUSSION

Introduction

In 1805, Norwich Castle Keep lost the royal status it had enjoyed since the time of the Conquest, while in 1999 the south bailey — owned by the city authorities since 1345 — was sold into private hands. The early 19th century saw the symbolic use of the castle ditches for musters and arrays, when it provided the setting for celebratory gun firing, bonfires and fireworks. Until the mid 19th century, the area surrounding the castle retained many of its old timber-framed and flint buildings, most of which were lost before the end of the century. Others disappeared during 20th-century slum clearance and bombing raids. The great Norman Keep or donjon, one of the architectural masterpieces of its age, retains its dominant position over the modern city. It has suffered many ignominies since the loss of its royal status, not least the Victorian gutting of its internal layout and its temporary disguise in 1994 as a giant birthday cake for the 100th anniversary of the founding of Norwich Castle Museum.

The Modern Castle

(Fig.11.12; Plates 14.1–14.2)

The Keep: Norwich Prison and Prisoners

Significant repairs and alterations were made to the Castle Keep throughout this period. The increasing numbers of prisoners meant that Soane's enlargements of the 1790s were soon outgrown and the whole of the relatively new structure was pulled down for rebuilding in the 1820s. With these alterations, most of the top of the Castle Mound was occupied by the prison, although space was left for a public promenade around its edge. The prison cemetery, discussed in the previous chapter, developed. Nineteenth-century burials lay to the north of the 17th- and 18th-century groups, the known burials spanning the range 1836–1886. Some of the gravestones can still be seen built into the existing wall. All of those buried on top of the mound were murderer's or others, such as suicides, whom their original parishes would not accept for burial (Nick Arber, pers. comm.). The death masks of many are currently on public view within Norwich Castle Museum. The Keep's *c.*800 year life as a prison ended in 1887. Many of its interior features were removed during its conversion in 1889.

The Bridge, the Mound and Remnants of Other Defences

(Plate 11.1)

In the early part of the period, the sides of the Castle Mound remained in use as allotments, which were subsequently developed into gardens as they remain today. Some of the previous features such as railings were retained in the new development. Observations relating to the addition of early 19th-century railings and eventually the prison's granite wall of 1826 were recorded in the 1990s (Site 429N, Shelley 1995; Penn 1999a), supplementing the evidence for modern dumping episodes recorded at Castle Mall. Dwarf walls inserted to the south of the mound (visible in the 1809 prospect; Plate 11.1) were also noted during the excavations (Period 7.1).

The Norman bridge was altered in *c.*1825 and the surviving stone lodges added in 1811 by Francis Stone (Sites 874 and 26001N). Each lodge is single storey with a square ground plan and blind semi-arched windows. The door on the bridge facade has double order semi-circular arches. Each lodge has a crenellated parapet with corner lamp turrets. The cast iron railings were added in 1825 by Dixon and Sons of Norwich, between square stone posts. Excavations on top of the bridge relating to these alterations are noted in Part I, Chapter 2 and included the exposure of the keystone which read 'May 19 1830'. The repeated archaeological observations during the 1990s relate to persistent problems with water leakage. Additional works at Castle Mall exposed 19th-century refacing and buttressing (Period 7.1).

Several references are made in documentary sources to the close proximity of an earth bank no more than 5ft from the rear of the *Castle Inn* and other properties immediately to the west of the Castle Mound (Woodward 1847, 41). In 1820, the bank had posts and chains placed on it 'to prevent accidents'. The 'bank' may refer to remnants of the barbican ditch rampart, although the eastern walls of buildings in this area appear never to have been located more than a few metres above the western edge of the barbican ditch (the rampart probably lying on its eastern side). Between 1822 and 1824 expenditure on road improvements and wall-building in the area suggests that it was then that the area was landscaped. This may only have involved the final removal of the rampart and widening of the street that was to become Castle Meadow; the remainder of the area may not have been lowered until the late 19th century.

Comparison between a map of the Cattle Market in 1836 and another in 1859 indicates that the area to the east of what is now Market Avenue was in use as part of the Cattle Market, the area above the barbican ditch having previously been used as backyards and a dumping ground for properties fronting Common Pump Street in earlier times. This area, however, probably still exhibited the last remnants of the barbican ditch which was only completely capped in the 1860s. The detailed map of the area between the market and the street made in 1861 (Plate 11.5) shows it almost completely infilled with numerous buildings and yards, including a large number of public houses, immediately prior to their demolition. A dotted line indicates a route running around the market between the western side of these buildings and the pig pens that lay on the eastern side of Market Avenue.

The freehold of the Castle Mall site (enclosing the castle's former south bailey and barbican) was auctioned by the City Council in *c.*1999 to raise funds. It was purchased by Friends Provident, ending over 650 years of city ownership. On entering the park by Castle Hill from reinstated Farmers Avenue, a sign now notifies the visitor that the land is private property.

The Shirehall

In its long history the Shirehall had moved from its original position in the south bailey (Chapter 7.I), up onto the Castle Mound in 1568 (Chapter 8.I) where it was adapted and extended until the late 18th century (Chapter 10.I), and down off the mound again to its foot in 1823 (Chapter 11.I). The Shirehall, in extended form, continued to house the County Court until 1988 when the Magistrate's Court moved to new buildings at St Martin-at-Palace Plain. The early 19th-century building at the castle now houses the Norfolk Regimental Museum.

The Modern City

Street Pattern, Paths, Alleys and Yards

(Fig.11.1; Plates 1.1–1.6, 11.6 and 11.9)

The early 19th century saw the closure of many of the narrow lanes and passages that led into the castle ditches and by the end of the 19th century, new tree-lined avenues had been created. The road-widening schemes were triggered by the increasing number of horse-drawn vehicles, with later alterations resulting from improved routes for trams, buses and the ever increasing number of cars.

Many of the roads constructed across the former south bailey and barbican area in 1862 were simply reinstatements of earlier routes, some of which were widened and straightened. Modern Cattle Market Street is a widening and southwards relocation of Common Pump Street. The original position envisaged in the plans for alterations to the road in the 1860s, which would have seen the new route beginning further north (at the northern end of Golden Ball Street), was not enacted. Instead the

Figure 11.12 The site today, showing the car park (Castle Green) laid out on the roof of the underground Castle Mall shopping centre (broadly encompassing the former south bailey) and the new lift shaft in front of the Castle Keep. The premises of Anglia Television lie above the north-east bailey (the former Castle Meadow). The Church of St John, Timberhill stands to the south of part of the above ground shopping centre, while in the right foreground are the premises of John Lewis (formerly Bonds).

modern road lies further south as a result of the decision to demolish the Golden Ball block (former Castle Fee Properties 44–46). Rose Avenue was a Victorian rationalisation further south of Holkham Lane, that was to move towards the north again in 1990. As has been noted, both Bell Avenue and the southern part of Market Avenue reflected the course of late 18th-century carriageways (see Chapter 10.I). Major new routes were established across former Castle Meadow, completely altering the local street pattern in the area.

Numerous observations of the castle gatehouse were made throughout the 18th and 19th centuries during road improvement schemes and are summarised in the following chapter. The evidence indicates that much more of the castle gatehouse survived, probably extending across the whole width of Bell Avenue. In addition, in 1909 the probable remains of the castle's south gate at the northern end of Golden Ball Street (in its old form) were exposed during the construction of a gas main, and recorded by J.Hotblack (see Fig.6.3).

As in the previous period, the local roads were chained to keep animals in on market days. In addition to metalling and tarmacadam, road surfacing recorded archaeologically included both granite and timber setts (Period 7.2). The latter survived along Bell Avenue until the 1950s–60s (Nick Arber, pers. comm.). Similar setts were recorded along Timberhill, both at Castle Mall and during the construction of a water pipeline (Site 26401, Shelley 1993). The oak setts, which had been laid in Flemish bond, where probably inserted in the latter part of the 19th century to dampen the noise of horse-drawn vehicles. The base of the tramway noted in Chapter 11.I was recorded to the west of the castle at Castle Mall (Period 7.2).

Grout's Thoroughfare, which is first documented as a right of way in 1406 (see Chapter 8.I and Plate 11.9) was lost during slum clearance in 1934 (see below). Its name migrated southwards to former Church Alley and it survives in its new position, immediately to the north of the church of St John the Baptist, Timberhill.

The Cattle Market

(Figs 11.6–11.8; Plates 11.3–11.4, 11.6 and 11.14)

It is fortunate that original plans for the 'lowering of the hill' in the 1860s (and indeed the tunnelling into the mound to provide air raid shelters), outlined in Chapter 11.I were not realised; the proposed depth of excavation was reduced by a third to keep down costs. The level of Pump Street was raised in areas by nearly 5ft (1.5m), a fact reflected in the very similar measurement of material found above demolished buildings in the eastern part of the Castle Mall site (former Properties 38–43, Chapter 7.1). As noted above, the original plan for a straighter line for the revised route was not adopted (Figs 11.6–11.7), although the line of the road did alter and was widened considerably. These plans were altered by the decision to demolish the Golden Ball block (former Castle Fee Properties 44–46; see below).

Archaeological evidence for the Cattle Market (both before and after the alterations of 1862) consisted of remnants of the animal pens, patches of surfaces, footpaths and evidence for the position of some of the trees known to have lined the avenues. The latter included a rare Huntingdon Elm which was moved during the excavation (Period 7.2; Plate 11.13).

The 1860s cutting in of Bell Avenue to reduce the local slope of the upper part of the market (*i.e*. the northern part of the excavation site; Areas 45–47, Fig.13.1) entailed a huge movement of soil (up to 2m is estimated in parts of the excavation; see Part I, Appendix 8). A pocket of Norman ground surfaces and features survived adjacent to the north-west of the new route (in Areas 5 and 49), fortuitously including the barbican well which was effectively preserved beneath Castle Hill. Early archaeology known to have been destroyed in this area includes a Middle Saxon cemetery, only a single burial from which survived *in situ* (see Cemetery 2, Chapter 4). Late Saxon and Norman pit groups and post-hole buildings also miraculously survived, the latter only due to the presence of undulations in the early landscape. Deeper features, such as ditches, also survived. The spoil used to raise and level the ground in the eastern part of the site included the 'old foundations of buildings once belonging to the castle', implying further disturbance of the remnants of the barbican gate and possibly other structures. It appears that much more of this structure was removed at this time, probably lying across whole width of road (see Chapters 6 and 12). The differing levels in the northern part of the site resulting from the insertion of Bell Avenue can be noted in a painting of 1871 (Plate 11.3). Dumps recorded in the eastern part of the Anglia Television site in 1979 had been used to reinstate the pre-Conquest slope, the

Plate 11.13 Removal of the Huntingdon Elm from Bell Avenue in 1990. It was one of the last surviving Victorian Cattle Market trees (watching briefs T7, T13 & T14, Period 7.2)

area being surfaced with granite setts for the 19th-century Cattle Market (Ayers 1985, 22).

The eventual dismantling of the market in 1960 was recorded on film (*Dismantling the Old Cattle Market, c.1960*, East Anglia Film Archive). One of the last remnants of the market was finally removed in December 1994 when the Shirehall café, which stood opposite the Shirehall on Market Avenue, was demolished. Encased in modern plyboard, glass and felt was a late 19th-century horse-drawn wagon which had originally been used as a 'temperance wagon' (Plate 11.14). With its modern extension removed, the wagon was seen to have retained its wheels, leaf springs and engraved internal mirrors (it was removed to the Rural Life Museum at Gressenhall but unfortunately collapsed subsequently). The wagon had served teas and snacks to users of the market, being pushed alongside the old Agricultural Hall when the fairs came. Once the market moved it became fossilised in its last resting place.

Plate 11.14 Removal of the late 19th-century temperance wagon from Shirehall Plain (formerly the Castle Meadow), showing Wilkins' (Jnr) early 19th-century Shirehall in the background. Looking west

Tenements and Public Houses
(Figs 11.4, 11.8 and 11.9; Plates 11.1, 11.6 and 11.7)

Buildings and cellars
The development of many of the hostelries surrounding the 19th-century Cattle Market has been detailed in Chapter 11.I, with earlier evidence presented in previous chapters. Although many public houses were swept away by the alterations in the 1860s (including those at Properties 38–46; Period 7.1), several survived into the 20th century and were only lost with the Castle Mall Development. Timber-framed *Le Rouen* (the *Plough*) at what was once Castle Fee Property 48 (Plate 11.7) is a lonely reminder of the former character of much of the area.

The 1809 panorama provides an accurate view of the buildings surrounding the baileys at this date (Plate 11.1). An atmospheric view of Buff Coat Lane (Beaumont's Hill) produced in 1857, looking towards St Peter Parmentergate church, indicates the very steep slope that existed in this area (Fig.11.5). In a similar view of Golden Ball Lane produced in 1855, both the original *Golden Ball Inn* and the *Plough* can be seen, the latter fronted by huge piles of hay beside the adjacent weighing machine (Fig.11.4).

The Castle Mall excavations exposed the fragmentary remains of several of the lost public houses, in the form of walls and cellars. The cellar complex hurriedly recorded at the southern end of Area 22 (Structure 61) probably related to the original *Golden Ball* public house, before its removal further south in the 1860s. An adjacent ?19th-century cellar of complex construction containing a system of flues and associated hearth (in Area 9; Structure 60) lay immediately in front of the *Stonemason's Arms* and again an association is probable. Another cellar recorded along Timberhill (Structure 62) probably relates to the *Star and Crown*, one of several hostelries along the street that remained popular with prostitutes and their clients (Riddington Young 1975, 25–26). Earlier wall lines detailed in previous chapters became fossilised within later buildings, including at Properties 49–50 a 16th-century garden wall in Area 8 which later lay at the rear of the *Cattle Market Inn* and an adjacent wall of probable later construction in Area 1 appears to have become part of the rear wall of the *Jolly Farmer's Inn.*

Like many areas of central Norwich, the Timberhill block became increasingly overcrowded, as shown by an 1844 plan (Fig.11.9). Correlations between this plan and the remains of walls recorded at Castle Mall appear in Chapter 11.II (Period 7.1) and indicate that many of the boundaries were based on medieval burgage plots in turn reflecting pre-Conquest boundaries. Areas of the block appear to have remained open, however, including space for a horse market. Grout's Thoroughfare, before its clearance, was overshadowed by buildings, some of which extended above it at its western end (Plates 11.6 and 11.9). Slum clearance of the area in the 1930s changed its character, the south-eastern part becoming a car park by 1939 (Plate 11.10).

Wells, water supply and drainage
Mains water was first piped to the prison in the early 19th century (from Golden Ball Lane), while mains sewerage was provided within the city from *c*.1870. Provision of water to the Cattle Market was both by pumps, wells and troughs, an animal trough being placed opposite post-1860s position of the *Golden Ball Inn*. The pump which gave Pump Street its name stood opposite the *Holkham Arms*. A large drinking fountain stood opposite the weighing machine until the 1860s. The surviving wells were covered with stone slabs in 1870.

Refuse disposal
The City Committee decreed in 1816 that bricklayers were no longer allowed to lay colder on the Castle Ditches without first obtaining permission. Such permission would presumably indicate a practice which continues to this day, in which builders will be asked for or will offer farmers rubble for tracks or farmyards. Even a small unmetalled track requires large amounts of colder to keep it passable as a result of continual erosion by vehicles, horses, rain, wind and frost action. The need to maintain a usable surface on the sloping ground of the Norwich Cattle Market, as well as the routes surrounding it, evidently required continual patching and consolidation. The wet, rutted and generally squalid nature of these routes is indicated in the sketches of the 1850s shown in

Figs 11.4 and 11.5 and the documentary record for the period attests to the continual presence of muck resulting from the livestock.

As in medieval times, the dumping of rubbish actually onto the roads surrounding the castle remained a continual irritant in the early 19th century. Fig.11.5 indicates that this rubbish included objects as large as tree trunks, although such timbers may well have been placed in muddy areas to facilitate the passage of carts and pedestrians.

People

This period sees a continuation of some of the themes discussed in earlier chapters, reflecting the contradictions in human nature. Felons and punishment remain evident, while carousing in the local hostelries contrasts with restraint represented by the temperance wagon noted above. Details of many individuals living and working in the area can be found in local directories, including the numerous publicans of the local hostelries (some of which have been detailed here). Amongst the very few modern artefacts summarily reported in this chapter is a personal item: a bone-handled toothbrush of late 17th- to 19th-century type, probably from an occupant of the *Stonemason's Arms* (Period 7.1). A medallion of Queen Victoria was found intrusively in an earlier feature.

With the 20th century comes the period of living memory: many locals still recall animals being driven to the market along both Ber Street and Magdalen Street. Following medieval traditions, a fair was still held in the area at Easter and Christmas until 1989, when the Castle Mall development began. As these volumes have demonstrated, such events had a history of many centuries on the site. The modern fair spent a few seasons at the new Cattle Market in Harford before relocating to alternative venues at Castle Meadow and Chapelfield Gardens.

Occupations

(Fig.11.8; Plate 11.12)

The predominant activity evident at the site during this period was clearly the sale of livestock. Related trades include the retail of agricultural machinery, implements, harness (see below) and hay. Activities on the site would have provided an ongoing demand for local refreshment, be it locally brewed beer or a cup of tea. The presence of so many thirsty farmers and traders in the area led to increasing demand for public houses, with associated breweries and off-licenses (see Fig.11.8). Despite its commercial aspect, only just over a dozen coins of the period George III to Victoria were found on the site.

The five sets of plough harness discovered in a cellar in Area 1 (Plate 11.12; see Chapter 11.II, Period 7.1) attest to the production and sale of such goods in the vicinity. Second-hand harness was for sale adjacent to Castle Hill by 1865 (Tillyard, Chapter 11.I), while harness makers were still operating in the area during the 19th century. The use of horse-drawn ploughs in Norfolk occurred well into the 20th century.

Other trades surviving within and immediately around the former castle precinct included builders, an iron foundry, blacksmiths and stables. Transport is a recurring theme, developing from horse-drawn vehicles (represented by stables/farriers in early part of period), through to trams, buses and finally cars.

The legal trade continued to be represented in the evidence for both the 19th-century prison and the County Court, which remained active on the site until the late 1980s. Public enjoyment relates to a range of activities from the gruesome viewing of public executions to the spectacular celebrations of the end of war (see Chapter 11.I). From the 1880s, the site has had a public entertainment and education aspect, with the conversion of the Keep to a museum and, within the last decade, the building of a cinema complex at Golden Ball Street.

Local Environment

Changes in the local environment between 1800 and 1987 were dramatic. In the early part of the period, conditions within the Cattle Market made it a focus for disease, including outbreaks of rinderpest. The muck extended into the surrounding area. Increasingly overcrowded conditions are evident in the local housing, with slums surviving until the 1930s. Grout's Thoroughfare appears to have survived in similar form from the 1880s until 50 years later. The castle area remained semi-industrial in character, with the concomitant noise and smells from the nearby presence of ironworking, breweries and livestock. It was considerably sanitised after the war.

Parishes, Churches and Cemeteries

Alterations to the boundaries of the cemetery of St John Timberhill continued to be planned in the late 19th century (conducted in the 1930s), with a road widening scheme of the period. The church survives, albeit rather incongruous in its modern setting. The parish of All Saints (Westlegate) was united with St John Timberhill in 1930.

The construction of Rouen Road in the 1960s saw the exposure of burials relating to the lost church of St Martin at Bale (-in-Balliva; Site 113/569N), the site of which now lies beneath the Eastern Counties Newspaper building. The church of St Michael at Thorn, which had subsumed St Martin at its demolition in the mid 16th century, was gutted by enemy action in the Second World War and demolished post-war.

Conflict and War

This period takes the Norwich story through internal disputes, such as rioting against the Corn Bill of 1815, to major external conflicts including the Napoleonic war, the South African campaigns of the late 19th century (represented by the memorial which now stands within the former north-east bailey/Castle Meadow; Site 26003) to the Second World War, represented archaeologically by the air raid shelters recorded at the Castle Mall site. As noted above, the Baedeker raids of April 1942 left much of the south-western part of Norwich's historic core in ruins, including buildings along Timberhill (see Chapter 11.I).

The Castle Mall Shopping Centre

(Plates 1.4, 1.5, 11.12 and 14.1–14.2)

The years of planning that preceded the Castle Mall development are fully detailed in Part I, Chapter 1. The new scheme was designed to integrate the development into the surrounding conservation area, without prejudicing the skyline. By way of addressing this issue, a much-needed public park — Castle Green — was provided above the underground shopping centre *inter alia* restoring much

of the open space of the castle's south bailey which has been a feature of the area since Norman times. Pedestrian access through the development now joins various parts of the city's retail centre. Included within the new development, forming the entrance arch to the underground car park, is one span of the iron Duke's Palace river bridge of 1822 (which was demolished in 1974).

Alterations have already been made to the new development. A cinema complex was inserted in 1998, improved access to the mound and refurbishment of the Keep took place in 1999–2001.

Conclusions

The archaeological sections of this volume (Chapters 8–11) have dealt with the period *c*.1345 to *c*.1999: the long period in which the castle's south bailey remained in city ownership. This chapter has outlined Norwich Castle's latest transformation from busy livestock market to modern shopping centre. The period *c*.1800 to 1987 saw the transition from squalid to sanitised conditions and the dramatic clearance of buildings from the site in the 1860s resonates with the Norman clearance of buildings eight centuries earlier. Changes in popular culture are reflected in the contrast between the 19th-century public viewing of executions and the 21st-century viewing of the latest offerings at the new cinema in Golden Ball Street. Public interest in the archaeological excavation led to the incredible success of its Visitor Centre and viewing galleries (see Chapter 1), while the new display within the Keep at Norwich Castle Museum is providing opportunities to appreciate some of the recent discoveries.

Endnotes

1. A small selection of these is discussed and/or reproduced in this chapter, many others being held in local collections such as those of the Art Department at Norwich Castle Museum and local newspapers.
2. Three notebooks of drawings by Francis Stone 1826 and '*Remarks and Orders of the County Justices re Works on or near the Hill 1822–27*' Castle Museum Archaeology Department; Hodgson drawings Book no. 41.98 pp 18, 34, 109, Castle Museum Art Department.
3. Cotman drawing no. NWHCM: 1951.235.431, Castle Museum Art Department (see Plate 6.8.B)
4. Photographs of Courts 1 and 2 appeared in the *Eastern Evening News* 5 July 1988
5. NRO Case 19 c) Tonnage Committee Minutes 1802–31, 9 October 1816
6. NRO Case 20 b) Quarter Sessions Minute Book 28, 16 January 1822
7. NRO Case 19 c) Tonnage Committee Minutes 1802–31, 24 July 1822. The building which was from 1823 the *Shirehall* public house was described in 1805 as 'the house late the Duke'. See City Committee Case 19 e), 20 September 1805
8. NRO Case 16 e) Norwich Corporation Map 57
9. NRO Case 19 c) city Committee III, 20 September 1805 and Case 16 e) Corporation Map 30.
10. NRO Case 16 e) Norwich Corporation Map 89
11. NRO Case 16 e) Norwich Corporation Map 30
12. NRO Case 19 c) Tonnage Committee Minutes 1831–5, October 1832
13. Evident, for instance, on a map of 1836 (N/En 20 184; see Fig.11.8).
14. NRO Case 19 c) Tonnage Committee Minutes 14 May 1834 and map N/En 184 of 1886 where it appears as 'railed path'
15. A photograph of these can be found at http://www.the-plunketts.freeserve.co.uk
16. N/EN 20/184, 1836
17. NRO Case 16 c) Assembly Book 1790–1805, 22 August 1803
18. NRO Case 19 e) City Committee 16 April 1777, 15 October 1790 and 18 February 1805
19. *bid* 6 September 1823
20. *ibid* 28 October 1823 Case 16 d) 12 Book of Assembly Proceedings 1800–1830, 7 December 1818, Case 22 (T77 C–D) Lease Book C, 285 d and Lease Book D, 74 d.
21. NRO Case 16 e) Corporation Map 13
22. NRO Case 19 e) City Committee
23. NRO Case 16 d) 12 Book of Assembly Proceedings 1800–1830, 3 and 18 May 1825 and 8 April 1827. Case 19 e) City Committee 15 July 1824, 6 October 1825 and 18 April 1827. Advertisement *Norfolk Chronicle* 15 October 1825
24. NRO Case 19 e) City Committee, 6 February 1834
25. NRO Case 16 c) Assembly Minute Book 12, 382
26. NRO Case 19 e) City Tonnage Committee Minutes III, 15 September 1816
27. NRO Case 19 c) Tonnage Committee Minutes, 1802–31, 8 March 1815
28. *ibid*, 6 March 1822
29. *ibid* 12 November 1823
30. NRO Case 19 b) Market Committee 1813–1820, 30 September 1820
31. In 1837 when tolls were auctioned, the Cattle Market brought in £480 and Tombland Fair £250 (Mackie 1901, 13 March 1837)
32. NRO Case 16 d) 12, Book of Assembly Proceedings 1800–1830, 236, 21 September 1809
33. *Norwich Mercury* 22 June 1861. Norwich Markets Act 1860
34. NRO Map N/EN 20/184
35. EEN 12 August 1977
36. N/TC 8/4, 28 October 1864. Photograph: collection Mr GAF Plunkett
37. Case 22d 12, 13
38. Norwich Corporation Markets Acts 1860 and 1862. Local Studies Library
39. N/TC8/3 13 February
40. *Norwich Mercury*, 22 June 1861
41. N/TC8/3, 25 June, 31 July, 5 December 1861
42. N/TC8/3 13 May, 31 May 1862
43. *Norwich Mercury*, 11 June 1862
. N/TC8/3, 12 June 1862
45. *ibid*, 31 July, 3 September 1862
46. *ibid*, 22 August, 9 September, 24 November 1862, 16 February 1863
47. *ibid*, 19 November 1862
48. *Norfolk Chronicle*, 3 December 1862: Paving Committee Advertisement
49. N/TC8/3, 12 June, 26 September, 19 November 1862, 23 January 1863
50. *ibid*, 24 November 1862
51. N/TC8/4, 10 August. Map: N/En20/186
52. N/TC8/3, 1 April 1863
53. Three stone lions are still to be seen at the top of the facade. N/TC8/4, 17 February 1864
54. *ibid*, 1 December 1863
55. *ibid*, 16 October 1863. On 25 March 1870 the old pumps on the Cattle Market were ordered to be removed and the wells to be covered with stone slabs
56. N/TC8/4, 8 August 1865. The space was 64 yards long
57. *ibid*, 11 June 1863
58. *ibid*, 13 December 1864
59. MC/191/1/M7
60. PR/DM T188A
61. N/TC8/4. 6 July 1863, 13 December 1864
62. *ibid*, 23 November 1871
63. N/TC8/3, 13 January, 14 February 1863
64. Photographs of the new building and the adjacent *Buff Coat Inn* are to be found at http://www.the-plunketts.freeserve.co.uk
65. N/TC8/4, 16 and 27 November, 11 December 1863
66. N/TC 620
67. N/TC 8/4, 23 December 1863
68. *ibid*, 26 February, 5 April 1864
69. *ibid*, 27 February 1865, N/TC8/5, 24 August 1866
70. *ibid*, 21 May 1868
71. *ibid*, 18 March 1869
72. N/TC8/5, 10 February, 10 December 1869, 18 April 1870
73. Local Studies Library, Tillett Scrapbook, vol 36, 137
74. N/TC 8/4, August 1864
75. N/EN20/20
76. before 1926 Colman 1990, 64 and photographs Local Studies Library

77. N/TC479/T218C. By 1688 there were already several tenements in this yard west of a well there and others further east.
78. N/EN18/1
79. NRO Case 22d 14, Cattle Market Improvements
80. *ibid*, 19 December 1861, 27 January 1862. Case 22d 14, lease: Crawshay and Youngs to TS Howes
81. N/EN 20/184, 1836
82. On the western side of the street, the timber-framed building at No.18 Golden Ball Street (lying on former Property h) is also shown at http://www.the-plunketts.freeserve.co.uk.
83. N/Tc568. Photograph 1963, Local Studies Library
84. For photographs of both, see http://www.the-plunketts.freeserve.co.uk
85. Local Studies Library, Tillett Scrapbook Vol 36, 168
86. A photograph of this building appears in Plunkett 1987, 93
87. Spelman 662
88. N/Tc8/3, 30 May 1862
89. N/EN8/28
90. Photograph taken before 1862, Local Studies Library
91. BR 122/182
92. PS1/13/2/24. Photographs: collection Mr GAF Plunkett
93. *Norwich Mercury*, 1 January 1862. *Norfolk News*, 14 February 1863. Photograph: Local Studies Library
94. N/TC8/3, 27 April 1863
95. BR 35/2/59 B
96. N/EN1/56
97. N/EN3/1. N/EN 4/244
98. N/EN1/47, research by Jayne Bown
99. C/Scf 1/313, N/TC 414
100. Local Studies Library, Tillett Scrapbook, vol 36, 137
101. Thanks are extended to Lucy Talbot (Norfolk Archaeological Unit) and Frances Collinson (Rural Life Museum, Gressenhall, Norfolk) for their comments on the hames.

12. The Changing Castle

'Probably no subject in English history has been so fraught with polemic as the study of the Norman Conquest. In 1066 Saxon England suffered a defeat so complete as to demand exceptional explanation, and subsequent attempts to provide such an explanation have given us some of the best academic skirmishing in English historical writing. Throughout these arguments, which have gone on for more than a century, the castle has remained the symbol of Norman aggression.'

B.K. Davison, *The Origins of the Castle in England*, 1967, 202

'The character of the surroundings of the Castle has been so completely changed by the revolutions of centuries, the buildings surrounding the great central keep have so entirely disappeared, and the great keep itself has been so bereft of almost every vestige of interior interest by centuries of short-sighted, shallow utilitarianism — only to become useless, at last, for the object for which it was gradually destroyed — that there is but little scope for novelty in description, or fresh discovery.'

F.R. Beecheno, *Notes on Norwich Castle,* 1888, 1

I. INTRODUCTION

While in recent years several excavation reports have incorporated excellent in-depth discussions of the wider context of castle sites — for example those at Stafford (Darlington 2001), Hen Domen (Higham and Barker 2000), Ludgershall (Ellis 2000) and Pontefract (Roberts 2002) — the present publication appears to be one of the first to attempt such analysis in a truly urban context. The current chapter seeks to provide a chronological overview of the evidence for the morphology of the defences of Norwich Castle, broadening out the study to consider the fortification in its wider East Anglian, Anglo-Norman and Norman contexts.[1] Arguments developed here build on those presented in previous chapters, to which the reader is referred for supporting data and in-depth discussion. As will be immediately evident, the use of the castle as a kingly residence, centre of Norman administration and fortification are aspects of what has been a much larger study spanning the Anglo-Saxon period to the present day. The following text deliberately focuses on the Norman period to the mid 13th century, making only brief reference to earlier and later activities which are detailed in other parts of the report.

The two main objectives relating to the investigation of Norwich Castle outlined in the original Castle Mall Project Design (Ayers 1980, revised 1982; see Chapter 1) were the examination of the effect of the construction of the castle on the pre-existing settlement, with special reference to the position and nature of the Castle Fee boundary, and in more general terms the location and nature of the castle earthworks. As was the intention highlighted at the assessment stage (E. Shepherd 1994a and b; see Chapter 1), analysis of the excavated evidence alongside documentary and historical evidence has allowed comments to be made on the establishment, development, adaptation, decay and eventual levelling of the castle earthworks and other defences which were not previously possible. The analytical process has sought to question, clarify, support or reinterpret previous hypotheses about the development of this castle in particular and other castles in general. Of particular interest is the relationship of the Castle Fee with the city, the archaeological evidence being supplemented by the extensive documentary background presented in Parts I and II (Chapters 5–11) and as a stand-alone report by each medieval tenement within the Fee during the period *c.*1397 to *c.*1626 in Part IV.

Another key area for study has been the relationship of the castle to its hinterland. This has been addressed in the immediate locality of the castle in previous chapters, which consider archaeological and documentary evidence for the local impact of the castle and its developing relationship with the rest of Norwich from the Norman Conquest to the present day. The wider hinterland is considered in terms of Norwich and Norfolk's economic setting in Chapter 13, where comparisons with other castle and urban assemblages are also made. Aspects of the zooarchaeological material are considered more fully in Part III and by period in Section IV of Chapters 4–10. The present chapter examines Norwich Castle in the wider context of Norman castles, comparing and contrasting it with other examples in Norfolk, East Anglia and beyond.

Important aspects of Norwich Castle which lie outside the remit of the current study include obligations of castle-guard and other services (see Kirkpatrick 1845, 257–293) and consideration of the long list of sheriffs and constables.[2] Royal castles were kept by the sheriff or constable as a hereditary office, while baronial castles were held of the king in fee but renderable at will. Such hereditary posts ceased in the 12th century and the status of sheriffs and resident constables later diminished (Drage 1987, 127).

It may be useful at this point to summarise the general academic framework within which the analysis of Norwich Castle presented here developed (1991–2004), although it should be reiterated that the excavation itself (1987–1991) pre-dated the period of rigorous project design and the research objectives posed were therefore general rather than specific (see Chapters 1 and 14). Until recent decades, castle studies of the Anglo-Norman period

tended to focus on the early development of fortifications and their historical context: 'Perhaps what is most needed now is to move the debate on from the origins to the uses of castles in the Norman period' (Eales 2003, 46). It was noted that 'The outer baileys of castles remain the least studied aspect and potentially areas which may significantly alter the accepted views of a castle's use' (Drage 1987, 130).

A summary of previous research and contemporary questions relating specifically to urban castles was presented by Drage (1987, 130–132), where the importance of research and excavation focused on pre-Conquest settlement and the form of early defences was stressed. The considerable variety and complexity in castle form had long been recognised, with excavations at several sites having demonstrated the sophistication and scale of early fortifications. As well as the need for large-scale excavation, Drage stressed the requirement for integrated study, particularly the inter-relationship of castles and towns in the light of archaeological and documentary evidence. It was emphasised that castles of the Conquest and later periods should not be studied in isolation, but should be considered alongside the morphology of the whole settlement. This holistic approach was emphasised in the statement of intent issued by the Castle Studies Group (1987, 2), which stressed the importance of:

1. the study of castles in all their forms and by all possible means: documentary studies, architectural history, fieldwork and excavation;
2. the study of castles as resources for a more widely-based appreciation of medieval society, emphasising their social and political history, their defensive and domestic evolution, their role in settlement development and their value as a source for the reconstruction of landscapes and economic environments.

These objectives were reflected in the analytical process at Castle Mall and Golden Ball Street and have influenced the results presented throughout these volumes. Linked to this approach and forming a key element in the final stages of analysis of the Norwich Castle site has been the production of a series of reconstructions spanning the Late Saxon period to the 18th century, based upon all available evidence. These are presented in Chapters 4–11, superseding a model of the defences as they may have appeared in the early 13th century which was produced at an early stage of analysis (see Plate 6.35–6.36). It is considered that the dangers of academic criticism of such depictions are outweighed by the accessible presentation of new ideas that they permit (Drage 1987, 131): such images highlight gaps in knowledge and raise more questions. The Norwich Castle reconstructions have formed an essential part of analytical process allowing full consideration of topography, social context and the development of the surrounding landscape, in particular the development of local street pattern. Of considerable benefit has been the extensive local knowledge of the illustrator concerned. Such drawings inevitably offer only one interpretation when several alternatives may have been have been posed in the text: the possible location of a gate or gates within the Castle Meadow is a case in point. A number of previously published reconstructions of the defences of Norwich Castle are now outdated (*e.g.* Reeve 1992, 22; Ayers 1994a, plate 9; Margeson *et al* 1994, fig.81). In turn, the reconstructions presented here will inevitably give way to new interpretations if and when more evidence comes to light, either specific to Norwich Castle or to castle studies in general. What is immediately evident from all of the images is the vast scale of Norwich Castle.

Despite the considerable extent of the recent excavations only *c*.21% (*c*.2ha, 5 acres) of the total area of 9.3ha (23 acres) within Norwich Castle Fee was explored during the Castle Mall and Golden Ball Street projects. Anticipated major features of the southern elements of the castle that were not found during the recent work include the south gate (traces of which may remain beneath the modern road of Golden Ball Street), the original 13th-century Shirehouse within the south bailey (which vanished without trace at some unknown date) and the barbican rampart which was completely removed during landscaping of the 18th and 19th centuries. Relatively small areas of the Castle Meadow (or north-east bailey) had previously been investigated: an 18 x 5m trench in 1973 (Site 150N; Carter *et al* 1974; Atkin 2002a) and in 1979 a 20 x 17m trench with a narrow southwards extension (Site 416N; Ayers 1985). The latter work recorded a pre-Conquest timber church and cemetery, pit groups and narrow ditches, which hint at possible survivals elsewhere within the bailey, parts of which remain undeveloped. As well as this bailey, areas to the west and north of the Castle Mound remain substantially unexplored. Chapters 2–11 provide further consideration of previous observations, while a number of issues for future investigation are listed at the end of this chapter.

II. THE LOCAL CONTEXT

Site Selection

(Figs 4.138, 5.1, 5.55 and 12.1)

Norwich was selected as the site of a major royal castle between *c.*1067 and 1075 due to a combination of financial, political and geographical factors. By the time of the Conquest, it was the fourth largest town in England and undoubtedly there was also a symbolic aspect to the construction of its castle. Just how much planning went into the strategic positioning of William I's earliest castles has long been a subject of debate (reassessed by Creighton 2002, 50 and Eales 2003, 53–59), although the objective of securing major centres is clear. While castles were not placed at random, it is generally accepted that 'castle planning and the needs of national defence after 1066 were achieved by a coincidence of interests between king and aristocracy rather than detailed direction from above' (Eales 2003, 54). Urban castles were, however, 'the prominent exception to this rule: the rapidity and coherency of this castle-building programme points towards a unified programme of Norman repression' (Creighton 2002, 137).

Castles were the bases for the advance of the Norman Conquest and were also sited in vulnerable areas, of which East Anglia was one: 'the strategic importance and military vulnerability of East Anglia must have been apparent to the English government throughout the eleventh century' (Heslop 1994, 6). As Heslop notes, although prior to the draining of the fens, Norfolk and much of north Suffolk were effectively cut off from central England (see

Figure 12.1 Norfolk and Suffolk castles mentioned in the text. Not to scale

Fig.12.1), with access to the region by land only easily achieved from the south-west, they were prone to sea-borne attack. The Scandinavian incursion into the region in 1069, for example, was reputedly repelled by Norwich knights led by Ralph de Gael (Chibnall 1993, 16–18 and map 2). Norfolk and the fens were also centres of English and 'Norman' rebellion against William the Conqueror, as occurred in 1075 and 1088 (see Chapter 5.I).

The inherited topography in the vicinity of the castle has been discussed in Chapter 5.V, while its initial economic and social impact has been outlined in Chapter 5.I and the archaeological impact in Chapter 5.II. The devastation of properties, churches and cemeteries and shifts of focus within the city have been noted in earlier discussion, with an apparent localised decline to the east of the castle. Documentary evidence hints at the moribund state of the English Borough in the early 12th century. As has been noted, before 1100 nearly half of the area of Late Saxon settlement south of the River Wensum appears to have been lost to Norman redevelopment for the castle and cathedral, while the development of earlier farmland to the west to form the new Norman Borough must have altered local patterns of agrarian activity. At Dover, the English inhabitants were ordered to evacuate their houses (*Carmen de Hastingae Proelio*, 38; cited in English 1995, 50 and n.29), reflecting the evocative image of the destruction of Late Saxon property in the Bayeux tapestry. The documented destruction of ninety-eight 'houses' in Norwich associated with the construction of the castle is explored in Chapter 5, while similar destruction and concomitant population displacement in other towns is considered in Chapter 14. It has been noted that there appears to be no correlation between acreage of castle sites and the number of properties lost during construction, as documented in the Domesday survey (English 1995, 47). The loss of many of the Late Saxon

properties at castle sites may have occurred within a 20 year span of 1066–1086.

Many Norman castles were sited on interfluvial ridges scarped to form the base of the motte with a series of transverse earthworks used to define baileys (Creighton 2002, 37). The siting of Norwich Castle was influenced by the position of the Great Cockey stream, which had previously formed the western boundary of the main focus of Late Saxon settlement. This same natural boundary was reflected in those of the Castle Fee, the French Borough and the Jewry. The reconstruction of the timber phase of Norwich Castle (*c*.1067–70 to *c*.1094) offered in Fig.5.55 indicates the possibility of a gap — probably cleared of buildings and vegetation at the time of the Conquest — between the new borough and the castle, formed by the line of the stream valley. Such a gap might have made the defences on this side militarily weak, accounting for the additional ditchwork known to have existed in this area. The development of a route along the eastern bank of the stream, reflecting a pre-existing route, can be anticipated in terms of local access (see Chapters 4–6). At Bedford, it has been tentatively suggested that areas of the castle exposed to the pre-existing town may have been cleared of town buildings to protect the castle approaches, although the relevant areas may not have been densely occupied (Baker 1973, 17).

Chapter 5 has considered the possibility that Norman castle ditchwork cut off part of any pre-existing 'defences' and reused elements where appropriate (*cf.* Pevensey and Dover; see English 1995, 49–50). The case at Norwich remains equivocal: although a possibly embanked ditch interpreted as relating to the defences of the southern part of the Late Saxon town has recently been recorded to the south-east of the castle, no continuation of it was recorded in its anticipated position at Castle Mall. Archaeological evidence does, however, point to the limit of pre-Conquest settlement in the immediate vicinity (see Chapter 4).

Rather than simply cutting off the southern end of the ridge on which the castle stood, it appears that such earthworks were placed around the entire circuit to cut off the end of the promontory (Fig.5.1), a fact explained by the rather gentle northwards slope here (the ground does not drop away sharply until some distance further north, on the northern side of modern London Street). The physical constraints and natural slopes of the site selected have been discussed in Chapters 3–6, including the Great Cockey stream to the west and Superior Conesford (now King Street) to the east. The irregularities in the local contours to the south (particularly in the modern Rouen Road and Rose Lane areas) may have influenced the line of the defences of the eastern part of the south bailey which remain to be explored, lying outside the recent development. The Castle Meadow/north-east bailey was placed on ground which drops away eastwards. Evidence from the Castle Mall site indicates the utilisation of natural undulations within this bailey as the basis for defences (Chapter 5).

As was noted by antiquarians (see Chapter 5.V and 6.I) the siting of Norwich Castle in relation to existing roads led to a slightly tortuous approach route from the south. This route used pre-existing Ber Street, one of the arterial Anglo-Saxon roads, and its northwards continuation (now Golden Ball Street) running along the top of the ridge of high ground rather than 'new' Needham Street (now St Stephen's street; leading to the modern A11 to London) which formed the southern limit of French Borough, and ran across the southern end of the stream valley. Ber Street leads southwards out of the city, ultimately towards Ipswich (thence to London) and the sea (see Fig.12.1). Despite the presence of the French Borough, there does not appear to have been a major access point directly from the castle to the west, although a possible postern gate leading from the south bailey was recorded (Chapter 6).

Space must have remained to house a besieging army encamped close to the castle for an extended period in 1075, indicating that substantial open ground still existed locally. Possible extra-mural suburbs with later associated churches along King Street have now been identified from as early as the late 10th century (not post-Conquest as previously supposed; see Chapters 4–6), although the situation is less clear along Ber Street. A few churches here are Norman or possibly pre-Conquest in origin (see Chapter 6.I) and post-Conquest street names may indicate Scandinavian influences (see Chapter 4.I), although there has been relatively little archaeological exploration in the area as yet. Initial settlement along King Street may have been attracted by river-borne trade and associated activities.

Castle and City

(Figs 5.1, 5.55, 5.56, 6.1, 6.47, 6.48, 7.1, 7.36, 7.37, 8.1, 8.61, 8.62, 10.76, 10.77, 11.12 and 12.2)

Construction of the castle increased Norwich's status and it now became the Norman centre of royal power and administration for Norfolk and Suffolk, a role which continued in varying form until 1805 (Chapter 11). As at many major castles, Norwich would have fulfilled the combined roles of high status residence, military strongpoint, judicial centre and seat of local government, armoury, gaol and treasury (Creighton 2002, 1). It was noted in Chapter 5 that Norwich Castle's large defensive circuit would not only have housed the garrison, probably sizeable at the outset, but also provided a place of refuge for local burgesses, their goods and livestock. The castle baileys were occasionally used as a shelter by the city's Jews, who were the king's property and the sheriff's responsibility, and were largely housed in a 'Jewry' to the west of the castle (see Chapter 6.I). Such proximity of Jewry and castle is often paralleled (Pounds 1990, 215; Creighton 2002, 147). At its height, Norwich's Jewish population may have been around 200, dwindling to a fraction of this by 1290 (Rutledge in prep.). Although the area to the south of the new market, including the part between the French Borough and the castle is often referred to as the Norwich Jewry, the Jewish community was not obliged to live there, as is demonstrated by scattered holdings across the city (Rutledge in prep.). Immediately adjacent to the Jewry, for example, Meyr the Jew held City/Castle Fee Property (a/51) before 1285 (see Chapter 7.I). Occasions of Jewish refuge occurred at Norwich Castle in 1144 and 1189 (see Chapter 6.I), while similar use at other castles includes that at Lincoln (Hill 1948, 209).

While seizure of land for the construction of castles is known, particularly in urban contexts (see Chapter 5.V), and purchase is evident largely at rural castles (Liddiard 2000a, 25), granting is perhaps most likely to have been

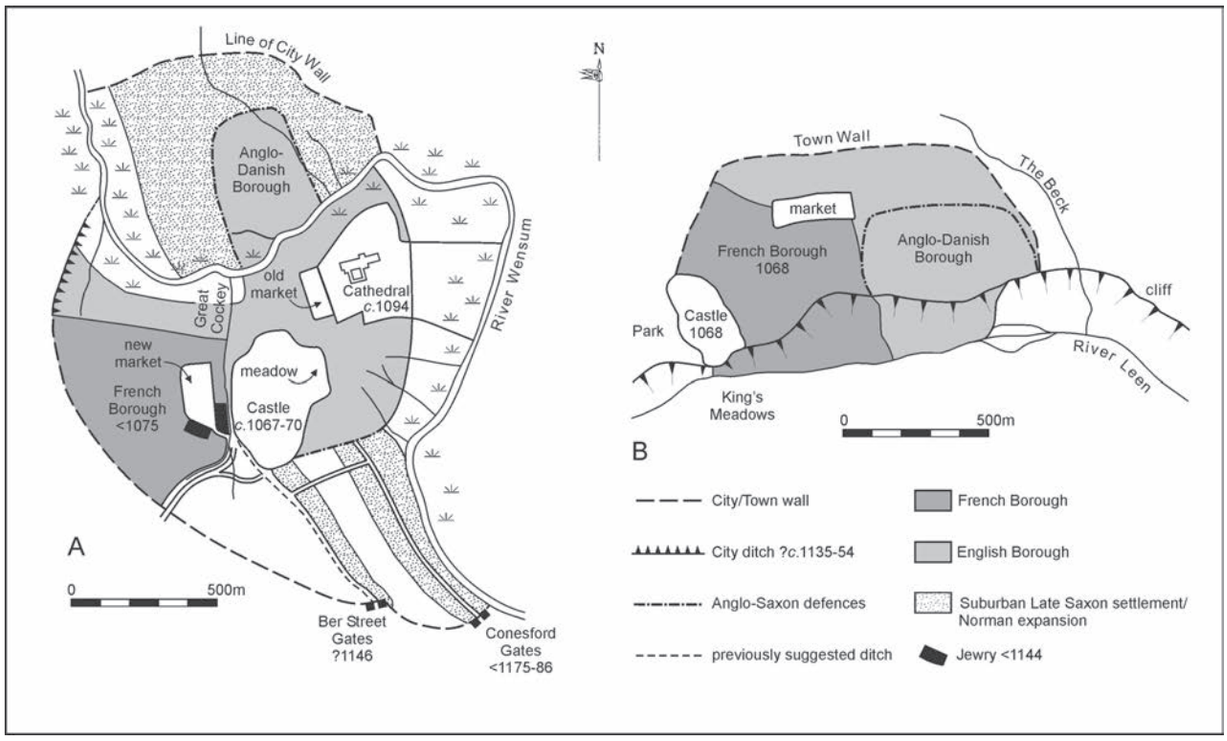


Figure 12.2 Comparison of layout of French and English Boroughs related to castle at market place at A: Norwich; B: Nottingham (after Drage 1983, fig.3) . Scale 1:25000

the case at Norwich. Here, however, it appears that the acquisition of the castle site may have had more to do with geography and topography than directly with previous land tenure. Land ownership in the Norwich Castle area before 1066 remains obscure. A return to the Domesday reference is merited: 'on that land of which Harold had the jurisdiction, there are 15 burgesses and 17 empty dwellings which are in the occupation of the castle. Also in the Borough there are 190 dwellings empty in this [area] which was in the King's and the Earl's jurisdiction and 81 in the occupation of the castle' (Brown 1984, 1.61, 116b). Amongst the dwellings affected by the imposition of the castle then, 17 were under the control of Harold prior to the Conquest, with the status of the further 81 being obscured by the Domesday phrasing: as was the case with the land to the west of the castle site, could this area also have been part of the demesne of the Earl before *c.*1067–70? Ralph de Guader/de Gael succeeded his father, Ralph the Staller, as Earl of Norfolk and Suffolk in 1069–70 (Liddiard 2000a, 27; Rutledge in prep.). Earl Ralph's Anglo-Breton family had been major Norfolk landowners before the Conquest, although as noted below his property was forfeit after his rebellion of 1075. While Ralph was not a Norman, granting land to the king for the new borough and perhaps even the castle itself would both have ensured royal support and increased the status of the relevant areas of Norwich. It is, however, perhaps dangerous to read too much into the Domesday reference and the situation must remain equivocal. (See Creighton 2002, 140, table 7.1, for Domesday wording in relation to destruction of properties at other castles.)

As has been outlined in Chapters 4 and 5 and briefly summarised above, Norwich Castle was originally set at the edge of the Anglo-Saxon settlement (Fig.12.2.A). Although in many medieval cities the development of encircling walls was often linked to a castle (Barley 1976; Drage 1987, 125), this was not the case at Norwich where urban development left the fortification at the centre point of the city. The Norwich case appears to stand alone as an example in which the castle forms the gravitational centre of the city's developing topography, the surrounding defences expanding from the early to late medieval periods in essentially concentric fashion. This particular aspect of its topography makes Norwich more like a Continental example (Oliver Creighton, pers. comm. 2003), although further study of this phenomenon lies outside the remit of the current project.

Like Norwich, Oxford and Stamford Castles are both now enclosed within settlements (English 1995, 46), while Coventry Castle was linked to the pre-existing defences rather than the later city walls (Barley 1976, 70 and fig.31). At Norwich, construction of gates across both Ber Street and King Street, possibly during the second half of the 12th century (see Chapter 6.I and Fig.12.2.A), begs the question of its associated defences and their relationship to the castle. The possible existence of pre-Conquest ditchwork along the eastern side of Ber Street has long been postulated (fully detailed in Chapter 4.I), in a theory which sought to explain the presence of an odd kink in southern part of the later city wall. Such ditchwork was not, however, located when sought during excavations at Ber Street gates (Jope 1952). Had such an earthwork existed in the 12th century, perhaps on the unexplored western side of the street thereby enclosing the gate, it could have linked directly to a ditch observed to the west of the castle, which served as the Fee boundary (see Chapter 5). The existence of such an earthwork running alongside Ber Street and forming a

12th-century boundary would imply an initially fragmented city boundary with a later shift westwards to link to the French Borough (Fig.12.2A; *cf.* Stephenson 1933, plate VI; excavations at the Chapelfield site, within the French Borough and adjacent to the city wall, are expected to elucidate the sequence of defences here. This interpretation effectively leaves a triangle of open ground to the south of the castle. Alternatively, and probably more likely, any defences associated with the early gates may have enclosed the new borough from the outset, linking to documented ditchwork of the late 12th century in the Westwick area. This was the case at Chester, where the full extent of the city's defences, enlarging those of the Roman period, had been reached by *c.*1190 and enclosed the castle (Thacker 2000, 27).

The presence of a castle added to the security of a town and engendered economic growth: 'This security is also implicit in the continued growth of the boroughs, the introduction of foreign communities of traders … and the formation of new boroughs, as at Nottingham, beside the established towns' (Drage 1987, 125). In late 11th-century Nottingham, the English Borough originated as a Late Saxon settlement around what was probably a high status 'manorial' centre beside the main church. A comparison with the placement of the French Borough at Norwich is given in Fig.12.2. Nottingham's French Borough was described as the new borough in 1086, fitting into the space between the old borough and the new castle of 1068 (Stephenson 1933, plate V; Drage 1983 119–120 and fig 3; Beckett *et al* 1997, 34–36). There were differences in customs and legal identities between the two boroughs at Nottingham, although the situation is less certain at Norwich (Rutledge in prep.). Co-operation between the two boroughs may be reflected in the construction of a new communal market place (Drage 1983, 120; see further discussion in Chapter 14). At Nottingham, the French and English Boroughs shared a market place which spanned the junction of the two areas (Fig.12.2B). At Norwich, however, the local topography made such placement impossible and led to the provision of an entirely new market which eventually eclipsed the old market at Tombland (Chapters 5.I and 6.I).

The social, topographical and economic associations between castles and markets is evident at many sites, supported by evidence in the Domesday survey (Creighton 2002, 163–167). At Norwich, the large new market was established to the west of the castle by 1096. It lay within the new French Borough probably itself established before 1075 on land which appears to have been utilised in part as fields before the Conquest although evidence from Domesday does indicate some pre-Conquest settlement here (Rutledge in prep.). This land may have formed part of the demesne of Earl Ralph, who must have granted it to the King after his assumption of the earldom in 1069–70 and before the loss of his property in 1075 (see Rutledge in prep. for a more detailed discussion and Chapter 5.I for general comments). The market itself lies on sloping ground, extending westwards from the west bank of the Great Cockey stream. Both royal patronage of the market and the security provided by its proximity to the castle were probably major factors in the immediate economic success of the new borough (Rutledge in prep.).

The lack of documentary and archaeological evidence for any major entrances at Norwich Castle facing towards the French Borough, the English Borough and the cathedral is puzzling, as has been noted in earlier text. Winchester Castle has its entrance similarly facing away from the town and the issue of the displacement of Norwich Castle in relation to the old town is explored further in Chapter 5.V. The question of why the latrine block within Norwich Castle donjon faces the French Borough has never been convincingly addressed and remains one of the many anomalies of the building. It has been suggested, albeit in a later medieval context, that the visibility of functional latrines is connected to ideas of the body politic, indicating the status of dietary components (Johnson 2002, 43), although this argument is not convincing at Norwich.

The impact of the presence of the castle on the surrounding street pattern from the Conquest to the present day has been charted in Chapters 5–11 and the immediate effect on the pre-existing town is discussed in Chapter 5.V 'Alterations to Street Pattern', where parallels at other sites can also be found. Effectively, some routes were lost, some were cut off and re-established on altered courses and new routes were founded. The later influence of the pattern of earthworks on the developing street pattern has long been recognised although, as has now been demonstrated, not always in the position previously anticipated.

The relationship of the castle and city from the 13th century to modern times has been explored in Chapters 7–11. Of particular note is the change of status of the castle baileys after their exchange to the city in 1345 (Chapter 8 and below). Other aspects include the decline engendered by the construction of the city walls (1297–1344), the increasing use of the castle earthworks and the barbican well as rubbish dumps and a source of raw materials, the relationship between the castle and the city's markets and the gradual process of encroachment into the formerly defended area.

Castle and Ecclesiastical Landscape

(Figs 4.138, 4.140, 5.1, 5.55, 5.56, 6.1, 6.47, 6.48, 7.1, 7.36 and 7.37)

A major opportunity for investigation at Castle Mall has been the relationship of the castle to both the pre- and post-Conquest ecclesiastical landscape. The Norwich Castle site provides evidence for antecedent churches and cemeteries lost at the Conquest (those at Farmer's Avenue (Cemetery 3) and beneath the north-east bailey (Ayers 1985)), another which appears to have survived the Conquest in reduced form (St John at the Castle Gate; later de Berstrete/Timberhill; Cemetery 4) and, possibly, an enclosed church (St Martin-in-Balliva). These may have been amongst the fifteen churches held by the town's burgesses in 1066 (Brown 1984, 1.61, 116b).[3] Full details of each of the churches and their cemeteries can be found in Chapter 4, while further comments on their status and local setting are given in Chapter 14, 'The Urban Church'. The following discussion confines itself directly to linkages between the ecclesiastical setting and the castle.

The close association of castles and parish churches has long been noted in rural contexts across the country (Creighton 2002, 110–132) and the destruction of urban churches during castle construction has been discussed

in Chapter 5.V. At Norwich the density of pre-existing churches meant that the extensive disruption of the incipient parochial system was inevitable at the establishment of the castle. At Pontefract, the displacement of a pre-Conquest church and cemetery by the construction of the Norman castle was seen as 'representing a massive assertion of seigneurial authority and a deliberate Norman intrusion into, and manipulation of, settlement and ecclesiastical topography' (Creighton 2002, 120). One Late Saxon church may have been reused by the Normans within the bailey as the castle chapel, while others were constructed in later centuries (Roberts 2002, 401–410 and fig.161). This may provide an analogue for the Norwich case, depending on the construction date of St Martin-in-Balliva and the stone church of St John at the Castle Gate. The wider issues of landscape manipulation certainly apply at Norwich, although the extent to which such manipulation of the ecclesiastical topography was deliberate is questionable given the evident density of churches in the vicinity. The issue of pre-Conquest land ownership in relation to church provision is also a major issue (see above).

Blomefield's suggestion of a period of possible ownership of St Martin-in-Balliva immediately after the Conquest by the family of Earl Ralph seems to offer a possible link both with earlier comments (above) about pre-Conquest land ownership and the castle, although his evidence remains obscure (Blomefield 1806, II, 121; see Chapter 5.V, 'Churches and Cemeteries'). Both St John's and St Martin-in-Balliva continued to have associations with the castle for centuries, particularly in relation to the burial of prisoners: St Martin-in-Balliva was effectively the castle's parish church throughout the medieval period, perhaps reflecting an arrangement dating back to Norman times. The name 'in-Balliva' and its variants has led to much speculation as to its meaning, either in relation to a castle bailey or the district of an official *cf.* bailiff (see Sandred and Lindström 1989, 22). The first documented reference to the church was made in the second half of the 13th century, although by this date the outer castle bailey in which it may have lain had already fallen into disuse perhaps implying an earlier origin for the church (see Chapters 4 and 7). During the latter part of the 12th and into the 13th century, St John's cemetery appears to have been used to hold inquests relating to Castle Fee tenants, presided over by the sheriff or constable and bailiffs (see Chapter 7.I).

Enclosed churches 'if they indeed coexisted with the castle in some form — would have occupied considerably less space in their eleventh- and twelfth-century forms' (Creighton 2002, 124) and indeed had St Martin's been a pre-Conquest foundation its cemetery would have been partially overlain by castle earthworks (see Chapter 5.V). While some enclosed churches may have served the lord's household and dependents only, others may have served the garrison (see Chapter 5.V). Depending on the position of St Martin-in-Balliva, the precise location of which remains unknown, the structure could have been utlised as a defensive feature: the use of such churches as strongpoints/gatehouses has been hypothesised (Creighton 2002, 124). Most enclosed churches, however, lay within the centre of the relevant castle bailey.

Conversion of pre-Conquest churches to castle chapels is known at Hereford, London and Dover (see Chapter 5.V). Norwich Castle donjon was also provided with private chapel, with another placed adjacent to the great tower. The presence of a possible third church/chapel in the bailey may indicate its differing status. If not a pre-Conquest survival, St Martin-in-Balliva could have originated as a private chapel associated with the castle, later assuming parochial status (parallels are given by Creighton 2002, 126–127 at Clitheroe, Lancs; Essendine, Rutland; St George's, Doncaster). Such chapels may originally not have had rites of burial. In some instances, enclosed churches may have been converted to secular use after the Conquest, as at Red Castle, Thetford (Andrews 1995, 139; this was also suggested for a church at Castle Rising (Brown 1978, 33–35) although this particular church has recently been redated to post-*c.*1100, Morley and Gurney 1997, 133). St Martin-in-Balliva clearly remained functional as a church until the mid 16th century (Chapter 8).

The physical proximity and similarities of architectural style between Norwich Castle (*c.*1094 to *c.*1121–22) and the Cathedral Church and the implications of such constructional pairings have been noted in Chapter 6.I. Exploration of the symbolic meaning of such unity in secular and ecclesiastical construction in the context of Norman Norwich and the wider Norman world has been explored by Heslop (1994). The overwhelming expression of power over both the secular and spiritual life of the city's populace represented in physical terms by the two great buildings remains astonishing.

Monastic foundations associated with castles are common (Thompson 1986), although their positioning within towns is often separate, as at Worksop, Nottinghamshire (Creighton 2002, 131). On a smaller scale at St Martin-in-Balliva, a small monastic house of unknown affiliation was eventually taken over by the Carmelites (see Chapter 7.I), although by this date the castle enclosure within which it may have lain had lost its defensive significance and no direct association with the castle is implied. After the Conquest, increasing tenure of churches by monastic institutions is evident both here and elsewhere: St John became affiliated with the Cathedral's Benedictine Priory and St Martin-in-Balliva with the Priory of Horsham St Faiths.

The history and economic status of the seven parishes that met at Norwich Castle has been discussed in earlier chapters which trace their development from the 13th century to the present day: the owners of properties within each parish are detailed in Part IV from the 14th to the early 17th century, with further details including archaeological evidence in Chapters 7–11. Parishes to the south of the castle are known to have remained relatively impoverished for some time. Some of the related churches were lost through processes ranging from fire and the dissolution to enemy action in the Second World War. These losses engendered revisions to the parish structure. Comments on the formation of parish boundaries can be found in Chapter 14.

III. THE EAST ANGLIAN CONTEXT

(Figs 12.1 and 12.3)

Norwich was William I's only castle in Norfolk and Suffolk: its isolation is clear in Fig.12.3, which indicates its setting against castles documented to have been founded immediately after the Conquest. As has been

Figure 12.3 Documented Anglo-Norman castles of the period 1066–1070 (after Higham & Barker 1992, fig.2.19) and Normandy castles mentioned in the text, showing the location of Norwich (foundation date undocumented). Not to scale

outlined in Chapter 5.I, the date at which Norwich Castle was established may have been as early as 1067 or 1068, probably being the earliest Norfolk castle: its defences were certainly well established when besieged in 1075. Despite its wealth and high population level, Norfolk contained only nineteen late 11th- and 12th-century castles of which the majority (eleven) were probably founded in the period *c.*1066 to *c.*1140s (Table 12.1: based on Liddiard's revision (2000a, 16) of King's list of twenty-three castles (1983)). This is the lowest density per square mile of any English county, the numbers for Suffolk and Lincolnshire also being relatively low (see Creighton 2002, 52, table 3.1). Two explanations for the low density of castle-building in Norfolk have been offered. The first theory suggests that it resulted from the military insignificance of East Anglia, in which Norfolk was 'never part of a credible invasion shore … it formed a strategic blind alley. …. This is not a situation condu-

Location	*Type*	*Details*	*Founder*	*Foundation date*	*Data Source*
Castle Acre	rural castle	house converted to donjon, bailey and barbican	de Warennes, Earls of Surrey	late 11th	Liddiard 2000a, 44
Castle Rising	rural castle and probable castle	stone donjon (modelled on Norwich) and earthworks	William d'Albini II	*c.*1140s	Morley and Gurney 1997, 2
Denton	rural castle	small motte and bailey	?d'Albini family	1088–1254 ?1136–54	Liddiard 2000a, 99
Horsford	rural castle	timber defences, small motte and bailey	?Walter of Caen (Lord of Eye, Suffolk)	?*c.*1060s	Liddiard 2000a, 85, 88
Middleton	rural castle	motte and small bailey	?Clare family	?late 11th	Liddiard 2000a, 83
Mileham	rural castle	square stone donjon, motte and two baileys	?William Fitz Aleyn	*c.*1110	Liddiard 2000a, 80
New Buckenham	rural castle	circular donjon, vast ringwork and outer bailey, planned village	William d'Albini II	*c.*1140s	Liddiard 2000a, 44
Norwich	urban royal castle	timber tower (*c.*1067–8–*c.*1094) replaced by square stone donjon (*c.*1094–1122), complex of defences including motte, two baileys and later barbican	William I	*c.*?1067–8 (<1075)	see Chapter 5.I, this volume
Old Buckenham	rural castle	moat survives	William d'Albini II	late 11th	Liddiard 2000a, 44
Thetford	urban castle	conical motte, reusing Iron Age defences	Earl of East Anglia (Ralph Guader or Roger Bigod)	?1060s (<1075)	Dallas 1993, 196
Thetford, Red Castle	urban castle	ringwork, small additional bailey		early 12th	Andrews 1995, 139
Weeting	rural fortified residence	motte and stone buildings	?Ralph de Plaiz or his son Ralph	1177–1185 or 1185–1208	Liddiard 2000a, 89
Wormegay	rural castle	small motte and bailey	?Reginald de Warrene	(1066–1200) ?1136–54	Liddiard 2000a, 75
Great Yarmouth	probable urban castle	stone donjon-like tower			
Hunworth	probable castle	ringwork (Castle Hill)	unknown	?12th	Liddiard 2000a, 96–97
King's Lynn	probable urban castle	motte and bailey			
Quidenham	probable rural castle	motte, no visible bailey	?d'Albini family	1088–1254 (?12th)	Liddiard 2000a, 102
Raveningham	probable rural castle	motte, no visible bailey	?Bigod family	12th	Liddiard 2000a, 103
Wymondham	probable rural castle	ringwork (Moot Hill)	?William d'Albini	?*c.*1088–*c.*1139	Liddiard 2000a, 89

Table 12.1 Norfolk Castles of the late 11th and 12th centuries (excluding Burgh Castle which was formerly in Suffolk)

cive to the building of castles' (King 1983, 305). The threat of sea-borne attack and local insurgeance noted above ('Site Selection'), however, argue against this. The second and more plausible explanation is that, despite the wealth of the population, the local pattern of land tenure meant that a relatively low number of magnates held the resources required for castle-building (Liddiard 2000a, 21; Liddiard 2000b). Liddiard's recent county study suggests that areas of dense population and concentrations of freeholders were expressly avoided in the siting of many of Norfolk's early rural castles (2000a, 23). Land ownership in the Norwich Castle area has been addressed in 'Castle and City' above.

As well as patterns of land ownership, the economic, geographical and topographical factors influencing the siting of Norfolk's castles are detailed by Liddiard (2000a, 20–26). The Norman castles indicated in Fig.12.1 lie along one line running from south-east to north-west (from Thetford to King's Lynn and Castle Rising), with two approximately parallel lines extending to the centre and east of the county and outliers to the south-east: the latter may have been short-lived 'fieldworks' (Liddiard 2000a, 25). Most of the castles lie to the west of the 'Central Watershed', an interfluve boundary crucial in the historic development of Norfolk (Fig.12.1). Norwich Castle lies towards the eastern end of the southern line of Norfolk castles — the end of routes from Cambridge, London and Suffolk — with the two castles at Thetford at the western end. This distribution not only reflects the Norman intent to control strategic locations including town defences, pre-existing strongholds, river crossings and roads, but — as discussed above — is also closely associated with economic and geograhical factors across the county. Norwich was both a strategic focus and a political objective as a major source of wealth and centre of administration.

The placement of Norfolk's other castles, constructed in a range of styles and including both motte and baileys

and ringworks, reflects lines of communication and centres of seigneurial power (see Table 12.1). Thetford, for example, controlled an important river crossing. Most of these castles were founded between the Conquest and the Anarchy, some having relatively short lives. Great Yarmouth and King's Lynn, both post-Conquest towns, housed castles. Architecturally, the most impressive examples of the rural castles are those at Castle Acre (Coad and Streeten 1982) and Castle Rising, the latter being modelled on Norwich (Brown 1978; Morley and Gurney 1997). New Buckenham, founded *c.*1150, is an early example of a circular donjon (Wilcox 1981, 15–17).

In order to provide a regional context, the castles founded in Suffolk also require brief consideration. During the century in which Norwich stood as the only royal castle in Norfolk and Suffolk, the Bigod family constructed three substantial castles at Bungay, Framlingham and Walton (Fig.12.1; Brown 1951, 128–129). The castle at Bungay provided shelter for the forces that were to attack Norwich and its castle in 1174 (see Chapter 6.I). Orford Castle, with its distinctive polygonal donjon, was constructed under the orders of Henry II between 1165 and 1173 specifically to control Hugh Bigod (Heslop 2003, 278; Eales 2003, 139). Its foundation 'must be seen in the context of the recent seizure of Norwich and Thetford from Earl Bigod, and also the failure to maintain the royal urban castle at Ipswich' (Drage 1987, 123): although Ipswich was a shire town, its castle was not developed but was retained as an administrative centre paired with Norwich (Barley 1976, 70). Henry also obtained the castles of Eye and Haganet (Haughley) by escheat, while the Bigod castle at Walton was confiscated by the King in 1157, and those at Bungay and Framlingham after the rebellion of 1173, both being demolished soon afterwards (Eales 2003, 139, fn.42; see also Chapter 6.I). The late 12th century therefore saw a reversal of the military and political fortunes of Suffolk, with a strong royal presence in the area. The Bigod family, however, remained a continual irritant: Henry of Huntingdon, for instance, noted Roger Bigod's 'exercise of crime throughout East Anglia' (HA, Greenway 1996, 413).

England was invaded by Prince Louis of France in 1216 and many castles in the south-east, including Cambridge, Norwich and Orford, were captured by him (Pounds 1990, 116). The 13th century saw the last great investments in the military development of Norwich Castle, which was last prepared for possible action in the 1260s (see Chapter 7). The changes included the provision of a massive new barbican (see below). Across Norfolk, castles and fortified houses of the later medieval period were constructed at Baconsthorpe, Caister, Claxton, Great Hautbois, Gresham, Marham, Oxburgh, North Elmham and Wood Norton (see Liddiard 2000a, 108–122; see Fig.12.1).

IV. THE NORMAN CONTEXT

(Figs 12.3 and 12.4)

The unusual scale of Norwich Castle in its British urban context has been discussed throughout these volumes. Detailed consideration of Continental parallels for the plan and layout of its defensive scheme, however, lies outside the remit of this publication and this large-scale phenomenon is worthy of further exploration in a wider European context. Similarly, this is not the place for a detailed discussion of the influences on the architectural style of the Norwich donjon — one of the largest and finest examples in England — nor its forerunners in France, particularly the fortifications of 11th-century Normandy. A few general comments about the character of both the timber and stone phases at Norwich in relation to other Anglo-Norman and Norman castles are, however, appropriate here.

Recent study of timber castles has been dominated by the excavations at Hen Domen (Barker and Higham 1982; Higham and Barker 2000), which demonstrate the probable character of features lost at Norwich due to centuries of urban development. The potential strength and sophistication of such early castles has now been recognised: timber castles could be 'permanent or occasional residences, long-term fortifications or temporary campaign and siege bases, and could also be the means by which territory was colonized by an expanding indigenous society or by an invading one' (Higham and Barker 1992, 349). New evidence for the strength and complexity of the timber phase at Norwich and for the activities undertaken within the first castle has been outlined in Chapter 5 and is summarised below, particularly in relation to the siege of 1075. Broad comparisons with the timber phases of other castles are drawn both in this chapter and in Chapter 5.V.

The specific reasons for the subsequent construction of such an ostentatious and costly donjon at Norwich are explored by Heslop, who sees it as a combination of economics, power politics and the architectural ambitions of William Rufus (Heslop 1994, 59–61): 'it was architecturally the most ambitious secular building in western Europe, a tribute alike to the most godlike vision of kingship of its patron and to the potential which he saw in the new administrative centre of East Anglia, in Norwich' (Heslop 1994, 66). Despite the considerable expenditure on both its buildings and defences, only

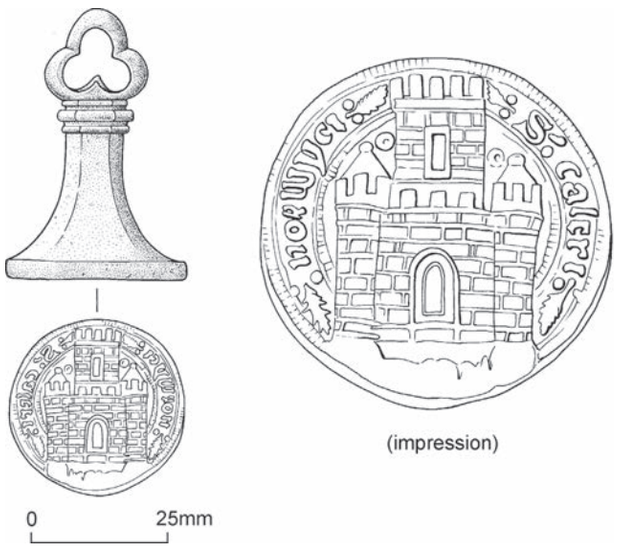


Figure 12.4 Copper alloy seal matrix of Norwich Castle, late 14th to 15th-century. Not to standard scale

occasional royal visits to Norwich and its palatial royal castle were made by the Norman and Angevin kings (Chapters 6.I and 7.I).

The broader Norman context of Norwich Castle's great tower, which followed the earliest Anglo-Norman donjons established at Colchester and at the White Tower in London in the mid 1070s, has been examined by Heslop who considers its relationship to the development of Romanesque architecture in Britain (1994, 56–66). The spectacular Norwich donjon appears to indicate 'a move from grandeur to intricate sophistication': in essence, such structures were perhaps inspired by the lordly residences of the Loire valley (Heslop 1994, 57–58). The general type as defined by Thompson (1992) may have developed at Ivry-la-Bataille by the early 11th century (Impey 2002, 198–199). In Normandy (Fig.12.3), architectural parallels have often been cited at Falaise (*cf.* Mesqui 1991, 123. fig.133) where the primary keep assigned to Henry I in the 1120s 'was probably conceived as Norwich was approaching completion', although the architectural similarities between the two great structures are now suggested to be generic rather than specific (Drury 2002a, 219). While Castle Acre closely parallels Norwich and may have provided the inspiration for its ground plan (Heslop 1994, 57, 61–62), the decorative detail at Norwich is distinctive: 'what we are witnessing is the formation of a distinctive local variant of a style the elements of which can be found piecemeal in England and on the Continent in the late eleventh century … just as the buildings are unmistakeably High Romanesque, they are also specifically East Anglian' (Heslop 1994, 64). The Norwich design was to influence other castles, including Castle Rising (Heslop 1994, 64; Dixon and Marshall 2002, 238). Further details of the Norwich donjon, encompassing its antiquarian, archaeological and architectural study, can be found in Chapter 6.I (see also 'The Donjon' below).

