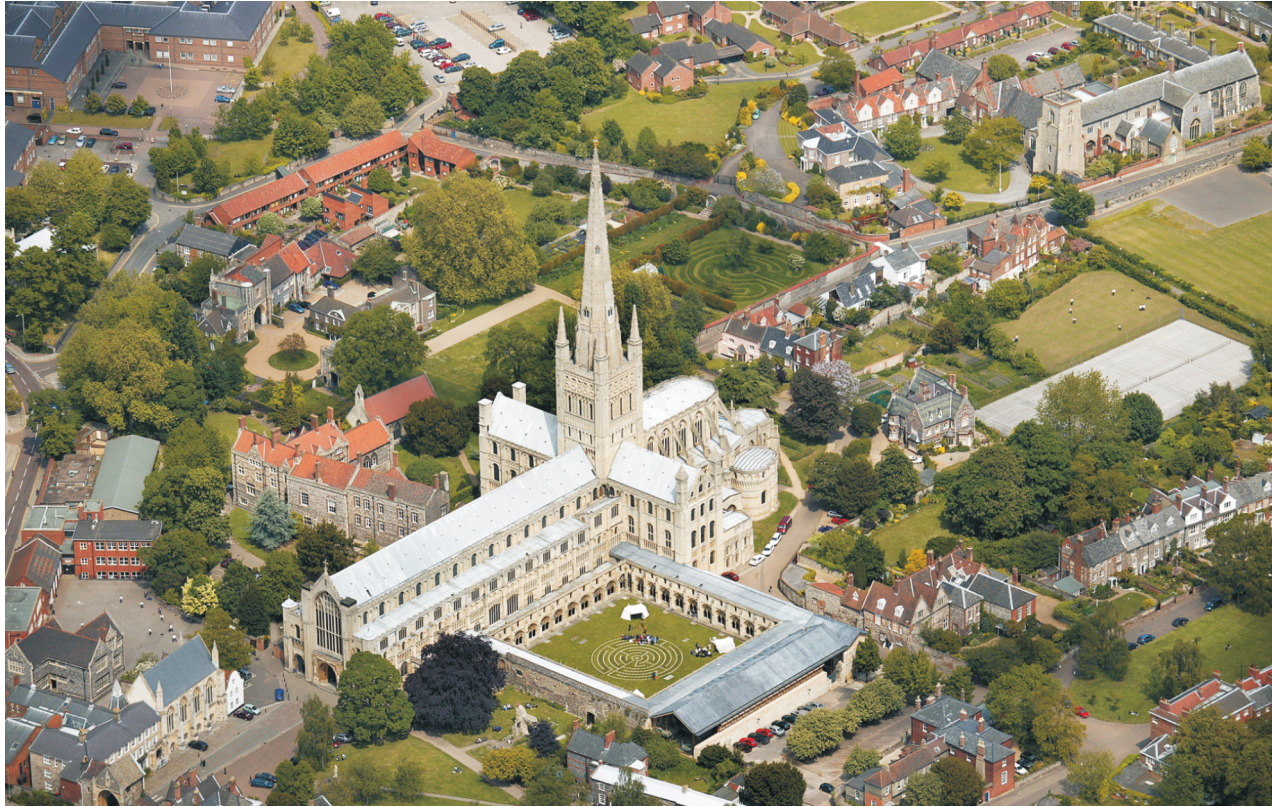


EAST ANGLIAN ARCHAEOLOGY



Frontispiece

Norwich Cathedral viewed from the south-west. The site of the medieval refectory lies beneath the new building that forms the south range of the cloister. *Photo courtesy Mike Page* <http://www.mike-page.co.uk>

Excavations on the site of Norwich Cathedral Refectory 2001–3

by Heather Wallis

with contributions from

John Ames, Sue Anderson, David Buckley,
Spike Bucklow, Sharon Cather, John Clark,
John Crowther, Julie Curl, Geoff Egan, Richenda
Goffin, Julia Huddle, Catherine Hassall, Stephen
Heywood, David J. King, Andrea Kirkham,
Graham Lott, Alice Lyons, Richard Macphail,
Adrian Popescu, Lucy Talbot and Hugh Willmott

illustrations by

David Dobson and Maggie Foottit

photographs by

David Adams, Julie Curl, Gary Hacon, Andrea
Kirkham, Sharon Cather, and Heather Wallis

East Anglian Archaeology

Report No. 116, 2006

Archaeology and Environment

Norfolk Museums and Archaeology Service

EAST ANGLIAN ARCHAEOLOGY
REPORT NO.116

Published by
Archaeology and Environment Division
Norfolk Museums and Archaeology Service
Union House
Gressenhall
Dereham
Norfolk NR20 4DR

in conjunction with
ALGAO East
www.algao.org.uk

Editor: Brian Ayers
Managing Editor: Jenny Glazebrook

Editorial Committee:
Brian Ayers, County Archaeologist, Norfolk Museums and Archaeology Service
Owen Bedwin, Head of Historic Environment, Essex County Council
Adrian Tindall, County Archaeologist, Cambridgeshire County Council
Keith Wade, Archaeological Service Manager, Suffolk County Council
Peter Wade-Martins, Director, Norfolk Archaeological Trust

Set in Times Roman by Sue Anderson using Corel Ventura™
Printed by Henry Ling Limited, Dorchester

©ARCHAEOLOGY AND ENVIRONMENT DIVISION,
NORFOLK MUSEUMS AND ARCHAEOLOGY SERVICE

ISBN 978 0 905594 44 6

Funded by Norwich Cathedral and their 'Inspiration for the Future' campaign

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

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

Cover illustration:

Reconstruction of the refectory of Norwich Cathedral Priory as it may have appeared before the fire of 1272, based on historical records and surviving architectural evidence.
Drawing by Margaret Mathews. Reproduced with permission from Gilchrist (2005); copyright is retained by Margaret Mathews

Contents

| | | | |
|--|------|---|----|
| Contents | v | Copper alloy objects, by Julia Huddle with John Clark and Geoff Egan | 50 |
| List of Plates | v | Lead objects, by Julia Huddle with Geoff Egan | 52 |
| List of Figures | vi | Iron objects, by Julia Huddle | 53 |
| List of Tables | vi | Metalworking debris, by Lucy Talbot | 55 |
| Contributors | vii | Worked stone objects, contributions by Geoff Egan, David Buckley and Heather Wallis | 55 |
| Acknowledgements | vii | Vessel glass, by Alice Lyons with Hugh Willmott | 56 |
| Summary/Résumé/Zusammenfassung | viii | Prehistoric pottery, by Sarah Percival | 60 |
| | | Post-Roman pottery, by Richenda Goffin | 60 |
| Chapter 1. Introduction | | Ceramic tobacco pipe, by John Ames | 70 |
| Introduction | 1 | Antler, bone and ivory, by Julia Huddle | 71 |
| Geology, topography and location | 1 | Oyster shell palette, by Spike Bucklow, Sharon Cather and Andrea Kirkham | 72 |
| Archaeological and historical background | 1 | Parchment, by Heather Wallis | 73 |
| Project aims | 4 | | |
| Excavation methods | 4 | Chapter 5. Faunal and Environmental Evidence | |
| Site phasing | 6 | Animal, bird and fish bone, by Julie Curl | 74 |
| Publication and archive | 6 | Soil micromorphology, chemistry and magnetic susceptibility, by Richard I. MacPhail and John Crowther | 78 |
| | | | |
| Chapter 2. Excavation Results | | Chapter 6. Watching Brief Observations to the South and East of the Refectory | |
| Geology | 9 | Introduction | 81 |
| Pre Late 10th century (Period 1) | 9 | Late Saxon: 10th to late 11th century (Period 2) | 81 |
| Late Saxon: 10th to late 11th century (Period 2) | 9 | Medieval: late 11th century to 1538 (Period 3) | 81 |
| Medieval: late 11th century to 1538 (Period 3) | 16 | Post-medieval to modern: 1538 to 1873 (Periods 4 and 5) | 82 |
| Early post-medieval: 1538 to late 16th century (Period 4) | 22 | The finds, by Richenda Goffin and Julie Curl | 83 |
| Post-medieval to modern: late 16th century to 1873 (Period 5) | 26 | | |
| | | Chapter 7. Conclusions | |
| Chapter 3. Building Material and Structural Fittings | | Introduction | 84 |
| Introduction, by Heather Wallis | 31 | Late Saxon | 84 |
| Iron fixings, by Julia Huddle | 31 | Monastic | 85 |
| Lead objects and metalworking debris, by Julia Huddle | 32 | Early post-medieval | 89 |
| Worked and moulded building stone, by Stephen Heywood | 32 | Post-medieval | 89 |
| The polychrome decoration of the building stone, by Andrea Kirkham | 36 | Late 19th to early 21st century | 89 |
| Ceramic building material, by Sue Anderson | 36 | | |
| Window glass, by David J. King | 42 | Bibliography | 91 |
| Lead window comes, by David J. King | 47 | Index, by Peter Gunn | 97 |
| | | | |
| Chapter 4. The Finds | | | |
| Coins, tokens and jetons, by Adrian Popescu | 48 | | |

List of Plates

| | | | | |
|---|----|----------|--|----|
| Frontispiece View of Norwich Cathedral | ii | Plate 7 | Black and red decorative schemes on voussoir (WS189) | 35 |
| Plate 1 Late Saxon road | 14 | Plate 8 | Voussoir with black and red decorative scheme (WS272 and 273) | 37 |
| Plate 2 Late Saxon chalk surface | 14 | Plate 9 | Column with engaged shafts showing area of marbling — red over black (WS279) | 38 |
| Plate 3 Medieval respond base | 19 | Plate 10 | Red ochre scrollwork on a limewash ground (WS265) | 39 |
| Plate 4 Early post-medieval pit filled with demolition debris | 24 | Plate 11 | Lead cloth seals and gilded hand of figurine | 51 |
| Plate 5 Plan and elevation by John Henry Brown 1873 | 27 | | | |
| Plate 6 Shaft ring (WS409) with vermilion painted directly onto the stone | 33 | | | |

| | | | | | |
|----------|---|----|----------|---|----|
| Plate 12 | Glass vessels and ceramic dish with religious scene | 57 | Plate 16 | Medieval floor surface including tiles and tile impressions | 81 |
| Plate 13 | Oyster shell palette | 72 | Plate 17 | Looking towards the south transept. Watercolour by David Hodgeson, c.1832 | 88 |
| Plate 14 | Parchment | 73 | | | |
| Plate 15 | Animal bone | 76 | | | |

List of Figures

| | | | | | |
|---------|--|----|---------|---|----|
| Fig. 1 | Location maps | x | Fig. 19 | Section: south respond base and later pit | 20 |
| Fig. 2 | Plan showing areas of excavation and watching brief | 2 | Fig. 20 | Plan: tile impressions | 21 |
| Fig. 3 | Location of excavation trenches within the site | 5 | Fig. 21 | Plan: stone-lined pit | 21 |
| Fig. 4 | Suggested levels of underlying natural deposits | 5 | Fig. 22 | Section: stone-lined pit | 22 |
| Fig. 5 | Key to section conventions | 6 | Fig. 23 | Elevation: pier 2054 | 23 |
| Fig. 6 | Section: east–west section on line of northern ground beam | 7 | Fig. 24 | Section: Late Saxon pit and medieval water-pipe trench | 23 |
| Fig. 7 | Plan: location of identified buried soils and prehistoric features | 8 | Fig. 25 | Plan: early post-medieval features | 25 |
| Fig. 8 | Plan: Late Saxon phase 1 activity | 8 | Fig. 26 | Plan: post-medieval phase 2 | 25 |
| Fig. 9 | Plan: detail of Late Saxon phase 1 | 10 | Fig. 27 | Plan: post-medieval phase 3 | 28 |
| Fig. 10 | Section: Late Saxon wheel ruts and metallated road | 11 | Fig. 28 | Plan: post-medieval phase 4 | 28 |
| Fig. 11 | Section: Late Saxon pit and overlying medieval features | 12 | Fig. 29 | Finds: structural ironwork | 31 |
| Fig. 12 | Plan: Late Saxon phase 3 | 13 | Fig. 30 | Finds: worked stone | 32 |
| Fig. 13 | Plan: Late Saxon phase 5 | 13 | Fig. 31 | Finds: painted window glass | 45 |
| Fig. 14 | Plan: Late Saxon structural evidence, phases 3 and 5 | 15 | Fig. 32 | Finds: painted window glass | 46 |
| Fig. 15 | Section: Late Saxon post-holes and surfaces, and medieval make-up | 16 | Fig. 33 | Finds: copper alloy objects | 49 |
| Fig. 16 | Plan: medieval foundations and construction features | 17 | Fig. 34 | Finds: copper alloy objects | 52 |
| Fig. 17 | Plan: medieval floor bedding and later features | 17 | Fig. 35 | Finds: lead cloth seals | 53 |
| Fig. 18 | Section: northern respond base and wall footings | 18 | Fig. 36 | Finds: iron objects and stone object 785 | 54 |
| | | | Fig. 37 | Finds: vessel glass | 58 |
| | | | Fig. 38 | Finds: pottery | 67 |
| | | | Fig. 39 | Finds: pottery | 68 |
| | | | Fig. 40 | Finds: pottery | 69 |
| | | | Fig. 41 | Finds: pottery | 69 |
| | | | Fig. 42 | Finds: bone, ivory and antler objects | 71 |
| | | | Fig. 43 | Axonometric reconstruction of refectory of Norwich Cathedral Priory as it may have appeared before the fire of 1272 | 86 |

List of Tables

| | | | | | |
|---------|---|----|----------|---|----|
| Table 1 | Quantity of worked stone pieces by period | 35 | Table 7 | Quantity of Thetford-type ware by period | 64 |
| Table 2 | Quantification of ceramic building material by category | 40 | Table 8 | Summary of major pottery fabrics from Period 5 Group 67 | 66 |
| Table 3 | Late brick forms | 41 | Table 9 | Quantities of bone by period | 74 |
| Table 4 | Quantities of Roman tile by fabric | 41 | Table 10 | Quantities of the species recovered | 75 |
| Table 5 | Pottery by ceramic period | 60 | Table 11 | Chemical and magnetic susceptibility data | 79 |
| Table 6 | Pottery by fabric | 62 | Table 12 | Soil micromorphology and microfacies analysis | 80 |

Contributors

John Ames

Project Officer, Norfolk Archaeological Unit

Sue Anderson, BA MPhil PGDip MIFA FSA Scot

formerly Finds and Post-excavation Manager, Suffolk County Council, Archaeological Service

David Buckley, BSc FSA MIFA

formerly Heritage Conservation Manager, Essex County Council

Spike Bucklow, Phd

Senior Research Associate, Hamilton Kerr Institute

Sharon Cather

Senior Lecturer, Courtauld Institute of Art

John Clark, MA FMA FSA

Senior Curator, Medieval, Museum of London

John Crowther, MA Phd

Reader in Environmental Sciences, Dept. Archaeology and Anthropology, University of Wales, Lampeter

Julie Curl

Finds Researcher, Norfolk Archaeological Unit

David Dobson, Dip. Graphic Design

Senior Illustrator, Norfolk Archaeological Unit

Geoff Egan

Medieval and Later Finds Researcher, Museum of London Specialist Services

Maggie Foottit

formerly Graphics Assistant, Norfolk Archaeological Unit

Richenda Goffin, BA PGDip

formerly Finds Officer, Norfolk Archaeological Unit

Julia Huddle, BA

Finds Researcher, Norfolk Archaeological Unit

Catherine Hassall

polychrome specialist

Stephen Heywood, BA FSA

Conservation Officer, Norfolk County Council

David J. King, BA

window glass consultant, Corpus Vitrearum

Andrea Kirkham, BA MA

wall paintings and polychrome surfaces conservator

Graham Lott, Phd

British Geological Survey

Alice Lyons, BA

Finds Researcher, Norfolk Archaeological Unit

Richard I. Macphail, BSc MSc Phd

Senior Research Fellow, Institute of Archaeology, University College London

Adrian Popescu, Phd

Assistant Keeper, Dept. Coins and Medals, The Fitzwilliam Museum, Cambridge

Lucy Talbot

Finds Co-ordinator, Norfolk Archaeological Unit

Heather Wallis, BA MIFA

formerly Senior Project Officer, Norfolk Archaeological Unit

Hugh Willmott, BA MA Phd FSA MIFA

Lecturer, Research School of Archaeology, University of Sheffield

Acknowledgements

This archaeological project was designed and monitored by Roberta Gilchrist, Norwich Cathedral Archaeologist, on behalf of Norwich Cathedral and their 'Inspiration for the Future' campaign, which funded the excavation, assessment, analysis and publication of this project. The archaeological impact of this building scheme within The Close was assessed by Roberta Gilchrist who, in liaison with Andy Hutcheson (Norfolk Landscape Archaeology), prepared the brief for the archaeological works and monitored the progress of the project.

This project could only have been completed through the contributions of many individuals and thanks are expressed to everyone involved in the project. Andy Shelley set up and monitored the project on behalf of the Norfolk Archaeological Unit. The excavation was undertaken by the following Norfolk Archaeological Unit staff members, without whose skill and enthusiasm the project would not have been a success:

David 'Ghost' Adams, Clare Atton, Sarah Bates, Francesca Boghi, Mick Boyle, Cath Chisman, Hannah Coleman, Gareth Dean, Giles Emery, Fred Garrett, Richard Jackson, Neil Moss, John Percival, Chris Phillips, David Robertson, Euan Rutter, Andy Shelley, Charlotte Stokes, Katy Stronnach, Matt Town, Sophie Tremlett, Kerry Tyler, Simon Underdown, Danny Voisey, Pete Warsop and Charlotte Wymark. Jonathan Clark worked on site as a volunteer. The finds were processed by Lucy Talbot.

The enablement works and machine excavation were conducted by Bryn Williams Construction. Phil Thomas (Assistant Cathedral Archaeologist) assisted with the archaeological surveying. The co-operation of Mario Rackham and Roy Nichols of RG Carter Ltd (main contractors) during the later stages of the archaeological project was much appreciated. Thanks must also be expressed to members of the Dean and Chapter at

Norwich Cathedral who showed a keen interest in the archaeological project, and particularly to David Breeze for his help and co-operation throughout.

The cover image and Figure 43 were drawn by Margaret Mathews and are reproduced here by permission. The frontispiece was provided by Mike Page; Plates 6–10 by Andrea Kirkham, Plates 14 and 16 by Julie Curl and Plate 13 by Sharon Cather. Plates 1–4 and 15 are by Heather Wallis, Plates 11 and 12 by David Adams, Plates 5 and 17 were photographed by Gary Hacon and are reproduced by permission of the Norfolk Records Office and the Chapter of Norwich Cathedral. Site illustrations

are by David Dobson and the finds drawings by Maggie Footitt. David Dobson also edited and prepared all the figures and plates for publication.

I would like to thank Roberta Gilchrist, Stephen Heywood, Andrea Kirkham and Phil Thomas for so willingly sharing their specialist knowledge in answering many questions which have arisen.

Richard Macphail would like to thank Ian Clewes, who undertook the laboratory analysis of bulk microphology samples. David Buckley would like to thank Caroline Ingle for her input to his comment on the millstone.

Summary

A campaign to improve visitor and education facilities at Norwich Cathedral began in 1999. This campaign, 'Inspiration for the Future' involves the construction of new buildings within the west and south ranges of the cloister. Commencement of the first phase led to excavation of the area where the medieval refectory once stood. This revealed archaeological evidence of the Late Saxon, medieval and post-medieval periods and forms the subject of this report.

Excavation confirmed the long-held supposition that this area of Norwich was populated during the Late Saxon period. Timber buildings of both post-hole and beam slot construction were present, along with rubbish pits, many very substantial in size. A rutted trackway developed into a metalled road, its discovery adding to the ever-evolving street plan of Late Saxon Norwich. It was also apparent that this area was subject to changes in the local water table, and liable to flooding.

Late Saxon occupation here was brought to a sudden halt by the acquisition of the land for the building of the Norman cathedral in the later years of the 11th century. The refectory, which has been described as one of the most magnificent in Europe, was built during the 1120s but largely demolished during the years following the Dissolution. An extensive programme of groundworks was carried out in the 12th century, prior to construction of the refectory, with the area being levelled. Unfortunately, later use of the site has destroyed most of the evidence

relating to the refectory itself. Despite this the level of the floor was established and footings for opposing responds were recorded. These would have supported an arcade, separating the high end from the main hall.

Following the Dissolution, not only the refectory but many of the conventual buildings were demolished. In the period from 1538 to 1620, large pits were dug across the site of the former refectory and it was used for the dumping of demolition debris on a massive scale. Surprisingly, of the identifiable rubble very little originated from the refectory building itself. Architectural fragments were found, including some with painted designs from the infirmary and chapter house, along with painted window glass which probably originated from the Lady Chapel.

In 1620 the western third of the site was the location for part of a prebendary's house and its associated outhouses, the rest being established as a garden. This remained the case, with minor alterations to layout, until 1873 when works, undertaken specifically to reduce the risk from fire, included the demolition of the prebendary's house. At this time 'restoration' work was carried out to the remaining medieval structure, and the area which had once served as the monk's refectory was left open as a garden plot. It remained so until archaeological work began in 2001.

Résumé

L'année 1999 marque le début d'une campagne visant à améliorer les installations de la cathédrale de Norwich pour les visiteurs et les élèves. Cette campagne appelée 'Inspiration for the Future' comprend la construction de nouveaux bâtiments dans les parties ouest et sud du cloître. La première phase des travaux d'amélioration a commencé par la fouille du site à l'emplacement du réfectoire médiéval. Cela a permis de découvrir des traces archéologiques des périodes saxonne tardive, médiévale et post-médiévale.

Les fouilles ont confirmé l'hypothèse déjà ancienne selon laquelle cette zone de Norwich était peuplée pendant

la période saxonne tardive. On a trouvé des bâtiments en bois construits à l'aide de poutres et de poteaux enfoncés dans le sol, ainsi que des fosses contenant des déchets, dont beaucoup étaient très grandes. C'est pendant la période saxonne tardive qu'on est passé d'une chaussée défoncée à une route pourvue d'un revêtement, dont la découverte est venue s'ajouter au plan sans cesse remanié de la ville. Il est également apparu clairement que les nappes d'eau de cette zone connaissaient des fluctuations et qu'il y avait des risques d'inondation.

Dans les dernières années du onzième siècle, l'occupation saxonne tardive fut brusquement interrompue

par l'acquisition du terrain destiné à la construction de la cathédrale normande. Le réfectoire, qui était considéré comme l'un des plus beaux d'Europe, fut construit au cours des années 1120 mais il fut démolé en grande partie pendant les années qui ont suivi la dissolution des monastères. De grands travaux de préparation furent lancés avant la construction du réfectoire afin d'aplanir le niveau du sol et malheureusement, les traces de la construction elle-même disparurent en grande partie lors de l'utilisation ultérieure de cette zone. Malgré cela, on a pu déterminer le niveau du sol et repérer l'emplacement de piliers en opposition. Ils devaient probablement soutenir une arcade qui séparait l'extrémité de la salle centrale du réfectoire.

La dissolution des monastères fut suivie par la destruction du réfectoire et de nombreux bâtiments conventuels. Entre les années 1538 et 1620, de larges fosses furent creusées sur tout le site car la zone de l'ancien réfectoire fut transformée en grands dépôts de gravats. D'une façon étonnante, une quantité très limitée

des débris identifiables provenait du réfectoire lui-même. On a trouvé des fragments architecturaux qui comprenaient parfois des motifs peints provenant de l'infirmerie et du chapitre, ainsi que des parties de verre également peint qui venaient probablement de la Lady Chapel.

En 1620, le tiers du site situé à l'ouest était en partie occupé par la maison d'un prébendier avec ses dépendances, le reste du site étant transformé en jardin. En dehors de quelques différences d'agencement, l'ensemble est resté en l'état jusqu'à l'année 1873 où la maison du prébendier fut détruite à l'occasion de travaux destinés uniquement à réduire les risques d'incendie. Des travaux de restauration furent entrepris sur la partie du bâtiment datant du Moyen Age, et l'espace qui était occupé par le réfectoire du monastère devint un jardin ouvert. Cette zone est restée en l'état jusqu'au début des travaux archéologiques en 2001.

(Traduction: Didier Don)

Zusammenfassung

1999 wurde eine Kampagne zur Verbesserung der Besucher- und Bildungseinrichtungen in der Norwich Cathedral gestartet. Zu der Kampagne mit dem Titel »Inspiration for the Future« gehört auch der Bau neuer Gebäude im West- und Südteil des Kreuzgangs. In der ersten Phase der geplanten Verbesserungen wurden an der Stelle, an der einst das mittelalterliche Refektorium stand, Ausgrabungen vorgenommen. Dabei kamen Funde aus der spätsächsischen Zeit, dem Mittelalter und dem Nachmittelalter ans Licht.

Die Ausgrabung bestätigte die lang gehegte Annahme, dass dieser Teil Norwichts in der spätsächsischen Zeit besiedelt war. Neben Holzbauten in Pfosten- und Ständerbauweise wurden auch Abfallgruben gefunden, von denen etliche sehr umfangreich waren. Ein ausgefurchter Weg wurde in dieser Periode in eine Schotterstraße umgewandelt, deren Entdeckung einen weiteren Mosaikstein in dem sich immer mehr verdichtenden Straßenplan des spätsächsischen Norwich bildet. Ebenso war zu beobachten, dass das betrachtete Gebiet Schwankungen beim Grundwasserspiegel unterlag und zur Überflutung neigte.

Die spätsächsische Besiedlung kam durch den Erwerb des Landes zum Bau der normannischen Kathedrale gegen Ende des 11. Jahrhunderts zu einem jähen Ende. Das Refektorium, das als eins der schönsten in Europa galt, wurde in den 1120er Jahren erbaut und in der Zeit nach der Auflösung der Klöster weitgehend zerstört. Vor Baubeginn des Refektoriums wurde die Stätte durch umfangreiche Erdarbeiten eingeebnet. Leider hat die spätere Nutzung des Areals den größten Teil der Hinweise

auf das Refektoriumsgebäude selbst zerstört. Allerdings war es möglich, das Fußbodenniveau und die Fundamente gegenüber liegender Halbpfeiler zu bestimmen, die offenbar eine Arkade trugen, die das obere Ende von der Haupthalle abtrennte.

Nach der Auflösung der Klöster wurden neben dem Refektorium auch zahlreiche andere Klostergebäude abgerissen. In dieser Periode zwischen 1538 und 1620 wurden auf dem gesamten Gelände große Gruben ausgehoben, da der Ort, an dem das Refektorium gestanden hatte, zur Ablagerung großer Schuttmengen benutzt wurde. Überraschenderweise stammte nur ein kleiner Teil des identifizierbaren Abrissmaterials vom Refektorium selbst. Unter den gefundenen Baufragmenten befanden sich Malereien aus dem Kranken- und dem Kapitelsaal sowie bemaltes Fensterglas, vermutlich aus der Lady Chapel.

1620 stand auf dem westlichen Geländedrittel ein Teil des Benefiziatenhauses samt zugehörigen Nebengebäuden, während das restliche Gelände in einen Garten umgewandelt worden war. Dies blieb — abgesehen von einigen gestalterischen Änderungen — bis 1873 so. Dann wurde bei Arbeiten, die vor allem dazu dienten, das Feuerrisiko zu mindern, das Benefiziatenhaus abgerissen. Die restlichen Teile aus dem Mittelalter wurden »restauriert« und das Areal, das den Mönchen als Refektorium gedient hatte, als offenes Gartenstück belassen. Dies war der Zustand des Geländes zu Beginn der archäologischen Arbeiten im Jahr 2001.

(Übersetzung: Gerlinde Krug)

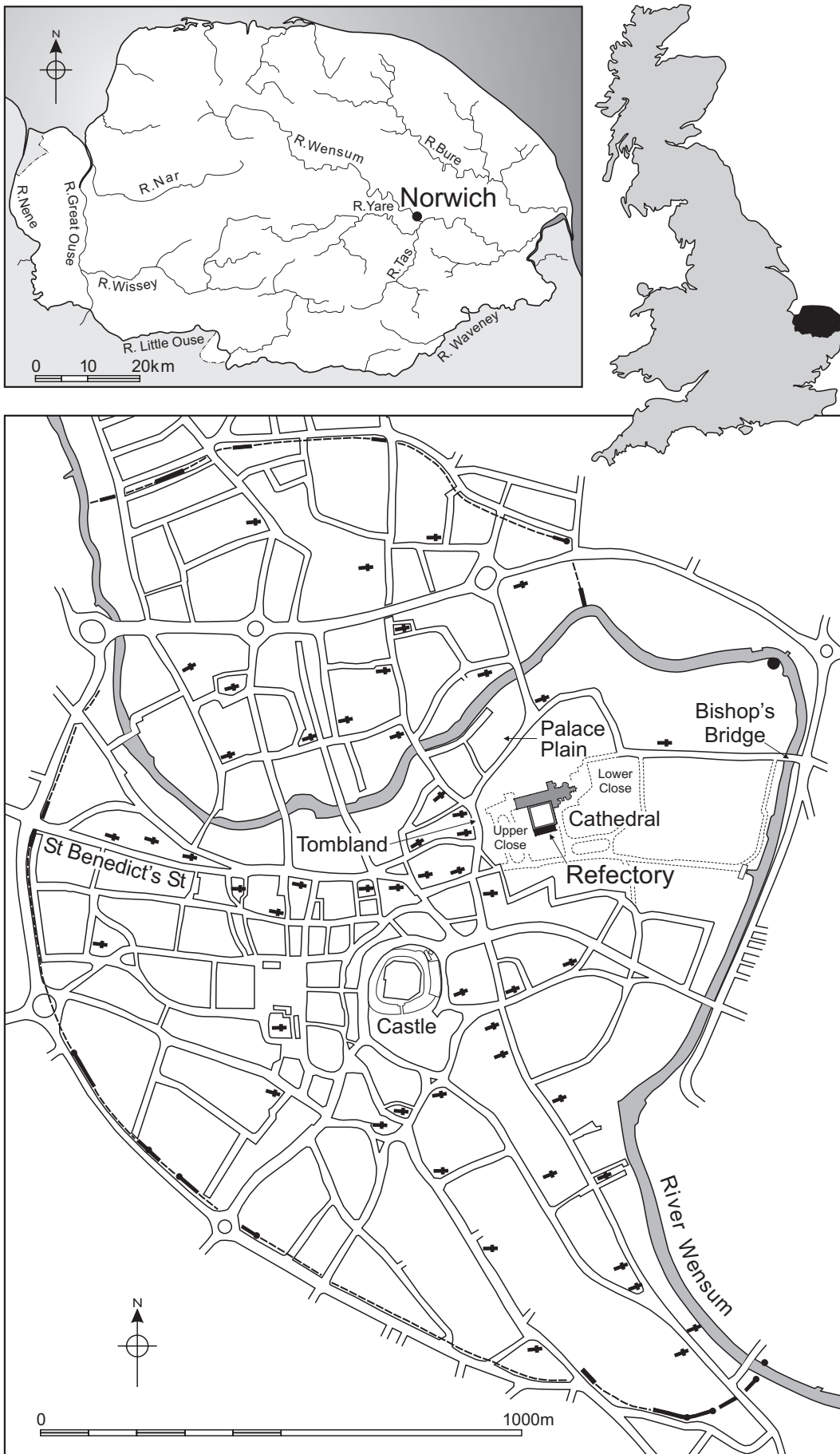


Figure 1 Location maps. Scale 1:12500

Chapter 1. Introduction

Introduction

The 'Inspiration for the Future' campaign was launched by Norwich Cathedral in 1999 with the aim of improving visitor access and information while at the same time transforming redundant areas within the Cathedral Close. The area affected by this work was mainly contained within the confines of the ruinous medieval refectory which had occupied the southern cloistral range. Additional works also investigated small areas within the medieval infirmary garden, the eastern range of the cloisters (below the dormitory) and the chapter house. In preparation for the building work, evaluation excavations (Shelley 1996), a desk-based assessment of the documentary records (Gilchrist 1994) and an assessment of the upstanding building remains (Smith 1996) were carried out. These were combined to form an archaeological report to accompany the planning application (Gilchrist 1997) and deposited with the Norfolk Historic Environment Record. Following this, in the summer of 2001, large-scale excavations covering an area of 47m × 10m commenced, with archaeological work continuing intermittently until spring 2003.

This work was carried out by the Norfolk Archaeological Unit (NAU) to meet the archaeological requirements set by Norfolk Landscape Archaeology and the Consultant Archaeologist, Norwich Cathedral (Hutcheson and Gilchrist 2001; Hutcheson and Gilchrist 2002) and according to method statements prepared by the Norfolk Archaeological Unit (Shelley 2001a; 2001b; 2002). The work was commissioned and funded by the Dean and Chapter, Norwich Cathedral.

Geology, topography and location

Norwich Cathedral is located on the south bank of the River Wensum within a broad curve formed by a long bend in the river (Fig. 1). Much of its close encompasses the low-lying land of the river valley, although from a point at the eastern edge of the Lower Close the land rises relatively steeply with the cathedral church occupying the eastern extreme of this higher ground. The natural subsoil is riverine gravels, sands and silts which overlie the Upper Chalk. The low-lying nature of the area between the cathedral and the river leaves it vulnerable to flooding, a circumstance which has probably not altered to any great extent over the last thousand years.

The excavation was sited within the south range of the cathedral cloister (TG 623506 308806 to centre), the area once occupied by the medieval refectory (Fig. 2). The original medieval fabric of the refectory walls remains on three sides and the location of the west wall is indicated by scars on the north wall just beyond the west edge of the excavation. The north wall had twenty-four windows (restored in the late 19th century) a pattern which was presumably mirrored on the south side. The interior was decorated with blind arcading, above which was an intramural passage. A stair turret from ground to passage

level survives in the south-east corner and fragmentary remains of a similar turret survive in the north-west corner. Whittingham (1949) suggests that a stair turret may also have been present in the south-west corner.

Archaeological and historical background

Little is known, with any certainty, about the area prior to the construction of the cathedral and associated monastery. Evidence relating to the prehistoric, Roman and Early Saxon periods is scarce. It is thought that an east-to-west aligned Roman road traversed the cathedral precinct *c.* 70m north of the site, from the crossing point of the River Wensum at Bishop Bridge to Princes Street and on to St Benedict's Street, possibly running under the present cathedral church (Ayers 2003, 21).

Evidence of Middle Saxon occupation in this part of the city is very limited. Some sherds of Ipswich Ware pottery, which is diagnostic of this period, have been found to the north of the cathedral (Wilson and Hurst 1957, 148; Atkin and Evans 2002).

It was during the Late Saxon period that Norwich developed into a town of social and economic importance, with the presence of the Danes influencing the development of the settlement in the late 9th and early 10th centuries, particularly on the north bank of the Wensum (Ayers 2003, 27–34). Continuing archaeological work has indicated that the town's focus had changed to the south bank by the early part of the 11th century. The study of the surrounding street alignments along with recent excavation results has suggested that a Late Saxon gridded street pattern existed on this the south bank of the river (Ayers 2003, 39). Late Saxon market places are known to have occupied areas to the west (Tombland) and north (Palace Plain) of the present Cathedral Close (Fig. 1). Both of these areas were associated with churches of an early foundation, and a further four, probably pre-Conquest churches were located within the area of the close (Ayers 2003, fig. 26). For a more detailed discussion of Late Saxon activity in the area later occupied by the cathedral precinct the reader is referred to Ayers (1996). The Late Saxon activity in Norwich was curtailed after the Conquest of 1066, when the land was obtained for the construction of both the castle and cathedral.

The church and monastic buildings at Norwich were arranged following the plan of St Gall (discussed in detail by Horn and Born 1979). This layout, drawn up between 816 and 836, was later adopted by many Benedictine monasteries. The cloister lay to the south of the church with the dormitory being housed in the east range, the refectory in the south range and the guest rooms (the hostry) in the west range. One difference between the St Gall plan and that of Norwich Cathedral was the addition of the chapter house within the east cloistral range. This development of the monastic plan was first seen at Cluny and became a common feature of monasteries throughout Europe (Braunfels 1993).

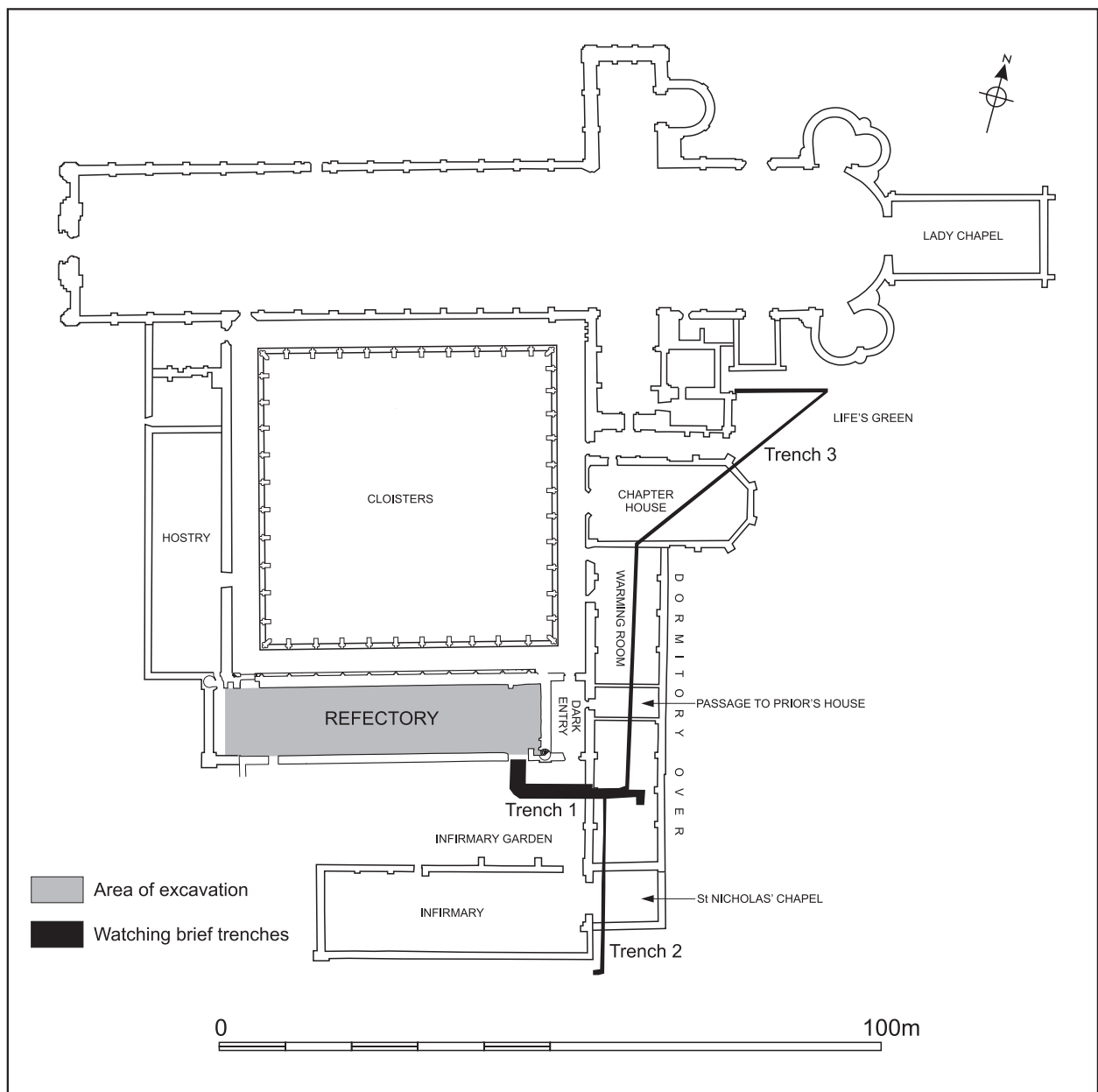


Figure 2 Plan of cathedral church, cloisters and selected monastic building to the south and east showing location of areas of excavation and watching brief (based on Whittingham 1949). Scale 1:1000

The history of the diocese of East Anglia is not easy to extract from the historical record but is fully discussed by Campbell (1996). In summary, it was formed *c.*630 and divided into two in the later years of the 7th century with the Saxon Sees thought to be located at Hoxne (Suffolk) and Elmham (Norfolk). After the Conquest Bishop Herfast transferred the See to Thetford in 1071. However, he had ambitions to move the See to the rich abbey at Bury, which he pursued from 1075 until he abandoned these attempts in 1081 following royal intervention (Margeson, Seillier and Rogerson 1994, 41; Dodwell 1996, 37). In 1090 the bishopric was acquired by Herbert de Losinga who had previously served as prior at Fecamp in Normandy. This practice of appointing Normans as bishops was one rigorously followed by William I (Chibnall 1993, 42), recognising the potential of such appointments as tools for the implementation of Norman rule. The See was finally moved from Thetford to Norwich in 1094, a relocation probably influenced by an

order of Archbishop Lanfranc that the Norman Sees should be moved to the economic centres of dioceses (Pevsner and Wilson 2002, 189).

It is apparent however, that plans were afoot before 1094 for the removal of the seat of the bishopric from Thetford to Norwich. Acquisition of the necessary land had begun prior to 1086 as the Domesday book refers to William I gifting land to Bishop Herfast (1070–85) for the principal seat of the bishopric (Brown 1984, 117a). It has been suggested that this occurred as early as 1075 (Tillyard 1987, 134), although at this time Herfast was attempting to obtain the wealthy abbey at Bury. Other suggested dates are 1081 (Ayers 1996, 71–2) and 1084 (Pevsner and Wilson 2002, 191). Further land was granted in *c.*1096, 1101 and 1106 (full details of the documentary evidence can be found in Tillyard 1987, 134–6, fig. 96). It is not known at what time the close as it is today was defined, although Pevsner dates the earliest parts of the existing precinct walls to the late 11th or 12th centuries,

contemporary with the construction of the cathedral (Pevsner and Wilson 2002, 224).

Much of what is known of the original form of the refectory is an interpretation of the surviving architectural elements, along with comparative evidence from other priories. This is supplemented by documentary evidence and antiquarian accounts and descriptions of the dilapidated building. These features include a daïs (reference from 1299) for the presiding table (1319) at the east end of the hall and a pulpit (in 1306 cover purchased for pulpit or lectern) from which readings would have been made to the monks as they otherwise observed a rule of silence throughout their meals (Gilchrist 1997, 12). The position of this within the refectory is not known although examples from other priories suggest it was usually located on the south wall, towards the daïs end of the hall. The building itself was built on a grand scale and unlike other priories, where storerooms lay under a first-floor dining hall, the refectory at Norwich occupied the full height of the range. It was highly decorated with interlaced blind arcading running round the four interior walls (one short section survives in the south-east corner), above which was an intra-mural passage. Documentary evidence has revealed that the refectory was plastered and painted in 1289 and 1314 and paved in 1455 (Gilchrist 1997, 12). The room was lit by candelabras in 1451 (Gilchrist 1997, 12) and the windows were frequently repaired. Mention is also made of a storeroom with windows and a pipe leading to it in 1411 in the Communars Rolls of 1478 (Gilchrist 1997, 12). A more detailed discussion of the medieval refectory and the other cloistral ranges can be found in Gilchrist (2005).

Relations between the cathedral church and the citizens of Norwich were always strained with disputes occurring throughout the lifetime of the monastery. One of the most explosive conflicts took place in 1272 when, during a civil riot, many of the buildings in the close were damaged, if not destroyed, by fire. An account compiled a few years later records how 'fire consumed the whole church...Moreover they burned the dormitory, the refectory, the guest hall, the infirmary and its chapel and indeed almost all the buildings within the precincts of the monastery' (Tanner 1996, 260).

The refectory remained in use up to the time of the Dissolution of the monasteries and the suppression of the cathedral-priories by Henry VIII, which had an instant and immediate impact on all religious houses (the single exception being St Benet's Abbey, Norfolk which was never dissolved). The church at Norwich Cathedral survived due to the fact it served a dual role as the mother church of the diocese as well as the church of the monastery (Williams and Cozens-Hardy 1953, 5). In instances such as this the bishop remained at the reformed institution, the prior was succeeded by a dean and monks were replaced by canons (Braunfels 1993, 153). At Norwich most of the personnel of the reformed church had also served within the monastic community. The last prior (William Castleton) became the first dean, and twenty-one of the monks were appointed within the new establishment; five became prebendaries and sixteen were made canons (Houlbrooke 1996, 507). Although the personnel remained unchanged, the monastic way of life was no longer practised, which in practical terms meant the destruction of many of the communal buildings

including the refectory, hostry, dormitory and chapter house.