Recent analysis of the function and symbolism of castles has contentiously brought into question the defensive capability of the great Norman towers: 'Buildings displaying the lordly attributes of 'fortification' range from the 'strong' to the merely powerful. Frequently they conveyed the message of authority (like the 'keep' conjecturally ascribed to William Rufus at Norwich) without being defensive at all' (Coulson 2003, 48). Coulson continues 'These stupendous residences … were evidently meant to be imposing, not to be defended … many … features show that oppressive but peaceable power was their message to an abject population. Making people labour in castle-works (anciently *burh-bot*), especially in the towns, rubbed in the new rulers' power as well as displaying their enormous ambition' (2003, 76). As in its forerunners noted above, 'Norwich was similarly an expression of power, but its military strength was toned down, both metaphorically and, particularly by its fore-building, literally. The message had changed in balance … Norwich is a more confident building, a palace as a demonstration of wealth, taste and artistic patronage, a *mise en scene* for ceremony and state which could both impress and intimidate: but it is still a real fortress' (Drury 2002a, 219). The analysis contained in these volumes does demonstrate that the already substantial earthwork defences at Norwich were enlarged and maintained here in association with the stone phase and were strengthened at the same time with the addition of other masonry features including gates. It is, however, possible that the choice of causeways rather than bridges across the two outermost ditches leading to the south gate may emphasise their territorial/boundary importance rather than their defensive significance: this however, must remain speculation given the absence of evidence for gates and associated defences. Amongst the many functions that this particular castle may have had during the late 11th and early 12th centuries, latent military strength, particularly of its inner core, remained one of them. Norwich Castle does not appear, however, to have been threatened by military action between the events of the late 1080s and the Anarchy of Stephen's reign (see Chapter 6.I).

The scale of the earthworks and other defences at Norwich mirrors the ostentation of the donjon itself. Consideration of the enormous quantities of labour and materials required in both the construction of the keep and the other elements can be found below. Comparisons with other urban castles indicate that, at *c.*9.3ha (*c.*23 acres), its Fee was one of the largest urban castle enclosures in Britain (see Creighton 2002, fig.7.2 for comparisons of scale). The great castle earthworks at Dover, for example, enclosed *c.*6.2ha (15.5 acres; calculated from Brown 1984, fig.51). In a Norfolk context, Norwich Castle's precinct was twice that of Castle Rising and three times that of Castle Acre. A more detailed comparison of the scale of the earthworks with those of other castles is made below.

The symbolism of Norwich Castle both as architectural showpiece and military stronghold has only been touched upon here. Undoubtedly, the castle had iconographic significance, as is indicated by its use on the two Norwich Castle seals depicting three-towered gateways dating to the 14th and 15th centuries (see Fig.12.4 and Chapter 2, 'Norwich Castle Seals'). These are rare examples with a direct association with a castle: most others are sheriff's seals. The similar Windsor Castle seal may have been used by the constable of the castle (Cherry 1992, 87) and the same interpretation can be offered for the Norwich examples. The castle embodied a stylised representation of associated justice and authority (Cherry 1992, 87; Creighton 2002, 68) and 'the choice of the castle gateway as the standard type for the sheriff's seal may reflect the use of the castle by him as the place of account or as a place of imprisonment since in England most prisons were situated in the castles in county towns' (Cherry 1992, 87). Castles were also depicted on customs seals for duties on goods such as wool and hides: at Norwich a late 13th-century example shows both the royal arms of England and two triple-towered castles (Cherry 1992, 96 and plate 4).

Symbolic meaning is also evident in 'Blanchefleur', the Norman French sobriquet possibly used for the new Norwich donjon, which is perhaps an example of the naming of castles in relation to young girls (Sandy Heslop, pers. comm.) and, as noted in Chapter 6.I, probably relates in origin to the whiteness of the new Caen stone. The French names of castles are often associated with their topographical setting (Creighton 2002, 69).

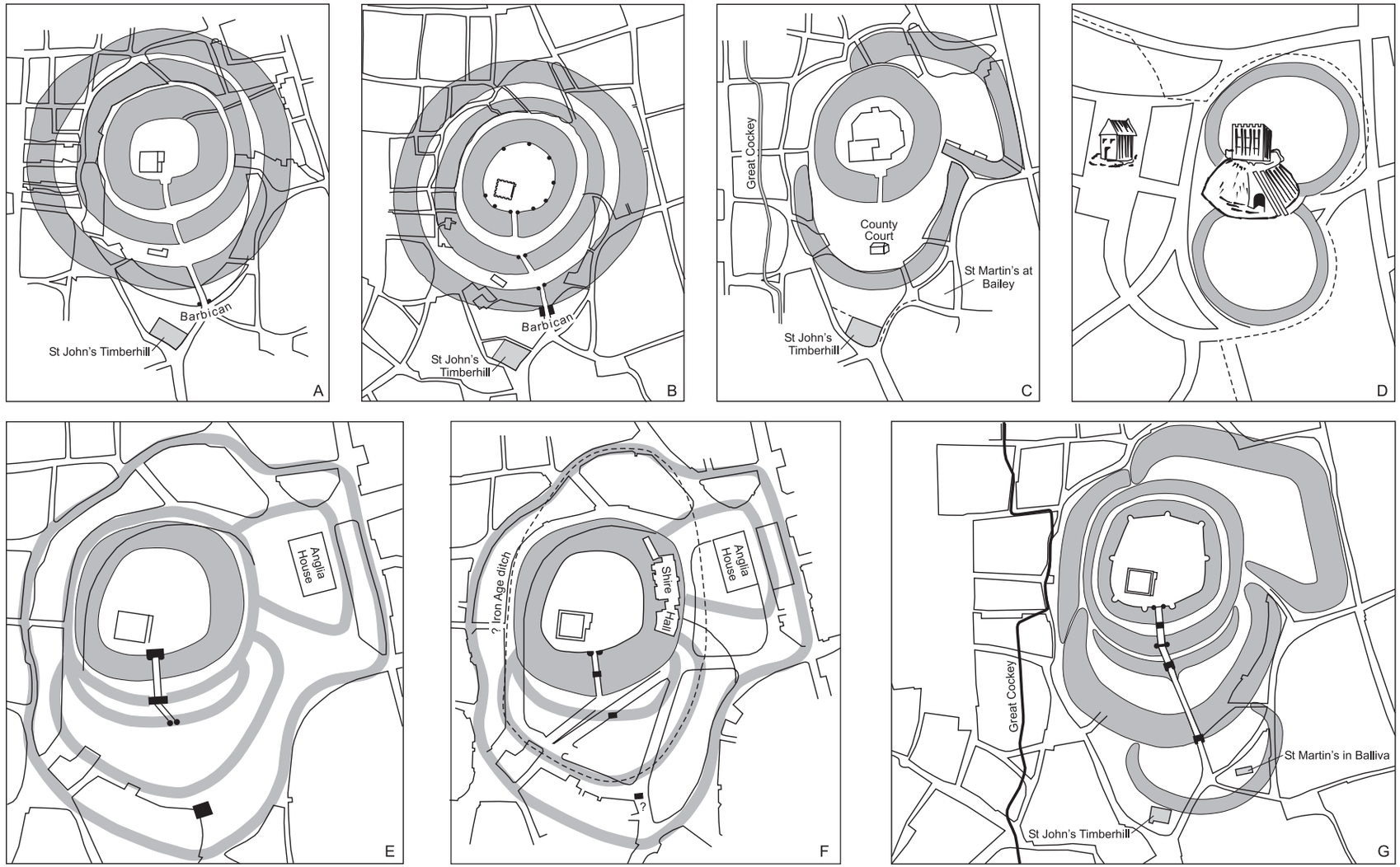


Figure 12.5 Previous interpretations of the ditches of Norwich Castle: A – Wilkins 1796 (after plate XXIII, 146); B – Woodward 1847; C – Harrod 1857 (after map page 133); D – Hudson 1896b (after map III); E – Green 1966; F – Carter et al 1974 (after fig.7); G – Campbell 1975 (after maps 2 & 3)

V. ANTIQUARIANS, HISTORIANS AND ARCHAEOLOGISTS

(Figs 8.2 and 12.5)

Previous observations and interpretations of the defences of Norwich Castle began with those of Neville in 1575 and continued until the period immediately prior to the Castle Mall excavations of the late 20th century. At times, academic debate became heated, in particular in the decades prior to the publication of Ella Armitage's great work — *The Early Norman Castles of the British Isles* — which established the Norman origin of this and other castles in England (1912). This is not the place for an overview of the history of castle studies, which has seen much discussion throughout the 20th century. There are, however, some key points to be made in the particular context of the evolution of understanding of Norwich Castle and the settlement over which it lay. The antiquarians, historians and archaeologists previously focusing on Norwich Castle over its long history have been summarised in Chapter 2 and their observations and interventions considered throughout Chapters 3–11.

The pre-Conquest history of the site is outlined in Chapters 3 and 4, commencing in the prehistoric period. Antiquarian observations of the pre-castle phase were effectively limited both by the fossilisation of the earlier landscape beneath the Castle Fee and the differences of opinion as to when the castle was constructed: many maintained a 'primitive', Roman or Anglo-Saxon origin (Chapter 2.I). The 19th-century writers generally dwelt upon the possibility of a Roman road beneath the motte (see Chapter 3) and broader discussions of the relationship of the new and old boroughs. Much effort was expended on elucidation of location and scale of the castle earthworks as well as detailed analyses of documentary records (for which see previous chapters and Part IV). Particular attention was paid to remnants of the barbican, elements of which could be traced in the ground until relatively recently. Local subsidence and undulations in some areas still indicate the presence of ditchwork in various locations.

Kirkpatrick (writing in the 1720s) was before his time in recognising that Norwich Castle donjon was probably Norman, long before the academic arguments on the subject of the late 19th and early 20th century: 'certain it is, the building now remaining is no work of the Britains, nor much, if at all, antienter than the Conquest' (Kirkpatrick 1845, 246). He still considered, however, an older origin for the earthworks (see Chapter 2).

Published plans of the castle earthworks are given chronologically in Fig.12.5, beginning with the three concentric ditches and southern barbican postulated by Wilkins in 1796 (Fig.12.5.A). Although conforming to this interpretation, Woodward, a local geologist, took the argument further and discussed the castle in relation to local topography and, specifically to the water table (see Chapter 3 and 'Wet or Dry Ditches?' below). 'Originally, there were three ditches surrounding this Castle, and from their circular form there can be little doubt that they were of great antiquity. The first still remains entire: of the second a considerable part existed a century ago. This and the outer one have been traced by Mr Wilkins with much care' (Woodward, published 1847). Arguments over the identification of ditchwork and the valley of the Great Cockey stream have been discussed in Chapters 2, 4 and 5.

It was Harrod who in 1857 produced the first definitive plan of the castle's two rather irregular baileys (Fig.12.5.C). This idea was taken up by Hudson in his own plan of two horseshoe-shaped baileys published in 1896 (Fig.12.5.D). Under the heading 'Exploded theory of three ditches' Hudson had earlier written as follows: 'For a long time it was universally believed that the Castle was surrounded by three great ditches with their banks. The innermost is that which still remains [*i.e*. the motte ditch]. The second was supposed to have crossed the Cattle Market at some distance in front of the first, whilst the third took in an immense circuit from the entrance to Golden Ball Street, skirting King Street, sweeping round by bank plain, half way down St Andrew's Hill, just touching the end of Pottergate Street, skirting the Back-of-the-Inns and so across White Lion Street and over Orford Hill, round to Golden Ball Street again.' (Hudson 1888, 3).

With Beecheno's unpublished work of 1908 (Fig.8.2) came the understanding of the extent of the Castle Fee, which has been crucial to the conduct of the research laid out in these volumes. Reconstructions of the castle earthworks by Green, Carter and Campbell in the 1960s and 1970s recognised the complexity of their development (Fig.12.5.E–G) and remained current at the time that the excavation began. Correlations between these theories and archaeological evidence have been made in earlier chapters and are briefly summarised below.

VI. OVERVIEW: NORWICH CASTLE AND ITS FEE

The Defensive Sequence

(Figs 5.55, 6.47, 7.36, 12.6 and 12.7)

Castles were not necessarily fortified by ditchwork on all sides where a powerful natural defence existed. Examples include the cliffs at Dover (Brown 1984, fig.51) and Nottingham (Drage 1983, fig.1), the confluence of two streams and their associated valleys at Rhyd Yr Onen, Llangurig, Powys (Higham and Barker 1992, fig.7.21) and the steep natural slopes of the promontory at Dinas Powys, Glamorgan (Kenyon 1990, fig.1.13). At Norwich, the natural slopes alone formed an insufficient natural defence and the castle does appear to have had ditched defences around its entire circuit. These, however, may have varied considerably in scale around the perimeter in relation to the defensive strength required and localised slopes. Vulnerable points, such as gates, are likely to have been more heavily defended. The Castle Mall excavations demonstrate the complexity of the defences of the southern approach, where the gently sloping ground made the castle most vulnerable.

Norman castles were often rebuilt or extended, sometimes even moving to different sites (for example, the old and new castles at Buckenham; see Table 12.1). The 'old castle' at Gloucester pre-dating 1086 was similarly succeeded by an adjacent 'new castle' between 1110 and 1120 (Darvill 1988, 1 and fig.1). It has recently been suggested that Norwich's first castle may in fact have been constructed elsewhere than its current site: Heslop interprets a reference in the Charters of Norwich Cathedral Priory to the area of the cathedral precinct *Apud Norwicense castrum* [at Norwich Castle] (Dodwell 1974, 78) as implying the

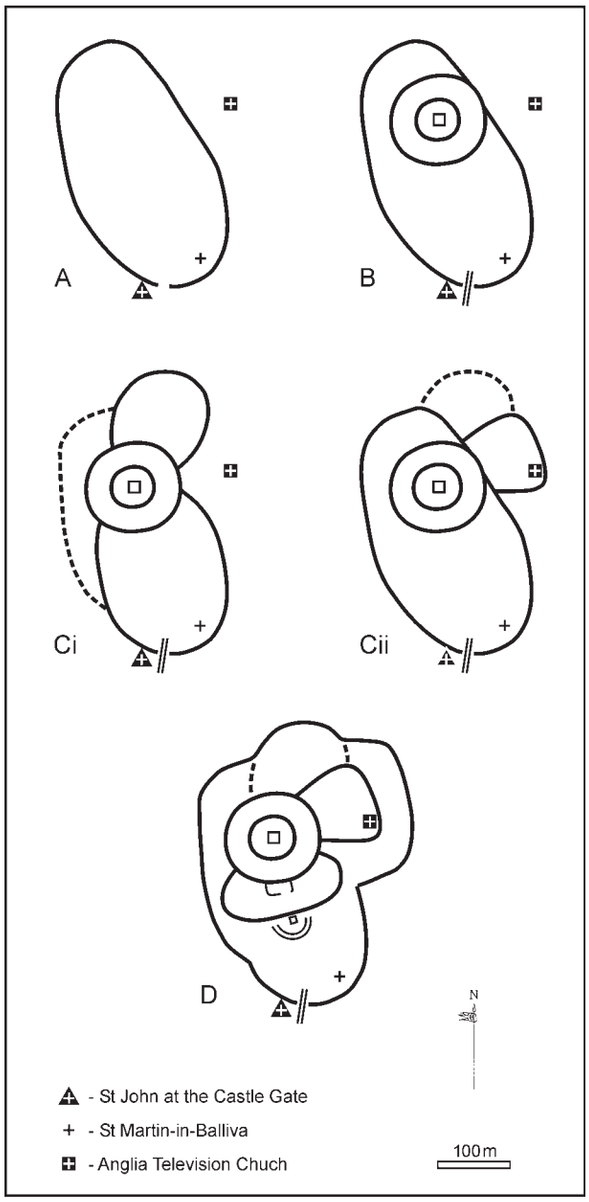


Figure 12.6 Interpretations of the defences before *c.*1075: A – enclosure; B – motte and single bailey; Ci – motte and baileys to south and north-east; Cii – motte and bailey to south and east; D – defences c.1075. Scale 1:10000

presence of a *castrum* in the area. He states that 'we need to be conscious of the fact that there is no archaeological evidence to demonstrate conclusively that the present site was occupied by a castle before the very end of the [11th] century, or indeed that it fits comfortably with the evidence provided by the documents. Consequently it must remain a possibility that the structures of *c.*1070 were elsewhere, for example closer to the river to protect the approach to the city up the River Wensum' (Heslop 1994, 7). Three alternative interpretations of the *castrum* are given: that it refers to the defended area of the Saxon burh; that it was the site of the early Norman castle or that it was both (Heslop 1994, 67, n3). The last interpretation, which tallies with the common reuse of earlier earthworks, implies that the castle may have been built at least partially within the burh at the cathedral site, moving to its present site at the time that the cathedral was built. There is, however, no archaeological evidence to support such an interpretation and the preferred hypothesis of the present author is that the castle occupied its existing site (also within the ?defended burh) from the outset.

The hazards of relying too heavily on cartographic and road alignment evidence in reconstructing the early layout of the castle earthworks have been noted in previous chapters, where the new plans of Norwich Castle's earthworks have been compared with earlier interpretations (*e.g.* Carter 1978b, fig.7, Atkin and Carter 1985, fig.02). Of particular note is the position of the south bailey ditch much further south than was originally anticipated. The barbican also runs further south than had been suspected, allowing space for a courtyard or inner ward to develop at the base of the castle bridge.

The Timber Castle (*c.*1067–70 to *c.*1094)
(Figs 5.55, 5.56, 5.58, 12.6 and 12.7.A)
The possible appearance of the timber tower of the period *c.*1067–70 to *c.*1094 indicated in Fig.5.55 is based largely upon work at Stafford Castle and draws heavily from the reconstructions presented by Higham and Barker (1992, figs 8.48–8.51; produced by Peter Scholefield for Stafford Borough Council). An evocative image of Durham Castle's timber tower, also housed on a Class I motte (see 'Stone Castle' below for a definition), is given in the 12th-century *Dialogues* of Laurence, monk of Durham: 'a mound of rising earth explains the flatness of the summit … on this open space the castle is seated like a queen; from its threatening height, it holds all that it sees as its own. From its gate the stubborn wall rises with the rising mound, and rising still further, makes towards the comfort of the keep …. A bridge gives a ready ascent to the ramparts, easy to climb …' (quoted in Higham and Barker 1992, 118).

Excavations at the Castle Mall and Golden Ball Street sites have provided the first evidence for the physical character of the earthworks associated with the timber phase of the castle at Norwich, while work at the motte provides important new evidence for its initial form and possible construction rate. The artefacts and ecofacts recovered from ditch and pit fills at Castle Mall and detailed in Chapter 5.II, demonstrate both the nature of activities and the local environment within the *enceinte* of the initial castle. As has been discussed in Chapter 5.V, there are several different possible interpretations of the layout of Norwich Castle's defences in their earliest years (*c.*1067–70 to *c.*1094) and consideration must also be given to the date and possible extent of the Castle Fee boundary and its relationship to other ditchwork. A southern entrance is indicated from the outset, leading across a causeway, while entrances to the west, north and/or east may also have existed either from the outset or at a slightly later date (see below). A schematic cross-section of the defences of this phase appears in Fig.5.58.

It has been noted that 'a distance of only a couple of hundred metres put a castle beyond the range of bowshot and siege weaponry' (Creighton 2002, 35). The timber phase of Norwich Castle reconstructed in Figs 5.55 and 5.56 puts the city's first castle *c.*250m from the accessible southern side of the defences and may explain the distance of the southern defence in relation to its other sides, which were physically constrained by the stream valley, local

contours and its urban setting. A similar distance was maintained in the stone phase.

c.1067–70 to c.1075

Three main interpretations of the castle defences in the period before *c.*1075 have been offered in Chapter 5.V (with associated archaeological evidence in Period 2.1, Chapter 5.II), although a number of others remain possible. Each must be considered in terms of the pattern of castle construction recorded elsewhere. The three options are:

1. a simple enclosure[4], with the later addition of a motte and alterations to ditchwork (Fig.12.6.A);
2. a simple motte and bailey castle, with the bailey lying to the south (and possibly also the west and north), a second bailey to the north-east being added later (Fig.12.6.B);
3. a motte, with two baileys (lying to the south and north or north-east) (Fig.12.6.Ci and ii).

1. Enclosure

(Figs 12.5 and 12.7.A)

It has been suggested that Norman castle building may have begun with the ringworks (later transformed into mottes) of the first wave of castle construction in 1066–68 leading to the motte and bailey form in the castle building campaigns of 1068–70 (Davison 1969, 44–45; English 1995, 48, 51, 53), Norwich falling into the motte and bailey category. Although an extensive initial Norman 'land grab' can be argued at Norwich Castle (encompassing the entire 23 acres of the Castle Fee), it remains possible that the first castle was actually of much smaller form perhaps being 'enlarged as the hurried fortifications of the 1060s were developed as permanent administrative centres for the shires' (English 1995, 47). As has been mentioned, such an initial enclosure at Norwich Castle may have been a primary stage, protecting the area within which the motte and inner bailey(s) were later constructed.

It was once proposed that the late 11th-century defences at Norwich Castle may 'conceivably consist of the oval enclosure ditch postulated at the north end of Ber Street and once suggested as being Iron Age' (Atkin 2002a, 75; Carter *et al* 1974, fig.7; see Fig.12.5.F). In this hypothesis the ditch looped around to the north and south of the extant motte, accounting for the odd street alignment in this area. Excavations at Castle Mall (Area 9) conclusively demonstrate that there was no ditch in the position indicated by Carter *et al* and an alternative, more easterly position (linking to the recorded south bailey ditch) can be discounted by the excavations in the north-east bailey (Site 416N) which extended across the anticipated course and where no such ditch was located. Further comments (and a refutation of the presence of any Iron Age ditch activity at the site) are given under the heading 'Prehistoric and Roman' in Chapter 3.

Having dismissed the possibility of ditchwork in the position postulated before the Castle Mall excavations, an enclosure sited slightly further west remains possible (Fig.12.6.A and *cf.* Figs 5.56 and 12.5.F). A 9m wide ditch recorded to the west of castle has been discussed in earlier chapters in relation to the Late Saxon burh, the Great Cockey stream, the Castle Fee and the boundary with French borough (Chapters 2 and 4–6). Green suggested that this ditch was not castle-related as it had been infilled by the mid 14th century (1963, 3), although early encroachment above the ditch is now clear and it appears that the ditch may relate to the initial definition of the castle and its Fee. Infilling of one stretch of the ditch recorded at Castle Mall (Ditch 3, Area 8; Chapter 5.II) does appear to have occurred by the time of the construction of the south bailey ditch in *c.*1094 to *c.*1121–22 (Ditch 10). The feature's stratigraphic position, and in particular its relationship to ditchwork associated with and pre-dating the cemetery of St John at the Castle Gate, appears to confirm that the ditch was active in the late 11th to early 12th century (see Period 2.2).

2. Motte and single bailey

(Fig.12.6.B)

The second interpretation sees Norwich's first castle as consisting from the outset of a motte and bailey extending to the south and possibly to the north-west of the motte, perhaps with a timber tower (see below). The probable position of the first motte indicated in Fig.5.56 which shows the local contours suggests that it was offset slightly to the south-west of the end of the natural ridge; the stone donjon was similarly placed at least partially above the position of the earlier mound. The first motte may have been coeval with ditchwork, although cases of free-standing mottes within baileys do occur, as at Bramber (Barton and Holden 1977, fig.1). The line of a ditch recorded in a watching brief to the west of the Castle Mall site (Ditch 4; Period 2.2, Chapter 5.II) has proved difficult to reconcile with other ditchwork in the vicinity and it is possible that this represented part of an early definition of the south bailey.

In both this and the previous option, the church beneath the north-east bailey (Site 416N) may have survived the first decade or so after the Conquest, with the local street pattern in this particular area remaining unaffected. Alternatively, even if not formally enclosed, the area confined by Superior Conesford (King Street), modern London Street and the postulated continuation of Rose Lane (see Chapter 4.VI, 'Street Pattern') may have been cleared of buildings.

3. Motte and two baileys

(Figs 12.5 and 12.6.Ci–ii)

The third option, which gives two baileys from the outset, may appear over-complex for an initial castle, although it remains a possibility. It is unusual to find an early castle (*i.e.* pre-1100) with multiple defences (Kenyon 1990, 27), although examples of 12th-century castles with two baileys, one on either side of the motte, are known including Castle Rising (Morley and Gurney 1997, fig.2).

The precise shape of the two baileys at Norwich remains a matter for debate, particularly the north-east bailey/Castle Meadow. Harrod's 1857 map recognised the possibly irregularity of this bailey (see Fig.12.5.C), while Hudson's schematic plan (1896, Fig.12.5.D) took a more conservative view and depicted two horseshoe-shaped baileys, lying to the south and north of a small motte. The bulge in the street pattern to the north of the castle (along London Street) may suggest the presence of a horseshoe-shaped bailey (Fig.12.6.Ci), much of which would have been subsumed when the motte was

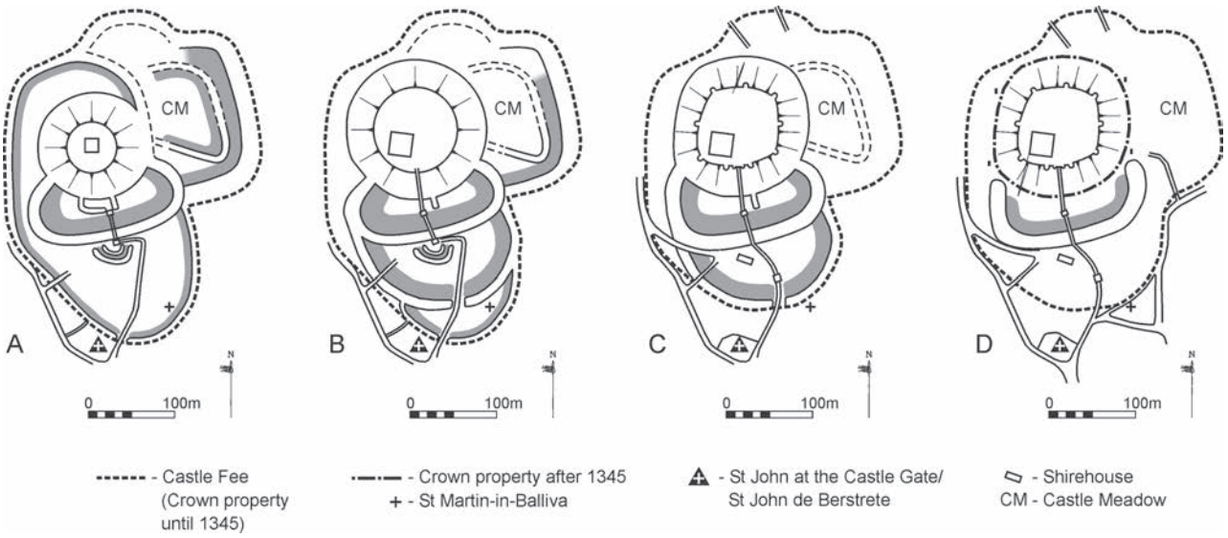


Figure 12.7 Summary of the major defensive alterations: A – *c.*1075; B – *c.*1094–*c.*1122; C – *c.*1250–1300; D – *c.*1345. Not to scale

extended, although the presence of ditchwork to the west of the castle must be remembered. Other interpretations for the odd road alignments to the north of the castle have already been discussed, for example that the curving lines of Elm Hill, Redwell Street and Bank Street indicated the line of the Anglo-Saxon town's western defences (Carter 1978b, 192 and fig.7), reflected in the later castle ditchwork. It was proposed that the bulge to the north and east respected the line of Saxon roads (see further discussion on this issue in Chapter 4.I and 4.VI, 'Viking and Late Saxon').

Another possibility is that the early north-east bailey consisted of the undated ditch recorded in 1979 (Site 416N), the northern side of which might have mirrored the odd sub-triangular shape suggested for the southern side (Fig.12.6.Cii), or may have continued north-westwards on an irregular course to take in the end of the natural ridge (*cf.* Harrod's plan; Fig.12.5.C). Antiquarian evidence suggests that a bank certainly existed here (see Chapter 2). Alternatively, another small enclosure may have existed here, between two other baileys, perhaps defending a north gate (see below).

c.1075–c.1094

(Figs 5.55, 5.56, 12.5.D and 12.7.A)

The subdivision of the south bailey appears to have occurred as a secondary phase of the timber castle, possibly in the period *c.*1075 to *c.*1094 (Period 2.2, Chapter 5.II), coeval with the insertion of ditched enclosures around gates and bridge landings (Fig.12.6.D). The resultant ditchwork plan indicates the significance of the southern approach from an early date and demonstrates the complexity and strength of the defences of the timber phase. As noted above, this period may have seen the addition of the north-east bailey/Castle Meadow and concomitant enclosure of the pre-Conquest church recorded at Site 416N (Ayers 1985). Some of these alterations may have been directly associated with the 1075 siege, or perhaps even with the occupation of the castle by Roger Bigod's forces in 1088. Possible access between the two baileys and out into the city and new French Borough is discussed further below.

Immediately adjacent to the motte, at the foot of the castle bridge, two ditches were inserted (Ditches 5 and 6). The westernmost (Ditch 5) was apparently infilled in the early 12th century and it has been suggested in Chapter 5 that this may have been in relation to a realignment of the approach route associated with the construction of a new masonry gate and adjacent well in *c.*1094 to *c.*1121–22 (Period 3.1, Chapter 6.II). Further south, on the other side of a postulated ditch, two crescentic ditches defended a bridge landing within the south bailey (Ditches 7 and 8) in a defensive arrangement which has proved difficult to parallel (see Chapter 5.V). Refuse disposal and the growth of vegetation within them, probably dating to the late 11th to early 12th century, suggests that they were not maintained for any length of time. Observation of the erosion rates of experimental ditches (Bell *et al* 1996, 70ff) has shown that it would take about twenty years for a ditch to become stabilised by vegetation, the presence of the latter preventing the bank eroding into the ditch further. If the crescentic ditches at Norwich were dug (as proposed) in around 1075, the vegetation evident within them (see 'The South Bailey' below) could therefore have accumulated by *c.*1094, suggesting that their decline may have been linked to the construction of the larger south bailey ditch in the period *c.*1094 to *c.*1121–22 (Period 3.1), thereby indicating their association with the castle's timber phase.

Double ditches, similar to those suggested around the perimeter of the north-east bailey/Castle Meadow in Period 2.2, were recorded at Hen Domen (Higham and Barker 1992, fig. 9.1). A reconstruction of the latter examples at Hen Domen indicates their possible appearance, with a bank and walkway running between the two ditches and an inner bank, both banks being surmounted by timber defences (Higham and Barker 2000, fig.7.1). This arrangement is closely paralleled in the reconstruction of Norwich Castle offered in Fig.5.55.

Despite the extended siege of 1075 (see Chapter 5 and comments on the probable encampment above), there is no evidence in either the documentary or archaeological record for a siege castle at Norwich. Orderic Vitalis states that during the three month siege, the army received daily reinforcements along with ample supplies of food and other necessities (OV ii, 317; see Chapter 5.I). Deliveries of such supplies would have relied heavily on good roads and water-borne transport (Morillo 1994, 128). The Norwich siege was exceptional in terms of its length; few others at this date lasted so long. Most ranged between four and six weeks although the siege of Arundel in 1102 was comparable to the Norwich case (Morillo 1994, 144; OV vi.22). The extended duration of both sieges may be due to the fact that no other tasks were required of the army at the time, meaning that the siege did not have to be accelerated by the use of force (Morillo 1994, 143). The burial of a small hoard of William I pennies, discovered at 13–15 London Street in 1972 (Site 215N) has previously been attributed to this event, although this no longer seems likely (Clough 1973; see Davies, Chapter 13). Direct evidence for the siege may come from evidence for dog skinning of the period, perhaps indicating the consumption of dogs in time of famine (see Chapter 5.IV and Part III). The use of 'every kind of engine of war' (see Chapter 5.I) may have included bombardment machines (such as the mangonel and balista), siege towers and battering rams (Morillo 1994, 138–139). The use of the crossbow has been noted in Chapter 5.I.

The Stone Castle (*c.*1094 to *c.*1200)

(Figs 6.47–6.49, 12.7.B and 12.8)

The building or re-building of English castles in stone began within a generation of the Norman Conquest (Brown 1966/9, 87) and the particular reasons behind this development in the case of Norwich are considered in 'The East Anglian Context' and 'The Norman Context' above. Norwich is one of six urban castles of the late 11th and early 12th centuries with a stone donjon and Class I motte, the latter classified by Drage as those over 10m high (the five other examples are at Durham, Tamworth, Oxford, Canterbury and Lewes; Drage 1987, 121 and fig.54). 'The largest mottes, like those of Conisborough and Norwich, could ... carry a complete inner ward together with its keep' (King and Alcock 1969, 95): this upper bailey at Norwich enclosed *c.*2.3 acres (see Table 12.2 and 'The Upper Bailey' below).

The construction of Norwich's great stone tower began at around the time that England's first great palace-keeps at the White Tower (London) and Colchester were nearing completion (Drury 2002a, 218). As a royal palace, Norwich's new donjon was far more elaborate than its predecessors and, as has been noted above, Norwich's donjon and cathedral church provided the foundation for a distinctive regional architectural style. Other great donjons of the period providing ample residential accommodation include those at Canterbury, Guildford and Rochester (Renn 1960; 1968). As was the case at Norwich 'the early development of urban castles exceeds the mere requirements of garrison and administration. While the form is quite suitable for the occasional visits of king and court, it may be directed to more permanent occupation by the great lords, often hereditary sheriffs and constables, responsible for the keeping of urban castles' (Drage 1987, 126). Comments on Norman and Anglo-Norman constructional parallels for the stone phase of the Norwich building (*c.*1094 to *c.*1121–22) have been given above in the section on 'The Norman Context' and more detailed information can be found in earlier chapters (particularly Chapter 6.I, 'The Donjon').

Construction of the new donjon entailed the enlargement of the motte, both in terms of vertical height and lateral widening (see schematic cross-section in Fig.6.49), and recent excavation confirms the complexity of this extension (see Chapter 6). Similarly extended mottes include those at Oxford and York (Renn 1968, 351; Hassall 1976). Further details of the Norwich motte are given below ('The Motte').

It is now clear that construction of the new masonry elements of the castle entailed far more than just the extension of the motte and construction of the mound. New evidence from the Castle Mall and Golden Ball Street excavations, fully detailed in Period 3.1, Chapter 6.II and discussed with parallels in Chapter 6.V, relates to the stone bridge and a series of new gates, as well as a defended well at the foot of the new bridge (the existence of which was previously unknown). The ditchwork itself was reshaped and enlarged, some of the alterations perhaps being made in response to the threat to the castle in the 1170s. A new south bailey ditch (Ditch 10) was inserted, the earlier, smaller ditch further south (demarcating the limit of the Fee boundary; Ditch 3) perhaps being recut to form a hornwork around the south gate. The north-east bailey's outermost ditch was also recut (Ditch 9), its infilling providing evidence for the presence of livestock, a brewery and possibly a lime kiln in the vicinity. Similar ditch recutting or clearance associated with the replacement of the castle in stone in the late 12th century was recorded at Newcastle-upon-Tyne (Harbottle and Ellison 1981, 78–79).

At an early stage of post-excavation analysis at Norwich, it was hypothesised that an earlier, inner ditch (Ditch 4), effectively a forerunner of the barbican ditch, might have connected directly with the defences of the north-east bailey, rather than turning to the north-west to join the motte ditch (an outdated reconstruction to this effect appears in Margeson *et al* 1994, fig.81). This would offer a broadly similar layout to the defences at Stafford (see Fig.12.8.C). The suggestion was later discounted at Norwich, however, as it did not tally with the spatial position of ditchwork and surviving natural deposits.

Clearly, the new constructional phase and associated revisions to earthworks would have taken a number of years to complete and consideration of the manpower and time necessary to adapt existing earthworks for the creation of the new defences is given below. Construction of the Norman cathedral may have taken a number of decades, in the period *c.*1094 to before *c.*1145 (Heywood 1996, 74). As has been noted, the time and manpower taken to construct the new castle and cathedral at Norwich indicates a relatively settled period in political terms, a fact emphasised when the labour requirements for both projects are considered. Although the traditional view is that castle building was a destructive process, in another sense it represented investment and in particular the construction of Norwich Castle's magnificent new donjon can be viewed within the context of 'endowing the city with the monumental trappings of a major governmental centre' (Heslop 1994, 7), reflecting the administrative,

mercantile and ecclesiastical status that has been outlined in Chapter 6.I.

Documentary evidence attests to the continued strengthening and repair of the defences of Norwich Castle throughout the 12th century, including the donjon and bridge (Chapter 6.I). Some of these alterations appear to have been directly associated with the troubles of 1173–4. The burning visible on the vault and surrounding masonry of Norwich Castle's forebuilding (Bigod's Tower) has been postulated as indicating fire damage caused by a massive combustion either during the events of 1174 or 1216. There is, however, no supporting archaeological

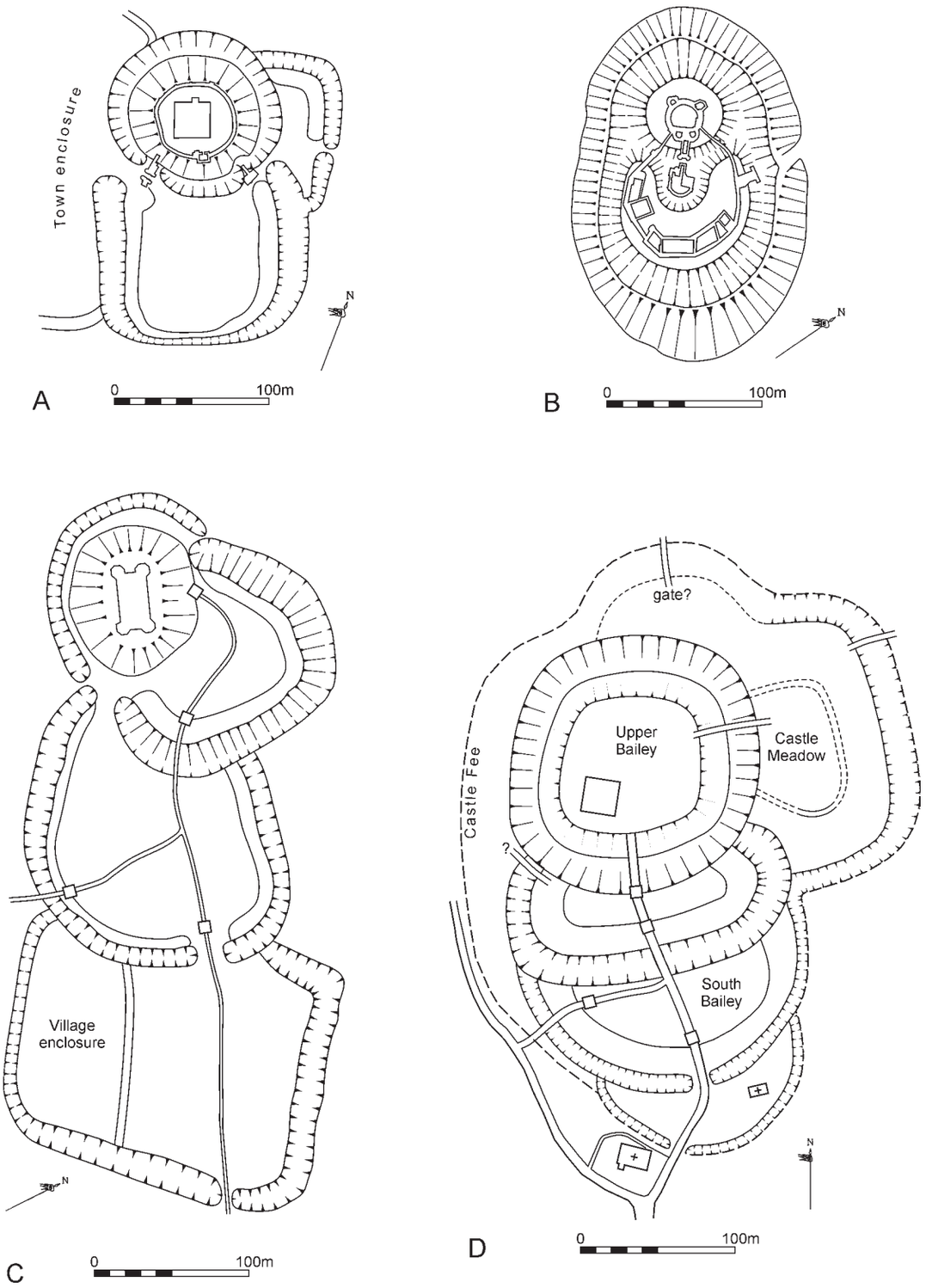


Figure 12.8 Comparison between Norwich Castle and other castles: A – Castle Acre (after Coad & Streeten 1982, fig.3); B – Sandal (after Mayes & Butler 1983, fig.8); C – Stafford (after Darlington 2001, fig.7); D – Norwich (*c*.1120s). Scale 1:4000

evidence for this (although substantial later patching in the adjacent donjon wall *could* indicate an attempt at undermining). Some of the antiquarian references to such undermining in 1174 may have confused Norwich with the undermining of Bigod's castle in Bungay, where the relevant tunnel survives. Such undermining took place during the 1216 siege of Dover (J. Goodall 2000).

It appears that at Norwich even the major ditches began to be infilled at least on a small scale relatively early, with 12th-century ceramic groups coming from the ?Castle Fee ditch (Period 3.2, Chapter 6.II). This resonates with events at other castle sites, where 'early urban castles of the Norman Conquest, built initially to serve very particular military purposes, fell into sharp decline from as early as the early twelfth century' (Creighton 2002, 138). Although Norwich Castle remained a functional castle for some time to come, the decline in the defensive capability of the Castle Fee boundary may indicate a lesser need for its presence and perhaps a replacement in another form at a relatively early stage (see comments on boundary markers elsewhere in this chapter).

The 13th-Century Castle

(Figs 7.36–7.38 and 12.7.C)

'The events … of 1216 show that the castles that had originally been raised to secure Norman control over a conquered England were still of central military importance a century and a half later. Control of the land required control of the castles …. The Civil War was predominantly a castle war: over 200 were certainly used during 1215–16' (Bartlett 2000, 275).

The adaptation of Norwich Castle to suit the new military needs of the 13th century is briefly outlined below and detailed in Chapter 7. By the middle of the century, with the construction or enlargement of the city ditch, Norwich Castle was positioned at the heart of the city, although this may have been the case from the latter part of the 12th century due to urban expansion. Considerable expenditure on the castle — both in money and labour — was made throughout the 13th century, including the barbican ditch (Ditch 13), the insertion of drum towers and a new gate on the castle bridge, the insertion of a new hall on top of the motte, repairs to the gaol and the rebuilding of Shirehouse (see Figs 7.36–7.38). These improvements reflected contemporary trends in both warfare and castle building, as discussed in Chapter 7.V. Improved gatehouses of the period were also constructed at Newcastle, Dover and Nottingham (Drage 1987, 123), while elsewhere outer works were strengthened and some provided with barbicans (Colvin 1963, 68–78, 114–18).

In the latter part of the 12th century or the beginning of the 13th, the outer ditch of the Castle Meadow at Norwich (Ditch 9) was recut in much narrower form (Period 4.1, Chapter 7.II) along the northern part of the earlier ditch. As has been noted in Chapter 7.V, its apparently limited lifespan could be connected with a reworking of the defences in relation to one of the documented attacks on the castle (perhaps in the 1170s or 1216; the latter depending on the date of insertion of the great barbican ditch which cut across the ditch after it had been infilled). Activities identified actually within the ditch included pitting, the placement of structures and animal grazing, indicating a lack of military significance relatively soon after its recutting. Pottery from features and deposits within the ditch has aided clarification of the date of the barbican ditch: upcast from the latter sealed the sequence of earlier ditches and the ditch itself cut across them (Period 4.2, Chapter 7.II).

The capture of Norwich Castle by Louis, Dauphin of France in 1216 has traditionally been associated with the date of construction of the barbican. At Dover, it is usually assumed that the barbican post-dates the siege of 1216, although this has recently been brought into question and an earlier date is possible (J. Goodall 2000). At Norwich the documentary evidence indicates two possible opportunities for the new defence, either during preparations for attack in 1215, or after 1224 when it was surrendered to the young King Henry III by Roger Bigod who held it in the interim (accounts for unspecified works begin again in 1223; Chapter 7.I). A date in the range *c.*1224–*c.*1250 seems probable, both in terms of the specific evidence at the site and the broader context of barbican construction across the country (see Chapter 7.V). Antiquarian observations of the barbican ditch have been summarised in Chapter 2, while further details in relation to its infilling and later use at Castle Mall are given in Chapters 8 and 10.

Beecheno noted that 'at Norwich, this entrenchment [*i.e.* the barbican ditch] *very nearly* touched the present moat on both sides with its horn' implying the presence of causeways (MS 1908, 11). The possible presence of causeways here (relating both to the barbican ditch and its forerunner), providing access to the west and eastwards to the Castle Meadow has been considered in earlier chapters, although the latter route does not appear to have existed in the 12th century when access was effectively blocked by the presence of another ditch (Ditch 6). A slight indication of rise in level at the western end of the barbican ditch, where it approached the motte ditch beneath the modern road of Castle Meadow, may indicate the presence of a causeway here although the evidence was inconclusive (see Period 4.2, Chapter 7.II) and, in defensive terms, it seems unlikely that such a causeway existed at this date.

During the disturbances of the 1260s, Norwich Castle was garrisoned but not actually involved in any fighting (Chapter 7.I). After the rebellion in East Anglia, the motte and bailey at Cambridge were replaced with a concentric castle by Edward I (Colvin 1963, 584) although the work was not completed, being rendered unnecessary by the lack of further rebellion (Drage 1987, 123).

Changes in the conduct of warfare during the later 13th and early 14th century meant that although the donjon and the buildings of the upper bailey at Norwich were maintained as a fortress, administrative centre and prison, the importance of the outer baileys diminished, especially so with the completion of the city walls (see Chapter 7.I and below). Refuse dumping and tenement encroachment inevitably accelerated.

The 14th Century and Beyond

(Figs 8.61, 8.62, 10.76–10.78 and 12.7.D)

Norwich's city walls were built in 1297–1344, replacing a formidable city ditch. As has been noted, however, decline was already evident in the outermost defences of castle with the commencement of encroachment and quarrying and use of the ditches as rubbish tips. Later medieval warfare was open and did not entail sieges; 'in these circumstances the walls of a town might shelter

its community and the administration based there more readily than an urban castle, but the inadequate resources of the later medieval kings must be a factor contributing to this shift of emphasis' (Drage 1987, 125). In addition, 'subject … to financial constraints, the decline of certain castles at certain periods must represent a considered assessment of their value to the Crown. This considered assessment must be understood primarily in terms of their continued military, that is political use, for urban castles might still be refurbished and rebuilt as the need arose' (Drage 1987, 123).

Many urban castles were used as courts and gaols in the later medieval period, with early examples of the 13th century at Chichester (Colvin 1963, 613) and Oxford (Colvin 1963, 774). The shortage of royal monies during the later medieval period ensured expenditure on the maintenance of donjons as prisons rather than construction of purpose-built structures: examples include the donjons of Norwich and Guildford (Colvin 1963, 658–659) and the gatehouse at Cambridge (Colvin 1963, 584–588). The Norwich donjon maintained its use as a prison until 1888, while the county courts functioned there until the late 20th century (see Chapter 11). Such limitations of use allowed other features of castles to decay: 'The paucity of royal finance, which affected … royal castles, contributes to this decline. Archaeology has yet to record this process with the eloquence or detail of contemporary surveys' (Drage 1987, 127). As detailed in Chapters 7–8, excavations at Norwich Castle have now done much to articulate such processes archaeologically from the late 12th century to the late medieval period. At both Colchester and Newcastle upon Tyne, the decline of each castle is similarly represented by rubbish dumping (Drury 1982, 404; Harbottle and Ellison 1981).

By *c.*1300, Norwich had fallen to the middle rank of castles (see Chapter 7.I) and 'the purely military use of urban and non-urban castles resulted in only short flurries of building activity and temporary occupation; few, such as Dover, were consistently maintained' (Drage 1987, 123). Although at Norwich the hall possibly attached to the donjon was rebuilt in the 1280s the castle was no longer used as a royal residence by the latter half of the 14th century. Royal visits to urban castles became less common as the court and central administration remained for longer periods at Westminster; 'There appears little reason for the disinclination of successive kings to progress through East Anglia, a rich and populous area …, thus ensuring the decay of Norwich, Colchester and Cambridge' (Drage 1987, 127). In addition, from the later 13th century England's towns and cities were increasingly able to defend themselves, which led to the decline of urban castles. Work on town walls 'sometimes aided by the king but often paid for by murage, was a means of avoiding expenditure on royal urban castles without detriment to the security of the town' (Drage 1987, 125). Similar decline was noted at Oxford Castle soon after completion of the city walls (Colvin 1963, 771–5).

The castle ditch at Newcastle-upon-Tyne was infilled with rubbish in the late 13th and 14th centuries and eventually became an official urban midden, including the deposition of offal during the early 14th century (Colvin 1963, 747; Harbottle and Ellison 1981, 85–86). Nearly 4m of rubbish accumulated in one part of the ditch during the 16th century (Harbottle and Ellison 1981, 93; Harbottle 1982, 412). At Colchester Castle, little pottery attributable to the period 12th–14th centuries was found within the bailey or its ditches, although much material of 1400–1550 was located, a fact taken to indicate that, from the end of the 13th century, rubbish was allowed to accumulate within the bailey rather than being removed from the site for disposal elsewhere (Drury 1982, 404). Quarrying for sand is known at Colchester Castle from 1336 and encroachments here included 14th-century dumping of waste into the castle ditch, again including cow offal (Drury 1982, 405). The deposition of butchery waste at both these castles during the late medieval period is mirrored in the deposition of similar waste into the barbican well at Norwich (Chapter 9 and Moreno García, Part III), while quarrying across the south bailey appears to have been accelerated by the transfer of the baileys to the city in 1345 (Chapter 8).

Although after 1345 the emphasis in terms of the Norwich Castle baileys shifted towards their use by the city, the donjon and other buildings on the mound remained in use as a prison and administrative centre (the contraction of the 'castle' area is indicated in the cross-section presented in Fig.10.78 and in the related reconstructions; Figs 10.76 and 10.77). The sheriff was still a tax gatherer and a justice, the constable was still responsible for prisoners and the buildings had to be kept in repair. Defence of the castle was not effective enough to prevent its being taken by force during the Peasant's Revolt of 1381 and, by the time of the rebellion of 1549 the castle had not even a symbolic strategic importance (Chapter 8.I). Small sums were spent on maintenance of the remnants of the castle in the latter part of the 14th and into the 15th century but it was increasingly a target for robbing by the local townspeople.

By the 16th century all the towers at Norwich Castle were in a state of decay and by the end of the 17th century serious cracking of the donjon walls was apparent. Most of the 13th-century curtain wall had disappeared by the end of the 17th century. Similarly, by the mid 16th century, Colchester Castle's buildings and defences were ruinous, with burials made in the castle yard (Drury 1982, 405). Prison burials of the mid 17th century were found at the top of Norwich Castle mound (Chapter 10), paralleled by late 17th-century examples found at Launceston Castle which again relate to the gaol (Saunders 1970, 91–92) and 16th- to 18th-century examples recently discovered at Oxford Castle (Poore 2004, images 3–11).

The 18th century saw repairs to both the bridge and donjon at Norwich, although the decline of the ditches continued and the banks were eventually removed completely during landscaping associated with the conversion of the site to the city's Cattle Market (see Chapter 10).

The Castle Fee

(Figs 5.1, 5.55, 5.56, 6.1, 6.47, 6.48, 7.1, 7.36, 7.37, 8.1, 8.2, 8.61, 8.62, 10.76–10.78, 12.5, 12.7 and 12.9; Plate 12.1)

As far as the author is aware, no other British Castle Fee has been subjected to such detailed scrutiny as has now been conducted at Norwich. Broad parallels at Chester and Lincoln have been discussed in Chapter 5.V. As noted in Chapters 5–6, prior to the recent excavations, little was understood of the early development of this area and its

Figure 12.9 Detail of one of the four copper alloy roundels from 2–4 Castle Street, serving as possible Castle Fee boundary markers. Probable late 13th- or early 14th-century date. Scale 1:1

inter-relationship with the other elements of the castle. Although Norwich's Castle Fee appears to have been in place during the 12th century, it remains uncertain exactly when and over what area it was first laid out (*cf.* the Liberties of the Tower of London; Keevill 2004, 12). It has been suggested in Chapter 5 that elements of a ditch (Ditch 3) recorded at Castle Mall and Golden Ball Street and other sites to the west of the castle may have formed the initial Castle Fee boundary, with a probable date of origin during the timber phase (between *c.*1067–70 and *c.*1094; Fig.12.7.A). This date is implied by the fact that the ?Castle Fee ditch had become largely infilled and was cut across by the south bailey ditch (Fig.5.4) which may have been inserted in the period *c.*1094 to *c.*1121–22. If the Castle Fee was not in fact established until the second major phase of castle construction (*i.e. c.*1094 to *c.*1121–22), the southern part of its line may have been demarcated throughout its life by the south bailey ditch (*cf*. Fig.12.7.B and 12.7.C), although this would imply that the outwork postulated around the south gate lay outside the Fee and is therefore unlikely. On balance, an origin in association with the foundation of the castle seems probable.

The uncertainties over the displacement of the first ditchwork discussed above ('The Timber Castle') mean that is difficult to clarify whether the initial Fee extended around the north-east bailey that was to become known as the Castle Meadow (Period 2.1, Fig.12.7). By *c.*1075 additional ditchwork had been set within the south bailey and possibly also within the north-east bailey (Period 2.2, Fig.12.7.A). By the time of the reworking of the defences associated with the stone phase, the stretch of the ?Castle Fee ditch to the west of the castle may have been infilled (pottery from its earliest fills at Castle Mall dates to the mid–late 11th century, followed by fills with 11th- to 12th-century ceramic dates; Chapter 5.II), indicating an early alteration to the character of this boundary which later documentary evidence indicates was maintained along the same line for all but the southern part of its course. Figure 12.7.B and the associated reconstruction offered in Figure 6.47 reflects this rather curious arrangement, leaving a narrow strip of land within the Fee but excluded from the reworked defences which may have included the recutting of the southern part of the ?Fee ditch to form an outwork around the south gate. It therefore appears that the western element of the Fee boundary may only have been defended in the very early years of the castle, its changing form perhaps relating to the additional security of this boundary provided by the development of the French Borough, established before 1075 (see Chapter 5.I). If this assumption is correct, the western part of the Castle Fee boundary may only have been needed for defence during the first few years of the castle, perhaps serving to mitigate against any military vulnerability along the Great Cockey stream valley. As has been noted, by the late 13th century, this part of the boundary at least may have been demarcated by purpose-made roundels set on posts or a palisade (see below). A similar arrangement is possible during the 12th century, at least along the eastern bank of the Cockey stream and possibly around the entire Fee circuit although much of this remained demarcated by ditchwork.

By the time that documentary evidence begins in the latter part of the 13th century (Fig.12.7.C), the southern part of the Castle Fee boundary may have been demarcated by the south bailey ditch which was to remain the boundary in later times (see also note on possible ditchwork to the south of St Martin-in-Balliva church noted in Chapters 7.I and 7.VI). The boundary around the Castle Meadow seems to have remained unchanged.

The Castle Fee continued to exert its influence over the subsequent medieval and later administration of

Plate 12.1 Copper alloy roundels from 2–4 Castle Street, Norwich: possible Castle Fee boundary plaques. Scale 1.1

this part of Norwich (Figs 12.7.C and D) and the area remained an administrative entity for the payment of rent for many centuries. Extant Castle Fee rent lists span the period from 1397 to 1626 (see Chapters 7–10, Fig.8.2 and Part IV). Demarcation of the Fee boundary in the late 13th or early 14th century may have entailed the use of bronze roundels (Fig.12.9; Plate 12.1) decorated with the Arms of England, 1198–1340 (Site 29N; Green 1965, 163–164; Shepherd Popescu *et al*, 2004). As yet, the positioning of such markers appears to have no direct parallel, although the marking of boundaries in this manner is known in other contexts (see Chapter 7.V and Shepherd Popescu *et al*, 2004). Some such precincts, as was the case with the Norwich Castle Fee, included the right of sanctuary. Other rights and duties of those residing within the Norwich Fee are detailed in the *Liber Cartarum et Placitorum* (Kirkpatrick MS, 42; quoted in Woodward 1847, 28–31; reputedly written between the late 12th and early 13th century). These included acting as part of the castle garrison when required.

The rite of sanctuary was one of the complaints resulting in the handover of the Fee to city in 1345, although in actuality the matter was more pragmatically based (see Chapter 8.I). From this date the city chamber-

Period	*Enclosure*	*Hectares (max. extent)*	Acres *(max. extent)*	*Hectares (area enclosed by rampart)*	*Acres (area enclosed by rampart)*
2–4	Castle Fee	*c.*9.3	*c.*23		
2 (*c.*1067–*c.*1094)	upper bailey (top of first motte)	*c.*0.3	*c.*0.81		
	?first enclosure	*c.*6.2	*c.*15.4	*c.*4.6	*c.*11.4
	inner bailey (pre-barbican)	*c.*1.1	*c.*2.9	*c.*0.3	*c.*0.78
	north-east bailey (outer ditch) north-east bailey (inner ditch)	*c.*3 N/A	*c.*7.6 N/A	N/A *c.*1.1–*c.*1.3	N/A *c.*2.8–*c.*3.2
3 (*c.*1094–*c.*1122)	upper bailey (top of second motte)	*c.*0.9	*c.*2.3		
	south bailey	*c.*1.5	*c.*3.7	*c.*0.65	*c.*1.6
	?hornwork around south gate	*c.*0.5	*c.*1.3	*c.*0.2	*c.*0.6
4 (13th century)	barbican	*c.*1.3	*c.*3.4	*c.*0.2	*c.*0.6

Note uncertainties over course of some ditchwork detailed in text

Table 12.2 Approximate size of castle baileys/enclosures (maximum extent = total area enclosed by ditchwork)

lain became responsible for collecting the taxes, rents and other payments from those who lived around the edges of the Castle Fee, while the fee-farm rent was increased to provide the king with compensation for the loss of profit (see Chapter 8.I). It is possible that from this date the surviving Crown property (the motte and donjon) was demarcated with stone posts placed around the base of mound (Fig.12.7.D; see Chapter 8 and Shepherd Popescu *et al*, 2004). Payment of Castle Fee rent continued until the mid 18th century (Chapter 10.I) and it was not until 1805 that the 'fee of the liberty of the Castle' (*i.e.* the motte and donjon) was passed to the justices for the County of Norfolk by George III, ending over seven hundred years of Crown ownership (Chapter 11.I).

Archaeological evidence for the character of 'settlement' within the possible earliest form of the Fee during the late 11th and early 12th century is given in Chapter 5, while the activities, occupations and transgressions of its later tenants are considered in Chapters 7–10. These included the 'many tenements … without the Ditch of the Castel Hill, which were Burgage Tenements, held in Burgage of the King of his Royal Castel of Norwich' (Gurdon 1854, 46).

The impact of the Castle Fee boundary on modern road alignments has been detailed in previous chapters and is particularly evident to the west, north and north-east. To the south-east, its line was disrupted by landscaping activities of the 19th century, although it remains broadly reflected in modern routes. To the south-west, the lack of roads in the area meant that the line of the Fee was eventually lost beneath later tenements.

The Motte

(Figs 5.55, 5.58, 6.47, 6.49, 7.36, 7.38 and 10.78; Plates 8.1, 10.1–10.3)

Although the exact size of the first motte at Norwich is unknown, it was presumably smaller and steeper in profile that its successor and can be postulated to have been in the range of 45–65m in surface diameter. Work in 1999–2001 indicated the level of both the base and top of the first mound, allowing broad calculations as to workforce and duration of construction (see Chapter 5.V and 'Labour and Materials' below). This assumes that a single ditch ran around the base of the mound, cutting off the end of the natural ridge (a schematic section is shown in Fig.5.58). The possibly swift construction of such early mottes and associated timberworks is noted below.

The timescale for the extension of the motte, prior to the construction of the new donjon in *c.*1094 to *c.*1121–22 remains equivocal, although an approximate period of *c.*87 days for a team of 200 men is calculated below. As noted, this figure may be expected to rise as much as three-fold when accounting for the movement of spoil to its final position, making an estimated total of 261 days for the same 200 strong team. Recent excavations demonstrate pauses in construction, witnessed by the presence of temporary structures and hearths (Wallis in prep.). It may, then, have taken around 9 months to extend the motte (depending on the size of the workforce and a number of variables noted below) after which the motte would have been allowed to settle (see Chapter 6.V). It has been suggested that the new donjon may have been completed by 1110, albeit with incomplete internal finishing (Margeson *et al* 1994, 26), although it has also been proposed that the royal visit in 1121–22, following those in 1103 and 1108, may have been an inspection of works in progress or a viewing of the completed structure (see Chapter 6.I). As has been noted in earlier text, the cracking of the north-east corner of the donjon, which appears to have occurred relatively quickly, may have resulted from the settling of the extended part of the mound, close to or above which this part of the donjon may have rested (Fig.6.49).

The large scale of mottes in East Anglia has long been noted (Pounds 1990, 19): Thetford, for example, was the highest motte in England at 25m. The initial motte at Norwich may have had a surface diameter of approximately 45–65m (3,316m^2; 0.81 acres) and was approximately 6.5m high to the north, although less made ground existed to the south where the natural ground-slopes were utilised (see Chapter 5). The surviving, enlarged motte has the largest surface area of any motte in England with an original summit diameter of approximately *c.*100–110m (9,498.5m^2; 2.3 acres) depending on the shape of the original mound which has been subject to extensive modification over the centuries (see below). In relation to modern (pre-development) ground

surfaces, the height of the motte varied from *c.*5m on the uphill side (to the south) and *c.*12–13m to the west, north and east. Archaeological evidence detailed in Chapter 6 indicates that the southern part of the mound consisted of *c.*8m of made ground, increasing to *c.*11m to the north. The modern level at the top of mound to the east lies at *c.*32.8m OD adjacent to the standing building and *c.*32.5m OD at the surviving edge of the motte. Levels to the west are slightly lower. As has been noted in previous chapters, the uppermost 1–2m of the mound consists of modern overburden or disturbance.

The original shape of the Norwich motte may have been circular or sub-circular (as indicated in the figures included in these volumes), although by the 18th century it had reached the pronounced sub-square form recorded by antiquarians and cartographers. This was the result of the combined processes of quarrying, cutting back of the western and northern parts for road-widening schemes (a process which continued as late as 1926; see Chapter 11.I), the insertion of buildings at its base and a Civil War gun platform at its top. The bulge at the mound's north-east corner results from the insertion of a carriageway in 1721. The extant protuberance in the south-western corner is probably due to the position of donjon which prevented extensive disturbance on this side, although quarrying evidently occurred here during the post-medieval period; additionally, the last remnant of the 13th-century curtain wall to the south/south-east was finally undermined by quarrying (a process noted by Kirkpatrick; see Chapter 11). Archaeological evidence recorded both at Castle Mall and other interventions demonstrates considerable late deposition onto the sides of the mound, as well as reshaping. Paths were cut into it at various dates and its sides were converted into allotments and gardens (see Chapters 10 and 11).

Although a square shape for the original mound would not be unparalleled (the ringwork at Castle Rising, for example, was sub-square; Morley and Gurney 1997, fig.2), the major alterations to the morphology of the Norwich motte over the centuries mean that the situation remains uncertain. In his schematic depiction of 1696 (Plate 10.1.A and B), Cleer shows the motte as square on his 4-sheet version (with quarrying all around its faces and minor paths running up it) and circular on his 1-sheet plan of the same date (Frostick 2002, 21–22). Thomas Kirkpatrick's plan of 1723 shows the motte as circular (Plate 10.1.D), although writing in the early 18th century, John Kirkpatrick thought that the original mound was square, rather than circular; 'the four sides of it respecting the compass' (Kirkpatrick 1845, 240). The fact that Thomas Kirkpatrick's plan was based on Cleer's 1-sheet plan may explain this anomaly (Frostick 2002, 32).

Wards, Baileys and Enclosures

Overview

(Figs 5.55, 6.47, 7.36, 8.61, 10.76, 10.77 and 12.8)

Understanding of the ditchwork and extent of the baileys at Norwich Castle at the commencement of the archaeological excavations has been outlined Chapters 5.I and 6.I and was generally based on antiquarian and cartographic evidence, with very limited archaeological exploration. The scale of its baileys and enclosures is indicated in Table 12.2, which includes calculations both for the maximum area enclosed (*i.e.* measured from the outside of ditchwork) and the areas available for use inside the postulated ramparts. By way of comparison with other Norfolk castles, at Castle Rising, the earthworks enclosed an area of 4.8ha (12 acres) (Margeson *et al* 1994, 32), while Castle Acre's earthworks cover an area of 2.8ha (7 acres) (Coad and Streeten 1982, 143), along with the adjacent town enclosure. Of this total 1.2ha (2.9 acres) is accounted for by the south bailey or lower ward. Further afield, at Winchester, an area of 2.3ha (5.6 acres) was enclosed to create the castle by cutting off the south-west corner of the existing city defences (Biddle 1975a, 104). The castle at Nottingham covered an area of approximately 5.4ha (13.3 acres; Drage 1983, fig.1) and Lincoln 3.9ha (9.7 acres), although here a considerable area of the city — 'the Bail' — (15.6ha, 38.6 acres) may have been part of the castle (Stocker and Vince 1997, 223; see further comments under 'The Castle Fee' above). In a rural setting, the defences of the Norman timber phase at Stafford Castle, a multi-period site which included a village enclosure, are comparable in extent to those at Norwich (see Fig.12.8.D), while those of the early 12th-century castle at Sandal are considerably smaller (Fig.12.8.C; after Mayes and Butler 1983, fig.8).

There is no particular evidence to indicate the use of particular units of measurement by the Norman castle surveyors (although Table 12.2 does tentatively indicate a possible significance of approximate thirds of an acre). As at other castle sites, the placement and scale of the earthworks may simply have been a response to the local terrain rather than to any specific scaled plan, whereas buildings may well have had units of measurement.

The following text briefly outlines the general development and usage of each of the baileys, full details of which are given in earlier text.

The Upper Bailey

(Figs 5.58, 6.49, 7.38 and 10.78; Plates 8.1, 10.1–10.3)

The donjon's position above the most stable area of the raised and enlarged mound (see above) permitted ample space for other structures within the upper bailey, which in its extended form enclosed *c.*2.3 acres. Its somewhat odd position on the south-western corner of the mound — at the furthest point from the English Borough that it was to dominate — seems to have been a practical response to local circumstances, including the position of the main approach route, rather than having any deeper meaning. Other than the great donjon, little is known of the remaining Norman structures on the mound. The large size of the motte may relate in part to the fact that this was a royal castle and could suggest that some of the buildings usually found within the bailey, including the constable's house, were from an early date sited at the top of the mound (Green 1966, 3). A chapel, dedicated to St Nicholas, lay on top of the motte, the earliest documentary reference being made in the mid 13th century. Kirkpatrick placed this behind the donjon, like the one at Castle Rising. A second chapel survives within the great tower at principal floor level (Heslop 1994, 44–46). Other buildings, including the kitchen, Great Hall and gaol, may either have lain on top of the motte or within the south bailey. In the late 13th century, a new Great Hall may have been built against the northern side of the great tower (Drury 2002b; see Chapter 7 and Plate 10.2.A).

The upper bailey was probably approached by a flying timber bridge in its earliest phase, latterly replaced in the period *c.*1094 to *c.*1121–22 with the great stone bridge, elements of which were explored during the Castle Mall project (see below). The position and character of any access point from the Castle Meadow remains uncertain. In both its timber and stone phases, the perimeter of the upper bailey was enclosed by palisades and other timberworks (Chapters 5.I and 6.1), which were replaced in the latter part of the 13th century by a curtain wall (see above and Chapter 7). No trace of any of these early features has been located archaeologically, despite a number of interventions around the edge of the motte.

The South Bailey

(Figs 5.58, 6.49, 7.38, 8.2 and 10.78)

The development of the south bailey of Norwich Castle has been fully detailed from the time of the Conquest until the present day in Chapters 5–11 and the sequence of ditch infilling is considered under 'Ditch Chronologies' below. Immediately after the Conquest, (Period 2.1, Chapter 5.II) it would appear that the first enclosed area, which may have contained the church of St Martin-in-Balliva, was used for craft/domestic-type activities including grain storage and processing and the stabling of horses (although note the caveats over dating detailed in earlier chapters and Chapter 13). Small-scale metalworking was evident and may have been associated with production for the castle and its garrison. Notable amongst the other craft waste was evidence for *in situ* bone- and hornworking (see 'Life Within the Castle' below). Further discussion of the nature of activities within the early bailey appears in Chapter 5.V, 'Bailey Usage'.

Before many years, Norwich Castle's defences were strengthened with increasingly complex ditchwork (Ditches 4–8; see Table 12.5), the smaller examples appearing to have been relatively short-lived and perhaps relating to the troubled years of 1075 and the 1080s (Period 2.2, Chapter 5.II and 5.V and see comments under '*c.*1075–*c.*1094' above). Evidently the pair actually lying within the south bailey (Ditches 7 and 8) became overgrown with weeds, indicating local vegetation dominated by nettles, thistles and other weeds, with bushes of elder and bramble. Use as a refuse tip followed in the late 11th to early 12th century providing some good artefactual assemblages and including the disposal of the partial carcasses of cats and dogs.

A major reworking of the defences, including the ditchwork of the south bailey, appears to have coincided with the construction of the stone donjon in *c.*1094 to *c.*1121–22. As has been discussed in Period 3 (Chapter 6.V), by this period if not before, the redefined south bailey would have housed a range of buildings, similar to those recorded at other castle excavations. At Norwich, other than the castle gates and well, these structures were represented during the excavations only by building materials and structural ironwork. Craft activities included limited antler-, leather- and metalworking (see 'Castle Life' below).

By the early 13th century (Period 4.1, Chapter 7.II), increasing deposition of waste into the castle ditches was evident, including animal carcasses and sewage. Despite its known position in the western half of the south bailey no trace of the medieval Shirehouse was located, although a ditch found here may represent the documented 'ditch to the Shirehouse yard' (Ditch 14). Deliberate infilling of the south bailey ditch during the mid 13th to mid 14th century (Period 4.2, Chapter 7.II) was probably associated with the combined presence of the new castle barbican and construction of the city walls. The south bailey was increasingly used as a local grazing ground, attested by the presence of on-site animal breeding. The parish boundaries between St Peter Mancroft, St John de Berstrete (Timberhill) and St Martin-in-Balliva (at Bale) ran across the south bailey and barbican (Fig.8.2). Some at least may have been dictated by the position of routes leading towards the motte.

Quarrying and extensive pitting occurred within the south bailey and above its rampart: although it appears to a limited extent earlier, this was evidently triggered by the transfer of the baileys to the city in 1345 (Period 5.1, Chapter 8.II). Allied to this was the robbing of masonry structures and the encroachment of fringing tenements (Periods 5.1 and 5.2), although distant areas of the site, away from contemporary roads, remained effectively blank in archaeological terms.

The early 17th century saw the first official use of the south bailey as Norwich's Cattle Market (Period 6), at which time the upper reaches of the south bailey ditch may have been infilled with refuse. Its last remnants at the Golden Ball Street site disappeared in the 16th century. Tenements and their yards and gardens later extended above the infilled ditch. By the 18th century, the bailey was used not only as the Cattle Market, but also for musters and ceremonial gatherings (Period 7.1). Its open space was the obvious choice for the air raid shelters in 1939 and its basic form survives in the shape of a park — Castle Green — above the new development (Period 7.2).

The Inner Bailey/Barbican

(Figs 5.58, 6.49, 7.38 and 10.78)

Other than the surviving remnants of the motte ditch, the great 13th-century barbican ditch remained the most dominant of the castle ditches in terms of the local landscape, its survival the result both of its massive scale and its physical position in relation to adjacent tenements. Details of previous observations of the ditch and interpretations of its shape and scale are given in Chapter 2 and Chapter 7, where constructional parallels for castle barbicans can also be found. Patterns of refuse dumping into the barbican ditch, which spanned the early–mid 14th to 18th centuries, are summarised under 'Ditch Chronologies' below and the archaeological evidence is detailed in Chapters 7–11.

Surprisingly, the barbican earthwork appears to have replaced a pre-existing ditch which already sub-divided the south bailey in the late 11th or early 12th century (Periods 2.2 and Period 3; Chapters 5.II and 6.II), effectively forming a 'barbican' as it would be known in a later age (described in earlier text as an 'inner bailey' or courtyard). This provides, perhaps, another example of just how advanced the defences of Norwich were for their time and is possibly an indication of how the castle withstood the prolonged late 11th-century siege. The ditch appears to have been replaced on a much larger scale in the 13th century (Period 4.2; Chapter 7.II), at which time the outer defences of the north-east bailey/Castle Meadow fell from use. Castle-related activities enclosed within the barbican, which proved to be wider

than pre-excavation reconstructions suggested, include the gates, substantial well and minor ditchwork retained from the 12th-century phase (Period 3, Chapter 6), alongside occasional pitting and structures of the 13th to 14th centuries (Period 4.2, Chapter 7).

After 1345, with the transfer of the baileys to the city, the well within the barbican became the focus of large-scale refuse disposal, particularly during the second half of the 15th century (see Chapter 9). At this time, robbing of the masonry structures within the barbican may have been underway. By the late 16th to early 17th century, the well superstructure had been entirely removed and quarrying was eventually to cause the collapse of one of the gatehouses in the 17th century (Period 6.2, Chapter 10.II). It was not until this time that 'domestic' pitting on any scale occurred within the barbican area, again emphasising its distance from burgeoning tenements. Much of the barbican area, including the rampart, was levelled in the landscaping campaigns of the 18th and 19th centuries (Periods 6.3 and 7.1, Chapters 10.II and 11.II).