The suppression of the cathedral priory not only caused the destruction of many of the buildings within the close, it also was the instigator of the subsequent rebuilding. With the demise of communal life, individual housing was required for the prebendaries and canons of the refounded cathedral. This led to the adaptation of many of the outlying buildings within the close, such as the bakery, brewhouse, granary and infirmary, as well as the re-use of areas above and adjacent to the cloister for housing (including the refectory). Fragmentation of the communal life was promoted by the acceptance of clerical marriage between 1549 and 1553 and again after 1558 (Houlbrooke 1996, 518), although some elements of communal living continued under the Dean and Chapter. It is recorded that the Deanery and the Canons' Hall shared a kitchen under the south end of the east range until the demolition of these buildings under Dean Suckling (1614–28) (Whittingham 1985, 104). The low value of the prebendaries stipend also encouraged the disintegration of the community as additional income had to be sought elsewhere in order to keep a house and family. Many took work which kept them out of the city for long periods of time, so buildings within the close were sub-let. This, along with the fact that by the later 15th century there were many shops in the precinct (Atherton 1996, 635), led the close to develop in much the same way as the city outside the precinct. The inhabitants and others complained of 'tippling, 'necessary houses', blocked drains and rubbish, the sort of complaints to be found in any early-modern community' (Atherton 1996, 638).

During the 16th century the cathedral entered a period of financial difficulty when it could not afford to maintain all the buildings (Houlbrooke 1996, 529), some of which were demolished to provide an income by selling off the salvaged building material (Atherton 1996, 638). This is thought to have been the fate of the Lady Chapel which was demolished during the reign of Elizabeth I (1558–1603) when the lead was stripped from the roof (Sansbury 1994, 32).

Life at the cathedral and in the close was dramatically disrupted during the years of the Civil War. Parliament confiscated the property not only of the cathedral chapters (for the parliamentary survey of properties belonging to Norwich Dean and Chapter see Metters 1985) but also that of all individuals who were thought to oppose it. Several bishops were expressly named including Joseph Hall, then Bishop of Norwich (Ketton-Cremer 1985, 225). The church itself was ransacked with windows being smashed and monuments and graves destroyed or defaced. For a period of almost fifteen years the cathedral existed in a void without an institution to regulate and maintain it. This situation led to a battle contested by the city, the county and the inhabitants of the close for authority within the close (Atherton and Morgan 1996, 557). Order was not resumed until 1660 when the Dean and Chapter was re-established. Its work during the following years concentrated not only on re-establishing services and the recovery of land and rights, but also the repair of buildings (Atherton and Morgan 1996, 559).

The late 17th century saw dramatic changes within the close. It became a fashionable place to live, favoured by country gentry when they moved to the city (Atherton 1996, 640). This trend continued and Chase's *Norwich*

Directory (Chase 1783) listed clergymen, attorneys, land agents and gentlewomen as living in the close. Seventy years later the census showed a change in the occupations of residents with an increasing number of professional men and some manual workers mixed in with the clergy (Wilson 1996, 576).

The late 18th and 19th centuries witnessed a 'tidying up' of the close along with a revival of appreciation of Romanesque architecture. For the first time consideration was given for the setting of the cathedral and this led to the demolition of many of the post-medieval domestic buildings, the opening up of vistas and the restoration of many of the early medieval façades (Atherton 1996, 644–5). In 1829–32 the buildings which crowded in front of the south transept, on the site of the east cloistral range, were demolished and Salvin remodelled the façade of the south transept (Cocke 1996, 714). Further demolition took place in the latter years of the 19th century in order to reduce the risk of fire in and around the cloisters (Gilchrist 1997, 13). This program of work included the demolition of buildings within the area of the former refectory and restoration of the surviving medieval fabric. The area of the former refectory remained unused until development commenced in 2001.

Project aims

The primary objective of the project was to further archaeological knowledge of the refectory and its relationship to the cloister complex whilst adhering to a policy of preservation *in situ* wherever possible (Shelley 2001a). Following assessment of the data recovered from the fieldwork eight specific aims for the analysis were identified (Wallis 2002a). These were:

- to establish the level of the natural ground surface;
- to identify any Middle Saxon or earlier activity;
- to examine the Late Saxon occupation of the area;
- to determine land use in the period between the Late Saxon occupation and the construction of the refectory;
- to outline the construction methods used for the refectory and establish the medieval floor level within the building;
- to locate and interpret any internal structures;
- to assess the evidence for the destruction of the building and determine the land use in the century following the suppression of the priory; and
- to format a chronology of events during the post-medieval and modern periods.

Excavation methods

Prior to excavation, enabling works were carried out by NAU which removed the trees and shrubs, demolished two 20th-century staircases and widened the eastern entrance in the south wall by the removal of post-medieval fabric. In each of these three areas the structure and fabric of the builds were described and photographed prior to demolition.

The archaeological work was undertaken in four phases, with additional observations being made under watching brief conditions as building work was taking place. The work was phased in order to facilitate conservation of the upstanding fabric and to allow

archaeological findings to be taken into account when finalising the design of the new building. Of paramount importance was the principle of preservation *in situ*, minimising the impact on below-ground archaeological deposits and above-ground medieval structures (Hutcheson and Gilchrist 2001).

Prior to work commencing, the area of the former refectory was a garden with a level of *c.*6.5m OD, although raised beds existed at each end. To the north of the site, the floor level within the cloister is at *c.*4.75m OD while to the south the area slopes from 5.8m OD at the west to 4.7m OD at the east. These levels indicated that a considerable build up of soil had occurred over the years.

Phase 1 involved reducing the overall area (47 x 10m) by *c.*1m to a formation level of 5.4m OD. This was carried out in two parts, with the northern half being excavated before the southern half to allow early access for conservation of the north refectory wall. Initial excavation was by machine with each *c.*0.2m spit being metal detected. Once a horizon with archaeological features was reached all the remaining excavation work was undertaken by hand. A further 1m of deposits was hand-excavated from an area (6.1m x 4.8m) in the north-east corner of the site (Fig. 3 'lobby' and 'lift pit'). Further excavation in this area was also undertaken during Phase 3 works.

Phase 2 consisted of the hand excavation of two ground beam trenches and a lift pit for the proposed building. Each area required archaeological deposits to be excavated to a set formation level (4.2m OD for the southern ground beam, 3.4m OD for the northern ground beam and 2.95m OD for the lift pit). Shoring was required in all of these areas. If archaeological deposits continued below the formation level and the shoring provision was sufficient, excavation continued until natural soil was reached.

Each of the ground beams was divided into six almost equal lengths (Fig. 3) and for safety reasons alternate segments of each ground beam were initially excavated (T1, T3 and T5, T7, T9 and T11). Once these had been backfilled, the remaining segments (T2, T4 and T6, T8, T10 and T12) were excavated.

Phase 3 work consisted of the excavation of eleven small areas across the site (Fig. 3, Trenches 13–23) to the set dimensions and formation level required by the planned development. This was undertaken by hand, with the exception of Trench 16 which was excavated by machine because it was located largely within a backfilled cellar.

Phase 4 excavation encompassed an area 3.5m x 2.6m, located towards the south east corner of the site, which joined the previous excavations of the lobby, lift pit and Trenches 6 and 17/22 (Fig. 3). Hand excavation was carried out to a formation level of 4.55m OD.

Watching Brief work was carried out both within and beyond the area of the refectory (Figs 2 and 3). Within the site the ground beam trenches were re-excavated by machine, and the fills from features which had extended too deep for hand excavation were recorded. The footings for a new west wall were monitored, along with the deepening of some of the Phase 3 trenches and the excavation of service runs. Outside the refectory the service trenches ran the full length of the eastern cloistral range and through the chapter house (Fig. 2 and Chapter 6).

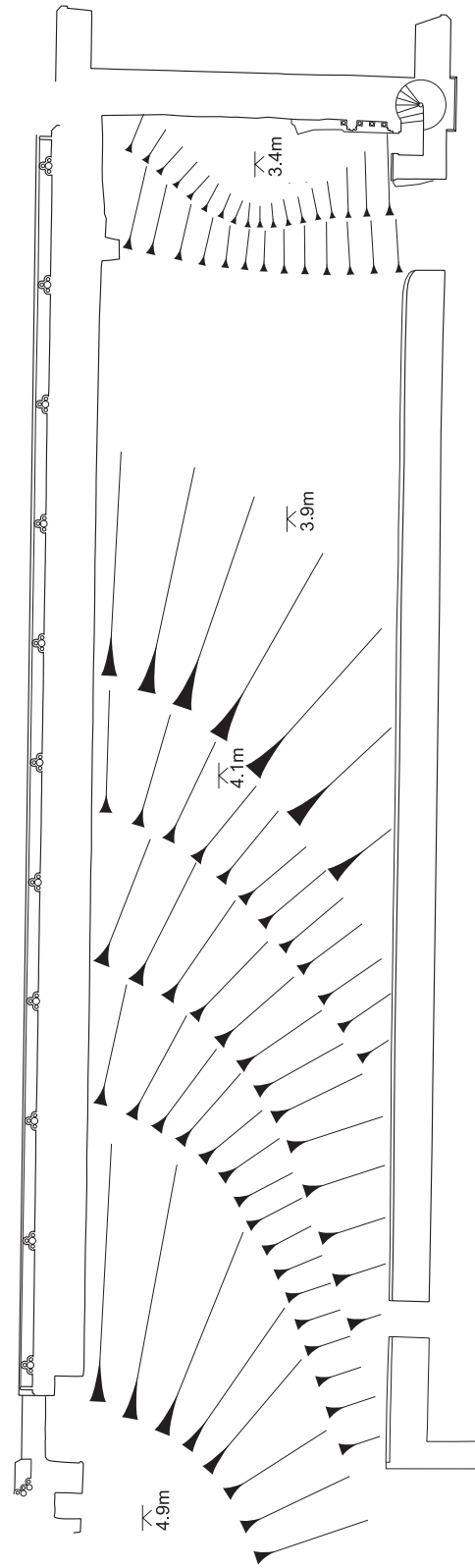
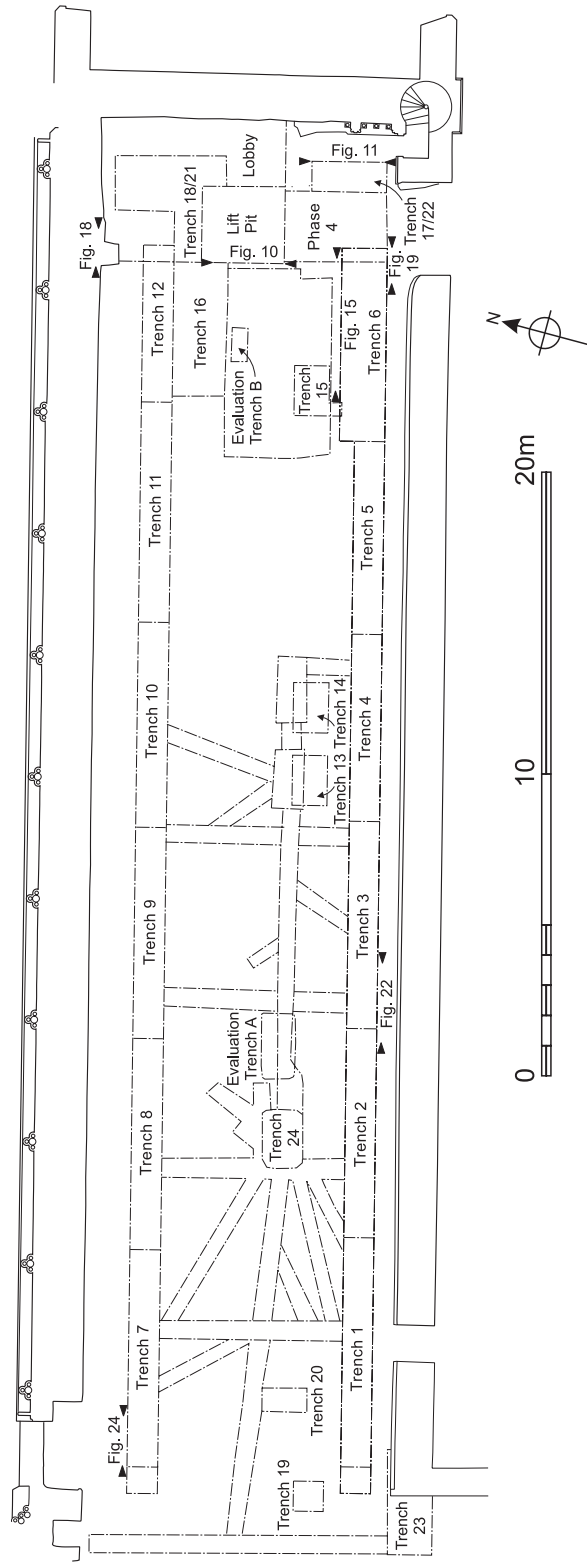


Figure 3 (above) Location of excavation trenches within the site. Scale 1:250
 Figure 4 (below) Suggested levels of underlying natural deposits. Scale 1:250

Photogrammatic survey of the newly exposed faces of the north, east and south refectory walls was undertaken by Phil Thomas, Assistant Cathedral Archaeologist, with the assistance of staff from the Norfolk Archaeological Unit and the results are archived at Norwich Cathedral.

Site phasing

An initial assessment of the Phase 1 and 2 material was made. This showed that well-stratified archaeological deposits, resulting from continuous use of the site from the Late Saxon period through to the late 19th century, survived. Using the historical framework of the site with this stratigraphic evidence and the spot-dates from the pottery, six main periods were defined (Wallis 2002a). These are:

| | | |
|----------|------------------|-----------------------------|
| Period 1 | Pre-950 | |
| Period 2 | c.950 to c.1094 | Late Saxon/Saxo-Norman town |
| Period 3 | c.1094 to c.1538 | Monk's refectory |
| Period 4 | c.1538 to c.1620 | Early post-medieval |
| Period 5 | c.1620 to c.1873 | Prebendary's residence |
| Period 6 | c.1873 to 2001 | Modern |

Deposits from Phases 3 and 4 and the Watching Brief were incorporated into this framework. A formal assessment was also completed for the Phase 3 work (Wallis 2002b).

Not all periods were equally represented in the archaeological record as features dating mainly from the late 16th century had truncated the earlier deposits across much of the area. This is well illustrated by the east to west section through the deposits (Fig. 6). Clearly apparent is the amount of disturbance which occurred in the early post-medieval period following the suppression of the priory which heavily truncated the Late Saxon and particularly the medieval deposits. Despite this truncation it has been possible to subdivide these main periods of activity.

The Late Saxon activity has been separated into five sub-phases based largely on stratigraphic relationships and the relative levels (metres OD). Consideration was also given to the proportion of general early medieval wares (mid 11th–12th centuries) to Thetford-type wares

(10th–11th centuries) in the pottery assemblages of the different sub-phases. Likewise Period 3 observations have been divided into three sub-phases. During Period 5 the area of excavation fell into two different post-medieval properties, so evidence for each property is considered separately. Again sub-phases have been defined, although exact dates cannot be put to the divisions.

Publication and archive

The stratigraphic chapter of this report presents the data chronologically. The artefactual data is presented in two chapters, the first of which is limited to artefacts and material relevant to building construction.

The piecemeal excavation of many of the lower deposits has meant that a single feature may often have more than one context number in the site record. For simplicity only one of these numbers is used in this text. Numbers prefixed with *G* (e.g. *G102*) are group numbers issued during the analysis of the data. They bring together several related contexts and are included in the text to ease the cross-referencing of finds to the stratigraphic data and also serve as a useful link to the full site archive. It should also be noted that the majority of the site plans and sections published here are to some extent interpretative, and are not exact copies of the excavation record. This again is the result of having to integrate many different areas of excavation and recording during the analysis of the data. All sections have the same datum level of 5.2m OD marked, as this is thought to be the approximate level of the refectory floor.

Many documentary records relating to the cathedral survive. These cover both the medieval and post-medieval periods and have been catalogued by Meeres (1998). However, no study of the primary documentary records took place as part of the post-excavation programme, since a search was made prior to the commencement of the project (Gilchrist 1997). This, along with other secondary source material, has been used to form the historical framework within which the archaeological evidence sits.

The full archive (site code 226N) is held by the Norfolk Museums and Archaeology Service and can be consulted on request.

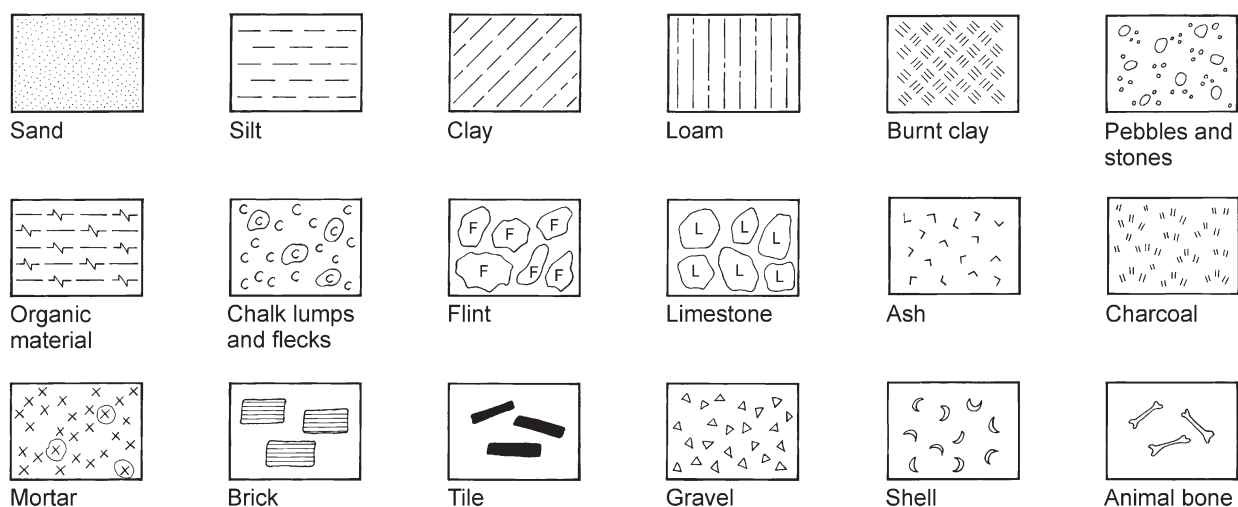


Figure 5 Key to drawing conventions used in sections

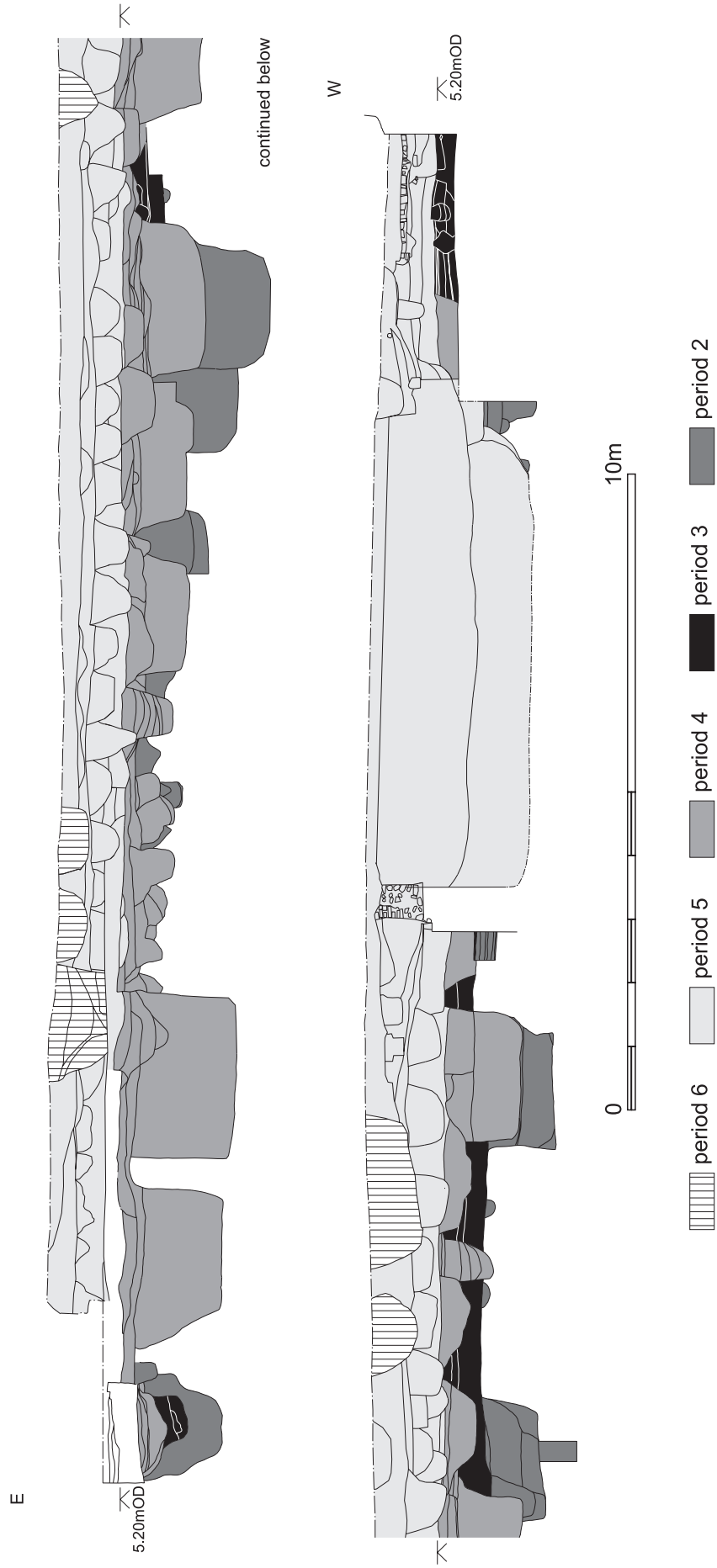


Figure 6 East-west composite section on line of northern ground beam showing level of truncation by post-Dissolution features

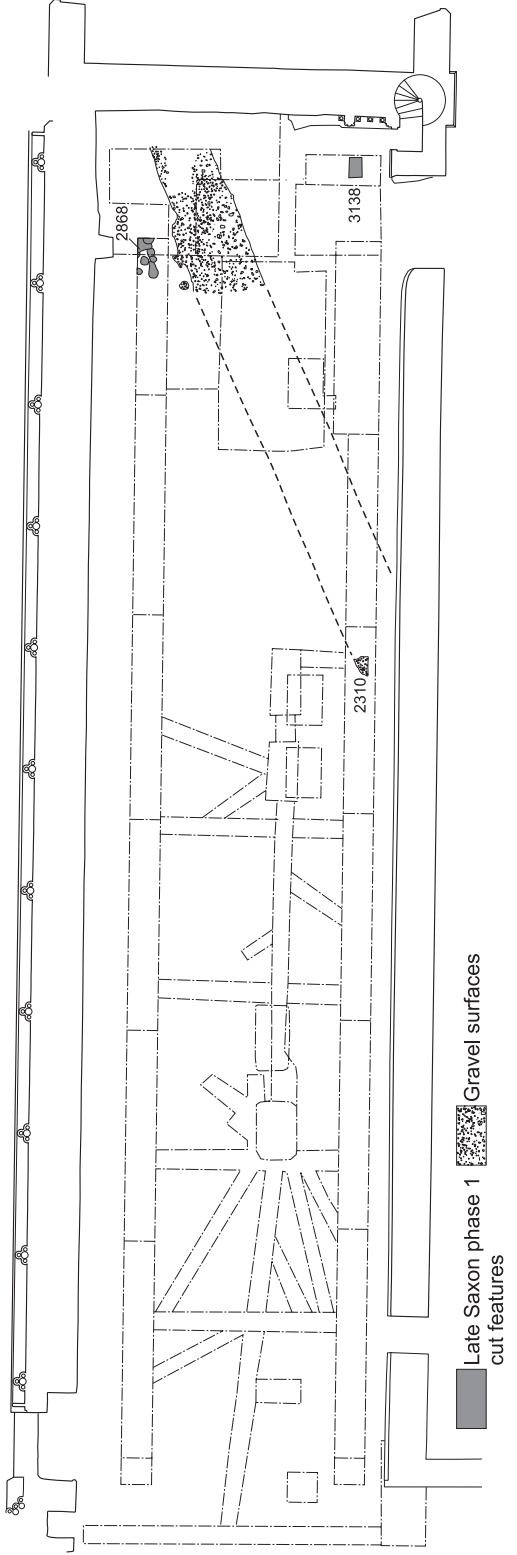
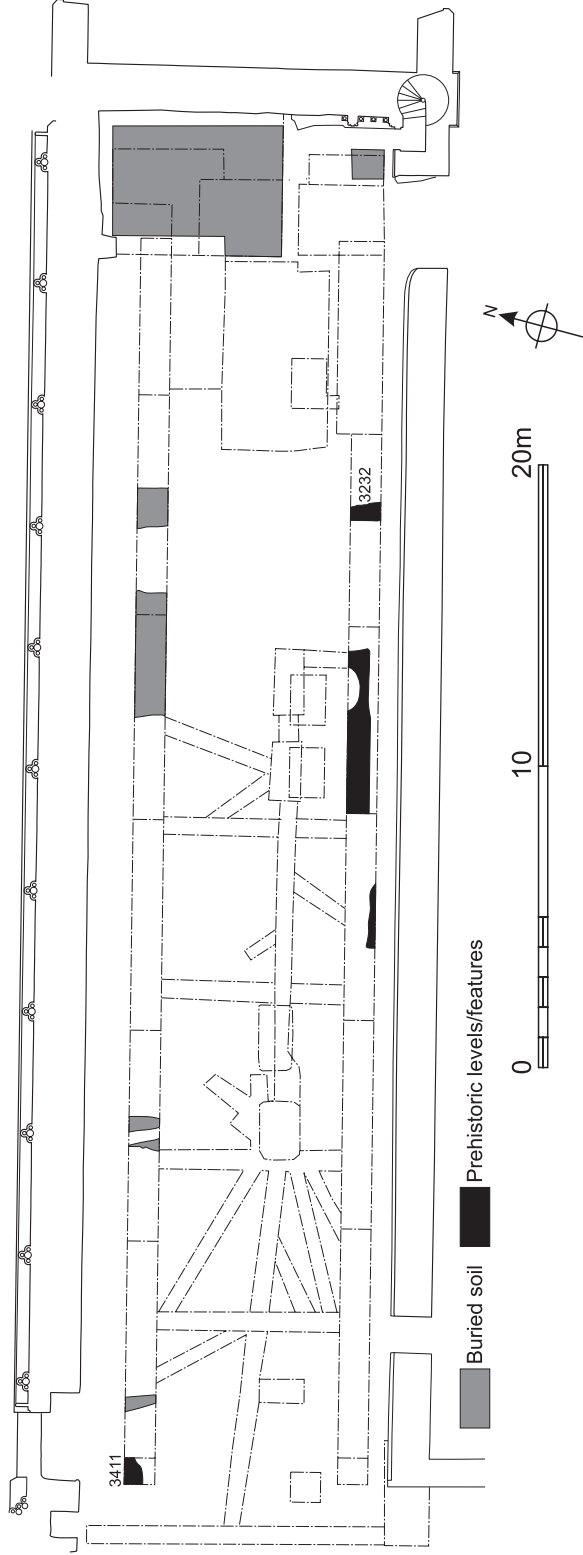


Figure 7 (above) Location of identified buried soils and prehistoric features. Scale 1:250

Figure 8 (below) Late Saxon phase 1 activity. Scale 1:250

Chapter 2. Excavation Results

Geology

The depth of excavation was generally limited to the formation level of the new building. Underlying natural deposits (silty sands overlaying the river terrace gravels) were therefore only seen in the ground beam trenches and the area of the lift pit and lobby. From these areas an approximation of the natural contours has been extrapolated (Fig. 4) which shows the highest point to be at 4.9m in the north-west corner of the site dropping away to the east and south to a level of 3.9m. At this point a natural plateau occurs before the ground further drops away to 3.4m OD. This suggests a gently sloping river valley, with a small terrace typical of post-glacial terracing within the flood plain of the modern river.

This variation in the level of the natural deposits was influential in the survival of pre-medieval archaeological features. At the east end of the site, where the level was raised in advance of the construction of the refectory, earlier features were sealed under a considerable depth of material, while those to the west were more vulnerable to later truncation.

Pre late 10th century (Period 1)

Buried soil

(Fig. 7)

A buried soil horizon (*G1*) formed from a series of mid to light brown silty sand deposits was located towards the bottom of the natural slope. It contained some evidence of cultural activity such as animal bone, pottery (of Middle and Late Saxon date) and charcoal flecks. The pottery could be an indicator that these soils developed during the Saxon period, however this material may have been intrusive as the deposits had been heavily disturbed by later root action. Micromorphological analysis (see Chapter 5) was undertaken on one sample which confirmed the interpretation of this horizon as a buried soil.

Prehistoric activity

(Fig. 7)

Prehistoric activity was recorded, although the evidence is slim. Soils of a similar consistency to the buried soil horizon, but with a green hue, were noted in the central southern part of the site (*G2*). These contained three sherds of Bronze Age pottery, and a further two sherds were found residually in nearby later features.

Two possible features of the prehistoric period were also recorded (*G3*), the dating of which relies on their stratigraphic location and the clean nature of their fills. Both were noted during the watching brief stage of the archaeological work. Pit 3411 was 1.6m deep and in excess of 2m wide. Ditch 3232, heavily truncated by later features, had a surviving depth of 0.5m.

Roman period

No archaeological features dating to this period were excavated, but a significant quantity of Roman brick and tile was found to have been utilised in the Late Saxon period (Period 2 Phase 4) and in the building of the refectory (Period 3 Phase 2). Two sherds of pottery were found residually in later features and one coin, a Tetricus radiate dating to AD271–4, was metal detected from the topsoil.

Early and Middle Saxon activity

There was no evidence of early Saxon activity and only two sherds of Middle Saxon pottery were found. This evidence is a significant contribution to the continued mapping of Middle Saxon artefacts in Norwich, as both the presence and absence of such material is keenly noted.

Late Saxon: 10th–late 11th century (Period 2)

Late Saxon activity was identified wherever excavation was deep enough to encounter it. The main feature of this period was a road which crossed the site on a north-east-to-south-west alignment. On either side of this, evidence of buildings and rubbish pits was recorded. The Late Saxon evidence has been divided into five main phases representing three phases of activity separated by periods of disuse which were probably the result of flooding. The creation of the feature groups within this period is based on a combination of stratigraphic and spatial positioning of the features. Due to the limited width of the deep excavations it has not been possible to identify the overall plans of structures nor to interpret the use of such structures.

Phase 1

(Fig. 8)

The Late Saxon activity was established upon a largely natural landscape, the earliest feature being a trackway crossing the site on a north-east to south-west alignment. This proto-road consisted of four parallel ruts (*G8*, 3180, 2225, 2226, 2227) (Fig. 9a) which had been worn into the contemporary ground surface (preserved as a buried soil). These may have been formed by double- or single-wheeled carts as well as foot traffic. On the south edge of the road a probable drainage ditch was identified (3385) although it could have been an exaggeration of the natural contours rather than a deliberately dug feature (Fig. 10).

Within these ruts and overlying the buried soil horizon was a deposit of very silty material (*G9*, 2194) which was probably formed as the result of damp ground conditions combined with the disturbance of the soils by 'traffic' movement. Soil micromorphology indicates that the soils were affected by drainage water contaminated by liquid waste probably from trafficking/draught animals. Thetford-type ware pottery was present in these deposits, including 10th-century type rims, as was a small quantity of butchered animal bone and two iron knives (SF691 and SF696). This muddy trackway was improved by the

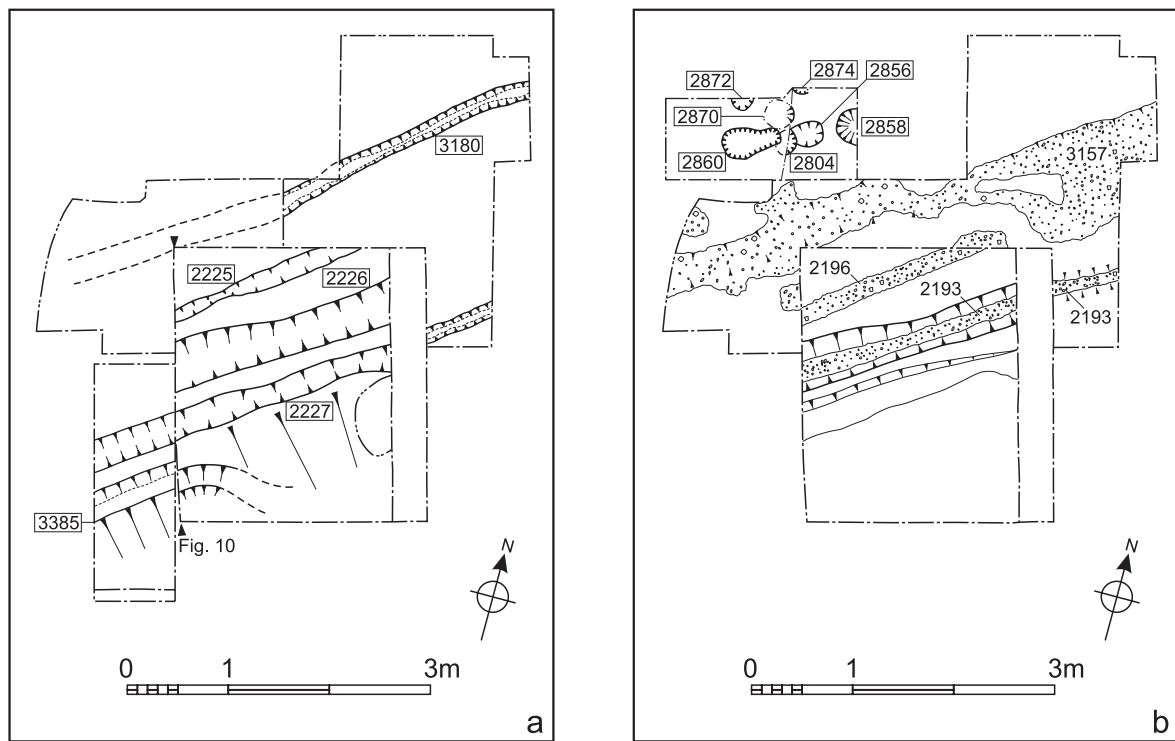


Figure 9 Plan: detail of Late Saxon phase 1 a) proto-road, b) gravelled track and associated features. Scale 1:75

addition of a layer of gravel (*G10*, 2193 and 2196) (Figs 9b and 10) which was present in the base of two further parallel ruts and spread out beyond them (3157). An area of gravel (2310, Fig. 8) which was probably part of this trackway was noted in the southern part of the site. Pottery from build-up over the road (*G11*, 2149) was all Thetford-type ware with the exception of a single residual Romano-British sherd. This included twelve rims of a 10th-century type and only three of a late 10th- to early 11th-century date, indicating a probable late 10th-century date for this phase of activity. Evidence of antler working (SF650, SF651 and SF695) was present together with an iron knife blade (SF694).

Activity contemporary with this early trackway was present on both sides of it. Pit 3138 (*G16*) was located c.3.5m south of the track (Figs 8 and 11). Only two sherds of Thetford-type ware pottery and a small quantity of butchered and chopped animal bone were found in the fills. On the north edge of road a second pit (*G21*, 2868) which contained only four sherds of Thetford-type ware was also excavated (Fig. 8). Cutting this pit was a group of seven post-holes (*G22*, 2804, 2856, 2858, 2860, 2870, 2872 and 2874) (Fig. 9b).

Phase 2

Following this first phase of activity there was a period of reduced activity, with intermittent, small scale occupation. Silts (2164 and 2174 (Fig. 10)), which were probably water-lain, accumulated in the area and soils including domestic refuse (*G12*, 2185) were dumped on the south side of the trackway (Fig. 10). Four post-holes (*G35*, 2166, 2306, 2308 and 2348) and one pit (2356) cut these (not illustrated), but all were sealed by the dumping of soils and refuse (1596) (Fig. 10).

The pottery assemblage derived from the abandonment deposits was primarily Late Saxon Thetford-type

ware (172 sherds) although the presence of a small quantity (ten sherds) of early medieval wares suggests an 11th-century date. Other finds of note included a piece of sawn antler (SF758) and a crucible fragment (SF667). These along with the lava quern fragments, animal bone and pieces of fired clay (some with wattle or wood impressions) make up a finds assemblage typical of Late Saxon Norwich.

Phase 3

(Fig. 12)

This phase saw an increase in activity with pits and post-holes on both sides of a road. Occupation stretched back at least 20m from the road edge with the majority of the evidence for buildings within 10m of the road, while pits were located further away. The pattern of settlement was not static as within this phase at least one of the buildings was replaced.

The track was re-established upon the flood silts, on the same alignment as before, using make-up layers (*G13*) of sandy gravel (1565) topped by a compacted layer of flints (1564) (Figs 10 and 12) set within a deliberately cut wide flat bottomed hollow (2154). Repairs to the gravel surface were noted, showing that it was well maintained. Late Saxon Thetford-type ware was found within these deposits along with two pieces of sawn antler (SF788 and SF759) and an antler comb (SF587).

To the south of the road two possible buildings, one replacing the other, and a rubbish pit were excavated. The earliest structural evidence of this phase (*G17*) consisted of a single post-hole (2848), a narrow slot (2269) and a hearth pit (2272) (Figs 12 and 14a). The post-hole was a wide (0.8m) cut with a deeper square (0.25m) post setting at one end. Close to this were the remnants of a heavily compacted chalk and clay surface (2806). The small pottery assemblage from this structure is notable only

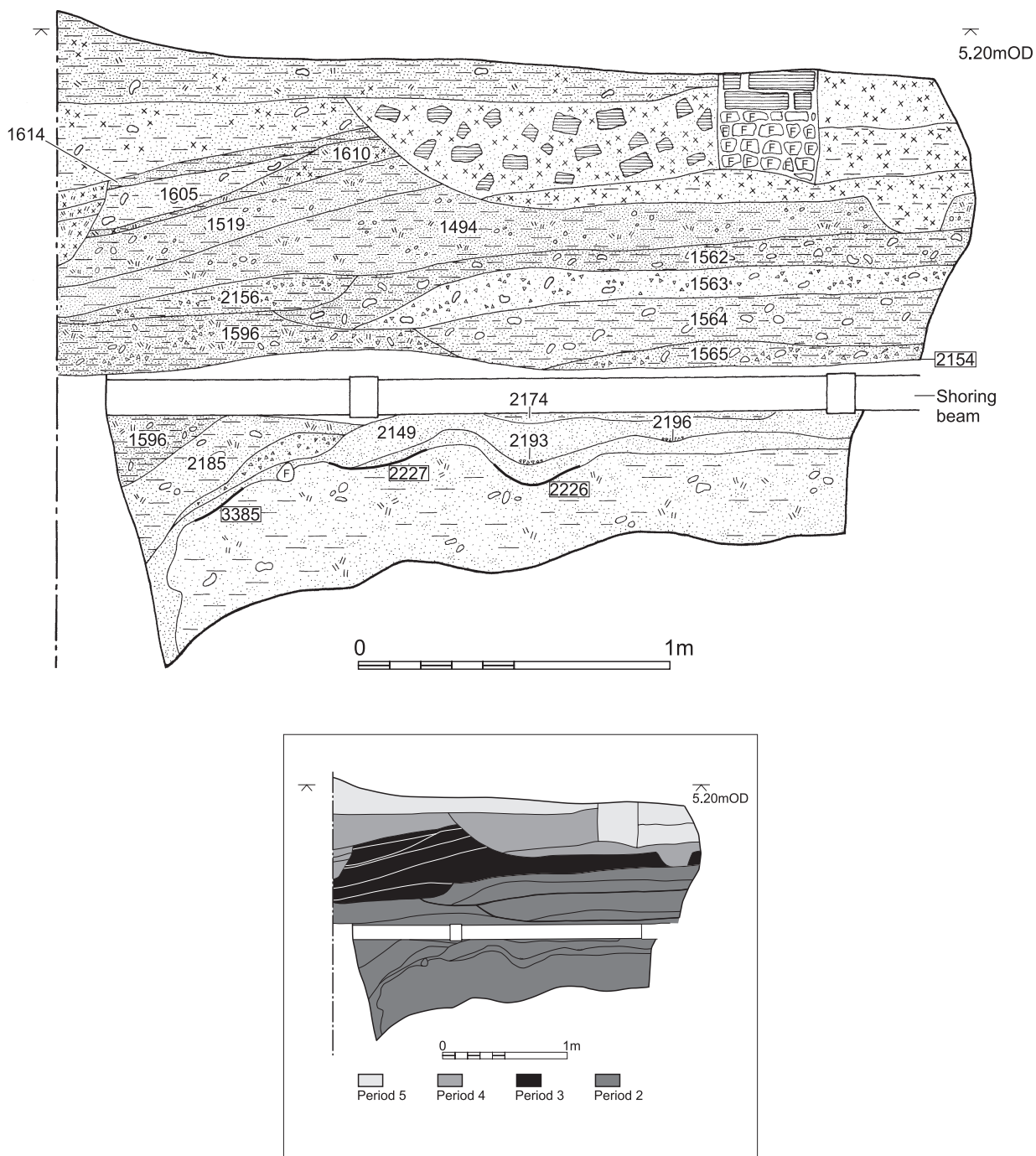


Figure 10 Section: Late Saxon wheel ruts and metalled road, east facing. Scale 1:20

because it contained early medieval wares along with Late Saxon sherds.

This building was abandoned and quickly replaced by another (*G18*) of which five single post-holes (2849, 2850, 2851, 2852 and 2855) and one double post-hole (2847) (Fig. 14b) were recorded. To the east of these structural elements were two hearths (2256, Fig. 19 and 2794) while to the west was a gravel surface (2845) which could have formed an external yard. One sherd of Thetford-type ware was found within the fills of these features. Two metres further east and cut from a similar level was a rubbish pit (*G113*, 3337) (Fig. 12), containing

a mixture of Late Saxon pottery and early medieval wares of an 11th-century date.

Several small groups of features were located to the north of the road. These are described according to their location beginning with the east end of the northern ground beam and continuing west, followed by those in the southern ground beam (Fig. 12).

Three post-holes (2532, 2534 and 2536) and two pits (2538 and 2540) were set 2m back from the road (*G26*). The post-holes were aligned east-to-west between the two pits. To the west of this was a gravel surface (*G25*, 2506) which was probably a yard area. Beyond this was a large

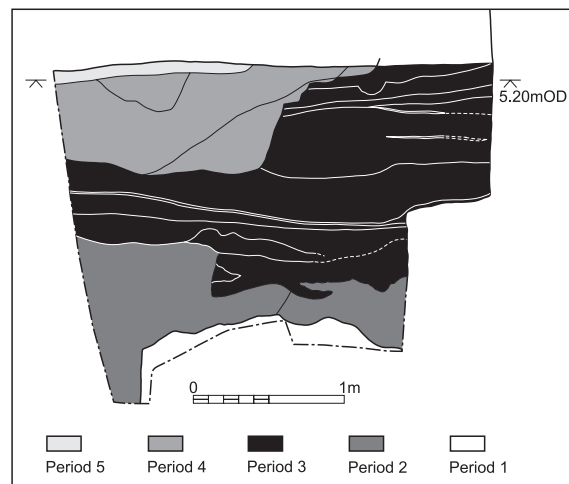


Figure 11 Section: Late Saxon pits (3138 and 3337) with overlying medieval make-up and floor surface (3093) and early post-medieval pit containing demolition debris. West facing. Scale 1:20

rubbish pit (G27, 2726). One of the fills contained frequent lumps of moist and claggy clay, an indicator that this was originally a clay-lined pit. The majority of the pottery recovered was Late Saxon Thetford-type ware although a few sherds of early medieval pottery were also present. A large quantity of butchered and chopped animal

bone was also found along with pieces of sawn fallow deer antler.

Beyond this and c.5m from the road were eight small post-holes and two stakeholes ranged to the north and west of a hearth (G29, 2815). The majority of the pottery from these structural features was Thetford-type ware although



Plate 1 Late Saxon road, looking north, scale rod 2m

a few sherds of early medieval wares were present indicating an 11th-century date.

Further to the west were four rubbish pits (*G30*, 2820, 2442, 2470 and 2468), two of which were intercutting. They varied in diameter between 1.05m and 1.9m and in depth between 1.2m to 2.2m. All except four of the 184 pottery sherds from these pits were Thetford-type ware, the exceptions being one residual sherd of Middle Saxon Ipswich Ware, two of early medieval fabrics and one later intrusive sherd. Large assemblages of animal bone and daub (some with wattle impressions) were found, the latter being debris from demolished structures. Metal finds included four iron nails, a harness mount (SF724) and a buckle (SF723).

Evidence of another structure (*G32*) consisted of two north-to-south beam slots (2700 and 2670), the latter incorporating a sub-square post setting, one east-to-west slot (2777) and one post-hole (2743) (Fig. 14c). The pottery from here comprised equal quantities of Thetford-type ware and early medieval wares.

At the far west end of the site, a single pit (*G34*, 2441) was excavated. The majority of the pottery found within its fills was Thetford-type ware although some sherds of early medieval wares were also present. Two iron nails and small quantities of slag, animal bone and daub were also found.

In the south ground beam and adjacent to the projected line of the road was evidence of a yard surface (*G36*) (2344) which was cut by two pits (2296 and 2298) and a post-hole (2300) (*G37*). Beyond these were two further small pits (2132 and 2370) and two post-holes (2134 and 2136) (*G38*).