Its spatial position meant that the barbican ditch did not influence development of the local street pattern, although its presence did restrict the width of fringing tenements (see below). Pathways developed leading into and along the base of ditch, while activities within it included the placement of a timber revetment (Period 6.2, Chapter 10.II). As with the motte ditch, the barbican was probably used as a sump for adjacent drains and sewers during the late medieval and post-medieval periods.

The Castle Meadow (North-East Bailey)
(Figs 12.2 and 12.5)
Generally, English castles 'remained singularly true to the normal compact curvilinear defence', although baileys were occasionally constructed with square sides (as at Windsor and Warkworth; King 1991, 43). At Norwich, however, the distinctive square shape of the eastern side of the Castle Meadow was dictated by the presence of a pre-existing road — Superior Conesford (King Street) — forming one of the main arterial routes into the city. The bailey effectively infilled an 'insula' of the Late Saxon town. The awkwardness of some of the previous interpretations of the bailey, first presented as a sub-triangular form by Harrod (see Fig.12.5.C) and taken up by Campbell (1975; Fig.12.5.G), Ayers (1985, fig.2) and Atkin (2002a, fig.1) has been noted in earlier chapters. It has been suggested that 'the anachronistic position of this bailey was already recognised by the time that the keep was built and that there was therefore no need to bring it into a co-ordinated defensive network' (Ayers 1985, 6). The sequence of ditch recuts recorded at Castle Mall, however, does indicate a co-ordination in planning, implying the presence of concentric ditchwork here as well as in the south bailey. Both this and the scale of the outer ditchwork refute the previous suggestion that the bailey was militarily weak (see Chapter 5.V).

New evidence from the Castle Mall site adds significantly to the understanding of the defences and character of this bailey and may confirm previous suggestions that it — or at least its outermost ditch — was a secondary addition. It has been suggested in Chapter 5 that the lack of access to farmland may have engendered construction of this defended meadow which also probably housed livestock and crops and may also have provided a field of fire and additional space for the garrison when required. The meadow was supplemented by castle land and meadow in Earlham (see Chapter 5.V). At Nottingham Castle, the brewhouse and castle mills lay immediately to south of castle precinct, between it and King's Meadows (Drage 1983, fig.1; see Fig.12.2). The strongly fortified large outer bailey of this castle contained little evidence of buildings and appears to have been used for grazing despite the provision of additional meadowland to the south (Drage 1983, 118). In a modern context, at Abinger Castle, Surrey, the motte ditch was used in the mid 20th century as a drove-way for cattle from an adjacent farm (Hope-Taylor 1956, 228) and the evidence for herbivore grazing within the Norwich ditch noted above suggests that similar use may have occurred during the medieval period within the Castle Meadow.

At Norwich, Beecheno suggests that this bailey was 'probably originally only accessible by a slight wooden bridge from the top of the hill' (*i.e*. the motte) (Beecheno 1888, 22). The Castle Mall excavations produced no evidence for access to this bailey, although possible access routes are discussed in earlier text. The development of tenements and routes around and within this bailey has been summarised in Chapters 7–11 and fully detailed in Part IV (in the parishes of St Michael at Plea, St Cuthbert and St Peter Parmentergate). In 1784, the ditch was 'let out in garden plots' (Beecheno 1888, 22). An outer bank in the London Street area is also suggested (Beecheno 1888, 23) although no such bank was recorded at the Castle Mall site.

Ditches and Ramparts

Comparisons of Scale
(Fig.12.8)
A comparison of scale of the major ditches at Norwich Castle is given in Table 12.3. Given the lack of surviving ramparts at Norwich, it is difficult to establish the original relationship of width to height in relation to associated ditchwork (see 'Ramparts' below). The surviving ditch profiles were generally V-shaped, with stepping of the sides caused by erosion. Some such stepping may, however, have been deliberate (*e.g.* in the north-east bailey; see Chapter 5) forming terraces/walkways within the ditches, or perhaps representing the stages necessary to the throwing up of spoil during ditch digging. Such V-shaped profiles are known at many castle sites and were the obvious choice for defensive capability.

The scale of the 13th-century barbican ditch exceeds the known size of the contemporary city ditch (see Chapter 7.V) and is similar in dimensions to the earthworks of the inner enclosure at Stafford, which were up to *c.*30m wide (Darlington 2001, fig.7; see Fig.12.8). The middle bailey ditch here was *c.*20m wide, making it wider than the Norwich south bailey ditch (although note that the Stafford measurements are from the earthwork survey plan which may mask original dimensions). At Castle Acre, the bailey ditch was *c.*20m wide and the barbican *c.*12m wide (Coad and Streeten 1982, fig.3; see Fig.12.8).

At Hen Domen, the inner bailey ditch (with a similarly stepped profile to some of the Norwich examples) was less than 5m wide and *c.*2m deep, while the adjacent outer bailey ditch was *c.*1.5m deep and less than 4m wide (Higham and Barker 2000, figs 3.20 and 3.25), both

Ditch	*Ditch no.*	*Construction Period*	*Details*	*Est. original width*	*Est. original depth*
?Castle Fee Boundary, to west	3?	2.1		9m	unknown
?Castle Fee Boundary	3	2.1		8m	3.5m
Motte Ditch	11	2.1/2.2	initial cut	unknown	unknown
	11	3.1	recut	*c.*26.5m	*c.*9m
South Bailey	10	3.1		14m	5.5m
?Inner Bailey (pre-barbican)	4	2.2		?*c.*15m	5.5m+
Barbican	13	4.2		23–27m	*c.*10m
North-East Bailey, outer ditch (Ditch 9)*	9	2.2	initial cut	*c.*20–27m	*c.*8.5–9.5m
	9	3.1	recut 1	*c.*14m	*c.*9m
	9	4.1	recut 2	*c.*8m	*c.*5m

* these figures are highly speculative, given the caveats presented in earlier text (Chapters 5–7)

Table 12.3 Dimensions of the major ditches of Norwich Castle

being smaller in scale than the minor ditches at Norwich although of course relating to the defence of a much smaller interior.

At Norwich, the minor ditches were generally in the region of 6m wide, with depths of between 2 and 5m (Table 12.4). These ditches generally had the sharpest profiles, probably because they were open for considerably less time than their larger counterparts. Of note is the fact that the largest of these minor ditches, and the only one with evidence of recutting, is Ditch 6, which lay just to the east of the gates defending the castle approach. Its position appears somewhat anomalous in the defensive scheme, although the fact that it was recut at the time when its former partnering ditch (Ditch 5) was infilled indicates that it maintained some kind of strategic significance. Its position in relation to the postulated rampart means that it would have cut off access into the eastern part of this inner bailey/courtyard, unless the rampart was much narrower than has been suggested which might have afforded access to the south of it. In this case, however, how the ditch could have functioned without its defensive pair remains a mystery, although the position of a gully may indicate the insertion of a palisade. Had this ditch fully blocked the gap between the defences of the north-east bailey and the rampart, no direct access would appear to have existed to the north-east bailey.

The character of most of the ditch junctions at Norwich went unrecorded, as they lay for the most part outside the excavation areas. The relative positions of some of the early ditchwork have proved problematic in terms of reconstructing the defensive sequence (see further comments in Chapter 6.II (Period 3.1) and 6.V). Some of the ditches were evidently of different depth where they joined, and were perhaps marked by timberwork including palisades (*cf.* Castle Acre, Margeson *et al* 1994, fig. opp. iv). Others were clearly butt-ended (as in the case of at least one phase of the outermost north-east bailey ditch) or may have had seamless junctions.

Wet or Dry Ditches?

It has been noted in previous chapters that references to 'the Common or King's Ditch called the Cockey' may have implications for the displacement of the Great Cockey stream in relation to the castle ditches to the west of the motte. Woodward believed that 'Into the latter [*i.e.* the motte ditch] a small stream emptied itself, which had its rise at the spot now St Stephen's gate; to which was added another stream running from Ber-street gate, a little to the north of Surrey Street, and uniting with the former at the east end of Rampant-Horse-street: and it is probable that the redundant supply of water passed off by a channel now called Cockey-lane, and thence through Wymer-street, in St Andrew's parish, to the river near Blackfriars' bridge.' (Woodward 1847, 10). On the basis of this theory, he produced a cross-section of the defences showing his understanding of the water table and some rather romantic views of Norwich Castle encircled by water (see frontispiece).

Rye was also convinced that the castle ditches (specifically the motte ditch) were 'once filled with water for defensive purposes' (Rye 1921, 10). He produced a plan showing the line of the water courses and gradients in relation to the castle ditches, suggesting that the Cockey stream could have been diverted into them: 'When the need for water in the Moat for military purposes ceased, nothing would have been easier than to shut it off from the moat and let it take a new course on lower ground' (*ibid.*). Rye cites documentary evidence that there was

Ditch	*Ditch no.*	*Period*	*Est original width*	*Est original depth*
L-Shaped ditch in inner bailey	5	2.2	*c.*5.75m>	*c.*2.4m>
Linear ditch in inner bailey	6	2.2	*c.*6m	<*c.*2m
	6	3.1	*c.*7m	*c.*3.40–4.80m
Inner crescentic ditch in south bailey	7	2.2	*c.*3.5m>	*c.*1.80m>
Outer crescentic ditch in south bailey	8	2.2	*c.*6.8m>	*c.*2.45m>
North-East Bailey, inner ditch (Anglia TV)	N/A	undated	6m (surviving)	2m (surviving)

Table 12.4 Dimensions of the minor ditches of Norwich Castle (defending bridge landings)

water in the ditches until the late 17th century, with a reference to a Water Gate (although the reference he uses does not necessarily indicate that this lay in the immediate vicinity of the castle).

Although sewers evidently drained into the castle ditches, there is no evidence to substantiate the theories outlined above and indeed it is now understood that wet moats were rare during the Norman period: dry moats made assault far more difficult (Morillo 1994, 140). In some places, the base of the barbican ditch at Norwich cut into the natural chalk and the whole area of the site was naturally well-drained (see Murphy, Chapter 13, 'Plant Remains'). A possible drop in the local water table in association with the construction of the ditches and, possibly, mining activity has been noted in previous chapters. Further comments on changes in sea/river level and the antiquarian assumption that Norwich was a sea inlet are made in Chapter 2.

Ground Preparation and Marking Out

Landscaping within the baileys at the time of the Conquest was recorded in the south bailey, where earlier features (including pits and hollows) were levelled with substantial dumps (Period 2.1, Chapter 5.II and V) and in the north-east bailey, where the sloping surface may have been scarped to raise the natural incline.

A marking out ditch was tentatively identified within the north-east bailey at Site 150N, although this interpretation was later revised (Atkin 2002a, 69–72). No such features were found at the Castle Mall site. Gullies found beneath ramparts at other castle sites have been recorded over an insufficient distance to prove such an origin (Renn 1968, 14). A gully recorded behind the inner bailey (later barbican) rampart at Castle Mall may have served to retain the rear of the rampart (Chapter 6).

Ditch Chronologies

For ease of reference, a summary all of the ditches (both castle- and city-related) recorded at Castle Mall and Golden Ball Street appears in Table 12.5. The duration of infilling — in the case of the barbican ditch over a period of *c.*500 years — is indicated by the ceramic date of each sequential phase of fills. Supplementary dating evidence of course comes from other categories of finds, the stratigraphic sequence and documentary sources. The minor ditches, lying within the south bailey and the inner bailey/courtyard at the base of the castle bridge (later the barbican) all appear to have been relatively short-lived and were probably operative in the period *c.*1075 to early 12th century. They appear to have become overgrown fairly soon after construction and as noted above an association with siegeworks is possible (see Chapter 5).

The sequence of ditches relating to the outer definition of the north-east bailey (Castle Meadow) provides the clearest evidence for re-cutting of any of the ditches, although the feature, which may have been a secondary insertion of the late 11th to early 12th century, appears to have been deliberately infilled at the time the barbican ditch was cut across its western end during the 13th century (Period 4.2). The ?Castle Fee boundary ditch, probably inserted during the late 11th century and perhaps recut as a hornwork in *c.*1094 to 1121–22, was finally infilled in the late 14th to 15th century and was sealed by an area of metalworking. The south bailey ditch, possibly inserted in the period *c.*1094 to *c.*1121–22, was substantially infilled during the 13th to 14th centuries, although evidence at the Golden Ball Street site indicates recutting and continued refuse dumping into this part of the ditch in the late 15th to 16th centuries. The possible reasons for this are considered further in Chapter 8. Infilling of the barbican ditch began on a small scale in the first half of the 14th century, although it was apparently maintained in a surprisingly clear state until the late 16th century, after which vast dumps of city refuse continued until the early 18th century, most of the ditch being capped during landscaping in 1738 (see Chapter 11).

Ramparts

(Figs 5.58, 6.49 and 7.38; Plate 6.35)

The only major surviving area of rampart was associated with the south bailey ditch, lying on its inner side (Chapter 6). A tiny remnant of what may have been a bank on the inner side of the ?Castle Fee ditch was recorded at Golden Ball Street (Chapter 5). The bank associated with the south bailey ditch survived to nearly 2m in height, with a basal width of *c.*20m (as noted above, the related ditch having estimated original dimensions of *c.*14m wide by *c.*5.5m deep). The rampart had been constructed above the old ground surface and partially overlay a Late Saxon cemetery (Cemetery 3; Farmer's Avenue). The surviving core of the rampart, the outer part of which had been quarried away, was of layered construction with a possible turf base. Possible pauses or phases in construction and the possible remnants of a timber framework were noted (Chapter 6.II and V). The Norwich rampart was similar in construction to the Norman banks recorded at other castle sites. Four phases of construction were evident, for example, in the construction of the bailey rampart at Launceston Castle with later adaptations to produce a timber-laced earth wall (Saunders 1970, 90–91). At its base, the initial rampart here was *c.*12m (*c.*40ft) wide, with a projected height at its outer face of 4.8m (*c.*16ft) — a low marking out bank was found in association. Such may have been the case at Norwich, although later truncation had unfortunately removed most of the evidence. The documentary record, however, attests to the presence of sophisticated timberworks used in association with the stone phase of the castle, including probable look-out towers, palisades and rampart walks. A few post-holes and possible walkways in the side of the ditch were recorded in the north-east bailey ditch (Chapters 5 and 6), while post settings and possible access steps were recorded within the ?Castle Fee ditch terminal at the Golden Ball Street site (Chapter 5).

Evidence for the presence of other banks comes largely from the documentary record, ramparts associated with both the barbican and north-east bailey/Castle Meadow surviving in the ground to be observed by antiquarians. In *c.*1725 Kirkpatrick described the barbican rampart as 20 yards wide (*c.*18m), describing it as 'steep on both sides and … narrow on the top' (1845, 243). No above-ground remnants of this bank were found (Period 4.2, Chapter 7.II), although its presence was indicated both by the position of later features and spoil from it which had later been pushed into the top of the ditch (Chapter 10). Confusingly, a number of antiquarian references appear to suggest that the rampart lay on the *outer* side of the ditch, although this does not seem to have been likely. A very approximate estimate of the rampart's

Ditch Phase	*Details*	*Period*	*Monograph Chapter*	*Ceramic date (infilling)*
Ditch 1: pre-dating Cemetery 4 (St John at the Castle Gate)				
1	cut	1.3	Part 1, Chapter 4	N/A
2	erosion/weathering	1.4	Part 1, Chapter 4	M11–12th
3	infilling	1.4	Part 1, Chapter 4	(10th)–11th
4	fire debris	1.4	Part 1, Chapter 4	M11–12th
5	refuse	1.4	Part 1, Chapter 4	L11–E12th
Ditch 2: cemetery boundary marker (St John at the Castle Gate)				
1	cut	1.4	Part 1, Chapter 4	N/A
2	silting/erosion	2.1	Part 1, Chapter 5	11–12th
3	refuse	4.2	Part 1, Chapter 7	13–E14th
Ditch 3: ?Castle Fee boundary marker				
1	cut	2.1	Part 1, Chapter 5	N/A
2	weathering/erosion	2.2	Part 1, Chapter 5	ML11th
3	deliberate infilling	2.2	Part 1, Chapter 5	11–12th
4	recut	3.1	Part 1, Chapter 6	N/A
5	silting/erosion	3.2	Part 1, Chapter 6	11–12th
6	redeposited natural	3.2	Part 1, Chapter 6	E12th
7	mixed silts and refuse	3.2	Part 1, Chapter 6	12th
8	mixed backfills	4.1	Part 1, Chapter 7	L12–13th (14th)
9	levelling	5.1	Part 2, Chapter 8	undated
	final backfills	5.1	Part 2, Chapter 8	L14–15th
Ditch 4: ?Inner bailey (pre-barbican)				
1	?cut	2.2	Part 1, Chapter 5	N/A
Ditch 5: L-shaped ditch, within inner bailey (pre-barbican)				
1	cut	2.2	Part 1, Chapter 5	N/A
2	silting/erosion	2.2	Part 1, Chapter 5	11–12th
3	?organic growth	2.2	Part 1, Chapter 5	L11–12th
4	infills	2.2	Part 1, Chapter 5	12th
5	refuse	2.2	Part 1, Chapter 5	E12th
Ditch 6: Linear ditch, within inner bailey (pre-barbican)				
1	cut	2.2	Part 1, Chapter 5	N/A
2	infilling	3.1	Part 1, Chapter 6	L11–12th (implied by other finds)
3	recut	3.1	Part 1, Chapter 6	-
4	infilling	3.2	Part 1, Chapter 6	(11th)
5	infilling	5.1	Part 2, Chapter 8	L14–15th
Ditch 7: Inner crescentic ditch, within south bailey				
1	cut	2.2	Part 1, Chapter 5	N/A
2	silting	2.2	Part 1, Chapter 5	L11–E12th
3	refuse/organic growth	2.2	Part 1, Chapter 5	L11–12th
4	infilling	3.1	Part 1, Chapter 6	L11–12th
Ditch 8: Outer crescentic ditch, within south bailey				
1	cut	2.2	Part 1, Chapter 5	N/A
2	silting	2.2	Part 1, Chapter 5	L11–E12th
3	refuse/organic growth	2.2	Part 1, Chapter 5	L11–12th
4	infilling	3.1	Part 1, Chapter 6	L11–12th
Ditch 9: North-east bailey/Castle Meadow (outer ditch)				
1	construction	2.2	Part 1, Chapter 5	mid 11th–12th
2	infill of 1st cut	3.1	Part 1, Chapter 6	mid 12th
3	recut and early fills	3.1	Part 1, Chapter 6	early 12th
4	silting and trampling	3.2	Part 1, Chapter 6	(mid 11th)
5	animal grazing	3.2	Part 1, Chapter 6	12–14th
6	silting and dumping	3.2	Part 1, Chapter 6	[L16–17th]
7	occupation	3.2	Part 1, Chapter 6	early 12th

Ditch Phase	*Details*	*Period*	*Monograph Chapter*	*Ceramic date (infilling)*
8	dumping	3.2	Part 1, Chapter 6	(11th)
9	recut and silts	4.1	Part 1, Chapter 7	12th
10a	pits	4.1	Part 1, Chapter 7	} (late12th) 13–14th
10b	structures	4.1	Part 1, Chapter 7	}
10c	structures	4.1	Part 1, Chapter 7	}
11	disuse	4.2	Part 1, Chapter 7	late12–14th [L14th]
Ditch 10: South bailey				
1	cut	3.1	Part 1, Chapter 6	N/A
2	infilling	3.2	Part 1, Chapter 6	12th
3	recut and refuse	3.2	Part 1, Chapter 6	12th
4	refuse and weathering	4.1	Part 1, Chapter 7	E13th
5	refuse	4.2	Part 1, Chapter 7	M13–14th
6	refuse	4.2	Part 1, Chapter 7	}13–14th
7	?recut	4.2	Part 1, Chapter 7	}
8	infills	4.2	Part 1, Chapter 7	}
9	recut and refuse	5.2	Part 2, Chapter 8	L15–16th
10	reuct and infills	5.2	Part 2, Chapter 8	L15–16th
11	cleaning/levelling	5.2	Part 2, Chapter 8	16th
Ditch 11: Motte ditch				
1	cut	3.1	Part 1, Chapter 6	N/A
2	erosion	3.2	Part 1, Chapter 6	-
3	refuse	4.2	Part 1, Chapter 7	13–14th
4	refuse	6.1	Part 2, Chapter 10	L16–E17th
5	refuse	6.3	Part 2, Chapter 10	-
Ditch 12: Ditch north of cemetery boundary (St John at the Castle Gate)				
1	cut	3.2	Part 1, Chapter 6	N/A
2	fills	3.2	Part 1, Chapter 6	12th
Ditch 13: Barbican				
1	cut	4.2	Part 1, Chapter 7	N/A
2	early fills	4.2	Part 1, Chapter 7	EM14th
3	infills	5.1	Part 2, Chapter 8	L14–15th
4	features	5.1	Part 2, Chapter 8	-
5	infills	5.2	Part 2, Chapter 8	M15–16th
6a	infills	6.1	Part 2, Chapter 10	}L16–17th
6b	?quarries	6.1	Part 2, Chapter 10	}
6c	infills	6.1	Part 2, Chapter 10	}
6d	infills	6.1	Part 2, Chapter 10	}
7	infills	6.2	Part 2, Chapter 10	ML17th
7a	refuse	6.2	Part 2, Chapter 10	(L16) M17th
7b	revetment	6.2	Part 2, Chapter 10	ML17th
7c	refuse	6.2	Part 2, Chapter 10	ML17th
7d	gullies	6.2	Part 2, Chapter 10	L17th
8	final fills	6.3	Part 2, Chapter 10	L17–18th
Ditch 14: Ditch to ?Shirehouse				
1	cut and slumping	4.2	Part 1, Chapter 7	-
2	redeposited natural	4.2	Part 1, Chapter 7	-
3	silting	4.2	Part 1, Chapter 7	-
4	backfill	4.2	Part 1, Chapter 7	(12th)
5	disuse	5.1	Part 2, Chapter 8	M14–15th
Ditch 15: Property boundary marker				
1	cut	5.1	Part 2, Chapter 8	N/A
2	early fills	5.1	Part 2, Chapter 8	(10–11th)
3	infills	5.2	Part 2, Chapter 8	ML15–16th

Table 12.5 Summary of all ditches recorded at the Castle Mall and Golden Ball Street sites, by ditch phase and period (Periods 1–6)

width, drawn from what little archaeological evidence there is (including the probable position of the gatehouse undermined by quarrying in the post-medieval period), lies in the region of 20m, comparing with an estimated original ditch scale of 23–27m wide and *c.*10m deep. At Castle Rising, the initial rampart forming the ringwork was approximately 5m high, later being raised in stages to reach a final height of *c.*11m and a width of over 20m, with a 6m wide flat top (Morley and Gurney 1997, 47–49, 52). The associated ditches here were in the region of 20m wide.

It is possible that low counterscarp banks were present at Norwich, similar to those recorded elsewhere (*cf.* Higham and Barker 2000, fig.3.25). Such banks placed on the outer circuit of a ditch often resulted from ditch cleaning (King 1991, 58). It was originally suggested that Norwich Castle's south bailey rampart was a counterscarp bank (Wilson and Hurst 1964), although this was based on a misunderstanding of the location of the related ditch which, as has been discussed in Chapter 6.V, lay further south than was previously believed.

There was little evidence to indicate the presence of Norman quarry pits at Norwich Castle, such as might have provided additional aggregate for the ramparts, although the numerous later quarries recorded within the south bailey (Chapter 8) confuse the issue (in the model produced in the 1990s, Plate 6.35, some of these quarries were postulated as having a possible Norman origin; an interpretation later revised on the basis of finds evidence). A few possible quarries were recorded in both Periods 2 and 3 at Castle Mall, with additional examples of late 11th- to 12th-century date (Atkin 2002a, 69) being recorded during earlier excavations beneath the north-east bailey. Such pits at Launceston Castle may have been used to obtain clay for the bailey rampart (Saunders 1977, 132). At Norwich, large scale quarrying may have occurred along the eastern edge of the Ber Street ridge to the south of the castle (see earlier chapters).

Palisades and Walls

(Figs 5.55 and 6.47)

Despite their regular mention in the documentary record from the 1170s onwards, there was little surviving evidence for the presence of palisades during the active military life of the castle due to the almost complete removal of the castle ramparts, as noted above. Timberworks associated with the crescentic ditches of the timber phase within the south bailey have been suggested (Fig.5.55). Palisades may have extended down the sides of the motte, and possibly within ditches (*e.g.* Fig.6.47).

The combination of repeated damage and subsequent repairs to the palisade around the top of the mound and changing trends in castle construction, led to the addition of a brick and stone curtain wall with a circuit of towers which was completed in 1268/9 (Tillyard, Chapter 7.I). Several interventions have taken place on the perimeter of the mound, but nothing of the 13th-century works has yet been found (see Chapter 7.V). The wall was damaged during the Civil War in works associated with the construction of a gun platform, although elements of it survived until the late 17th to early 18th century (Chapter 10.I). The perimeter wall was rebuilt in a different position in granite in the early 19th century, in association with use of the donjon as a prison (see Chapter 11.I).

Well

One of the most significant and entirely unexpected discoveries of the Castle Mall excavation was the substantial masonry-lined well nearly 30m deep, just to the west of the foot of the castle bridge and contained within an inner bailey (later the barbican), providing a supplementary source of water to the other well within the donjon itself. Timberwork associated with the well included an integral access ladder and scaffolding. Full details of its complex construction are given in Period 3.1, Chapter 6.II with a wider discussion of comparable castle wells and implications for water supply presented in Chapter 6.V. The well was eventually filled with the refuse of local artisans and other inhabitants of Norwich during late medieval times, providing a unique insight into daily life of the period (Chapter 9). Its presence, although long-forgotten, continued to cause localised subsidence within the Cattle Market and later car park (Chapters 10–11).

Approach Roads, Gates and Bridges

(Figs 5.1, 5.55, 5.58, 6.1, 6.49, 7.1, 7.38, 12.5 and 12.7)

A Norman desire to control road traffic has been noted, particularly in rural contexts (Creighton 2002, 40–41); at Castle Acre a pre-existing route was diverted to produce a 'carefully contrived approach' to a formalised setting of the castle. At Norwich a reflection or reworking of a pre-existing route may have enhanced defensive capability, although in the stone phase the route may have been straightened somewhat to lead through the sequence of new gates, over the bridge towards the formal entrance of Bigod's Tower on the eastern side of the donjon. The castle's north-east bailey/Castle Meadow was delimited to the east by King Street which maintained its previous course, in a similar way to Mileham, Norfolk where the castle was specifically placed to overlook the major local route (see Creighton 2002, 141–3).

The main approach to Norwich Castle was always from the south (see 'Site Selection' above) and 'it is tempting to interpret in a symbolic sense the fact that the keep looked towards London' (Heslop 1994, 8). The new evidence contained in these volumes demonstrates that the approach road (now Golden Ball Street) was a reworking of a Late Saxon or earlier route (Chapter 4.VI). Indirect evidence for the position of the main approach road comes from the position of the donjon's entrance itself, newly discovered causeways, bridge landings and gates. As has been noted, in the timber phase of the castle defences, the southern approach route appears to have made two right-angled turns to reach the motte (see Fig.12.7.A). A similar right-angled turn occurred at Barnard Castle (Austin 1979, fig.3). The course of the Norwich route was apparently straightened in the second major building campaign, although a twist was still required to reach the mound from the south gate (Fig.12.7.B).

The history of the surviving castle bridge has been detailed in previous chapters, with archaeological observations of its surviving Norman fabric detailed in Chapter

Date	*Observation*
1720s	Kirkpatrick noted the collapse of the masonry as the result of settling or undermining, realising that these were the remains of a great gate and tower
1728	Thornaugh Gurdon believed the visible remains to be those of a grange for the castle constable
1741	Blomefield reported that the remains levelled in association with construction of the 1738 Cattle Market
*c.*1784	Browne noted that further elements of the gate were destroyed (same ref as Wilkins?)
1796	Wilkins notes remains still visible; workmen destroyed elements
1822	Woodward, during road widening, large mass of masonry lowered
1856	Harrod's excavation of one 'mass' during road alterations
1864	Gatehouse masonry encountered again during the insertion of Bell Avenue. The position of the masonry blocks was replicated from memory of the engineer, Mr John Moore, in Mr J.T. Hotblack's plan (1909); some elements were broken up and removed, others were lowered and left

Table 12.6 Summary of observations of the collapse and destruction of the barbican gate

6.II. The evidence recorded at Castle Mall indicates the quality of its original construction and the fact that its considerable original height is masked by centuries of refuse deposition into the motte ditch. No other physical evidence for bridges survived.

One of the major findings of the excavations at Norwich has been the discovery that both the Castle Fee and south bailey ditches were crossed by causeways rather than by bridges: 'these causeways were presumably less satisfactory from a military point of view than a timber bridge, parts of which could presumably be removed in defence' (King 1991, 56). Nevertheless, both ditches of the south bailey had causeways with squared-off terminals, the outermost ditch (?Fee boundary) with timberwork at its end. At Gloucester Castle, a causeway *c.*2.5m wide across the castle ditch may have had similar squared-off terminals (Darvill 1988, 15 and fig.7).

As noted elsewhere in this chapter, definition of any means of direct access between the south bailey and the Castle Meadow remains problematic. Harrod (1857, 133 (map) and 142) believed that 'Pump Street is the most ancient way to the castle', implying an entrance between junction of the south and north-east baileys (*cf.* Campbell 1975, maps 2 and 3; Fig.12.5.G), although there is no archaeological evidence to support this assertion. Beecheno surmised that 'there is something in Mr Harrod's opinion that the most ancient route ... [to Norwich Castle] was by Pump Street, now destroyed, but formerly situated at the angle formed by the semi-circular enclosure on one side, and the Castle Meadow on the other, leading out of King or Conesford Street' (Beecheno MS 1908, 11). This route, first documented in 1301–02 (see Chapter 7.I) running between the two baileys (later Market Street/Holkham Lane) appears in both Harrod and Campbell's maps of the castle ditches (Fig.12.5.C and G). The ditch recorded at Site 416N ran parallel to the suggested course of the route, although the position of the outer ditch of the north-east bailey at Castle Mall seems to suggest that such a route could not have existed particularly early, although bridgework is of course possible.

No evidence for the castle's documented south gate was found, although remnants may survive beneath modern roads (see possible observation at the Golden Ball Street site reported in Chapter 6). Recorded gates included a possible timber example forming a postern leading out of the south bailey and the collapsed remnants of a major masonry gate, with an opening of *c.*2.6m wide, which retained some of its architectural details: constructional details and parallels for both gates are given in Chapters 6.II and V. As has been noted in previous chapters, observations of the same gatehouse masonry near the foot of the castle bridge were regularly made during earth-moving operations and road widening schemes over the centuries. Beecheno (MS 1908, 12) summarises antiquarian observations, which are given here in Table 12.6 and detailed in Chapters 6 and 10–11.

The fact that no gate is documented leading from the Castle Meadow indicates that any such entrance may have been relatively minor and perhaps an embanked timberwork that was never replaced in stone. Any such route would ultimately have led onto the motte, presumably via a postern gate. At least one entrance must have existed somewhere around the circuit of the Meadow and comments on access between the castle and cathedral are given in Chapters 5 and 6. The minor gate leading from the north-east bailey towards King Street shown in the Period 2 reconstruction (Fig.5.55) is loosely placed to indicate a gate affording access to King Street, the cathedral and the English Borough (an access point later leading onto King Street known as Griffen Passage may not have been formed until 1704 when a gateway was inserted; Chapter 10.I). The possibility of a more northerly gate (leading onto London Street) has been noted in earlier chapters. The presence of a defended entrance in this position would help to explain the kink in the edge of the Castle Fee boundary at this point. Neither of the routes leading into the bailey in this area (Opie Street and Berningham's Stile) is documented until the 14th century (see Chapter 8.I). No firm conclusion can be drawn until such time as archaeological evidence becomes available. The bulge replicated in the street pattern — which survives as an area of raised ground — is just as likely to result from the influence of natural contours, either in the Late Saxon or Norman periods (*cf.* Woodward's 1847 plan in Fig.12.5.B), or from some other form of earthworks which remain to be discovered.

Labour and Materials

Workforce

As noted in Chapter 5.I, labour on fortifications was an obligation to kings which may have been inherited by the Normans from their Late Saxon predecessors, although the relative proportions of those working regularly in the

local building industry as opposed to those pressed into labour, can never be known. Amongst those named in the Domesday survey were Herbert the ditcher and Rabel, possibly the engineer or architect of the first castle (see Chapter 5.I). The architect of the stone donjon remains unknown (Heslop 1994, 11). The initial workforce would have included labourers engaged in demolishing pre-Conquest houses and churches and levelling the site, as well as clearing woodland and vegetation from the environs (see Chapter 5). The specialised workforce, supervising less skilled and perhaps enforced workers, would have included surveyors, craftsmen (including carpenters and, later, stonemasons) and ditchers. In later times, the workforce appears to have been supplemented by the castle garrison.

The medieval workman would have been provided with a wooden shovel tipped with iron and little else. Picks are mentioned in later building accounts but they may not have been in general use at an early date (Pounds 1990, 18), although picks or similar digging tools appear to be shown on the Bayeux tapestry (Plate 6.3). Several types of spades were in use during the early medieval period: 'in the Bayeux Tapestry men are shown building the castle at Hastings; they use spades with pointed metal-shod blades and only one foot-tread for digging, and shovels with oval or splayed blades for shovelling up the earth and stones to form the mound' (Dunning 1958, 216). Excavated examples of medieval spades are rare in Britain; two came from a Norman pit at Pevensey Castle, one from near the town ditch at Chester and another from a lead mine at Wirksworth. Although three iron spade shoes were recovered during the Castle Mall excavations, one came from late medieval/transitional fills of the barbican well (Mould, Chapter 9.III), while the others came from post-medieval deposits (Mould, Chapter 10.III).

Raw Materials

Raw materials imported to the site during construction of the castle would have included those deriving from local sources such as timber (*e.g*. oak from local estates in 1288 during the rebuilding of the Great Hall; see Chapter 7.I), iron, flint, lime, sand and gravel (all of which are known to have been quarried, mined or produced locally: see Chapter 8). Vast quantities of stone were also imported, principally fine limestone from Caen, Normandy, as well as Barnack from Northamptonshire, brought to the site via a canal at Pull's Ferry (see Chapter 6.V). The White Tower at London was built entirely with imported stone (Pounds 1990, 127–128). Lead from Derbyshire was brought to Norwich by sea via King's Lynn. Refacing of the donjon conducted in the early 19th century (see Chapter 10) primarily used Bath stone but also employed Clipsham and York stone for architectural details. The Norman importation of stone both to Norwich and the castle and cathedral sites has been commented on in earlier chapters. Clearly, this was a major logistical achievement which involved not only shipping the material to the city, but also transporting it uphill to the castle itself, where ample storage space must have been made available within the baileys. New research hints at the possible presence of a second cutting off the River Wensum in the bend of the river adjacent to the later Austin Friary at the site of an un-named stream (Shelley in prep.a). However, the use of any such cutting to bring stone to the castle appears unlikely given the locally steep contours and the narrowness of related routes towards the castle's south gate. If as seems likely the transportation route led from the known canal at Pull's Ferry via the cathedral precinct to the castle, along the gentler slope in this area, storage of building materials within the north-east bailey/Castle Meadow would appear probable.

Motte Construction

(Figs 5.58 and 6.49; Plate 6.3)

New calculations for the time required to construct the two phases of motte at Norwich have been possible on the basis of evidence from both the Castle Mall excavations and work in 1999–2001 (Wallis in prep.). This uses the formula R1 x R2 x H =m3 (where R1 = radius of base, R2 = radius of top and H = height), to approximate the cubic volume of each mound, subtracting the first mound from the calculation for the second. Day rates for spoil movement are based on those of Pounds (1990, 18) who used figures calculated by the 19th-century military which include allowances for declining productivity throughout the day. The figures assume a maximum throw of 12ft horizontally (3.6m) and 4ft (1.2m) vertically. It must be stressed that these new figures are broad estimates, given that the exact dimensions of each mound in its original form remain uncertain and that construction of the mottes was not simply a matter of heaping up earth, but utilised sophisticated engineering. Local geology, working hours and weather conditions must also have been factors in construction time. The movement of spoil to its final position is another factor in any consideration of labour estimates. Pounds estimated that excavation rates should be multiplied by three to allow for this additional labour requirement, with an exponential labour increase in relation to raised height or increased depth or mottes, banks and ditches (1990, 18). The results for Norwich are as follows:

> Motte 1 (Period 2.2, *c*.1060s–*c*.1094): R1 (*c*.70m) x R2 (*c*.32.5m) x H (*c*.5m; an average accounting for the downwards slope to the north) = 70 x 32.5 x 5 = 11,375m^3. At a rate of 2.264m^3 per day (calculated from Pounds figure of 80ft^3 per day; 1990, 18), this gives a figure of 5,024 days (*c*.50 days for team of 100 men).
>
> Motte 2 (Period 3.1, *c*.1094 to *c*.1121–22): R1 (*c*.85m) x R2 (*c*.55m) x H (*c*.9.5m; total made ground average, accounting for the downwards slope to the north) = 85 x 55 x 9.5 = 44,412m^3, minus first motte = 39,388m^3. At a rate 2.264m^3 per day (see above), this gives a figure of 17,397 days (173 days for a team of 100 men; 87 days for a team of 200 men).

The grand total for both mottes at Norwich amounts to 22,421 days (*cf*. Pounds 1990, fig.1.6; 24,000 days), which as noted above may need to be tripled to reach anything like a realistic estimate (bringing the total for the motte alone to 67,263 days; 336 days for a team of 200 men). Many estimates have been carried out as to the labour required to construct castle earthworks. At Castle Neroche construction of the motte has been calculated at between 13,780 and 18,980 man days (Davison 1972, 56–7), while at Bramber the estimate comes to 228,269 man hours (Barton and Holden 1977, 69–70). English (1995, 52) provides summary of recent calculations for

motte and earthwork construction. The speed of construction for early castles (presumably simple enclosures) is stressed, notably Hastings in 16 days and two others at 8 days each (Dover; Foreville 1952, 212–3 and York; OV ii, 222–3), although it has been noted that the speed at which timber castles were built has 'often been exaggerated, by both contemporary and modern writers. A motte and bailey could not be completed in a matter of days or even weeks. A defensible perimeter might be erected quickly, but the works which would then proceed within it would surely take several months, perhaps a number of building seasons, to complete. Nevertheless, a timber castle could be built more quickly and cheaply than a stone one' (Higham and Barker 1992, 349).

Ditchwork

(Figs 5.58, 6.49 and 7.38)

It is difficult to assess the labour required for the ditchwork associated with the timber phase of the castle, given the variables over ditch chronology and the position of ditches noted above and in earlier chapters. Calculations for the ditchwork associated with the stone phase are slightly easier, although the following calculations exclude contemporary works associated with the north-east bailey/Castle Meadow and any alterations to the pre-barbican ditch which may have occurred at this time. Using simple calculations of volume (where volume = width x depth x length ÷ 2) and work rates (using the same figures for the latter given under motte construction above), a figure of 6,121 man days (30 days for 200 men) can be estimated for the construction of the south bailey ditch and associated rampart. A matter of a few days would have sufficed for the possible recut section of the ?Castle Fee ditch: even if recut or cleared out along its entire postulated length a timescale of 974 man days (<10 days for 100 men) would be suggested. Note should be taken, however, over the possible triple multiple for these figures noted above.

Added to the figure for motte enlargement given above, this amounts to a total of 24,492 man days for the new earthworks (including the motte ditch with the motte construction figures given above, but as noted excluding the north-east bailey and any alterations to the pre-barbican ditch). To this estimate must be added time for construction of the great donjon and associated masonry structures (including the bridge, gates and well) and any associated timberworks (palisades *etc*). Using the same broad calculation, excavation of the 13th-century barbican ditch would have required 15,238 man days (76 days for a team of 200 men), although the presence of a pre-existing ditch in the same position would reduce this figure.

VII. CASTLE LIFE

In recent years much attention has been paid to the archaeological evidence for activities conducted within castle baileys and, in particular, new insights have been gained into their function and status from the study of artefactual and ecofactual assemblages. At Norwich, the probable character of ancillary buildings within the baileys, including workshops, stables, breweries and kitchens has been considered in preceding chapters, while attested craft activities are detailed in Chapters 5.III, 6.III and 7.III, with an overview in Chapter 13.III. Although structured 'settlement' within the Castle Fee/south bailey to house the Men of the Fee was not located (see, however, the remains of a few timber buildings detailed in Period 1.4, Chapter 4.II which *may* date to the Conquest), both the number and nature of 'domestic' pits of the late 11th to early 12th century found within the early castle enclosure (Chapter 5.II, Period 2.1) do seem to indicate a permanence of settlement rather than sporadic garrisoning or maintenance of open space. Only two cess pits apparently relating to the stone phase were located (Period 3), seeming to indicate a change in usage of the south bailey: amongst the 84 pits assigned to Period 2, however, those with ceramic dates of late 11th- to early 12th-century and without stratigraphic relationships to 'dated' ditchwork could relate to this phase. Pits of 13th- to 14th-century date located within the barbican (Chapter 7.II, Period 4.2) provided good ceramic groups and partial bird skeletons: of note amongst the avifaunal assemblage was an apparent increase in the consumption of birds at this time, including partridge (Albarella *et al*, Chapter 7.IV and Part III).

Although limited in terms of structural remains, data from the late 11th and 12th centuries at Castle Mall indicates crop-processing and storage, limited amounts of both ferrous and non-ferrous metalworking and other craft activities, notably including bone-, horn- and antler-working along with leatherworking, textile working and brewing (the latter perhaps relating to a brewery in or near the Castle Meadow). As well as groups of horn-cores and bone strips from both pit and ditch fills, one pit contained four sheep skulls from which the horns had been removed (Huddle *et al*, Chapter 5.IV). Such activity is immediately reminiscent of the published evidence from the rural setting at Barnard Castle, where the processing of deer carcasses appears to have been carried out within the castle baileys: here it was suggested that the exploitation of meat, skin, bone and antler was a commercial venture, the venison itself going to York (Austin 1984, 73). The context at Norwich is, however, considerably different and perhaps comparable to the smaller scale bone- and antlerworking activity recorded at Castle Acre Castle (Lawrence in Coad and Streeten 1982, 282). Stoneworking within the inner bailey (the forerunner of the barbican) relating to the construction of adjacent structures was evident in Period 3 ditch fills in the form of discarded materials including fragments of 12th-century Caen stone dressing, one with a mason's mark (Chapter 6.II and 6.III).

Few artefacts attributable to the Norman period at Castle Mall and Golden Ball Street gave particular indications of status. In general, the ceramic assemblage from the timber phase was similar in overall character to that from Hen Domen in that no obviously high status material was recovered within the bailey groups. The ceramic assemblage from Period 2 deposits at Norwich is almost entirely domestic in nature, represented by rims from a wide range of kitchen wares as well as finer table or serving wares imported from regional centres, as well as in far lesser quantities from the Continent (Goffin, Chapter 5.III). Of particular note amongst some of the pottery assemblages from pits was one which has important implications for Late Saxon/early medieval pottery production (Goffin, Chapter 5.III and Chapter 13). The ceramics from the stone phase (Period 3) indicate a

limited number of Continental imports and the introduction of glazed wares, although again the assemblage is utilitarian in character and not noticeably different to other Norwich sites of the late 11th to 12th centuries (Goffin, Chapter 6.III). A similar pattern is evident in the 13th and first half of the 14th centuries (Period 4), when the continuation of previously established trading patterns attests to the links between Norwich's thriving port and the Rhineland, Northern France and the Low Countries (Goffin, Period 4.III). Most of the pottery examined in this and later periods came from the deposition of waste from the city, rather than the remnants of the castle.

Amongst the few diagnostically 'Norman' items of metalwork recovered from the site are a fairly substantial group of Type 2A horseshoes (Mould, Chapters 5.III and 6.III) and gilded strips of a type which have now been found at many castle and manor sites of the 12th and 13th centuries, such as Goltho and Castle Acre (Goodall, Chapter 6.III and 9.III). Another example was retrieved from Norwich Castle Meadow (Ayers 1985, fig.27, no.12).

Of note amongst the remaining metalwork from Periods 2 and 3, which includes a small range of personal possessions and domestic items, is a tiny gilded belt mount in the form of a dagger or cross (SF411, Fig.5.33; Goodall, Chapter 5.III) and a possible mount of unusual form, with a stylised animal head terminal (SF5765, Fig.6.44; Goodall, Chapter 5.III). No Norman coins were found at the Castle Mall site, although coins of the period are present elsewhere in the city, as at Greyfriars just to the east of the castle (Davies 2007) and from Site 215N at 13–25 London Street (Clough 1973 and Chapter 5), immediately to the north-west (located in Fig.13.2).

Despite its 'military' context, relatively small numbers of arms and weaponry were recovered from the excavations and none came from Norman contexts. A scabbard chape and arrowheads of both hunting and armour-piercing type came from Period 4 (Goodall, Mould, Chapter 7.III), while deposits of other periods contained a range of weapons and armour including arrows (attested by arrowheads, a shaft and possible evidence for fletching), mail and plate armour, sword fragments, scabbards and daggers of varying date. One 15th-century example was the type of arrowhead used in archery practice (Mould, Chapter 8.III). The most notable evidence for weaponry and associated trades came from the mid 15th- to early 16th-century fills of the barbican well and may indicate the clearance of a castle-related storeroom and waste from surrounding workshops (Chapter 9).

In Chapter 5.V it has been suggested that at Norwich, as in the bailey at Hen Domen, a clear central area may have been used 'for assembly, fires and the corralling of horses' (Barker 1969, 22). As well as providing a defended meadow, the north-east bailey may also have housed part of the garrison, stabling and other castle-related occupations. Knight's horses, however, may have been kept in the innermost enclosure due to their high value (Higham and Barker 1992, 199). At Castle Mall, the presence of horses is attested by their bones, evidence for fodder, horseshoes and related equipment, of note amongst which is a Norman horse harness pendant (SF408, Fig.5.54, Mould and Ashley, Chapter 5.III).

The remains of a small number of dogs and cats (one of which had been skinned) were found within early Norman fills of the castle ditches. During times of siege (as in 1075), dogs may have been butchered for human consumption, while dogs themselves may have been fed horse meat (see Chapter 5.IV).

Details of the faunal assemblage from Castle Mall and Golden Ball Street during the active military phases of the late 11th to 13th centuries are given in Chapters 5.IV, 6.IV and 7.IV, supplemented by the broader discussion in Chapter 13.II and more detailed evidence in Part III. The latter includes evidence for provisioning and diet within the castle, its relationship with local markets and interaction with its agricultural hinterland. The presence of a royal castle in the late 11th to 12th centuries might lead to the expectation of evidence for a high status diet. This was not the case, however, and the typical high status animals such as deer and wild birds proved as rare during the Norman castle phases as they are at other times (Albarella *et al*, Chapter 5.IV, 6.IV and Part III). An increase in pig consumption (often linked to high status sites) was noted in the mid to late 11th century (Period 1.4, Chapter 4.IV) and could indicate the raised status that the site acquired after the Conquest, but is more probably due to some change in animal exploitation or in use of the site which was brought about by the arrival of the Normans. The presence of fallow deer and rabbit bones, both Norman introductions, was also noted (Chapter 4.IV).

It is possible that the increase in cod consumption evident in Period 2 deposits provides evidence for increased status, although this suggestion is tenuous on present evidence and unsupported by other species linked with status, such as halibut and turbot, which are both present in other phases at the site (Locker, Chapter 5.IV). The fish remains recovered from 12th-century contexts (Period 3) appear, however, to reflect the early use of the ditches as a repository for food waste, coming either from the garrison/Men of the Fee or from the townspeople. An increase in the number of flatfishes (plaice and flounder) may indicate an increased consumption of traditionally cheap fish caught by shoreline trapping (Locker, Chapter 6.IV).

The findings from the plant remains are consistent with the faunal results, with no exotic species or any other evidence of high status being observed at these periods (Murphy, Chapter 5.IV, 6.IV and Chapter 13). On-site grain storage may have occurred in lidded pits (Chapter 5.II) while beans were evidently also stored locally (Murphy and Robinson Chapter 5.IV; see also Chapter 5.V and Chapter 13.II).

Livestock was evidently housed in the south bailey as well as the Castle Meadow, where crops and fodder were probably also grown. The grazing of herbivores within the outer ditch of the Castle Meadow has been reported by MacPhail (Chapter 6.IV). Gullies within this bailey may relate to water supply or demarcate areas within it, perhaps for agriculture (Chapter 5.V). Evidence for on-site breeding was apparent in both the stone and timber phases of the castle and is paralleled at other Norman castle sites (Chapter 13.II and Albarella *et al* Part III). Period 3 was the only period from which no articulated animal skeletons were recovered, a circumstance that may have more to do with the lack of pitting attributable to the period than any particular enforcement of cleanliness within the castle.

Diversions of the Norman period were represented by buzz bones (Huddle, Chapter 5.III), a bone die (Huddle,

Chapter 6.III) and a Nine Men's Morris or Merrel's board of probable 12th-century origin from the barbican well (Huddle, Chapter 9.III). The latter is the second example to have been found at Norwich Castle (see Site 429N, Chapter 2). A badger mandible could suggest hunting for fur (Albarella *et al.* Chapter 6.IV and Part III).

VIII. CONCLUSIONS

Norwich Castle is amongst a small but growing number of urban castles to have been extensively excavated. The new results supplement previous evidence from other castle excavations in East Anglia, notably including the rural castles at Castle Acre (Coad and Streeten 1982) and Castle Rising (Morley and Gurney 1997).

That the 'size and strength of the urban castles by 1100 suggest intense development' (Drage 1987, 130) is amply demonstrated by the new calculations relating to the construction of Norwich Castle presented above. Such use of castles to overawe local populations may only have been for short periods (Drage 1987, 123) and many towns and cities were not so rebellious as to require it: at Norwich, infilling of the outermost ditch appears to have been well underway during the 12th century. This relatively limited military timescale resonates with the evident contraction of the defences which culminated in the transfer of the baileys to the city in 1345: 'many early castles were extremely large in area and have been reduced in size. Norwich, where the baileys were progressively abandoned to the town, is a case in point' (King 1991, 8).

Although many of the previous questions posed about the development and displacement of Norwich Castle's earthworks and other defences can now be answered a number of issues remain open to debate. These include:

1. clarification of the setting of the castle in relation to any Late Saxon defences and sub-urban development along Ber Street;
2. the course of the ?Castle Fee and south bailey ditches to the east of the southern approach road (now Golden Ball Street);
3. the course of the ?Castle Fee ditch to west and north of castle and its relationship to the ditchwork of the Castle Meadow;
4. the general displacement and sequential development of the Castle Meadow defences;
5. the position and form of access points from the Castle Meadow to the other enclosures and the motte;
6. the date of the insertion of the route later known as Holkham Lane and whether any Norman route existed here;
7. the precise inter-relationship of the numerous ditches and the character of the barbican ditch termini;
8. the position of other gates and the access route from the castle to the cathedral;
9. the reason for the odd kink in the defensive line to the north of the Castle Mound;
10. the morphology of the motte ditch and any associated evidence for the disposal of high status waste from the castle;
11. access between the castle and the French borough and the position and nature of any boundary between them.

Despite these remaining aspects, some of which it may never prove possible to address, the excavations at Castle Mall, Golden Ball Street and those on the top of the mound, have provided significant new evidence to demonstrate the character and social meaning of a major urban castle over the centuries (see Chapter 14 for wider discussion of the castle area in its developing urban context). Beecheno's despairing comment quoted at the beginning of this chapter, in which he deplores the 'little scope for novelty in description, or fresh discovery' at Norwich Castle after the ravages of the centuries has, it is hoped, been assuaged by the new information contained in this report.

Endnotes

1. Thanks are extended to Robert Higham and Oliver Creighton (University of Exeter) for many references and for their comments on early drafts of this chapter and to Robert Liddiard (University of East Anglia), both for lively discussion of the findings at Norwich Castle and the loan of numerous books.
2. As well as the official lists, listings of the sheriffs and constables of Norwich Castle from the late 11th century to the early 17th century include those assembled by Kirkpatrick (1845, 320–327), Round (1920) and Rye (1921, 17–23), supplemented for the period to 1154 by Green (1990).
3. Of note amongst the churches listed in the Domesday survey is 'a certain church of St Martin … also in the Borough, which Stigand held before 1066' (Brown 1984, 1.61, 116b): this is understood to refer to St Martin-at-Palace (Sandred and Lindström 1989, 45–46).
4. The term 'ringwork' has been avoided in order to offset confusion over the smaller type of enclosure that might eventually be filled in to produce a motte.

13. Trade, Industry, Technology and Economy

'In provisioning the Castle of Norwich, by the King's writ with 100 loads of corn … 100 bacons … salt … iron … 3 handmills … cords … 100 cheeses …'
Pipe Rolls 19 Henry II, 117

'…. It is ordained and established that each man or woman of whatsoever estate or condition he may be, who has boar, sow or other pig within the said city, that they keep them within their enclosure as well by day as by night'
19 November 1354
Hudson and Tingey, *Records of the City of Norwich* II, 1910, 205–206

'my grete scythe, with the belhous [bellows], all my hamers, my grynston and my other toolls belonging to the Smithes craft'
Will of John Brystomer 1493
Castle Fee Properties 16, 17 and/or 59 (St Michael at Plea), NCC Will 70 Multon

I. INTRODUCTION

This chapter draws together the evidence presented in preceding text and in Part III to provide an overview of the implications of the artefactual and ecofactual assemblages from the Castle Mall and Golden Ball Street sites which span the Anglo-Saxon to post-medieval periods. It represents one of the major research themes and mirrors the founding objectives of the Castle Studies Group, detailed in Chapter 12, which emphasise the significance of the role of castles in their wider social and economic setting: this is particularly pertinent in relation to the interaction of Norwich Castle with the surrounding city's developing topography. Amongst the areas investigated is trade, which encompasses all site periods and has some interesting implications at a local, regional, national and, to a lesser degree international level. Within the evidence for craft, industry and manufacturing technologies, little-understood categories such as hornworking and late medieval/transitional leatherworking, founding and metalworking are addressed below. Diet and patterns of provisioning are also highlighted. Economic activity is explored in the context of evidence for local farming and fishing, animal husbandry and butchery practices. Of particular note is the evidence for changing animal breeds relating to the agricultural revolution, an issue of considerable relevance in the transition from late medieval to post-medieval traditions. In Norwich, the influence of Dutch immigrants is particularly apparent in this transition: evidence for their presence in the Norwich Castle area has been discussed in Chapter 10.I, 10.III and 10.VI and in Part IV, Chapter 3. As in previous chapters, individual authors of the constituent parts of the text are indicated below: where no author is shown, the text was written by Elizabeth Shepherd Popescu.

II. ENVIRONMENT AND ECONOMY: PATTERNS OF PROVISIONING AND DIET

Introduction

Excavations at Castle Mall yielded the largest faunal assemblage ever recovered from Norwich with the greatest, most continuous chronological spread. A total assemblage of 937kg of mammal and avian bone was collected (Albarella *et al*, Part III, Chapter 3), of which 131kg (14%) of mammal bones and 6kg (0.5%) of avian bones came from mid to late 15th- to early 16th-century fills of a major castle well sited at the foot of the castle bridge (Moreno García, Chapter 9.IV and Part III, Chapter 4). Additional material was obtained from 1,898 (site-riddled samples (SRS) producing 764 measurable bones and bulk samples (BS) accounting for a further 561 measurable bones). Over 14,000 fish bones were identified, of which 2,882 (20%) came from fills of the well (Locker, Chapter 9.IV and Part III, Chapter 5). An additional 54kg of mammal and avian bone and 0.322kg of fish bone was retrieved from the excavations at Golden Ball Street (Curl, Part III, Chapter 6).

The faunal remains from both sites are summarised by period in Chapters 4–10 of Parts 1 and 2, where significant assemblages are highlighted (in Sections II and IV of each chapter). The relevant sections of the following text draw largely upon the more detailed evidence presented in the zooarchaeological study (Part III), to which the reader is referred for methodologies, detailed data, analysis and discussion.

As noted above, nearly two thousand environmental samples were taken from the Castle Mall site and the sampling policies for both this site and Golden Ball Street are outlined in Part I, Chapter 1 and Appendices 3 and 4. Plant macrofossils are again detailed and discussed by assemblage and period in Chapters 4–10 (Sections II and IV of each chapter), with the overall discussion and conclusions presented below.

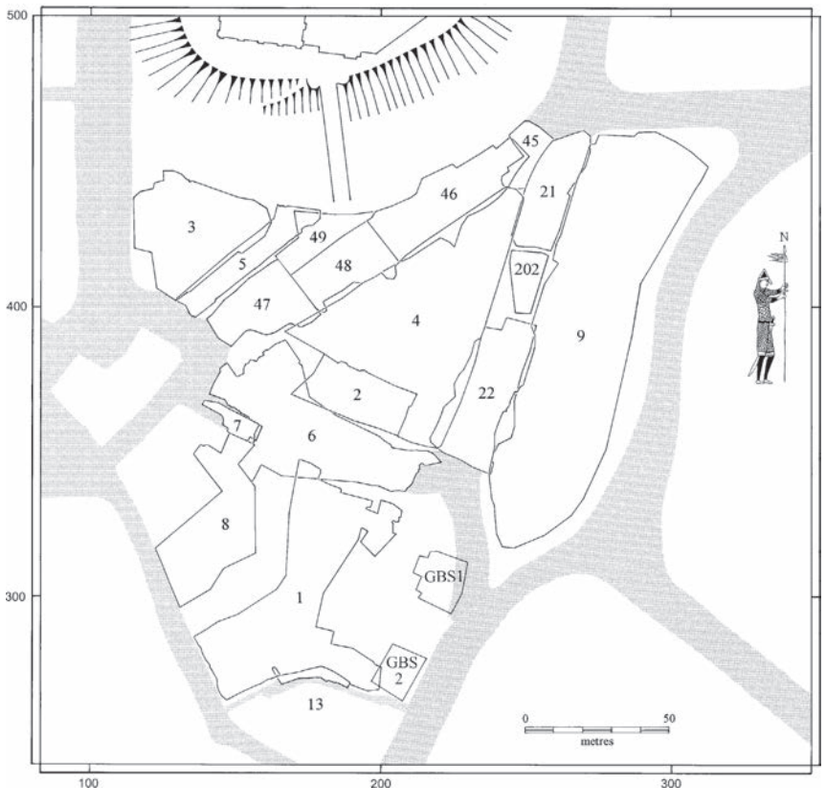


Figure 13.1 Location of excavation areas at Castle Mall and Golden Ball Street. Scale 1:2000

Mammal and Bird Bone at Castle Mall

by Umberto Albarella, Mark Beech and Jacqui Mulville (Figs 13.3–13.5 and Part III, Figs 4–9 on CD)

Summary

The large assemblage (800kg) of mammal and bird bone recovered from the Castle Mall site, detailed in Part III, Chapter 3, has been divided into six main periods that range in date from the late 9th or 10th to the 18th centuries AD (Late Saxon to post-medieval; see Chapter 1.IV for further definition). The assemblage is dominated by the major domesticates, such as cattle, sheep, pig and domestic fowl. Beef was consistently the main meat consumed, with pork making an important contribution to the diet in the early periods and mutton in the later periods. Meat supply derived from three main sources: some animals were bred on site, others were brought to the site on the hoof while pieces of dressed carcasses were purchased from the market. The local breeding of cattle and sheep may have died out in post-medieval times, whereas pigs continued to be reared within the city. The practice of intramural stock rearing confirms that open areas remained available, Norwich providing a mixture of rural and urban environments.

While the majority of remains represent butchery and kitchen refuse, many are also associated with craft and industrial activities such as bone-, horn-, antler- and leatherworking (see 'Occupations, Craft, Industry and Trade' below). Taken as a whole the bones indicate a variability in the quality of diet which is typical of urban sites. No evidence of high status faunal remains was found in Periods 2 and 3 when the castle was most active as a royal residence. The bones do not, therefore, appear to represent the remains of banquets, royal or otherwise. The presence of two parrot bones in a 17th-century context points to the existence of trade with distant countries.

An increase in animal size and morphological changes are found in the post-medieval and, in some cases, the late medieval levels. These changes are related to the agricultural revolution and indicate the presence of improved breeds. A difference in the kill-off patterns in later periods attests to a change in use. Cattle, which had mainly been used for traction throughout the Middle Ages, became more important for meat production. Sheep remained extremely important for their wool, but their size increase after the 16th century suggests also an emphasis on mutton production. There is a particularly early increase in the size of domestic fowl which represents an original contribution that the Castle Mall assemblage can provide to the debate on the beginning of the agricultural revolution.

Species Present

Table 13.1 indicates the range of species present in all periods at Castle Mall, excluding the large assemblage from the barbican well (see Moreno García below). Part III, Chapter 3 contains discussions of analytical methodology and recovery biases, as well as species-specific details of anatomical distribution, ageing data, considerations of animal size, shape and sex, non-metric traits, abnormalities and pathologies, butchery practices and boneworking.

Figure 13.2 Location of previous excavations in the Norwich Castle area, showing position of Thetford-type ware kilns and waste (see also Fig.13.10) and other relevant find spots. Scale 1:2500

The Occurrence and Relative Importance of Different Species Over Time

As noted above, the Castle Mall animal bone assemblage, like those from most other medieval sites in Britain, is dominated in all periods by the main domestic livestock — cattle, sheep, pig and domestic fowl. However, a variety of other mammals and birds was also found at the site (Table 13.1 and Part III, Tables 3–6). Some of these

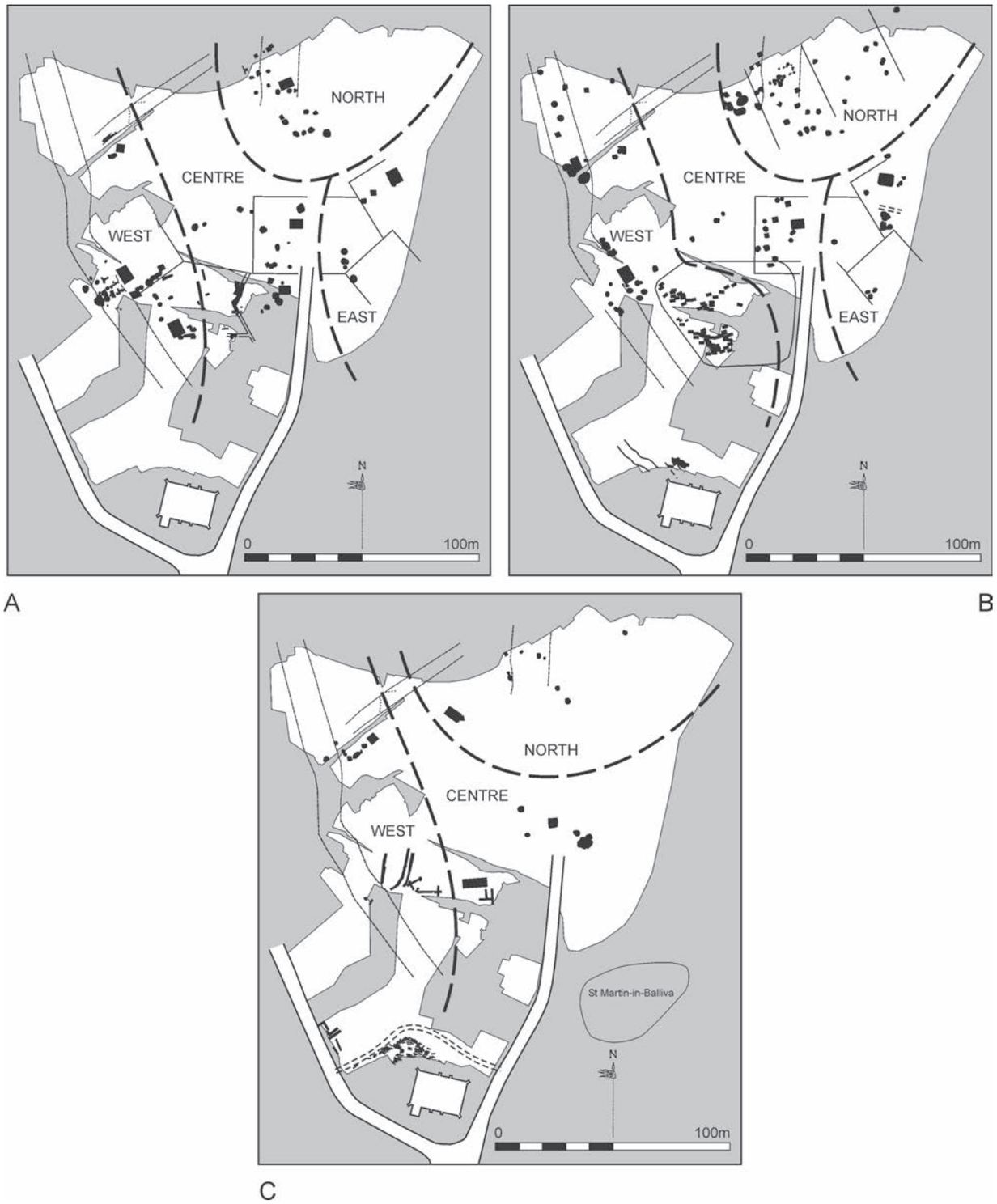


Figure 13.3 Spatial distributions used for analysis of animal bones in Period 1. A = 1.2 (10th to early 11th century); B = Period 1.3 (11th century); C. Period 1.4 (mid to late 11th century). Scale 1:2500

taxa may not have an anthropogenic origin, and certainly not all of them represent food animals. Nevertheless, it is obvious that most of the animals were associated with people and certainly the bulk of the bones originate from animals which were eaten.

Comparison between different periods

Although there are problems in combining information from different areas and types of context an attempt to compare the frequency of the main mammals and birds between different periods was undertaken. Only a few contexts clearly contained bone deposits which were different from the usual mixture of butchery, food and

Taxa	*Period*					
	1	*2*	*3*	*4*	*5*	*6*
Cattle (*Bos taurus)*	HSB	HSB	HSB	HSB	HSB	HSB
Sheep/goat (*Ovis/Capra)*	HSB	HSB	HSB	HSB	HSB	HSB
sheep (Ovis aries)	HSB	HSB	HSB	HSB	HSB	HSB
goat (Capra hircus)	H	HSB	H		H	H
Pig (*Sus domesticus)*	HSB	HSB	HSB	HSB	HSB	HSB
Equid (*Equus* sp.)	HS	HSB	HS	H	H	HS
Dog (*Canis familiaris*)	H B	HSB	HS	HS	HS	HS
Dog/fox (*Canis/Vulpes*)	B					
Cat (*Felis catus)*	HSB	HSB	HSB	HSB	HSB	HS
Red deer (*Cervus elaphus)*	H	H	H	HS	H	H
Fallow deer (*Dama dama*)	H		H			H
Roe deer (*Capreolus capreolus)*	H	H				
Badger (*Meles meles*)			B			
Hare (*Lepus* sp.)	SB	H		HS	HS	HS
Rabbit (*Oryctolagus cuniculus)*	H			H	HSB	HSB
Lagomorph				H		
Rat (*Rattus* sp.)		B	S	HS	S	
Rat/water vole (*Rattus/Arvicola*)	H					
House mouse (*Mus musculus*)			B			
House/wood mouse (*Apodemus/Mus*)	B	B		B	B	
Field vole (*Microtus arvalis)*	B					
Domestic fowl (*Gallus gallus*)	HSB	HSB	HSB	HSB	HSB	HSB
Goose (*Anser anser*)	HSB	H B	H	HSB	HSB	HSB
Duck (*Anas* sp.)	H B	HS	H	HSB	HSB	HS
Turkey (*Meleagris gallopavo*)					H	H
Little Grebe (*tachybaptus ruficollis*)					H	
Cormorant (*Phalacrocorax carbo*)						H
Grey heron? (*Ardea ?cinerea*)		H				
Swan (*Cygnus* sp.)		H			H	
Teal/Garganey (*Anas crecca/querquedula)*		S	B	H		
Pochard/Tufted duck (*Aythya ferina/fuligula*)					H	
Buzzard (*Buteo buteo*)	B					
Goshawk (*Accipiter gentilis)*	H					
Grey partridge (*Perdix perdix*)				H	B	H
Coot (*Fulica atra*)					HS	
Moorhen (*Gallinula chloropus*)						H
Woodcock (*Scolopax rusticola*)						S
Curlew (*Numenius arquata*)				S		
Snipe (*Gallinago gallinago*)						S
Crane? (*?Grus grus*)					H	
Small wader		B				
?Black headed gull (*Larus ?ridibundus*)						H
Pigeon (*Columba* sp.)	H	HS			S	H
Parrot (*Psitaccinae*)						H
Rook/Crow (*Corvus frugilegus/corone*)					H	H
Small corvid	H		S	H		H
Turdid		SB				
Passeriform			H			S
Bird	B				H	HS
Amphibian	HSB	H B			SB	HSB
(Toad (Bufo bufo))	B					

Taxa present in hand-collected material are denoted as 'H', that in Site Riddled Samples as 'S' and sieved material from Bulk Samples as 'B'.

Table 13.1 Presence of mammal, bird and amphibian taxa in all levels at Castle Mall

Period	*Element*	*Cattle % MNI*	*Sheep/Goat % MNI*	*Pig % MNI*
Period 1	incisors	4%	4%	8%
	astragalus	*20%*	*9%*	*8%*
Period 2 and 3	incisors	4%	7%	7%
	astragalus	*24%*	*3%*	*7%*
Period 4	incisors	6%	3%	15%
	astragalus	*25%*	*10%*	-*
Period 5	incisors	5%	2%	14%
	astragalus	*9%*	*7%***	*5%*
Period 6	incisors	3%	1%	5%
	astragalus	*14%*	*6%*	*6%*
Pits (all periods)	incisors	5%	2%	11%
	astragalus	*17%*	*6%***	*10%*
Ditches (all periods)	incisors	4%	1%	7%
	astragalus	*17%*	*11%*	-***

% MNI is calculated as follows:
incisors: [MNI of incisors/ (MNI incisors + MNI premolars + MNI 1st and 2nd molars + MNI 3rd molar)] x 100
astragalus: [MNI astragalus/ (MNI femur + MNI tibia + MNI astragalus + MNI calcaneus + MNI metatarsi)] x 100.
* – not calculated due to small sample size
** – a 'special' group with many sheep metatarsi has been excluded from this count
*** – no pig astragali out of 37 hind-limb bones

Table 13.2 Percentages of small elements in different periods at Castle Mall

working refuse found in most urban medieval sites. Only one of these 'special' assemblages — a pit full of sheep horncores, metapodia and phalanges from Period 5 — was large enough to severely bias the analysis of taxon frequency, and it was excluded from this comparison.

Another consideration was the possibility that variation in the recovery rate of hand-collected bones had occurred between different periods. This could affect the relative frequency of species and thus create artificial differences between periods. The problem was tackled by calculating the relative number of small elements (incisors and astragali) within each period (Table 13.2, left). Although the small elements were heavily underrepresented no major changes could be noted between different periods. Thus it can be assumed that roughly the same recovery bias affects the hand-collected assemblage in all periods and that no large differences in the frequency of the species due to differential recovery occur as a result. Although not the most numerically frequent species (Part III, Tables 8 and 9), cattle, due to their large size, must have provided the bulk of meat in most periods at Castle Mall. Whilst the frequency of cattle remained stable throughout the Castle Mall chronological sequence, in the later periods sheep became more common at the expense of pig.

Although many varied factors are affecting these percentages, they still demonstrate an interesting trend. Despite possible differences in preservation, in the use of the archaeological features and in disposal practices between different periods, the change in the frequency of the main domestic mammals reflects the results of previous research. Several authors have noted a country-wide trend (*e.g.* Grant 1988; Albarella and Davis 1996) for a high frequency of pigs in early medieval periods and an increase in the importance of sheep, probably connected to the rise of the wool industry, in the late Middle Ages. A decline in the number of pigs in late medieval times has been identified in another area of Norwich, Fishergate (G. Jones 1994).

The presence of a large number of pig bones has been linked to high status sites (Grant 1988, Albarella and Davis 1996). Pigs are typically 'meat animals' and are thus expected to be more common on sites with a higher meat consumption. Periods 2 and 3 at Castle Mall are those associated with the most active period of castle life, and thus it is possible to speculate that the higher frequency of pigs in these periods is an indication of status. However, as will be discussed below, no other evidence of high status, either from the animal or the plant assemblages (Murphy, 'Plant Remains' below), could be found. This suggests rather that the decrease in

Hand-collected bones and teeth

	Period 1.2–1.3		*Period 1.4*		*Total*	
	n	*%*	*n*	*%*	*n*	*%*
Cattle	421	**57**	119.5	**37**	540.5	**51**
Sheep / Goat	150	**20**	86	**27**	236	**22**
Pig	162	**22**	114.5	**36**	276.5	**26**
Total	**733**		**320**		**1,053**	

SRS and BS bones and teeth

	Period 1.2–1.3		*Period 1.4*		*Total*	
	n	*%*	*n*	*%*	*n*	*%*
Cattle	70.5	**35**	8		78.5	**33**
Sheep / Goat	48	**24**	17		65	**27**
Pig	83	**41**	14.5		97.5	**40**
Total	**201.5**		**39.5**		**241**	

Table 13.3 Period 1 — numbers and percentages (NISP) of the main taxa in pre-Conquest (Period 1.2 and 1.3) and pre/post-Conquest contexts (Period 1.4) at Castle Mall

	Period 1				*Period 2*				*Period 3*				*Period 4*				*Period 5*				*Period 6*			
	Ditch		*Pit*		*Ditch*		*Pit*		*Ditch*		*Pit*		*Ditch*		*Pit*		*Ditch*		*Pit*		*Ditch*		*Pit*	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Cattle	14	**45**	448	**37**	124	**38**	144	**35**	33	**39**	16	**53**	116	**37**	32	**27**	17	**49**	277	**28**	254	**36**	234	**37**
Sheep/Goat	10	**32**	185*	**15**	59	**18**	62	**15**	18	**21**	9	**30**	96	**31**	21	**18**	6	**17**	439	**45**	184	**26**	226	**35**
Pig	4	**13**	258*	**21**	35	**11**	88	**22**	21	**25**	3	**10**	29	**9**	19	**16**	4	**11**	105*	**11**	65*	**9**	66	**10**
Equid	2	**7**	35*	**3**	10	**3**	14	**3**	3	**4**	-	**0**	2	**1**	4	**3**	-	**0**	2	**<1**	111	**16**	13	**2**
Dog + Cat	1	**3**	129*	**11**	75*	**23**	52*	**13**	9	**11**	2	**7**	27*	**9**	8	**7**	3	**9**	53*	**5**	100	**14**	34*	**5**
Domestic fowl	-	**0**	166*	**14**	21	**7**	47	**12**	1	**1**	-	**0**	44	**14**	33*	**28**	5	**14**	98*	**10**	1	**<1**	64	**10**
Total	**31**		**1,221**		**324**		**407**		**85**		**30**		**314**		**117**		**35**		**974**		**715**		**637**	

Corrections for the number of metapodia (see Part 3, Table 44) have not been carried out for this table. Only hand-collected material is included.
* These figures include bones from partial skeletons (see Table 13.5 for details).

Table 13.4 Frequencies of main taxa (NISP) in ditch and pit fills at Castle Mall

Period	*Area/ Group*	*Context*	*Related feature*	*Collection method*	*Species*	*Notes*
1.2	9/109	90469	pit 90504	BS sieve	cat	16.5 bones
1.2	9/109	90398	pit 90504	hand	dom. fowl	12 bones
1.2	9/109	90366	pit 90389	hand	pig	3 bones
1.2	22/138	22023	pit 22015	hand	goat	10 bones + teeth
1.2	22/145	22110	pit 22111	hand	cat	13 bones + teeth
1.3	9/109	90354	pit 90516	hand	horse (juvenile)	10 bones
1.3	9/109	90354	pit 90516	SRS sieve	cat	4.5 bones
1.3	9/109	90491	pit 90516	hand	goshawk	4 bones
1.3	9/109	90501	pit 90516	hand	dog	13.5 bones
1.3	9/109	90506	pit 90516	hand	horse (juvenile)	6 bones
1.3	9/109	90506	pit 90516	hand	cat	18 bones + teeth
1.4	9/63	90227	pit 90292	hand	dog	5 bones
1.4	2/11	40002	pit 40003	BS sieve	dom. fowl	5 bones
1.4	2/11	40047	pit 40003	hand	pig	13 bones
2.1	2/5	20168	pit 20167	hand	cat	15 bones
2.1	2/7	40319	pit 40320	hand	dog	16.5 bones + teeth
2.1	5/47	49192	pit 49193	hand	cat	25 bones
2.2	2/2	20152	ditch 20129	hand	dog	14 bones
2.2	2/2	20163	ditch 20129	hand	dog	17.5 bones
2.2	2/4	40185	ditch 40285	hand	cat	5 bones
4.1	8/16	80268	ditch 80301	hand	cat	4.5 bones
4.2	2/28	40416	ditch 40928	SRS sieve	cat	8 bones
4.2	8/28	80112	pit 80113	hand	dom. fowl	7 bones
4.2	45/1	45183	pit 45196	hand	dom. fowl	13 bones
4.2	45/1	45183	pit 45196	hand	small corvid	11 bones
5.1	1/97	10976	pit 10899	hand	cat	20 bones
5.1	1/97	10976	pit 10899	BS sieve	cat	4.5 bones
5.1	9/61	90765	pit 90766	hand	dom. fowl	10 bones
5.2	9/73	90171	pit 90261	hand	pig	6 bones
5.2	9/94	92716	pit 92715	hand	dog	5 bones
6.1	1/87	10023	dog burial	hand	dog	10.5 bones + teeth
6.1	1/98	10521	pit 10766	hand	dog	3 bones
6.1	1/98	10850	dump	hand	dom. fowl	4 bones
6.2	1/103	10095	pit 10463	SRS sieve	rabbit	6 bones
6.2	9/41	91387	barbican ditch 91295	hand	pig	3 bones

The number of bones and teeth given in the notes are the number of countable specimens from each skeleton (see also Part 3, Tables 2–4).

Table 13.5 Catalogue of partial skeletons found within all periods at Castle Mall

the number of pig bones in later periods is a consequence of a genuine change in the animal economy noted at a countrywide level. This question is discussed further in the section 'Comparison with Other Sites'.

A substantial increase in the number of pigs was noted in the later part of Period 1 (Period 1.4, Table 13.3), namely in the immediately pre-Conquest or early post-Conquest period. This again could be interpreted as a consequence of the high status that the site acquired with the erection of the castle, but it is more probably due to some change in animal exploitation or in the use of the site which was brought about by the arrival of the Normans (although see further comments in 'Comparisons with Other Sites' below).

Another expected trend is a decrease in cattle, relative to horse, in late medieval and post-medieval times (Albarella and Davis 1994). In Norfolk in particular, horses increased in importance very early, already during the Middle Ages (Langdon 1986). Equids are rare in any period at Castle Mall with the remarkable exception of the post-medieval Period 6 (Part III, Table 4). However, it is doubtful that this is connected with changes in the economic system. The high number of horse bones in the late fills of the castle ditches (mainly the barbican ditch) is probably the consequence of the different disposal practices carried out in post-medieval times. Historical evidence of the illegal disposal of horse skeletons in the castle ditches is abundant (*e.g.* see Tillyard, Chapters 8.I and 10.I). Horses are typical farm animals and are

generally not common in urban sites: they were used in towns, but they were generally bred or slaughtered elsewhere. Very low frequencies of horse bones have also been noted for the other Norwich sites of Alms Lane (Cartledge 1985), St Martin-at-Palace Plain (Cartledge 1987) and Fishergate (G. Jones 1994).

Among the main domestic birds, domestic fowl represents by far the most common species, with goose relatively common and duck only occasionally present. A slight increase in the importance of goose was noted after Saxon times: a possible consequence of minor cultural and economic changes. Slightly higher percentages of goose bones have been found in the 10th–12th-century levels at Fishergate (Norwich) (G. Jones 1994) and Thetford (G. Jones 1993), although this may only reflect differences in the efficiency of recovery.

Spatial analysis

Bone assemblages within each period have so far been considered as single units. However, the possibility must be considered that variation occurs between different areas of the site and types of context. This analysis is aimed at the identification of possible differences and similarities in use of the site in different areas and to assess to what extent these affect the frequency of the species in different periods.

Due to the nature of the archaeological evidence the analysis of lateral variation in animal bone distribution in terms of a comparison between different 'activity areas' could only be undertaken for Period 1 (Fig.13.3). (See Chapter 4.IV for a general comparison of these areas and Albarella *et al*, Chapter 4.III for the distribution of horncores and antlers. The frequency of the main domestic taxa is presented for each area in Fig.4.109.) For other periods the comparison was limited to the study of the contrast between the contents of pit and ditch fills.

Although bones were recovered from floors, external layers and other contexts, the majority of the Castle Mall animal bones derive from pit and ditch fills (Table 13.4). The assemblages from Periods 2, 3, 4 and 6 are more or less evenly distributed between these two types of context, whereas bones from Periods 1 and 5 derive almost entirely from pits, with the exception of the small groups from the Late Saxon buildings. Differences between the distribution of bone in ditches and pits have been noted by several authors (Maltby 1982; Coy 1983; Wilson 1994). Wilson (1994) also suggested that ditches have a tendency to contain higher frequencies of the bones of larger animals (cattle and horses). If the small, and possibly misleading, assemblages are ignored this tendency is confirmed at Castle Mall (Table 13.4). Although the difference is not striking, cattle bones are regularly relatively scarcer in pit fills. The figure for Period 6 must be carefully considered as the percentages are affected by the high number of equid and carnivore bones presumably derived from complete bodies discarded in the barbican ditch.

The main difference between ditch and pit fills is the larger number of domestic fowl bones in the latter contexts. This is particularly evident for Period 6. The large number of chicken bones in pit fills can be associated with the possibly more 'domestic' nature of these features and with the fact that their small bones are more easily tolerated in the vicinity of domestic activities. No major differences in the recovery rate could be noted between ditch and pit fills.

Variation in the frequency of taxa between different types of contexts thus occurs but is not particularly striking and does not severely affect the interpretation of differences between periods. However a slight underrepresentation of cattle in Periods 1 and 5, which are found mainly in pit contexts, must be taken into account. The hypothesis that the higher number of bird bones in Period 4 is due to a genuine change in diet/economy rather than the nature of the excavated deposits (Table 13.4 above) is confirmed.

A high concentration of partial skeletons was found in a series of pits in the eastern part of the settlement in the 11th century (Open Area 8, G9/109, Periods 1.2–1.3, Figs 4.22 and 4.43 and Part III, Fig.4 on CD, Table 13.5) suggesting that in Late Saxon times these pits were used to dispose of dead bodies. The contexts then remained undisturbed, as indicated by the presence of bones in articulation. More bones than indicated in Table 13.5 presumably derive from complete, rather than butchered and dismembered skeletons. This is probably the case for many of the bones found in the barbican ditch fills (Period 6, Part III, Fig.9 on CD). A substantial number of complete horse, dog and cat bones was found in these contexts (*e.g.* Plate 10.25). Whilst most were not found in articulation it is probable that they derive from complete skeletons discarded in the ditch and subsequently reworked. Thus the archaeological evidence suggests that illegal disposal of animal corpses (mainly horses) continued in spite of all prohibitions (Tillyard, Chapter 10.I).

Comparison with the barbican well assemblage

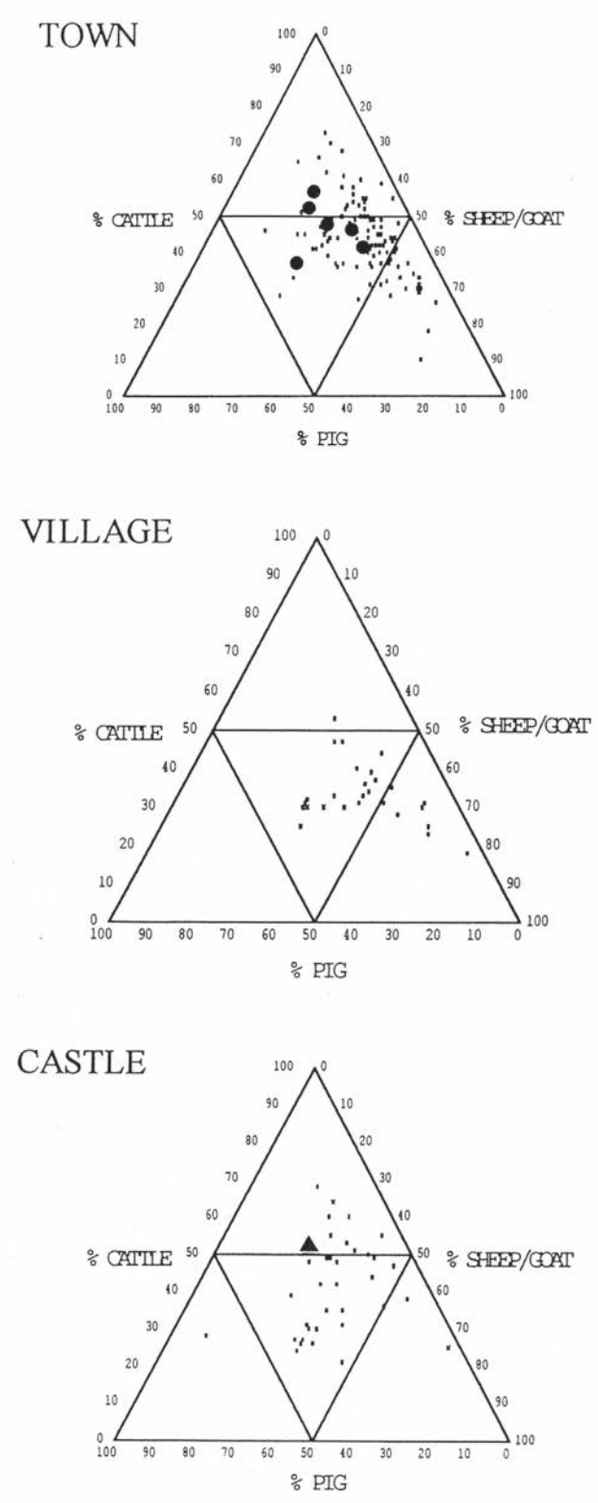
A comparison of the barbican well assemblage with the faunal assemblage from the remainder of the Castle Mall site is given in Chapter 8.IV.

Comparison with other sites

The comparison of the frequency of species between different sites is one of the most difficult tasks in zooarchaeology (King 1978; Payne 1985; Albarella 1995). Differences in butchery patterns, waste disposal, preservation, excavation strategies (especially recovery) and quantification methods can severely affect the frequency of taxa and therefore the interpretation of variation between sites.

Two possible approaches can be adopted. One possibility is to compare two assemblages, trying to take into consideration all possible biases which may have affected the frequency of species at the two sites. Once this 'background noise' has been eliminated differences and similarities are interpreted on the basis of environmental and economic factors. This is the approach that has been adopted in the comparison of the barbican well with the rest of the site (see Chapter 9.IV).

The other approach is to examine a large number of assemblages, without exploring in detail all the variables which can affect the frequency of species in each assemblage. It is then possible to observe whether, despite all biases, general trends can still be detected. This approach has successfully been undertaken by King (1978 and 1984) who analysed a large number of Roman sites and succeeded in identifying patterns of regional variation within Europe. More recently Albarella and Davis (1994 and 1996) have applied a similar method to medieval and post-medieval England. By considering a large number of sites from across the country some of the trends initially



Town: ● = Castle Mall, Periods 1.4, 1.1–3, 3, 4, 5 and 6 (left to right)
Castle: ▲ = Castle Mall, Period 2

The inner triangle assists the reading of percentages in the appropriate direction, e.g. the left outer triangle on the pig axis represents greaterthan 50% (as does the top triangle on the cattle axis and the bottom right triangle on the sheep/goat axis). Points located within the innermost triangle indicate sites where none of the three major species form more than 50% of the total

Figure 13.4 Comparison of town, village and castle zooarchaeological assemblages in England

suggested by Grant (1988), such as the higher number of pig bones in early medieval and high status sites, were confirmed. Naturally many exceptions to these general trends occur; this method therefore cannot be used to determine the status or the cultural context of an individual site.

The latter approach has been used to compare Castle Mall with other contemporary sites in England. The list of sites taken into account can be found in Part III, Table 14 and includes a larger number of sites than originally used by Albarella and Davis (1996). In particular Saxon sites and important sites in the same geographic area as Norwich and within the city itself have been added. The list is far from complete, but the majority of the main Saxon to post-medieval sites have been incorporated. The sites have been divided on the basis of their type of settlement (Fig.13.4): towns, villages and castle. This division is very approximate, as the status of a site is not always clear, urban castles occur (Castle Mall is an example), monastic sites and manor houses are not easily assigned to one of these categories, *etc.* However, the aim, as stated above, is only the identifications of broad trends. Castle Mall has been considered as a 'town' in Periods 1, 3, 4, 5, and 6 and a 'castle' in Period 2, when the excavated features are more closely associated with the castle.

The Castle Mall assemblage is located within the main cluster of urban sites, which tend to be characterised by a high frequency of cattle (in most cases above 40%) and a relatively small number of pig bones. An exception is Period 1.4, which stands out as having a higher percentage of pig (Fig.13.4). In general there is a higher variability in castle sites, but even though many exceptions occur they tend to have a larger number of pigs. This is not evident at first sight, but if a line is drawn separating sites with more than 20% pig from the others, this group would contain 49% of the castles, 32% of the villages and only 16% of the towns. With its 25% pigs, Castle Mall Period 2 is within the >20% pig category. It is not until Period 4 that the pig frequency at Castle Mall drops below 20%. This suggests that the relatively high percentage of pigs in the early phases is not a consequence of status, but is a feature of the early medieval economy.

This can be better illustrated by dividing the assemblages by chronological period (Fig.13.5). The frequencies of sites with more than 20% pigs are distributed as follows: Saxon 38%, early medieval 38%, middle medieval 33%, late medieval 26% and post-medieval 8%. For sheep the frequency of sites with more than 40% of this species is: Saxon 29%, early medieval 28%, middle medieval 38%, late medieval 43% and post-medieval 62%. The steady decrease of pig and increase of sheep are countrywide phenomena and the Castle Mall assemblage — apart from the unusual Period 1.4 (see above) — lies well within the main distribution of sites for each period.

Environment and Economy at Castle Mall: the Evidence of the Animal Bones

Food Provision

One of the most interesting findings from the Castle Mall animal bones was the evidence of on-site breeding. The

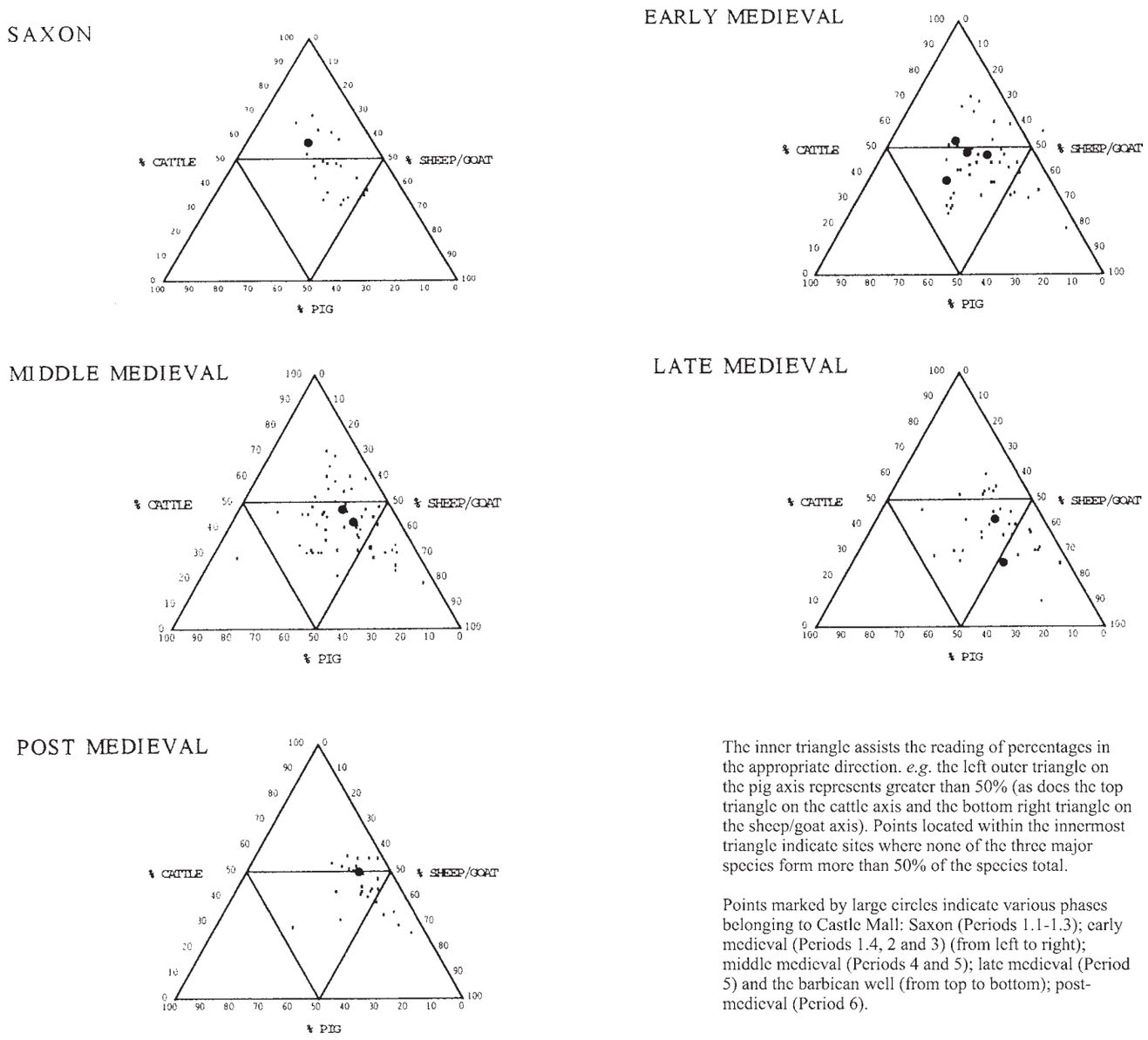


Figure 13.5 Comparison of Late Saxon, early, middle and late medieval and post-medieval zooarchaeological assemblages in England

main evidence for this is the presence of neonatal bones of the main domestic animals: cattle, sheep, pig, horse and domestic fowl. These bones are not very abundant, but this is likely to be a result of their small size and fragility which cause poor preservation and recovery. Neonatal cattle and sheep bones are more common in early periods, whereas newborn pig bones were more commonly found in Periods 5 and 6.

Stock breeding within the town may be unexpected, as towns are primarily considered to be consumer sites. In fact animals were reared in the area of Castle Mall confirming other evidence that the town was not fully urbanised until at least post-medieval times (much of the excavated area forming the castle baileys from the Normn period onwards). These rural areas within the walls were probably used as pasture rather than cultivated land, as the evidence from the plant remains suggests that 'most grains were imported to the site as semi-cleaned prime product at all periods' (Murphy, 'Plant Remains' below). The absence of local agriculture is also suggested by the presence of large numbers of latrine pit assemblages, these indicate that there was no need to use human sewage locally as manure or 'night soil' (Murphy, 'Plant Remains' below).

The scarcity of cattle and sheep neonatal bones in post-medieval times implies that breeding of these animals in the town gradually died out, or became much reduced. This is consistent with the growth of the Norwich population and the increasing urbanisation of the castle surroundings. However, pig breeding continued. This is

not surprising as pigs need much less space and could be raised in house courtyards and fed with household food scraps (see also Hudson and Tingey 1910, 205–206 and Moreno García, Part III, Chapter 4).

The evidence from Castle Mall contrasts with that found in other Late Saxon and early medieval towns, such as Southampton (Bourdillon 1994) and York (O'Connor 1994). In these sites the presence of all skeletal parts of the livestock body, combined with the absence of neonatal bones, was taken as evidence that animals were imported to the site on the hoof. In other words, the breeding of animals took place elsewhere but the slaughtering and primary butchery occurred in town. Can it therefore be suggested that Norwich had more open areas and was less urbanised than Southampton and York? This does not seem probable. It is more likely that these differences are due to assemblages coming from different areas of the town. There probably were areas in Southampton and York where stock rearing occurred. It is also possible that Norwich in Late Saxon times still had a rather rural aspect. In the subsequent medieval period the presence of the castle and its earthworks contributed to the fact that much of the area was not developed and retained 'open land' characteristics suitable for animal pasturing (see Parts I and II). The north-east bailey in particular (the Castle Meadow) continued in use as rough pasture. Full details of the use of the castle baileys for animal grazing (*e.g.* the trampling of herbivores attested by micormorphology; see MacPhail, Part I) and the various phases of the post-medieval and later Cattle Market are given throughout Parts I and II of this report.

The town and the castle were probably only partly supplied with products derived from local breeding. Norwich had an important market and, as already noted, the arrival of livestock on the hoof is historically well attested. Moreover the evidence from the distribution of body parts indicates that, although complete carcasses were present, selected cuts of meat were also sometimes imported or just distributed. For example, the presence of a high number of sheep scapulae in the post-medieval fills of the barbican ditch can be interpreted as the acquisition of selected parts of the carcass, not necessarily from the countryside but perhaps from butchers elsewhere in the town.

Diet

Isotopic analysis of the human remains from the Late Saxon cemeteries at Castle Mall is detailed by Bayliss *et al* in Part I, Chapter 4.IV, allowing broad consideration of the contribution that animal products make to the diet compared to cereals. The direct evidence for dairy products is poor. The kill-off patterns of cattle and sheep within Norwich do not suggest a particular emphasis on milk production, but the situation might have been different in the countryside, and milk and dairy products could regularly have been sold in urban markets. It is however possible to find historical sources describing the difference in the patterns of animal protein consumed by urban and rural populations, and the rich and the poor. Those in towns ate more meat than those living in villages, although for both cereals would have made a significant contribution to the diet, and by the early 15th century cereal foods accounted for 63% of the diet. Fish (Locker these volumes; Locker 2001) and dairy products were also an important food source, and the latter formed the major source of animal protein for peasants and artisans (Dyer 1989).

Even taking into account the obvious over-representation of cattle bones, it is quite clear that beef was the most consumed meat during all periods. Pork was particularly important in Late Saxon and early medieval times. Mutton was also consumed but was of secondary importance to the main use of the sheep, which was the production of wool. Horse and dog meat may occasionally have been eaten, perhaps in periods of crisis, but the flesh of these animals was more likely to have been used to feed dogs.

Chicken and goose meat provided a secondary but constant contribution to the diet. This probably increased in post-medieval times when these birds began to be bred specifically for their meat, rather than for eggs or feathers. The contribution of wild game to the diet was negligible. Venison and wildfowl were only very occasionally eaten, perhaps in special circumstances and only by the more wealthy townsfolk.

Status

The presence of a royal castle in Periods 2 and 3 might lead to the expectation that evidence of high status would be found in these periods. In fact this was not the case and the typical high status animals, such as deer and wild birds, are as rare during the castle phases as they are in earlier and later times. Continuity, rather than change, could be observed in the transition from Period 1 to 2. Thus it appears that the excavated features, even if belonging to the castle, did not contain refuse from royal banquets or those of castle officials. This is not surprising as visits of the king, for example, were only very occasional (Tillyard, Chapters 5.I, 6.I and 7.I) and may have left traces in other areas of the castle, untouched by this excavation. The findings from the plant remains are consistent with the animal bone results: no exotic species or any other indication of high status was observed (Murphy, 'Plant Remains' below).

Some findings, such as the evidence for falconry in the 11th century, or a rather high proportion of pig bones in Late Saxon to early medieval periods — roast pork was 'the most consistent source of more delicate meat' (Dyer 1989, quoted by Serjeantson forthcoming) — or even the presence of exotic species, such as a parrot in a 17th- century pit fill, may hint that some evidence of high status is indeed present. However, this is not necessarily related to the castle, but is more probably a consequence of the variation and inequality of the distribution of the wealth within towns (Dyer 1989). For instance, the parrot might have belonged to a rich merchant (Plate 10.32; see 'Foreign Contacts', Chapter 10.IV and 10.VI) and, as discussed elsewhere in this report (Chapter 4.IV, 'Hunting'), the goshawk was not necessarily a bird associated with the highest aristocracy.

Use of Space and Disposal Practices

As these volumes have demonstrated, the topography of the site changed enormously in different periods, and any comparison between periods also entails comparisons between different types of sites. Whatever the type of building present or the organisation of the space, in all periods the animal bones mainly derived from pits and ditches that were filled with a mixture of food and industrial refuse.

		Period 1–2+3	*Period 2+3–4*	*Period 4–5*	*Period 5–6*
Cattle	Age	stable	stable	*decrease*	stable
	Size	stable	stable	increase??	*increase*
	Shape	stable	stable	?	*change*
Sheep	Age	stable	stable?	*increase*	stable
	Size	stable	stable	stable	*increase*
	Shape	stable	*change*	stable	*change*
Pig	Age	stable	?	?	*decrease*
	Sex	stable	stable	stable	stable
	Size	stable	stable	stable?	*increase*
	Shape	stable	stable	stable	*change*
Domestic fowl	Age	stable	stable	stable	*decrease*
	Sex	stable	stable	*change*	stable
	Size	stable	stable	*increase*	stable
Goose	Age	stable	stable	stable?	*decrease*

Table 13.6 The main domesticates: changes in age, shape and size over time

In Period 1 the site was loosely organised as a settlement with several 'properties' (Fig.13.3; see Part I, Chapter 4.IV). Although no obvious division between domestic and industrial areas could be detected, lateral variation occurred in the distribution of the animal bones. Not only did the frequency of different species vary in different areas, but also for the type of handicraft — in particular horn- and antlerworking. The significance of this variation is not completely understood but it might be related to the disposal of food refuse on site, and to the spatial distribution of different workshops.

From Period 2 onwards, most of the features excavated consist of the outer and inner ditches of the castle and pit groups associated with the developing tenements surrounding the castle, both within and outside the Castle Fee, as well as a few minor structures. Some differences in the contents of ditches and pits have been noted, which are probably due to the different use of these two types of features. Ditches may have mainly been used for large scale dumping of the town refuse, whereas pits were associated with small scale domestic activities. In particular, the disposal of the carcasses of dead animals in the barbican ditch (see Part II, Chapter 10) seems to have been common practice during late medieval and post-medieval times. Many complete horse bones were found in the ditch, but they were not in articulation, which suggests that these are not primary deposits and that reworking of the barbican ditch fills occurred at some stage.

A lower frequency of gnawing marks in later periods probably indicates a prompter burial of bone refuse and thus a more organised system of waste disposal. This would have become necessary as the density of population increased and is consistent with the increasing urbanisation of the town in late and post-medieval times as suggested above.

Animal Economy and the Agricultural Revolution: the Castle Mall Contribution

The type of animals and the husbandry techniques found in the Late Saxon and medieval periods at Castle Mall are both consistent with other archaeological sites in England and with information from historical sources. It has also become apparent that the age, sex and size of the animals are inter-related factors which must all be considered in any study of the evolution of husbandry techniques.

From the late 9th/10th century (Period 1) to at least the mid 14th century (Period 4) the principal uses of the main domestic stock at Castle Mall and throughout the country were probably as follows: cattle were mainly exploited for traction, sheep were a precious source of wool, pigs provided almost exclusively meat (and fat) and domestic birds produced eggs and feathers. All animals were at some point eaten, but in some cases their flesh may have represented only a secondary product. This is obviously an over-simplification, because variation occurred across the country and in some periods other products may have become predominant, but in very broad terms these were the main uses of the animals.

In medieval times, partly due to the primitive techniques then available and partly due to the type of animal use, the livestock was of a relatively small size. This is well attested by historical sources and has been confirmed by the study of the Castle Mall animal bones. However, this does not mean that the animals were all identical across the country. Variation occurred and even if it is not yet possible to talk of genetic breeds in the modern sense, regional types were present (Trow-Smith 1957). The high homogeneity of the medieval sheep, in particular, has hitherto been emphasised in the zooarchaeological literature. However, using a technique which allows the comparison of different measurements on the same axis (Davis 1996), it appears that the medieval sheep at Castle Mall, even being of roughly the same size, show some shape variation between periods. This suggests that the homogeneity of the medieval sheep might have been overemphasised due to the way the measurements have been examined to date.

After a period of relative stability which lasted for several centuries, some major changes in the type of use and in the size and shape of the animals occurred between the end of the Middle Ages and the beginning of the modern period. When exactly did these changes occur? The evidence available from other sites suggests that many of these changes had already begun during the 16th century (Davis 1997). This is consistent with the

	medieval	*late medieval - post-medieval*
Cattle	TRACTION, meat, milk	MEAT, milk (traction in limited areas)
Sheep	WOOL, meat, milk	WOOL, MEAT, milk
Pig	MEAT, fat	MEAT, fat
Goat	milk, meat	-
Horse	traction	TRACTION
Domestic fowl	EGGS, meat	MEAT, eggs
Goose	FEATHERS, meat	MEAT, feathers

Table 13.7 The main domesticates: changes in use over time

view of some historians who suggest that the 'agricultural revolution' was an earlier and more gradual phenomenon than often claimed (see for instance Kerridge 1967). Unfortunately the 16th century at Castle Mall is either poorly represented or not securely dated, therefore this animal bone assemblage cannot provide a major contribution to the question of when livestock improvement began. However, interesting data have been found concerning the changes in husbandry techniques and consequent modifications of animal size and shape that the agricultural revolution brought about.

Before entering into a detailed discussion of the exploitation of the main species at Castle Mall it will be useful to summarise the data for age, sex, size and morphology (Table 13.6).

Details of how these results were obtained and their interpretation are presented in the relevant sections of Part III and will not be repeated here. This concluding section will make some very general comments. In both cattle and sheep, variation in the kill-off patterns precede size and morphological changes. In the case of cattle it is plausible to assume that a new type of animal use, more specifically aimed at the production of meat, was associated with a different kill-off pattern and led to the selection of larger beasts. The situation for sheep is more complex, as changes in size and mortality do not go in the same direction. The shift towards older animals is evidence that wool production was increasing in importance, whilst the size increase suggests that large animals capable of producing more mutton were also being selected. In fact the two changes do not go together, but they are perfectly compatible, because large sheep can also produce good quality wool. Many of the best 'wool' breeds, such as the Lincoln Longwool, are actually very large (Keith Dobney, pers. comm.).

The situation is different for pig where both the main changes are concentrated in the post-medieval period. The use of pig for meat and lard production continued and the only reason for these changes was to increase productivity. It is probable that this was achieved by the importation of new stock, which was larger, faster growing and could thus be killed at an earlier age.

The role of domestic fowl has been neglected in the study of changes connected to the agricultural revolution. However, the Castle Mall evidence suggests that already in Period 5 (*i.e.* almost certainly during the course of the 15th century) these birds had been subject to a size increase: possibly the consequence of selective pressure towards higher meat production. This improvement was successfully completed in the subsequent period, where an age decrease implies the increasing importance of meat. The evidence from Castle Mall alone is not enough to suggest that the increased size of domestic fowl represents one of the first results of the agricultural revolution, but it certainly provides a stimulus for further investigation of this question on other sites.

Now that it has been demonstrated how the Castle Mall animals changed, it is appropriate to summarise the innovations in their type of use. The following table illustrates this by taking into account both the Castle Mall data, and what is known from the rest of the country, from both historical and archaeological sources. The animal products or uses of greater importance have been indicated in capital letters (Table 13.7).

Certainly, these changes did not all occur contemporaneously and in some areas they did not happen at all. In addition some of the data presented above are still under debate. Nevertheless, it is only by trying to generalise that the Castle Mall data can be put in a wider context and contribute to the history of animal husbandry in Britain. One general consequence, which is clear from the above table and concerns most animals, is that the agricultural revolution gave rise to a much greater emphasis on meat production. This was probably caused by the growth of the urban population which required an increasingly larger meat supply.

Norwich was one of the largest medieval towns in Britain and a very important market place (the development of which has been outlined in Chapters 4–11). Any study of the economic history of England must consider this town which had the advantage of being situated in a convenient position for contacts with the continent. The Low Countries, from where so many technological and economic innovations originated, have always had close contacts with the Norfolk area. If improvements in either the animals or husbandry techniques occurred, it is to be expected that they began earlier in Norfolk than in many other parts of the country. Potentially, the Castle Mall data can contribute to current understanding of the economic development of the town and of the country as a whole. At the same time there may be more animal bones recovered from secure 15th- to 17th-century contexts in the city. Information from such contexts may provide answers to the important question of when improvement started which could not be firmly established in this report.

The Barbican Well Assemblage

by Marta Moreno García

The most significant single faunal assemblage from the site was recovered from mid/late 15th- to early 16th-century fills of the barbican well which has been discussed in Chapter 9.IV, with a summary of species present given in Table 9.13. Full details of this important group are given in Part III, Chapter 4 and the feature is located in Fig.9.2. The evidence will not be repeated here but, in summary, the excellent preservation and recovery of the barbican well animal bone has allowed a detailed study of the relative occurrence of the main domestic taxa of the period in question. Analysis of this important assemblage (comprising 131kg of mammal bone and 6kg of avian bone) has gone some way to fulfil the vital need for well preserved and well recovered late medieval

faunal samples from urban and rural sites in East Anglia. The barbican well assemblage suggests that, between the mid/late 15th and early 16th centuries at Norwich, cattle were raised for prime beef production and pigs for pork. Sheep seemed to be more important for products other than meat, such as wool and skin. Chicken and geese supplied meat and eggs, with geese also providing the raw material for the fletching of arrows and/or quills for writing. The results from other specialists working on the antler fragments, leather and worked bone (detailed in Chapter 9.III) complement the findings of the analysis of the mammal and avian bone, and increase the knowledge on the craft activities developed in a late medieval town, based on animal by-products.

The Mammal, Bird and Fish Bone from Golden Ball Street

by Julie Curl

Introduction

This section of the report summarises the faunal assemblage collected during excavations at Golden Ball Street in 1998 (further details of which appear in Part III, Chapter 6). Excavations at the site revealed evidence for a continuation of the previously recorded boundary ditch around the northern part of the cemetery of St John at the Castle Gate (de Berstrete/Timberhill) and evidence for the termini of both the Castle Fee and south bailey ditches, adjacent to the castle approach road. Later activity consisted of pit groups linked to identifiable properties and infilling of the castle ditches.

A total of 54.060kg (3,844 fragments) of bone was recovered from pit and ditch fills. The majority was animal and bird bone (51.273kg hand-collected; 2.465kg from SRS), with a lesser quantity of fish bone (0.322kg hand-collected and SRS). A single fragment of human bone was found. In consideration of the detailed analysis of the large Castle Mall assemblage, the Golden Ball Street remains were subjected to study at a lower analytical level (*i.e.* a thorough scan) as a supplement to the previous work. Metrical data was not recorded and fish bone was not identified to species except in a single instance.

No deposits of Late Saxon date (Period 1) were encountered at the Golden Ball Street site. Most of the bone recovered came from contexts dating between the Norman Conquest and the post-medieval period (Periods 2–6; detailed in Part I, Chapters 4–7 and Part II, Chapters 8 and 10), with small quantities either being modern or unstratified. The majority of the assemblage dated to the 15th and 16th centuries (Period 5.2, Part II, Chapter 8), with a substantial part of the remainder being post-medieval.

Species Present

The species present are indicated in Table 13.8 and a single denticle from a roker (Thornback Ray) was identified. For further details by species see Part III, Chapter 6.

Discussion

As is evident at the Castle Mall site, waste from all levels of society is present at Golden Ball Street. The assemblage demonstrates that cattle were the most popular source of meat throughout all periods with both beef and veal consumed in later times. Sheep and pigs were also consumed regularly, with younger animals being preferred. Mutton was eaten, but this meat would have taken secondary place to the main use of the sheep for their wool. A variety of birds was also consumed, most commonly chicken and goose. The goose was an obvious choice for food given its large size. Both of these birds would have provided a ready supply of eggs, the goose also providing feathers. In medieval times, however, the emphasis changed from egg to meat consumption and this may have contributed to their greater numbers at the site between the 15th and 17th centuries. Wild birds such as partridge and pheasant had some place in the diet but neither they nor fish feature much compared to other remains. Notably, no pheasant remains were identified from the Castle Mall excavation (Albarella *et al,* Part III, Chapter 3).

Although smaller in scale, the Golden Ball Street assemblage provides additional evidence to support the findings of the Castle Mall excavation in relation to changes in agricultural practice, specifically a reduction in the culling age of cattle during the late medieval/post-medieval period linked to the consumption of veal. The lack of detailed metrical analysis, however, hampers comment on changes in other species.

The animal bones from this site again derived from two main types of context: domestic-type pit fills and ditch fills. The pit fills probably represent small scale general domestic/craft residue and the disposal of butchery waste. The ditch fills are likely to represent larger scale disposal of rubbish and probably included complete or near complete animal carcasses. As noted by Albarella *et al* above, documentary evidence indicates that the disposal of animals into the ditches was common practice and the lack of any articulated material from Golden Ball Street may suggest considerable re-working of the soil at various stages. The evidence of canid gnawing indicates that rubbish may have been left uncovered for periods of time, allowing scavenging by dogs and cats. Such activity could also account for at least some of the redistribution of the animal remains.

Fish Bone at Castle Mall

by Alison Locker

Summary

Over 14,000 fish bones were identified to species or family level at Castle Mall from Periods 1–6 and are summarised by period in Table 13.9. The assemblage was dominated by marine fish particularly herring, reflecting the proximity of the East Anglian herring fishery which was centred on Great Yarmouth. Cod and related species were also important and cod, when compared with herring as a quantity or portion of fish rather than a number of bones (see Locker 2001), was the most important species, particularly from Period 2 onwards. The distribution of different skeletal elements of cod suggested that both whole (probably fresh) fish and stored fish are represented. The latter are distinguished by retention of only those bones comprising the 'shoulder' and the vertebrae close to the tail. The species composition showed minor fluctuations in different periods, though the order as represented by bone numbers remained the

Taxa	*Period (NISP)*					
	1	*2*	*3*	*4*	*5*	*6*
Cattle (*Bos taurus)*		23	8	10	69	63
Sheep/goat (*Ovis/Capra)*		2	8	4	81	67
sheep (Ovis aries)						
goat (Capra hircus)				*1*	*1*	
Pig (*Sus domesticus)*				1	8	7
Equid (*Equus* sp.)		1			1	
Dog (*Canis familiaris*)			1			3
Cat (*Felis catus)*						
Red deer (*Cervus elaphus)*						Antler only
Fallow deer (*Dama dama*)		Antler only				
Hare (*Lepus* sp.)						
Rabbit (*Oryctolagus cuniculus)*					4	1
Lagomorph						
Mole (*Talpa europaeea*)		11*				
Domestic fowl (*Gallus gallus*)			1	2	25	30
Goose (*Anser anser*)				2	16	11
Duck/Mallard (*Anas* sp./ *Anas platyrhyncos*)				1		
Teal (*Anas crecca)*						1
Grey partridge (*Perdix perdix*)					3	1
Pheasant (*Phasianus colchicus*)					9	
Amphibian						
(Toad (Bufo bufo))					*1 **	*1*
Total	**0**	**37**	**18**	**21**	**218**	**185**

* = Material from SRS is only included when it forms the only representation of a species from the excavation.

Table 13.8 Golden Ball Street: Quantification of hand collected mammal and bird bone by period

same. The greatest number of species was found in the largest assemblages from Periods 1 and 5, from which the greatest weight of 'whole earth' samples were fine sieved, samples from other periods being smaller. Lateral variations between contexts were not evident as with the animal bones (described in Part III), though material from the barbican well showed a greater proportion of herring than the rest of Period 5. Rays and other elasmobranchs are present throughout, though under represented by poor skeletal preservation as are the salmonids. Flatfishes, mainly plaice and flounder, were important and increased compared to other species through time. Variety to the main marine food fishes was provided by mackerel, scad, the sea breams and gurnards: these were commonly identified but in comparatively low numbers. Freshwater species were few and in low numbers, pike, perch and a variety of cyprinids were identified. Migratory fish, most commonly eel and also smelt, could have been caught locally in the town's rivers.

Further details of the fish bone assemblage by period are given in Parts 1 and 2, Chapters 4–10, while the more detailed analysis and associated methodologies are presented in Part III, Chapter 5.

Species Present

The following species/families were identified; Elasmobranch indet., spurdog (*Squalus acanthias*), Rajidae, roker (*Raja clavata*), eel (*Anguilla anguilla*), conger eel (*Conger conger*), herring (*Clupea harengus*), sprat (*Sprattus sprattus*), pilchard (*Sardina pilchardus*), Salmonidae, smelt (*Osmerus eperlanus*), pike (*Esox lucius*), chub/dace (*Leuciscus* sp.), tench (*Tinca tinca*), roach (*Rutilus rutilus*), Cyprinidae, cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), whiting (*Merlangius merlangus),* pollack (*Pollachius pollachius*), saithe (*Pollachius virens*), ling (*Molva molva*), Gadidae, Triglidae, sea scorpion/bullrout (*Taurulus bubalis/ Myoxocephalus scorpius*), perch (*Perca fluviatilis*), ruffe (*Gymnocephalus cernuus*), bass (*Dicentrarchus labrax*), scad (*Trachurus trachurus*), black sea bream (*Spondyliosoma cantharus*), pandora (*Pagellus erythrinus*), Sparidae, red mullet (*Mullus surmuletus*), thin-lipped grey mullet (*Liza ramada*), ballan wrasse (*Labrus bergylta*), catfish (*Anarhichas lupus*), *c.f.* dragonet (*Callionymus lyra*), mackerel (*Scomber scombrus*), Scombridae, turbot (*Scophthalmus maximus*)/brill (*Scophthalmus rhombus*), plaice (*Pleuronectes platessa*), flounder (*Platichthys flesus*), halibut (*Hippoglossus hippoglossus*), sole (*Solea solea*) and flatfish indet..

Distribution of Species Through Time

The primary food fish (namely herring and cod and to a lesser extent the other gadids, small flatfishes and eel) consistently show their dominance over other species by bone number. These fish, which also show consistent ranking by bone number in the Castle Mall fish assemblage, show a superficial similarity through all periods.

The size of the assemblage identified from each

Period	*1*	*2*	*3*	*4*	*5*	*6*	***Total***
Elasmobranch	31	9	6	10	21	9	**86**
Spurdog	0	0	0	0	1	0	**1**
Ray	10	2	2	11	7	0	**32**
Roker	25	13	6	18	13	15	**90**
Eel	741	73	60	33	394	46	**1,347**
Conger eel	0	0	1	1	5	0	**7**
Herring	2548	765	949	566	2281	238	**7,347**
Sprat	3	0	0	62	202	2	**269**
Pilchard	0	0	0	0	1	0	**1**
Salmonidae	1	2	3	3	3	4	**16**
Smelt	5	6	2	3	6	2	**24**
Pike	13	7	35	1	29	0	**85**
Tench	72	0	0	0	0	1	**73**
Chub/Dace	0	0	0	0	1	0	**1**
Roach	3	0	4	0	12	0	**19**
Cyprinidae	6	2	12	7	115	6	**148**
Cod	467	258	220	309	505	206	**1,965**
Large Gadid	448	72	118	253	322	56	**1,269**
Small Gadid	1	2	13	3	10	0	**29**
Haddock	10	7	22	12	100	9	**160**
Whiting	82	50	39	65	301	23	**560**
Pollack	1	0	0	0	7	0	**8**
Saithe	2	0	0	2	2	0	**6**
Ling	1	0	4	6	16	5	**32**
Gurnard indet.	2	1	7	1	0	0	**11**
Sea scorpion/Bullrout	0	0	0	0	2	0	**2**
Perch	0	0	0	0	4	0	**4**
Ruffe	0	0	0	0	1	0	**1**
Bass	0	1	0	0	1	0	**2**
Scad	1	2	2	1	0	0	**6**
Black sea bream	1	0	0	0	0	0	**1**
Pandora	0	0	0	0	1	0	**1**
Sea bream indet.	3	1	1	1	1	0	**7**
Red mullet	3	0	0	0	0	0	**3**
Thin lipped-grey mullet	1	0	2	1	0	0	**4**
Ballan wrasse	0	0	0	0	6	0	**6**
Catfish	0	0	0	0	1	0	**1**
?Dragonet	0	0	0	0	1	0	**1**
Mackerel	68	22	14	10	25	9	**148**
Scombridae	0	1	0	0	1	0	**2**
Turbot/Brill	2	0	2	0	2	4	**10**
Plaice	1	2	6	7	19	9	**44**
Plaice/Flounder	25	21	75	25	201	41	**388**
Halibut	2	0	0	0	6	2	**10**
Sole	1	0	0	4	23	3	**31**
Flatfish indet.	9	6	3	12	17	14	**61**
Total	**4,589**	**1,325**	**1,608**	**1,427**	**4,666**	**704**	**14,319**
% hand-collected	*2.8*	*6.4*	*2.7*	*2.8*	*12.5*	*15.4*	
% site riddled	*7.8*	*8.6*	*10.2*	*16.6*	*25*	17.1	
% bulk sieved	*89.3*	84	*87*	*80.5*	*62.4**	*67.3*	

*low % of BS influenced by the comparatively low % in the barbican well, 55.7 compared to 77.6 from the rest of Period 5.
Only identified bones have been included in this table.

Table 13.9 Summary of the total number of fish bones identified from each period at Castle Mall

Period	*1*	*2*	*3*	*4*	*5*	*6*
No of species/families in BS	31	21	23	25	33	20
No of bones in BS	4100	1126	1399	1150	2913	474
Sample weight (gms) in BS	1083	586	385	402	753	232

Table 13.10 Comparison of the number of fish species and bones identified compared with sample weight

Period	*1*	*2*	*3*	*4*	*5*	*6*	
Eel	18.3	6.6	4.3	2.9	11	9.7	%
Herring	62.4	69.4	68.1	50.4	55.5	49.1	%
Cod	6.4	12.3	6.9	11.9	4	12.3	%
Large Gadid	5.4	1.9	6.5	17.9	4.1	7.3	%
Haddock	0.1	0.5	0.7	0.3	1.6	0.6	%
Whiting	1.9	3.9	2.3	5.1	6.6	3.3	%
Plaice/Flounder/Sole/Sm flatfish	0.7	1.2	4.6	3	4.9	11.5	%
% of all fish	95.2	95.8	93.4	91.5	87.9	93.8	%
Total number of bones by period (BS)	**4,043**	**1,102**	**1,385**	**1,117**	**2,885**	**452**	

Table 13.11 Percentage by bone number (nisp) of the main fish species in each period

Period	*1*	*2*	*3*	*4*	*5*	*6*	
Herring	44	5	23	21	33	19	%
Cod	52	94	71	68	48	77	%
Haddock	0.5	0.2	4	2	8	1	%
Whiting	3	0.6	2	6	7	3	%

Table 13.12 Herring and the Gadids compared by 'portion' percentage

period by all methods of recovery is summarised below with the percentage of hand-collected, site-riddled and bulk sieved fish.

Each sub-period showed some variation (shown in Tables 81–83 of Part III, Chapter 5) in which the fish identified from each sub-period are divided by the method of recovery; hand-collected, site-riddled (coarse sieving to 8mm mesh on site) and bulk sieved (fine screening of whole earth samples through a 0.5mm mesh) from which the smallest bones were recovered. The number of species and families identified in each phase reflect the weight and volume of the 'whole earth' samples, the greatest number and weight being in Periods 1 and 5. The number of species identified in the bulk sieved samples and the weights of those samples are shown above (Table 13.10). This confirms a general correlation between sample weight, bone numbers and the number of species, though if each period is listed in ascending order of magnitude for each category only Period 6 consistently retains the same position, lowest in all cases (note, however, that a proportionately lesser number of samples was taken from post-medieval contexts; see Appendix 3).

The occurrence of the major food fishes is shown above (Table 13.11) by percentage of the number of bones for each phase by all methods of recovery. There is a strong bias against small fish like herring by hand collection and to a lesser extent by the coarse mesh (8mm) used in site riddling. Therefore only the bulk sieved material was included and from that total the elasmobranchs including the rays have been excluded since they are largely represented by denticles and not comparable with the bony fish identified and counted from skeletal elements.

Eel was largely identified from vertebrae and, since eel has approximately twice the number of other bony fish, is likely to be shown here at double the true representation in terms of numbers of fish. Nevertheless they were important, particularly in Period 1. The dominance of herring is clear, and represents large numbers of small fish, whose skeletons are discarded whole as food waste. However herring is more numerous in the first three periods declining from Period 4, the late 12th century to *c.*1345. This is not entirely mirrored by the reverse movement in cod, though looking at cod and large gadid together, Periods 4 and 6 see the highest levels. Haddock shows no particular change by nisp percentage and whiting is strongest in Periods 4 and 5. The small flatfishes, largely plaice and flounder, show a gradual increase through time with a slight dip in Period 4 and peak in Period 6. These species are the majority of the identified fish as shown in the table and irrespective of the sample size or date.

In the summaries of the fish for each period the relative percentage of herring and the gadids was also compared as a 'portion' of food. This method is based on historical accounts from monastic and naval records of what constituted a 'portion' of fish for an individual. Based on the number of bones per whole fish and stored fish (described in Locker 2001) the following equivalents were used; five herring = quarter cod = sixth of a ling = one haddock = two whiting. A set number of identified

bones per whole fish was set at 87 and in a stored cod, ling or haddock as 28. These are not the total number of bones per skeleton, but those clearly identifiable to species. Those percentages are summarised in Table 13.12 below and in Period 5 were averaged from the barbican well and the rest of the period.

Ling was included in the original data but, like saithe and pollack, only occurred so rarely that it has not been included here. These figures show Period 2, associated with the timber phase of the castle, to be different from other periods in that cod is a very high percentage. Herring is at its highest in the earliest period, and although cod is low in Period 5 (the castle decline from the mid 14th century) this is in part influenced by the numbers of herring in the barbican well (see Chapter 9.IV). Haddock shows an increase from Periods 3 to 5, while whiting is strongest in Periods 4 and 5. These figures suggest as a quantity of food cod is the most eaten fish in all periods, with herring its closest rival in Period 1. The figures for the 'portion' data were calculated from all forms of recovery, unlike the nisp percentages in Table 13.11. Therefore 'portion' can be said to favour larger fish like cod and haddock which are more likely to be recovered by hand collection and site riddling than the smaller herring and whiting. Despite this cod dominates by a sufficient margin to suggest it was the main food fish.

The Fisheries and Their Associated Trade and Industry

The supply of herring was from the local fisheries off the East Anglian coastline which, before the river became silted, were brought up river to Norwich directly from the coast. Subsequently Great Yarmouth, a famous herring fishing and processing port, was the point at which some herring were loaded on to river craft and taken to Norwich for processing and marketing. The East Anglian herring fishery was an ancient one, and well known from at least the 7th century. Fish, and herring in particular, were considered by Campbell (1975) as a possible source of major wealth for Norwich in the 11th century which spans Periods 1.3 and 1.4, at a time when the town was still a fishing port receiving herring directly from the East Anglian fishery. Despite the later loss of direct access, Norwich was still documented as a major centre for curing Yarmouth herring in the late 16th century. Herring would have been a major source of fresh fish in the autumn during the season and were netted in large numbers attracting fishermen from round Britain and abroad. The salted and smoked 'red' herring and the salted 'white' herring were prepared in Norwich and eaten throughout the winter and during the spring while supplies lasted. The importance of the herring as a Lenten symbol of fast in Norwich is exemplified by a Lenten effigy of Lent clad in 'red' and 'white' herring skins in 1444 (Cutting 1955, 72). As well as source of food herring also provided employment in curing and subsequent trade of the stored fish for Norwich. Even after the Reformation 'fish days' were encouraged on a non-religious basis to relieve the pressure on meat supplies and encourage suitable manpower for the navy through experience gained at sea as fishermen. The current author has suggested that by quantity herring was in fact secondary to cod, despite the large numbers of bones identified, but it still represents a major commodity in Norwich.

The main gadid species identified by number and quantity is cod. In the North Sea, during winter, the seasonal movement of adults could have supported an inshore fishery and, immature smaller fish tend to be found in shallower waters all year (Wheeler 1978, 150). The measured cod bones indicate that adult, sexually mature, fish were caught and these may have been part of that local seasonal fishery. However fishermen from East Anglian ports were exploiting the cod stocks off Norway in the late 14th century and Iceland in the 15th century (Starkey *et al* 2000, 22). The proportions of certain skeletal elements of cod have suggested that both whole and stored fish remains are present from the earliest period. Trade in dried cod, or 'stockfish' to East Anglian ports from Norway and Iceland is well documented. Cod was also salted and partly dried in English ports and along the coastline and widely traded. A less desiccated product, salt cod did not have the longevity of storage of 'stockfish', but required less reconstitution into an edible state. Some cut and chop marks on cod cleithra suggest they may be the remains of stockfish. Other marks on branchiostegal rays and articulars, as well as chop marks across precaudal vertebrae close to the head and caudal vertebrae near the tail, are further evidence of fish preparation.

Of the other gadids, pollack and saithe were few which may, in part, be due to their similarity to cod (leading to their inclusion in the large gadid category). Haddock was also comparatively scarce though better represented in Periods 3 to 5, particularly by quantity or 'portion' (see Table 13.12). Wheeler and Jones (1976, 221) consider haddock may have been more common in the central and southern North Sea than it is today. Haddock was identified relatively more frequently in the 11th- to 12th-century assemblages from Fullers Hill, Great, Yarmouth. However haddock were few at St Martin-at-Palace Plain (Locker 1987, 115) and Fishergate (Locker 1994, 44) in Norwich, perhaps suggesting little demand for this species in the town and this fish has traditionally been more popular farther north, particularly in Scotland. Whiting was also low both by number and 'portion' though readily available as a local fishery in which large numbers can be netted seasonally. Ling was not represented in all periods and totalled few bones. These are likely to be from stored fish, from a deep water fishery using lines based at a more northerly port. Elder (1912, 30) records Yarmouth fishermen going to Irish waters to fish for cod and ling in the 17th century and Williams (N.J.,1988, 167) states that in the late 16th century most cod and ling landed at Yarmouth went to feed Norwich.

The remaining species are all of lesser economic importance and there are a number of ways in which they can be grouped, habitat, fishery, quantity *etc*.. Turning to the fully marine species the selective survival of the elasmobranchs undervalues their importance, but spurdog and roker were eaten. These could have been caught locally in inshore waters and were consumed both fresh and stored. The flatfishes were most commonly plaice and flounder, caught on lines and in shoreline traps, Young fish, particularly flounder, enter into estuaries and freshwater so this fishery could be a local, low budget, shoreline operation. Other species were few, sole and turbot (and possibly brill) were also available locally, but halibut, traditionally a high status fish whose large size formed an impressive table centrepiece, would have come from fishing grounds in the northern North Sea.

Of the remaining marine fish only mackerel appears in sufficient numbers to suggest any impact in fish consumption. Typically found in May off the Norfolk coastline (Williams, N.J., 1988, 166) this species is prone to early spoilage and mackerel was often exempted from any restrictions on Sunday sales. There is no evidence to suggest that it was particularly marketed as a stored fish in the pre-industrial period (Starkey *et al* 2000, 42) either salted and or smoked, the latter being common today. Conger eel is poorly represented and only present in Periods 3 to 5. Caught on rocky shores on lines and in traps, this fish was eaten fresh and as salted fish in barrels and frequently recorded among the stored fish traded, particularly in the south west. However at Castle Mall it is rare. Other locally available marine food fish include; gurnard, bass, scad, sea breams, red mullet, grey mullet, and wrasse. All of these are in such low numbers as to represent a only small element of variety in the main diet of marine fish based on herring and cod, other gadids, flatfishes and mackerel. The single bone attributed to pilchard in Period 5 is based on a ridged opercular which distinguishes this species most clearly from herring. This single bone suggests it was rare, even taking into consideration the possibility of inclusion as herring on less specific bone elements. Although occurring locally in the North Sea it is more typically a species of the south-west and local fluctuations in the geographic distribution of herring and pilchard are influenced by small changes in sea temperature.

Migratory fish include primarily eel, which mature in fresh water, migrating to the sea to reproduce. These could have been trapped in the town's rivers and streams. Eels were eaten both fresh, with a rich and oily flesh and also salted, being stored in a number of ways giving rise to a variety of names used to describe particular sizes and types of storage listed on customs inventories and household accounts. Other migratory species include smelt, which migrate up river from the sea in winter to spawn in spring. They were the object of a short seasonal fishery and also identified from St Martin-at-Palace Plain and Fishergate. Young herring and sprat also enter freshwater and were the object of the 'whitebait' fishery in the Thames. The bones of salmon survive poorly, though there is documentary evidence for barrelled salmon sent to Norwich in the 16th century (Williams, N.J., 1988, 179) and great quantities were traded round Britain from Ireland (Carus Wilson 1967) and also from Berwick as 'Newcastle salmon'. However the bone evidence for salmon from Castle Mall is poor.

Freshwater fish, as might be expected from a town so near and with good communications to the coast, are poorly represented. Apart from pike the main group are the cyprinids of which tench is over represented by two partial skeletons in Period 1, otherwise roach is the most common species. Perch and ruffe were present only in Period 5.

Other evidence of marine exploitation includes dolphin (*Delphinus* sp.), two vertebrae being identified from the barbican well (Moreno García, Chapter 9.IV and Part III, Chapter 4). In pre-Reformation times dolphin would have been included as fish for fasting purposes (Wilson 1973, 38). Both dolphin and porpoise (the latter was specifically listed with fish in contemporary documents) may still have been regarded as fish in post-Reformation times. A number of marine shellfish were also identified though not quantified (see Murphy 'Molluscs and Crustaceans' below) including cockle (*Cerastoderma edule)*, mussel (*Mytilus edule)*, oyster (*Ostrea edulis)*, whelk (*Buccinum undatum)* and winkle (*Littorina littorea*). A few fragments of edible crab (*Cancer pagurus*) were also identified by Murphy who considers that the rarity of crab in Castle Mall deposits might imply a status food. Of all the marine resources represented fish appear to be by far the main contributor.

Conclusion

The large fish assemblage from Castle Mall provides a small window from the Late Saxon period to the 18th century of fish consumption and disposal in a particular part of Norwich. The assemblage very much reflects the fish from other excavations in the town. Despite the changing association of the area of excavation with the castle, domestic and industrial activities as the town grew, the fish assemblage shows the continuing importance of both cod and herring as food, employment in fish processing and as a commodity, supported by documentary evidence. Other fish were consistently represented and provided not only variety in the diet, but may have also been processed for storage in the town. However cod and herring were the key species. It is not possible to assess any changes in fish consumption after the Reformation through comparison of fish bone numbers with other bone material, but the documentary data referred to above implies that their importance continued through the 17th century.

Molluscs and Crustaceans

by Peter Murphy
(Plate 13.1)

Retrieval and Preservation

Shells, cheliped and carapace fragments were extracted from bulk samples (BS), sieved to 0.5mm and site-riddled samples (SRS) sieved to 8mm. Most of the archaeological features were cut into the superficial sand deposits overlying chalk, and their fills had a re-worked sand matrix, evidently of neutral to slightly acidic pH. As a result, despite extensive sampling, rather little shell was recovered, and much of it is fragmentary and disintegrating. Exceptions to this were:

1. Very occasional shell dumps (*e.g. 10561* from cess pit *10557*, Open Area 60, Property (g), G1/116, Period 6.1), in which relatively large amounts of shell created a locally base-rich micro-environment. Aestivating clusters of *Helix aspersa* (*e.g.* BS115, *11008*, from pit *11009*, Open Area 44, Property (e/f), G1/129, Period 5.1) produced similar conditions, but these assemblages are unlikely to be of archaeological significance.
2. Samples including burnt shell. Burning modifies the crystalline structure of the shell, making it more resistant to leaching by soil acids and resulting in the preservation, in some contexts, of diverse assemblages of terrestrial, freshwater and marine species (*e.g.* G9/104, Open Area 36, Property 43, Period 5).
3. Samples from deep features cut into the chalk (*e.g.* lower fills of the barbican well (G5/23, Period 5; see Chapter 9.IV) and some of the castle ditches).

	Cerastoderma sp	*Cerastoderma edule*	*Mytilis edulis*	*Ostrea edulis*	*Buccinum undatum*	*Littorina littorea*
Frequency	4	6	22	53	5	1
Hinge/apex counts	0	105	1	79	0	0

Table 13.13 Area 1 Marine mollusc shell from soil samples (all periods). 71 samples (SRS and BS)

Context no.	*Group*	*Period*	*BS no.*	*Sample vol (l)*	*Context type*
21105	G21/168	1.4	1683	30	fill of pit/oven 21070, Open Area 16
50313	G5/23	5.1	1888	15	lower fill of barbican well
90523	G9/104	5.1	1035	15	fill of pit 90524, Open Area 36 (Castle Fee Property 43)

Table 13.14 Distribution of *Cancer pagurus* cheliped fragments

These include mollusc shells derived from the local fauna, predominantly open-habitat and synanthropic species, such as *Trichia hispida* gp, *Vallonia* spp., *H. aspersa etc*., with food waste.

Even these exceptional contexts, however, did not produce large assemblages of marine mollusc shell.

Taxa Represented

Mollusca from the samples comprised terrestrial, freshwater and marine species. Molluscs from some particular context groups have been discussed in Period 5 (Chapters 8 and 9; pits and associated features in Castle Fee Property 43 noted above and the barbican well). The main edible shellfish present were *Cerastoderma edule* (cockle), *Mytilus edulis* (mussel), *Ostrea edulis* (oyster), *Buccinum undatum* (whelk) and *Littorina littorea* (winkle). Some of the larger gastropod fragments could be of either *Buccinum undatum* or *Neptunea antiqua*, but separation of columella fragments and abraded whorl fragments from these two species was difficult. Marine species occurring rarely were *Littorina littoralis* (flat winkle) from *90522* (pit *90524*, G9/104, Period 5.1) and *Gibbula cinerea* (grey topshell) from *91232* (a makeup dump, G9/44, Period 7.1), presumably accidentally collected with edible species. Crustaceans included ostracods, *Balanus* spp. (no doubt originally, with other invertebrate groups such as Bryozoa, attached to marine mollusc shells) and *Cancer pagurus* (edible crab). Large helicid shells (mostly *Cepaea* spp., *Helix aspersa, Helicella itala, Trichia* spp.) and derived chalk brachipods, bivalve and echinoid fragments had also been extracted during on-site sorting of the SRS residues.

Quantification

Quantification (recording presence of fragments and counts of bivalve hinges and gastropod apices) was begun for all samples from Area 1, but it rapidly became apparent that counting would not, in general, be meaningful: frequency and abundance of taxa was determined largely by their state of preservation. For example, *Mytilus edulis* was represented in Area 1 almost entirely by small non-hinge valve fragments. Counts based on hinges would have resulted in this species scarcely being recorded, yet in terms of frequency of fragments *Mytilus* was a relatively important species (Table 13.13). Moreover, particularly in samples from later site periods, it is probable that a proportion of shell fragments represents residual material. Occasional shell concentrations (in this case, of 95 *Cerastoderma* valves from one sample, context *10561*; see above) clearly also bias the representation of taxa. Overall, the quantities of shell retrieved in Area 1 were small, and this was typical of the site as a whole. Consequently, samples from the remaining site areas were simply scanned to detect samples containing unusual taxa. The distribution of *Cancer pagurus* is summarised in Table 13.14.

Conclusions

For reasons given above, the poorly preserved shell assemblages from the site provide no reliable basis for assessing the relative importance of shellfish taxa. Examination of epifauna and biometrical studies, which might have given data on the source of the material and intensity of exploitation were precluded, in most samples, by poor surface preservation and by the very small sample sizes available.

The presence of *Cancer pagurus* (edible crab) in only three contexts implies that it may have been a 'luxury' food (Plate 13.1). Crabs must have been imported from the north-east Norfolk coast, in the Cromer–Sheringham area, where there is an off-shore bed of hard chalk, providing suitable substrates for crabs and lobsters. Remains of this species have been recovered from other

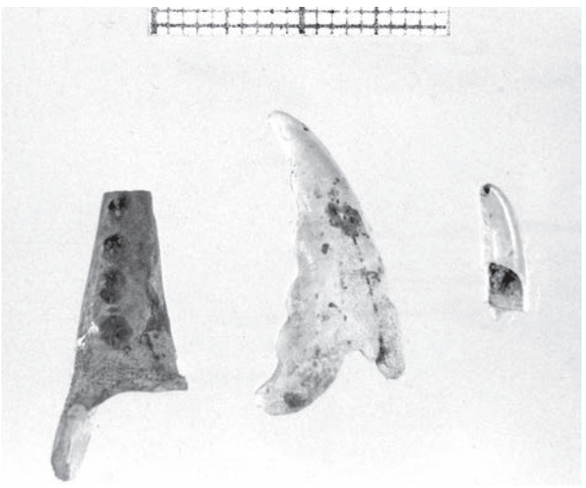


Plate 13.1 Cheliped fragments of edible crab (*Cancer pagurus*). Context *21105*, ?oven *21070*, Period 1.4, barbican well fill *50313* (G5/23, Period 5.2) and fill *90523* of pit *90524* (Period 5.1). Scale 20mm

sites in Norwich. Hitherto, the earliest reliably-dated specimen came from a 15th-century pit at Pottergate (Murphy 1985), all other specimens post-dating this. At Castle Mall crab remains came from contexts of similar date (Period 5, late medieval/transitional) but also from a Period 1 pit which may have formed the base of an oven (feature *21070*, Open Area 16, Period 1.4). It appears that, in general, the products of the 'Cromer crab' fishery were not reaching Norwich in any quantity before the later Middle Ages, but there was some importation from about the 11th century.

Plant Remains

by Peter Murphy
(Figs 13.6–13.7 and Part III, Figs 4–9 on CD; Plate 10.33)

Introduction

Urban Environmental Archaeology has been dominated over the last two decades or more by the study of waterlogged sites. Although well-drained sites have not been completely neglected, this generalisation is true of Norwich (Ayers and Murphy 1983; Murphy 1987b, 1994) and Britain as a whole (Greig 1991). The reasons for the higher profile of wet sites are readily understandable: at waterlogged sites a very wide range of readily identifiable macro- and micro-fossils is preserved, providing opportunities for numerous lines of investigation (Kenward and Hall 1995). By contrast, at well-drained sites such as Castle Mall, uncharred macrofossils are preserved only sporadically and not well. The principal form of non-charred preservation in such situations is by calcium phosphate replacement, which is often coarse or incomplete, resulting in the preservation of material from only a limited range of taxa, and difficulties in identifying closely those which *are* preserved. Samples including charred plant material are ubiquitous but often difficult to interpret, commonly coming from secondary contexts and including mixed assemblages incorporating material from a variety of sources.

However, it must be recognised that waterlogged urban sites are atypical: most people, in most periods, would have chosen to live in a dry, healthy location, unless considerations of economics or defence dictated otherwise. The excavations at Castle Mall should be seen as an unusual opportunity to study the environment and economy of a very extensive well-drained area of one of the principal cities of England. In Period 1 (pre-Conquest) it may be argued that the current case provides a more typical representation of Late Saxon urban deposits than at wet sites, which in some ways may have been marginal to the main settlement focus.

The establishment of a royal castle thereafter might at first seem to suggest that unusual, high-status, deposits would be anticipated, but this does not seem to be so: the macrofossil assemblages recovered are entirely comparable to those from other sites in Norwich, relating to the commonplace activities of food processing and refuse disposal. It is therefore hoped that the extensive investigation of the comparatively 'ordinary' urban macrofossil assemblages considered in this report will help to provide a context for, and inform, the small-scale interventions which now typify British urban archaeology.

The assemblage of plant remains from the Castle Mall site is detailed by period in Section IV of Chapters 4–10, with a full listing of all taxa from the site given in Chapter 1, Table 1.7 on CD (see also Appendices 3–4 and 7–8 on CD).

Economic Plants

The full list of economic taxa, with an indication of representation in the six main site periods (Periods 1–6), is given in Table 13.15. Criteria for identification are given in Appendix 7 on CD. The main oat species was *Avena sativa* (common oat), though a Period 2 context included a possible floret base of *Avena strigosa* (sand oat). The barley grains from many contexts were deformed due to germination before charring. Asymmetrical lateral grains were seen in samples from all periods, establishing the presence of *Hordeum vulgare* (six-row hulled barley). Rye was consistently represented by grains and rachis nodes. Except in a few samples from Period 1 buildings, wheat was sparsely represented and rachis nodes were very uncommon. Most grains were of short hexaploid type, and the few nodes present were of *Triticum aestivum* (bread wheat) type. *Triticum turgidum/durum* (rivet/macaroni wheat) was not identified at Castle Mall. Tetraploid wheat is now known to have been grown in the medieval period in Britain (Moffett 1989), and has been identified from medieval deposits at Greyfriars, Norwich (Fryer and Murphy 1995).

The gross composition of the total cereal grains from successive site periods is summarised in Fig.13.6 and Table 13.16. Oats predominated in Periods 1–2, except in samples from buildings, but in Periods 3 and 5 the samples were barley-dominated. Rye and wheat occurred at generally lower frequencies. The probable significance of this is discussed below.

Other field crops, represented by charred seeds or mineral-replaced testa fragments were *Pisum sativum* (pea), *Vicia sativa* (cultivated vetch), *Vicia faba* var *minor* (horse-bean) and *Linum usitatissimum* (flax/linseed). From their occurrence at low frequencies in association with cereal grain, the charred seeds are thought to have been no more than contaminants of other crops, in these particular samples.

The range of fruits, nuts and herbs/flavourings, from Periods 1–5, mainly preserved as mineral-replaced macrofossils in latrine pits, is typical of medieval urban sites (Greig 1991, 325). At Castle Mall wild taxa predominated in Periods 1–3, and 'exotic' fruits including *Vitis vinifera* (grape) and *Ficus carica* (fig) were not usually recorded before Period 4 (late 12th to mid 14th centuries), though one sample from a pre-Conquest pit (pit *80537*, G8/6; Period 1.3) included some fig seeds. Their rarity or absence in contexts up to about the 12th century does not suggest that the deposits sampled related to high-status occupation.

The record of *Cucurbita* sp (marrow/pumpkin) from a mid/late 17th- to early 18th-century context (Period 6.2; see pit *57136,* Fig.10.13 and Plate 10.33) adds to the accumulating list of records from post-medieval contexts in Britain (Moffett 1995).

Cereal Use and Processing

One of the main questions posed at the outset of the Castle Mall project related to the economic status of the pre-Norman town. Were the inhabitants engaged in

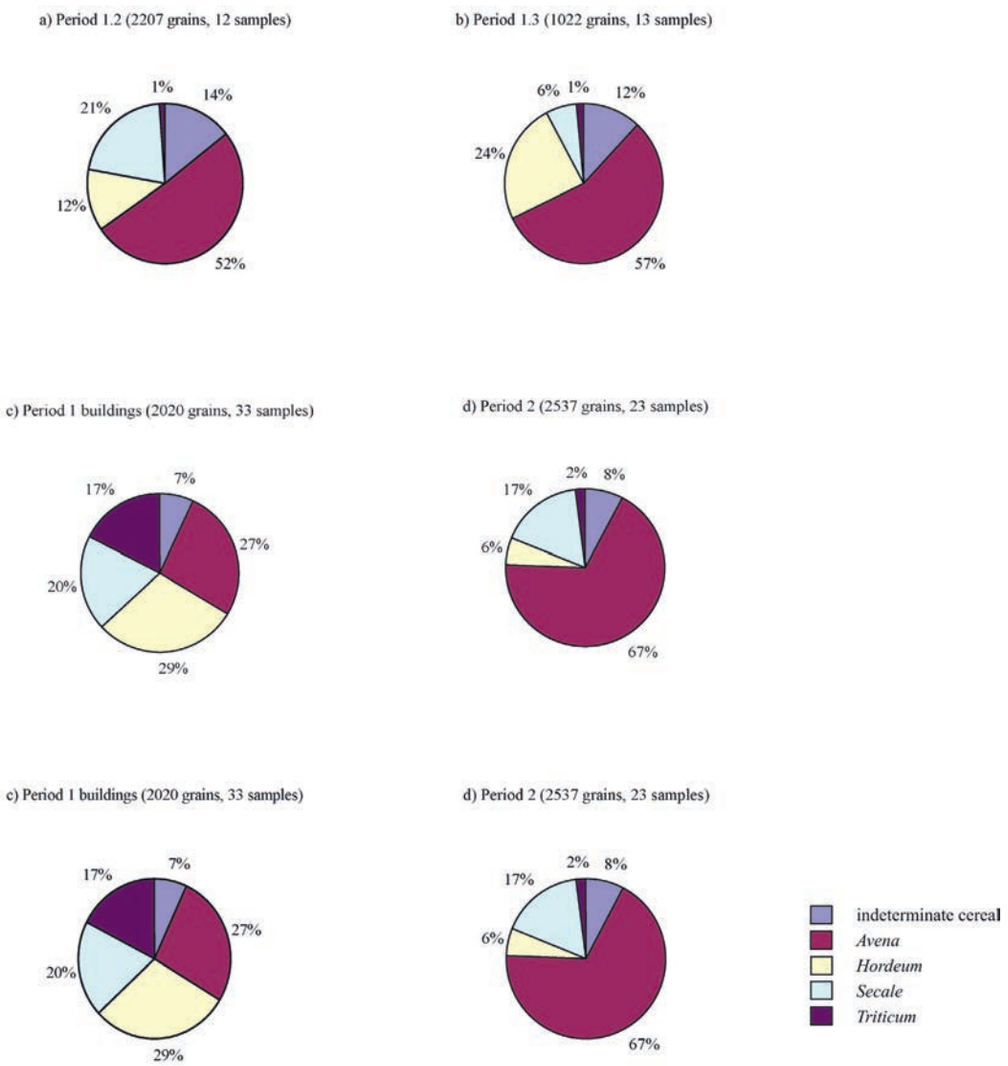


Figure 13.6 Cereal grains from selected features by period

farming and associated activities such as crop processing, or were they nett cereal consumers, receiving processed crops from subsidiary farms? This type of question is best addressed by considering the overall composition of the charred cereal assemblages. In Fig.13.7, assemblage composition for all charred samples including more than 50 items is summarised in the form of triangular diagrams (M. Jones 1985). Notes on the preparation of these diagrams are given in Appendix 10, but in summary the assemblages are considered to have three main components (grain, chaff and weed seeds), which are presented in percentage terms.