Phase 4

Abandonment of this area followed, the buildings being deserted and a build up and dumping of soils over parts of the road occurring (*G19*, *G28* and *G40*). This raised the ground level to the south of the road by c.0.35m. The pottery assemblage was a mix of Late Saxon Thetford-type ware and early medieval fabrics indicating a later 11th-century date. A large quantity of animal bone was also recovered, much of it showing evidence of butchering and chopping. Evidence of abandonment was represented in the finds assemblage by iron nails, Roman brick and tile fragments, daub and slag.

Phase 5

(Fig. 13)

Settlement was quickly re-established with the road (*G14*, 1562 and 1563) (Plate 1, Fig. 10) being re-built on the previous alignment and a ditch (3163) being dug along its north side. Three post-holes (not illustrated) were dug towards the north edge of the track during its construction, two of which were sealed by the make-up layer while the other cut the make-up layer but was sealed by the gravel surface. The pottery from these deposits was a mixture of Late Saxon Thetford-type ware and early medieval wares. A small quantity of fired clay and animal bone was found, along with two iron nails and a badly corroded piece of plate iron.

To the south of the road were two compacted gravel surfaces (*G24*, 2680 and 2724) separated by a dump of peat ash (2701) (Fig. 15). A similar surface (2498) set on bedding layers (2499 and 2500) (*G23*) was also noted to the north of the road. These can either be interpreted as yard surfaces or as the remnants of a second trackway which crossed the site at right angles to the long established road.

Within the northern ground beam were the remains of two possible structures. The first of these was represented by three possible beam slots (*G31*, 2462, 2464 and 2466) on the same north-west-to-south-east alignment. The outer two of these were 0.5m wide and c.0.5m deep, the inner (2462) being smaller in both width and depth (0.15m wide and 0.3m deep). An adjacent ashy layer (2383) was probably formed through the occupation processes

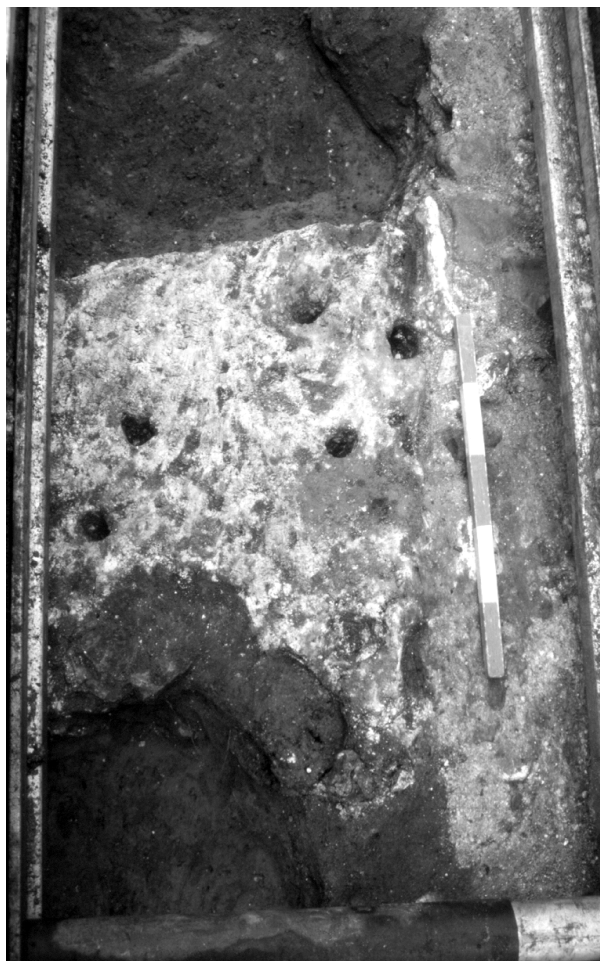


Plate 2 Late Saxon chalk surface (*G39*), looking east, scale rod 0.5m

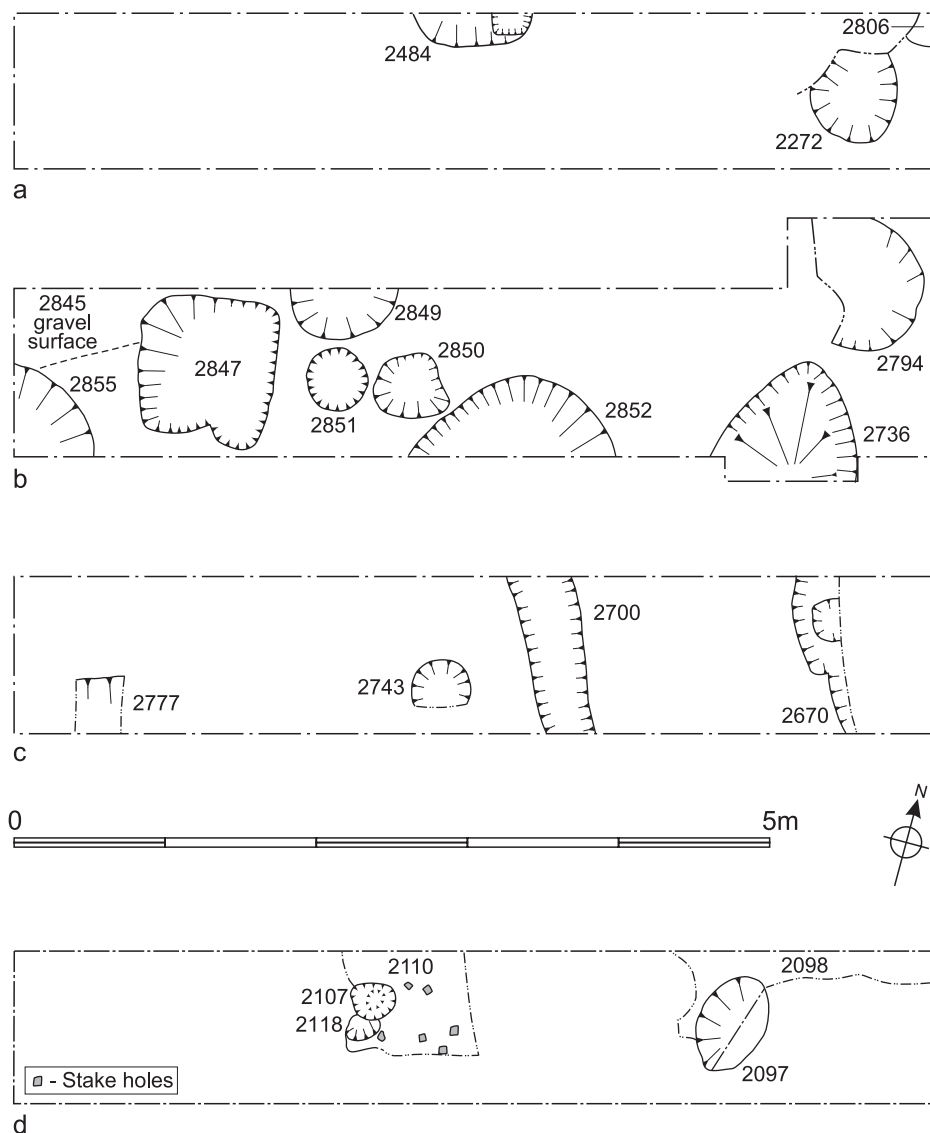


Figure 14 Plan: Late Saxon structural evidence, phases 3 and 5 a) phase 3, trench 6, *G17* b) phase 3, trench 6, *G18* c) phase 3, trench 8, *G32* d) phase 5, trench 5, *G39*. Scale 1:50

associated with this building. A higher percentage of early medieval ware was found within this group, indicating an 11th- to 12th-century date. Structural evidence included fired clay and an iron clench bolt (SF641). A second structure, whose overall plan or use could not be defined, was indicated by eight small post-holes (*G33*, 2613, 2615, 2617, 2619, 2674, 2676, 2678, 2775), some intercutting, two of which were recorded in section only (2676, 2678).

Located in the southern ground beam on the north side of the road was evidence of a structure (Fig. 14d) (*G39*) which consisted of two surfaces, three post-holes and six stake holes (Plate 2, Fig. 14d). One surface was made up of pinkish white chalk with inclusions of decomposed fired clay lumps (2110) set on a bedding layer of flint gravel (2130). It was cut by a post-hole (2118) which had been re-cut (2107). Six stakes, each formed by a quarter of a larger post, had also been driven through this surface. The second surface lay *c.*1.35m further to the east and was made up of an orangey red sandy clay (2098). This was cut by a post-hole (2097). Pottery from these features was exclusively Thetford-type wares with the single rim sherd

suggesting an 11th-century date. Two iron small finds were recorded; one nail and one unidentified object.

Other beam slots and post-holes were found to the west of these. Within these features it is possible to outline one possible building (*G43*) made up of three beam slots and one post-hole. Two of the beam slots ran on a north-west to south-east alignment 3.5m apart (2288 and 2366) with the third (3318) at right-angles to them. The post-hole (2364) was located within the area defined by the beam slots. The remainder of the structural features (*G42*) were so disparate that no single structure could be suggested. The presence of two hearths, however, suggests the presence of at least two other buildings in this part of the site.

The evidence shows settlement in this phase to be more closely set than previously. Since the evidence from this phase was almost exclusively structural, it can be suggested that settlement of this area was more concentrated than before. It also implies that rubbish was carried a greater distance for disposal, indicating some organisation and zoning of activity.

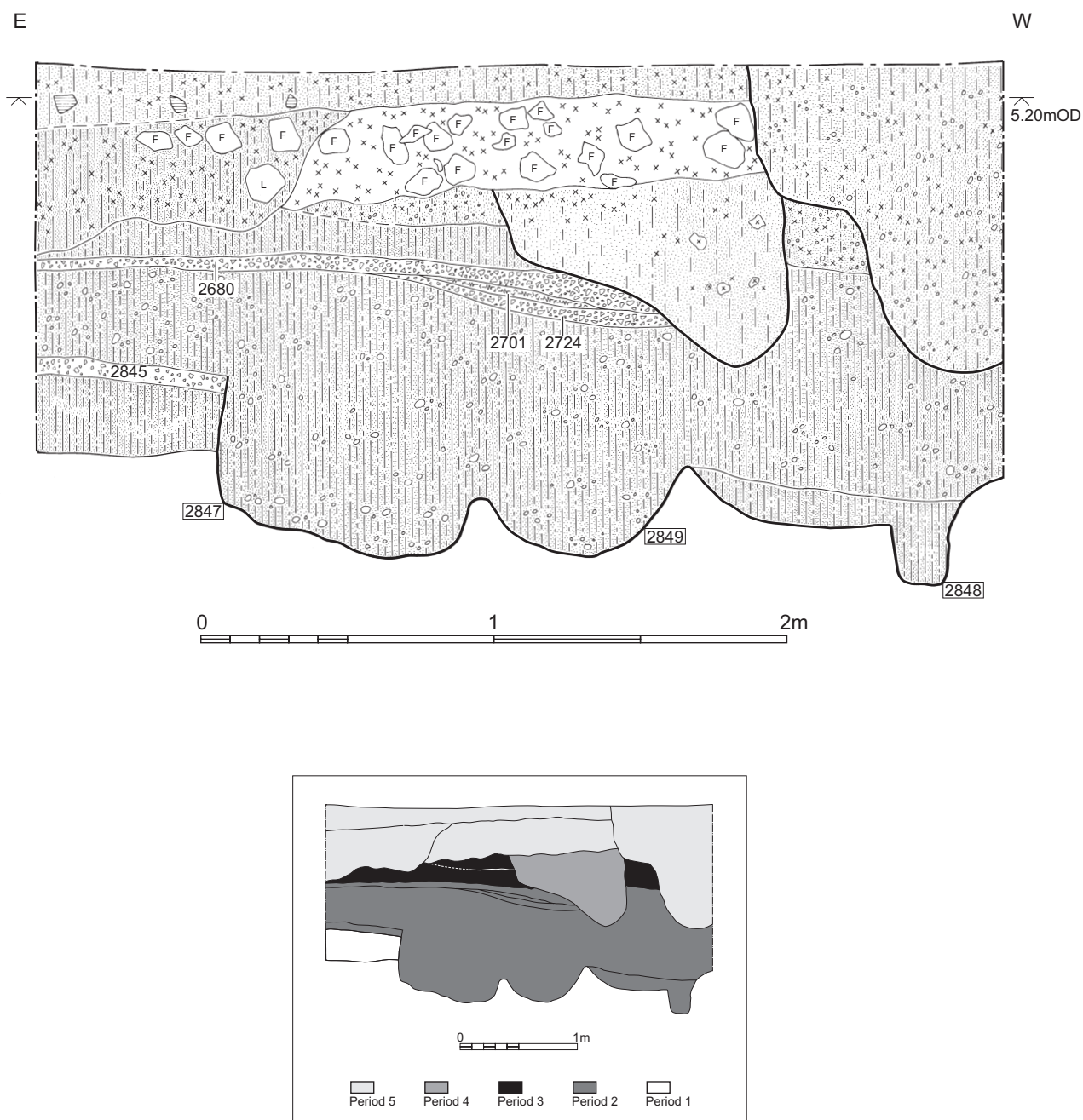


Figure 15 Section: Late Saxon post-holes (2847 and 2849) and surfaces (2845 and 2680), and medieval make-up. South facing. Scale 1:20

Medieval: late 11th century to 1538 (Period 3)

This period covers the activity between the clearing of the Late Saxon occupation and the suppression of the priory at Norwich Cathedral in 1538. The archaeological evidence has been divided into three phases. The first phase covers initial clearing of the area prior to construction work, the second encompasses preparation for, and initial construction of, the refectory (begun *c.* 1125 and completed by 1145), while the third includes alterations to the interior of the building.

Phase 1: late 11th century

Initial work on site would have included the expulsion of the local inhabitants and the demolition of any buildings. This is clearly represented in the archaeological record by the creation of a horizon of destruction material made up of redistributed Late Saxon deposits (*G15*, 2156) (Fig. 10). This work also included the importation of Late Saxon occupation material (*G20*, 1494) (Fig. 10), an activity which began the process of levelling the area by raising the eastern part of the site by *c.* 0.7m. (These deposits were more substantial on other parts of the site than indicated on Fig. 10.)

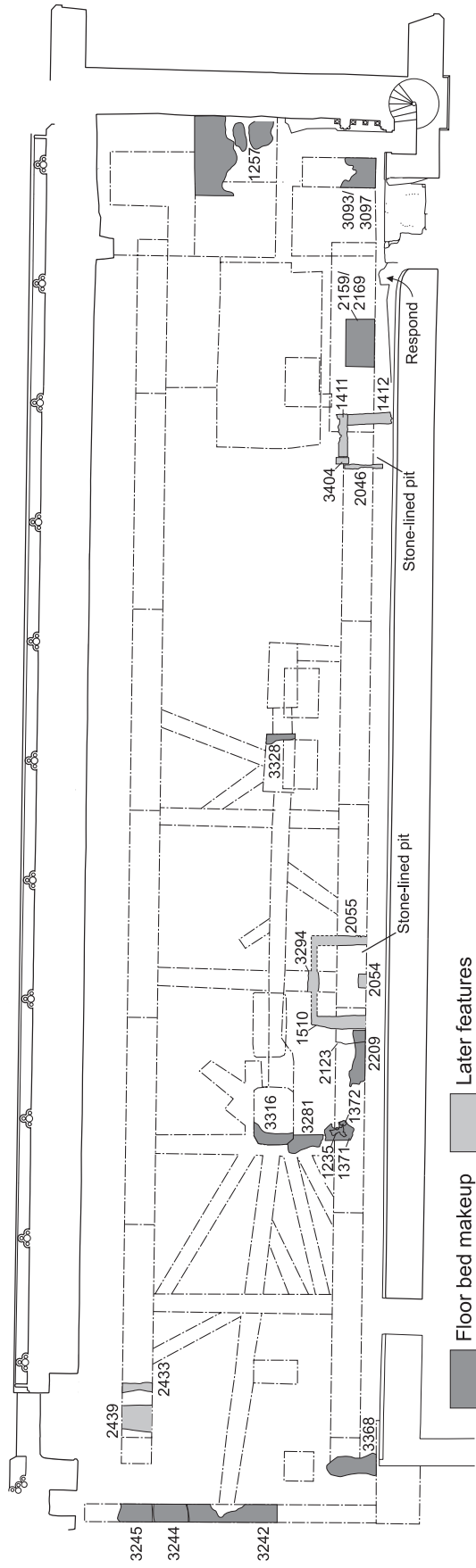
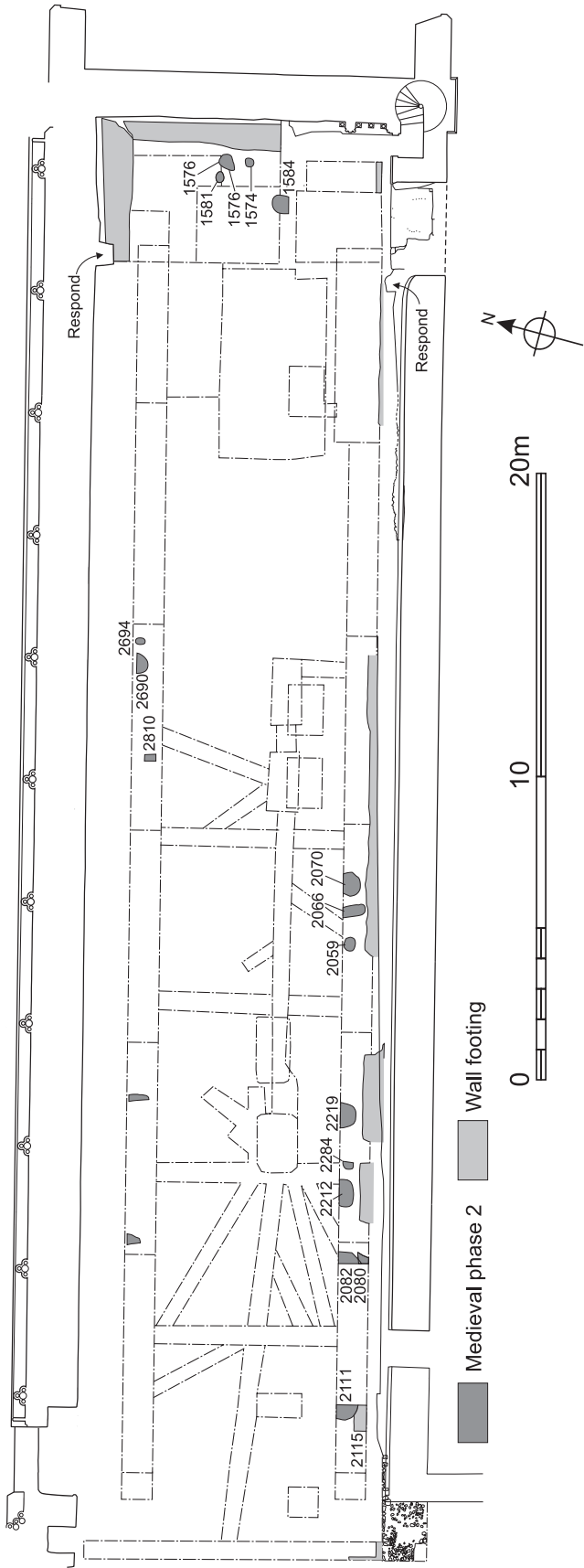


Figure 16 (above) Plan: medieval foundations and construction features. Scale 1:250

Figure 17 (below) Plan: medieval floor bedding and later features. Scale 1:250

The finds assemblage from these deposits was similar to that found during the Late Saxon occupation phases with the destruction levels containing Thetford-type ware and early medieval fabrics. Much of the pottery from the imported soils was abraded and the sherd size was small, attributes which are associated with the re-deposition of soils. The small finds were also typically Late Saxon and included sawn fallow deer and red deer antler, three iron knives (SF638, SF447 and SF619) and an iron bridle boss (SF639). Roman brick and tile was found along with fired clay and daub representing the destruction of buildings on and around the site.

Phase 2: early to mid 12th century
(Fig. 16)

Construction of the refectory began with the digging of the foundation trenches for the walls (G44). The footings for the north, east and south wall were encountered (Fig. 16) but were excavated only in two small areas. These were formed of compacted layers of mortar, chalk and flint; silt,

sand and flint; clay, sand and flint (similar to those shown on Fig. 18). This technique of rammed layers of material including horizontal seams of flint is commonly seen in Norman and later construction in Norwich. A significant quantity of Roman tile and brick and a few fragments of limestone were incorporated within these foundations. The footings were wider than the upstanding walls and the depth of the foundation trench varied according to the depth of the underlying natural deposits. Late Saxon and early medieval pottery as well as a copper alloy brooch? pin (SF670) were found within the footings.

The walls themselves were constructed of a flint rubble core with the occasional piece of Roman brick and tile, faced with coursed flint with some pieces of limestone. Sections of the refectory walls exposed by excavation revealed both the flint facing, made up of coursed rounded flints, and eight put-log holes. The put-log holes, a common feature in medieval and later structures for supporting scaffolding during construction, were revealed in the north (interior) facing of the south wall.