It is immediately apparent that in Periods 1–3, most assemblages were grain-dominated, with relatively little chaff and few weed seeds. There were a few exceptions to this, which have been discussed elseswhere in these volumes (Chapters 4.IV and 5.IV), but cereal grain was by far the main component overall. In general, preservation of chaff and weed seeds was moderate to good, so the predominance of grain in most samples is not generally thought to be a product of differential preservation during charring (Boardman and Jones 1990), though no doubt in some samples composition is biased by differential preservation. Models interpreting such compositional data have been reviewed by Van der Veen (1991). In the ethnographically-based model of Hillman (1981, 1984), predominance of large deposits of charred prime product is considered characteristic of large consumer sites, where there would have been bulk storage of cleaned or semi-cleaned grain.

An alternative model developed by Jones (1985) proposes that, to the contrary, large grain-dominated samples would be expected at sites of production, where the perceived value of the crop was less than at consumer sites.

Obviously, application of any interpretative model has to be considered within the context of the specific site study. At Castle Mall, it is thought that Hillman's model is most applicable. It appears that most grain was being imported to the site as a semi-cleaned prime product at all periods, and that there was little or no primary processing on site. Some samples from Periods 4–6 (notably from one pit in Castle Fee Property 43 (Open Area 36, G9/104, Period 5; Chapter 8.IV), the barbican well (Period 5.2,

Period	*1*	*2*	*3*	*4*	*5*	*6*
Cereals						
Avena sativa (common oat)	x	x	x	x	x	x
Avena cf strigosa (sand oat)		x				
Hordeum spp. (barley)	x	x	x	x	x	x
Secale cereale (rye)	x	x	x	x	x	x
Triticum aestivium (bread wheat)	x	x	x		x	x
Triticum sp(p) (indeterminate wheat)	x	x	x	x	x	x
Pulses						
Pisium sativum (pea)	x	x	x			
Vicia sativa (vetch)			?		x	
Large *fabicaceae* frags (indet. Pulse)	x	x	x		x	x
Fibre/oil crop						
Linum usitatissimum (flax/linseed)	x	x			x	
Nut						
Corylus avellana (hazel)	x	x	x	x	x	
Wild and cultivated fruits						
Crataegus monogyna (haw)	x					
Curcubita sp. (?pumpkin)						x
Ficus carica (fig)	x			x	x	x
Fragaria vesca (strawberry)	x				x	x
Malus sylvestris (apple)	x	x	x		x	x
Prunus avium (cherry)	x	x			x	x
Prunus domestica s.l. (plum/bullace)					x	x
Prunus spinosa (sloe)	x	x	x		x	x
Rubus fruticosus (bramble)	x	x	x		x	x
Rubus idaeus (raspberry)	x				x	
Sambucus nigra (elder)	x	x	x	x	x	x
Vitis vinifera (grape)				x	x	x
Herbs/flavourings						
Foeniculum vulgare (fennel)						x
Papaver somniferum (opium poppy)	x					
Satureia hortensis (savory)					x	

Table 13.15 Distribution of records of economic plants by period

Period (context type)	*1.2*	*1.3*	*1.4*	*Period 1 buildings*	*2*	*3*	*4*	*5*	*Barbican well*	*6*
Indeterminate cereal	318 14.40%	122 11.90%	88 36.80%	139 6.90%	194 7.60%	66 11.00%	57 39.00%	99 17.70%	97 40.70%	98 30.90%
Avena	1124 50.90%	570 55.80%	27 11.30%	540 26.70%	1723 67.90%	74 12.40%	15 10.30%	76 13.60%	22 9.20%	91 28.70%
Hordeum	272 12.30%	250 24.50%	114 47.70%	592 29.30%	144 5.70%	428 71.60%	68 46.60%	324 57.90%	61 25.60%	67 21.10%
Secale	468 21.20%	65 6.40%	8 3.30%	398 19.70%	425 16.80%	10 1.70%	3 2.10%	7 1.20%	23 9.70%	2 0.60%
Triticum	25 1.10%	15 1.50%	2 0.80%	351 17.40%	51 2.00%	20 3.30%	3 2.10%	54 9.60%	35 14.70%	59 18.60%
Total grain count	**2,207**	**1,022**	**239**	**2,020**	**2,537**	**598**	**146**	**560**	**238**	**317**
No. samples	**12**	**13**	**3**	**33**	**23**	**13**	**4**	**35**	**11**	**7**

Table 13.16 Summary of cereal grain counts by period

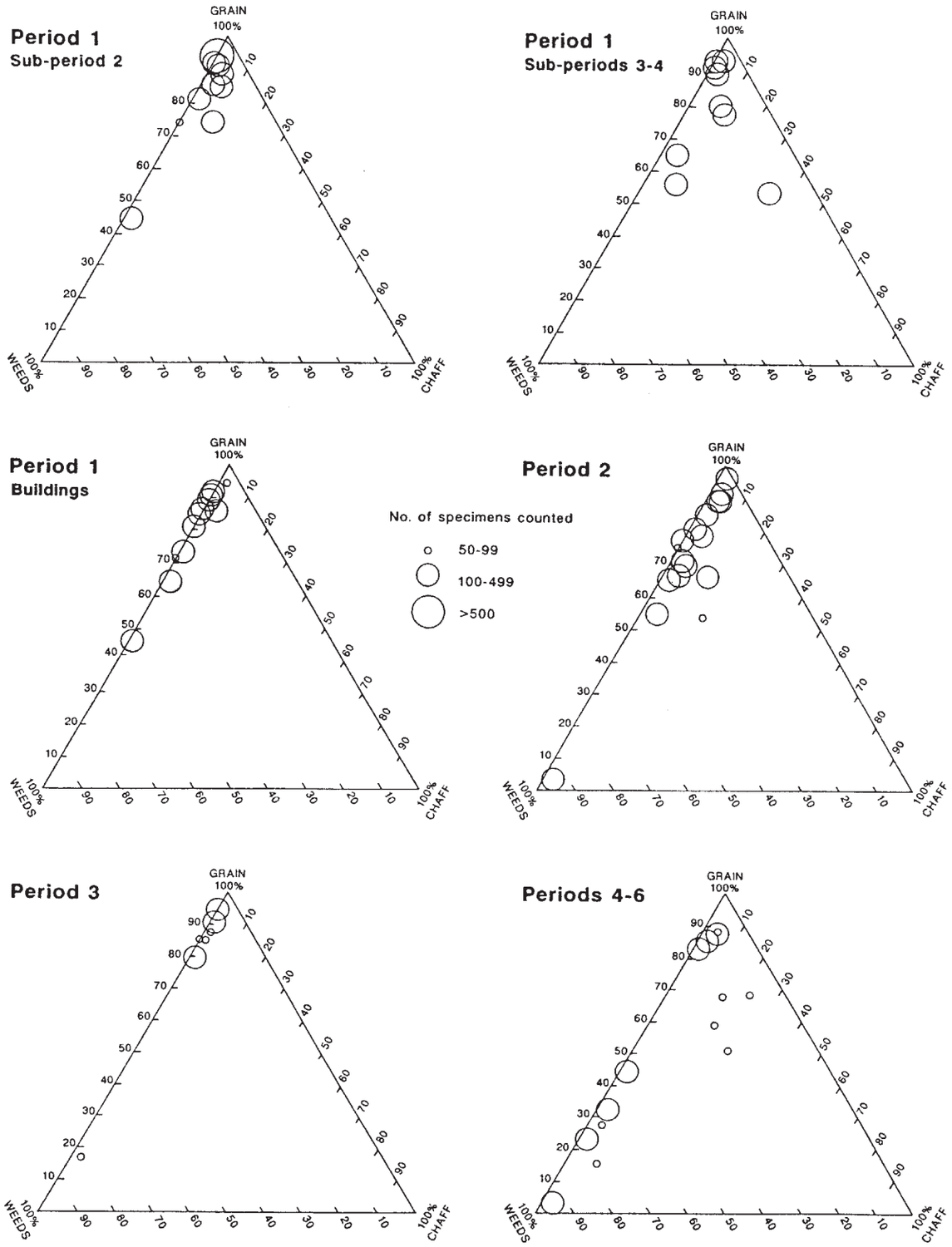


Figure 13.7 Triangular diagrams showing plant macrofossils assemblage composition by period (see Appendix 10). The assemblages are considered to have three main components (grain, chaff and weed seeds), which are presented in percentage terms.

Chapter 9.IV) and a malting kiln (Open Area 58, G1/130 and 131, Property (e), Period 6, Chapter 10.IV)) included higher proportions of weed seeds and/or chaff. These are, however, thought to relate to fuel sources, rather than processed products (see below). Certainly, no large deposits confidently interpretable as primary crop processing waste were encountered. The assemblages recovered are thought to relate mainly to the later stages of crop processing (primarily malt-drying) and to cereal storage.

Crop Storage

Deposits of cereals thought to represent stored prime products charred during the destruction of buildings by fire have been discussed in detail in Chapter 4.IV (see Fig.13.7). It is likely that some of the charred cereals from other features represent material dispersed from such catastrophic events, but context provides no direct confirmation of this. Sample groups considered to be *in situ* charred granary deposits were as follows:

Area 6 (Building 1, G6/4, Period 1.2). Sample composition was variable, but some samples included a high proportion of bread wheat-type grains with very little chaff and few weed seeds.

Area 22 (Building 11, G22/154, Period 1. 2 and 1.3). A single sample included abundant rye grains with very little chaff and few weed seeds apart from corn-cockle (*Agrostemma githago*).

Area 1 (Buildings 17 and 18, G1/138 and G1/140, Period 1.4). Samples were composed principally of six-row hulled barley grains, with other cereals and peas as contaminants. Cereal chaff was absent. Weed seeds were rare.

The available evidence indicates that crop cleaning was in general efficient and that bulk stores included few contaminants in Period 1. Seeds of corn-cockle were, however, an exception to this. The large seeds of this weed would not have been easily separable from rye grains by sieving, and would presumably have been separated, if at all, by hand-sorting immediately before preparation for consumption. Testa fragments of corn-cockle were common in mineral-replaced faecal concretions from latrine pits at Castle Mall (and also in Anglo-Scandinavian deposits rich in faeces from York: Kenward and Hall 1995, 758) implying that separation was not attempted or was incomplete. The seeds include haemolytic toxins (saponins) which would have had a deleterious effect on the health of consumers, where present in high concentrations (Forsyth 1968).

The stored products from Period 1 contexts showed no evidence for insect pests, either in terms of the charred pests themselves nor bored grains. However, Dr M. Robinson notes the presence of the grain weevil, (*Sitophilus granarius*), in the lower fills of the barbican well (Period 5, Chapter 9.IV). Also noted was the bean weevil, *Bruchus rufimanus*, in pit fill *80011* (pit *80002*, Open Area 26, Period 3.2, Chapter 6.IV), often a pest of stored beans.

Malting

It has been argued in Chapter 4.IV that deposits of charred germinated cereal grains, mainly oats, from a Period 1 sunken-featured building (Building 12, G9/48, Period 1.2; Chapter 4.IV; Figs 4.11 and 4.24–25) were accidental products of malt-drying in hearths within the building. Other samples of Periods 1 and 2, from secondary contexts such as pits, also included abundant germinated oat grains, and it is likely that at least some of these were also related to malt-drying. The samples from Building 12 also included sprouted barley grains (the oat: barley ratio in the largest sample from post-hole fill *91974* was 13.6:1). Unsprouted wheat grains were also present. Corran (1975, 60) notes that in the late 16th century about 10% of unmalted wheat or oats were added to barley malt before mashing, and it is possible that a comparable practice is represented in these samples. Alternatively, they may include cereal grains from more than one source. Similar samples largely composed of germinated oat grains with some barley and traces of other cereals have come from an early medieval sunken-featured building at the Buttermarket site, Ipswich (Murphy 1991). Many of these grains had been broken before charring, and were interpreted as a coarse malt grist, stored ready for brewing and charred when the building burnt down. From these two sites, it would appear that oats were widely used for malting in early medieval East Anglia.

Oaten malt was still produced in 18th-century England (Findlay 1956, 21), but by then barley malt was in more common use. By Period 3 at Castle Mall, barley had replaced oats as the main cereal represented by charred grains (Fig.13.6). Again, a high proportion of the grains had germinated before charring (*e.g.* in north-east bailey ditch fills, Ditch 9, G9/7, 9/11 and 9/12, Period 3, Chapter 6.IV), and it seems probable that much of this material was related to malt-drying. The post-medieval kiln (noted above and detailed in Chapter 10.IV) produced charred sprouted barley, amongst other macrofossils, and is thought to have been used, in part at least, for malt drying.

Malting is a very 'archaeobotanically visible' activity at dry sites, for it would have been one of the few large-scale processes on site involving heat-treatment of cereals, with the opportunities for accidental charring which this would present. Indeed, it seems probable that the relative abundance of oats, and subsequently barley, in the samples was related very largely to their use for malting. The relative rarity of charred rye and wheat (except in charred granary deposits from Period 1 buildings) is probably a consequence of the fact that these cereals were consumed in ways which did not involve exposure of whole grain to heat-treatment, as flour or meal.

Sewage Disposal

As noted above, deposits containing human sewage have been characterised by the presence of mineral-replaced food residues and faecal concretions, usually with mineral-replaced fly puparia, (particularly *Thoracochaeta zosterae*, which was identified by Dr Robinson in latrine pit fills of Periods 1, 3 and 6) and commonly with abundant fish bones. Such deposits came predominantly from pits, but also from other contexts such as the fills of castle ditches (Periods 2–5) and a quarry fill (Period 6), suggesting some more casual discharge of sewage. In general, sewage disposal seems to have been careful.

Mineral-replaced latrine pit assemblages are commonplace at medieval urban sites. At Castle Mall, contexts characterised as latrine pits occurred from Period 1.2 onwards. This is very much an urban pattern of disposal. At rural sites latrine pits are much less common, suggesting that human sewage was used as a manure: it was regarded as a resource, rather than a nuisance. This pattern of disposal clearly fits well with the cereal evidence, discussed above, that the Late Saxon occupants of the site were nett consumers, rather than producers of agricultural produce.

Comparisons With Other Sites

Castle Mall was obviously a specialised high-status site, once the royal castle was established. The macrofossils retrieved, however, give no hint of this: had they been considered without knowledge of context, they would have been indistinguishable from those retrieved at other sites in Norwich. Comparison with material from medieval tenements at Alms Lane, Norwich, is instruc-

tive (Murphy 1985). From the late 13th century onwards at Alms Lane, the charred cereals were dominated by barley, and indeed, a small-scale malting and brewing site was defined there. The non-charred material from this well-drained site comprised a comparable range of mineral-replaced macrofossils to that from Castle Mall. Overall, the Alms Lane material closely resembled material from Castle Mall, and is thought to indicate a similar range of activities and processes. Clearly, though refuse deposits from high-status, even royal, occupants are likely to exist somewhere within the vicinity of Norwich Castle, they have not been encountered during this excavation.

It is interesting to note the complementarity of results between Castle Mall, a large dry urban site, and Coppergate, York, the exemplar of large urban wet sites (Kenward and Hall 1995). At Castle Mall, some activities detected at Coppergate (*e.g.* textile processing and dyeing) are completely unrepresented. By contrast, there is abundant evidence for bulk cereal storage and for malting at Castle Mall, whereas at Coppergate 'cereal grains were usually present in rather small amounts' (*ibid*, 753). The reasons for this are obviously in part related to preservation conditions; and it may be suspected that the very high content of largely undegraded organic material at Coppergate had a 'dilution effect' on the concentrations of charred plant material present in the deposits. Putting such considerations of preservation and deposit taphonomy aside, however, there are grounds for suggesting that there were real functional differences between these contemporary urban sites. It seems reasonable to suppose that cereal storage and bulk processing activities were best done in well-drained locations, where the risks of spoilage through damp were less. The riverside location of the Coppergate site may have favoured other types of activity, such as wool processing and dyeing, requiring greater water supplies and a means of discharging fouled effluent.

General Discussion

Many of the provisions consumed during all periods of occupation at the Castle Mall site would no doubt have derived from local markets, which were themselves generally supplied by local farms and fisheries supplemented by imported goods. The evidence indicates which cuts of meat were reaching the site at each period, while consideration of various evidence for the processing and storage of foodstuffs has also been undertaken. Various methods of fish preservation, specifically salting, drying and pickling, have also been discussed. As well as provisions imported onto the site, on-site breeding and grazing of animals also occurred, while crops and fodder would have been produced in Late Saxon fields to the west of the castle and within the Castle Meadow during Norman times. The main Anglo-Saxon market lay to the north-east of the castle area at Tombland (Chapter 4.I), later supplemented by a large provisions market which was in existence to the west of the castle by 1096 (see Chapter 5.I; Fig.12.2.A) and continues to thrive to this day. The development of this great Norman market and its later subsidiaries — including the city's livestock market which lay within the castle baileys — is fully detailed in preceding chapters.

In addition to the food waste and patterns of provisioning discussed above, two of the pre-Conquest burial groups excavated at the Castle Mall site allow some additional conclusions to be drawn about the local diet of the time. At the cemetery recorded beneath the south bailey rampart at Farmer's Avenue (Cemetery 3, Period 1.3, Chapter 4) relatively high levels of iron deficiency anaemia and deficiency of Vitamin C (scurvy) and Vitamin D (rickets and osteomalacia) were recorded (Anderson, Chapter 4.V). Pathological changes indicate that some essential dietary components may have been missing and that these individuals may have suffered to a greater degree than in other similar groups. Anderson suggests that, although poor nutrition was common, it may have been a seasonal problem affecting rich and poor alike and may not have reduced adult life expectancy to any noticeable degree. Children, however, would have been vulnerable. Iron deficiency anaemia and possible rickets were again evident in the group from the Late Saxon (or early Norman) Cemetery of St John at the Castle Gate (de Berstrete/Timberhill; Cemetery 4, Period 1.4, Chapter 4). The difference in dental pathology evident in a comparison of these two groups may reflect a change in eating patterns: caries is thought to increase in the medieval period due to increased carbohydrates in the diet (Anderson, Chapter 4.V). (Additional comments on the Late Saxon/early Norman diet in relation to stable isotopes are given by Bayliss *et al* in Chapter 4.V).

Similar evidence for malnutrition and dietary deficiencies to those found in the Castle Mall groups was recorded in another Late Saxon cemetery beneath the north-east bailey (Castle Meadow), notably including another case of rickets (Stirland 1985, 54, 56). When combined, the variety of dietary deficiencies (indicated by conditions such as *cribra orbitalia*, *parietalosteoporosis* and enamel *hypoplasia*) and the recorded pathologies indicate that these individuals, particularly the males, had undertaken hard physical work whilst excluded from sunlight (Stirland 1985, 56). A possible association with mining activities was suggested: several medieval chalk mines are known in Norwich, although these may not have been operative until the 16th century (see Chapter 8.VI). The deficiencies evident in all three groups considered here indicate the persistent lack of certain elements in the local Late Saxon — and possibly the early Norman — diet. Rich sources of iron include organ meats (liver, kidney and heart), while it is also found in egg yolk, legumes, shellfish and parsley (Davies and Stewart 1987, 59). Vitamin C occurs in most fruit, green vegetables, liver, kidney, with particularly high levels in rose hips and exotic fruits (Davies and Stewart 1987, 29). Historically the main source of Vitamin D was sunlight. It is also found in fatty fish, cod liver oil, eggs, milk, butter and cheese (Davies and Stewart 1987, 35). Although many of these foods are evident or implied in the Castle Mall Late Saxon assemblage, they were evidently consumed in insufficient quantities to provide a truly balanced diet.

Continuity between the Late Saxon and Norman periods was evident in consumption of fish, fowl, meat and crops at Castle Mall, although occasional hints at the change in the status of site with the arrival of the Normans were noted. At the time of the Conquest, food provision would generally have been quite localised and would have consisted of the main domestic animals (cattle, sheep/

goat and pig), supplemented by wild species. Fish would have included salted or pickled herrings, as well as cod, supplemented by lesser species (Locker, Chapter 4.IV and above). The peasant diet would also have included a high proportion of pottage. Bread was a staple food for all, although it came in different varieties and qualities. Evidence from the Late Saxon buildings at Castle Mall indicates grain storage within buildings and attests to the presence of batches of cereals from different farms, with different crops being stored in individual buildings (Murphy, Chapter 4.IV and above). Many of the Late Saxon and Norman pit fills examined contained grains of bread wheat (*Triticum aestivum*), while burnt bread and charred textile was also found in a pre-Conquest pit (*40020*, Open Area 10, Period 1.3, Chapter 4.II).

The Norman castle would have had its own bakehouse, with ovens fuelled by wood, peat or furze (see Murphy, 'Fuels' below). In larger castles, the bakehouse and brewhouse would often have been separated from the kitchen (Pounds 1990, 193) and such buildings may have lain within the baileys of Norwich Castle. The few querns recovered at Castle Mall would have supplemented any larger mill located outside the castle precinct, and would have been particularly necessary in times of danger. Environmental remains from pits within the early Norman castle bailey include a large charred deposit of prime grain, perhaps held in a sack (see pit *20070*, Period 2.1, Chapter 5.II). As has been discussed in Chapter 5.V, the use of such pits for grain and wine storage is known at other Norman castles such as Pevensey (Dunning 1958, 205–217).

Pre-Conquest hunting is perhaps attested by the presence of a goshawk and a roe deer trophy (Chapter 4.IV). Domesday Book notes that Norwich made a pre-Conquest payment (annually?) of a goshawk to the Earl (Brown 1984, (61) 117b). A goshawk found at the Norman castle at Hen Domen, Montgomery, notably appeared to have been ringed (Browne 2000, 134), although no such evidence was found on the Norwich bird. Evidence for hunting and horse-riding in later periods includes artefactual evidence for arrowheads, horse equipment and, in later centuries, a powder horn and scraps of leather pouches which may also have been used to hold gunpowder.

Animal grazing is well-documented at the site, both within the Castle Meadow and the south bailey. The evidence from the excavations, however, also indicates the unexpected breeding of animals in all periods other than Period 4, making this to some degree a producer as well as a consumer site. Similar evidence was recorded at the Norman Castle of Hen Domen, Montgomery, where a group of eight neonate piglets found in a pit indicates that their mother was housed within the castle bailey (Browne 2000, 131, 134). At Norwich, the Castle Meadow would have produced crops and fodder for the garrison (in Periods 2–4) and, after 1345, the green area provided local grazing. A lease of around 1260 includes a reference to Ralph Couwe, who perhaps pastured cows there (Tillyard, Part IV). Such pasturing eventually transformed into the city's great Cattle Market which, in its authorised state, was active at the site for well over three hundred years.

In times of attack or the threat of it (as occurred in 1075, the 1170s and 1216), Norwich Castle would have been amply provisioned. Supplies purchased in 1172/3, for example, included wheat with querns for grinding it, salt pork, sausages and cheeses (up to 200 in a single delivery), together with rope and iron (Tillyard, Chapter 6.I). Two years later there was also barley and a large quantity of oats, as well as peas and beans. The presence of stored beans at the site during the Norman period is attested by the presence of the bean weevil (see Murphy 'Crop Storage' above). The grain would have included fodder for horses. During times of siege, dogs may have been butchered for human consumption, while evidence for the feeding of dogs themselves comes from a horse hind limb recovered from a Norman context (Chapter 5.IV). Enormous supplies would also have been needed for royal visits to the castle such as the Christmas crown-wearing of 1121–22. When King John was at Winchester for Christmas in 1206, for example, the sheriff had to provide 500 hens, 5,000 eggs, 20 oxen, 100 pigs and 100 sheep. 'Status' meats of the Norman and medieval period would have included game animals (such as boar and deer; absent or negligible in the Castle Mall assemblage) and wild birds. A wide range of birds would have been eaten. Water fowl and/or terrestrial birds were found in all periods at Castle Mall (Albarella *et al*, Part III). Pork is often associated with high status sites, the roast variety being considered a consistent source of delicate meat. The prevalence of pig at around the time of the Conquest has been noted at the Castle Mall site (Albarella *et al* above).

Some foods were used more for their dramatic effect than for their flavour. Peacocks, for example, are associated with high status sites, although they were notoriously tough and indigestible to eat. Either swan or peacock was served at most great banquets, in full plumage. Swan bones were found in Periods 2 and 5 at Castle Mall and, although a peacock bone was also identified, it came from a modern deposit on top of the Castle Mound. The 'royal' fish were whale, sturgeon and porpoise, none of which were recorded at the site (other than a whale bone gaming piece in Period 4; Huddle, Chapter 7.III), although dolphin bones were found in 15th- to early 16th-century fills of the barbican well (Moreno Garcia, Chapter 9.IV and Part III). Halibut was also a status fish: bones of these fish were, however, found in Periods 1, 5 and 6 at Castle Mall, rather than during the Norman and medieval occupation of the site. The rarity of crab bones may suggest that this too was a 'luxury' food (Murphy, above).

Salt made from evaporated sea water had been produced in East Anglia for centuries and was essential for preserving food including meat and fish (Locker above). During the Norman period, salt works are documented in both west and east Norfolk (Keen 1988, fig.2). Many spices were luxuries introduced to Britain by the Normans and could be used to improve the flavour and appearance of salted and dried winter foods. Their long journey to England from the East increased their value. A single charred seed of opium poppy, notably found in Period 1 at Castle Mall, was probably a weed rather than a crop (Murphy, Chapter 4.IV).

A wide range of herbs would have been used, both for flavouring and decoration, although none were identified at Castle Mall during Periods 1–3. The dried variety would have been available even in winter. During winter, vegetables would have included root varieties, onions and other types preserved during the year including dried peas and beans which, as noted above, where certainly

imported to the site during the Norman period. Pulses were recorded at Castle Mall in all but Period 4 (Table 13.15 above).

Access to a wide range of fruits was evident at the site during the Late Saxon (Period 1) and, to a lesser extent, the Norman period (Periods 2–3), increasing in range during the later medieval and post-medieval periods (see below). During the winter, fruit was largely confined to the dried variety while expensive imports would have included raisins, figs and dates (Hammond 1993, 12). The first recorded presence of fig at Castle Mall occurs in a Late Saxon pit and is paralleled in findings of a similar period at Dragon Hall (Fryer in Shelley 2005) and London (Rackham 1994, 134). Certain varieties of apple and pear could be kept throughout the winter and apple seeds were recorded in all but Period 4 at Castle Mall. Nuts would have provided a rich source of calcium, although the only nut species evident at Castle Mall was the hazelnut (present in Periods 1–5).

Malting was virtually ubiquitous at all periods at the site and was recorded in association with Late Saxon buildings. It was particularly prevalent in Norman fills of the Castle Meadow (north-east bailey) ditch (Ditch 9), indicating the possible presence of a castle-related brewery in the vicinity (see Chapter 6). Brewing was again a significant local product during the late medieval and post-medieval periods, with a burgeoning number of hostelries and breweries near the castle from the late 14th century onwards (the development of which is fully detailed in earlier chapters and in Part IV). A malting oven of late 16th- to 17th-century date was found in the southern part of the site in a tenement (Property e) which has no documented association with the activity (Chapter 10.I).

Amongst the artefacts discussed in Period 4 is the only fish hook recovered from the excavation (Goodall, Chapter 7.III). There was a small but apparently significant increase in the consumption of birds at this period (Albarella *et al* above and Part III). Documented trades around the Castle Fee in the period 1285–1341 include spicers or apothecaries, one baker and two poulterers (Tillyard, Chapter 7.I).

In the period *c.*1397–1558, a sizeable proportion of those paying Castle Fee rent was associated with food and provisions, including brewing, butchery, a miller, a baker, a fishmonger and numerous grocers (see Chapter 8.I and V). After the hand-over of the baileys to the city of 1345, food was for sale at booths within the south bailey, while the baileys were increasingly used for the grazing and eventually the sale of livestock, culminating with the transformation of the defences into Norwich Cattle Market in the early 17th century (Chapter 10.I and 10.VI). While in all periods many animals may have been brought to graze at the site on a daily basis (penned elsewhere at night) some were apparently bred and presumably kept locally. Pigs, for example, need little space and could have been raised in backyards fed on household scraps.

The main domestic species continued to dominate the late medieval/transitional assemblage, with a low proportion of wild species. A shift towards culling of juvenile animals was noted, suggesting that this trend may have occurred earlier in Norwich than elsewhere (Abarella *et al* and Curl above and Part III). Among the terrestrial birds found in Periods 5 and 6 were woodcock and grey partridge, both of which were highly prized in medieval times (Albarella *et al* above and Part III). Partridge and pheasant bones were found in 15th- to 16th-century pits (Period 5.2) at Golden Ball Street, although the latter species was not apparent at Castle Mall (see discussion by Albarella *et al* in Part III). Of note amongst the faunal remains from Castle Mall were turkey bones (found in both Periods 5.2 and 6.2) indicating that the species reached Norwich soon after its introduction to England in the mid 16th century (Albarella *et al*, Part III). Supplementary evidence for kitchen and table waste comes from plant remains found in cess pits, which attest to the consumption of wild and cultivated fruit and cereals (Murphy, Chapter 10.IV).

A substantial proportion of the material recovered from late medieval/transitional fills of the barbican well (Chapter 9) relates to food preparation and waste, in the form of food residues and kitchen equipment. It appears that the well may have been a focus for the disposal of butchery waste (Moreno García above, Chapter 9.IV and Part III, Chapter 4) . This assemblage and the contemporary diet are discussed in Chapter 9.VI. The diet again included the main domesticates, supplemented by wild species, marine fish and shellfish. A dolphin may also have been an unusual food source. The inclusion of lower status domestic refuse is evident, while some of the beetle species present are of types commonly found in dirty kitchen environments (Robinson, Chapter 9.IV).

Individuals working in the food trades maintained their presence around the castle into the post-medieval period (Tillyard, Chapter 10.I). Again, the contemporary diet in its historical context is summarised in Chapter 10.VI. Changes in kill-off patterns occurred at this time, partly associated with the introduction of new breeds (Albarella *et al* above and Part III). Of note is the slaughter of pigs, domestic fowl and geese at a younger age than in previous periods. Fish bones demonstrate the increase in cod as the dominant food fish during the post-medieval period, with few freshwater species apparent (Locker above, Chapter 10.IV and Part III). The lack of fish bones from fills of the barbican ditch is notable, possibly indicating that this was not typical household waste. Beverages represented during this period (both by plant macrofossils and other archaeological evidence including drinking vessels) include beer, wine and tea (Chapter 10.III *passim*, 10.IV and 10.VI).

The meagre rations likely to have been issued to the group of 17th-century felons buried at the top of the Castle Mound are noted in Chapter 10.VI. Notably, the group showed no particular evidence for malnourishment (Anderson, Chapter 10.V) .

Norwich was renowned for its orchards and gardens and a number of its plantsmen specialised in growing a wide range of fruit, a practice well established by the early 18th century (Priestley and Fenner 1985, 29–30). A wide range of wild and cultivated fruits was evident at this time at the Castle Mall site. The presence of pumpkin/marrow seeds is particularly significant, providing the first example of the species in Norwich (Murphy above and Chapter 10.IV). The Castle Mound is known to have been used as allotments during the late 18th century, with areas of the former baileys used as gardens and orchards from the late 16th century until 1800 and beyond. Periods 5 and 6 provide limited evidence for

such activity at the site, in the form of garden soils and a few tools (Chapters 8–10).

In conclusion, the analysis of the Castle Mall and Golden Ball Street material has done much to elucidate the diet and economy of Norwich from its earliest development until recent times. The integration of historical and documentary evidence has proved particularly fruitful and has allowed close linkage between documented activities at the site and those which are represented archaeologically. The scale of the site and its related assemblages has permitted both intra- and inter-site comparisons which have never before been possible in Norwich. The analysis has also produced new lines of enquiry and has permitted comparisons between (and critiques of) varying methodological approaches.

III. OCCUPATIONS, CRAFT, INDUSTRY AND TRADE

Introduction

The major craft activities recorded archaeologically at the Castle Mall and Golden Ball Street sites are broadly summarised in Table 13.17. The presence of many more is indicated in the documentary and historical record, summarised by period in Chapters 4–11, with further details in Part IV. In some instances the crafts are represented by the presence of tools or scatters of raw materials, primary or secondary waste and the implications of finished objects. Others are represented by significant individual or period assemblages, along with *in situ* features. Of particular note is the important assemblage recovered from late medieval/transitional fills of the barbican well (fully detailed in Chapter 9).

The crafts are discussed below under trade groups based on those used by Kelly *et al* (1983), most of which have been presented in previous chapters. Those specifically included here are: metal trades, weaponry and horse equipment; butchery, leatherworking and associated trades; textiles and clothing; the building trades and household goods. Although noted in Table 13.17, food and related provisions have been discussed in the previous section. Craft activities within and around the Castle Fee in the period from *c.*1297 onwards have been detailed with reference to Castle Fee and city property numbers in Chapters 7–11. Modern activities at the site (Period 7) are not detailed below, but a consideration of post-*c.*1800 craft, industrial and economic activities in the area (many of which relate to the Cattle Market) can be found in Chapter 11. The evidence notably includes a substantial group of plough harnesses recovered near Farmer's Avenue.

Metal Trades and Weaponry

Ferrous and Non-Ferrous Metalworking

by Justine Bayley, Catherine Mortimer and Elizabeth Shepherd Popescu

(Figs 7.30, 9.1 and Part III, Figs 4–9 on CD; Plate 5.14)

Quantification by site area

A total of *c.*122kg of ferrous and *c.*11kg of non-ferrous material was recovered from the Castle Mall site, with an additional 10kg from Golden Ball Street (Table 13.18). Given the large size of the excavation area, this is not a large assemblage, although there are implications to be drawn for each period (Chapters 4.III–10.III, with wider considerations given in each period discussion). The distribution across the site is uneven and many areas produced negligible amounts of material. There were, however, some notable concentrations: Castle Mall Areas 1 and 13 and Golden Ball Street Area 2 (which adjoined; Fig.13.1) account for *c.*48% (69.691kg) of the combined total, Area 5 accounts for *c.*19%, while Area 9 yielded a further *c.*10%. Methodologies relating to the retrieval, assessment and analysis of the assemblage are given in Part I, Appendices 3 and 4.

Most of the contexts produced only small quantities of slag though there were a few exceptions. Larger amounts of ironworking debris came from the contexts listed in Table 13.20. All of these, except *40425* (a fill of the barbican ditch in Area 4, Period 6.3), were in the areas producing the majority of the slags. The small quantities of slag from other areas probably represent the background scatter that is found on most sites of Roman and later date.

Industries represented

The vast majority of the material recovered from the Castle Mall site derives from iron smithing. There is some variety in the nature of these slags and it is therefore possible either that more than one type of smithing was practised, or that methods of working changed with time and the variations represent chronological differences. The tap slag indicates iron smelting but the small quantity suggests that it was not a major on-site industry.

Three types of non-ferrous metalworking are indicated. The first is small-scale metal melting in crucibles and the second the production of large copper alloy castings. Although the mould material is described as 'bell mould', the products could have included bells or other large vessels such as cauldrons. Small-scale leadworking was also evident.

The lack of identification of the metalworking slags at Golden Ball Street prohibits any comments on the nature of activities being carried out in this area although there is a notable concentration of activity in a single fill of the ?Castle Fee ditch attributable to the 12th century (GBS Group 20, Period 3.2), while the second largest group came from later fills of the same ditch (Period 4.1). Small-scale leadworking is evident, largely during the post-medieval period. Of note is the absence at this site of evidence for large-scale copper alloy working which was so prevalent at the adjacent Castle Mall excavations (Areas 1 and 13) during the late medieval/transitional period (Period 5).

Site period	Period/ Date Range	Ferrous Metalworking	Non-Ferrous Metalworking	Founding/Casting	Spurs & Spur Leathers	Arrow Fletching/ Quill Dressing	Butchery/Skinning	Leatherworking	Antlerworking	Hornworking	Boneworking	Ivoryworking	Textiles & Needlework	Stoneworking	Woodworking	Window-glazing	Pottery production	Clay Tobacco Pipe Production	Plant Food/Crop Processing & Storage	Brewing/Malting	Horticulture/ Agriculture
1	Late Saxon (10th to 11th century)	**	*					*	*	*			*				**		**	*	
2	Early Norman (late 11th to early 12th century)	*	*					*	*	**	**		*						*	*	
3	Norman (12th century)	*	*					*	(*)	*	*		*	*						*	
4	'Medieval' (late 12th century to *c*.1345)	*	*						(*)	*									*		*
5	*c*.1345 to *c*.1558	*	**	**			**	**	*		*		*		*					*	
	Barbican well assemblage (late 14th to early 16th century)	**	**	*	**	**	**	**	*	*			*		*					*	*
6	*c*.1559 to *c*.1800	*	*				*	**	**	*	**	*	*		*	**	*	**	*	**	*	*

(*)– residual? *= present **= strongly present (significant assemblages or related features)

Table 13.17 Summary of presence/absence of occupations attested archaeologically at the Castle Mall and Golden Ball Street sites, by period

Iron smelting

Tap slag was found in a number of contexts at Castle Mall, again in Areas 1/13, 5, 47 and 9 (Table 13.19). It had a notable concentration in Area 47, suggesting a restricted spatial distribution (although much of it was found residually in post-medieval and modern features). A significant proportion of this material, however, came from pre-Conquest deposits, indicating that iron smelting was a Late Saxon industry. Of note amongst the features containing tap slag was an early Norman fire pit (*60023*, Period 2.2, Figs 5.28–5.29, Plate 5.14) within the castle's newly established south bailey. Smelting activity generally yields hundreds of kilos of slag and it therefore appears likely that slag was imported into the site, perhaps from the known ironworking extraction and smelting enclave on the north bank of the River Wensum (see Chapter 4.III, 'Metalworking').

Iron smithing

Relatively large assemblages of smithing debris (supplemented by blacksmithing scrap) came from Areas 1/13, 5, 9 and 47, the larger groups being listed in Table 13.20. These are concentrated within Periods 1, 5 and 6. The material associated with the cemetery of St John at the Castle Gate (de Berstrete/Timberhill; Cemetery 4, Period 1.4) is probably residual or intrusive and may either have been disturbed from the underlying fills of Ditch 1 during grave digging or introduced into earlier features by late medieval pit digging in the vicinity. Given the quantity of material recovered from fills of the ditch itself, the possibility of residuality from the Late Saxon/Norman period is perhaps the most likely.

Castle Mall Area	*Approx. Slag Wt (kg)*	*% Total (both sites)*
1 and 13	37.567	26.0
	*11.000	7.6
2 and 4	9.116	6.3
3	1.175	0.8
5	27.186	18.9
6	1.322	0.9
7	1.144	0.8
8	4.250	2.9
9	14.495	10.0
12	0.555	0.4
21	0.628	0.4
22	1.686	1.1
45	1.026	0.7
46	5.804	4.0
47	13.672	9.5
48	2.929	2.0
Sub-total	**133.555**	
Golden Ball St	*Actual Slag Wt (kg)*	
1	0.644	0.4
2	10.124	7.0
Sub-total	**10.124**	
Total	**143.679**	

* – all copper rich material

Table 13.18 Weights of slag recovered (by site area)

Two Period 1 pits in the northern part of the site (Areas 9 and 47) also contained relatively large assemblages of smithing waste. One example which lay above fills of Hollow 1 in the western part of the site (pit *47153*, Period 1.3) is of note as it also contained a 10th-century coin, 10th–11th-century pottery and numerous iron objects,

Context	*Group*	*Period*	*Context type/association*
Definite tap slag			
60149	6/4	1.2	post-hole 60150, Building 1
46527	46/14	1.3	pit 46527, Open Area 10
47090	47/33	1.3	pit 47153, above Hollow 1
60023	6/7	2.2	fire pit 60023, within south bailey
80470	8/18	2.2	consolidation dump above Hollow 1
47093	47/34	6.2	quarry pit 47094
47095	47/34	6.2	quarry pit 47094
47097	47/34	6.2	quarry pit 47094
47099	47/34	6.2	quarry pit 47094
47631	47/5	6.3	pit 47632, 1738 Cattle Market
47106	-	archived	post-hole 47107
Probable tap slag			
47008	47/21	1.4	pit 57187, Open Area 8
47146	47/37	6.2	quarry pit 47240
47881	47/47	6.3	post-hole 47882, 1738 Cattle Market
47114	47/3	7.2	modern overburden
47179	47/36	archived	
47181	47/36	archived	
47834	47/31	archived	

Table 13.19 Contexts producing tap slag (by period)

Context	*Slag Wt (kg)*	*Group*	*Period*	*Context type/association*
47090	3.592	47/33	1.3	fill of pit 47153, above Hollow 1
90041	3.846	9/64	1.4	fill of pit 90223, Open Area 6
10978	3.425	1/43	1.4	fill of ditch segment 11109 (Ditch 1)
11241	0.019	1/41	1.4	fill of ditch segment 11313 (Ditch 1)
13112	1.376	1/61	1.4	fill of pit 13235, Cemetery 4 (St John)
13196	1.494	1/61	1.4	fill of pit 13235, Cemetery 4 (St John)
50284	11.192	5/24	5.2	upper fill of barbican well
50285	5.698	5/24	5.2	upper fill of barbican well
50295	5.893	5/24	5.2	upper fill of barbican well
47311	0.943	47/26	6.2	fill of barbican ditch segment 47667 (Ditch 13)
40425	0.209	2/33	6.3	fill of barbican ditch segment 40928 (Ditch 13)

Table 13.20 Contexts producing larger amounts of ironworking slags (by period)

Context	*SF no.*	*Group*	*Period*	*Context type/ association*	*Material*	*Comments and XRF results summary*
Castle Mall Site						
80613 (x 2)		8/6	1.2	pit 80614, within Hollow 1	ceramic	One fragment trace Cu, strong Zn signal; heavily vitrified outside. Other fragment Fe and trace Cu
60116		6/8	1.2	pit 60252, Open Area 2	ceramic	TTW (type BE1)
11594		1/10	1.3	grave 11596, Cemetery 3	ceramic	TTW
80679		8/7	1.4	beamslot 80680, Building 20	ceramic	overfired; trace Cu, strong Zn signal
					ceramic	Stamford (A), Kilmurray 1980, form 16
80471		8/8	2.1	layers within early bailey, beneath south bailey rampart	ceramic	unidentified
80674		8/8	2.1	layers within early bailey, beneath south bailey rampart	fired clay/ ceramic	trace Cu; external surface has tool marks
80010		8/21	3.2	pit 80004, Open Area 26	fired clay	tiny trace of copper alloy: Cu, Pb, Sn
92387	6543	9/24	4.1	north-east bailey ditch segment 92462 (Ditch 9)	ceramic	unidentified
10121		1/145	4.2	pit 10135, Open Area 31	ceramic	Non-Local Med Glazed rim sherd (Fig.7.30, no.10)
80302		8/17	4.2	fill of south bailey ditch segment 80301 (Ditch 10)	ceramic	unidentified fabric
10311		1/76	5.1	pit 10289, above former Cemetery 4	ceramic	unidentified fabric
10187		1/146	5.1	slot 10220, Berstrete/Timberhill frontage	ceramic	LMU rim sherd
90375		9/65	5.1	quarry pit 90345	ceramic	TTW
10009 (x 2)	5006	1/99	6.1	well 10012, Woolpack Street frontage?	Fe	post-medieval form; Cu, Zn, Pb, Sn
91438		9/41	6.2	barbican ditch segment 91295 (Ditch 13)	ceramic	GRE
91601		9/45	6.2	pit 91602, tenement to east	ceramic	GRE
92751	503	9/41	6.2	barbican ditch fill (Ditch 13)	ceramic	unidentified
92761	357	9/41	6.2	barbican ditch segment 91295 (Ditch 13)	ceramic	fragments of virtified pottery; possible crucible
10926		1/162	archive			?crucible with copper alloy; leaded bronze
Golden Ball Street site						
368		60	-	unstrat.		copper alloy residue adhering
569		53	3.2	fill of south bailey ditch		

Table 13.21 Crucibles (by period and area group)

including knives, as well as lead spillage. Hollow 1 was noted as a possible focus of non-ferrous metalworking throughout Period 1 (Figs 4.3, 4.31 and 4.49). The other example (pit *90223,* Period 1.4) may date to the immediately pre- or post-Conquest period. Both this and surrounding pits contained a number of metal artefacts, as well as lead sheeting and strips.

The material recovered from the barbican well in Area 5 is likely to be in contemporary context and late medieval/transitional fills of this feature contained considerable evidence for a range of craft/industrial activities deriving from workshops specialising in different trades. This includes a significant group of smithing scrap and associated evidence (Period 5.2, Chapter 9), while other evidence provides an indication of the finished products (including military items and mounts/rivets used to decorate spur leathers; see below). Further evidence for blacksmithing (again in the form of smithing slags and scrap) was recorded in post-medieval deposits, alongside indications of the manufacture of needles and pins, supplemented in contemporary deposits by the presence of pinner's bones and a flint ?anvil. Other ironworking tools from Periods 5 and 6 include a possible engraving chisel, punches and possible sets or wedges (wedges would be used to split wood *etc*, not for metalworking, but are very similar in appearance to sets).

Crucible melting

A small group of crucibles was recovered from the site (22 examples from all periods at Castle Mall, along with two further examples from Golden Ball Street; Table 13.21). These include ceramic forms in TTW (type BE1), Stamford ware (Fabric A, Kilmurray 1980, form 16), LMU and a Non-Local Medieval Glazed ware (Fig.7.30, no.10), as well as a few later and unidentified fabrics. This contrasts with recent excavations at Greyfriars, some 300m to the north-east, where 88 ceramic crucibles were recovered in two main fabric groups: TTW and Stamford wares (Goffin 2007). The pre-Conquest crucibles from Castle Mall examined by XRF analysis were too small to indicate their complete form, although they clearly had thinner walls than the post-medieval examples recovered. Their small size is what would be expected in the Late Saxon period (Bayley 1991a). Many

Context/SF no.	*Group*	*Period*	*Context type/association*	*Comments and XRF results summary*
'bell' mould				
10911	1/67	5.1	bell pit 10088	
11005	1/67	5.1	bell pit 10652	
11021 (fc)	1/67	5.1	bell pit 10952	no non-ferrous detected
11026	1/67	5.1	bell pit 10952	no non-ferrous detected
10857	1/68	5.1	bell pit 10888	Fe, strong signals Cu, Pb, Sn; Sb detected
copper alloy spillage				
80762; SF5923	8/5	1.2		copper alloy droplet; leaded copper
22112	22/133	1.2	22143	
50007	5/3	1.3	pit 50023	
22116	22/131	1.3	grave 22128, Cemetery 3	
10966	1/140	1.4	construction cut 10967	leaded bronze
22126	22/148	2.1	pit 22119	
80471	8/8	2.1	deposits beneath south bailey rampart	copper alloy spill and fuel ash slag; leaded copper
10637	1/71	3.1	pit 10638	
80208; SF1067	8/ 19	3.1	south bailey rampart	leaded bronze
11126	1/57	3.2	ditch 11036	
80374	8/16	4.1	ditch 80301	
11005; SF5630	1/67	5.1	bell pit 10652	a) bronze b) copper alloy c) bronze
10857	1/68	5.1	bell pit 10888	
10801	1/72	5.1	dump layer	spill (x2), both leaded bronze
10822	1/101	5.1	pit 10880	
50308	5/23	5.1	lower fills of barbican well	spill/miscast; leaded copper
90646	9/55	5.1	pit 90878	bronze
90016	9/56	5.2	pit 90017	
90922	9/82	5.2	pit 90961	leaded copper
90683	9/82	5.2	pit 90702	leaded bronze
90716	9/82	5.2	pit 90716	leaded bronze
10732	1/86	6.1	pit 10824	
10903	1/105	archive		
13000	unstrat.			
copper alloy waste				
13099	1/61	1.4	grave 13011, Cemetery 4	
40212	2/9	2.1	pit 40200	
10911	1/67	5.1	pit 10952	a) leaded bronze b) leaded bronze c) bronze d) As, Sb
11005	1/67	5.1	bell pit 10652	
10857; SF1016 (d)	1/68	5.1	bell pit 10888	a) quaternary b) leaded bronze c) quaternary d) copper alloy e) quaternary; Sb?, Ag?, As
10637	1/71	5.1	pit 10638	quaternary alloy
10823	1/72	5.1	pit 10824	leaded bronze
11257	1/76	5.1	pit 11258	
13184	1/76	5.1	pit 13183	
50296	5/24	5.2	upper fills of barbican well	
47480	47/26	6.2	ditch 47667	
90251	9/76	7.2	modern	copper alloy and vitrified furnace lining; leaded bronze
13000	unstrat.			

fc – fired clay

Table 13.22 Non-ferrous metalworking, excluding crucibles (by category, period and area group)

of the early examples, from both Late Saxon and Norman deposits, came from areas within or adjacent to Hollow 1 in the western part of the site.

Copper alloy smithing
Many of the copper alloy sheets, strips and other offcuts recovered from all site periods were probably used in the manufacture or repair of objects, while others may have been intended for re-melting. Non-ferrous waste has a notable concentration in the late medieval/transitional period (Period 5, Chapters 8 and 9), again particularly deriving from artisan waste deposited into the barbican well. The manufacture of specific copper alloy items (including mounts/stud heads and rivets) is indicated.

Copper alloy casting, spillage and waste
The evidence for non-ferrous metalworking (excluding leadworking) is summarised alongside XRF analysis in Table 13.22. Evidence for large scale non-ferrous casting largely came from Area 1 and includes small fragments from large clay moulds that were used for casting large vessels such as cauldrons, as well as bells. Additional mould fragments were recovered from late medieval fills of the barbican well shaft. Although recovered from all site periods, the majority of the non-ferrous waste assemblage dated to the late medieval/transitional period and came from a sequence of archaeological features directly associated with metalworking processes and waste disposal, including two 'bell-casting' pits (Figs 8.22–8.23; Plates 8.5–8.6; see further discussion in Chapter 8.III and 8.V). Such evidence was notably absent from excavations at the adjacent Golden Ball Street site. The property on which these features were found (Property e) has a documented association with brasiers/bell-founders (William le Sutton le Brasier and John de Sutton, 1402), as detailed in Chapter 8. The location of these and other brasiers working in the vicinity of the castle is indicated in Fig.9.1.

Leadworking
A total of 68 pieces of leadworking waste (including ingots, sheet fragments/offcuts and spillage/droplets) was recovered from all periods at the Castle Mall site, with an additional 28 from the Golden Ball Street excavations (Table 13.23). The notable concentration in the late medieval period (Period 5) at Castle Mall reflects the focus of non-ferrous metalworking activity at this time and includes a small group of craft waste found within the barbican well shaft.

Period	*Castle Mall Site: no. frags*	*Golden Ball St Site: no. frags*	*Total (no. frags)*
1	11	0	11
2	8	0	8
3	3	2	5
4	2	0	2
5	25	7	32
6	14	14	28
7/unstrat.	5	5	10
Total	**68**	**28**	**96**

Table 13.23 Leadworking waste (by period)

In itself, the limited assemblage does not indicate significant amounts of leadworking in the area, although XRF analysis of crucibles and copper alloy spillage and waste does suggest use of the metal in the immediate vicinity. The raw material may have been brought onto the site as ingots and could either have been utilised in the production of copper alloys, or in the manufacture of lead or pewter artefacts (Schofield and Vince 1994, 106). A number of pewterers are known to have been working in the vicinity of the castle during the late medieval and post-medieval periods (Chapters 8–10). Four post-medieval pewter objects were recovered from the excavations, along with a small assemblage of lead objects. The two stone moulds recovered from fills of the barbican well may have been used in casting low melting-temperature alloys, in particular lead- and tin-rich alloys such as pewter (Goodall, Chapter 9.III).

Conclusions
by Elizabeth Shepherd Popescu
It is evident that a range of metalworking processes were undertaken in the Norwich Castle area; before, during and after its active military life. Although these processes are paralleled at many other urban centres locally, regionally and nationally, their presence provides important new evidence both for this particular area of Norwich and for its castle. Documentary evidence broadens the picture and has permitted consideration of possible links between archaeologically attested activities and named individuals from as early as Domesday (see below).

As at so many Late Saxon settlements, metalworking at the Castle Mall site during the pre-Conquest period was characterised by small, localised production of iron and copper alloy and manufacture of objects serving the immediate needs of its inhabitants. Although evidence for smelting was recovered, its quantity appears insufficient to indicate large-scale on-site activity. Evidence for both ferrous and non-ferrous metalworking from other excavations in the vicinity of the later castle has been noted in Chapter 4.III. It is not only the metalworking waste that contributes to local knowledge of metalworking at this time: finished artefacts also make their contribution. The hand of a single workman may have been identified in the manufacture of hooked tags from the site, which are notably similar to those recovered at Greyfriars to the north-east (Emery 2007). It has also been suggested that Borre style brooches (such as those recovered from both the Castle Mall and north-east bailey sites) may have been manufactured in or near Norwich at this time (Margeson 1997, 23), while a disc brooch with pseudo-coin motif may also have been a 10th-century product of Norfolk workshops (Blackburn, Chapter 4.III).

Larger castles, including Norwich, would have required regular maintenance and the relevant craftsmen may well have been permanently resident there (Shepherd Popescu *et al,* Chapters 5.III–7.III). Many castles are known to have had their own smith: the one working at the Tower of London was kept supplied with raw materials including iron and charcoal (Pounds 1990, 198). A range of similar artisans is documented at other castles including Windsor and Dover. Two lorimers, Robert and Hildebrand, are recorded in association with Norwich Castle in the Domesday Book (Brown 1984, 116b, 1.61), and were no doubt accompanied — and succeeded — by numerous others providing a range of metal-related

crafts. There are only a few excavated examples of metal workshops within castle baileys, including a 14th-century example from Bramber Castle in Sussex (Barton and Holden 1977, 38).

The demand for large quantities of iron in particular would suggest that smelting was carried out elsewhere, probably nearer the source of ore on the north bank of the river.

The late medieval period saw the growth of non-ferrous metalworking in the southern part of the Castle Mall site, in the Berstete/Timberhill area (Chapter 8). This was based on the casting of large objects including bells, cauldrons and other items. Bell-founding in the vicinity of Norwich Castle is well documented and a number of sites nearby have provided archaeological evidence for its presence. Dumping of ferrous and non-ferrous metalworking waste into the barbican well shaft attests to the continuation of these industries and has provided significant new information to supplement documentary evidence for local specialist trades within the Castle Fee and on its fringes (Chapter 9).

Although by the post-medieval period, metalworking in this part of Norwich had declined with its removal to an extramural setting, the castle's south bailey clearly continued to provide a home for small-scale smithing activity which may in part have been linked to the growing number of stables surrounding the Cattle Market (see below and Chapters 10–11).

Weaponry and Horse Equipment

As noted in Chapter 12.VIII 'Castle Life', a relatively low number of items of weaponry and armour were recovered from the Castle Mall site, the largest group dating to the late medieval/transitional period. The mid to late 15th-/early 16th-century assemblage from the barbican well includes manufacturing and repair waste from items including armour and weaponry, indicating possible workshop clearance (Chapter 9). Alongside the group of completed spurs, spur buckles, hook attachments for spur leathers and spur leathers themselves, evidence for the waste materials from at least one spurrier/lorimer workshop was found, supplementing earlier evidence on a much smaller scale located by the Norwich Survey at St Benedict's Street (Margeson 1993, 235).

During the post-medieval period, ironworking was focused around the large quarry responsible for the collapse of the barbican gate, from which an assemblage of late 17th- to early 18th-century blacksmithing scrap and tools came (Period 6.3, Chapter 10.II; Shepherd Popescu *et al*, Chapter 10.III). A link with the immediately adjacent stables of butcher Nicholas Lane, built in 1735, seems possible.

Arrows/Quills and Pens

The most conclusive evidence from the animal bone refuse of a particular craft is provided by the remarkable group of goose carpometacarpi from the barbican well (Moreno García, Chapter 9.IV and Part III, Chapter 4; Shepherd Popescu, Chapter 9.VI), for which no parallels of the same importance have been published in Britain. Goose wing tips would have been valued for their primary feathers and a minimum of 270 left and 122 right wing tips were recovered from the well, along with many other wing bones and matted lumps of feathers. These may have been the residue from a quill-dresser or fletcher's workshop. Supplementary evidence for both crafts was found in the well, including a number of unfinished arrowheads (Mould, Chapter 9.III). A substantial group of bird bone ?pens made from goose and chicken radii may have been used in association with wax tablets, but appeared to have been deposited prior to usage (Huddle, Chapter 9.III).

Butchery, Leatherworking and Associated Trades

The known intensity of craft and industrial activities in Norwich and the Castle Mall area (detailed by Tillyard and Shepherd Popescu in Parts I–II and IV) finds wide confirmation in the zooarchaeological and artefactual evidence. There was scattered but plentiful evidence of bone-, horn-, antler- and leatherworking found throughout the site in all periods, supplemented by a few related tools. A few groups of bones associated with craft activities were found, although in most cases they were mixed with common food refuse.

Butchery

Throughout the medieval and post-medieval periods, Norwich's butchers generally lived and worked along Berstrete (modern Ber Street and what is now Timberhill) and a number of named butchers, skinners and other leatherworkers have been identified within Castle Fee properties and the surrounding area (see Chapters 7–10 and Part IV). 'One reason for this localisation would undoubtedly have been to limit the offensive effects of their trade to a specific area, but an important reason could also be that Ber Street lies between the point of entry for cattle into the city at Carrow and their point of sale in the market' (Kelly 1983, 26). Certainly, the open space of the castle baileys seems to have attracted noxious activities of many kinds. Secondary occupations, such as most of the city's glovers and chandlers, were also concentrated along Berstrete (Kelly 1983, 28–29 and 30), a fact which probably links to the proximity of the butchers who would have provided skins and animal fat. The city's great shambles for the sale of meat and animal by-products (which lay in the market place to the west of the castle) has been discussed in earlier chapters.

Full details of animal butchery and kill-off patterns by species found at the Castle Mall and Golden Ball Street sites can be found in Part III, with summaries in Chapters 4–10. Of particular note is the apparent usage of the barbican well as a designated area for the disposal of waste by the city's 15th to early 16th-century butchers (see Moreno García, Chapter 9.IV and Part III, Chapter 4). Alongside the faunal evidence, butchery tools found at the site include butchery, boning and blood-letting knives (Mould, Chapters 4.III–10.III). Slaughter houses associated with the Cattle Market were present in the north-east bailey in the 19th century (Chapter 10).

Leatherworking

The history of the Norwich leather industry has been noted in preceding chapters and it was a dominant occupation during from medieval to modern times. By the mid 19th century the city depended — as it had in the 13th century — on leather rather than textiles and an important shoe-making industry developed (Campbell

1975, 20–23). Of the owners of Castle Fee properties in the period *c.*1397–1558 (Period 5), those working in leather and related trades accounted for 19% of the total whose occupations are known. By *c.*1559–1700 (Period 6), this figure had fallen to 9%. These figures, however, are subject to a number of caveats which have been explored in earlier chapters and the leatherworkers are known to have remained operative in the area.

The presence of skinners has a long history in the area immediately surrounding Norwich Castle, the first being recorded in *c.*1300 and the last in 1569. Amongst the Norwich trade groups identified in the period 1285–1341 are the tanners, skinners and tawyers, who required large amounts of water and were working along the Great Cockey stream immediately to the west of the castle (Period 4, see Chapter 7.I and Kelly 1983, 22). By Period 5, documentary evidence attests to the proliferation of leatherworkers and related trades within the Castle Fee, including skinners/pelters (x 9), spurriers, pouch and sheath makers, makers of clothing (including shoes), a bookbinder and parchmentmakers (see Chapter 8.I and Chapter 8.V). Specialist leatherworkers within the Castle Meadow properties include two curriers, who dressed and coloured leather. A gatherer of rabbit skins was noted in the parish of St John (Timberhill) in 1570 (see Ives, Part IV). Notable omissions from the Castle Fee owner occupations noted for Period 6 (see Chapter 10.VI) are the cobblers and other leatherworkers (apart from the skinners), although their presence is recorded archaeologically.

Leatherworking waste was attested in all but Period 4 at the Castle Mall site, with notable concentrations in Periods 5 and 6. In Period 5, alongside the evidence for tanning/tawing noted by Albarella *et al* below and a low heat process possibly associated with the curriers or allied trades working in the area (see Property 43, Chapter 8), large quantities of leather waste were recovered from fills of the barbican well and included unparalleled evidence for the fitting/refitting of spur leathers (see above and Mould, Chapter 9.III). From post-medieval fills of the barbican ditch (Period 6) came evidence for the manufacture of shoes (see Mould, Chapter 10.III). In other periods, leatherworking was generally represented by the presence of associated tools and evidence for animal skinning. Evidence of skinning has been identified for many species including cattle, pig, horse, fallow deer and cat, although the use of cat pelts is almost entirely limited to the early phases of the site (see Part III).

Bone- and Hornworking

by Umberto Albarella, Mark Beech, Jacqui Mulville, Elizabeth Shepherd Popescu and Julia Huddle
(Part III, Figs 4–9 on CD; Plates 5.17 and 8.11)

Bone tools found at the Castle Mall site were generally made from cattle and horse bones, although bones of other animals were occasionally utilised. Due to their robust shaft, cattle and horse metapodia were the bones most commonly used; evidence of sawing and faceting has been found on these bones. Many other objects, such as spindle whorls, handles, skates and a sledge were also found (see Huddle Parts 1 and 2 *passim*). Spectacular evidence for the use of goose feathers for making quills or fletching arrows and for the utilisation of goose bones as tools has been found in late medieval/transitional fills of the barbican well (noted above and see Moreno Garcia, Chapter 9.IV and Part III; Huddle, Chapter 9.III).

Elsewhere on site, bone- and hornworking was particularly evident in Period 2 (see Chapter 5.III). A remarkable group of four sheep skulls from which the horns had been removed was recovered (pit *40200*, Fig.5.11, Plate 5.17). Additionally, horncores and bone strips came from a number of adjacent pits within the early castle bailey, attesting to the manufacture of horn combs with bone side-plates during the late 11th or early 12th century. One such pit, adjacent to that containing the sheep skulls, yielded 20 cattle horncores with chop/cut marks, along with nearly 200 bone strips (pit *20059*, G2/5, Period 2.1; see Huddle, Chapter 5.III and discussion in Chapter 5.V).

Evidence for craft activity at Golden Ball Street was limited, although antler-, bone- and hornworking were apparent. Boneworking was evident only in early fills of the castle ditches. Probable hornworking utilised the horns of cattle, sheep and goat. As is commonly the case, none of the actual horn was preserved and the boney horncore is all that was recovered. As at Castle Mall, the tips of some of the Golden Ball Street horncores had been removed as part of the process of removing the horn sheath.

Further evidence for boneworking at the Castle Mall site came from the post-medieval period, where a pit in Area 8 contained 8 worked cattle metapodials (pit *80188*, G8/29, Open Area 39, ?Property b, Period 6.2), along with other related evidence. The craft evidently entailed tool production, although the function of the finished objects has yet to be established (see Huddle *et al*, Chapter 10.III). This pit may have had an association with a public house (see Chapter 10.VI).

Antler and horn were also used for making tools. The presence of horn-handled artefacts at the Castle Mall site has been attested by analysis of minerally-preserved organics on a number of knives (see Watson and Paynter in previous chapters). Abundant evidence for the use of cattle, sheep and goat horns has been found in all periods at Castle Mall (well over 300 horncores being recovered in total, a large proportion of which were cut, chopped or sawn). Sheep horns are more common in Period 5, a phenomenon also noted in fills of the barbican well. The presence of a number of goat horncores, in contrast to the rare occurrence of post-cranial bones, attests to the existence of an independent horn trade and thus to a specific interest in this material. The same was true for antlers (see below), which are found in large numbers, despite the rare occurrence of deer bones.

It is possible that the hornworker was closely associated with the tanner — or tawyer — as horncores and foot bones were generally still on the skin when it arrived at the tannery (Serjeantson 1989). A mid 15th-century pit at Castle Fee Property 49 (a garden facing onto the Shirehouseyard) contained a large assemblage of sheep bones, including 21 horncores, 109 metapodials and 60 phalanges (pit *11048*, G1/24, Period 5.2, Fig.8.32; see Chapter 8). This large group (Plate 8.11) can indeed be explained as the dump of a tannery workshop. Further comments on skinning and leatherworking are given elsewhere in this chapter and in previous chapters.

That hornworking continued into the post-medieval period is attested by a group of 87 cattle horncores from post-medieval fills of the barbican ditch which contained

a large assemblage of other animal bones (Trial Hole 1, G9/41, Period 6.2; see Chapter 10). Although still used for decorative purposes, by the post-medieval period, the main use of horn was in the manufacture of cutlery handles and the waste from urban tannery and horn workshops of the period has been found at Northampton and London (Crossley 1994, 221). The London evidence includes 17th-century horn- and boneworking at Aldgate (Armitage in Thompson, Grew and Schofield 1984, 131–143) and pits containing large numbers of horncores at numerous sites including St Mary Graces (the Royal Mint; Richenda Goffin, pers. comm.).

Antlerworking

by Julia Huddle and Elizabeth Shepherd Popescu

(Fig.13.2)

Antlerworking waste was recovered from much of the site (Areas 2, 5, 7, 9, 202, 21, 22, 46 and 47 and watching briefs; Figs 13.1 and 13.2), although was notably absent across the southern part of the excavation area, except at the Golden Ball Street site where two additional pieces of primary waste were recovered. The Castle Mall assemblage consists of a total of 75 pieces including a number of tools. The material was recovered from all periods, with some notable concentrations. Some may be residual (Periods 3–4), although that from Periods 1, 5 and 6 appears to relate largely to contemporary working. In the Saxo-Norman period, the main product was the single-sided composite comb, a type familiar from many sites of the period both locally and nationally. In the late medieval to post-medieval periods, the production of cutlery and other implement handles is evident.

Deer bones in general are rare from the site although thirteen identified specimens of post-cranial deer bone were found within the barbican well (see Moreno García, Chapter 9.IV and Part III). This low ratio of deer bones to antlers is reflected at other Norwich sites and indicates that the majority of the antlers here were naturally shed and had been collected off site. At the adjacent Greyfriars site (Site 845N), the majority of antlerworking waste was recovered from Late Saxon deposits although no post-cranial deer bones were found in deposits earlier than the 13th century (Moreno García, in Emery 2007). Most of the identifiable pieces from Castle Mall come from red deer, although fallow and roe deer bones were present (none of the latter being worked). Antlers associated with the barbican well in Area 5 (G5/24 Period 5.2; and G5/52; Period 6.1) include both fallow and red deer.

Period	*Primary waste*	*Secondary waste*	*Wedge*	*Total*
1	15	1	2	18
2	2	1	0	3
3	3	0	0	3
4	0	2	0	2
5	14	3	0	17
6	24	4	2	30
unstrat.	3	0	0	3
Total	**61**	**11**	**4**	**76**

Table 13.24 Quantity of antler-working waste and antler-working tools recovered by period at Castle Mall

The assemblage from Castle Mall consists of primary and secondary waste (Table 13.24). Primary waste includes all split and or sawn antler, while secondary waste is sawn and further worked, its shape often reflecting the intended finished item.

The various stages of antlerworking are described by MacGregor (1985, 55–71), where analytical work on excavated material by Ulbricht (1978), Ambrosiani (1981) and Christophersen (1980) is summarised. The Castle Mall waste fits neatly into these known stages. A recent analysis of antler waste has been carried out on the material from Fishergate, York (Rogers 1993), which includes a considerable quantity of comb waste.

A small concentration of waste at Castle Mall was found in a Late Saxon pit in Area 9 (pit *91816*, G9/39, Open Area 16, Period 1.3) which contained 5 sawn fragments and an antlerworking wedge. In addition to the composite horn and bone combs from the Castle Mall site noted above, up to ten pieces of single-sided antler combs were recovered from Period 2 deposits. Small quantities of primary and secondary antler waste were also recovered, largely from Area 9 (all from red deer), suggesting the manufacture of antler combs on or near the site. Further antler objects and antlerworking waste of possible Late Saxon date had been recovered during earlier excavations in the north-east bailey (including a comb fragment, a tool used to split cores for comb manufacture and twelve probable comb blanks; Ayers 1985, 45–47). Various other sites around the perimeter of the castle have also produced quantities of worked antler (Sites 16N, 17N, 356N, 417N, 718N and 845N), all of them lying to the north-east (Fig.13.2). Excavations in 1979 within the north-east bailey produced a few pieces of antler debris, which were identified as uncut tooth segments and antler blanks for the production of Late Saxon composite combs (Site 416N; Margeson and Williams 1985). Significant amounts of antlerworking waste dating to the 11th to 12th century have recently been excavated at Greyfriars (Site 845N, Huddle in Emery 2007). This group amounts to 460 pieces, again relating to manufacturing debris for the production of composite combs. The distribution of antlerworking waste therefore has a notable concentration around the Castle Meadow and indicates antlerworking in the vicinity in the Late Saxon and/or Norman periods, although the general scatter indicated in Fig.13.2 simply reflects the suggested extent of the contemporary settlement.

The utilisation of antler at the Castle Mall site was evident again in the late medieval/transitional and post-medieval periods. The mid/late 15th- to early 16th-century fills of the barbican well contained, *inter alia*, a near-complete fallow deer antler, along with the post-cranial bones noted above (Period 5.2; see Chapter 9.III). A late 16th- to early 17th-century layer around the top of the barbican well contained 18 worked antler fragments and other evidence for the manufacture of handles (layer *50077*, G5/52, Period 6.1; see Huddle, Chapter 10.III).

Ivoryworking

Post-medieval bone workshops were also supplied with more exotic raw materials and, at Castle Mall, ivory-working waste was found in fills of the barbican ditch (Riddler in Chapter 10.III). The evidence includes a comb trial piece and fragments of discarded elephant tusk. A number of London sites near the Tower (Tower Hill West

and the Tower Postern) and another at St Mary Graces (the Royal Mint) have also produced evidence for post-medieval ivoryworking (Richenda Goffin, pers. comm.). Further evidence comes from the London Blackfriars site, where late 17th- to early 18th-century waste probably associated with a fan-maker's workshop included bone, ivory and tortoiseshell (Crossley 1994, 221; Egan 1986, 335). At the time of the excavation, the material from Castle Mall was the first direct evidence for ivoryworking in Norwich, although another fragment of ivory waste has recently been found at Norwich Cathedral (Site 26604N; Richenda Goffin, pers. comm.).

Textiles and Clothing

Textile working and clothing manufacture are one of the recurrent themes throughout the Late Saxon to post-medieval periods at Castle Mall, both archaeologically and in the documentary and historical record. This is unsurprising, given Norwich's role in the textile industry. Small-scale textile production and preparation are evident in the Late Saxon period (Period 1) in the form of related tools and equipment for shearing, spinning and needlework (Chapter 4.III). The presence of spindle whorls within some of the excavated buildings is more likely to suggest a craft pursued in the home than a particular specialism (Huddle, Chapter 4.III).

In Periods 2 and 3, limited evidence for working with textiles again comes from tools, although these may be residual in these periods (Chapters 5.III–6.III). No such objects were found in Period 4, although textile itself was found (Crowfoot, Chapter 7.III).

In Period 5, fragments of worsted cloth, knitting and silk attest to Norwich's thriving textile industry, the bulk of the assemblage coming from fills of the barbican well (Crowfoot, Chapters 8.III and 9.III). By the mid 16th century the city was famous for its worsted, particularly knitted stockings many of which were exported to Europe (Margeson 1993, 234). Other textile working in the vicinity is again attested by processing and needlework tools. Documentary evidence for textile working within the Castle Fee in the late medieval period demonstrates the presence of wool, worsted and silk, as well as embroidery, while madder was also grown (Tillyard, Chapters 8.I and 9.I). The textile remains themselves, along with associated trades (such as drapers, tailors and hatters), are commented on in Chapter 9.III. Sheep of the period may have been reared substantially for wool, the fleeces of wethers being considered the best. Artefacts were again recovered relating to textile manufacture/processing and needlework.

The textile industries remained a significant part of the Norwich economy during much of the post-medieval period. Textiles from the excavations include worsted, felt for hats, lace, knitting and linen. A single cloth seal was recovered from the Castle Mall site, while a 16th- to early 17th-century example from Augsburg (Germany) was found at Golden Ball Street. Again, processing and finishing tools were found and the manufacture of drawn wire pins for use in dress-making was noted (Huddle, Chapter 10.III). Although the acquisition of wool remained significant, the animal bones indicate an increasing focus on mutton consumption during the late medieval and post-medieval periods (see Part III, Chapter 3).

Building Trades

Glazing

Glasswrights were present near the castle from the mid 14th century and the trade was to persist in the area during the following centuries (see Tillyard, Part IV). It has been suggested that the bellfounders, painter, glasswrights and latoners named as owners of Castle Fee properties within the Castle Meadow may indicate a concentration of ecclesiastical craftsmen (Cattermole 1990, 143).

The earliest evidence for window glazing at the Castle Mall site comes from the barbican well, in which a piece of possible 12th-century glass was recovered residually. It appears logical that, at the time of the building of the Castle Keep and cathedral from the 1090s onwards, the craft of window painting may have begun in Norwich (see King, Chapter 9.III). The Castle Mall excavation provides the first piece of evidence for this assumption. The continued use of painted glass in later centuries is also attested in the barbican well by an heraldic fragment which may have come from a nearby late 14th-century house (King, Chapter 9.III).

Waste materials from post-medieval window glazing were recovered from a large quarry adjacent to the barbican ditch and from fills of the ditch itself, its presence echoing the thriving glass industry of the time. King's analysis of the material (Chapter 10.III) indicates that such episodes of reglazing may have begun after the Reformation. The presence of glaziers within the Castle Fee at this time has also been demonstrated in the documentary record (Tillyard, Chapter 10.V and Part IV).

Stoneworking

The only evidence for stoneworking at the site came from Period 3.1 (Heywood, Chapter 6.III) reflecting the large quantity of building activity taking place in association with the rebuilding of the Keep in stone in *c.*1094 to *c.*1121–22 (see Chapter 6.V, 'Buildings and Raw Materials'). As has been fully detailed in earlier chapters, a number of the medieval and later Castle Fee rent payers were masons or others associated with the building trades, such as tilers, thatchers and lime-burners.

Quarrying

(Figs 8.13 and 10.13)

Open-cast quarrying for sand, gravel and marl was common in Norwich over a long period and the open area of the castle baileys and their ramparts proved an attractive resource for local inhabitants. Quarrying appears to have proliferated after the handover of the baileys to the city in 1345 (Chapter 8). Masonry elements of the castle defences were eventually robbed for building materials, as has been detailed in previous chapters. Substantial evidence of quarrying for sand and gravel was recorded across the site during the late medieval and post-medieval periods. In Period 5.1 (Fig.8.13), this was focussed in the area to the east of the lane leading towards the castle (Properties 44–46), where it may have had an association with documented lime-burners indicating extraction on a commercial scale (see Chapter 8.II and V). In the post-medieval period, substantial quarrying took place in

the barbican area (Fig.10.13), undermining the barbican gatehouse and causing its collapse (see Chapter 10). For a general overview of quarrying in the late medieval/transitional period see Chapter 8.V. For similar activity of the post-medieval period, see Chapter 10.VI.

Woodworking

The documentary record attests to the presence of woodturners and other carpenters in the castle area during the medieval and post-medieval periods. Carpentry is represented at both the Castle Mall and Golden Ball Street sites by the presence of a few woodworking tools in Periods 5 and 6, including chisels, a drill bit and an axe (Mould, Chapter 8.III–10.III). Wooden objects include shoe heels, a wooden bowl, brush and spoon, while handles and other fittings came from wooden vessels such as barrels, buckets, shovels and caskets which no longer survive (Huddle; Mould; Taylor; Chapters 8.III–10.III). The wood species identified indicate that Norwich's late medieval and post-medieval carpenters were using boxwood, ash and willow/poplar for handles (the latter also used for an arrow shafts) and oak for other objects.

Household Goods

Pottery Manufacture and Associated Waste

Thetford-type ware

by Elizabeth Shepherd Popescu, Irena Lentowicz and Richenda Goffin

(Figs 4.15, 4.16, 4.41–4.42, 4.71, 4.85, 13.2 and 13.10; Plates 4.7 and 4.18–4.20)

Thetford-type ware is well-fired and wheel-thrown, with a grey colour. It was produced in large amounts at the East Anglian towns of Ipswich, Thetford and Norwich and is currently thought to date to the Late Saxon to early Norman period (9th to early 12th centuries). TTW was also produced at rural sites such as Langhale (Wilson and Moorhouse 1971; 129), Grimston (Clarke 1970; 79–95) and Bircham (Rogerson and Adams 1978, 33–44). Kiln sites found in Norwich are indicated in Fig.13.10. Although most of the pottery recovered from Norwich sites — including the 359kg from Castle Mall — was probably made locally, the fabrics from all three towns are very similar and have been given a generic name. The range of forms includes cooking pots, bowls, jars, spouted pitchers, large storage jars and lamps.

Transitions between fabrics of successive periods are always problematic and the development of dominant ceramic fabrics and forms between Middle and Late Saxon pottery in Norwich is not entirely clear, due mainly to the dearth of Middle Saxon pottery and the lack of stratified sites which have both Middle and Late Saxon occupation (see Chapter 4.VI). The decline of Ipswich-type ware is dated to the mid 9th century. While production of TTW began in Ipswich in the second quarter of the 9th century, the date that manufacture began in Thetford itself is uncertain (Dallas 1984, 126), although it probably followed on from the Ipswich industry. The production of TTW in Norwich is currently thought to have begun in the late 9th century (or *c*.900), its manufacture continuing into the early 12th century. After *c*.1100, Early Medieval ware takes over as the dominant fabric.

As noted in Chapter 4.VI, evidence for the manufacture of Norwich TTW comes from an area to the west of the town, the nucleus of known kiln sites being in the Pottergate/Bedford Street/London Street area[1] (Atkin *et al* 1983; see Fig.13.2 and 13.10). Several of these sites lay within the suggested confines of the southern part of the Late Saxon town bounded by the valley of the Great Cockey stream to the west, which no doubt supplied the industry with water (Fig.12.2.A). Much of the production centre may have been sited in a 'suburban' development to the west of the main area of settlement (Carter 1978b, 200).

Few scientific dates have been obtained for the Norwich kilns. Of the two absolute dates obtained one was a radiocarbon date of AD 1210–1280 (HAR 2560; 770 ± 80BP, Stuiver curve 1982; Site 336N; Atkin *et al* 1983, 97) from charcoal post-dating the use of the kiln at 5 Lobster Lane and therefore of little value in dating its use. The second is an archaeomagnetic date of AD1000 +60/-40 (Dec. 29.0°, Inc. 68.2°, α 95 = 2.3° AML curve 1981) from the kiln at 27 Bedford Street (Site 424N, Clark in Atkin *et al* 1983, 92). These kilns were given a broad provisional date range by Sarah Jennings of late 10th- to early 12th-century (Atkin *et al* 1983, 91).

New evidence from Castle Mall and adjacent sites indicates the possible siting of similar industry beneath the castle. At Castle Mall, a putative wood-fuelled kiln (*22285*, G22/134; Fig.4.16; Plate 4.7) contained over 25kg of pottery (illustrated in Fig.4.71) of late 10th- to 11th-century date. The pottery comprised a mixture of failed or waster sherds of TTW, together with sooted and abraded sherds typical of a domestic assemblage, including some other fabrics. The composition of the assemblage is detailed in Chapter 4.II (Period 1.2) and the nature of identified fuels summarised below and detailed by Gale in Chapter 4.IV. The feature lay adjacent to pits used for the disposal of ceramic waste, next to the fragmentary remnants of a possible building. The fired clay lining was the subject of unsuccessful archaeomagnetic dating (Noel, AML88/90; see Chapter 4.III). On site it was evident that this lining, though bright orange in appearance and slightly firmer than the surrounding soil, was not sufficiently baked to indicate firing. It was provisionally interpreted as a failed kiln or drying oven.

The plans of many Norwich kilns are fragmentary while many of those excavated at Thetford in 1966 are considerably better preserved (Dallas 1993, fig.86). In Norwich, two basic types were recognised, which it was tentatively suggested might reflect a chronological shift (Atkin *et al* 1983, 73–74). The example at Castle Mall conforms to the basic keyhole shape and oven and stoke-hole type of the others, in which a pit was dug into the subsoil for the kiln oven, then lined with clay. No superstructure survived. Comparison of its plan with one of the kilns from Thetford (Rogerson and Dallas 1984, fig.62) indicates a similar construction, although the Norwich example is considerably smaller (measuring 2.12 m long by 1.06m wide; the Thetford example was 3.5m long by 2.5 m wide).

A pit, lying *c*.40m to the east of the 'drying kiln' at Castle Mall, contained similar waste although it appeared to be slightly later, dating to the 11th century (pit *90989*, G9/79, Figs 4.41–4.42 and 13.10). Its fills indicated the disposal of hot kiln clearance waste and burnt gravel adjacent to the feature was tested for archaeomagnetic

dating (Linford, Chapter 4.III). During analysis of the ceramic assemblage it was determined that, although the material was homogeneous, the general nature of the pottery did not suggest that this was primary kiln refuse (see Chapter 4.II, Period 1.3 for assemblage details). However, both the large quantity of pottery (nearly 60kg; Fig.4.85) discarded at one time and character of the fills does appear to indicate ceramic production in the vicinity. Adjacent pits in this area of the site notably contained further waster sherds and complete or near-complete pots.

Other TTW wasters were found in later features (see Fig.13.2): although those from early 12th-century contexts may have been contemporary with their place of deposition, others were clearly residual. Such waster sherds came from Ditch 1, phase 5 (Period 1.4), the disuse of sunken-featured Building 25 (Period 2.1) and a fill of Ditch 14 (Period 4.2). A significant number of wasters and a near-complete vessel were found residually in Trial Hole 3, while large quantities of Late Saxon pottery were notably disturbed by later features (particularly late medieval/transitional quarries). All of these lay in the area that contained the major 11th-century waster pit noted above.

Further waster sherds have also come from beneath or upcast within the Castle Mound (Site 135N; Tench 1910; Goffin in prep.c). Vessels from recent excavations, found in the eastern part of the extended mound attributable to the period *c.*1094 to *c.*1121–22 (Fig.13.2), appear to represent a transitional stage in the development of early medieval wares (Goffin, Chapters 4.III and 5.III). Pottery recovered from Tench's work at the Shirehall was described as follows: 'Among them were two cones in same ware as the pots; these had, roughly, a diameter of 3 ins and were the same height. The bases of the cones were hollowed out about 1¼ ins, making the articles not unlike extinguishers with extra wide bases. One or two other articles in the same ware are rather remarkable, and have been suggested as handles and feet of jars. The sides of some of the larger jars were covered with a lattice-work pattern, with the imprint of the potter's thumb at every crossing. Some of the rim handles are ornamented in a similar way ....' (Tench 1910, 45). The description indicates that some of these may have been later TTW forms of the 11th century. In addition, a possible kiln of indeterminate type had previously been recorded beneath the north-east bailey (Ayers 1985, 7).

The fact that wasters and failed products have been recovered from beneath and within the construction of the castle mound (Site 135N and recently at Site 429N; Wallis in prep.) confirms manufacturing activity during the Late Saxon or possibly the very early Norman period (certainly pre-*c.*1094 when the original castle mound was extended; and probably before the castle was established). A later, westward movement of the pottery industry is possible (Atkin *et al* 1983, 96) — perhaps as a result of the construction of the castle. At least some of the known Norwich kilns noted above may in fact indicate later (*i.e.* 11th- to early 12th-century) TTW production and it is possible that an earlier industry was swept away by the arrival of the Normans.

Tin-glazed Earthenware
(Fig.8.52)
A possible waster sherd (Fig.8.52) found residually in a cellar at Golden Ball Street (Structure 56, Period 6.3) may have come from a Norwich production site, possibly from a kiln on Ber Street (Goffin in Chapter 10.III). Although similar biscuit ware sherds have been recovered from sites in Norwich, most notably from Ber Street, no actual kiln site has so far been identified in the city. Further analysis of its chemical composition will be required to determine the source of the sherd, whether English or from the Low Countries. If it proves to be from Norwich, a link can be suggested with the Dutch immigrant potters documented in the area (see Chapter 10.III and VI).

Clay Pipe Manufacture
(Fig.10.61)
Debris from a tobacco pipe kiln or kilns was recovered from several areas of the site, most of it coming from fills of the barbican ditch (Fig.10.61). The notable clay pipe assemblage from both the Castle Mall and Golden Ball Street sites supplements previous excavated material in Norwich and provides useful connections with documented manufacturers, production being attested by the presence of pipe kiln muffles and wasters (see Peacey, Chapter 10.III). A number of maker's marks were present on the pipes actually within the kiln muffle, including a previously unknown mark 'IO' (Atkin, Chapter 10.III). Further comments on the supply and consumption of tobacco in Norwich can be found in Chapter 10.VI.

Fuels

by Peter Murphy
(Figs 4.15–4.16, 8.22, 13.7 and 13.10)

The expansion of population at Norwich, and the development of the city from the Late Saxon period onwards inevitably resulted in the development of a fuel-providing infrastructure to meet its needs. Cities are, above all, gross consumers of fuel.

Charcoal was present in virtually every context at the Castle Mall site, but samples for identification were submitted to Rowena Gale from only a few features where it could confidently be related to specific industrial processes. Samples from a pre-castle pottery kiln/drying oven (*22285*, Period 1.2; see 'Pottery Manufacture' above) were composed principally of wood charcoal (in order of abundance) of *Quercus* sp (oak), *Fraxinus* sp (ash), Salicaceae (willow/poplar), *Acer* sp (field maple?), *Corylus* sp (hazel) and Pomoideae (hawthorn etc). Those from the Period 5 bell-founding pit (Fig.8.22) and associated contexts (see 'Metal Trades' above and Chapter 8) included charcoal of oak, ash, *Acer*, Ericaceae (heathers/ling), *Ulmus* sp (elm), *Alnus* sp (alder), hazel, Salicaceae and Pomoideae. Metalworking processes require both high temperatures and a reducing atmosphere and it therefore seems likely that the fuel used in the bell-founding process was charcoal, whereas wood would have sufficed for the pottery kiln (see Gale, Chapter 4.IV and 8.IV). Charred macrofossils of *Carpinus betulus* (hornbeam), hawthorn, hazel, oak, bramble and elder from contexts within a Period 1 building (Building 12, G9/48, Fig.4.24–4.25) were thought to be related to the use of wood fuel for malt-drying (see Chapter 4.IV).

Sources of this wood fuel may only be surmised, though by the Domesday record of 1086, Thorpe Wood to the north-east of Norwich was one of the largest woodland areas in Norfolk (O. Rackham 1986, 301).

During the course of the medieval period, Thorpe Wood became progressively de-forested by over-exploitation. In common with much of the hinterland of Norwich, where areas had been cleared of woodland much earlier, from prehistory onwards, this resulted in leaching of sand- and gravel-based soils, podzolisation and the development of heathland. Local heaths were exploited for fuel at least as early as the Romano-British period: an iron smelting furnace of this period at Valley Belt, Trowse included charcoal of trees with broom (*Sarothamnus/Cytisus* sp) and Ericaceae (Murphy 1992). Elsewhere in Norfolk, heathland fuels were widely used in the Middle Ages (O. Rackham 1986, 295). At Castle Mall, Gale's identification of Ericaceae charcoal from the bell-founding pit gives one indication of heathland fuel sources. In fact, charred macrofossils of *Calluna vulgaris* (ling) and *Erica* spp. (heathers) were present in samples from Period 1 onwards, and a ditch fill of Period 1.4 (Ditch 1, G1/41) included charcoal of *Ulex/Sarothamnus* (gorse/broom), together with pinnules of *Pteridium aquilinum* (bracken). The latter occurred sporadically in later contexts.

Charred remains of heathland taxa were notably abundant in the barbican well fills, and in a Period 6 malt-drying oven (G1/131; Period 6.1, Figs 10.9–10.10).

In the early medieval period vast quantities of peat ('turf') were extracted from the river valleys of east Norfolk and Suffolk, producing the peat pits which, from the late 13th century onwards, became flooded to form the modern Broads. Oliver Rackham (1986, 359) estimates total extraction at 900 x 106 cubic feet and considers that at this time Norwich was 'a peat-burning city'. The evidence for this very large-scale activity is elusive palaeobotanically in soil samples from the city: the available evidence implies, to the contrary, that wood and charcoal were of greater importance than peat.

It is possible to demonstrate peat-burning, by obtaining AMS dates on charred macrofossils of peat-forming plants. For example, at London Lode Farm, Nordelph, Norfolk, charred nutlets of *Cladium mariscus* (saw-sedge) from the debris of a Roman salt-producing site were dated to 400–170 cal BC and 820–510 cal BC (OxA-5437, 5438: 2 sigma date range). These nutlets significantly pre-dated the Roman site, and were obviously already sub-fossils when charred, by inference, during peat-burning (Murphy 2002).

At Castle Mall, charred remains of wetland plants including peat-formers were present, but at low frequencies. At least some of these (*e.g. Eleocharis palustris* (spike-rush), *Carex* spp (sedges)) may have arrived as crop contaminants or in animal fodder. *Cladium* was not identified from samples before Period 3. The only samples interpretable with reasonable confidence as including peat-burning residues are those from Castle Fee Property 43 pit groups in Area 9 (G9/104 and G9/105; Tables 8.23–24). These produced abundant charred remains of *Carex, Eleocharis, Cladium* and *Phragmites*-type culm nodes, besides heat-discoloured oogonia of charophytes (stoneworts) and freshwater molluscs. These macrofossils point to the burning of base-rich *Cladium* or *Phragmites* peat. A contemporary pit (Period 5.1, pit *47694*, G47/10) and the fills of the barbican well also produced charred wetland plant remains, which might represent peat residues, or alternatively charred remains of thatching, litter or animal fodder. These contexts post-date the main phase of peat-extraction in the Broads. Similar remains came from pre- or immediately post-Conquest pit fills (*47746*, pit *47831*, Period 1.4), with a ceramic date of mid to late 11th-century, possibly indicating pre-1100 extraction although the date is equivocal (see Lentowicz, Chapter 4.II and Appendix 6 on CD).

A supplementary source of fuel was apparently crop processing waste and/or waste hay. This is most evident in Periods 4–6 (Fig.13.7). Seeds of arable weeds and grassland plants were common in the Property 43 pits noted above and the malting oven, samples from both of which were thought to include charred fuel waste. Chaff fragments were moderately common in samples from the barbican well, again perhaps, in part, charred fuel waste. Given the small number of samples, it is probably inappropriate to attach too much significance to this. By the later Middle Ages, peat production from the Broads had declined, and the limited areas of surviving woods in Norfolk would have been unable to meet the fuel demands of Norwich (O. Rackham 1986, 359), but there is no need to think in terms of a fuel crisis. As evidenced by the increasing occurrence of clinker, the coalfields of the Northumberland/Durham area would have met the shortfall in the city's fuel requirements. The use of supplementary fuels probably indicates no more than an economical use of what was readily and cheaply available.

General Discussion

(Figs 9.1 and Part III, Figs 4–9 on CD)

The wide range of craft activities and occupations evident at the site supplements previous knowledge of activities within the Late Saxon town and later city of Norwich, including those associated with the Norman and later castle. Many of the activities noted above and detailed more fully in preceding chapters recur over consecutive periods, the technologies and end products reflecting contemporary trends in manufacture and design, as well as the character of raw materials available. Other occupations documented at the site have been fully detailed in earlier chapters, including some which left no archaeological evidence in the form of artefacts. Amongst the group are those working as gaolers, sergeants, clerks/scriveners, barber-surgeons, lawyers, politicians and ecclesiastics (see Chapters 8–10).

Many of the crafts recorded relate to the proximity of the constant source of water provided by the Great Cockey stream and, after the Conquest, utilisation of the open space the baileys provided. In the pre-Conquest period, the settlement lay on the fringes of the Late Saxon town with its inhabitants operating in small domestic dwellings associated with workshops and storerooms, possibly housed in small social or economic groups working with bone, antler, horn, leather, textiles and metal (see also Chapter 4.VI, 'Craft and Economy' and Chapter 14, 'Economy'). The new evidence for early pottery manufacture in the vicinity is particularly significant (Lentowicz *et al* above and see Chapter 4.VI). Additional evidence comes from the bones of those buried within

the cemeteries at the site, which it has tentatively been suggested may relate to occupational activities. These include a repeated swinging action such as would be used in threshing, scything, beating cloth, hammering or similar, weaving/shoemaking (although see caveats attached in earlier text), the occupational use of teeth (perhaps again associated with textiles/weaving), horseriding and archery (Anderson, Chapter 4.V). The smoky environments within local workshops/houses have also been noted on the basis both of plant remains and skeletal evidence for sinusitus (Murphy Chapter 4.IV; Anderson, Chapter 4.V).

Activities conducted within the Norman baileys of the castle have been detailed in Chapters 5–6 and summarised in Chapter 12, 'Castle Life' and will not be repeated here. From the latter part of the 13th century, the rich local historical framework presented in Chapters 7–10 has permitted linkage between the documentary and archaeological evidence for activities undertaken by owners of Castle Fee properties and those in the immediately surrounding area. For example, metalworking within the Castle Meadow is first documented in *c.*1260 and a wide range of associated primary and secondary trades and finished objects has been discussed in previous chapters. Although present in all periods, this activity was archaeologically most prevalent in the late medieval/transitional period (Chapters 8–9). Both ferrous and non-ferrous working continued into the modern period when an iron foundry lay immediately to the east of the south bailey (Chapter 11).

The later castle baileys and surrounding area provided space for other noxious activities and large-scale quarrying. During the mid 15th to early 16th centuries a wide range of local specialist trades has been confirmed through both documentary and archaeological evidence, (fully detailed in Chapters 8 and 9 *e.g.* see Fig.9.1 for the late 14th century to *c.*1530). Murphy's analysis of the plant macrofossils has indicated some variations between wet/dry sites and, within its geographical setting, the presence of early to mid 15th-century tanning/tawing activities at the castle site, possibly associated with a small workshop or shelter (Open Area 48 and Structure 35 at ?Property 49), is somewhat unexpected as such industries were usually placed immediately adjacent to water. Presumably, access to the stream and/or local wells was sufficient to permit such activity within such a well-drained area. Activities particular to the post-medieval period included ivoryworking, window glazing and the manufacture of clay pipes (Chapter 10), while in the modern period the remnants of the baileys were mainly used as a livestock market, supporting allied trades such as agricultural tools and supplies (Chapter 11).

Linked to the evidence for production both on and around the site is the evidence for trade and commercial activity. The group of 142 coins, jettons and tokens recovered from Castle Mall and Golden Ball Street covers a chronological span of over 1600 years beginning in the Late Roman period (Davies, Section III of Chapters 3–5 and 7–10). In comparison with other coin assemblages from Norwich, this collection is large and contains some noteworthy finds. Following the Late Saxon group, it is perhaps surprising that no other issues occurred at Castle Mall until those of the late 13th century, although a short cross cut farthing of a Plantaganet king dating to 1180–1247 came from Golden Ball Street (GBS SF102). Notable late assemblages include the group from the barbican well (Chapter 9.III) and a silk purse lining containing a number of 16th-century jettons from the barbican ditch (A.Popescu, Chapter 10.III).

Amongst the small group of weights recovered from Castle Mall was a single coin weight (Davies, Chapter 9.III). A rare official merchant's weight of James I joins the few examples now known from Norwich (Huddle, Chapter 10.III). A number of other lead discs bear no official stamps and are probably unofficial merchant's weights or privately owned domestic weights. Lead discs incorporating initials and probable merchant's marks may have been used to pay labourers, or to signify units of merchandise. A 13th-century lead seal matrix from Golden Ball Street is of a rare type attributable to a wife (Ashley, Chapter 7.III). An unparalleled ?clothier or ?weaver's seal was found, and may have been intended to indicate the person in whose name the textile was marketed (Egan, Chapter 10.III). A 16th- to early 17th-century example from Augsburg (Germany) came from Golden Ball Street. Two scale pans came from the barbican well, of the type that would have been used for weighing precious commodities such as gold or spices (Goodall, Chapter 9.III).

Continental trade in fine pottery is a consistent presence from the Late Saxon period (with the introduction of Pingsdorf) to the post-medieval period which has been discussed by Lentowicz and Goffin chronologically in Chapters 4–10 and in more general terms above. The range of continental contacts observed at many Norwich sites is repeated in this large assemblage and there is nothing in the ceramic groups from Periods 2 and 3, particularly when compared to that of Period 1, to signal a major change brought about by the arrival of the Normans. The later centuries show the usual increase in highly decorative wares including some notable individual items and changes in vessel form relating to alterations in cooking practice (see Chapter 10.III). The late medieval and post-medieval pottery demonstrates contacts with the Low Countries, Germany, Italy, Spain and France that are familiar at other Norwich sites.

As well as locally traded products, evidence from the barbican well (Period 5, Chapter 9) indicates imports both from elsewhere in Britain and the Continent. Foreign imports include the familiar Dutch and German pottery and fine-grained stone for hones from Norway (Mills and Moore, Chapter 9.III). The raw material for a tiny red coral bead (Huddle, Chapter 9.III) also probably came from the Mediterranean, possibly as a linked trade with other goods such as spices and Italian textiles (Egan and Pritchard 1991, 310). During the late medieval period elephant ivory (evident both in knife handles and sword fittings; Chapter 9.III) would have reached Britain from a variety of sources, including the French and Flemish ports (MacGregor 1985, 39). The possible mother-of-pearl used in another knife handle may have come from the tropics and appears to be only the second known example of its type from Britain (Watson and Paynter, Chapter 9.III).

Supplementing earlier studies, the Castle Mall and Golden Ball Street projects have provided considerable evidence for the presence of Dutch immigrants in the area surrounding Norwich Castle, drawn both from artefactual and documentary evidence (for the former see Chapter 10.III and VI; for the latter see Ives, Part IV,

Chapter 3). Dutch (or Low Countries) Red Earthenwares were a large group of undecorated glazed earthenwares with a wide date range, manufactured in many centres in the Low Countries from the 13th century (Baart 1994, 19). They were imported into Norwich in the late medieval and early post-medieval periods and the forms were extensively copied by local potters. The earliest imports probably came in with cargoes of wool and grain, or for personal use by Dutch traders. Later they began to be imported for Dutch immigrants and were eventually manufactured locally to supply the demand. Many of the Dutch or Dutch-type objects found at Castle Mall and Golden Ball Street (fully detailed in Chapter 10) are likely to indicate personal possessions of immigrants rather than trade. Those items known to have been imported to Norwich from the Low Countries via Great Yarmouth include clay pipes, dyers' madder and pottery.

Contacts with the New World evidently began early in Norwich, with turkeys reaching the city soon after their introduction to England in 1541 (examples came from both Period 5.2 and Period 6.2 at Castle Mall; Albarella *et al*, Part III). The presence of pumpkin/marrow seeds is also significant, providing the first example of the species in Norwich (Murphy, Chapter 10.III). Exotica notably includes parrot bones (Albarella *et al*, Part III and Plate 10.32), perhaps brought to Norwich from the tropics/sub-tropics by a local merchant in a trading venture for eventual display in a public house or as a talking point in the home.

Imitations of Venetian glass may indicate local products in response to the disruption of supply engendered by the Civil War (Shepherd, Chapter 10.III). German objects include a bird whistle (Lentowicz, Chapter 10.III) and a fine bone powder horn decorated with a hunting scene (Huddle, Chapter 10.III). Elephant ivory was evident as both raw material and finished objects (Riddler, Chapter 10.III) attesting to importation of the raw material for working in Norwich.

IV. FINDS OVER TIME

Introduction

This section considers the spatial and chronological setting of artefacts and selected categories of Bulk Finds from both excavated sites over time, supplementing the period-based data presented in preceding chapters. The assemblage begins with a few items of prehistoric and Roman date (Chapter 3) and ends with notable objects of the modern period (Chapter 11). A general discussion of the assemblage including comparisons with those from other sites can be found in the concluding text of this section. More detailed comments on individual items, material groups and assemblages can be found in Section III of chapters 4–10, with additional comments relating to the Norman castle given in Chapter 12, 'Daily Life'.

The Small Finds

(Figs 13.1, 13.8–13.9)

Quantification

A total of 10,509 Small Finds was recovered from the Castle Mall site, with a further 424 from Golden Ball Street (Table 13.25), forming the largest single assemblage ever excavated in Norwich. By far the majority of the objects came from late medieval/transitional deposits at both sites (Period 5, *c.*57%), of which 4,843 (46% of the Castle Mall site total) came from fills of the barbican well dating to the mid/late 15th to early 16th century (Chapter 9.III). Another large assemblage (1,368; 13% of the site total) came from post-medieval fills of the barbican ditch (Chapter 10.III), the majority of the group deriving from fills dating to the mid 17th to early 18th century recorded in Trial Hole 1 and Area 9 (Period 6.2). The finds have been summarised by period and assemblage in Chapters 4–10, where they are grouped and discussed by functional category broadly in the order adopted for *Norwich Households* (Margeson 1993), with a catalogue of the illustrated items (further comments on methodologies can be found in Part I, Chapter 1 and its appendices).

Chronological and Spatial Distribution

The chronological pattern of object deposition indicated in Fig.13.8 is familiar from many multi-period sites in Norwich and from many urban excavations elsewhere. It is often difficult, however, to make detailed comparisons between site assemblages due to varying periodisation as well as differing quantification methods (or in some cases, the absence of their quantification).

Given the known presence of a major royal castle at the site, relatively few objects of Norman date (Periods 2 and 3) were retrieved, the figure for Period 2.1 being raised by the presence of an assemblage of 187 bone strips, most of which came from a single pit. Similarly, the quantity of 'medieval' objects in Period 4 is relatively low, although more objects attributable to the period were found intrusively or residually in contexts assigned to other phases of activity (as occurs in all other periods). A large increase in numbers of artefacts, accounting for *c.*52% of the combined total of both sites, occurs in Period 5.2 (the 15th to 16th centuries), with most of the material dating to the second half of the 15th century.

The quantifications presented in Fig.13.9, which shows finds by excavation area, of course have relationships to the relative size of each area (see Fig.13.1) and the nature of archaeological deposits encountered, although the high figure for Area 5 (a relatively small area) relates to the large assemblage recovered from fills of a single feature: the barbican well. This assemblage represents the dumping of refuse on a very large scale (Chapter 9). The recorded infilling began in the late 14th century, although earlier fills at the base remained unexplored. The assemblage, most of which dates to the mid/late 15th to early 16th century, demonstrates the presence of varying categories of waste deriving from surrounding households, craft/industrial activities (including butchery) and manufacturing activity. The ironwork, for example, represents a wide range of object types. Throughout the fills there is a consistent occurrence of structural and domestic ironwork typical of the refuse of an urban population. In addition, there is a large amount of ironworking debris and objects apparently deriving from the clearance of a specialist workshop or workshops (see Chapter 9 and above).

The assemblage of 6,566 items of iron recovered from Castle Mall occurred in all areas of the excavations but came principally from Areas 1/13, 5 and 9 (all but Area 5 suffering later encroachment by tenements), the

Period	*Castle Mall*		*Golden Ball Street*	
	No.	*%*	*No.*	*%*
Period 1: Anglo-Saxon	347	3.3	0	0
Period 2: Norman (*c*.1067–*c*.1094) *	451	4.2	6	1.4
Period 3: Norman (*c*.1094–12th century)	133	1.2	27	6.3
Period 4: late 12th century to *c*.1345	218	2.0	27	6.3
Period 5: *c*.1345 to late 16th century**	5,842	55.5	147	34.6
Period 6: late 16th century to 18th century	2,851	27.1	179	42.2
Period 7: 19th to 20th century	291	2.7	2	0.4
Unstratified/archived contexts	*376*	*3.5*	*36*	*8.4*
Total	**10,509**		**424**	

* The figure for Castle Mall Period 2 is elevated by the presence of an assemblage of 187 bone strips, most of which came from a single pit.
** Amongst the Castle Mall Period 5 assemblage are 4,843 objects from the barbican well (46%).
The figures represent objects found in contexts of a particular period and therefore includes residual and/or intrusive objects.

Table 13.25 Total number of Small Finds by period (number of objects)

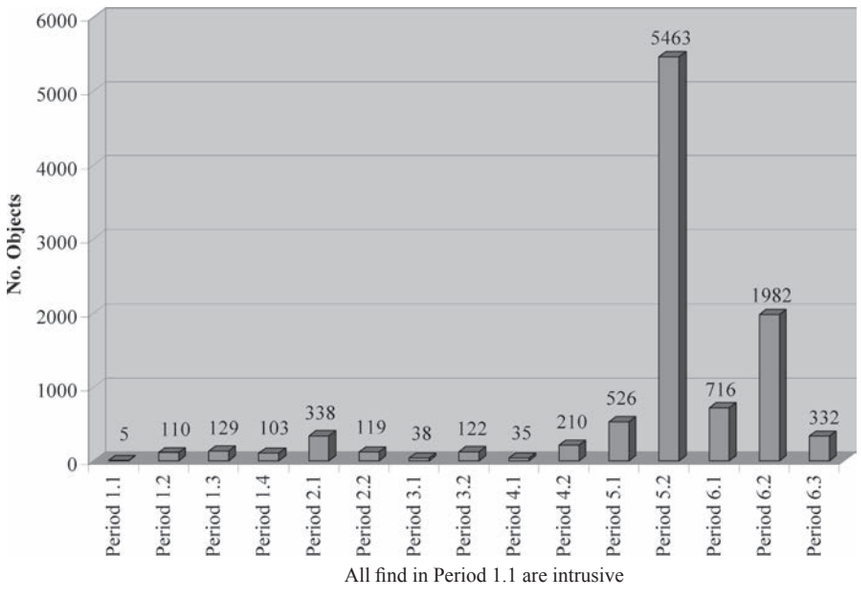


Figure 13.8 Number of Small Finds found in Periods 1–6, Castle Mall and Golden Ball Street

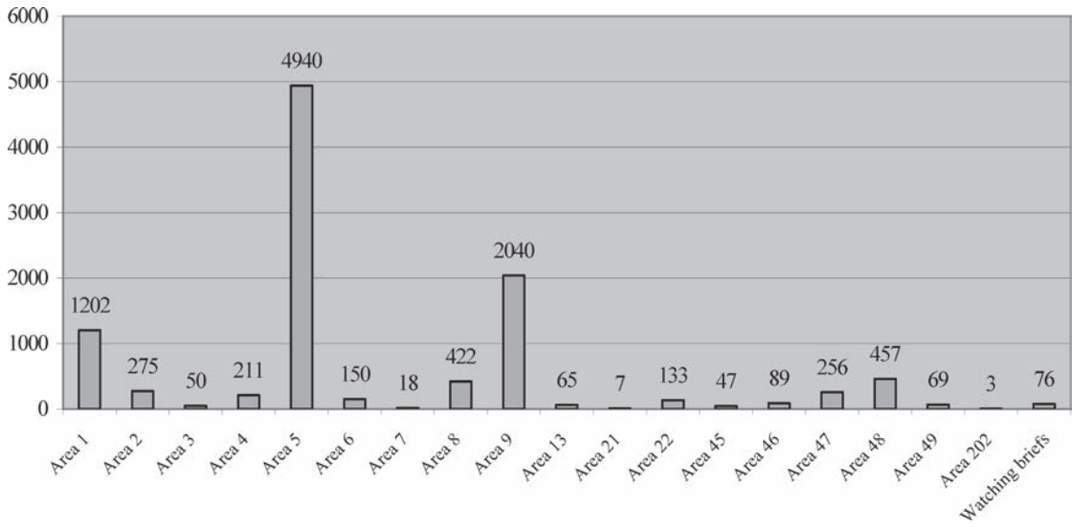


Figure 13.9 Number of Small Finds by excavation area at Castle Mall

largest groups deriving from the upper backfills of the barbican well (G5/24) and post-medieval dumping in the barbican ditch recorded during trial work (Trial Hole 1; see Chapter 1) and in Area 9 (G9/41). The same is true of all of the other major material groups, including the 1,469 copper alloy objects recovered from the site.

The finds were mainly recovered from the backfills of pits or ditches, indicative of secondary deposition. On its own this scattered and mainly redeposited material does little to aid interpretation of a particular deposit or area from which it is found. There are, however, instances where sufficient material was recovered to permit suggestions both about the type of context and the status of people depositing their rubbish (as in specific pit groups detailed in previous chapters, backfills of the barbican ditch recorded in Area 9 and the barbican well in Area 5). Additionally, large concentrations of a particular object type allow a further understanding of the objects themselves. Examples include the bone manufacturing waste found in early Norman pits in Area 2 (G2/5; Huddle, Chapter 5.III) and the late medieval/transitional bone pins/pens from the barbican well (G5/24; Huddle, Chapter 9.III). Other concentrations relating to craft activities are discussed in 'Craft, Industry and Manufacturing Technology' above.

The Bulk Finds

Summary and Quantification

This section deals provides a chronological overview of the development of pottery and ceramic building materials from the Castle Mall site. These and selected other Bulk Finds are quantified in Table 13.26. Animal, fish and avian bone have been discussed elsewhere in this chapter, while human remains (a total of 422 individuals including disarticulated bones) are detailed by Anderson in Chapters 4.IV, 5.IV and 10.IV, with comments on chronologies given in the discussion below. Architectural stone generally relates to the Norman castle and is discussed by Heywood in Chapter 6.III. Information relating to pottery manufacture can be found above. Details of collection and analysis methodologies for all categories of Bulk Finds appears in Chapter 1 and Appendices 3 and 4 on CD.

Pottery Overview

by Irena Lentowicz, with Elizabeth Shepherd Popescu and Richenda Goffin
(Figs 13.10–13.12)

Introduction and quantification

The pottery from Castle Mall and Golden Ball Street has been detailed and illustrated by assemblage in the archaeological sections (Section II) of Chapters 4–10 and Appendix 6, and discussed by period in the associated finds sections (Section III) of each chapter. The total assemblage amounts to 82,733 sherds weighing 945.455kg from Castle Mall, with an additional 2,713 sherds weighing 39.903kg from Golden Ball Street (Table 13.27).

Material type	*Quantity*
ceramic building material	234.258kg
ceramics	945.455kg
clay pipes	*c*.3,500 fragments
stone (architectural)	36 fragments

Table 13.26 Quantification of selected Bulk Finds at Castle Mall (excluding ecofacts)

The relative proportion of the assemblage assigned to each period is indicated by number of sherds in Fig.13.11 and by weight in Fig.13.12. Comparison between the two immediately demonstrates the better preservation and larger average sherd size of the post-medieval material (Period 6), which included a large number of complete or near-complete vessels. For the early periods, the large groups of small sherds retrieved via the sieving programme raised the sherd count.

A comparison of the number of sherds by sub-period indicates the dominance of certain phases of occupation in relation to the quantity of pottery deposited, particularly in the Late Saxon and early Norman phases during Periods 1.2, 1.3 and 2.1, each of which contain some substantial individual assemblages (although note should be taken of the difficulties in both ceramic and archaeological distinction between pits assigned to these two periods outlined in earlier text). The high proportion of material dumped during the 11th century is also clear (Period 1.3), accounting for just over 60% of the total pre-Conquest assemblage. During the major phases of military use of the castle between the late 11th and 13th centuries (Period 2, Period 3 and Period 4.1) which were well-represented at the site in terms of the construction of ditchwork and other defensive features, the quantity of pottery is noticeably low in all but Period 2.1, which may itself include some pre-Conquest features. The proportion of pottery from Period 5 is again relatively low, particularly when compared with the large numbers of other artefacts recovered (*cf.* Table 13.8): this is mainly due to the deposition of large quantities of non-ceramic waste into the barbican well during the mid to late 15th to early 16th centuries. The relatively high figure for Period 6.2 relates to the substantial groups of waste from the post-medieval city that were dumped into rubbish pits, quarries and the barbican ditch between the mid 17th and early 18th centuries.

The following text provides a chronological overview of the ceramics, using all of the material recovered from Castle Mall as a basis for discussion (*i.e.* ordered by type rather than site period and including all unstratified material). The material from Golden Ball Street is not included here. Discussion on local ceramic production can be found in 'Pottery Manufacture' above. Prehistoric, Roman (57 sherds; 0.497kg) and Middle Saxon pottery (17 sherds of Ipswich ware, one unidentified sherd; 0.182kg) is discussed in Chapters 3 and 4.III respectively.

Late Saxon and early medieval pottery (10th to early 12th century)

A total of almost 57,000 sherds of Late Saxon and early medieval pottery weighing 411.313kg was recovered at Castle Mall, accounting for 43.5% of the pottery assemblage. Not surprisingly, these fabrics dominate the assemblages from the pre-Conquest phases of occupation, where Late Saxon pottery accounts for *c*.93% and early medieval wares for *c*.5% of the Period 1 assemblage. With Period 2, however, the proportion of early

Period	*Castle Mall*				*Golden Ball Street*			
	Quantity	*Weight (kg)*	*% Qty*	*% Wt*	*Quantity*	*Weight (kg)*	*% Qty*	*% Wt*
1	32517	237.330	38.5	24.8	0	0	0	0
2	10775	82.143	12.8	8.6	348	3.504	12.8	8.8
3	2660	15.602	3.2	1.6	189	0.750	7.0	1.9
4	6051	34.943	7.2	3.7	267	2.276	9.8	5.7
5	10246	114.519	12.1	12.0	1185	16.377	43.7	41.0
6	14507	384.402	17.2	40.2	660	15.332	24.3	38.4
7	4214	36.395	5.0	3.8	3	0.543	0.1	1.36
Unstratified or archived	3448	51.567	4.0	5.3	61	1.121	2.2	2.8
Total	**84,418**	**956.801**			**2,713**	**39.903**		

Table 13.27 Quantification of the total pottery assemblage at Castle Mall and Golden Ball Street by sherd count and weight

medieval wares increases to account for 18.8% of the period assemblage while Late Saxon fabrics account for 78.3%. During Period 3, early medieval wares were more common than Late Saxon fabrics, 34.1% compared to 28.6%, and medieval pottery forms a large proportion of the assemblage (32.3%). Late Saxon wares account for 15.4% of the Period 4 assemblage, while early medieval wares for 8.5%; in Period 5 early medieval wares account for 3.2% while Late Saxon pottery accounts for 32.3% of the period assemblage, this artificially raised figure being the result of the disturbance of earlier features by massive quarries.

The Late Saxon pottery is dominated by TTW which accounts for 38.0% of the entire assemblage. Of this 78.6% came from contemporary contexts in Periods 1 and 2, while a further 0.8% was from Period 3, though some of this material was undoubtedly residual by this stage. As is evident from the figures given above, the fabric continues to occur as a substantial residual element in later periods.

As detailed above, the majority of the ware was probably produced in the city and a cluster of kilns and associated debris has been recorded along Lobster Lane, Bedford Street and London Street to the north-west of Castle Mall (Fig.13.10). A putative kiln was discovered on site during the excavations (see above) and, although this was not conclusively interpreted as a kiln, the large ceramic refuse pits do indicate that pottery production was also based in this part of the city. Although standard TTW dominated the assemblage, variations in the fabric were identified (see Table 13.29) indicating that a number of production centres were providing Norwich with the ware (Goffin, Chapters 4.III and 5.III).

Although a range of vessels were represented by rims (see Table 13.30), as would be expected the most common form recovered was the jar/cooking pot (3473 rims). Medium-sized jars dominated the assemblage (type AB, 2715 rims, 78.1%), with larger vessels (type AC, 578 rims, 16.6%) being more common than small vessels (type AA, 83 rims, 2.3%); the remaining 97 rims were not allocated to a type (2.7%). Comparison of rim sizes throughout the periods, and between Periods 1 and 2, reflects little change in proportion over time. In general, medium sized vessels account for *c.*80% of the assemblage, large vessels for *c.*16% and small vessels for *c.*3%; this appears to be the case regardless of period.

Almost the full range of Dallas' rim typology was represented by the rims recovered. The most common rim forms included everted rims with sides expanded to a wedge shape (type AB6, 247 rims; type AC6, 53 rims), which account for 8.6% of the total jar/cooking pot rims recovered. However, the most common types were vessels with everted rims with internal hollow and sides expanded to a wedge shape (type AA10, nine rims; type AB13, 579 rims; type AC13, 137 rims) or with sides expanded to a degenerate wedge shape (type AB14, 513 rims; type AC14, 162 rims). These two rim forms account for a total of 1400 rims and represent 40% of the total jar/cooking pot rims. These types were long-lived and appear throughout the production period of the industry (but see also note on a possible dating revision by Goffin, Chapter 4.III).

Other types which appear in some quantity include rims with internal hollow and parallel sides (types AB11, 525 rims, and AC11, 68 rims) which account for 17.1% of jars/cooking pots. This is a later, 11th-century type. Other later rims recovered in some quantity included jar/cooking pots with everted rim and exaggerated internal hollow (type AB12, 63 rims and type AC12, 13 rims). Earlier, 10th-century rims found in quantity included jars/cooking pots with internal hollow and triangular sections/developed triangular sections (types AA11, nine rims; AB7, 105 rims; AB8, 159 rims; AC7, 21 rims and AC8, 10 rims). These accounted for only 8.7% of jar and cooking pot rims.

Other vessel forms were represented by rims in much smaller numbers; utilitarian kitchen wares included storage jars (22 rims), handled jars and multi-handled jars (16 rims). Serving and pouring vessels were represented by rims from spouted pitchers (four examples) and bowls (42 examples), as well as a dish rim. More unusual kitchen vessels included a possible lid. Other kitchen wares were represented by other diagnostic sherds, including a pierced colander base, neck and body sherds from a two-handled costrel, and spouts from bunghole pitchers.

Other Late Saxon fabrics were recovered in much smaller quantity. The most common of these was a soft, soapy shelly ware recorded as St Neots type ware (NEOT); the fabric is light reddish brown on the surface with a darker grey-brown core, with abundant calcareous inclusions. A high proportion of the NEOT came from

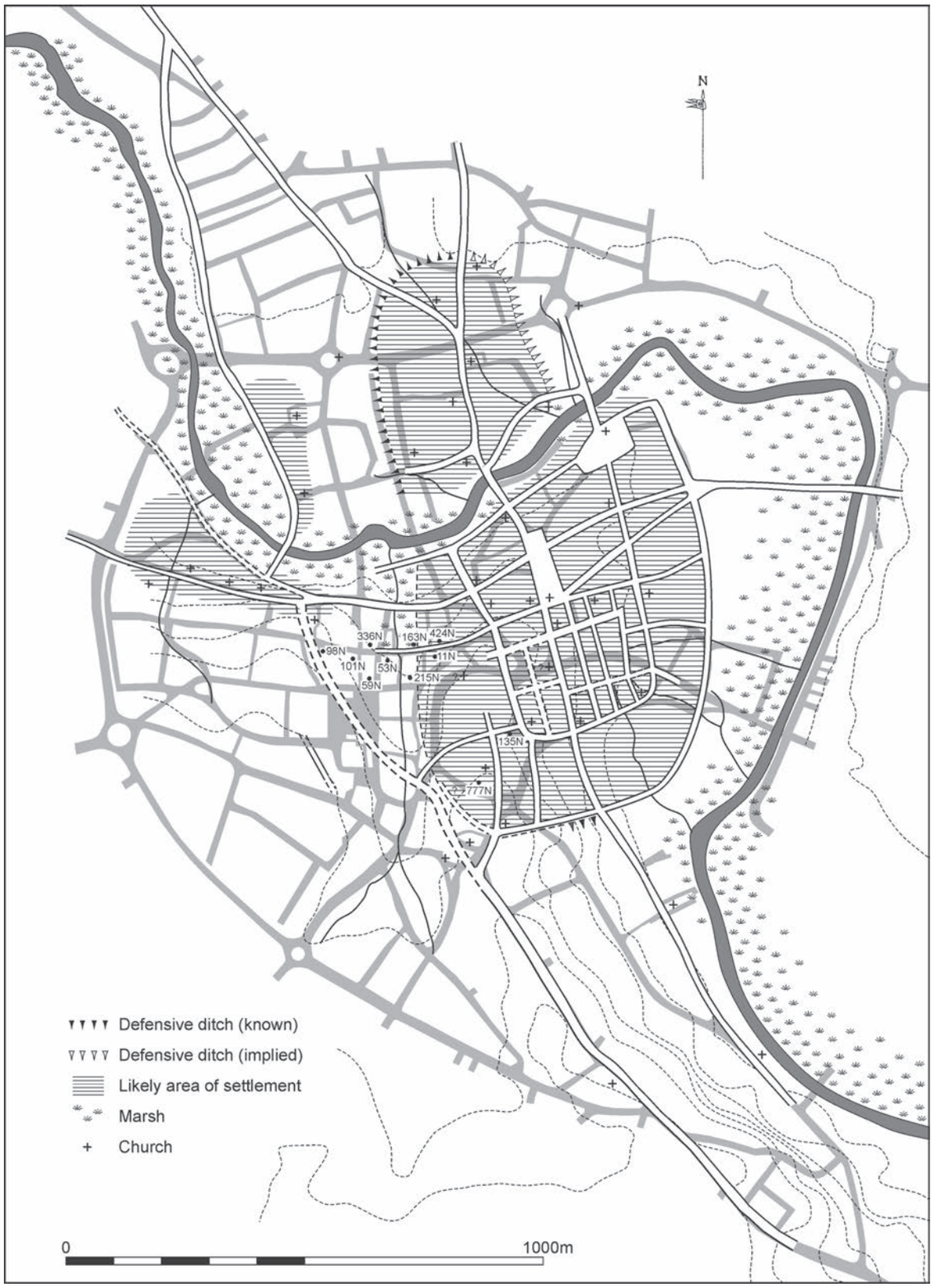


Figure 13.10 Location of Norwich sites with evidence for production of Thetford-type ware pottery. Scale 1:1250

contemporary contexts (51.7% of all NEOT came from Period 1, and 19% from Period 2), but this Late Saxon fabric would be residual by Period 3. Only bowls and jars/cooking pots were represented by rims, although a socketed bowl was represented by a body sherd with a spout, and a possible jug or handled vessel by a large handle.

A small quantity of Late Saxon regional coarseware imports was recovered. Mahany's classification of Stamford ware fabrics is adopted, and as such both

Fabric	*Quantity*	*Weight*	*% Qty*	*% Weight*
TTW	47470	358.988	57.4	38.0
TTW/EMW Transition	22	0.415	<0.1	<0.1
NEOT	525	5.726	0.6	0.6
Stamford ware (Fabric A)	25	0.196	<0.1	<0.1
Bardorf-type ware	2	0.036	<0.1	<0.1
Pingsdorf-type ware	71	0.755	0.1	0.1
Blue-grey ware	2	0.301	<0.1	<0.1
Total	**48,117**	**366.417**	**58.2**	**38.75**

% relate to total site assemblage

Table 13.28 Total quantity and weight of Late Saxon pottery

Fabric	*Quantity*	*Weight*	*% Qty*	*% Weight*
TTW	47132	352.794	57.0	37.3
Fine TTW	110	2.145	0.1	0.2
Coarse TTW	131	2.018	0.2	0.2
Black TTW	42	1.156	0.1	0.1
Chalk-tempered TTW	22	0.605	0.1	0.1
Grimston-Thetford ware	3	0.027	<0.1	<0.1
Thetford-type White ware	2	0.028	<0.1	<0.1
Misc. TTW	7	0.220	<0.1	<0.1
Total	**47,470**	**358.993**	**57.4**	**38.0**

% relate to total site assemblage

Table 13.29 Total quantity and weight of TTW by fabric

Form	*Total*	*%*
Jar	2982	82.7
Cooking pot	491	13.6
Storage jar	22	0.6
Multi handled jar	16	0.4
'ginger jar'	20	0.5
Spouted pitcher	4	0.1
Bowl	42	1.1
Dish	1	<0.1
Lamp	15	0.4
Crucible	1	<0.1
Other	8	0.2

Table 13.30 TTW forms represented by rims

Fabric A and Fabric B can be deemed to be contemporary during the Late Saxon to Norman periods, as the coarse wares produced in Fabric A are dated to the 10th–mid 11th century and the fine ware in Fabric B from the mid 11th–12th century. However, only a small quantity of pottery from this production centre was identified; 0.196kg of Fabric A and 0.330kg of Fabric B from the excavation as a whole. Of this only 26g of Fabric A came from Period 1 and a further 64g of Fabric B.

Stamford ware (Fabric A) is represented only by body sherds and by a single base sherd (25 sherds in total);

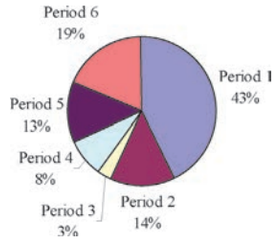


Figure 13.11 Relative proportion of pottery in each site period at Castle Mall, by number of sherds

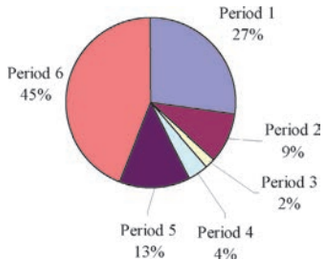


Figure 13.12 Relative proportion of pottery in each site period at Castle Mall, by weight

many of the sherds were small in size. The base came from a small sagging based vessel, possibly a crucible (Kilmurray form 16). Fabric B is more common at 53 sherds, and vessels were represented by rims from a jar, a jug and a crucible, as well as a number of flat bottomed base fragments, presumably from jars.

The transitional period from the Late Saxon TTW tradition to medieval pottery production, is covered by a small range of early medieval wares as well as later TTW production (see above). Of these Early Medieval ware (EMW) is the most common, producing thin-walled vessels in a hard-fired, sandy fabric with reddish-brown surfaces often discoloured through use. As this ware develops and merges into Local Medieval Unglazed ware (LMU), transitional sherds were also recorded.

The range of EMW forms is generally limited to small jars/cooking pots and 'ginger jars'; however, five bowl rims (including an usual socketed bowl) were also recovered. Other more unusual forms include a putative lid and, most unusually, a jug which may be a product of transitional EMW/LMU production.

Jars and cooking pots make up over 60% of the forms represented by rims. The jars/cooking pots usually have a diameter of less than 15cm (type J1), though some larger examples are also known (type J2). Three examples of a larger jar rim (type J3) were also recorded; however, some may come from a bowl rather than a jar. The rim forms are simple and include upright rims (types J1a and J2a, 69 and 10 rims respectively), plain everted rim (type J1b and J2b, 76 and 44 rims respectively) and everted, tapering rims (types J1c and J2c, 16 and 10 rims respectively).

There does not appear to be any chronological difference in the proportions of small- and medium-sized jars between Periods 1 and 2. Small jars/cooking pots account for 51% of EMW rims recovered in Period 1, while medium-sized vessels make up 28% of the rims.

During Period 2 the proportion of small vessels increases to 59% and medium jars/cooking pots account for 24%. By Period 3, however, small jars/cooking pots make up 82.5% of EMW rims and medium-sized vessels account for only 11.1%.

'Ginger jars' account for almost 35% of the forms represented by rims. These globular vessels generally have plain rims (type G1, 40 examples), slightly upright, everted rims (type G2, 66 examples) or rims with an internal bead (type G3, 10 examples). The vessels range in diameter from 7cm to 24cm; the majority of the rim diameters fall between 10cm–16cm (70 rims), though both smaller (7cm–9cm, 19 rims) and larger vessels (18cm–24cm, 12 rims) are both well represented. In general, smaller vessels tend to have plainer rims; 35% of type G1 rims recorded had diameters of less than 10cm, compared to only 5% of type G2 and 13% of type G3.

'Ginger jars' are found in both TTW (see above) and EMW and an origin in the 11th century was suggested by Jennings (1981, 22). At Castle Mall, the form in EMW came from graves in the Late Saxon cemetery beneath the south bailey rampart (Cemetery 3, Period 1.3), while fills of a ditch beneath another cemetery dated to the Late Saxon or possibly early Norman period (Period 1.4) contained 'ginger jars' in TTW, EMW and — unusually — YTW. Evidence from both Castle Mall and the Shirehall (Goffin, in prep.c) supports Jennings' general dating, indicating broadly that the form was in general currency *before* the third quarter of the 11th century (*i.e.* pre-Conquest).

EMW bowls are much less common and four singularly individual vessels were recovered. The most unusual is the largest, most complete example (Fig.5.39, no.2; Plate 5.16). This is a large bowl with steep sides and an everted, pulled rim and a sagging base with a definite carination body/base junction, decorated with a stamped circular motif of double circle of dots. Stamped decoration is known on EMW vessels, however this motif is unusual and as yet no parallels have been found for this vessel (see Goffin, Chapter 5.III). The other bowls were more readily identifiable as similar to vessels produced in either TTW or later, medieval examples. These included a socketed bowl with an everted rim and carinated profile and a bowl with a hammer-head rim more usually recorded on 13th–14th-century jars, cooking pots and bowls.

Another locally produced early medieval fabric is Early Medieval Sandwich ware (EMSW). While the fabric is similar to TTW, the sherds have a dark grey/black surface and core with oxidised orange-red margins. Many of the sherds are noted as abraded, and as the forms recovered are also similar to later TTW forms it is likely that this ware is a later, less well-fired variant of TTW. Over 11kg of EMSW was recovered from the site, accounting for 1.2% of the entire assemblage. As with other Late Saxon and early medieval fabrics, much of the EMSW assemblage is recovered from Periods 1 and 2 (41.7% and 19.0% respectively).

EMSW forms also mirror TTW vessels in that the ware is represented mostly by rims from jars and cooking pots (104 examples recorded). With the exception of three storage jars (type AG5), other forms are represented by single examples such as bowls (type BB5), handled jars (type AE2), 'ginger jar' (type G2) and a lamp. Even the usually common EMSW form, the spouted pitcher, is only represented by a single rim. However, an additional number of vessels were represented by three handles.

Fabric	*Quantity*	*Weight*	*% Qty*	*% Weight*
EMW	6651	27.616	8.0	2.9
EMW/LMU	51	0.160	0.1	<0.1
EMSW	1566	11.279	1.9	1.2
EMSSW	77	0.550	0.1	0.1
Early Medieval Shelly ware	1	0.014	<0.1	<0.1
YTW	419	3.296	0.5	0.3
Stamford ware (Fabric B)	53	0.330	0.1	<0.1
Flemish Grey ware	8	0.061	<0.1	<0.1
Misc. Early Medieval ware	11	1.595	<0.1	0.2
Total	**8,837**	**44.901**	**10.7**	**4.75**

% relates to total site assemblage

Table 13.31: Total quantity and weight of early medieval pottery by fabric

Form	*Total*	*%*
Jar/cooking pot	251	62.9
'ginger jar'	138	34.6
Bowl	4	1.0
Spouted bowl	1	0.2
Jug	1	0.2
Lid	2	0.4
Vessel	2	0.4

Table 13.32 EMW Forms represented by rims

Other early medieval wares include Yarmouth-type ware (YTW), a coarse, sandy fabric with calcareous grits comparable with Mellor's Fabric 3/1 (Mellor 1976, 188). This fabric is found in small quantities on a number of sites in Norwich and has been dated as a late 11th–12th-century fabric (Irena Lentowicz pers. comm.). However, its presence in earlier contexts here at Castle Mall and at recent excavations at Greyfriars (Lentowicz, in Emery 2007) suggest either that YTW is earlier, or that an earlier variant of Mellor's Fabric 3/1 occurs in the city. In addition, Mellor's Fabric 3/1 usually has reduced light grey surfaces and core, while much of the Norwich YTW has a light red-brown surface and reduced grey core. An early medieval variant of Fabric 3/1 was identified by Mellor as Fabric 5, which though heavily tempered with fine sand as YTW is, does not appear to include the calcareous inclusions which are typical in the Norwich sherds. A total of 3.296kg of YTW was recorded at Castle Mall, and two variants to the standard YTW were noted; the first contained a much greater proportion of calcareous inclusions (59g), while the second was noted as smoother (17g) and may indeed be similar to Mellor's Fabric 5.

A limited range of forms was found, and the majority of the forty-four rims recovered came from jars and cooking pots (37 rims). 'Ginger jars' (three examples; see above) and bowls (three examples) were also recorded, as well as a rim from a curfew.

Less than half a kilogram (0.342kg) of YTW was recovered from Period 1, just over 10% of the ware.

The fabric is present in small quantity in Period 1.2, and increases in Periods 1.3 and 1.4. The majority of the pottery is body sherds, but three rims all from jars were recorded. The quantity of YTW increases in Period 2 and falls only slightly in Period 3, before decreasing dramatically in subsequent periods, and it is probable that, though it occurs in small amounts in the 11th century, the main *floruit* of the ware is the late 11th to 12th century.

Medieval pottery (12th–14th century)

Over 58kg of medieval pottery was recovered, making up 6.1% of the entire site assemblage. The majority of the medieval pottery was locally produced wares supplemented by a small quantity of regional non-local fabrics and a smaller proportion of imported continental wares. Although medieval fabrics occur in Periods 1 and 2, these are either intrusive or transitional sherds, and it is not until Period 3 that medieval pottery makes a significant impact in the ceramic record. In Period 2 medieval fabrics account for only 1.3% of the period assemblage, and by Period 3 this has increased to 32.5% of the pottery recovered. However, it is unsurprising that in Period 4 medieval pottery peaks, accounting for 64.8% of the assemblage, and by Period 5 its dominance is on the wane with only 17.0% of the material recovered being medieval fabrics.

Unglazed utilitarian wares dominate the assemblage (70.4% of medieval fabrics; see Table 13.33), and the most common fabric is Local Medieval Unglazed ware (LMU). This hard, sandy fabric emerges from the tradition of Early Medieval ware, and indeed some fifty-one sherds recovered could not be definitely assigned to EMW or LMU and are transitional in appearance. Vessels begin to be larger and their firing is more controlled. They are fired to a uniform grey surface, occasionally with patches of discolouration.

LMU appears as a small, intrusive element in Period 1, while transitional sherds are recovered from Period 2 and form a larger part of the assemblage as a contemporary fabric. Almost 12% of the ware was recovered from Period 3 contexts, but over half of the fabric recovered came from Period 4 . In both these periods, LMU constitutes a large proportion of the period assemblage. A proportion of the total LMU assemblage came from Period 5 (22.4%), but it is obvious that by this period the demand for practical kitchen wares is being met elsewhere. The fabric is residual in Periods 6 and 7.

Jars and cooking pots were also allocated to rim types, which paralleled and extended the EMW typology. The earlier LMU rims are similar in type to the handmade, simple everted, plain EMW examples, whilst the later vessels are characterised by more complex developed rims which can be separately formed and attached to the vessel around the area of the neck. Developed rims are dated to the 13th–14th century and are represented by incipient internally and externally pulled (or 'hammer-head') rims (type J1/2i, 163 examples) and developed 'hammer-head' rims (type J1/2j, 77 examples). Other rims are recorded, but the above five types account for 86.6% of all the recorded LMU rims from this site. However, although type a, b and c rims are known from the beginning of the LMU sequence, they also occurred in later periods indicating that they may be long-lived and possibly produced alongside more developed forms.

As with EMW, the LMU rims and other diagnostic sherds were catalogued according to the Norwich Type Series classification. Rims were first assigned to a vessel form, then allocated a rim type. Not surprisingly jars and cooking pots were the most common vessel represented by rims, 87.1% of the total number of rims recorded came from these form (see Table 13.34 below). Small rims with diameters of less than 15cm (type J1) account for 10/1% of the recorded jar/cooking pot rims, while large rims with diameters of more than 26cm make up 6.5% (type J3); a further 2.5% could not be measured accurately. The remaining 80.8% came from medium

Fabric	*Quantity*	*Weight*	*% Qty*	*% Weight*
LMU	7011	39.434	8.5	4.2
Grimston Coarse ware	4	0.159	<0.1	<0.1
East Cambs-type ware	106	1.001	0.1	0.1
Kings Lynn NS ware	1	0.104	<0.1	<0.1
Non-local Medieval Unglazed wares	25	0.198	<0.1	<0.1
Grimston Glazed ware	983	14.778	1.2	1.6
East Norfolk Medieval Glazed ware	2	0.015	<0.1	<0.1
Developed Stamford ware (Fabric C)	33	0.302	<0.1	<0.1
Hedingham-type wares	25	0.179	<0.1	<0.1
Cambridge Sgraffitto ware	2	0.082	<0.1	<0.1
Scarborough-type ware	1	0.002	<0.1	<0.1
Bourne ware	1	0.023	<0.1	<0.1
Non-local Medieval Glazed wares	114	1.363	0.1	0.1
Andenne ware	42	0.118	0.1	<0.1
Aardenburg-type ware	7	0.034	<0.1	<0.1
Cologne Encrusted ware	1	0.008	<0.1	<0.1
Saintonge wares	1	0.015	<0.1	<0.1
Rouen-type/North French ware	3	0.004	<0.1	<0.1
French Red Painted ware	2	0.014	<0.1	<0.1
Proto Stoneware	2	0.026	<0.1	<0.1
Misc. Medieval Import	2	0.010	<0.1	<0.1
Misc. Medieval wares	19	0.218	<0.1	<0.1
Total	**8,387**	**58.087**	**10.2**	**6.1**

% relates to total site assemblage

Table 13.33 Total quantity and weight of medieval pottery by fabric

Vessel type	*No. rims*	*% Total*
Jar	223	36.7
Cooking pot	306	50.4
Curfew	4	0.6
Bowl	35	5.8
Jug	30	4.9
Crucible	1	0.2
Other	8	1.3
Total	**607**	

Table 13.34 Total quantity of rims by vessel form: LMU

sized jars or cooking pots with diameters between 16cm and 25cm (type J2).

Jars and cooking pots were further sub-divided according to rim type. Typologically rims on cooking pots developed from being handmade, simple, everted and plain to more complex, developed examples which are wheelthrown then attached to the vessel body. In addition, smaller jars/cooking pots (type J1) are thought to be of earlier production than vessels with medium- and large-sized diameters. Unfortunately, this is not borne out by this assemblage. Earlier 12th-century rim types are defined as small jars with upright rims (types J1a, 11 examples), with plain, everted rims (types J1b, 19 examples) and plain, everted rims coming to a point (types J1c, 9 rims). These combined account for 39 examples of the rim total (7.5%), and are found mostly in contexts assigned to Periods 4 and 5 rather than earlier. Larger vessels with the same rim forms (type J2a, 12 rims; types J2b and J3b, 77 and 10 rims respectively; and types J2c and J3c, 46 and 13 examples respectively) account for 98 of the rims (18.8%) and are found in Periods 3 and 4, and in many cases Period 5 indicating that these are long-lived types.

More developed rims with incipient externally and internally protruding profile (types J1i, J2i and J3i — 3, 159 and one examples respectively) and hammer-head rims (types J1j, J2j, J3j and J4j —5, 65, 4 and 3 examples respectively) are later 13th- to 14th-century in date. These appear in the ceramic assemblage in Period 4 where they are most common, and also in Period 5. In many cases these rim types are recovered with glazed sherds in the Grimston Glazed ware tradition, indicative of a late 12th-century date and later. It was noted that of the 241 incipient and hammer-head rims recovered, the majority (regardless of size) were sooted and therefore could be classified as cooking pots: 197 rims were allocated as cooking pots compared to only 44 as jars.

In the main, the other rim forms were not recovered in sufficient quantity for statistical analysis to be valid, except medium-sized jars with a rounded rim (type J2g, 17 examples). These were recovered almost exclusively from contexts allocated to Period 3 (16 examples); the remaining rim was residual in a later context. This would appear to indicate that this is an earlier, 12th-century rim type.

Other forms were represented in much smaller quantities. A total of 35 rims from bowls were recorded; indeed, some of the larger jar rims may be from bowls but unless it was obvious from the profile these were allocated as jars (any sooted rim was classed as a cooking pot). Bowls were also classified according to size and rim type; in most cases it was not possible to assign a profile type as not enough of the vessel wall remained. However, both straight-sided and curved profiles were recorded, where possible. The majority of bowls were only identified due to size; the rims appear to come in three sizes: small (type B1) 16–19cm, 5 examples, medium (type B2) 22–28cm, 6 rims, and large (type B3) 32–50cm, 10 examples. Medium sized bowls were more common, but a number of rims came from vessels where the diameter could not be measured.

Rim types tended to be internally and externally pulled (either incipient or developed 'hammer-head' rims, types Bi and Bj) over the range of vessel sizes. However, these were not recovered until Period 4.

The majority of the bowls were recorded with incipient or hammer-head rims; seven rims were noted with thumbing along the outer edge of the rim creating a rippled effect. Other than this, bowls were undecorated.

Four curfew rims were also recorded and also tend to have hammer-head rims. These were identified by sooting on the exterior, the position of which indicates that they were used close to fires rather than over them.

Local wares were supplemented by regional and English imports, as well as a small quantity of continental wares. None of this pottery is found in any quantity and it is unlikely that it represents the results of trade.

Unglazed wares include a kilo of sherds made from a sandy fabric with inclusions of shell which are likely to have an origin in the west of the county or beyond. They are similar to fragments of Ely coarseware, which has also been identified on other sites in the county.

Other non-local coarse wares were unprovenanced and referred to by non-specific general descriptive names. The majority were represented by a few sherds, and probably represent single vessels.

Glazed wares were more prolific. Regional imports included Developed Stamford ware and Hedingham-type wares, as well as Cambridge Sgraffitto ware. From further afield small quantities of Scarborough-type ware and Bourne ware were also present. Again, unprovenanced non-local glazed wares were common and have been described individually.

Medieval continental imports were dominated by products from the Low Countries. Most common was Andenne-type ware, while smaller quantities of Aardenburg-type ware were also present. A much more unusual fabric, Cologne Encrusted ware, was represented by a single sherd. French wares, though not common were present and included sherds of Saintonge polychrome ware, North French ware and Red Painted ware.

Late medieval and transitional pottery

An assemblage of 92.459kg of late medieval and transitional pottery was recovered from the site, accounting for 9.9% of the total ceramic assemblage (Table 13.36). The group is dominated by Late Medieval and Transitional ware (LMT), and also includes late products of the Grimston industry. Continental imports and vessels imitating them (produced by local potters) include Dutch (or Low Countries) Red Earthenwares and their locally produced counterpart Dutch-type Red Earthenware (DUTR). Stonewares from Siegburg, Langerwehe and Raeren-Aachen were evident, alongside small quantities of Tudor Green-type ware. In addition, an assemblage of 6.680kg of local Early Post-medieval ware (EPM) was recovered.

Although Grimston Glazed ware was recovered from earlier medieval contexts at the site, it only formed a significant proportion of the assemblage during Period 5; only *c.*10.5% of Grimston wares came from Period 4 contexts, while the 9.823kg recovered from Period 5 represented *c.*66% of the total weight of the fabric recovered from the site. Some of the more unusual vessels, such as skillets and bunghole cisterns, show the local Grimston industry endeavouring to increase its product range to cope with a changed demand. Despite this, by the late 15th century the industry was in decline.

The demand for new forms was met by industries producing a range of pottery during the late 14th to late

Fabric	*Quantity*	*Weight*	*% Qty Med Fabrics*	*% Weight Med Fabrics*
Unglazed wares	**7,147**	**40.896**	**85.2**	**70.4**
Local	7,011	39.434	8.5	67.9
Regional	111	1.264	1.3	2.2
Non-local Medieval Unglazed wares	25	0.198	<0.1	0.3
Glazed wares	**1,161**	**16.744**	**1.4**	**28.8**
Regional	985	14.793	11.7	25.5
Non-local	62	0.588	0.7	1.0
Non-local Medieval Glazed wares	114	1.363	1.3	2.3
Imports	**60**	**0.229**	**0.7**	**0.4**
Low Countries/Rhineland	52	0.186	0.1	0.2
French	6	0.033	<0.1	<0.1
Misc. Medieval Import	2	0.010	<0.1	<0.1
Misc. Medieval wares	**19**	**0.218**	**<0.1**	**0.4**
Total	**8,387**	**58.087**	**10.2**	

Table 13.35 Total quantity and weight of medieval pottery by provenance

Fabric	*Quantity*	*Weight*	*% Qty*	*%Wt*
LMT	2,843	71.247	3.4	7.5
LMT/LMU	6	0.051	>0.1	>0.1
Dutch-type REW	224	7.631	0.2	0.8
Tudor Green ware	31	0.223	>0.1	>0.1
Dutch Red EW	34	1.038	>0.1	0.1
Siegburg Stoneware	72	1.472	>0.1	0.1
Langerwehe Stoneware	279	7.879	0.3	0.8
Raeren-Aachen Stoneware	118	2.918	0.1	0.3
Misc. late medieval	4	0.030	>0.1	>0.1
Total	**3,607**	**92.459**	**4.5**	**9.9**

% relates to total site assemblage

Table 13.36 Total quantity and weight of late medieval and transitional pottery by fabric (excludes 235 sherds; 6.680kg of local EPM)

16th centuries. These industries were dominated by Late Medieval and Transitional ware (LMT), the common name given to the large group of products recovered in some quantity on many Norfolk sites. The fabric occurred as an intrusive element in small quantities in early periods, although some of the material recovered from Period 4 may be contemporary since the fabric was introduced into the Norwich assemblage in the early to mid 14th century. By Period 5, LMT comprised a larger proportion of the assemblage, with just over half of all the LMT recovered from the site deriving from this period (*c.*50.5%). An additional 36.6% came from Period 6 contexts, although only the material from Period 6.1 could be considered contemporary (366 sherds, weighing 6.969kg, 9.8% of all LMT recovered). The range of vessels produced in LMT represents a combination of medieval elements with influence from the continent and changes in cooking and eating habits. The majority of the forms recovered were kitchen wares, although jugs and table wares were also produced.

Dutch (or Low Countries) Red Earthenwares form a large group of undecorated glazed earthenwares with a wide date range, manufactured in many centres in the Low Countries from the 13th century (Baart 1994, 19). They were imported into Norwich in the late medieval and early post-medieval periods and the forms were extensively copied by local LMT potters. A total of 204 sherds of Low Countries/Dutch Red Earthenware weighing 4.671kg was recorded at Castle Mall and first appeared in the ceramic record in Period 4.2. Locally produced DUTR was more common than its Dutch counterpart, with a total of 233 sherds weighing 7.753kg recovered from the site. However, only 2.451kg came from contexts allocated to Period 5 (2.1% of the period assemblage, and 31.6% of all DUTR recovered). Almost a quarter of the entire assemblage (22.6%) came from contexts not assigned to a specific period, and a small quantity was recovered as an intrusive element in earlier contexts. A single sherd came from Period 4.1, just over a third from Period 5 contexts and a further 3.338kg (43.0%) from Period 6. However, as with LMT, it is only the material recovered from Period 6.1 (0.949kg) which can be considered contemporary.