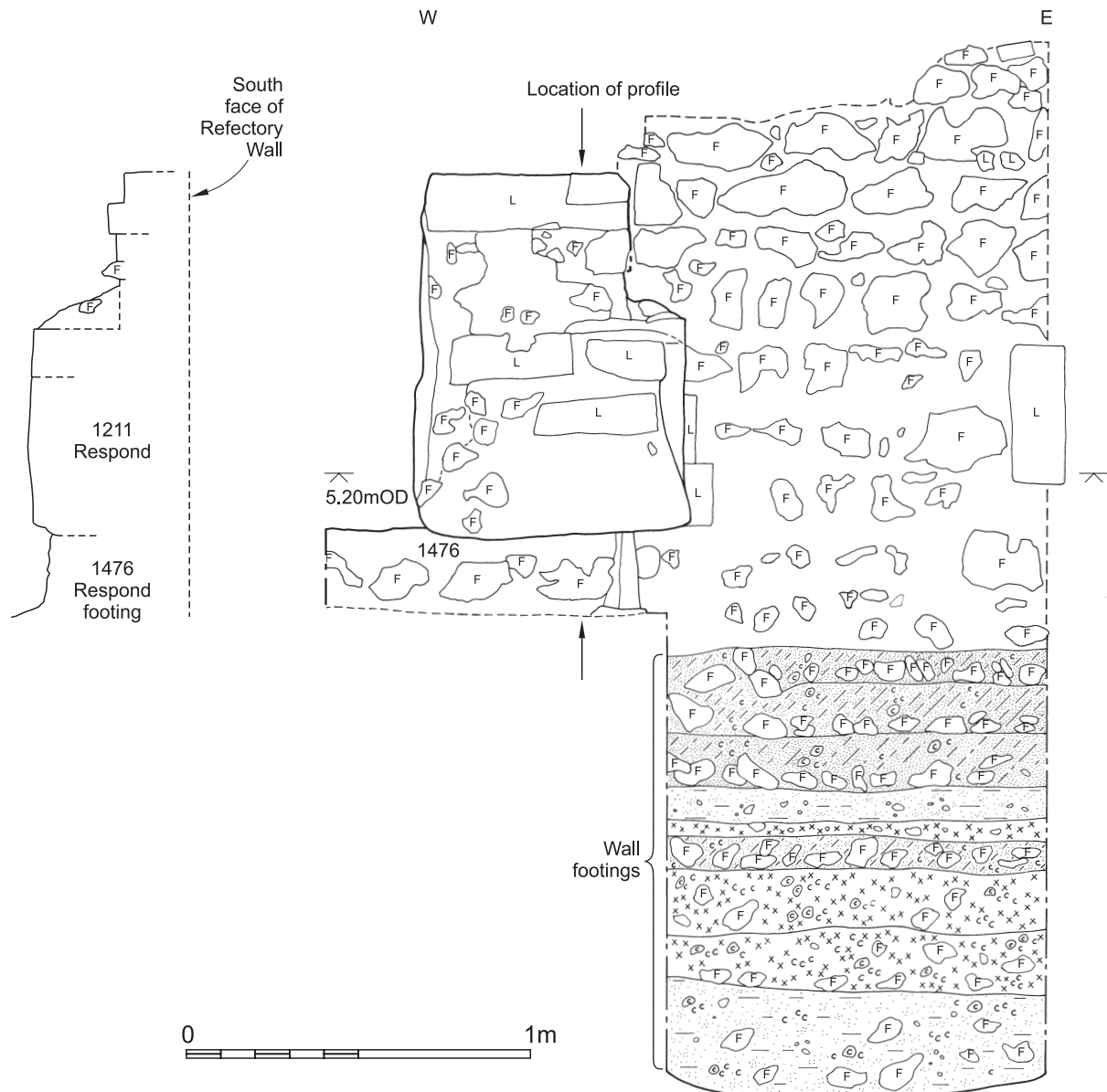


Figure 18 Section: Northern respond base and wall footings. South facing, with east facing profile on left. Scale 1:20

They measured between 0.11m × 0.11m and 0.18m × 0.17m, although having been constructed within a flint cobble wall their cross-sections were somewhat irregular. Their height above the level of the refectory floor (5.2m OD) was also variable, progressing from c.0.3m above this level at the east end to c. 0.8m at the west end. The depths of the holes into the fabric of the wall varied from c.0.3m to c.0.5m. The shortest recorded distance between put-logs was just under 2.5m and the longest over 3m. Overall this suggests that the scaffold may have been erected in an *ad hoc* manner, possibly in short sections, as construction of the wall progressed.

Associated with the construction of the walls was a segmented linear cut (G47) (not illustrated), which ran parallel to and adjacent to the footings of the south refectory wall. The stratigraphic relationships indicated that it was of a similar date to the construction of the south wall although the exact function of these features is unknown. Pottery from these deposits was a mixture of Late Saxon and early medieval fabrics. An iron nail and an ivory object (SF408) of uncertain date were also found.

Located 0.4m out from the footings of the south wall (1.1m from the wall itself) was a group of six post-holes (G45, 2111, 2082, 2212, 2219, 2059 and 2070) of which one (2082) was later recut (2080). These may have held a wooden scaffold erected for the construction of the refectory. Two were particularly deep (2212 and 2219), between which was a smaller post-hole (2284). The depth of these suggests that they may have needed to bear a greater load than the others. A speculative interpretation being that they supported other enabling equipment such as, for example, a hoist. Between two of the other post-holes a linear feature (2066) 0.35m wide, 1m deep and extending beyond the northern edge of excavation was present. Pottery from these consisted of Late Saxon and early medieval wares.

Sealing these features in the central and western part of the site was a series of make-up layers (G122), raising the ground level by a maximum of c.0.45m. In the north-east part of the site the earliest deliberate dumping of material (G5) sealed the footings but abutted the lower part of the walls. These soils were distinctly different from the underlying re-distribution of demolition and occupation material from the Late Saxon horizon, as they were lighter coloured sands and silts virtually devoid of finds (only a single sherd of Thetford-type ware pottery was found within them). They raised this part of the site by 0.15m from c.4.45m OD to c.4.6m OD.

Once this level had been attained, footings for a respond were constructed (G53) (Fig. 18, Plate 3) in the north-east corner. This was located 4.4m from the east end and formed one of a pair, the other being sited on the south wall. The footings consisted of banded sandy lime mortar and sandy silts which supported a foundation made up of flint rubble set in a sandy lime mortar (1476). On this, a respond base of limestone ashlar and flint rubble set in a hard sandy lime mortar (1211) was built. Construction of the southern respond was similar in many ways with a lower footing (2233, 2231, 2238) supporting foundation (2175) on which the respond base was constructed (Fig. 19). It is also noticeable that to the east of these both the north and south walls of the refectory increased in thickness by c.0.6m.

These two responds would probably have supported a three-bay arcade across the refectory which separated the



Plate 3 Medieval respond base, looking north-west, scale rod 1m

‘high’ east end from the rest of the hall. This interpretation is supported by the presence of a corresponding buttress on the north side of the north wall. A similar buttress was almost certainly present on the south side of the south wall, the surviving evidence for this being a noticeable area of scarring on the face of the wall. It is also pertinent to note that a recess in the south face of the north wall corresponds to the location of the proposed arcade. This would have allowed the intramural passage around the refectory to pass behind the arcade respond (Heywood 1996, 106).

The ground level of the eastern end within the refectory was further increased by the dumping of imported soils (G6, 3325) (Fig. 11). Initially the level was raised to between 4.45m and 4.6m OD although this created a somewhat uneven and undulating landscape within the building. The end of this phase of make up was marked by the presence of a thin and intermittent layer of partially concreted lime mortar (1514, 3304 (Fig. 11) and 3099) containing small broken flints. This was thicker towards the edge of the site, becoming thinner and less continuous towards the centre of the area, indicating that it resulted from trampled debris created by construction of the walls.

A relatively even ground level was achieved by the dumping of further deposits (G46, 3092, 3094, 3110 on Fig. 11 and 1519, 1605, 1610, 1614 on Fig. 10). These raised the level of the eastern part of the site by between 0.5 and 0.65m to a height of c.5.1m OD. In the south-east corner of the site the uppermost of these deposits was formed by thin layers of mortar, again probably the result of building debris and trample from the ongoing masonry work on the building. Again the pottery recovered from this group was a mixture of Late Saxon and early medieval wares.

Cut into the top of these make-up layers was a series of four post-holes (G48, 1574, 1576, 1581 and 1584) and eight shallow pits (not illustrated). Three other post-holes of this phase are located to the north of the site (G123, 2690, 2694 and 2810) (Fig. 16). All of these probably served a function in the construction of the refectory building although their specific use remains elusive. Finds from these features were few but included both Late Saxon and medieval pottery and animal bone. No evidence of the original floor surface was found but the height of the make-up deposits and the level of the respond bases suggests this was at c.5.1–5.2m OD.

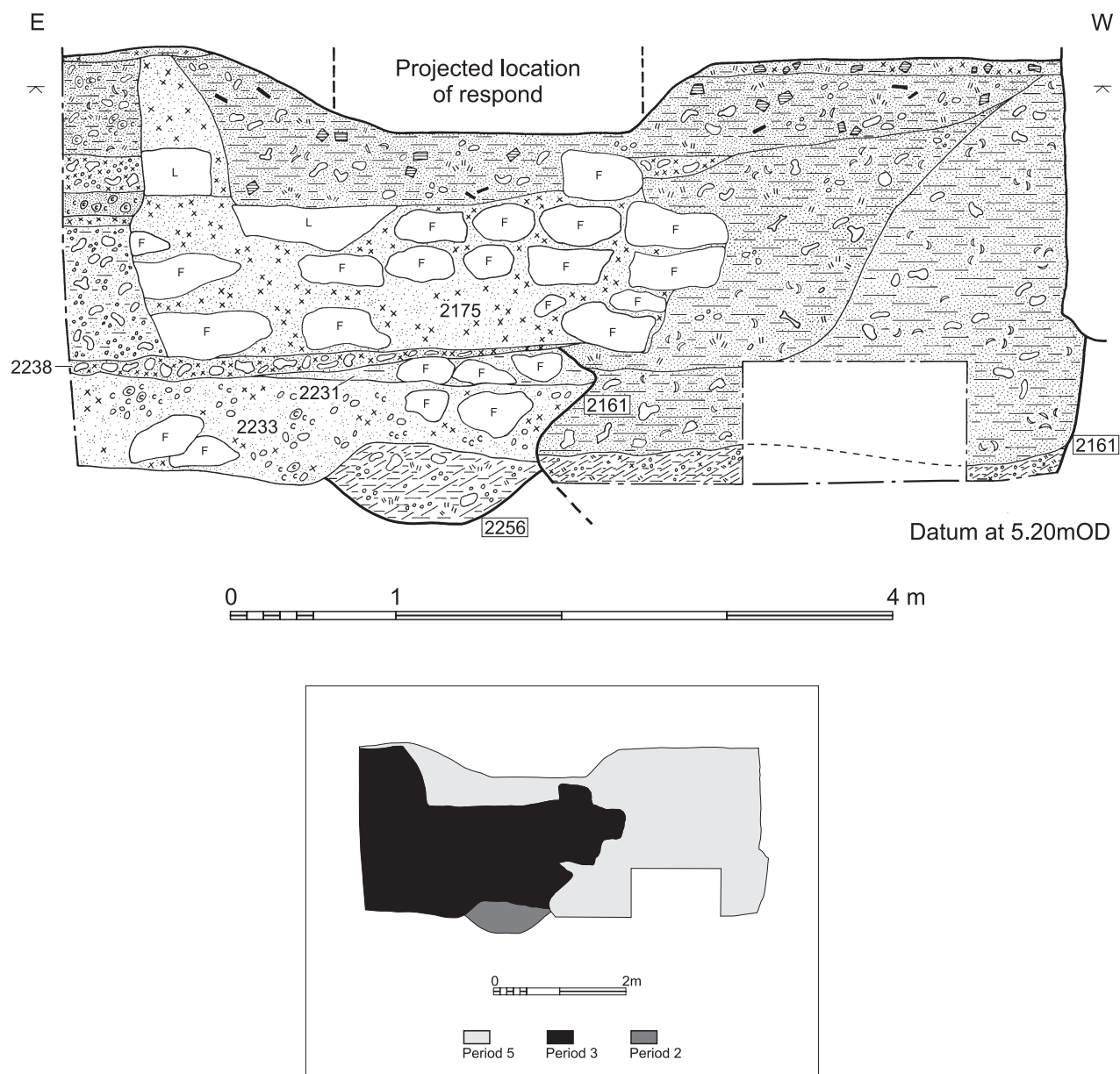


Figure 19 Section: south respond base (2175) and footings with later pit (2161), north facing. Scale 1:40

Phase 3: 13th to 15th centuries

(Fig. 17)

During the lifetime of the refectory some major alterations were made to the interior. One of these was the replacement of the original floor. This event is represented in the archaeological record by a number of horizontal spreads of thin makeup and mortar bedding layers for tiles (G55) (Fig. 11, 3093). These deposits had survived in only a few isolated areas across the site but are unified not only by similarities in their makeup but also by the fact that they occurred at consistent level of between 5.1 and 5.2m OD.

No tiles from the floor survived *in situ* and tile impressions within a mortar bedding (1235) were found in only one small area measuring $c.0.5 \times 0.3\text{m}$ and at 5.2m OD (Fig. 20). Where the tile impressions remained it can be seen that the floor bedding deposits were made up of a thin deposit of sand (1372) upon which a layer of greyish crushed mortar (1371) had been spread. The tiles themselves were set on a lime mortar which had occasional small stones evenly distributed throughout

(1235). Fourteenth to 15th century Flemish type tiles with either a yellow glaze over a white slip or green glaze were found during the excavation. This date comfortably accommodates a documented re-paving of the refectory in 1455. It is therefore suggested that the layers of mortar found across the site correspond to this re-paving of the refectory, the process of which appears to have destroyed any evidence of earlier floor levels.

Also during the time that this building functioned as the refectory, two stone-lined pits were constructed adjacent to the south wall (Fig. 17). One (G49) was located 28.3m (to its centre) from the east end of the refectory while the other (G52) was 10.4m from the east end. The first of these was recorded in greater detail as the latter was heavily altered during the post-medieval period and not recognised as a medieval feature until the analysis of the archaeological record was undertaken.

The larger and more complete of these (G49) (Fig. 21 and Fig. 22) was built within a vertically-sided cut (2123) with a slightly flared top and cut through the deposits

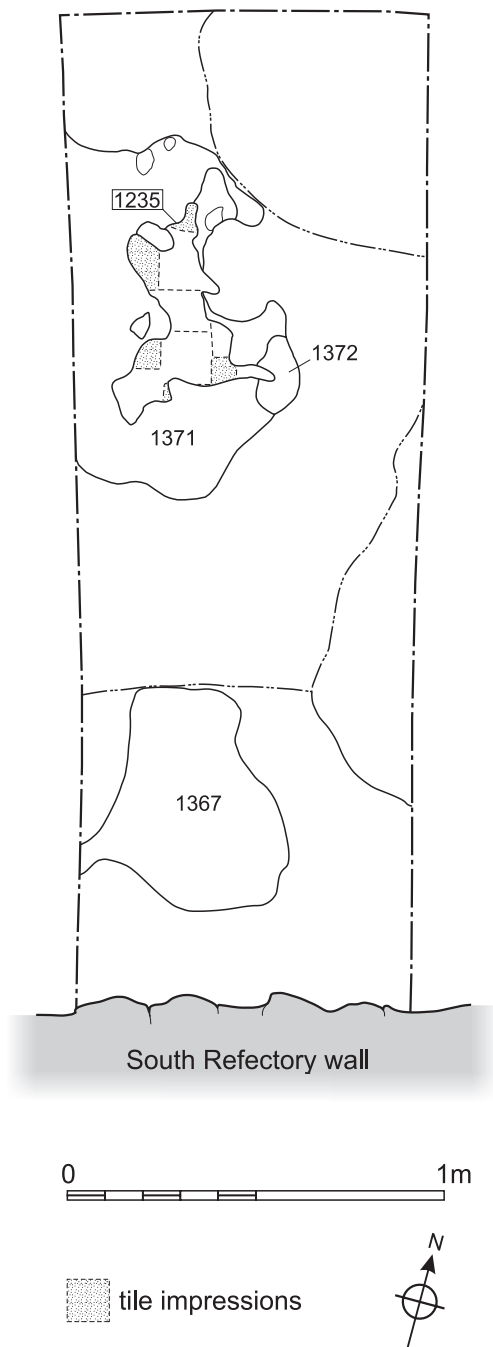


Figure 20 Plan: tile impressions from the refectory floor. Scale 1:20

related to the construction of the refectory. Within the area of the pit, the footings of the south refectory wall had been removed. The resulting pit was lined on its east, north and west sides with ashlar blocks, some flint and the occasional piece of re-used limestone moulding set in a lime mortar and rendered to give a smooth surface. Opposing put-log holes were noted in the internal faces of both the east (2055) and west (2053) walls. It is thought that these walls stood to their original height as wall 2053 was topped by a thick layer of mortar which had also been spread across the remains of the footings of the south refectory wall.

Set midway between the eastern and western walls, and abutting the south refectory wall, was a pier or buttress (2054) (Figs 21 and 23). The lowest footing level of this

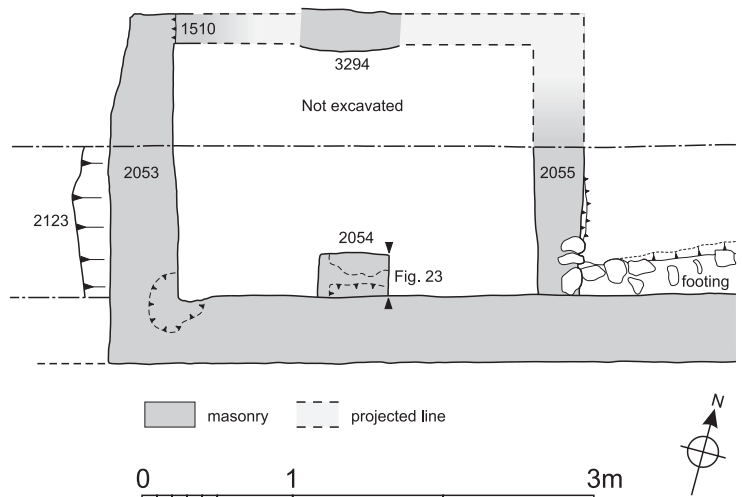


Figure 21 Plan: stone-lined pit (G49). Scale 1:50

buttress was constructed of large flints in mortar, and the remainder of the structure was made up of mortared ashlar limestone blocks. All of this was rendered over with mortar in the same manner as the two other walls. The render was removed in one small area where two moulded limestone fragments were noted which allowed the profile of these pieces to be recorded. These are of a mid 13th- to 14th-century style.

The resulting stone-lined pit was 2.1m deep with a floor surface (2479, Fig. 22) of compacted sandy mortar containing frequent small flints. The mortar appeared to be degraded and light greenish grey in colour. All the remaining fills of this lined pit were post-medieval in date which indicates that it was not backfilled during the medieval period, but kept sealed. It is suggested that a timber floor could have been suspended over it, either at the height of the of the refectory floor (5.2m OD) or at the lower level of the top of the buttress (4.45m OD) in which case the put-log holes in the east and west walls could have held a supporting timber.

The date of construction of this feature cannot be exactly determined. The earliest possible date, considering the inclusion of probably re-used pieces of limestone, is the late 13th century, although it could have been built anytime before the Dissolution. However it is tempting to tie in the construction of this feature to the re-paving of the refectory in 1455. Its function is also unclear. The lack of contemporary deposits in the base suggests it remained covered, an empty underground chamber. It is suggested that it may have acted as a sounding box to help project the voice of the monk reading to the rest of the fraternity during mealtimes. Alternatively this could have been constructed and used as safe storage for precious and valuable objects (Gilchrist 2005, 129).

The smaller of the two stone-lined pits (G52), located closer to the east end of the refectory, had been heavily altered in the post-medieval period and therefore the upper parts of the walls included large quantities of 17th- and 18th-century brick. Overall it was slightly smaller than pit G49, but built to similar proportions. The walls (1412, 1411 and 2046) were constructed of flint and larger limestone blocks. The formation of the north-west corner was not clear, as a similarly built wall (3404) was incorporated into the structure. The floor was of flint

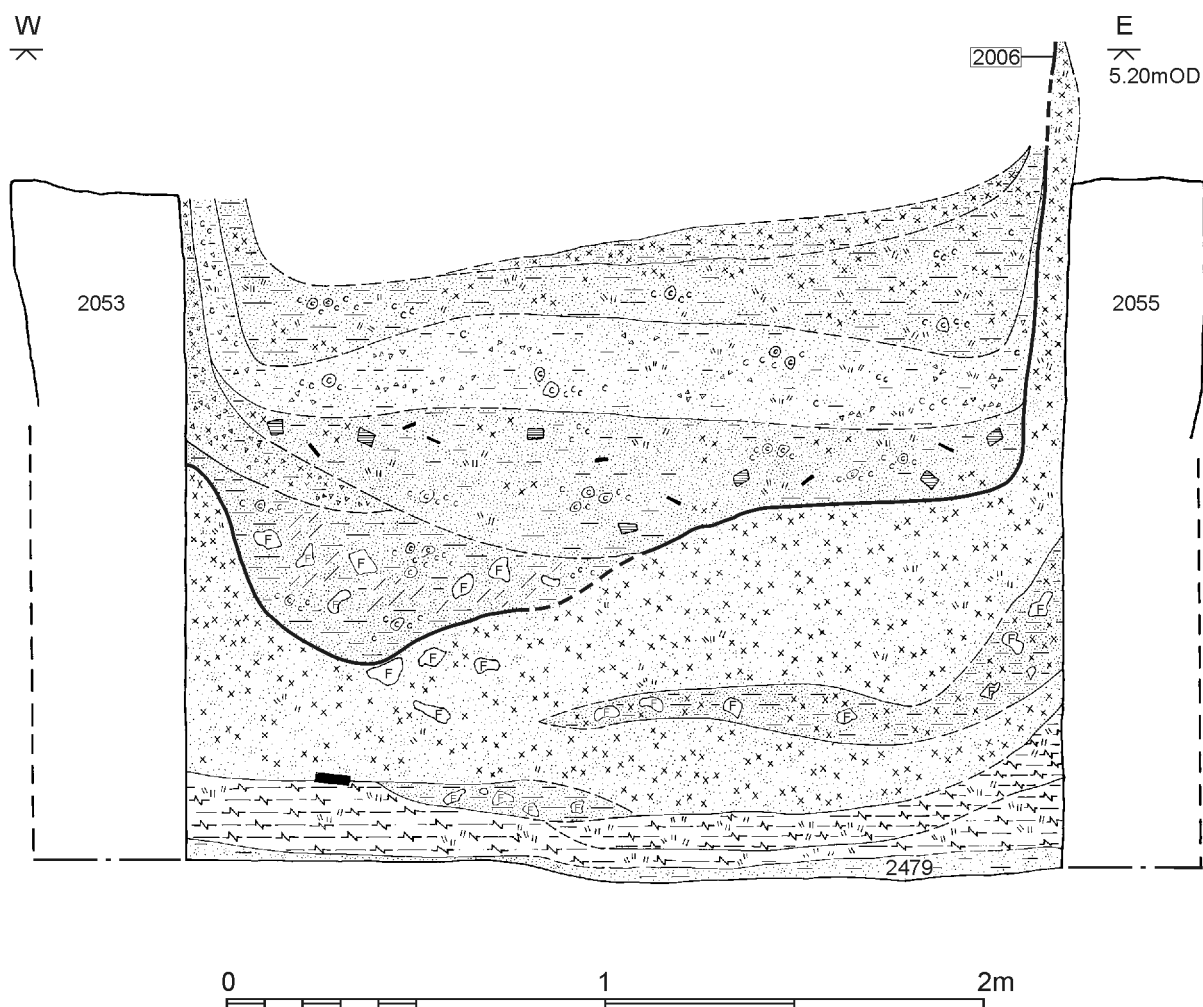


Figure 22 Section: stone-lined pit (G49), south facing. Scale 1:20

cobbles, although these may be post-medieval in origin if the west wall was substantially rebuilt during this later period and incorporated into a cellar. All of the fills within this stone-lined pit were post-medieval in date although it is not clear whether this was due to the post-medieval re-use of this feature or if, like pit G49, it had been maintained as a below-ground chamber.