Cauldrons and pipkins were the most common vessel forms recovered in this fabric, although it is possible that some of the 'cauldrons' were actually fragments of one-handled jars rather than two-handled examples. Other cooking vessels included three skillet rims and one base; other forms consist of bowls, jars, dishes and handled bowls.

A small quantity of English Tudor Green-type ware was recovered (0.223kg from the entire excavation). The fabric first occurred in Period 4.1 (only one sherd weighing 8g), while only 75g was recovered from Period 5 with a further 97g from Period 6. Two forms were represented by a splayed base with lip from Period 5.1 and the rim of a drinking vessel/mug from Period 6.2.

Most of the drinking and pouring vessels consist of Rhenish stonewares. Imports from the first large stoneware production centre at Siegburg appeared in Norwich in the early 14th century (Jennings 1981, 109), and indeed a small quantity of the fabric was recovered from Period 4.2 contexts. Only a small amount was recovered in total (1.472kg), and just over 97% of all Siegburg stoneware came from Period 5 contexts. Long-necked jugs and small jugs were the most common forms produced, although the majority of the Castle Mall assemblage was made up of body sherds.

Langerwehe stonewares were much more prolific than Siegburg products and such vessels are common in later 14th- and 15th-century contexts in Norwich. The most common imported forms were again jugs and two-handled cups, although rims recovered from the Castle Mall site tended to come exclusively from jugs.

Manufacture began at Raeren-Aachen in the 15th century and imports to Norwich appear in the late 15th to early 16th century. At Castle Mall, the fabric appears in small quantities as an intrusive element in Periods 1.3 and 2.2, but makes its first impression in Period 5 where the 1.023kg recovered represented 35.1% of the total quantity recovered, with 0.801kg (27.5%) from Period 6. The most common imported forms were small

globular drinking vessels with wide necks, strap handles and frilled bases.

Post-medieval pottery

The total assemblage of post-medieval pottery recovered from the site amounted to 365.552kg, accounting for 39.5% of the site assemblage (Table 13.37). The dominant fabric was Glazed Red Earthenware (GRE) (212.618kg) accounting for 22.5% of all pottery recovered and 57% of post-medieval fabrics. A wide range of kitchen and domestic vessels was recovered, including tablewares and serving vessels. The range of vessel forms is indicated by period in Table 10.30 and demonstrates the dominance of dishes/plates (399 vessel rims; 25% of the recorded rims) and jars (353 vessel rims; 22.5% of the recorded rims). Other relatively common forms included handled jars/bowls (12.5%) and bowls (11.5%).

Other locally produced earthenwares were dominated by Iron-glazed Black ware (IGBW) vessels which account for 4.8% of the entire site assemblage and 12.1% of the post-medieval fabrics (45.202kg). Vessel forms are summarised in Table 10.31, demonstrating the dominance of tygs (44% of identified rims and bases) and other drinking vessels (39% of identified rims and bases). Such vessels reflect the popularity of hostelries and public houses in the vicinity of the Norwich Castle during the post-medieval period (see Chapter 10.I and 10.VI).

Speckled Glazed wares were introduced into the ceramic assemblage in the late 17th century and just over 10kg came from the site (10.509kg), accounting for 1.1% of the post-medieval fabrics. Forms were similar to IGBW and the vessels recovered were all hollow wares, jugs and drinking vessels being the most common forms recorded.

The only other locally produced coarseware recovered in any quantity was West Norfolk Bichrome ware; 0.533kg was recovered (0.1% of post-medieval pottery) consisting of pipkins and dishes. Other locally produced earthenwares were represented in much smaller quantity. Both East Norfolk White ware and Local Slipwares were represented by five sherds apiece, most of which came from other periods. Most of the material from Castle Mall was recovered from Period 5.1, while the only diagnostic sherd came from a drinking vessel rim retrieved from a Period 7.1 context.

These dominant local products were supplemented by regional English wares and foreign imports, the majority of which were retrieved in small quantities with the exception of certain key fabrics which were slightly more prolific. Non-local or regional imports came from Essex, Surrey and Staffordshire, as well as Tin-glazed Earthenware (TGE) which was produced both in the Netherlands and various centres in England.

The most common regional import recovered was Metropolitan slipware (14.317kg, 3.8% of post-medieval wares) which was produced in Harlow, Essex during the 17th century.

Surrey White ware in the form of Border ware accounted for 1.6% of all post-medieval fabrics (5.975kg) and such vessels recovered in Norwich appear to date largely from the first half of the 17th century. The most common forms found at the site included plates, bowls, cups and pipkins, as well as porringers.

The only other English import of any significance was Staffordshire slipware (1.465kg) making up 0.4% of the

	Quantity	*Weight*	*% Qty*	*% Wt*
GRE	7,375	212.618	8.9	22.5
IGBW	1,278	45.202	1.5	4.8
Fulmodestan IGBW	17	0.0328	>0.1	>0.1
Speckled Glazed ware	419	10.509	0.5	1.1
WNBC	38	0.533	>0.1	>0.1
Kings Lynn NS ware	1	0.104	>0.1	>0.1
East Norfolk White ware	5	0.017	>0.1	>0.1
Local Slipware	5	0.153	>0.1	>0.1
Metropolitan Slipware	332	14.317	0.4	1.5
Surrey White ware	230	5.975	0.2	0.6
Staffordshire Slipware	112	1.465	0.1	0.1
TGE	1,502	26.841	1.8	2.8
North Holland slipware	27	0.736	>0.1	>0.1
North Holland cockeral bowls	1	0.021	>0.1	>0.1
Low Countries Slipware	6	0.121	>0.1	>0.1
Low Countries Slipware (dec)	1	0.012	>0.1	>0.1
Dutch White EW	61	0.649	>0.1	>0.1
Low Countries Earthenware	169	3.621	0.2	0.3
Cologne-Frechen Stoneware	414	17.815	0.5	1.8
Frechen Stoneware	536	18.237	0.6	1.9
Westerwald Stoneware	211	4.931	0.2	0.5
Werra ware	8	0.127	>0.1	>0.1
Waser ware	2	0.036	>0.1	>0.1
North Italian Marbled ware	9	0.528	>0.1	>0.1
Nth Italian Slipware	3	0.015	>0.1	>0.1
Spanish coarse ware	1	0.062	>0.1	>0.1
Spanish Amphora ware	4	0.096	>0.1	>0.1
Spanish Lustreware	1	0.005	>0.1	>0.1
Martincamp flask	24	0.478	>0.1	>0.1
Total	**12,792**	**365.552**	**16.9**	**39.5**

% relates to total site assemblage

Table 13.37 Total quantity and weight of post-medieval pottery by fabric

Fabric	*Qty*	*Weight*	*% Qty*	*%Wt*
Cream ware	5	75	>0.1	>0.1
Whieldon-type ware	27	216	>0.1	>0.1
Black Jackfield ware	1	1	>0.1	>0.1
Misc. late post medieval	1	1	>0.1	>0.1
Stoneware	192	3,774	0.2	0.4
English Stoneware	8	930	>0.1	>0.1
Staffs Brown Slipware	15	710	>0.1	>0.1
China	341	3,470	0.4	0.3
Total	**590**	**9,177**	**1.2**	**1.3**

% relates to total site assemblage

Table 13.38 Total quantity of modern pottery by fabric

post-medieval assemblage. Only small quantities came from Periods 6.1 (where it was probably intrusive) and 6.2, and it only forms a significant part of the assemblage in Period 6.3 and Period 7.

The most common non-local fabric recovered was Tin-glazed Earthenware (TGE) which accounted for 7.2% of the post-medieval fabrics, and 2.8% of the total assemblage (26.841kg). This was a large group of pottery from a number of sources, not only continental vessels from the Netherlands but also from English potteries in London and Bristol, and possibly even from Norwich itself. A putative kiln has been suggested on Ber Street (see Goffin, Chapter 10.III and above). A summary of the forms by period appears in Table 10.38 and indicates the dominance of plates (42% of rims and bases).

Other imports from the Low Countries/Netherlands made up a small proportion of the assemblage. The most prolific of these was Low Countries Red Earthenware, which has already been discussed since this fabric made its first appearance in Norwich assemblages in the late 14th century (see Chapter 8.III and above). Dutch White Earthenware (DWE) was much less common; only 0.649kg was recovered, 0.2% of post-medieval fabrics. This ware was imported during the 16th and early 17th century.

The remaining Low Countries imports were slipwares or slip-decorated wares, represented by rims from bowls and dishes, including distinctive cockerel bowls. North Holland slipwares were more common (0.757kg, 0.2% of post-medieval fabrics), and generally represented by cockerel bowls (ten rims, four bases) as well as by a dish and bowl rim. A smaller quantity of Low Countries slipware was recovered (0.133kg), accounting for less than 0.1% of the post-medieval assemblage.

Products from the Rhineland formed the largest proportion of imported wares, overwhelmingly dominated by stonewares from Cologne, Frechen and Westerwald. Products from Cologne-Frechen accounted for 17.815kg (4.8% of post-medieval fabrics); production expanded in the 16th century to provide a range of vessels with elaborate decoration.

Stonewares were not the only German products represented, and a small quantity of slipware was recovered. Both Werra ware and Weser ware are very distinctive and occur in small numbers on many Norwich sites.

Only very small quantities of other continental imports form Italy, France and Spain were recorded. Italian wares were restricted to North Italian slipwares (0.543kg), including a particularly fine bowl of marbled Pisa ware probably made in the Po valley during the first half of the 17th century (Fig.10.36, no.13). A rather fine Saintonge Polychrome sweetmeat dish was also found (Fig.10.43, no.6; Plate 10.13).

Modern pottery

Over 9kg (9.177kg) of modern pottery was recovered, accounting for 1.3% of the total site assemblage. The fabrics present are indicated in Table 13.38.

Conclusions

by Richenda Goffin

The combined excavations at Castle Mall and Golden Ball Street provided an unprecedented opportunity to study the full sequence of ceramics from stratified deposits in Norwich dating from the 10th to 11th century through to the post-medieval period. Nearly a metric ton of pottery was recovered from these excavations (996.704kg, 87,131 sherds). The analysis of such a large and varied assemblage has formed a valuable supplement to the work already undertaken by Sarah Jennings, Bill Milligan and Barbara Green in the compendium *Eighteen centuries of pottery from Norwich* (Jennings 1981). This illustrated catalogue and gazetteer presents a provisional chronological sequence of pottery from Norwich, which was recovered mainly as unstratified material from building sites rather than from controlled excavations. The pottery from Castle Mall has added to this existing typology, with the benefit of stratigraphic and other artefactual analysis.

The pottery presented in the current report once again reflects the particular location of the city of Norwich and the overall character of its ceramic assemblages. Although not a coastal port, the city is situated on a substantial river, forming part of an extensive system of waterways with easy access to the East Coast. In the days when freight by water was a cheap and efficient method of transporting and selling merchandise, Norwich was the recipient of a diverse range of imported ceramics. This trading contact is shown in the Castle Mall assemblage with the presence of pottery mainly from Northern France, the Low Countries and the Rhineland, but also from South-Western France, and from Italy and Spain. The city of Norwich was close enough to the ports of Great Yarmouth and Lowestoft to benefit from their position on the western edge of a vast trading network encircling the North Sea. In addition during the medieval and post-medieval periods Norwich and the surrounding area was the destination for a substantial influx of immigrants from the Low Countries. Their taste and customs influenced the indigenous pottery production as well as, no doubt, leaving a physical legacy in some of the ceramic assemblages of this date recovered from city excavations. Norwich was also able to take advantage of regional trading contact, both with London and the south-east, and with production sites in Cambridgeshire and Lincolnshire, and during the later part of the post-medieval period, with increasing quantities of pottery from Staffordshire.

The ceramics recovered from Castle Mall and Golden Ball Street also reflect another feature of Norwich assemblages. The city was not just a consumer of ceramics, it was also a producer, both in the early medieval and post-medieval period. Limited archaeological work on some of the Norwich TTW kiln sites has taken place, but a precise chronology of this industry and its extent has so far proved elusive. This is also true of the early tin-glazed ware production which is known from documentary evidence to have been established in Norwich in the second half of the 16th century. The duration and precise location of this industry has not yet been established, although recent work along Ber Street does appear to confirm that the delftware kiln was indeed nearby (Goffin in Shelley 1999). Although both sites detailed here have provided more evidence of these industries, further work is required before a fuller understanding of their history can be gained.

Ceramic Building Material Overview
by Irena Lentowicz, with Elizabeth Shepherd Popescu

Introduction
A total of 228.413kg of CBM was recovered from Periods 1–6 at Castle Mall, with additional material found unstratified or in modern deposits bringing the total to 234.258kg. A further 25.110kg was recovered from Golden Ball Street (Periods 2–7 and unstratified), of which 24.742kg came from the Norman to post-medieval periods (Periods 2–6).

Ceramic building material by form and fabric type
Eleven categories of CBM were recorded at Castle Mall (see Table 13.39) and are discussed chronologically by type below. Information by assemblage and period can be found in Chapters 4.III–10.III.

Roman
Fragments of Roman material are recovered throughout the city and Roman tile accounted for almost 3% of this assemblage, 6.774kg. Five individual fabrics were recorded and these can be paralleled with Drury types R1 and R3. The assemblage is dominated by Type R1 which are bonding tiles/tegula; Fabrics 120, 127, 135 and 138 produced 5.697kg accounting for 84.1% of the Roman material. One fragment of Fabric 138 tile was recorded as an imbrex tile, but the specific imbrex tile type R3 (Fabric 132) accounted for 1.046kg, making up the remaining 15.4% of the Roman assemblage. The occurrence of Roman tile is often interpreted as residual element imported as a result of agricultural activity; however, since much of the material is made up of bonding tile, Drury interprets its presence as more often the result of re-use as hearth pads/surrounds or as rubble for building construction (1993, 163). Roman farmsteads are known north of the city and to the south Caistor-St-Edmunds is also a probable source.

Fired clay and daub
The first truly contemporary CBM recovered is fired clay and daub. This material was used to cover walls, floors and wattle as well as probable structural elements within buildings, and also occurs as the result of clay or earth being directly or indirectly heated. Three distinct fabrics were identified. Fabric 136 was the most common (18.064kg, 61.1% of the fired clay category) and this generally consisted of daub and fired clay, with some wattle and reed impressions recorded on the surface. Fabric 129 was less common (11.088kg, 37.5% of fired clay/daub) and more commonly noted as fired clay than daub. Wattle and reed impressions were also observed on some surfaces. The remaining material (0.43kg) was made up of Fabric 300, which was recorded mostly as unidentified fragments of fired clay and characterised by the fragmentary nature of the material. The average sherd size of Fabric 300 is 1.3g, compared to 11.3g for Fabric 129 and 10.9g for Fabric 136. The general trend indicates that Fabric 136 was more common in contexts allocated to Period 1 and declined in use in later periods, while Fabric 129 was less common in Period 1 but increased in use in Periods 2 and 3.1. In any period it is difficult to assess how much of the assemblage was contemporary material and how much residual. Fired clay and daub would have been used to patch structures and features as and when required. All three fired clay fabrics were also recovered from Saxo-Norman contexts at Greyfriars (Emery 2007). Interestingly, Fabric 300 was by far the most common fabric on that site with much smaller quantities of Fabrics 129 and 136 recorded.

Medieval roof tile
Medieval material accounts for almost 60% of the CBM recovered (135.714kg, 59.7%). Of this 60.429kg of medieval roof tile was retrieved and a number of fabrics were recorded, and some were paralleled with Drury's types. Roof tile was introduced to Norwich at some stage during the mid–late 13th century though elsewhere in East Anglia it appeared earlier, for example in 1165–73 in Suffolk and *c.*1200 in King's Lynn (Drury 1993, 168). Any roof tile recovered from contexts prior to Period 3.2 at Castle Mall is deemed to be intrusive, and even its introduction in Period 3.2 is debatable. It is probably not until Period 4 that roof tile can be seen as truly contemporary.

The majority of the roof tile fragments recorded were flat, peg hole tiles (generally with two circular peg holes along the upper edge). The most common was Fabric RT100 and its variants RT103 and RT111 which corresponds to Drury's early type RT2 and RT3; these fabrics produced hard fired, red sandy tiles. The 121 fragments weighed almost 50kg (49.925kg) and account for 21.3% of the CBM recovered and 82.7% of the medieval tile. The majority was recorded as roof tile, though two ridge tile fragments were also noted. Glaze was noted on a number of fragments but it was not a common feature; indeed, glazed roof tiles are not a common occurrence in Norwich. Less than 2% of the number of fragments of type RT100/103/111 tiles recorded were noted as glazed (23 of 1212 fragments). The Drury parallel types RT2 and

	Castle Mall			*Golden Ball Street*		
Period	*No. frags*	*Weight (kg)*	*% Weight*	*No. frags*	*Weight (kg)*	*% Weight*
1	2,538	28.329	12.4	0	0	0
2	428	10.976	4.8	4	0.116	<1
3	351	3.798	1.6	12	1.588	6.3
4	406	6.790	3	2	0.022	<1
5	2,155	75.352	33	39	2.884	11.4
6	2,073	103.168	45.1	210	20.132	80
Total	**7,951**	**228.413**		**267**	**24.742**	

Table 13.39 Total analysed number of CBM fragments and weight by period at the Castle Mall and Golden Ball Street sites (excluding Period 7 and unstratified material)

Fabric	*No. fragments*	*Weight (kg)*	*% Weight*
Miscellaneous	698	11.067	4.7
Roman	140	6.774	2.9
Fired clay	2959	29.582	12.6
Fabric 200	749	1.494	0.6
Medieval roof tile	1,382	60.429	25.8
Medieval brick	1,677	70.710	30.2
Medieval floor tile	27	4.575	1.9
Post-medieval roof tile	53	6.785	2.9
Post-medieval brick	413	39.612	16.9
Post-medieval floor tile	12	2.640	1.2
Modern	2	0.590	0.2
Total	**8,112**	**234.258**	

Table 13.40 Total number of CBM fragments and weight by category (includes selected Period 7 and unstratified material; excludes Golden Ball Street)

RT3 occur in late 13th-century contexts on a number of Norwich sites (for example, Bishopgate 156N, Westwick Street 159N and Greyfriars 845N) and they continued to be used into the 14th century. Here, the earliest contemporary contexts could be Period 3.2 but more probably Period 4.1 where RT100/103/111 was present, although not as common as fabric RT117.

The next most common fabric was RT114 (4.045kg, 6.7% of medieval tile), which was originally recorded as a floor tile fabric until it became clear that it was also used to record roof tile. At Greyfriars (Site 845N) it was recorded entirely as a floor tile fabric and identified as probably Flemish (Ian Betts, pers comm). Multi-type fabrics are not unusual as roof tiles were often produced in the same kilns as not only pottery but other CBM; if a tilery was set up to produce CBM for a specific building (such as a church or castle) the source of clay for all types of CBM including roof and floor tile would be similar, if not the same. Peg tile fragments were the most common tile type recorded, though a ridge tile also noted. At over 40% a larger proportion of this tile type was noted as glazed (23 out of 63 fragments). This fabric was recovered intrusively in Period 1, but was most common in Period 4.2.

A similar quantity of tile was type RT104 paralleled by Drury type RT4 (3.623kg, 6% of the medieval roof tile). This fabric is also hard, red and sandy and was generally unglazed; only one of the 64 fragments was recorded as glazed. Most of the tile was noted as peg tile, but two ridge tile fragments were also recorded. This fabric is recovered in 13th-century contexts and is the standard long-lived plain roof tile fabric in Norwich; for example, it was recovered from late 13th-century contexts at Greyfriars (Site 845N) and was also used extensively in Pottergate in the 15th century.

Other tile fabrics were found in lesser quantity, in the main less than 1kg in weight and more distinctive than the usual hard fired, red sandy tile fabrics. Fabric RT117 is equivalent to Drury's type RT5 and is a pale yellow to off-white sandy fabric (0.92kg). It occurred in Periods 4.1, 4.2 and again in 5.2, and is found elsewhere in Norwich in late 13th-century contexts (for example at Bishopgate, Site 156N and Greyfriars, Site 845N).

Another distinctive fabric is RT116/Drury type RT1 which is ill-mixed and variegated, ranging in colour from pink to buff (0.378kg). Only three fragments were recorded and one of these was glazed. Drury type RT1 tiles are unusual in that they have a single, central peg hole; none of the examples recovered here was complete enough to determine whether it had a single hole. One fragment was intrusive in Period 1, and the remaining two came from Period 6.1.

Five fragments of fabric RT108/Drury type RT7 were recovered (0.130kg). Only flat peg tile fragments of this pale pink sandy fabric were recorded, from contexts allocated to Periods 6.1 and 6.2. Elsewhere in Norwich type RT7 tile was recovered in pre-Dissolution contexts at Greyfriars as well as late 15th-century contexts (Magdalene Street/Cowgate, Site 168N) and later (Market Avenue, Site 150N; Bishopgate, Site 156N and Botolph Street, Site 281N). This fabric is similar to the fabric of Late Brick type LB2.

Two roof tile fabrics could not be paralleled with Drury types. Fabric RT105 (0.937kg) is a hard, red sandy fabric and only flat peg tiles were recorded. Similarly only peg tile fragments of Fabric RT123 (0.471kg) were recorded. This was a more distinctive hard pink fabric with buff-cream surface.

Medieval brick

A total of 1677 fragments of medieval brick weighing 70.71kg was recovered. Again, where possible, fabrics were allocated to or paralleled with Drury's type series which is based on manufacture and on size rather than fabric. Drury divides bricks into two groups. Group A bricks were made on sanded forms (and therefore have sandy surfaces) and are larger than Group B bricks which were made on un-sanded forms often with vegetation adhering to the surface. The division based on manufacture implies different production centres. Group A bricks are 13th- and 14th-century in date and probably imported, while Group B bricks occur occasionally in late 13th-century contexts but are more common and become dominant by the end of the 14th century and are East Anglian in origin. Because the material from excavations is more fragmentary and whole bricks generally not common, the fabric-based NAU typology is used as well as the Drury type series.

Bricks were first introduced into the city during Royal works when the wooden palisade around the castle was replaced by a curtain wall in 1268–70 AD (see below). Drury suggests that type EB1 bricks were used for Royal works in London as well as in Norwich but points out (1993, 164) individual types are hard to date as many bricks were re-used. Buildings could be demolished, the bricks salvaged and used for another structure, such as types EB1 and EB7 on the Dukes Palace site (Site 169N). Nevertheless, it would seem that any bricks recovered from contexts assigned to Periods 1 through to Period 4.1 were probably intrusive. The assemblages from these periods do contain a substantial proportion of brick fragments, but this is due to the weight of the fragments. Much of this was made up of earlier, Group A types EB1 and EB3 but later Group B types EB7 and EB8 were also present in these contexts.

Over 27kg of Group A bricks were recorded (27.275kg) which represents 38.6% of all medieval bricks. Group A bricks were represented by all types from EB1 to EB5, as

well as a number of fabrics which were paralleled with Drury's types: fabric EB113 (0.250kg) was paralleled to type EB1, fabric EB107 (1.222kg) was similar to types EB2 and EB3, while fabric EB110 (0.145kg) was similar to type EB3. In addition fabric EB106 was also included as a Group A brick as it was made on a sanded form. Type EB3 was the most common Group A type (0.8635kg), and also appears in the later 13th century in Bishopgate 159N. Type EB2 was also present in some quantity (6.333kg), and these bricks were also recorded from the Wilderness Tower and sections of the city walls built *c.*1270–1300, as well as in tenements built on Westwick Street 159N dated to the 13th century. Type EB1 bricks were also recorded (3.190kg). Type EB4 (0.295kg) was less common, though similar bricks were recorded in a later 13th-century smithy on Alms Lane. Rather surprisingly type EB5 (1.92kg) was more frequent; this small brick type is rare (Drury 1993, 164).

Group B bricks were more common; 41.056kg representing 58.1% of the medieval brick assemblage. The individual most common types recovered were EB8 (20.765kg, 29.4% of medieval bricks) and EB7 (13.175kg, 18.6%), with much smaller quantities of EB6 (0.775kg), EB9 (0.05kg) and EB10 (0.390kg) recorded. Type EB8 occur in the vault of the passage under the east end of St Gregory's Church built in the late 14th century, while types EB6 and EB7 are recovered from 15th-century contexts on Magdalene Street/Cowgate (Site 168N). Type EB9 bricks were recovered from Magdalene Street/Cowgate as well as being used to face the Cow Tower.

Medieval floor tile

The remaining medieval CBM consisted of floor tile fragments (4.575kg), adding to the small corpus of floor tiles from Norwich. These tiles appear to be sturdier and better preserved than other CBM types and this is reflected in an average sherd size of 169g (compared to *c.*42g for medieval brick and *c.*44g for medieval roof tile). The majority of floor tiles recovered in Norwich are plain glazed tile which would be used to produce a chequerboard effect. They are an indicator of high status.

Floor tiles appear in the archaeological record from the late 13th–14th century, and until the middle of the 16th century English tiles are much less common than imported Flemish products. However, at Castle Mall this does not seem to be the case and plain, poor quality, locally produced tiles dominate the assemblage (sixteen fragments, weighing 2.34kg, 51.1% of the medieval floor tiles). A small quantity of Drury types FT3 and FT4 was recorded; also a small number of examples of other English types FT101, FT125 and FT128. A smaller quantity of Flemish floor tiles was recovered (six fragments, 1.08kg, 23.6% of the floor tile) and types represented included Drury types FT9, FT10 and FT18, along with type FT114. However, the most common floor tile fabric recorded, FT140 (five fragments, 1.155kg, 25% of the floor tile) cannot yet be identified as either Flemish or English. It is type FT140 which first appears in intrusively in Period 1.4 (note that this is from the cemetery of St John de Berstrete/Timberhill; see further comment in Chapter 4), while Flemish type FT114 was recovered from Period 4.2. English types FT101, FT125 and FT4 were recorded in Period 5, but the majority of the material was recovered as a residual element from Period 6.

Post-medieval roof tile

Post-medieval CBM weighed 49.037kg accounting for 20.9% of the assemblage. Only *c.*13% of this (6.785kg) was made up of post-medieval roof tile. Two fabrics were recorded, types RT141 and RT142 which is paralleled to Drury type RT10. These are pan tiles, flat roof tiles with an integral nib. Fabric RT141 appears to be a variant of, and possibly a continuation of, medieval roof tile fabric RT103. Pan tiles are widespread in Norwich from the 17th century, for example from Oak Street (Site 351N), Pottergate (Site 149N) and Alms Lane (Site 302N). At Castle Mall they appear as an intrusive element in Periods 2, 4 and 5. The majority of the material was recovered from Period 6 (6.195kg, 91.3% of post-medieval tile).

Post-medieval brick

A larger quantity of post-medieval brick was recovered, 39.612kg, 16.9% of all CBM recovered and 80.8% of the post-medieval CBM. Late Bricks begin to take over from Early Bricks elsewhere in East Anglia in the mid 15th century, associated with a change in the style of architecture under the influence of German and Flemish architects (Drury 1993, 165). In Norfolk the earlier traditions of brick making appear to continue much longer and deep red, sandy, regular bricks begin to appear in Norwich in the 16th century rather than earlier.

A very distinctive early fabric, type LB2 was recovered in some quantity (6.276kg), and the standard brick type LB1 was also recorded (2.993kg). Types LB3 (5.463kg) and LB4 (9.173kg) were also recovered, but the most common type was type LB5 (13.83kg). Only one fabric not directly attributed to Drury's type series was noted, type LB102 (1.567kg) which is paralleled to types LB1, LB3 and LB4.

Post-medieval brick was recovered as an intrusive element in Periods 1 to 4, where it formed a small part of the period assemblages (from 1.4% to 3.9%). In possibly contemporary context, a single fragment of early type LB2 was recorded from Period 5.1, but it is probably in the latter part of Period 5.2 that type LB bricks become truly current. The range of types from LB1 to LB5 was recorded, and again LB5 is the most common single type. By Period 6.1 post-medieval brick accounted for *c.*19% of the assemblage, though Early Bricks were still more common.

Post-medieval floor tile

Post-medieval floor tile accounted for a small proportion of the CBM assemblage (2.64kg, 1.2%). All tiles were directly paralleled to Drury's types; the most common was type FT26 (1.985kg) with smaller quantities of FT22 (0.39kg) and FT21 (0.265kg). These are generally square and unglazed. They appear in late 16th-century contexts and though the majority of the material here is recovered from Period 6, the remaining assemblage is intrusive in Period 4.

Chronological distribution

Full details of assemblages by period can be found in the finds sections of Chapters 4–10. In summary, CBM was recovered from all periods and shows marked differences throughout the occupation of the site. Throughout all periods a small quantity of Roman material was recovered; in some cases this would have been the result of re-use though the fragmentary nature of the material also

indicates that some of it is residual. In Periods 1 and 2 the main building material in use is fired clay and daub. This was used not only for walls but also for hearths and structural features within buildings. During Period 1, Fabric 136 appears to be more common, but both fired clay and daub fabrics are recovered from structures and post-holes as well as pits and ditch fills. The Late Saxon buildings are fully detailed in Chapter 4.

A much smaller assemblage was recovered from Period 2 (Chapter 5). This is unexpected as the Conquest period saw great changes in land use with the demolition of structures for the establishment of the castle. Much of the material came from ditch fills. By Period 2.2 Fabric 129 is more common than Fabric 136. A small assemblage was also recovered from Period 3 (Chapter 6), less than 2% of the total group. Again the material used is fired clay and daub; though medieval forms make up a proportion of the assemblage this is probably intrusive.

Brick was not introduced to the city until the third quarter of the 13th century (during Period 4), though this was associated directly with the castle during the replacement of the palisade around the Castle Mound with a curtain wall and towers, the wall being completed in 1268–69 (Tillyard, Chapter 6.I). Kirkpatrick, writing in the early 18th century when part of the wall and tower on the south side still stood, states that the materials used were brick and stone, though he does not specify whether the stone was flint or ashlar (Kirkpatrick 1845, 240–241). He noted that the bricks were exceptionally large and Tillyard (Chapter 6.I) has suggested they may have been comparable to those made by Cistercians for their Priory at Little Coggeshall in the early 13th century which were 2 inches thick, 7 inches wide and between 14 and 18 inches long. Similar large bricks are present in 13th-century webbing of Norwich Guildhall (Brian Ayers, pers. comm.). Most of the castle's curtain wall was demolished during the Civil War (see Chapter 10.I).

The Period 4 assemblage from Castle Mall is not large although it does include medieval roof tile and a small quantity of brick which could indicate the construction or repair of buildings and other structures within the castle compound and on its fringes. Such repairs — including those on the castle gate — are documented during the early 14th century (see Tillyard, Chapter 7.I). In 1271 £5 were allotted to a building to house Norfolk's Shire Court, although it may already have been present in 1240 or earlier (Beecheno suggested a date of 1220, proposing that it was constructed at the same time as the gaol; 1888, 18). This building lay within the western half of the south bailey, but as is discussed elsewhere in these volumes, it was not located during the excavations. The Shirehouse was rebuilt in 1325/6.

Repairs to the castle and its associated buildings, including the Shirehouse, continued between the late 14th and 16th centuries (Period 5). Repair work to the Shirehouse in 1391–2, for example, used sand, lime, stone, timber, reed and nails, hinges and keys: no bricks are mentioned and the building was evidently thatched for much of its life. In 1579 the Shire Court moved up onto more spacious accommodation on the mound (Tillyard, Chapter 8.I). By Period 5 the quantity of ceramic building material recovered at Castle Mall increases dramatically, though little is associated with actual buildings as the majority is recovered from pits. Roof tiles and bricks continue to be recorded and by Period 5.2 almost the entire range of types is recovered. Much of this sub-period assemblage came from the fills of the barbican well (G5/24, Chapter 9) and indicates a wide range of building materials used in the area. Elsewhere on the site some building material was recovered from structures, including a growing number of garden walls from the mid 16th century (see Chapter 8.II and 8.V). Along with identifying use of specific brick types, these assemblages also indicate an element of re-use of earlier material.

Period 6 produced the largest period assemblage, a large proportion of which was recovered from 17th- to early 18th-century refuse dumps into the barbican ditch recorded in Area 9 and Trial Hole 1 (G9/41). The interesting group of tin-glazed wall tiles (mainly recovered from Trial Hole 1 in the barbican ditch) demonstrates a wide range of different designs (Fig.10.59). Both polychrome and monochrome tiles made in the Netherlands and in the English delftware centres are present and the assemblage, which reflects changing contemporary tastes, is detailed by Goffin in Chapter 10.III. Where structural evidence for tenement development on the fringes of the site occurs, including cellars, walls, wells and cess pits (detailed in Chapter 10), earlier fabrics are used alongside contemporary fabrics. Many of these buildings were demolished in the 19th century (see Chapter 11).

Further discussion of buildings, building materials and constructional details can be found in Chapter 14, while the building trades are summarised above and detailed in previous chapters in relation to Castle Fee properties.

General Discussion

The finds assemblage from the Castle Mall and Golden Ball Street sites provides some of the largest individual groups excavated in Norwich and across Norfolk, adding to existing chronologies and typologies. In broad terms, the artefactual assemblage from Castle Mall reflects previously recorded local, regional and national trends at each period and indicates a wide range of social status, from the impoverished to the aristocratic. Unusual aspects of the assemblage have been highlighted above and in preceding chapters and most relate to craft activity or individual items, some of which belong to previously rare groups or are new additions to the Norwich repertoire. A few individual items or groupings appear to be currently unparalleled nationally. The development of many categories of object can be broadly traced through comparisons between the artefactual sections of each period chapter. Other than the pottery, however, most of the individual categories of object were too small to permit typological analysis.

Amongst the Castle Mall assemblage are some large individual assemblages of object types, such as the group of 173 iron knives (Mould, Chapters 4.III–10.III). The large group of knives from the barbican well (totalling 132 blades and handles; see Chapter 9.III and 9.VI) is of comparable size to the 138 examples from nearly forty Norwich Survey sites catalogued in *Norwich Households* (Margeson 1993). Amongst an extensive range of other dress and shoe fasteners (such as hooks, buckles and buttons) from the well were over 750 small annular buckles which may have been used to fasten shoes or hose, although other evidence from the well indicates a possible association with spur leathers (Mould, Chapter

9.III). Such buckles have been found in small numbers previously from Norwich (Goodall in Margeson 1993, 33, fig.18, nos 206–217) and other late medieval and post-medieval excavations. The well assemblage also indicates some possible early forms of objects familiar from Norwich sites, which are detailed in Chapter 9.III. These include a spur of apparent late 16th-century type (Ellis, Chapter 9.III) and the group of wirework hooked fasteners (Goodall, Chapter 9.III): although the latter appear on other Norwich sites in 17th-century deposits, 16th-century examples are known in Amsterdam and other wirework products were in use in the city in the late 15th to early 16th centuries (Margeson 1993, 19).

As is the case with the faunal remains and plant macrofossils, few of the artefacts from Castle Mall are indicative of the presence of a royal castle and not one Norman coin was found. There are, however, occasional indications of status including the small group of gilt binding strips discussed in Chapter 12, 'Castle Life'. There are clear biases in the chronological and spatial distribution of finds at both the Castle Mall and Golden Ball Street sites, relating primarily to the use of castle-related features for refuse disposal by Norwich's inhabitants. Aside from the barbican well assemblage, the distribution patterns of the Norman period and beyond generally relate to gradual encroachment on the fringes of the castle. Excavation of the castle ditches, which cut across the existing pattern of land use, affected the survival pattern across the site. It has, however, proved possible to identify the different uses of certain areas and buildings during the Later Saxon period, as has been discussed in Section I above.

It has been noted in previous chapters that evidence for the medieval, late medieval and post-medieval periods is particularly well-represented in Norwich by the findings of the Norwich Survey (Margeson 1993) and specifically the 1507 fire recorded at 31–51 Pottergate (Site 149N, Evans and Carter 1985). This provides useful comparisons for the substantial barbican well assemblage, including groups from both domestic contexts and others that are craft-based, which are detailed in Chapter 9. The well assemblage provides a significant addition to the corpus of evidence for many aspects of mid/late 15th- to early 16th-century Norwich. The late medieval and post-medieval assemblages from Castle Mall, as at many Norwich sites, are particularly well-paralleled in the published Low Countries assemblages (*e.g.* Baart *et al* 1977), reflecting both close trading contacts and the movement of peoples.

V. CONCLUSIONS

The Castle Mall assemblage — in terms of faunal remains, raw materials and artefacts — demonstrates the distribution of wealth within towns and indicates the presence of a wide social range at all periods. Of particular significance is the new evidence for a pottery production centre beneath the later castle. All categories combine to indicate a typical urban — rather than castle — assemblage, although there are indications of Norwich's standing in the English hierarchy with continental innovation and trade attesting to the wide contacts of the city. In particular, Norwich's relationship with Low Countries — and the innovations and trends this engendered — is highlighted, with changes evidently likely earlier here than in other parts of country.

Some comments on regional variations in animal type have been possible, alongside assessments of methodologies for data collection and analysis. Some new lines of enquiry are also clear. Original contributions of the Castle Mall faunal remains include early evidence for the increased size of domestic fowl. In addition, the information about late medieval craft (summarised above and fully detailed in Chapters 8 and 9) provides important new evidence for life in Norwich during the 15th and early 16th centuries. The integrated study of local documentary and historical evidence, specifically the owners and occupants of Castle Fee properties, has provided a particularly rich framework for the archaeological discoveries.

Many country-wide trends are reflected here, including changes in animal consumption, kill-off patterns and the representation of species at various periods. A range of depositional processes is evident, including some instances of primary deposition. The fills of both the barbican and south bailey ditch had apparently been reworked during clearance processes and animal scavenging. Contrasts in disposal patterns are immediately evident between pits used for domestic/specialised waste and large-scale deposition into the castle well and ditches. The specialist utilisation of the barbican well by the city's butchers and other artisans is particularly striking.

To conclude, perhaps more than any other section of this report, this chapter has demonstrated that this publication concerns far more than just a 'castle site': the castle, in terms of its impact on earlier settlement and its gradual development and decline, is itself a route into a wide array of social and economic issues.

Endnotes

1. The local kilns and related evidence from previous sites is summarised in Chapter 2, 'Pottery Manufacture and Sites to the North-West'.

14. General Discussion and Conclusions

> 'The excavation of the sites of urban castles … with adequate funding and with the aid of a properly constituted research design, is a heavy and unrepeatable responsibility.'
>
> C. Drage, *Urban Castles*, 1987, 132

I. INTRODUCTION

Many of the themes in this final chapter are taken from the research framework recently established for East Anglian urban centres (Glazebrook ed. 1997; Brown and Glazebrook eds 2000), linking also to the project-specific research objectives outlined in Chapter 1. Some of the latter were ultimately drawn from the research aims established by the Norwich Survey which, during the 1970s, sought to address the complex processes of urban origins and development (Carter 1978 a and b).

Each of the preceding chapters has attempted to demonstrate the understanding of a range of aspects of the development of the site prior to the excavations at Castle Mall and Golden Ball Street, as well as to indicate how the results of the analyses contained in this report support, alter or enhance earlier hypotheses. For the first time it has been possible to investigate a large part of the landscape which had effectively been fossilised by the imposition of Norwich Castle's extensive precinct: the Castle Fee. Prior to this project, investigation of the Fee itself (consisting in the medieval period of seventy-one identifiable properties) was effectively limited to documentary research: it has now been possible to link topographical, archaeological, documentary and historical evidence to specific Castle Fee tenements, in particular the fourteen Castle Fee and eight city properties encompassed by the excavations. In the case of the 15th to early 16th centuries the stunning discoveries of the assemblage within the barbican well, which link directly to documented owners of Castle Fee properties, speak volumes about the character of the area. Land use at Castle Mall was ultimately dictated by the continuing open character of much of the site and many aspects of its usage are repeated in different centuries.

A key area highlighted for regional investigation is the development of urban ecclesiastical, administrative and political institutions and, ultimately, this entire project has focused on the examination of the great urban institution of Norwich Castle. This report presents the combined archaeological, historical and documentary evidence for the administrative and political centre of Norwich Castle and its Fee, as well as, to a far lesser extent, the adjacent French Borough and Jewry. In addition, the development of the local ecclesiastical landscape from the Late Saxon to modern periods, including the possible constructional pairing of the castle and cathedral church, has been considered. Connections of Norwich Castle with the penal system and local government have been elucidated and are replicated at many urban castles such as Oxford and Cambridge: like Norwich, both of these sites served as prisons into the modern period and both still house local council offices. This report traces the evidence for Norwich prison from its origins in the Norman Castle to its final removal from the site in the late 19th century.

The following text is cross-referenced to some of the key illustrations in preceding chapters.

II. PROCESSES OF URBAN DEVELOPMENT

Influence of Natural Topography

(Maps: Figs 3.1, 3.5 and 3.6)
(Schematic cross-sections: Figs 5.58, 6.2, 6.49, 7.38 and 10.78)

The relationship of the pre-Conquest settlement at the Castle Mall site to the local natural topography and locally available natural resources has been detailed in Chapter 3, with the resultant built topography of the Late Saxon period explored in Chapter 4. Investigations at the site have clarified the terrain of the end of the Ber Street ridge on which the site lies, with concomitant evidence for utilisation of the contours by the Normans in the placement of the castle motte and baileys (Chapters 5–6). Attempts to change the local contours occurred over the centuries, beginning with the Norman scarping of slopes noted in the north-east bailey. Centuries later, this was followed by the determined infilling of parts of the barbican ditch prior to the construction of the unified Cattle Market in 1738 (Chapter 10) and finally the extensive ground reduction scheme and demolition of buildings in 1862 to consolidate the ground above the barbican ditch and enlarge the commercial space by altering the local groundslopes (Chapter 11).

Analysis of the relationship of activities at the Castle Mall site to the Great Cockey stream and, in wider terms, the influence of the watercourse on urban development has sought to enhance previous understanding with new data. Revised theories about the date of the diversion of the watercourse and its relationship to the castle precinct have been put forward. The stream valley, of which observations and the local context are detailed in Chapter 3, formed a natural boundary from the Late Saxon period, separating the settled area to the east from fields and farms to the west in what was to become the parish of St Peter Mancroft (Chapters 4 and Chapter 12). While the position of the stream clearly influenced the position of the military and administrative boundary between the Castle Fee on its eastern bank and the French Borough and Jewry to the west, it is now clear on the basis of both archaeological and documentary evidence that the

Cockey stream did not in itself form the actual boundary of the Castle Fee.

The influence of the stream on the development of the street pattern in this area of the city, notably its constraining effect in the surviving course of Back of the Inns, has been set within the wider context of the similar effects noted in relation to other Norwich streams in preceding chapters. A notable parallel further afield comes from the Late Saxon burh at Winchester where 'a complex series of water-courses, closely related to the new layout of the streets, and designed to provide both a supply of water and motive power for the city's several mills … was certainly in existence by the late ninth century' (Biddle 1976b, 450 and fig.25). In Anglo-Saxon Oxford, a timber lined 'kennel' or open drain ran along the centre of the High Street (Blair 1994, fig.95). At Norwich, the Great Cockey clearly provided an important urban industrial and domestic water supply from an early stage, later being used as a sewer and ultimately becoming completely culverted. While there is little in the cartographic evidence to indicate its presence across the block between White Lion Lane and the stretch of former Cockey Lane which is now part of London Street, it is evident that in at least some places tenements were extending actually across the original line of the stream by the late 13th century, implying that parts of it were culverted by this date (see Chapter 7.I). The date at which an element of it was diverted eastwards remains equivocal (Chapter 7.V), although it may have occurred as late as the 15th century when the cockey was 'made anew', perhaps to serve as a roadside water source or drain (see Chapter 8). In modern Cambridge, water is diverted to this day to cleanse roadside gutters and a comparable usage can be envisaged in medieval Norwich.

Settlement Origins and Early History

(Figs 4.1–4.3 and 4.10)

Suggestions of an Iron Age predecessor for Norwich Castle's defences can now be firmly refuted, prehistoric 'activity' at the site being restricted to a few finds of Neolithic and Bronze Age date (Chapter 3.III). Similarly, Roman activity was limited to the redeposition or re-use of material. There is, however, growing evidence to indicate Roman activity elsewhere in Norwich, particularly at the Chapelfield site (Whitmore, ongoing excavations 2003). As outlined in Chapter 3, two possible Roman routes leading broadly north-west to south-east have been postulated (now Ber Street and King Street; Fig.4.1), the course of the former perhaps disrupted by the construction of the castle. At time of writing, more Roman finds have been recovered from sites along King Street than along Ber Street, although this is unsurprising as little archaeological investigation has yet taken place along the latter route (Chapter 3.III). Given the suggestion of a possible Roman farm to the west, beneath the later French Borough (recently recorded at the Chapelfield site), the case for an early road along Ber Street is strengthened. This might confirm earlier suggestions that the route originally continued north-westwards, ultimately towards Oak Street on the north bank of the river, although the presence of the early cemeteries at Castle Mall may provide support for the postulated more easterly route leading beneath the mound (both routes are shown in Fig.4.1). Only further excavation will tell. Certainly, prior to the Conquest, evidence from the position of ditchwork indicates that Ber Street bifurcated at a point just to the south of the later castle earthworks. This confirms that the route now known as Golden Ball Street originated prior to the Conquest, rather than as the southern approach to the castle.

The argument about the date at which settlement overlain by the defences of Norwich Castle was established has effectively come full circle. The existence of the Middle Saxon hamlet of *Needham* beneath the castle as envisaged in the 1970s and 1980s was later dismissed during excavation on the basis of the lack of finds and *in situ* features of the period (Chapter 4.I). This view was revised during post-excavation analysis in the late 1990s, with radiocarbon dates indicating the presence of a grave of possible 7th-century date and an 8th- to 9th-century cemetery, one inhabitant of which proved to be of 'Viking' extraction during DNA analysis in 2003 (Töpf, Chapter 4.V and see below). Allied to this is the recovery of a growing corpus of Middle Saxon metalwork from the castle site and its environs, although little pottery of the period has yet been found (see Chapter 4.VI). The question remains as to whether the evidence is strong enough to suggest that Middle Saxon *Needham* — or at least part of it — existed here. As has been noted, the place-name implies a needy or poor homestead or meadow, with an associated marshy area at *Needham Slough* (Chapter 4.I). Did *Needham* lie to the east of the Great Cockey stream on the Ber Street ridge between the two roads (*cf.* Carter 1978a, fig.8A) and, if so, was settlement of the period restricted to road margins or more extensive? Alternatively, did *Needham* lie to the west of the stream, with the cemeteries recorded at Castle Mall relating to scattered farmsteads between it and *Conesford* to the east of King Street? As yet, there can be no definitive answer to these questions.

Later truncation at the castle site may have removed all trace of settlement associated with the excavated cemeteries, although the fact that no pits of the period were found may suggest that specifically domestic settlement did not occur here. It does appear, however, that one or more farmsteads in the vicinity of the site may have been using a burial ground(s) here during the 8th to 9th centuries, the population evidently including a Scandianavian element, with settlement becoming firmly established during the 10th century. The hiatus in activity at the site during the 9th century may, however, be more apparent than real, given the current questions over ceramic chronology for the period *c*.850–900, which saw the end of the production of Ipswich-type ware and the introduction of Thetford-type ware (see Chapter 13.III 'Pottery Manufacture and Associated Waste'). If *Needham* did exist here, it remains uncertain whether occupation continued unabated until the Late Saxon period, when it coalesced with the other Middle Saxon settlements to form the Late Saxon town, or whether the eventual dominance of *Northwic* on the north bank in the 10th century led to the decline of the other early 'villages' and thereby an hiatus in activity at the Castle Mall site. At the cemetery of St John's, Bayliss argues against the continued use of this particular cemetery over the 8th to 9th centuries on the basis of the absence of burials of this date amongst the large dated sample (Chapter 4.V). Conversely, Anderson suggests that continued use is

sustainable on the basis of non-metric traits and congenital anomalies which indicate a possible family association between the ?7th-century burial and overlying graves of Late Saxon date. Given these conflicting arguments, the situation remains uncertain.

As was noted in Chapter 4.VI, the widespread dispersal of human remains across the later castle site, taken alongside the evidence for *in situ* burial, could indicate that much of the area of this ridge of high ground was utilised for burial grounds during the Middle Saxon period. A comparable situation is evident at Dover castle, where an early inhumation cemetery on a hilltop was superseded by the Late Saxon church of St Mary in Castro which remained in use within the confines of the later castle (Biddle 1970, 264–5). At Newcastle-upon-Tyne, a cemetery founded around the beginning of the 8th century remained in use until, and to a limited extent after, the construction of the Norman castle (Barbara Harbottle, pers. comm.).

At Norwich, the Middle Saxon group beneath the castle barbican (Fig.4.10) provides an unusual case of possible corpse movement and reburial, the possible reasons for which are discussed in Chapter 4. Amongst this displaced group of over forty individuals, half were children or sub-adults. Recorded pathologies provide new evidence for the health of '*Needham's'* Middle Saxon population, including a case of Paget's disease. While the original extent of this burial ground will never be known, an indication is given by the displacement of human remains recorded both at Castle Mall and disturbed by groundworks during the 18th to 20th centuries (see Chapter 2 and 4.VI).

In conclusion, while definition of the status of the Middle Saxon 'settlement' at Castle Mall as proto-urban remains equivocal, the discovery of the early burials here is of great significance to the study of the city's origins: the presence of the stream and its subsidiary may have been a factor in drawing settlement to the area.

Urbanisation

(City maps: Figs 4.1, 4.2, 5.1, 6.1, 7.1, 8.1, 11.1 and 12.2; Plate 10.3.B)
(Phase plans: Figs 4.3, 4.11, 4.31, 4.49, 4.139, 5.2, 5.18, 6.4, 6.30, 7.4, 7.10, 8.3, 8.25, 10.1, 10.11, 10.19, 11.8)
(Period reconstructions: Figs 4.138, 5.55, 6.47, 7.36, 8.61, 10.76, 10.77 and 11.12)
(Street pattern: Figs 4.139, 5.56, 6.48, 7.37 and 8.62; Plates 10.1, 10.3 and 11.6)
(Tenement development: Figs 7.2=8.2, 7.3 and 9.1)

Urban Development

The complex process of urbanisation has effectively been demonstrated in microcosm by the evidence presented in this report. Although specifically relating to Norwich, many of the themes evident here are replicated at urban centres across the country. In essence, the city effectively has a composite plan (Fig.12.2). While any inherited topography from the putative Middle Saxon settlements (Fig.4.1) remains a matter for debate, elements of the modern street plan to the north of the river derive from the possible period of Danish occupation in the late 9th to early 10th century or its aftermath in the early 10th century (Fig.4.2). Those to the south of the river, along with the market at Tombland, derive from the Late Saxon town, while still more originated with the imposition of the Norman castle, French Borough, new market and cathedral (Figs.5.1 and 6.1). Additional elements result from the construction of the city defences and other developments of the later medieval and post-medieval periods (Figs.6.1, 7.1, 8.1; Plate 10.3.B).

Danish interest in Norwich appears to have been triggered by the growth of its port. Scandinavian influences on the Anglo-Saxon town have been considered in earlier chapters and the results from the Castle Mall excavation make an important contribution towards understanding of the Anglo-Scandinavian town, in particular the influx of 'Viking' peoples into the region from the late 9th century (Chapter 4.VI, 'Anglo-Scandinavian Norwich and Viking Influence' and 'Population Movement and Immigration' below). Whether, when combined with the important new results from Greyfriars just to the east of the castle, the results are enough to substantiate the suggested Danish impetus towards urbanisation at Norwich first postulated in the 1970s (Campbell 1975, 5; Carter 1978b, 195–201) remains open to question. It may be that an 'incipient urban network' such as that suggested for Northampton during the last quarter of the 9th century (J.H. Williams 1984, 32) can be proposed.

Chapter 4 has highlighted the relationship between the burh on the north bank of the river and the settlement to the south. A specific issue is whether or not the southern settlement was in any way planned, either in the early 10th century as a result of the Edwardian re-conquest or later in the 10th century. Pre-excavation theories included the hypothesis that 'most of the Norwich churches were probably founded as private chapels … the dense scatter along street frontages suggests land apportionment' associated with the presence of long, narrow tenements. This led to the suggestion that 'the plan was implemented in the tenth century, probably as a deliberate act following the Edwardian reconquest in 917 … The suggested grid plan then provides a context for the Norman replanning with … the castle imposed over the south-west insulae' (Atkin 1985b, 34–35). This suggestion was later revised to suggest that the southern area saw the development of a very Late Saxon undefended but planned 'new' town in the former *Needham* area, with later development along approach roads (Atkin 1993, 132; see Chapter 4.I).

New evidence from recent excavations permits a revision of the previous plan of Late Saxon Norwich (Figs 4.2 and 4.139), with evident regularity on the lower ground to the east of King Street, probably the result of the combined effects of local topography and proximity to the economic centre of the town. This flatter ground was noted by Carter as the 'optimum site for a trading settlement' (Chapter 4.I). Interpretations of the early street pattern to the east of King Street have now been revised in the light of recent excavations and allied analysis of topographical details and medieval land holdings (Emery 2007). Whether this more regular settlement was established during the Late Saxon period, with side-streets set either at right angles to a main street or aligned with topographic features, or whether this regularity was a post-Conquest development remains open to debate due to a lack of secure dating. Of course, such regularity does not necessarily imply planning since unplanned settlements (*i.e.* those not deliberately laid out as an entity) 'could also appear regular owing to the constraints imposed by natural or relict features acting as morpho-

logical frames' (Biddle 1975b, 31). At Northampton, it has been suggested that the approximately rectilinear street pattern 'was probably imposed by the axial streets and the line of the defences rather than being a deliberately planned layout' (J.H. Williams 1984, 31): this may also be the case at Norwich.

The concept of Late Saxon town planning at the Castle Mall site appears to be discounted, with growth being a much more organic process rooted in the Middle Saxon period: this outlying part of the town does not appear to have conformed to a plan, lying between the more regular area to the north-east and a possible 'inter-mural' road (Fig.4.2). This part of the Late Saxon settlement seems to have been similar in overall character to Northampton and Thetford, which both display a 'loose' settlement arrangement (J.H. Williams 1984, 31). At these two sites, it has been suggested that the excavated areas lay away from the commercial centres and such was evidently the case at Castle Mall. Each of these settlements contrasts with the more regular layouts of planned towns such as Winchester and Wareham (Aston and Bond 1976, figs 10 and 11), effectively emphasising the Danelaw/Wessex contrast.

Despite the lack of road surfaces or roadside ditches at Castle Mall, the position of buildings and churches has allowed a tentative revision of the street plan in this area (Fig.4.139). The irregularity of much of the new plan reflects natural features of the local topography such as streams (see Chapters 3 and 4). Had a forerunner of Ber Street continued northwards beneath the later castle motte (as suggested by antiquarians; see above and Fig.3.6), broad similarities with the layout of Lydford might be suggested: here the arterial route follows the spine of a ridge of high ground with minor routes set at right-angles to it and an intra-mural road within a defensive rampart cutting off the end of the promontory (Ralegh Radford 1970, 94 and fig.95). At Northampton, archaeological evidence suggests that buildings were randomly arranged, perhaps in small social and economic groups (J.H. Williams 1984, 31) and a similar situation is demonstrated at Castle Mall, where the placement of buildings allied with the distribution of craft waste (*e.g.* antler-, horn- and metalworking), environmental remains (grain storage and processing) and the evidence from the cemeteries indicates a similar phenomenon. The question of whether the 'leper cemetery' at St John's indicates an entry point to the Late Saxon town, effectively mirrored in the position of the castle's south gate, has been considered in Chapter 4.VI 'Leper Burials'.

The issue of at what point during the 10th century the settlement at Castle Mall can be described as urban or suburban must be addressed. The discovery of silver refining and other evidence associated with minting at Greyfriars just to the east of Castle Mall (Emery 2007) may argue for the beginnings of truly urban activity during the 10th to 11th century, with its origins in the late 9th century. Attribution of the earliest phase of activity at Site 416N to the late 10th century was simply a reluctance at the time to push the date further back into the 10th century (Brian Ayers pers. comm. 2002), the final phase of timber church here being considered of 11th-century urban form. Corroborating evidence for a necessary revision to the chronology is perhaps provided by radiocarbon results (now recalibrated broadly to the Middle to Late Saxon period; see Chapter 4.V and Table 4.62) which 'pre-date' received artefact 'dates', specifically Thetford-type ware pottery: this may either indicate the use of old timber in the excavated church or may imply an earlier chronology than was previously suggested, although note should be taken of the caveats attached to the dates by Bayliss (Chapter 4.V).

Finds clearly attributable to the 10th century from Castle Mall include three coins, one each of Aethelstan (minted in Norwich 924–939), Eadred (946–955; mint unknown) and Aethelred II (997–1003; mint unknown) (Davies, Chapter 4.III). Only one of these — the Eadred coin — was found in a Late Saxon context: a pit with an 11th-century ceramic date. An important disk brooch with psuedo-coin motif, possibly manufactured locally during the 10th century, was found residually within a Norman castle ditch fill (Blackburn, Chapter 4.III). Additionally, an unstratified Borre style brooch is of 10th-century attribution, with two further examples and a hooked tag of the same date having come from Site 416N in the north-east bailey (see Goodall, Chapter 4.III). A group of eight hooked tags of Middle to Late Saxon date came from Castle Mall and were probably also manufactured locally (Goodall, Chapter 4.III). Of particular note amongst the metalwork from Castle Mall is an ansate brooch of 8th- to 9th-century type found on a skeleton in the cemetery beneath the south bailey rampart (Cemetery 3): its presence has engendered discussion about the age of the object when buried, the date of the pottery associated with the cemetery and the radiocarbon range for burials of late 9th- to early 11th-century (see Chapter 4, *passim*). A second brooch of this type has recently been found during excavations at the Castle Mound (Wallis in prep.).

Ceramic analysis at Castle Mall indicates that the relative proportions of Thetford-type ware rim types from Period 1 contexts are 16% for 10th-century forms and 34% for 11th-century forms, with the remaining 50% being long-lived forms spanning the whole period (Lentowicz, Chapter 4.III). A similar pattern was noted at Greyfriars, where a sample of rim types indicated proportions of 18% for 10th-century forms, 27% for 11th-century forms and 54% for long-lived types (Site 845N; Lentowicz in Emery 2007). More recent work at both Castle Mall (Goffin, Chapter 4.III) and Thetford (Anderson 2004) has, however, suggested refinements to the current form series, which remains relative rather than absolute: a 10th-century origin can now be suggested for some forms previously attributed a broad 10th- to 11th-century date. At Castle Mall, comparison of dating has been possible between pottery fabrics and forms and scientific dates derived from human bone from the Late Saxon cemeteries (Chapter 4.II and 4.VI). A limited number of ceramic groups from the site indicate specifically 10th-century assemblages and this pottery was notably concentrated in the vicinity of Hollow 1 to the west of the excavated area and in a few scattered pits: in contrast most of the few sherds of Middle Saxon pottery were found further to the east, closer to the displaced 8th- to 9th-century cemetery. Few features were assigned a specifically late 10th- to 11th-century ceramic date, although these notably included the large group associated with a failed kiln or drying oven (Chapter 4.II, Period 1.2). Although present in small quantities in many contexts, implying an early 11th-century date, early medieval wares accounted for only 5% overall of the total period assemblage. Taken as

Town/City (County)	*Excavated evidence for Late Saxon domestic occupation beneath castle*	*Domesday reference to destruction*
Cambridge + (Cambridgeshire)	Castle built above part of Late Saxon town (Palmer 1925, 69), within Roman enclosure (Renn 1968, 128). Graveslabs of late 10th or early 11th century date recovered (RCHME 1988, Part II, 306), suggesting distruption of a cemetery.	27 houses (*domus*) (Rumble 1982, 189a)
Canterbury + (Kent)	Late Saxon pits and two wicker-lined wells recorded (Tatton Brown 1976, 240; Bennett *et al* 1982, 23, 48–50).	14 properties in exchange for the castle and 11 more for the castle ditch (Morgan 1983, 2a)
Gloucester + (Gloucestershire)	Castle disrupted earlier (Roman) defences (Barley 1976, 57 and fig.32). Late Roman building reused intermittently from 5th to 11th century (Darvill 1988)	16 houses (*domus*) (Moore, 1982, 162a)
Huntingdon + (Cambridgeshire)	Possible road and early defences beneath castle area, although no pre-Conquest remains were found in 1980s excavations (Paul Spoerry pers. comm. 2004); DOE excavations to the north of the castle found Late Saxon pits and a possible Anglo-Saxon church (Spoerry 2000, 43).	20 residences (*mansiones*) (Rumble 1982, 203a)
Leicester (Leicestershire)	Castle situated in south-western corner of Roman defences, disruputing pre-existing defences (Creighton 2002, 143). No archaeological evidence for Late Saxon occupation beneath castle (Richard Buckley pers. comm. 2004), although castle may have displaced the church of St Mary in Castro (Ralegh Radford 1955, 156).	Derelict houses (Morgan 1979, C.12)
Lincoln + (Lincolnshire)	Castle placed in south-west quarter of the Roman upper city (Barley 1976, fig.33). Limited archaeological evidence for Late Saxon occupation (Stocker and Vince 1997, 223)	166 residences (*mansiones*) (Morgan and Thorn 1986, 336c)
Lydford (Devon)	Castle placed within Late Saxon burh (Ralegh Radford 1970, fig.35). Remains of pre-Conquest features, including town defences, excavated (Saunders 1980)	unspecified destruction of houses (Thorn and Thorn 1985, 100b)
Northampton (Northamptonshire)	Castle located within confines of earlier settlement (Barley 1976, fig.33). Late Saxon settlement remains located, including buildings (Wilson and Hurst 1962–3, 322, Renn 1968, 258).	unspecified destruction of 14 derelict residences (Thorn and Thorn 1979, 219a, B1)
Norwich + (Norfolk)	Castle overlay south-western quadrant of the Anglo-Saxon town (Fig.12.2). Excavated evidence includes 27 buildings and up to 6 cemeteries (2 Middle Saxon, 4 Late Saxon) (see Chapters 4, 5 and 12, this volume and Ayers 1985)	98 dwellings (*mansurae*) (Brown 1984, 116b (1.61))
Oxford (Oxfordshire)	Castle constructed above Late Saxon suburb (Blair 1994, fig.92). Motte constructed above Late Saxon pits, building debris (Jope 1952, 81) and a building: the site was levelled with a foot of gravel prior to castle construction (Hassall 1976).	unspecified destruction of houses (Morris 1978, B.4)
Shrewsbury + (Shropshire)	Castle place at neck of loop in River Severn (Renn, 1968, 311).	51 dwellings (*mansurae*) (Thorn and Thorn 1986, 252a)
Stamford + (Lincolnshire)	Castle placed adjacent to Late Saxon burh (Mahany 1977, 223 and figs 4–5). Archaeological evidence indicates a pre-castle pottery kiln, dated *c.*900–1000 AD overlying a ditched and palisaded enclosure (Mahany 1977, 232–33), possibly indicating a high status defended residence (Creighton 2002, 150).	5 residences (*mansiones*) (Morgan and Thorn 1986, 336d)
Wallingford + (Oxfordshire)	Castle obliterated the north-east sector of the rectangular burh, obliterating settlement and street pattern (Astill 1984, 73–76; Barley 1976, fig.36). Late Saxon postholes, foundations and other features were recorded beneath the outer castle bank, as well as buildings of 11th to 12th century date, some cut by castle ditches (Wilson and Hurst 1967, 284; 1969, 255; Webster and Cherry 1973, 161). A cob house may be later as it was backfilled *c.*1250 (Mellor 1994, 63).	8 sites (*hagai*) (Morris 1978, 56b)
Wareham (Dorset)	Castle placed above south-west quadrant of the Late Saxon town (Ralegh Radford 1970, 86). Excavated evidence for pre-Conquest defences (Renn 1968, 338).	unspecified destruction and derelict houses (Thorn and Thorn 1983, B.3)
Warwick + (Warwickshire)	Castle placed within the corner of earlier defences (English 1995, 53). No extensive excavation has taken place (*op.cit.,* 60, note 45).	4 dwellings (*mansurae*) (Morris 1976, 238a)
Worcester (Worcestershire)	Castle positioned in part of the monastic precinct and cemetery, to the south of Worcester Cathedral (Barley 1976, fig.36). Bailey ditch cut off part of cathedral cemetery (Renn 1968, 350). No modern excavation has taken place (Hal Dalwood pers. comm. 2004).	unoccupied houses (Thorn and Thorn 1982, 175d), but no firm evidence for the destruction of tenements (Beardmore 1980, 54).
York + (Yorkshire)	Two castles in relatively underdeveloped areas (Creighton 2002, 145 and fig.7.5; Barley 1976, fig.36). Indeterminate occupation pre-dated the mound at Baile Hill (Addyman and Priestley 1977, 122–124)	1 shire (Faull and Stinson 1986, 298a)

+ denotes destruction which DB specifies was castle-related

Table 14.1 Destruction of property in relation to the imposition of castles, including those recorded in the Domesday Book

a whole, the Late Saxon ceramics do not discount activity at the site during much of the 10th century and the settlement may have been well-established by *c*.980, when the now dominant settlement of *Norwic* was documented in the *Liber Eliensis* (Book of Ely; see Chapter 4.I).

The impact of the construction of the castle on the development of Norwich has been detailed in Chapters 4, 5, 12 and 13, in both physical and economic terms. Disruption to the Norwich street pattern caused by the castle, cathedral and other monastic institutions has been traced in preceding chapters. 'Imposition of an urban

castle could clearly transform a Saxon townscape radically. In the short-term, settlement could be flattened, communications networks disrupted and water courses diverted in order to level and defend a site, while, in the longer-term, properties and streets could be re-planned as the townscape adjusted to the castle's presence' (Creighton 2002, 141). The placement of castles within a defined block of a pre-existing Late Saxon town, as was the case at Norwich, is replicated at Wallingford, Oxfordshire (Astill 1984, 73–6 and fig.29) and Wareham (Keen 1984, fig.78). In both these cases, a previously rectilinear street pattern was obliterated, to be replaced at Wareham by curving new roads respecting the castle bailey. The very similar effect at Norwich is detailed in Chapter 5.V, 'Alterations to Street Pattern' (Fig.5.56).

Eleven towns were recorded by Domesday as having damage, destruction or abandonment of buildings specifically due to the construction of a castle, while six more castle towns had recorded destruction, the cause of which was unspecified (Table 14.1). At several other urban centres destruction of roads, properties, churches and cemeteries has been recorded archaeologically, without any reference to such damage in Domesday Book: examples include Newark (Marshall and Samuels 1994), Newcastle (Harbottle, forthcoming), Thetford (Knocker 1967; Rogerson and Dallas 1984), Winchester (Biddle 1976b) and Pontefract (I. Roberts 2002).

Undoubtedly the Late Saxon and/or Saxo-Norman buildings recorded at Castle Mall (see Chapter 4.VI, 'Buildings' and summary comments below) correlate with some of the 98 'dwellings' lost to construction of the castle and when combined with the evidence for churches and cemeteries allow new assessments of settlement density (see Chapters 4.VI, 'The Late Saxon Town' and Chapter 12, 'Church and Ecclesiastical Landscape'). As has been noted, a reconstruction based on both the Domesday and archaeological evidence indicates a much less dense settlement than the number or properties alone suggests, directly relating to the extensive acreage encompassed by the Castle Fee (Fig.4.138 and 5.55). The new figures for settlement density calculated in Chapter 4.VI indicate a relatively low density of occupation in the Castle Mall area, contrasting with the more regular settlement and street pattern of the Saxo-Norman period now evident to the east of King Street. It has been suggested that 'if houses were removed to make way for a castle, the adjacent streets must also have been destroyed, since by this date houses were normally built on or close to the street frontage, rather than well back on the plot' (Biddle and Hill 1971, 82).

There is increasing evidence for settlement of the late 10th and 11th centuries along the arterial roads of Ber and King Street, with fields and possibly scattered farmsteads lying to the west of cockey stream within the demesne of Earl Ralph. The possible function of Ber Street as a Norman market, effectively at the castle gate, was noted in Chapter 4.VI: 'castle-towns were added to Anglo-Saxon nuclei at Nottingham and Norwich, and in each case a new castle accompanied a broad street space for market activity' (Lilley 1997, 18). This possibility requires further investigation at Norwich.

Throughout the medieval period and beyond, the gradual demise of the outer earthworks affected the local street pattern. In the 13th century a minor route, which appears to have run along the outside of the southernmost castle ditch (Fig.7.37), was lost in a process probably connected with the infilling of the relevant ditch and possibly the concomitant northwards migration of the route to the north of the church of St Martin-in-Balliva (Chapter 7). Although the basic footprint of routes surrounding the castle appears to have remained relatively static between the 12th century and the post-medieval period, minor routes leading into the baileys developed (Chapters 5–10). It was only in the late 18th century and beyond that the routes saw substantial changes, many of which were attempts to improve access into and across the Cattle Market which now occupied the castle baileys (see Chapters 10 and 11).

There was little direct evidence at Castle Mall either for known or hypothesised routes of the medieval and later periods, including the castle approach and later routes such as the medieval Shirehouse Gap (later Pig Lane; Fig.8.2; Plate 11.5), although the position of a number of archaeological features indicates their location. Minor routes leading into the baileys increased in the period after 1345 (Chapter 8), providing access for robbing, refuse dumping and general access across the site. Pathways between city properties developed, as was the case in tenements recorded in the southern part of the Castle Mall site. Many of these were later converted into cartways or roads, forming the basis of the modern street plan. New evidence for the origins of the modern topography in the castle area includes the history of Grout's Thoroughfare, which began as a Late Saxon cemetery boundary, had become a path by the early 15th century, and was to be respected by the position of boundary walls in the 16th century, when it was retained as path. Its migrated name survives as a modern alley some distance to the south of its original position, the original alley having been lost during slum clearance.

The differing fates of Norwich Castle's ditchwork have now been clarified: whereas prior to the excavations, only the motte and barbican ditches were known to some degree due to their late survival in the urban setting, both postulated and previously unknown ditches have now been recorded. The larger ditches remained open for centuries, while some of the smaller examples may only have survived for years or decades (see Chapter 12, Table 12.5). At Coventry, where it appears that the Norman Castle site had been completely lost by *c.*1200, some ditches up to 8m deep were infilled towards the end of the 12th century while another was recut for a different function in the same position during the 13th century (Lilley 1997, 15). One ditch survived in the later road pattern, with another being completely lost. Such was the case at Norwich, where some ditches were entirely lost either beneath medieval tenements or the later Cattle Market and others survived to influence the pattern of both street and tenement development.

Physical evidence has been traced for the documented processes of encroachment into both the castle baileys (a process which began before 1221; see Chapter 7.I) and the cemetery of St John (encroachment here being first documented in 1297 and archaeologically attested by pit groups of the same date; Chapters 7.I and 7.II). The impact of the transfer of the south bailey to the city after 1345 is particularly striking, with the dramatic increase in quarrying. The physical constraint of the area to the north of the church of St John led to the distinctive development of this block (Figs 7.2 and 7.3). During the medieval

period, the commercial development of properties closest to the roads is evident and artisan groupings within the Castle Fee and the wider area are apparent (*e.g.* Fig.9.1). The catchment range of these artisans has been detailed in Chapters 7–11, spanning the whole social scale.

Previous chapters have traced the urban responses to conflict in its changing forms from the Norman period to the mid 20th century. The castle's role as a political and military focus was to continue from the 'Norman' rebellions against the crown and later threatened invasions from France (Chapters 5–7): in archaeological terms, these military threats are demonstrated by recorded alterations to the castle's ditchwork and other defences between the late 11th and mid 13th centuries. Some later periods of unrest, such as the Peasant's Revolt of 1381 and Kett's Rebellion of 1549 (Chapter 8.I), left no archaeological trace. The south bailey ultimately provided open space for the construction of air raid shelters in 1939, although fortuitously plans to tunnel beneath the motte were abandoned (Chapter 11).

Urban Boundaries

Definition of boundaries has been an important element of the analysis contained in this report. Ultimately, both the Late Saxon settlement boundary — whether defensive or not — and the displacement of the Castle Fee, relate back to the natural topography of this area of high ground and adjacent stream. The physical limits and possible delimitation of the southern part of the Late Saxon town have been dealt with in earlier text (Chapter 4.VI, 'Settlement Boundary'), with the implications for the placement of the castle considered subsequently (Chapter 5.V, 'Selection of the Castle Site and Inherited Topography' and Chapter 12, 'The Local Context'). Although no clear evidence for a pre-Conquest defensive bank and ditch was recorded at the Castle Mall site, there was evidence to indicate that the limit of 10th- to 11th-century settlement ran across the site, with the cemetery of St John at the Castle Gate (de Berstrete/Timberhill) lying outside it (see Chapter 4.VI, 'The Late Saxon Churches and Cemeteries'). Issues relating to the positioning of this 'leper' cemetery in relation to the developing urban topography are indicated in Chapter 4.VI ('Leper Burials'); its delimitation ultimately influenced the local tenement pattern into the modern period.

There was remarkably little evidence at the site during the Late Saxon period for minor land division, the remains consisting of a few minor gullies and possible fences or hedge lines. A possible field or property boundary was present in the southern part of the site (Ditch 1), although its dating and function remains equivocal (Chapter 4.II and 4.VI). The origins of a series of 'hollows' also remain obscure. Various interpretations have been offered for these three features, which may have been tracks or hollow ways, livestock routes or, in one case, a boundary marker. None of the interpretations offered is particularly convincing for the westernmost hollow (Hollow 1), which was a wide, shallow feature, the position of which was respected by adjacent buildings: whatever its origin, this feature had been extensively pitted during the 10th and 11th centuries and the area above it was ultimately levelled and sealed by the castle's south bailey rampart. A Middle Saxon origin would make the hollows contemporary with the two early cemeteries (Fig.4.3), although more dating evidence of the period might be anticipated. It is conceivable that Hollow 1 was a 10th-century or even earlier boundary, the morphology of which was later disguised by pit digging with a second hollow (which can tentatively be identified as a track) running across it. If the first hollow remained an active boundary during the 11th century, its inter-relationship with the separate boundary ditch around the cemetery of St John (Figs 4.139 and 4.140) is brought into question and may suggest that the feature had disappeared by this date, a suggestion perhaps supported by the proliferation of pitting within it.