The dating for this feature is even more difficult to suggest. It is presented here as a secondary feature to the refectory but there is no evidence to confirm this. It cannot be proved whether the two pits were built as contemporary features of the refectory or if they were sequential.

Two other linear features, both on a north-to-south axis, were recorded in the north-west part of the site (Fig. 17). The larger (G64, 2439) was c.0.8m wide although it had been truncated by later features (Fig. 24). Within the lower fill a 0.45m long segment of lead pipe was found, aligned with the cut. The pipe (estimated diameter 0.72m) appeared to be *in situ*, leading from the refectory into the cloister (or *vice versa*). Sitting above the pipe was a 0.1m thick deposit of mortar and small limestone pieces forming a protective layer. No other artefacts were found within the fill. It is thought that this pipe may have led from the *lavatorium* in the cloister and it can be suggested that the pipework is contemporary with the rebuilding of the southern bays of the west cloister walk which is dated to 1415–16.

Adjacent to this was a narrower linear slot (2433) (G62), 0.35m wide and 0.3m deep, aligned with the east jamb of the doorway from the refectory into the cloister. This has been interpreted as a robber cut of a beam slot which may once have supported a screen shielding the doorway from the main hall.

Early post-medieval: 1538 to late 16th century (Period 4)

With the suppression of the monastery and subsequent refounding of Norwich Cathedral by Henry VIII in 1538, most of the conventual buildings were deliberately demolished or allowed to fall into disrepair. The exact date for the demolition of the refectory is uncertain although Whittingham suggests that the roof was dismantled under Dean Gardiner (1573–1589) (Gilchrist 1997, 12). It is likely that the interior was stripped of its decorative blind arcading, floor tiles were probably removed and other internal details destroyed. The west wall was totally removed and the height of the south wall lowered to below that of the intra-mural passage. The internal face of the north wall was taken down, so removing the intra-mural passage. Both the north and east walls were left more complete as they still served the adjoining buildings, the cloister to the north and the Dark Entry to the east (Fig. 2).

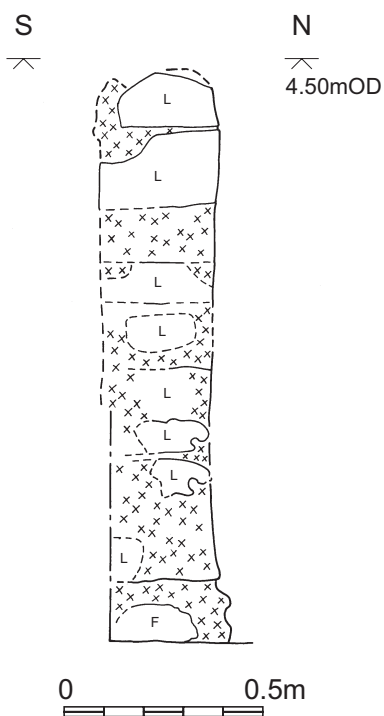


Figure 23 Elevation: pier 2054, showing reused, moulded limestone blocks within the construction. East facing. Scale 1:20

The majority of the archaeological evidence relating to this period was in the form of pits filled with demolition rubble (Fig. 25) and layers of demolition rubble and make-up. Two groups of features stood out from this. One was a series of seven post-holes (*G54*), located in the eastern part of the site. These probably related to scaffolding being erected in order to aid the demolition of

the building. The second was a group of three ovens (*G63*, 2431, 2599, 2670) all located in the northern part of the site, two of which were heavily truncated by pits containing mortar debris from demolished buildings. No evidence of the refectory floor was present in this area, so it is probable that this had been removed prior to the firing of the ovens.

The deposition of mortar rubble within the area of the refectory building occurred in four main stages. Initially a series of large pits (*G56*) (width between 2.0m and 2.5m) were dug. The majority of these ranged along the northern part of the site. Depths varied, the deepest being 1.5m while most were *c.*0.7m deep. Due to the nature of the excavation the full plan of only two of these pits was revealed. One of these (1593) varied from the rest of the group by the presence of two contemporary post-holes in its base and with the fills of loamy material as well as demolition debris. The deposition of the fills also suggests that it was possibly reshaped while open, suggesting an alternate primary use. The other (1255) was located to the east of this. There was probably a sequence of larger rubble filled pits in the centre of the area, although with the exception of one pit (3401) these were only partially seen during the watching brief stage.

The fills from this large group of pits were generally of mortar rubble which had been well sorted with much of the worked stone having been removed. However 154 pieces of worked stone were recovered from these pits of which fifty-three were moulded pieces and eight were moulded and painted, the remainder were undiagnostic fragments. They also contained 846 pieces of window glass, much of which may have come from the Lady Chapel which fell into disrepair in the decades following the Dissolution. Of the glass *c.*80% came from just two pits (1255 and 2754). The majority of ceramic building material from this period was found within these pits with

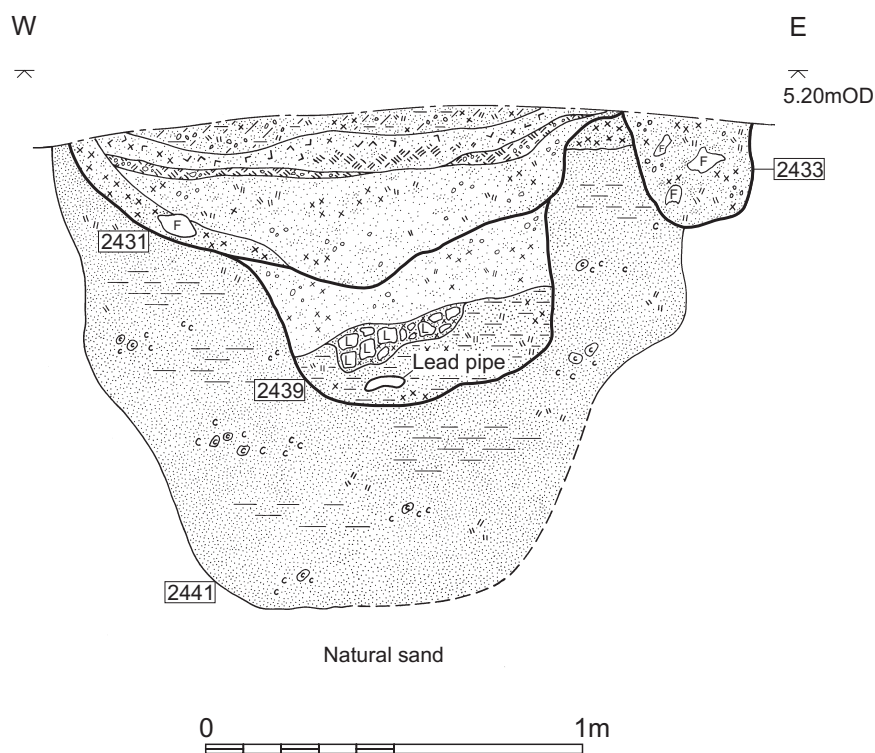


Figure 24 Section: Late Saxon pit (2441) and medieval water-pipe trench (2439) cut by early post-medieval features (2431 and 2433). South facing. Scale 1:20



Plate 4 Early post-medieval pit filled with demolition debris located below the only surviving bay of the internal medieval arcade. Looking east, scale rod 2m

the assemblage made up largely of floor tile, although roof tile and early brick were also present along with floor bedding mortar. The pottery was largely residual Late Saxon and early medieval wares although some later fabrics were also present, noticeably Raeren/Aachen wares (15th- to early 16th-century). Small finds included one Nuremberg jeton dating from 1500–1525 (and therefore residual), eleven iron nails, two pieces of lead came and five pieces of lead offcuts/metalworking debris.

Following on from this phase of pit digging several layers were dumped across the site (*G58*), particularly across the northern part and in the south-west and south-east corners. These deposits appeared to be similar to the material (yellowy brown, grey and orange sandy silts, many with mortar fleck and charcoal inclusions) removed by the digging of the pits, interspersed with occasional dumps of mortar debris. Overall this phase represented a period of levelling and consolidation across the site. Finds included small quantities of floor and roof tile, pottery which was mainly residual and eleven pieces of worked stone of which five were fragments. Small finds recovered comprised twelve iron nails, three pieces of window glass and one fragment of lead metalworking debris.

A second phase of pit digging occurred (*G57*). These pits, again located mainly to the north of the site (with one exception to the centre of the east part of the site) were

significantly shallower than the first series of pits, their depths ranging between 0.1m and 0.55m, with one exception which was 0.78m deep. The finds assemblage was similar to that of the earlier pits with the pottery assemblage containing a large amount of residual material along with some post-medieval fabrics. Of the forty-nine pieces of worked stone found, twenty were diagnostic mouldings dating from the 13th century and two (an abacus and a capital) were 12th-century. Only fifty-eight pieces of glass were found although forty-eight of these came from a single pit (2459). Other small finds included five iron nails, an iron bar, a perforated lead sheet, three offcuts/spillage from lead working and an iron rowel spur.

Two distinctive pits contemporary with this phase of pit digging were located to the east end of the site (*G92*). One (3059) differed from many of the other pits as its fill contained layers of more loamy material between the dumps of mortar demolition debris. The second pit (3300) (Plate 4) measured 3.5m × 4.9m and contained an exceptionally large and interesting assemblage of worked stone. Of the 129 pieces from this pit seventy-one had painted decoration surviving on the surface. A number of different forms were found including a capital, six shaft rings, twenty-one column fragments, eleven voussoirs and four water-holding bases. It is thought that most of this came from the chapter house, which was originally built in the early 12th century but drastically remodelled in the 13th century. Ninety-four pieces of glass, some painted, were also found within this mortar rubble-filled pit.

Following the dumping of demolition material from the monastery buildings, a number of deposits (*G61*) were spread across the site, sealing the pits and pre-dating all later activity. These layers in general were made up of gritty sandy silt which may have been imported to the site, or could have been the upcast from the large rubble pits, redistributed across the site. In places the lowest level of this deposit is below that of the refectory floor surface (Fig. 6), emphasising the extent of destruction which had taken place during the demolition of the building. Overall the ground level within the refectory was raised to a maximum of *c.*5.9m OD towards the west end and *c.*5.5m OD towards the east. All except two of the sixty-five pottery sherds were residual fragments of Thetford-type ware and early medieval wares. Of the remaining two sherds one is a large fragment of a Martincamp costrel possibly dating to the 16th century while the other is a sherd of Frechen stoneware dating from the second half of the 16th century. Fragments of floor bedding mortar probably from the refectory floor and pieces of 13th- to 15th-century floor tile were also present along with ten iron nails.

It is also during this period that the larger of the medieval stone-lined pits was partially backfilled (*G50*) (Fig. 22). The basal fill of this feature (2478) was a light reddish brown mix of silty organic material which accumulated to a depth of 0.2m towards the sides of the pit diminishing to 0.06m nearer the centre. Within this deposit and directly on the floor (2479) of the stone-lined pit was the almost complete remains of a tall fluted glass beaker (SF469) decorated with horizontal and vertical applied white glass trails which probably dates to between 1550 and 1600 at the earliest. The upper fills (*G51*; 2122, 2473, 2474 and 3220) were distinctly different and included large quantities of mortar within sandy silt soils. Also included within these loose deposits were frequent

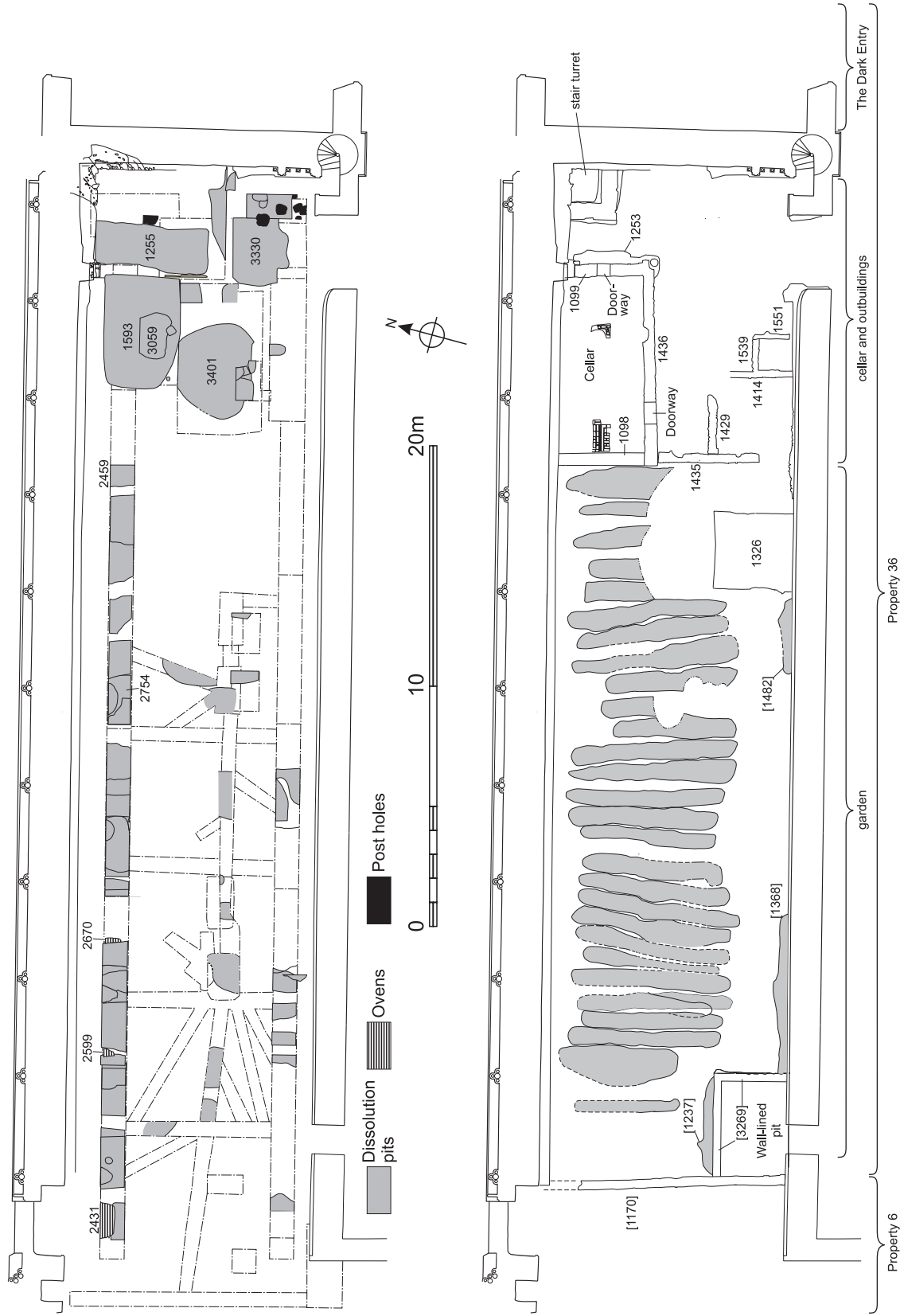


Figure 25 (above) Plan: early post-medieval features. Scale 1:250
 Figure 26 (below) Plan: post-medieval phase 2 features. Scale 1:250

charcoal flecks, flint and grit with occasional limestone fragments.

On considering this period of activity as a whole it is interesting to note there was no evidence relating to the refectory structure itself found within these deposits. Of the significant finds assemblages, the datable window glass probably originated within the Lady Chapel, while the diagnostic stonework was primarily of a 13th-century style and probably from the chapter house. No elements of the distinctive inter-laced arcade of the refectory, nor the pilasters which divided it, were present in the worked stone assemblage. It is therefore likely that most of the refectory had been demolished prior to this area being used as a dumping ground, with both the re-useable material and the waste rubble and mortar being removed from site.

Post-medieval to modern: late 16th century to 1873 (Period 5)

This period sees a change of land use, from an area used for the disposal of demolition debris to one of domestic habitation. From c.1620 the area once occupied by the refectory was divided into two properties, each of which was occupied by a prebendary's house (Fig. 26). The majority of the area belonged to the larger eastern property (Property 36 as numbered in the survey of The Close c.1649 (Metters 1985)) which also extended over the Dark Entry, while the remainder of the area formed part of the garden to Property 6, which fronted onto the Upper Green.

Property 36 and Property 6

Phase 1 late 16th century to 1620

The earliest features (*G71*) were few and sparse and located in the area to the east of the west cloister door and included four small pits and five linear features. One pit (*G102*, 2161) (Fig. 19), located at the east end of the site is worthy of note due to its comparatively large and varied finds assemblage. The pottery included a range of local and imported wares of the late 16th to early 17th centuries, which concords with the vessel glass assemblage in which eight of the ten vessels date to the second half of the 16th century or the first half of the 17th century. Other datable finds include a single clay tobacco pipe bowl (1610–1630), a Nuremberg jetton (1586–1635) (SF503) and a copper alloy stirrup (SF492) of an unusual type but probably from the early 16th century. Other finds included iron nails, bars, linked chain rings and a knife blade (SF629) and copper alloy lace tags and a pin.

Sealing all these features was a series of redeposited make up and levelling layers which raised the ground level to c.5.85m OD. These consisted of two distinct groups. The first (*G72*), located in the central and western part of the site, consisted of silty sands with moderate small flints, charcoal and mortar flecks. The second group (*G103*) located in the eastern part of the site included a larger quantities of rubble. This variation in deposits corresponds with the later use of the area, with the rubble deposits forming a more solid platform for the later buildings and the soil-based deposits forming the garden area. On completion of this, a wall (1170) (*G66*) was constructed towards the west end of the excavated area on a north-to-south axis, which divided the area into two distinct properties (Fig. 26). It was constructed of flint

with some brick and re-used limestone. The wall survived to a height of c.0.75m (1.25m at the extreme north end) and had a wider footing of less even construction.

Property 36

Phase 2: 1620 to mid 17th century

(Fig. 26)

Many of the rooms of this house were located over the medieval Dark Entry to the east of the site. The eastern third (c.12m) of the area of excavation contained other elements of the house, (a cellar, and a stair turret) and outbuildings, while the remaining two thirds (c.30m) was transformed into a garden area.

The cellar (*G77*), which measured 7.3m × 3.8m internally, utilised the north refectory wall as its northern edge. The eastern wall (1099) incorporated the medieval respond base within its build and had a centrally placed doorway (c.1m wide and later blocked by 1201). At the same height as this threshold (5.45m OD), in the interior of this wall, a slot was present which may have held a timber, possibly supporting timber stairs. Located in the south wall of the cellar (1436) was a second doorway (c.2.5m wide at 5.85m OD) which was also later blocked. All of the walls (1089, 1099 and 1436) were constructed of flint and brick, with the flint concentrated in the lower levels. The upper part of the south wall was of brick laid in English bond. The floor of the cellar was only seen in the base of the ground beam trenches, at a level of 4.1m, where the remnants of some internal divisions were noted, between which were tiled floors.

This cellar formed the footprint for a two-storey building which is shown in documentary records (Plate 5). This element of the building was connected to the rest of the house (above the Dark Entry) by a stair turret located in the north-east angle of the former refectory. Construction of this occurred in two phases denoted by a slight change in the alignment of the footings. It is possible that the earlier phase of footing held a temporary (perhaps wooden) structure which was quickly replaced by a more substantial build.

The stair turret footing was made up of re-used ashlar, the occasional brick and some roughly faced flints in a lime mortar. The worked stone included three abacuses, two voussoirs, a painted major half shaft and eleven engaged column pieces which came from the blind arcade within the refectory. Also included in the build was a post-medieval jamb or reveal and a millstone (unusual as it was made of limestone). The area within the turret had been floored in brick, the western edge of which was formed by a strip of roughly shaped small limestone pieces which created a threshold to a doorway.

Extending southwards from the south-west corner of the cellar was a wall (1435) (*G118*) which separated the house and most of its outbuildings from the garden area to the west. Like the cellar it was built of flint, limestone and brick set in lime mortar with a greater proportion of flint in the lower levels. It was faced on its west side (the garden side) with brick. A gateway (1.7m wide) was left at its south end, which would have provided access to the garden and a brick-built 'cool house' (see below). To the east of this wall a number of other walls partially survived, indicating that this area contained outbuildings. A cellar was located adjacent to the south refectory wall. This was constructed of three brick-built walls (1540, 1539, 1551) built up against

the refectory wall, thus forming a small square structure (1.3m × 1.3m internally). Bricks sampled from this were of the same type as those used in the construction of the cellar of the main house. Sections of both a north-to-south (1414) and an east-to-west (1429) wall were also recorded, showing that this area was further sub-divided and may have contained other lean-to type structures.

The majority of the area to the west of the dividing wall (1435) was given over to horticultural activity, although one large structure was present. This was a brick-built below-ground cellar (2.7m × 3.3m), with vertical sides and a vaulted roof (G87, 1326). The west end of this vault was sealed by a wall while the east end of the original build was not present as this had been removed by later alterations. The base of this feature was only revealed during the watching brief but no floor surface was noted. Precise dating and interpretation of this feature is difficult. Brick samples suggest a 17th-century or later date although no dating evidence relating to its primary use was recovered. It is thought likely that it was built as part of the main construction phase of the house or very soon after and may have been constructed as a 'cool house' for storage of food stuffs. Although there was no indication of access to this space, it is likely that this would have been at the east end which was later drastically altered.

With the construction of the prebendary's house, the garden was formally laid out (G60) (Fig. 26). Twenty-eight closely spaced linear garden beds, aligned north-to-south, were dug. The majority were 0.7m wide and they varied in length between 5.2m and 6.8m. All were filled with easy draining material including many small stones and fragments of both ceramic building material and limestone.

One other large feature was constructed during the initial phase of building. This was a walled pit (G66) c.3.15m deep located in the south-west corner of the property, which utilised the property boundary as its western wall, the southern 3m of which had been built to a greater depth as part of this pit. The north and east sides (3269) were built with the same materials, a mix of flint, brick and re-used worked stone. The south side was formed by the southern refectory wall, although the footings had been removed to the width of the upstanding wall and a new face of brick, flint and limestone built against it. The lower three fills contained pottery and vessel glass dated to the late 16th and early 17th centuries, although the pit was not completely backfilled until the 18th century (see below). A number of irregular features (G75, 1237, 1368, 1482) were excavated adjacent to the north and east face of this pit and against the south refectory wall which have been interpreted as beds for plants. Once established, plants would have partially hidden the walls from view.

Phase 3: late 17th to mid 18th century
(Fig. 27)

Access to the cellar was changed when its east and south doorways were blocked (G80). The external east face of the cellar wall was also repaired with a red brick face being added. An area for ash disposal was created adjacent to the east refectory wall (1097, G81). This took the form of a highly compacted rubble surface made up of re-used brick fragments, flints and limestone rubble edged by a retaining brick wall (1185). Overlying this surface was a deposit of ash and cinders from which clay tobacco pipe dating from the 17th century was recovered.