The dominant boundary at the site from the Norman to early modern periods was the Castle Fee. Its changing physical character and position over the centuries and the influence its presence exerted over the development of Norwich has been summarised in Chapter 12 ('The Castle Fee') and fully detailed in earlier chapters. From a probable origin as ditchwork in the late 11th century, the boundary may have been demarcated by specifically-designed armorial markers in the 13th century and eventually by stone posts, which perhaps remained active markers throughout the period *c.*1345 to 1805. Although by the 13th century the position of the Great Cockey stream and the western limit of the original Castle Fee was broadly mirrored in the boundary between the contemporary Castle Fee Leet and the Leet of Mancroft (Hudson and Tingey 1906, maps I and II; Kelly *et al* 1983, figs 3 and 4), it did not dictate parish boundaries in the area which met in a curiously irregular arrangement at the castle (Fig.8.2). Both St John de Berstrete (formerly 'at the Castle Gate' and latterly Timberhill) and St Martin-in-Balliva (at Bale) formed part of the Leet of Conesford during the 13th and 14th centuries and, by the 15th century, the small ward of Berstrete which was one of the constituents of the great ward of Conesford. The definition of the 14th-century parish boundaries in the castle area reflects in two instances the presence of routes leading towards the Castle Mound and such may be the case for at least some of the others.

Late Medieval and Post-Medieval Urban Growth

The processes of late medieval and post-medieval growth have been examined in Chapters 8–10, including the decline of the castle defences, their quarrying, robbing and landscaping. The physical constraints of the presence of the Shirehouse and its yard within the western half of the south bailey were notable in the absence of features throughout the medieval and post-medieval periods (Chapters 8 and 10). In contrast, the impact of the release of the baileys to the city in 1345 on land to the east of the castle approach road was clearly demonstrated by the presence of massive quarries, possibly spanning the second half of the 14th century to the first quarter of the 15th century (Chapter 8.V, 'Quarrying and Robbing'). During the 17th century, excavation of a huge quarry led to the collapse of one of the castle gatehouses (Chapter 10.VI, 'The Decline of the Castle Defences').

Urban development of the 14th and 15th centuries can be considered in relation to civic planning of the period elsewhere: 'although the morphologies of Bristol and Norwich are 'irregular', in the sense that they are made up of different 'plan-units' (of different form), this does not mean that medieval Bristol and Norwich evolved 'naturally', spontaneously or without plan' (Lilley 1997, 23). At Castle Mall, specific archaeological

evidence for the period relates to the impact of the royal decision, engendered by the pleading of the civic authorities in 1345, to release the castle baileys to the city. This ultimately led to infilling of the barbican well during the 15th and early 16th centuries (Chapter 9), quarrying and robbing of the castle ramparts and gates and alterations to the local street pattern. The possible diversion or making anew of the Great Cockey stream noted above may relate to the burgeoning artisan groups in the vicinity. The mid to late 15th and early 16th centuries are particularly well represented in Norwich (*e.g.* at Castle Mall and the fire deposits of 1507 elsewhere; see Chapter 9).

Pressure for space within the city's great market eventually led to the decision to transfer the livestock market to the castle baileys in 1616, where it remained until the 1960s. That the baileys were already in use as grazing land during the medieval period is confirmed both by documentary evidence and indications of on-site breeding (Part III), while livestock grazing associated with the Norman castle is attested within the outermost ditch of the north-east bailey or Castle Meadow (Chapter 6). Alterations to the local landscape engendered by changes to the Cattle Market in the 17th to 19th centuries have now been confirmed archaeologically, most dramatically in the regularised infilling of parts of the barbican ditch and ultimately in the destruction of properties in the eastern part of the site in 1862 (Chapters 10 and 11). These actions are a direct result of the urban setting of the site and the continued success of Norwich as a retail centre. An increasing formalisation of both the Castle Mound and surrounding area is evident during improvement schemes which began in the 18th century and culminated with construction of the Castle Mall shopping centre.

Nomenclature

An aspect of the new research has entailed tracing the naming of places and things and the significance these names may imply. The significance of *Needham* has been noted above, while the castle itself may have been *Blanchefleur* to the Norman mind (see further comments in Chapters 6 and 12). Other than Norwich Castle itself, the Castle Fee was the longest-lived name, surviving in common parlance and administrative use from the 12th century until the early 19th. Use of the word 'bailey' or its Latinized forms appears to be restricted in the documentary record to references to the church of St Martin, the south bailey and ditchwork itself variously appearing as generic terms *Castellond* and the *Castle Dykes* (the latter name also used for the ditches of the barbican and motte). Part of the south bailey was later to become the *Shirehouseyard*. The name 'barbican' never seems to appear in the documentary record and survives today, somewhat ignominiously, as the name of the food hall in the modern shopping centre. The north-east bailey is invariably referred to in documents as the Castle Meadow. Roads, churches and public houses on and surrounding the site were continuously re-named, while road names occasionally migrated: contemporary names have been detailed chronologically in each of the period chapters.

Urban Living

The Urban Church

(Figs 4.2, 4.10, 4.37, 4.51 and 4.140)

One of the major academic contributions of the Castle Mall project is to cemetery studies, with concomitant evidence for the urban population and local street pattern. The proliferation of churches across Late Saxon and early Norman Norwich has been noted in earlier chapters, a fact witnessed by the archaeological findings. In Winchester, it was suggested that 'the foundation of these churches [*i.e.* those which were probably pre-Conquest] may have been undertaken for a variety of motives, but few can be proved. On the Winchester evidence we may suggest that the prevailing purpose was the fulfilment of a community need, whether that community was a family, a neighbourhood, or a guild association' (Biddle 1976b, 459). While the topographic impact of Norwich Castle on the development of local parishes from the Late Saxon to modern periods has been considered in earlier text (Chapters 4–11; Fig. 4.140) and in relation to the castle in Chapter 12, a few additional comments are warranted here in the broader context of early urban development. Wider considerations of culture and religion are given in Section V below.

It was noted in Chapter 4.VI that the Anglo-Saxon burial groups recorded at the Norwich Castle site (Figs 4.10, 4.37, 4.51, 4.140) represent a significant proportion of the total number of inhumations of the period from the region. The excavation of multiple cemeteries at Castle Mall, permitting comparisons between cemetery groups on a single site, is unparalleled in Norwich and appears to be unparalleled at any other urban castle site in England: while many other Norman castles displaced earlier cemeteries, the opportunity to examine such displacement on this scale appears thus far unique. The site has provided opportunities for the examination of Middle and Late Saxon (and possibly Norman) groups, providing a major contribution to cemetery studies both in the city and in East Anglia.

When combined, the evidence from Castle Mall, the north-east bailey (Ayers 1985) and St Martin-at-Palace Plain (Beazley 2001), provides a considerable corpus of evidence for the origins of the early church in Norwich, with allied evidence for the health, composition and character of the local population. A broad chronology for the churches and cemeteries beneath the castle has now been constructed. The documented histories of two churches in particular have been detailed in this report: the surviving church of St John at the Castle Gate (de Berstrete/Timberhill) and St Martin-in-Balliva (St Martin at Bale), lost in 1562. Both have been examined in relation to the development of the castle and its urban setting and both appear to have had links with the prison. Although no physical evidence for church buildings was definitively recorded at the Castle Mall site, the extant fabric of St John's demonstrates a Saxo-Norman origin. Notably, Norwegian parallels have been drawn for the timber church beneath the north-east bailey, which in its final form was interpreted as of 11th-century 'urban' type (Site 416N; see Chapter 4.VI). The following text seeks to expand on the arguments begun for this particular church (Ayers 1985, 63–65).

The development of the English parochial system has been defined as a four-fold process (Blair 1988,

1) consisting of: firstly, a system across Anglo-Saxon England of large parishes served by teams of priests operating from important central churches (the 'old minsters' or mother churches); secondly, the rapid proliferation between the 10th and 12th centuries of 'local' or 'private' churches (*Eigenkirchen*; see below) with resident priests; thirdly a major campaign of the 11th and 12th centuries of stone church building at a local level; and finally the eclipse of the minsters, division of their parishes between local churches and the crystallisation of the modern parochial system, a process underway during the 11th century and complete by the 13th.

It has been suggested that the plethora of local parish churches in Norfolk and Suffolk resulted from the Danish incursions of the 9th century which had virtually wiped out the previous ecclesiastical system, allowing new churches to develop outside the minster system from the 10th century (Godfrey 1969, 56). By the time of the Domesday survey many churches had originated by seigneurial foundation, devolution from minsters or by collective groups including freemen, the latter phenomenon being particularly common in East Anglia (Godfrey 1969, 57; Blair 1988, 7–8).

The status of the pre-castle churches at Norwich remains uncertain, although some at least may have been *Eigenkirchen* ('proprietary' or private churches, not necessarily independent from the mother church or a monastic institution but generally so in East Anglia until the Conquest). The importance of private churches linked to high status residences/manorial sites beneath rural castles has been identified, although the question in relation to urban castles remains equivocal (Creighton 2002, 117–118, 149–150). There is no specific indication of a demonstrably high status in that area of Norwich — possibly part of *Needham* and possibly part of the demesne of Earl Ralph — beneath the castle and indeed the place-name evidence, the general character of the settlement and the information gleaned from the human remains at the site all point to a lower position in the social scale. The discovery of certain objects does, however, seem to imply the presence of higher status individuals. Most notable is a rare and expensive stone coffin of probable pre-Conquest date that may have been associated with Castle Mall Cemetery 3 beneath modern Farmer's Avenue (Chapter 4.III and 4.VI). This part of the Late Saxon town certainly appears to have had a distinctive character, evinced by the presence of leper burials at St John at the Castle Gate (Cemetery 4). As in other periods of activity at the site, the complete social range — from the poor to the aristocratic — is evident in varying degrees and the skeletal evidence points to deprivation, disease and a tough working life for many of its inhabitants (Chapters 4.V and 13).

At Winchester, it was suggested that large blocks within the gridded street system of the Late Saxon burh perhaps initially housed a principal dwelling and a private church (Biddle 1976b, 454), the blocks later being sub-divided. The reconstruction of the Norwich Castle area prior to the construction of the earthworks (Fig.4.138) demonstrates that, even with the presence of the 98 'houses' mentioned in Domesday (Brown 1984, 1.61, 116b; see Chapter 4) and the known churches and their cemeteries, the character of the area remained essentially suburban, perhaps consisting as at Winchester of small landholdings and their 'proprietary' churches. Towards the middle of the 11th century, later than other counties, many of Norfolk's small timber churches were replaced in stone (Batcock 1988, 179), as occurred at St Martin-at-Palace (Beazley 2001, 56). This may have been the case with the churches of St John and St Martin-in-Balliva, both of which may have been built or rebuilt in stone either before or immediately after the Conquest: at St John's, a possible timber phase awaits excavation in the future, should the opportunity ever arise. The church beneath the north-east bailey was timber-built as was, probably, the postulated example beneath the later south bailey rampart (Farmer's Avenue, Cemetery 3): there was no evidence to indicate that any of the early timber churches subsumed by the castle precinct in the late 11th century were rebuilt in masonry form.

Inter- and intra-cemetery comparisons have been made in Chapter 4.VI in relation to a range of issues including burial practice, demography, status and disease. The impact of topographic features on burial alignment has been examined and was particularly clear in the case of the cemetery of St John's. There were evident contrasts in the degree of pressure for space: graves in cemeteries beneath the castle's south bailey rampart (Farmer's Avenue) and the north-east bailey were both widely spaced, while the dense sequence of intercutting graves at St John's is more similar to the group recorded at St Margaret-in-Combusto (Jayne Bown, pers. comm.). In these latter cases the graves, although some distance from church, were densely packed and exhibit pressure for space.

The disruption to urban form caused by the insertion of the castle means that there has been little opportunity to trace early parochial boundaries, although the revision of the possible incipient parish structure at the Conquest has been noted above and in Chapter 4.VI, with the probable movement of the displaced population and its integration elsewhere. Medieval to modern developments of the seven parishes that met at the castle have been traced in Chapters 7–11, with comments on their boundaries made at relevant points throughout this chapter.

In terms of cemetery studies, the results from the Castle Mall excavations have surpassed expectations at the outset of the project, particularly in terms of the quantity of cemeteries discovered, the wide-ranging data they have provided and the implications for their relationship to the castle.

Buildings, Building Materials and Constructional Techniques

(Late Saxon buildings: Figs 4.18, 4.24, 4.59, 4.60, 4.62, 4.146; Plates 4.8, 4.9 and 4.31)

(Post-medieval buildings: Plates 11.7–11.9)

In addition to the great royal Norman *donjon* and associated structures discussed in Chapters 6 and 12, the buildings in the castle area detailed in preceding chapters exhibit a wide range of functions and social status. Although the documentary record attests to large numbers of buildings at the site by the time of the Conquest and others around the fringes of the castle baileys from the medieval to post-medieval periods, relatively few such structures survived the ravages of later development and most of the excavated evidence relates to boundary walls, together with pits and wells within backyards or gardens. The documented buildings include the 98 'houses' mentioned in Domesday, the Shirehouse, cottages, work-

Period	*Date range*	*No.*
Period 1	Late Saxon (10th to 11th century)	27
Period 2	Early Norman (*c.*1067–*c.*1094)	1
Period 3	Norman (*c.*1094 to12th century)	1
Period 4	'Medieval' (late 12th century to *c.*1345)	5
Period 5	*c.*1345 to *c.*1558	1
Period 6	*c.*1559 to *c.*1800	27
Total		**62**

Table 14.2 Buildings and structures by period (excluding castle gates/gatehouses)

Constructional Type	*No. examples*
sunken-featured	3
?sunken-featured	2
post and upright plank	3
post-in-trench	2
beamslot	2
post-in-slot and post	11
post built	4
Total	**27**

Table 14.3 Pre-Conquest buildings by constructional type

shops and shops of the medieval period and the later minor prisons, Gun House, domestic dwellings, stables, workshops and public houses (some of which survive).

The remains of 62 buildings (including domestic dwellings/workshops, storerooms, shelters and outbuildings) and structures (including cellars) were identified at the Castle Mall and Golden Ball Street sites, in all periods (Table 14.2). Many more were destroyed prior to the commencement of the excavation, either in earlier demolition campaigns or in association with the shopping centre development. The major medieval structure known to have existed within the south bailey — the Shirehouse, later the city Gun House (see Chapters 7 and 10) — was not located, any remnants having been lost during levelling activities in 1738 (see Chapter 10.I). As has been discussed in the period chapters, the building traditions recorded at many other Norwich sites were apparent here, with the gradual transition from clay- and timber-walled structures to the use of flint and brick in the medieval and later periods.

The excavated remains of most structures were relatively ephemeral and some are very tentatively identified, although the sunken-featured Late Saxon buildings and late medieval and post-medieval cellars had been less disturbed. The pre-Conquest buildings, some of which had been used for crop storage and processing, are discussed in Chapter 4.VI (Buildings 1–27) and are quantified by constructional type in Table 14.3. The most substantial structures, two possible granaries constructed using large posts set in trenches (Buildings 17 and 18), survived along a road frontage (now Timberhill). Although the dating of these particular structures remains uncertain, this constructional type appears to have ceased in Norwich by the early 13th century (Atkin and Evans 2002, 240).

As has already been discussed, the Norman south bailey may have contained high status buildings such as the Great Hall (*cf.* the example within the lower ward at Castle Acre, Coad and Streeten 1982, fig.3), although recent work suggests that at Norwich this building may have lain adjacent to the keep itself (Drury 2002a and b; see Plate 10.2.A). A new gaol was constructed at Norwich Castle in 1183–4, the location of which is not stated; it may have stood at the top of the motte or within the south bailey. No trace of these buildings was found, although structures that were located included one of the gates, new evidence for the construction of the castle bridge and a heavily defended well at its foot. The constructional and engineering methods associated with each of these Norman structures, along with the keep itself, are detailed in Chapter 6, with additional comments in Chapter 12. Only two structures could be identified within the Norman castle baileys: a post-built structure possibly associated with the construction of the south bailey rampart (Building 28, Period 2.2) and another tentatively identified on the Timberhill frontage (Building 29, Period 3.2). It is possible that one Late Saxon domestic building (Building 25) was retained in use after the Conquest. At Launceston Castle, 12th-century buildings were positioned gable end on to a road within the bailey (Saunders 1977, 136), although no similarly positioned buildings were evident at Norwich.

Later in the medieval period, a number of structures identified actually within the outermost ditch of the Castle Meadow may have had an association with the management of livestock (Buildings 30–33, Period 4.1), while another possible post-built structure lay confined within the castle barbican (Building 34, Period 4.2). The single late medieval/transitional ?workshop (Building 35, Period 5.2) may have been related to tanning/tawing activities (Chapter 8.IV, Chapter 13 and Part III). Amongst the sixteen late medieval/post-medieval cellars and other building remnants (Structures/Buildings 36–59, Period 6) were examples in the north-eastern part of the site which may have originated in the late medieval or early post-medieval periods. These and many later examples were probably associated with the public houses and other buildings fringing the Cattle Market. The cellars of some of these late buildings were recorded (Structures 60–62, Period 7).

Refuse Disposal and Water Supply

Pits, middens and rubbish-tips
(Figs 14.1 and 14.2)
The history of refuse disposal at the site has been detailed in Chapters 4–11, with archaeological evidence for middens only occuring during the Late Saxon and early Norman periods (Chapters 4 and 5). From as early as the 12th century, the castle ditches and other features were utilised for refuse dumping, culminating in the vast depositions of cultural material in the late medieval and post-medieval periods. Nightsoil was extensively used for manuring the agricultural land surrounding the Norwich and trade in muck is recorded in the late 13th century (Ayers 1994a, 69). At the castle, the extensive documentary evidence presented by Tillyard in Chapters

Period and date range		*Indeter-minate*	*Latrine*	*Craft/ Industrial*	*Quarry*	*Refuse*	*Storage*	*Well*	*Fire pit*	***Total***	***% Total (both sites)***
Period 1	1.2	87	0	3	1	22	2	0	1	**116**	
Late Saxon	1.3	95	2	11	5	21	0	0	0	**134**	
	1.4	38	0	2	0	1	0	0	0	**41**	
Sub-total		*220*	*2*	*16*	*6*	*44*	*2*	*0*	*1*	*291*	*28%*
Period 2	2.1	34	0	1	6	13	0	0	0	**54**	
*c.*1067/8– *c.*1094											
	2.2	27	0	2	0	0	0	0	1	**30**	
Sub-total		*61*	*0*	*3*	*6*	*13*	*0*	*0*	*1*	*84*	*8%*
Period 3	3.1	13	0	0	1	0	0	1	0	**15**	
*c.*1094– *c.*1122											
	3.2	11	1	0	2	0	0	0	0	**14**	
Sub-total		*24*	*1*	*0*	*3*	*0*	*0*	*1*	*0*	*29*	*3%*
Period 4	4.1	24	2	0	0	6	0	0	0	**32**	
late 12th century to *c.*1345											
	4.2	34	0	0	2	6	0	0	0	**42 (6)**	
Sub-total		*58*	*2*	*0*	*2*	*12*	*0*	*0*	*0*	*74 (80)*	*7%*
Period 5	5.1	134	2	4	49	15	0	3	0	**207**	
*c.*1345– *c.*1558											
	5.2	69	7	0	0	30	0	3	0	**109 (21)**	
Sub-total		*203*	*9*	*4*	*49*	*45*	*0*	*6*	*0*	*316 (337)*	*30%*
Period 6	6.1	72	3	6	5	19	0	6	1	**112 (1)**	
*c.*1558 to 18th century											
	6.2	76	4	0	20	14	0	9	0	**123 (16)**	
	6.3	17	0	0	2	0	0	0	0	**19**	
Sub-total		*165*	*7*	*6*	*27*	*33*	*0*	*15*	*1*	*254 (271)*	*24%*
Total		**731**	**21**	**29**	**93**	**147**	**2**	**23**	**3**	**1,048 (1,092)**	

Bracketed numbers are pits at Golden Ball Street

Table 14.4 Pit types by period and sub-period (Periods 1–6)

8.I and 10.I attests to repeated arguments about illicit rubbish dumping at the site during the late medieval and post-medieval periods.

As has been noted in previous chapters, the spatial distribution of pitting in the post-Conquest period reflects the gradual encroachment around the fringes of the south bailey, while the pre-Conquest distribution relates in part to the effects of later truncation and in part to actual concentrations of activity in certain areas of the site. Pits have been fully detailed and discussed by period in Chapters 4–10, although a few general comments are appropriate here. Many of the pit types given in Table 14.4 are loosely defined and, as has been much discussed in theoretical literature, the excavation of pits specifically for refuse disposal is still disputed. Certainly, refuse was deposited into many of the pits at Castle Mall, although in many cases this may have been secondary usage of, for example, cess or storage pits.

An overall quantification of pits and wells by period — totalling 1,092 in Periods 1–6 — is given in Figs 14.1 and 14.2, the same information being shown by pit type and sub-period in Table 14.4. Both clearly demonstrate the high proportion of pits utilised at the Castle Mall site during the Late Saxon period (28%) and at both the Castle Mall and Golden Ball Street sites during the late medieval to post-medieval periods (30% and 24% respectively). The lowest figure (3%) is for Period 3 (*c.*1094 to 12th century), when the castle was at its height as a military fortification.

The majority of pits from Castle Mall at all periods are of indeterminate type (731 pits, 69% of the total), while most of the remainder were categorised as 'refuse' pits (147 pits, 14%). The prevalence of quarry pits (93 pits, 9%) relates to the character of the site, with the exploitation of the castle banks and baileys for aggregate: over half of such pits occurred during the late 14th to mid 15th centuries (Period 5.1; see Chapter 8). Cess

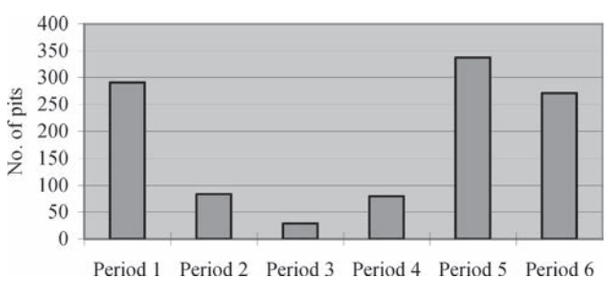


Figure 14.1 Number of pits by period

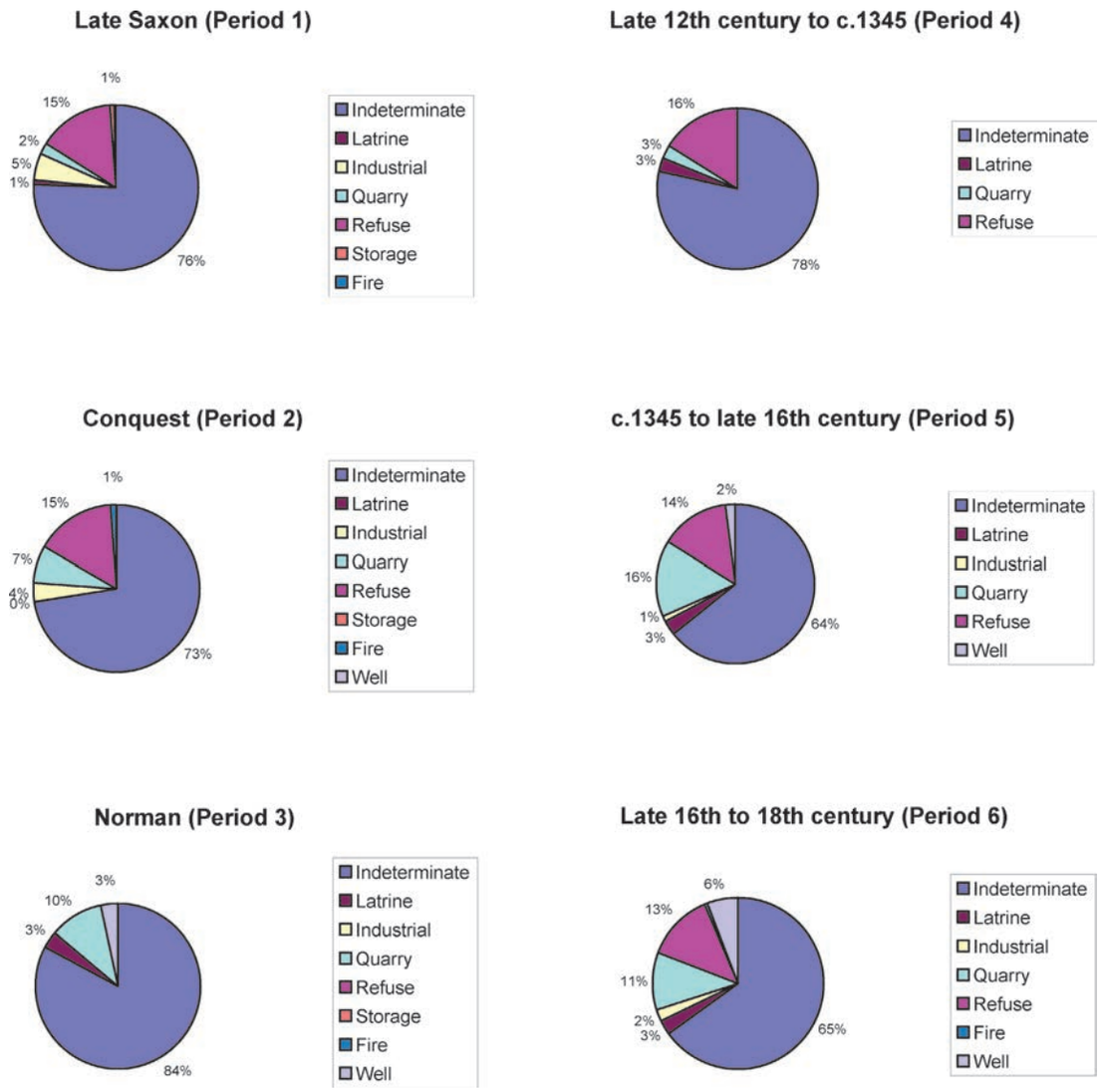


Figure 14.2 Pit types by period at Castle Mall

pits, wells and pits relating to the deposition of waste from craft/industrial activities or *in situ* working (such as metalworking) were present in relatively equal proportions (*c.*2%), while the least represented categories were those with possible functions for storage (of goods and water) and as fire pits. The deepest domestic-type pits occurred in the Late Saxon and early Norman periods. Lined pits were present in all periods, except Period 4. A range of lining types was recorded, including timber, wattle, clay, flint and brick (the latter in the late medieval and post-medieval periods), some contained timberwork and some may have been lidded. As was noted in Chapter 10.VI, pit digging had virtually ceased by the late 17th century (Period 6.2) and the last recorded pits were a few examples of 18th-century date (Period 6.3).

Wells, water supply and drainage
(Plates 6.18–6.21)
Amongst the group of 23 wells recorded at the site (Table 14.4 above), the most spectacular example lay within the castle barbican and may have been constructed in the 12th century (see Chapter 6; Plates 6.18–6.21). No wells of Late Saxon to early Norman date (*i.e.* before *c.*1094) were identified and it is possible that the Great Cockey stream provided the main water source at this time (although a defended supply might be anticipated for the castle). A 16m deep well was recorded in the north-east bailey and appears to have been associated with a Late Saxon church, serving as a baptistry (Site 416N; Ayers 1985, 19, 25–26). Its depth and the effort required to construct it may explain why no other examples were found at the Castle Mall site; the 12th-century castle well was nearly twice as deep (Chapter 6.II). In early periods, water may have been stored on site in tanks or cisterns, possibly supplied by drainage ditches (see Chapter 6.V), as well as in smaller quantities in pottery vessels.

The difficulties of discerning wells from cess pits in the late medieval and post-medieval periods has been noted in earlier chapters, where the relationship of wells to local water supply has also been considered. As has been discussed in Chapter 8.V, many of Norwich's medieval and later wells were shared by adjacent tenements, a fact which is demonstrated both archaeologically and in the documentary record for properties surrounding

Norwich Castle from the late 14th century onwards. Comments on public wells (such as that at Sadelgate) and the changing fortunes of the Great Cockey stream are made in preceding chapters. The provision of water and sanitation facilities for late medieval and post-medieval domestic dwellings, prisons and public houses in the vicinity of the site has been detailed in Chapters 8.V and 10.VI, with a consideration of water supply to the 19th-century Cattle Market in Chapter 11.III.

Medieval and Post-Medieval Tenements
(Figs 7.3, 8.2 and 9.1)
This report has sought to elucidate the development of the numerous tenements surrounding the castle, documented from the 13th century, against the physical constraints of the topography of the castle earthworks. Where possible, archaeological evidence specific to these tenements has been detailed and correlation with the activities of named individuals within particular properties has also been attempted. While some of these remain hypothetical, due to lack of certainty over ownership versus occupation, a number of direct linkages have been made. Cottages, shops and gardens were present on the fringes of the baileys and within the Fee from early periods, some of the latter persisting for centuries. The inner part of the Timberhill block evidently remained open space for a considerable period, while other areas remained undeveloped land or were used as gardens and orchards. Public houses were present from the late 14th century and many survived for considerable periods.

Some of the property strips in the southern part of site appear to have originated as 'burgage' boundaries which developed into late medieval walls and were thence fossilised in later structures. The few that survived indicate widths of *c.*6m (*c.*19.5ft), although there were evidently variations in width (*e.g.* along Timberhill) and many plots were subdivided. Properties recorded at Westwick Street, Norwich dating to the late 12th to late 13th century were of very similar width (Atkin 2002b, 120, fig.24), their boundaries being effectively preserved into the 17th century, a fact which confirms the stability of the ground plans of such tenements. Work by the Norwich Survey has demonstrated that, as anticipated in an urban setting, tenements towards the centre of the city, which might be as little as 4m wide, were considerably narrower than those on the outskirts where pressure for land was not so great (Atkin and Evans 2002, 241).

The gradual increase in the formalisation of the townscape is evident at Castle Mall during the post-medieval period, although the neat plan of tenements as produced by Cleer in 1696 (Plate 10.1) is belied by archaeological evidence which suggests that many buildings and gardens were placed above ditches and/or ramparts, leading in some areas to the necessity for terracing. Excavated evidence at Castle Mall does, however, provide broad confirmation of Cleer's map in the form of the position of boundary walls (*e.g.* Figs 8.25, 10.1 and 10.11). Linkage has also been made with other cartographic evidence such as Hochstetter's map (1789; see Fig.10.19 and Plate 10.3.C) and more localised maps, plans and views of the area surrounding both the castle and the Cattle Market.

Consideration of the site footprint against road frontages partially explains the general absence of recorded buildings (*e.g.* along the western side of Golden Ball Street), a phenomenon also allied to known demolition campaigns which ultimately resulted in the presence of modern warehouses and a car park within the Timberhill block (Plate 1.2). Given the known proliferation of buildings around the fringes of the site throughout the medieval and later periods, particularly along Timberhill and Common Pump Street, the lack of archaeological evidence for their walls needs to be addressed: many properties are simply represented by pit groups or boundary walls. Their absence may partially be a result of reuse of wall lines over time, as witnessed in the numerous phases of reconstruction evident in the southern part of the site, which may have led unwittingly to the removal of the remnants of medieval and late medieval walls during site clearance in advance of excavation. The presence of apparently early cellars (*i.e.* 15th- to 16th-century) in the north-eastern part of the site indicates that this may indeed have occurred (Chapter 10). The upper parts of the buildings associated with these cellars may have been incorporated into later structures which were swept away in 1862 (Chapter 11). In other cases, buildings may simply have been of clay and timber construction which did not survive.

Many of the difficulties that have been encountered in correlating documentary and historical evidence with archaeological remains are common to medieval and later sites, particularly in an urban context. Where integration has been attempted, the results can assist identification of the origins of parish boundaries, as work in London has demonstrated (Hammer, McCann and Elsden 1993). A number of suggestions for the origins of parish boundaries around Norwich Castle have been possible, as discussed elsewhere in this chapter.

III. SOCIAL ORGANISATION

Issues of social and economic differentiation have been addressed throughout this report and in each period the whole range of society is represented. Social differences between local 'segregated' groups such as lepers, Jews and Strangers have been considered (Chapters 4–6 and 10), while differences between those inhabiting the old and new boroughs of the Norman city have been noted (Chapter 5.I and Chapter 12). Pre-Conquest social status generally indicates the lower social range, although there are occasional hints at higher status in terms of artefacts (Chapter 4.III), ecofacts (Chapter 4.IV) and burial types (Chapters 4.II and VI). This contrasts to some extent with the hard physical labour indicated in the bones of the inhabitants of the cemeteries at the site (Chapter 4.V). Low quality 'housing' was evidently utilised for a range of domestic craft activities relating to small-scale production and, as noted above, this may have been set within a framework of social and/or economic groups served by local churches. The important implications of a possible pre-Conquest date for the group of leper burials at St John's have been discussed in Chapter 4.VI, where aspects including segregation and associated changes in social attitude are considered. Social factors may have led to the zoning of these burials within the town, perhaps within an identifiable 'community' conveniently sited to beg for alms. The possible significance of the positioning of the church of St John has also been noted: its location at a possible entrance to the Late Saxon settlement

is mirrored in its later position at the castle's south gate. Its original position outside the settled area may have been a direct reflection of its leper population. Despite the provision of numerous extra-mural post-Conquest leper houses, by the later medieval period, documentary evidence attests to a degree of integration of lepers into Norwich society (Chapter 4.VI).

The status of the site clearly increased dramatically with the construction of the royal castle. Despite this, much of the artefactual and environmental evidence for the late 11th and 12th centuries points to the presence of a 'normal' urban community, effectively providing important evidence for the status of those living and working within the Castle Fee (see Chapters 5, 6 and 13 and Part III). While high status living may only have occurred in the upper bailey (*i.e.* in the donjon and some of the adjacent structures), for which no archaeological evidence was encountered during these particular excavations, it might have been anticipated that a proportion of good quality artefacts would have found their way into rubbish deposits in the surrounding castle baileys. As has been discussed in earlier chapters, the site is a reversal of the norm where, in the absence of historical data, status is often inferred from artefacts, ecofacts and the morphology of archaeological features. Had the royal status of the site not been known prior to the excavations, it would certainly not be inferred from the finds although the proliferation of ditchwork would have indicated its defensive character. These comments emphasise the fact that, although the area in question was called a 'castle', this project has effectively elucidated the history of a large area of an important urban settlement, within which was an urban castle.

Comments on the impact of the church on urban settlement have been summarised above ('The Urban Church'), while organisation of the ecclesiastical landscape in the vicinity of the castle has been traced from its earliest origins in the Anglo-Saxon period to the present day in Chapters 4–12. This analysis has included evidence for encroachments into and contractions of cemeteries relating both to the imposition of the castle and the growth of surrounding tenements.

The clearest evidence for social organisation and political change demonstrable at the Castle Mall site is the impact of the institution of the castle and in particular the changing character and meaning of the Castle Fee and its developing interaction with surrounding city. While the Keep's royal status was maintained from the Conquest until 1805, the differing fortunes of both the Fee and the castle earthworks have now been traced. The Fee was maintained until the 18th century and survived as an administrative entity — the Castle Fee Leet — into the 19th century (see above).

A ditch running along the inner side of the south bailey rampart (Ditch 14) has tentatively been identified as the ditch to the Shirehouseyard, documented from the late 13th century, although its relationship to the south bailey ditch itself, which was substantially open at the time, remains equivocal. Its presence would appear to imply an additional boundary around the courthouse, as is evident at Ipswich (see Chapter 7). The administrative functions of the Shirehouse and its developing relationship with Norwich's prisons have been detailed in Chapters 7–11, along with the physical movement of the building around the castle site over the centuries. The constraining influence of the Shirehouseyard on the usage and exploitation of the western half of the south bailey from the 13th century to 1579 has now been demonstrated archaeologically.

Corporate activity is difficult to identify in archaeological terms, although at the castle site the clearest evidence of the actual effects of corporate decisions relates to the construction of the city ditch and walls in relation to the castle defences (Chapter 7; Fig.7.1) and the transfer of the baileys to the city in 1345 (Chapter 8; Fig.8.1). The impact of the construction during the 13th and 14th centuries of the city defences on those of the castle, ironically partly the result of threatened invasion from France, has been detailed in Chapters 7 and 12. The outer castle ditches fell into decline and the baileys were increasingly subject to encroachment, despite the protection that royal ownership continued to offer until 1345. Once this protection was removed, the opportunistic exploitation of the available area for quarrying, noxious activities and the dumping of waste has been clearly demonstrated by the evidence presented in Chapters 8 and 9.

The organisation of city administration and financial control mechanisms are indicated in the long history of the Castle Fee rents (Fig.7.2=8.2). The sequence of property ownership in and around the Castle Fee from the 13th to the 19th centuries has been meticulously traced by Tillyard (Chapters 7–11, *passim* and Part IV). The changing values of properties that have now been detailed could have been subjected to further analysis although this lay outside the remit of the current project: it is intended that the significant data presented here will facilitate future research. The rental list effectively forms a directory of ownership of Castle Fee properties that extends over a period of more than four hundred years. The 1345 transfer of the baileys to the city began a process of sale and conversion of leases which continued until the 18th century. A tax directory for the Strangers living in the parish of St John Timberhill during the 16th century has also been presented and Ives' ongoing work on the regulation of strangers within the city demonstrates the role of immigrant merchants in the success of the Norwich economy (Chapter 10.VI, Chapter 13 and Part IV).

IV. DEMOGRAPHY

Population and Population Structure

Analysis of the local population was one of the research objectives established at the assessment stage (Shepherd 1994), relating both to detailed information from the excavated burials and to wider issues of demography. The excavated groups date to the Middle and Late Saxon period (Cemeteries 1–4, Chapter 4) and the 17th century (Cemetery 5, Chapter 10), while two further individuals, both infants, were recovered from mid 15th- to early 16th-century fills of the barbican well (Chapter 9).

Regional and national comparisons between the Anglo-Saxon groups excavated at Norwich Castle and those recorded elsewhere have been made in Chapter 4.IV. The composition of Norwich's Middle and Late

Saxon populations can now be confirmed as of mixed origin by the new DNA evidence from the Castle Mall cemeteries, which demonstrates both possible 'Viking' and Saxon (Danish/German) genetic connections (Töpf, Chapter 4.V). Analysis of and comparisons between the Late Saxon groups provides new information on population health, age at death, stature, occupation and urban hazards such as violence and disease. Particularly significant is the evidence for Norwich's leper population (Anderson, Chapter 4.V; Chapter 4.VI, 'Leper Burials').

Estimates of the immediate impact of the Norman Conquest on the local population have been identified both from historical and archaeological evidence (Chapters 5 and 6). The reduced numbers and reduced status in the city is clear, at least some fled the city and it appears that almost half of the Late Saxon town south of the river was lost to Norman redevelopment.

Indications of local population structure have been considered at all periods and in each the whole social scale is evident, based on the combined findings of documentary, artefactual and ecofactual research. Although the influx of new elements into the population was apparent (see below), the evidence contained in this report demonstrates periods when the local population remained relatively static. Throughout this report, the identities of those who shaped the development of the site have been traced. The key figures must remain the Norman kings responsible for the construction of the castle and in particular the great keep and its astonishing defences. Analysis of the Castle Fee properties has identified both the movement of property owners within the city from the 13th century onwards and those families which held property there over generations (Chapters 7.I–11.I and Tillyard, Part IV).

Other demographic indicators considered throughout the report include evidence for housing and provisioning, while issues of the spread of wealth in Norwich and urban status generally have also been discussed. Prisons and lawlessness have been traced from the Norman and medieval gaol associated with the castle, to the gaolers living in Castle Fee properties during the 14th and 15th centuries, the excavated felons of the 17th century and the minor institutions documented in the south bailey and finally to the Victorian prison (Chapters 6–11).

Population Movement and Immigration

Over the centuries Norwich saw repeated population movement, both willing and unwilling, on a local, regional and international scale. These volumes highlight the historical and documentary evidence for such movements, alongside the archaeological evidence for their effects at the Castle Mall and Golden Ball Street sites.

As was reported in Chapter 4, the influx of new peoples to East Anglia in the Early Saxon period was not clearly reflected at the site, although a cruciform brooch of late 5th- to early 6th-century date may have originated on the Continent (Penn, Chapter 4.III). Evidence for population movement comes most evocatively from the excavated cemeteries. The presence of DNA sequences indicative of genetic input from Norway and the Western Isles (specifically Orkney) in both the 8th- to 9th-century displaced cemetery beneath the castle barbican (Cemetery 2) and the late 9th- to early 11th-century cemetery beneath the south bailey rampart (Cemetery 3) is of particular significance to the study of 'Viking' influence in Norwich (Töpf, Chapter 4.V and discussion in Chapter 4.VI). The new results offer the possibilities either that the earliest burial was the offspring of one of the first groups to settle in Norwich during the period of the Danelaw, or was the result of a population already mixed during the Migration period of the 5th to 6th centuries. Other evidence for Scandinavian influence is provided by some of the early artefacts, while the architectural style of the timber church recorded in the north-east bailey may have originated in Norway (Site 416N; see Chapter 4.VI).

Of considerable interest is the discovery of an individual of possible Romani origin in one of the Late Saxon cemeteries (Cemetery 3), indicating contact with and potentially movement of the Roma people 500 years before their documented presence in Britain (Chapter 4.V and VI; see also Töpf and Hoelzel 2005). This early contact may have been brought about by Viking activity in the eastern mediterrean.

The Castle Mall project has provided a unique opportunity for the analysis of cemeteries beneath and immediately outside the earthworks of Norwich Castle. The displacement of a substantial part of the local community by the construction of Norwich Castle, in a process which saw people driven from their homes, workshops, churches and burial grounds, has been discussed in Chapters 4 and 5, where issues such as land seizure, transfer, purchase and compensation have been discussed. Although such effects have been recorded at numerous castle sites (see Chapters 5 and 12 and 'Urbanisation' above), seldom has it been possible to examine the impact over such a large geographical area as part of a single project. The possible movement of the populace from those areas of settlement that were lost at the Conquest has been considered in earlier text (Anderson, Chapter 4.V and discussion in Chapter 4.VI).

'Political' migrants are also in evidence at the site, including the Norman French and the Jews. One hundred and twenty-five Norman French burgesses were housed in Norwich's French Borough by 1086, with an unknown additional number of Normans housed at the castle itself (Chapter 6.I). Along with the presence of the Normans at the castle site in the form of the physical evidence for the castle itself, limited artefactual and ecofactual evidence also hints at cultural change (see Chapters 5, 6 and 12). Skeletal changes in the cemetery of St John's *may* indicate a new genetic input during the early medieval period (Anderson, Chapter 4.V). Although Jews were settled in the immediate vicinity of the site, including a property on the Timberhill road frontage, no evidence for their presence was found during the excavations, as had been the case in artefactual terms at earlier sites (see Chapter 6.I). It had been envisaged that dietary evidence from animal bones at the Castle Mall site might have indicated their presence, although in the event this did not prove possible due to the lack of access to relevant deposits in the motte ditch and along the frontage to the west of the castle. This remains an area for future research.

Documentary evidence attests to large numbers of foreign mercenaries at Norwich Castle during its military phase. Certain parts of Europe were particularly noted for providing such mercenaries to supplement the warring armies of Europe, including the urban and overcrowded areas of Flanders and Brabant. Flemings were chosen

by the rebels of 1173–4 when they attacked and held Norwich Castle in 1174 (see Chapter 6.I). Many of these men were effectively economic migrants. Overpopulation and the generally difficult living conditions in Flanders — and indeed the poorer pastoral areas of the Norman-Angevin empire including Wales and Brittany — led to emigration in the 11th and 12th centuries, especially during the second half of the latter century (Bartlett 2000, 266–269).

Perhaps a less obvious case of the movement of peoples comes from the movement of prisoners to the gaol within Norwich Castle Keep. These came not only from across the county but also across the country: prisoners from Wales and Scotland were held at Norwich Castle, for example, during the late 13th and early 14th centuries (see Chapter 7.I).

With the 16th century comes evidence for further immigrants in the form of the Strangers, who reached Norwich through combined processes of religious persecution and economic necessity. The documentary and archaeological evidence presented in Chapter 10 and by Ives in Part IV demonstrates the movement of this group both within Norwich and to other urban centres and indicates cultural differences. Although working predominantly in the textile trade, the identification of other minor trades has been assessed in earlier text and is demonstrated archaeologically at the Golden Ball Street site by new evidence for Dutch-type pottery manufacture (see Goffin, Chapter 13).

In conclusion, the project has provided unexpectedly wide-ranging evidence for the movement of peoples in most of the site periods. Although many of the influxes of peoples outlined above are well-attested at numerous English towns and cities, the results presented here are perhaps unusual in the scope of the information available and the opportunity to assess their impact in real terms.

V. CULTURE AND RELIGION

It was noted in Chapter 4.VI that the Anglo-Scandinavian character of Norwich has generally been underplayed in the literature in comparison to its better known counterparts such as York. The similar material culture of Norwich's Danish and Late Saxon inhabitants inevitably causes identification problems, as has been noted elsewhere (J.H. Williams 1984, 31). A strong Scandinavian element is, however, evident in the artefacts and human skeletal remains from the Castle Mall site and in the findings from the north-east bailey (Ayers 1985).

The development of specifically urban culture is one which is difficult to address archaeologically. This report has sought to demonstrate in real terms the relationship of the great institution of Norwich Castle to the city. Effectively, the castle itself was one of the main cultural dominants of the Norman city, the culture of the period being most expressively represented in the form and architectural detail of the great keep and the form and conception of the castle earthworks: comments on the symbolism and iconography of the castle can be found in Chapter 12. Possible indications of cultural change at the site, including an increase in the consumption of pig, have been summarised in Chapter 13 and in more detail in Chapters 5 and 6 and Part III.

Analysis of the development of properties beneath and, later, around the castle has sought to move beyond tenement identity and chronology to investigate its meaning within the urban landscape, including the character and status of local houses and their occupants. Technological innovation has been examined in terms of new materials to Norwich, specialised manufactures (see, for example, Chapter 9) and the demand for new forms including ceramics (see Lentowicz, Chapter 13, 'Pottery Overview'). The presence of a specifically urban culture during the late medieval and post-medieval periods is indicated by the evidence for long-distance trade, occasional exotica such as new species (marrow/pumpkin, turkey, parrot) and early introductions of both raw materials and finished objects (Chapters 8–10).

The relationship of parishes and burial has been explored, particularly with respect to social outcasts such as lepers and prisoners. As noted above, the possible existence of a leper 'community' has been examined in Chapter 4.VI and it is noteworthy that informal groupings of the sick and infirm appear to have occurred at both the Castle Mall and north-east bailey cemeteries. As has been discussed, the catchment areas for these churches in a Late Saxon context remain uncertain. In particular, the question has been raised as to whether this was part of the *Needham* area of Norwich, or *Conesford* as the later leet/ward structure may suggest. Within the Late Saxon cemeteries possible 'family' burial groupings have been identified through metric and non-metric traits and DNA linkage. Analysis of Late Saxon burial practices at the site confirms the increasing significance in head position (including the provision of ear-muffs and/or organic/inorganic pillows) in the context of issues relating to penitence and purification. Finds within graves include items worn on the body and others which may have been deliberately placed beside the burial, an occasional practice within urban cemeteries of the period.

Ecclesiastical provision for the Norman castle garrison has been discussed in Chapters 5, 6 and 12. Clerics living within the Castle Fee are noted throughout the medieval period (Chapters 7 and 8 and Part IV), while a possible grouping of ecclesiastical workmen is recorded in the Castle Meadow (see Chapter 7.I). The remains of two probably unbaptised children within late medieval/transitional fills of the barbican well have been discussed in Chapter 9, in relation to possible infanticide and/or concealment. Documented books owned by local residents notably include bibles and other religious works (Chapter 10.VI, 'Dress and Personal Possessions').

Occasional traces of 'ritual' deposition have been tentatively identified, some of which appear to relate to illness and superstition. These include the possible deposition of prehistoric objects into swallow holes (Chapter 3) and, less likely, the deliberate placement of a cow skull and pottery within a Late Saxon pit (Chapter 4.VI). The possible reasons behind the deposition of live animals (amongst the total group of 16 cats and 15 dogs) into the barbican well has been discussed in Chapter 9.VI. The clearest evidence for superstition comes from the presence of witch's bottles in the barbican ditch which has been discussed in Chapter 10.VI.

VI. ECONOMY

(Figs 8.63, 9.1, 10.79, 13.2–13.7 and 13.10; Part III, Figs 4–9 on CD)

The local economy has been traced through preceding chapters, with a summary in Chapter 13 and further details in Parts III and IV. The research has followed the development of local trade groups, the history of the development of local markets and regional workshops, patterns of access to and acceptance of continental imports and the development of agricultural production and fisheries.

It was suggested in the Late Saxon burh at Winchester that 'the variety of crafts and trades practised … on the eve of the Norman Conquest must have been one of the most strikingly urban features of the community' (Biddle 1976b, 459) and such is the case at the Norwich site. At Castle Mall, as at many other urban centres, many of the activities of the period are related to food and provisioning (butchery, crop processing and storage and brewing/malting), while other crafts include metalworking, leather-, antler- and hornworking, textile production and processing and pottery production (see Chapter 4.VI, 'Craft and Economy' and Chapter 13). Artefactual and ecofactual evidence for Late Saxon craft activities and daily life is supplemented by the 'occupational' changes evident in the skeletal groups from the site, which may indicate repetitive activities conducted on a daily basis along with archery and horse-riding (Chapter 4.V and VI). New evidence for pre-castle pottery manufacture has been identified (Chapter 13, 'Pottery Manufacture and Associated Waste'). A major source of clay for pottery and brick making existed to the west of Great Cockey (at the Chapelfield site; Whitmore ongoing excavations 2003), where vast medieval pits attest to major exploitation.

Evidence for castle-related craft of the Norman period was relatively limited, although notably included evidence for antler-, bone- and hornworking (Chapters 5–6). Although evidence for craft activity was also evident in the period late 12th century to *c.*1345 (Chapter 7), it was the 15th and 16th centuries that provided the widest range. Direct linkage proved possible between documentary and archaeological evidence, including a few cases where individuals responsible for activities could be identified. Medieval to post-medieval crafts and occupations have been traced by trade group in Chapters 7–10, based on those established by Kelly *et al* (1983), allowing comparisons and contrasts between periods (Chapter 13.III). The groups represented include the metal trades (ferrous and non-ferrous), weaponry and horse equipment, butchery, leatherworking and associated trades (skinning, tanning, antler-, bone-, ivory- and hornworking), textiles and clothing, the building trades and household goods. Discussion of urban workshops in relation to the large assemblage from the barbican well is given in Chapter 9, the excavated group catering for both the rich and poor man's market and including evidence for raw materials, stock, part-made and finished products in a wide range of materials and artefact types.

'The increasing sophistication of borough government in late medieval England both suggested and encouraged new efforts in the control and the amelioration of the environment. Trades that constituted a fire risk or were assumed, for whatever reason, to be a health hazard (*e.g.* potting or tanning) were banished to the suburbs' (Platt 1976, 55): evidence at Castle Mall indicates that the remnants of the castle baileys served as a substitute intramural open space for such activities. Comparisons between periods at Castle Mall demonstrate the fluctuating fortunes of many of these trades. Metalworking for example was present in all periods, with a notable increase during the late medieval/transitional period (Chapters 8 and 9) and a dramatic decline in the post-medieval period (Chapter 10), reflecting the gradual removal of such production from the city. It did not entirely disappear from the castle site and its immediate environs, however: smiths, farriers, harness makers and an iron-foundry were present until the modern period (Chapter 11).

Disposal of waste by the city's butchers into the barbican well and the barbican ditch (Chapters 9–10 and Part III) is replicated at other castle sites, the earthworks providing useful dumping places: such practices are attested both by butchered bone and documentary evidence for the deposition of offal. Animal carcasses were regularly dumped into the barbican and motte ditches, the remains of some of which were found during the excavations.

For the post-medieval period, evidence for wealth *per capita* indicates the undeveloped nature of parishes to the south of castle until the end of the 17th century, including that of St John Timberhill (see Chapter 10 and Ives, Part IV). Economic activity of the period, including evidence for the impact of the agricultural revolution, is detailed in Chapter 10.VI 'Crafts and Occupations', Chapter 13 and Part III.

Documentary evidence indicates that public houses were present around the Castle Fee from the late 14th century, although brewing/malting activity was archaeologically evident in most periods from the Late Saxon onwards, as is detailed in Chapters 4–10 and Chapter 13, 'Malting'. In the Late Saxon period, malting activity and grain storage within buildings was apparent, while residues within the north-east bailey ditch of the castle may indicate the presence of a castle-related brewhouse nearby during the 12th century (Chapter 6). In the post-medieval period, a yard area possibly associated with a documented hostelry was identified and a malting kiln was found further south (Chapter 10.VI, 'Public Houses and Inns'). The probable walls and cellars of other public houses were also noted (Chapter 11.III, 'Tenements and Public Houses'). One example constructed at Castle Fee Property 48 survives as *Le Rouen*.

Details of modern economic usage of the Castle Mall and Golden Ball Street sites, including the Cattle Market and fringing tenements and public houses, are given in Chapter 11, with details of the modern shopping centre itself appearing in Chapter 1.

VII. ENVIRONMENT

The changing character of the local environment at Castle Mall has now been elucidated. Plant remains, molluscs and insects indicate the species growing and living locally at each period and generally reflect the open character of much of the site, with vegetation and tree cover evident. This confirms the documented fact that, despite the presence of the Castle Fee tenements, much of the ground

fringing the castle baileys remained undeveloped land until relatively late and the baileys themselves remained substantially open.

Local terrain of the pre-Conquest period is indicated in the traumas evident on the skeletal remains which demonstrate a prevalence of foot and ankle injuries perhaps suggesting uneven ground (Anderson, Chapter 4.V). Urban living conditions are suggested by sinusitis perhaps resulting from smoke inhalation by Late Saxon populations. As has been noted, throughout the medieval and post-medieval periods the cramped and dirty conditions of the local tenements, prisons and Cattle Market led to continued outbreaks of disease affecting both humans and animals (Chapters 7–10). Attempts to improve local conditions and to increase available space for commercial activity have been elucidated. Ultimately, overcrowding within the city led to the slum clearances of the 1930s, during which areas of the Castle Mall site were cleared of buildings (Chapter 11).

VIII. REASSESSMENT OF ARCHAEOLOGICAL OPPORTUNITIES

This project has inevitably raised many new questions and highlighted new avenues for future research. Those relating directly to Norwich Castle, many of which relate to areas outside the excavations, have been given in Chapter 12. Although the entire area of the excavations themselves has now been cleared of all archaeological remains (with the exception of the very base of the barbican well and the time capsules buried for future generations to discover), excavation opportunities in the immediate vicinity remain and the Castle Mall project indicates some potentially interesting areas for future work. These include:

1. exploration of the remaining elements of the defences of the Castle Meadow and the area to the north and west of the castle;
2. identification of activities within and beneath the Castle Meadow;
3. exploration of the remaining undisturbed elements of the Castle Mound, specifically evidence for the timber phase of the donjon and the 13th-century curtain wall and its towers;
4. the location and date of any surviving remnants of the castle defences to the east of Golden Ball Street and their relationship to any Late Saxon town defences;
5. confirmation of the date of origin of Timberhill, Ber Street, Golden Ball Street and King Street and exploration of the possible presence of a market at the castle gate;
6. the position and character of the castle's south gate;
7. examination of the remaining tenements in the Timberhill block and around the remaining perimeter of the Castle Fee;
8. exploration of the remaining area of the St John Timberhill cemetery, specifically the distribution of any remaining leper burials;
9. investigation of evidence for other cemeteries, particularly those noted in observations to north and north-east of the castle;
10. exploration of the Great Cockey stream valley and the relationship (including boundary demarcation) between the French Borough, Jewry and Castle Fee;
11. correlation of social and economic data (*e.g.* artefactual and ecofactual) between the castle site and the French Borough, along with the identification of 'Jewish' properties and associated waste disposal;
12. consideration of the scale, character and development of the defences of Norwich Castle alongside Continental parallels.

Questions relating to specific objects or assemblages have been highlighted throughout this report, including some important aspects of the zooarchaeological evidence in Part III. Major issues raised for future research are numerous and include:

1. clarification of regional Late Saxon ceramic chronologies and their relationship to scientific dating methods;
2. examination of evidence for Thetford-type ware pottery production beneath the later castle and associated evidence for the transition to early medieval wares;
3. implications of Scandinavian elements in the local population, during both the Middle and Late Saxon periods;
4. the date of changes in social attitudes towards leper burials and any hospital affiliation of the group recorded at St John at the Castle Gate (de Berstrete/Timberhill);
5. confirmation of the date of artefacts which may be early introductions to Norwich;
6. exploration of at what point during the medieval period the city's population was influenced by changes in food supply, signalled in particular by a proportional increase in the consumption of mutton;
7. changes in animal and bird shape and size and the introduction of new breeds associated with the agricultural revolution, requiring examination of Norwich groups securely dated to the 15th to 17th centuries.

IX. REFLECTIONS

Introduction

This section is devoted to a few personal reflections on a range of aspects of the projects at Castle Mall and Golden Ball Street. The following text is not intended as a criticism of the excavation approach adopted in often difficult circumstances at Castle Mall (and one in which the current author was not involved), nor the post-excavation and publication programme, but is presented with the objective of informing subsequent work and reviewing the approaches and their results with the benefit of hindsight. The duration of the project, extending over a period of more than seventeen years from evaluation to report submission, has meant that it has been overtaken by new technological and philosophical approaches on a number of occasions. Advances in computer technology would now permit new approaches such as terrain modelling, which could only be attempted to a rudimentary degree at Castle Mall. In the latter stages of report production, new approaches to digital publication and data dissemination

led to some challenging issues that had to be addressed at a very late stage in the programme.

Project Planning

As noted in Chapter 1, the Castle Mall project was planned before the introduction of MAP2 (English Heritage 1991a) and developed within an evolving city-specific research framework that was not formally articulated. This meant that the research objectives current during the excavations were neither as detailed nor as broadly-based as would now be expected: more emphasis would now be placed on the evaluation and desk-based assessment stages, along with opportunities for multi-media presentation to both public and academic audiences. Today, a project of this size and significance might be based on research objectives approved by an academic panel, which would no doubt be rooted in the foundation statements of the Castle Studies Group (see Chapter 12). The difficulty of establishing research objectives, whether national, regional or site-specific, which are both meaningful and achievable in practical terms is a key challenge for modern archaeological practice. Application of such objectives requires that they are set out in detail before excavation begins and are regularly communicated to staff: in practice this is often impossible in the field due to funding and time constraints. Unless such objectives lead to the acquisition of specific data within a framework of quantifiable sampling or sub-sampling, they are in danger of remaining a paper exercise. In the real world, many questions only arise during the analysis stage when it may be too late to address them with data acquisition. It is also difficult on a multiple-occupancy site to tie in research objectives requiring access to particular areas with the demands of a complex development programme. Such was the case at Castle Mall where, for example, the possible terminals of the barbican ditch could not be adequately examined due simply to their physical position in relation to the pile line surrounding the shopping centre.

It must be admitted that a number of areas which might have been anticipated as the focus of research were not adequately considered prior to excavation, which was a direct result of the absence of a more detailed evaluation stage. For example, the possible existence of a Late Saxon town boundary and its relationship to the positioning of the castle which might have been predicted from a study of pre-existing theories (see Chapters 4.I and 5.I), was not fully explored during the excavation. Additionally, despite its coincidence with Carter *et al*'s 1974 plan, no specific provision was made in advance for the possible existence of a double boundary around the north-east bailey, which was subsequently located in the northern part of Area 9. The complex site record that resulted from the reactive approach that had to be adopted to record the feature led to the some challenging reconstruction and interpretation at a later stage. In addition, despite Norwich's significance during the late medieval and post-medieval periods which had been the focus of research by the Norwich Survey, these later periods were deliberately underplayed at Castle Mall in favour of the Late Saxon and Norman remains, investigation of which had previously been limited within the city (see Chapter 1): with hindsight, this was unduly restrictive and the initial research objectives for the project made no mention at all of the post-medieval period. Research today would seek to take a more holistic approach, examining development over time. While 'examination of medieval settlement in the Fee' was highlighted for investigation, no practical approach to the linking of documented properties (*cf.* Beecheno's MS 1908 map; Plate 7.1) with the archaeological evidence was offered and potential opportunities may have been missed for the tracing of tenement boundaries over time. Having said this, it would be difficult to conceive how the acquisition of even more data could have been accommodated in practical and financial terms.

Site Recording

The differing records of the castle ditchwork reflect in microcosm the innumerable challenges of modern data acquisition and analysis (as explored, for example, by Carver 1990), allied to consideration of on-site savings versus resultant expenses at the analytical stage. At Castle Mall time-saving approaches on site using sections set at angles across ditchwork resulted in a disproportionate amount of time during post-excavation analysis, particularly as the top of the steps joining each of the sections were not recorded, limiting the identification of context correlations and hampering identification of recutting episodes: these limitations were countered at the Golden Ball Street excavations in light of the findings at Castle Mall. The results at Castle Mall confirm that small-scale observations of large ditchwork over a number of areas can lead to considerable difficulties in correlating data between observations and can result in dating anomalies between trenches. Particular care needs to be taken that plan evidence for the outer edges of ditches is recorded and collated between areas, including surface plans for those areas that it is not possible to excavate.

The different results in recording ditchwork achieved by hand and machine excavation at Castle Mall have been noted in Chapter 10 in relation to the barbican ditch and the south bailey and ?Castle Fee ditches at both Castle Mall and Golden Ball Street (Chapters 5–8). The machining approach, while permitting records of general morphology and character, does not provide nuances of dating and environment and does not recognise the fact that activities occur actually within ditches: those evident at Castle Mall (many of which it should be admitted were recorded more by luck than judgement) include defensive features such as posts and walkways, buildings, pits, fence lines and paths. Clearer definition was possible at Golden Ball Street, where a number of ditch recuts were convincingly recorded. Few finds were hand-collected from the machined areas at Castle Mall, many of which also went unsampled: those that were sampled were targeted towards the artefactually or ecofactually rich. The resultant data was inevitably erratic. Of course, 'assemblages are only comparable if they have been recovered at the same recovery level' (Carver 1990, 77) and a more controlled approach was therefore adopted at Golden Ball Street. Here, it was possible to address the collection of comparable data from each ditch fill by ensuring that a sample of the same size was taken from each context, regardless of whether it appeared to contain any artefactual or ecofactual remains. Study of

the pottery thereby provided much more closely dated sequences than had been recorded at Castle Mall.

With hindsight, a methodology which combines these various approaches can be suggested for anyone tackling ditchwork on a large scale, particularly in an urban context. Ideally, one person or a small team should be made responsible for ensuring a consistent record. The approach suggested would include:

1. surface plans of ditch lines connecting various trenched elements of ditchwork;
2. targeted recording of predicted areas of interest along the line of the ditch (*e.g.* in the possible location of bridges and/or causeways), with particular attention to ditch junctions;
3. sub-sampled areas step-trenched by machine, ideally set at right angles to the feature, with recording of both sections and step surfaces to provide linkage between observations of fills and profiles, with allied sampling procedures;
4. hand-excavation and context planning of selected areas for the tracing of observable processes (including the identification of cleaning and recutting episodes) and features within the ditch (*e.g.* timberworks, pathways);
5. a controlled system of finds and environmental sampling and recovery, ideally with the retention of samples of similar size from each context in at least one of the major cross-sections from each ditch;
6. provision for a consistent photographic record of both excavation methodology and archaeological detail;
7. provision for terrain modelling and allied recording of the natural topography, including confirmation of natural deposits in the surrounding area as opposed to material redeposited in the process of large scale earth movement.

Health and Safety restrictions at Castle Mall meant that only a small proportion of pits were fully excavated and/or bottomed by hand (see Appendix 2): while augering to the base provided details of feature depth, in many cases the original morphology, function and date of features could not be ascertained. Rather than the sporadic recording of a few early pits in considerable detail (*i.e.* the very few that were fully excavated and/or within which the finds were three-dimensionally recorded), a percentage sub-sample of pits of all periods and all areas could have been selected for detailed and complete excavation by hand (in the case of features over 1.20m in depth entailing the staged reduction of the surrounding ground by machine). It would have been particularly interesting to investigate fully at least a few of the very deep Late Saxon and Norman pits (those up to *c.*5m in depth). Of course, these suggestions assume opportunities for selection within the timetable that might rarely be possible: a project with the scale and complexity of Castle Mall is necessarily reactive.

As outlined in Appendix 3, both finds and environmental collection was targeted towards apparently early features and specific types of features of all periods (*e.g.* hearths and cess pits). In the event the collection of samples from upper pit fills of 'early' features which were not otherwise excavated was of limited use as many of the samples from these particular features were later discounted from analysis on the basis of unreliable dating and/or contamination.

Understanding of the ultimate destination of data was often lacking at Castle Mall, a fact directly linked to the circumstance that this was the first Norwich site at which many new approaches were adopted (see Chapter 1). For example, time was expended inputting data fields in relational databases which would never be used and resources would have been much better restricted to those fields required during the analytical stage. In such situations, there must be a clear understanding of whether the data is intended as a digital archive replicating site data in more accessible form (in which inputting of all fields, the scanning of sketches on the reverse of context sheets and procedures for long-term digital storage are essential), or whether it is part of the analytical process in which only selected elements will ever be used. Minor but irritating problems were encountered with the Small Finds database which had been input in upper case, causing the need for extensive editing when eventually output to produce the publication catalogue.

Many lessons have been learnt over project monitoring and management throughout the project and in particular the need for ensuring that each member of the team takes ownership of their tasks and carries the responsibility for successful completion of their own timetable, within an understanding of the overall programme and its research goals. While all staff should be aware of the destiny of the data they record, they do not necessarily have to conduct these processes themselves: in some instances a team or individual approach may be more satisfactory. For example, rotas for on-site inputting and digitising of data may be politically correct, but they make no allowance for the aptitude or interest of personnel and at Castle Mall the resultant record was therefore of quite variable quality and in some cases had to be reworked during the post-excavation stage.

Developments in Interpretation

The most dramatic change in interpretation during post-excavation analysis resulted from radiocarbon dating of St John's cemetery, which led to its rephasing from the medieval to pre-Conquest period (although see caveats over dating in Chapter 4.IV and 4.VI and Bayliss *et al* 2004). Rephasing of this cemetery in relation to the surrounding archaeological seqence effectively became a damage limitation exercise (the approach adopted being fully supported by English Heritage) and some discrepancies remain between the phasing used in the ceramic and faunal assemblages and rephased parts of site. In the event, however, these changes were relatively limited and do not have any detrimental effect on the data and interpretations presented in these volumes.[1]

The identification of Middle Saxon burials (possibly both at St John's and at the southern end of the castle bridge) caused only minor changes to site phasing. The presence of the Middle Saxon burials in Area 45 and its environs did not dramatically alter the phasing, since their date was previously unknown (and they were easily phased to Period 1.1 without impacting on other phasing). Since only two graves were affected at St John's their rephasing again entailed only a minor change: rephasing to Period 1 would have occurrred anyway on the basis of

the other dates obtained from the cemetery. Clearly, the presence of two possible dispersed cemeteries of Middle Saxon date and the possible continuation of one of these into the Late Saxon period has considerable implications both for the origins of Norwich and the possible early origins of churchyard burial: the evidence from St John's cemetery must, however, be treated with caution since it relates to a single radiocarbon date. The presence of this possible Middle Saxon burial engendered some disagreement between the two specilialists concerned as to whether it represents a few isolated burials in an area coincidentally later used as a larger cemetery, or a continuation in use of the same cemetery (see Chapter 14, 'Settlement Origins and Early History'). Unfortunately, it was not possible to obtain further dates (particularly of the burial underlying the putative Middle Saxon grave) due to the combined effects of bone preservation, funding and project timescale.

With hindsight, it would of course have been beneficial to obtain radiocarbon dates much earlier in the post-excavation programme, although in the case of St John's cemetery it was only with recognition of leprosy during analysis that the issue of dating was raised (see Bayliss *et al*, Chapter 4.IV). For the particular period in question, it would have been difficult to argue for such analysis convincingly during excavation. The fact that no attempt was made on site to obtain dates for the *in situ* burial in Area 45 was an unfortunate result of the extreme time pressures of this complex project. In the event, the bulk of the final dates were only obtained after a considerable delay due to severe equipment failure.

Many other interpretations were revised, from those made on site to those made in the early stages of post-excavation analysis, and are detailed in the site archive.

The Public

The lack of a display outlining the results of the excavations within the new shopping centre is disappointing. Sadly, plans to incorporate archaeological information into the structure of the complex (including schematised archaeological levels adjacent to the transparent lifts and above-ground indications of the former position of ditchwork) were abandoned. In the event, only the historical mural within the food court provides any immediate indication to the public of the history of the site. The relatively limited display within Norwich Castle keep itself is also regrettable and the opportunity for a full display of the site's Anglo-Saxon and Norman past was not fully developed. Unfortunately the approach for contributions to the display did not permit the data to tell its own story but was constrained within pre-set themes. For example, a display relating to the evidence from the barbican well presented in Chapter 9 might have been of particular interest. The fluctuating fortunes of the model of the castle defences (detailed in Chapter 1; Plates 6.35–6.36) reflects the changing interest in the castle. Initially on display within the Keep, the model was later relegated to museum stores to be, hopefully, resurrected again in a future reworking of the display.

Public interest in the project has, not surprisingly, fluctuated from the huge numbers that visited the site during the excavations (see Chapter 1), to frequent requests for talks from local groups and societies at the outset of the analytical stage in 1991 to very few by the end of the project. Some of the more unexpected questions from the public included one about the possible historical and ritual significance of the ley lines purported to meet at the site and whether a burial ground lay beneath a ladies underwear shop within the new shopping centre, which was purportedly being troubled by the ghost of a child (coincidentally or not, the shop lies approximately above the former position of one of the Late Saxon cemeteries). Changes in the focus of urban and castle studies have been evident in the approaches made by undergraduate and postgraduate students. Academic interest in the Anglo-Saxon cemeteries has been consistent throughout the post-excavation project and data has been made available in digital form for future academic re-use (see Chapter 1.VI). In the latter stages of report production approaches were made about the developing social and economic context of the castle, reflecting the growing trend towards the analysis of castles and their hinterlands.

Plate 14.1 Norwich Castle Keep viewed from the new shopping centre

Conclusion

The current author's personal ambitions at the outset of the post-excavation and publication programme in 1991 were very much targeted towards an holistic approach, placing appropriate weight on the archaeological sequence, artefacts/ecofacts, documents and historical evidence to produce an integrated synthesis of this part of Norwich at all periods, setting the site into its wider social, economic and historic context. This publication effectively presents a sequence of individual chronological reports linked by thematic discussion and, it is hoped, has successfully addressed both the author's ambitions and each of the research objectives of the project.

X. CONCLUSIONS

It is difficult to suggest what will be considered the single most significant achievement of the Castle Mall project, which has studied in microcosm a millennium in the life of one of England's major cities. In academic terms, for the Anglo-Saxon period it has offered major contributions in the fields of church and cemetery studies, the

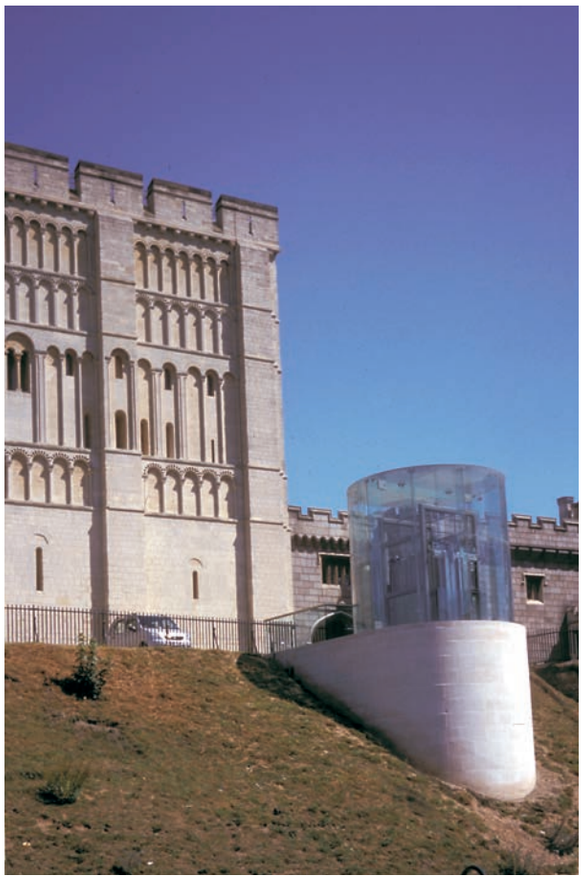


Plate 14.2 The new lift shaft on the southern side of the Castle Mound

Middle Saxon origins of Norwich and Viking influence. Contributions to castle studies have been equally substantial, permitting investigation of the great fortification of Norwich Castle over its long history. For urban studies more generally, the opportunity to investigate the social, economic and historical context of an urban royal castle, set within the framework of the Castle Fee, is currently unparalleled in England. The changing character of Norwich Castle Fee and those living within and around it from the Norman Conquest to the 18th century has proved particularly fascinating. As has been demonstrated, the area developed from a military enclave at its outset, into an area almost with the character of a 'village', its inhabitants perhaps identifiable to the general populous by their rights and privileges. As an administrative boundary the Fee maintained its influence over this area of Norwich as encroachments gave way to rents and leases.

Some indications of the changing perceptions of the castle and heritage in general terms are implicit in the preceding chapters. From a statement of military control in its timber phase, to an outpouring of Norman power and wealth in its stone phase, the castle developed into a late medieval administrative centre, gradually declining in status to become a target for robbing and eventual near dereliction. The great Norman donjon was effectively made anew with the rebuilding works of the 18th century, only to be gutted in the 19th century and finally converted for public use as a museum. The decision to insert an incongruous perspex lift shaft into the front of the motte (Plate 14.2) has been as controversial to the inhabitants of Norwich as the insertion of the great iron 'forebuilding' at Falaise has surely been to both the French and castle scholars further afield.

Like all major projects, involvement with Castle Mall has been a mixed experience of interest, excitement, anticipation and achievement, countered by periods of frustration, stress, anxiety and exhaustion. At times, it has seemed impossible that this long programme of excavation, analysis, collation and report-writing would ever be completed. Having now reached the end of this process, a Romanian proverb seems apposite:

'Până şi marea are fund'
[Even the sea has a bottom].

Endnote

1. The impact of rephasing is fully detailed in the project archive and an associated Project Design; Shepherd and Lentowicz 1998.

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