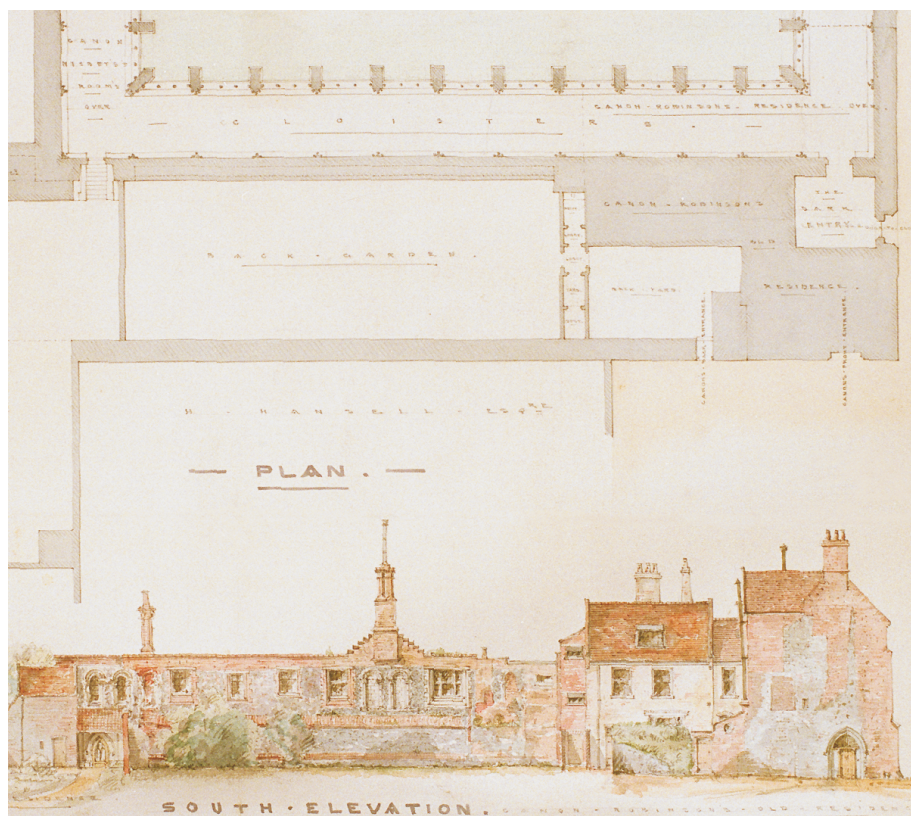


Plate 5 Plan and elevation of the prebendary's residence on the site of the refectory by John Henry Brown, 1873. With permission of the Norfolk Records Office and the Chapter of Norwich Cathedral, NRO DCN 127/64

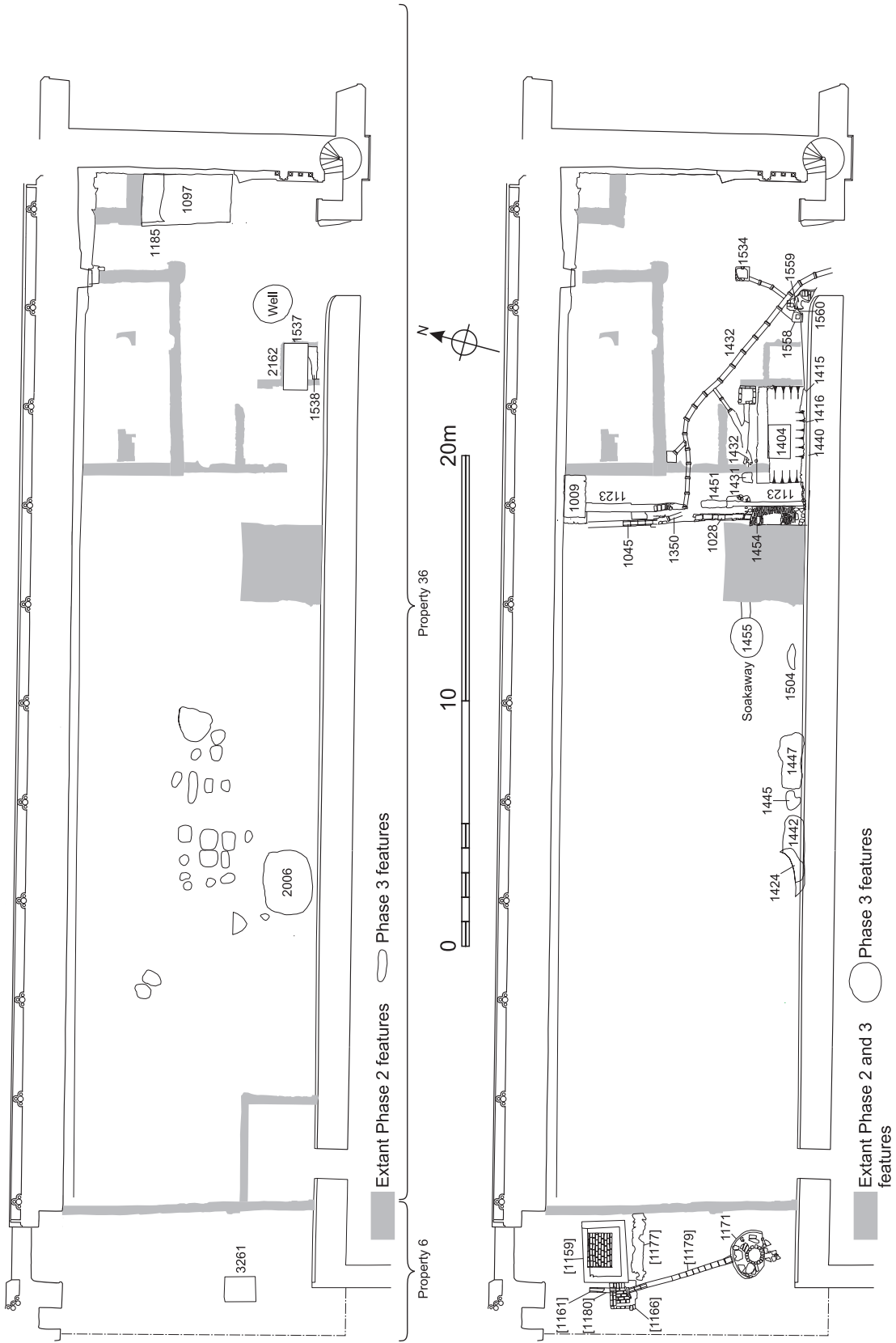


Figure 27 (above) Plan: post-medieval phase 3 features. Scale 1:250
 Figure 28 (below) Plan: post-medieval phase 4 features. Scale 1:250

Alterations to the outbuildings included the backfilling of the small cellar adjacent to the south refectory wall (G79). This cellar was replaced by a newly constructed storage tank (G120) which was formed by three walls (1538, 1537, 2162), sloping at *c.*45°, one vertical wall and a tile floor. The function of this is uncertain but it is probably best interpreted as a store perhaps for vegetables and fruit grown in the garden. Brick samples taken from these walls date to between the 16th to 18th centuries. A well was built to the east of this, the bricks of which date to the late 17th to 18th centuries.

Changes were also made to the layout of the garden, the level of which was raised by the importation of soils to the site (G73). A number of sub-circular planting holes were dug (G74). These were located in the central part of the garden and were filled with loose sandy silty ash. A gravel pathway was also established which ran alongside the south refectory wall. Finds from these garden features included some residual material as well as pottery of late 17th- or early 18th-century date.

One pit (2006) (G108) of particular note was located close to the south refectory wall and recut into the top of the larger medieval stone-lined pit (Fig. 22). The pottery from this was mainly post-medieval wares in particular glazed red earthenware, although other local and imported wares were also present. Small finds included iron nails and a right-angled bar. Of the twenty-three pieces of clay tobacco pipe found five were bowls which could be dated to the mid to late 17th century.

The walled pit in the south-west corner of the property was finally completely backfilled (G67). Its upper fills contained vessel glass, bottle glass and pottery of a late 17th- to early 18th-century date. The ceramic tobacco pipe assemblage dates mainly from the early to mid 17th century, although a few examples were dated to the late 17th to early 18th century.

Phase 4: late 18th century to 1873 (Fig. 28)

During this period further alterations were made to the outbuildings and a new drainage system was constructed. As part of the drainage system the east end of the 'cool house' was demolished and an extension to this structure (0.75m in length) constructed in order to convert it into a soak-away (G88). This was partially backfilled with rubble (G89) from which pottery of 19th-century date was recovered. Water was directed into the north-east corner of the soakaway via a drain (1045) made of paired ceramic blocks with a central hollowed channel. This probably took water from both the cloister roof and the prebendary's residence. As part of this system, a circular soakaway, constructed of brick with a domed top and external diameter of 1.5m. (1455), was built. This was located 0.6m west of the converted 'cool house' and connected to it by a drain of paired ceramic blocks.

This elaborate drainage system did not appear to have been in use for long, as within this period the system was completely redesigned (G95), with ceramic drainage pipes (1432) being used to take the excess water, not into the soakaway but across the eastern part of the site and beyond the limits of investigation. These changes may relate to an order made in 1861 (Gilchrist 1997, 13) to adjust the drainage of the house.

A new boundary wall (G97; 1123) was built, separating the prebendary's house and outbuildings from

the garden. This was *c.* 1.3m west of the previous boundary and at its north end abutted a rectangular base (1009) constructed of re-used limestone ashlar blocks and flint rubble. The wall aligned with the east end of the extension of the 'cool house' on its conversion to a soakaway and extended the full width of the area except for a central gap which formed a new gateway (0.75m wide) into the garden.

Changes to the outbuildings included the construction of a second brick-built storage tank (G90) with sloping sides and a cobbled floor surface. Pottery of late 18th- to 19th-century date was found within the floor construction. The garden at this time appears to have been largely left open, the only addition being a number of planting holes (G84) along the south wall.

Phase 5: post 1873

The prebendary's house is documented as being demolished in 1873. This process saw the buildings knocked down, the cellar backfilled, and the barrel-vaulted soakaway damaged and backfilled with rubble. The backfill of the cellar included moulded and ashlar limestone, which had originally been part of the medieval refectory. Medieval floor tiles were also present which may indicate that they had been re-used in the post-medieval house.

Property 6

Phase 2: 1620 to mid 17th century

This property fronted onto the Upper Close to the west of the site, so only *c.* 5.5m of its grounds were within the area of excavation (Fig. 26). Two early phases (G105 and G106) of levelling deposits were recorded. Although no dating evidence was found within them they were sealed by Phase 3 levelling deposits.

Phase 3: late 17th to mid 18th century (Fig. 27)

A phase of levelling (G108) was identified containing dating evidence which included 17th-century clay tobacco pipe and 18th-century pottery.

Eleven small features (G69), containing 16th- to 18th-century finds were seen cut into these deposits (not shown on plan). One larger pit (G104, 3261) was also partially excavated, with further work occurring during the watching brief stage, where a wall was noted which may have formed its northern edge. The pit contained a significant quantity of finds which included almost 7kg of pottery, most of which was of a late 17th- to 18th-century date. Some of the ceramic tobacco pipes date to the early to mid 17th century while other examples date to the late 17th to 18th centuries. Ten glass vessels were also found some dating from the late 16th to early 17th centuries and others from the late 17th to 18th centuries. A strip of parchment was also retrieved from within the wall. It is unlikely that this was accidentally included within the construction of wall and so was probably deliberately placed there. The reason for this is unclear, but perhaps it was regarded as some sort of charm.

Phase 4: late 18th century to 1873 (Fig. 28)

Water management also featured strongly within this property as a sophisticated system for taking water from

the cloister roof was built (G65). This consisted of large circular soakaway (1171), small square soakaway (1159), a silt trap (1166) and connecting drainage pipes (1161, 1179). Incorporated in the build was a fragment of a grave slab engraved A + H 1805. An irregular garden feature (1177) was located along the south side of soakaway 1159, which when planted would have hidden this feature from view. It is possible that this drainage system is the result of an order made in 1871 demanding that the drainage of

Canon Nesbit's house in the south-west corner of the cloister be put in order (Gilchrist 1997, 13).

Phase 5: post-1873

This drainage system went out of use (G85) and the small square soakaway was backfilled entirely with limestone pieces including moulded and ashlar pieces. Of these, forty-seven were retained and included pieces which originated from the medieval refectory, the infirmary and other post-medieval buildings.

Chapter 3. Building Materials and Structural Fittings

Introduction

by Heather Wallis

All of the relevant objects found during excavation have been analysed, although only selected objects are discussed and catalogued in Chapters 3 and 4. A full list of all items is available in the site archive, together with more detailed reports.

Special finds were allocated Small Find numbers (SF), individually recorded pieces of worked building stone were given Worked Stone numbers (WS) and each fragment of window glass was allocated a catalogue number (Cat. No.). These reference numbers are used throughout the text and in the figures. Other finds are referred to by context number only.

The reports on the finds have been divided into two chapters. This chapter considers objects used in building construction and includes structural fittings and fenestration as well as decorative designs and techniques. It covers building materials of all periods from the Late Saxon through to the post-medieval. Chapter 4 includes all of the other finds categories, with the information being presented by material type.

When considering the information presented in both this and the following two chapters it should be remembered that deposits formed during the Late Saxon period were often redeposited during the following periods. Hence there is a high degree of residuality in the finds assemblages from some later periods. The use of shoring in many of the trenches will have increased the risk of intrusive material in earlier contexts.

Iron fixings

by Julia Huddle

The majority of the structural ironwork assemblage consisted of nails or parts of nails (240 pieces, thirteen from Period 2, twenty-nine from Period 3, 106 from Period 4 and ninety-two from Period 5). Two clench bolts were present, both with a diamond-shaped rove and one with a stub of 'bolt' *in situ* (SF771). Clench bolts were used for joining overlapped timbers and many have this distinctive diamond-shaped rove at their ends. They are well known from Late Saxon contexts elsewhere, for example over eighty have been found from Anglo-Scandinavian levels at Coppergate, York (Mainman and Rogers 2000, 2557). The examples from the Norwich Survey excavations were recovered from 11th/12th-century contexts right through to the post-medieval period (Goodall 1993a). One other find of a similar date was a looped staple (SF612). These may have been used to hold chains and hasps in place, such as for use on gates doors and chests. Examples of these have also been found at Coppergate (Ottaway 1992, fig. 270).

A looped spike (SF693) of possible medieval date was found. These spikes were driven into joints in masonry or wood and could have held door jambs in place, although alternatively it has been suggested that they may have been used for holding candlesticks (Goodall 1993a, 146).

Items found in post-medieval contexts include three hinge pivots (SF467) and a double-pronged object (SF789). Doors, windows, shutters, gates *etc.* were all hung on hinge pivots. The type recovered here, all with tapering shanks, would have been driven into timber. No direct parallels for the double-pronged object have been found but it shares some of the attributes of latch rests (Margeson 1993, 154, fig. 114, nos 1214–24) although these have just the single shank springing from a rest plate.

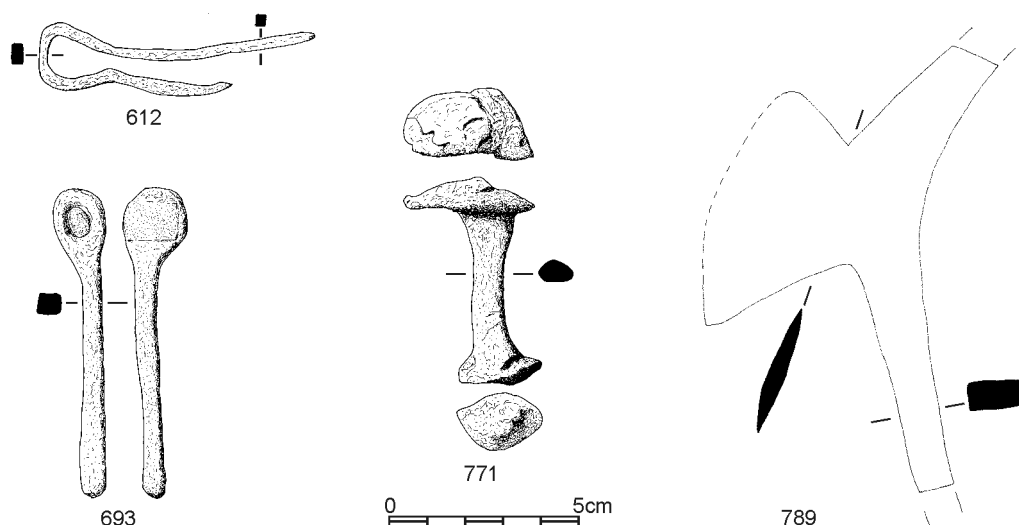


Figure 29 Finds: structural ironwork. Scale 1:2

Catalogue
(Fig. 29)

- SF612** Looped staple, one arm broken off. Context 1494, layer, Period 3, *G20*, Object date: medieval.
- SF693** Looped spike, with oval-shaped hole in head. Context 3012, pit fill, Period 4, *G92*, Object date: medieval.
- SF771** Clench bolt and rove, rove broken but originally diamond-shaped. Context 3376, make up, Period 3, *G46*, Object date: medieval.
- SF789** Artefact with centrally-placed crescent-shaped plate on double-ended ?shank. Context 3212, pit fill, Period 5, *G67*, Object date: post-medieval.
- SF467** L-shaped hinge pivot with tapering shank. Context 2001, pit fill, Period 5, *G67*, Object date: post-medieval. *Not illustrated.*

Lead objects and lead working debris

by Julia Huddle

Six perforated lead sheets, one nailed sheet and four lead strips were found. Two large neatly folded sheets are almost certainly roofing lead. Two sections of lead water pipe were also found, both were squashed to varying degrees with an estimated diameter of 63mm. Lead water pipes are not unusual within monastic complexes, examples from Norwich were found during the excavation of part of the Greyfriars precinct (Egan forthcoming a). Fifty-six pieces of lead waste were recovered which can be divided into two categories, that of molten or irregular lumps, including spillage, and roughly cut sheets and strips many of which are likely to be offcuts. All of the lead came from Period 4 and 5 contexts.

Worked and moulded building stone

by Stephen Heywood
(Fig. 30, Plates 6–9)

The refectory excavations recovered 781 fragments of worked stone of varying dimensions. Almost all the stones were of the smooth yellow limestone characteristic of the stone from the Caen quarries in Normandy while only nine pieces were of the shelly limestone from Barnack. Of the identifiable pieces 121 were shaft fragments with axe tooling, possibly from the former arcading which stretched the lengths of the four sides of the refectory. Forty-seven pieces of ashlar, the majority with diagonal tooling, were indicative of a late 11th- to mid 12th-century date. Eighty-nine pieces are described as mouldings of which twenty-nine had plain rolls and thirty-two had

filleted rolls, eight had keeled roll mouldings and eleven had nibbed rolls.

Many of the moulded pieces were identified as voussoirs while many more probably were but the evidence for this had been lost. Some of the moulded pieces have original painted decoration which emphasises different parts of the complex mouldings. These are discussed in detail by Andrea Kirkham (see below).

Occasional fragments of capital, abacus, string-course and chevron decoration were found but not in sufficient quantities or of particular distinctiveness to point to any particular demolished part of the cathedral. However, a very interesting group of fragments came to light consisting of complex miniature mouldings, possibly turned on a lathe, forming circular sections with diameters similar to shafts (Plate 6). The tentative interpretation is that they were shaft rings which were fairly common embellishments to *en délit* shafts in the late 12th and 13th centuries. Although Bishop Walter de Suffield's Lady Chapel of 1248 to 1257 may have had rings to nook shafts beside the windows, the most likely provenance for these is the infirmary built by Bishop John of Oxford from 1183 to 1190. The building stood a few yards to the south of the refectory and drawings of the building before its demolition clearly show elaborate rings to the shafts decorating every alternate column. John Adey Repton's drawings show the rings with distinctive nicks cut into the scotias in a similar fashion to the scotias of the surviving water-holding bases (Pierce 1965). No sign of similar nicks was found on the fragments, which sheds some doubt on the proposed provenance. However, the drawings show only one side of one column with two out of the twelve shaft rings in enough detail.

Another factor which suggests a different provenance for the shaft rings is the small number of the other fragments which can be confidently assigned to having been part of the Infirmary. This is confined to the eight fragments of keeled rolls which were clearly used at the Infirmary. Other mouldings such as the typical Romanesque roll and cavetto could possibly have come from there as indeed could the finest piece of sculpture from the excavation which is a tiny fragment of a delicately carved reversed volute (Fig. 30). On stylistic evidence alone, the sculpture is typical of the later 12th century and could well have come from the Infirmary. However this is not certain as the fragment cannot be matched to the surviving or drawn capitals. It is worth remarking that the cathedral's collection of stone

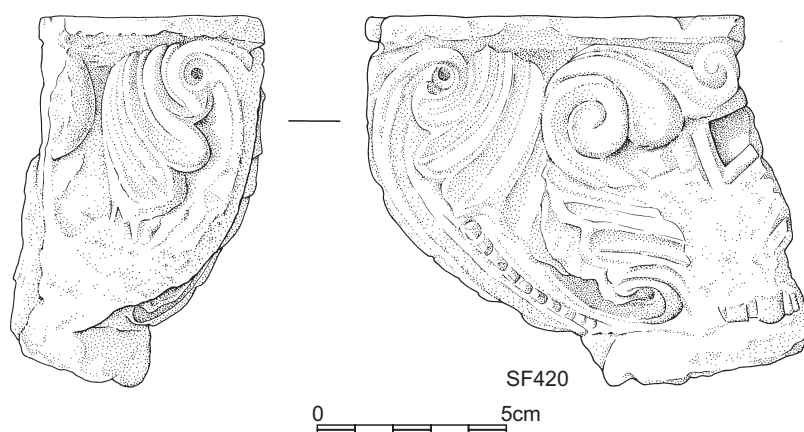


Figure 30 Finds: decorated worked stone fragment. Scale 1:2



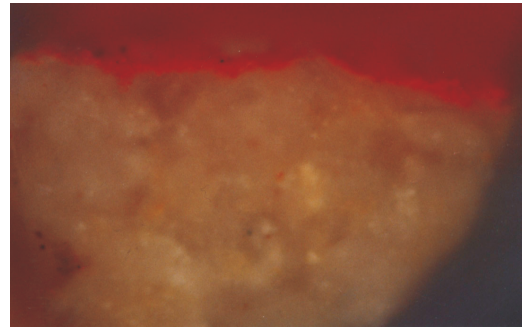
Description: Shaft ring

Number: 3301/409

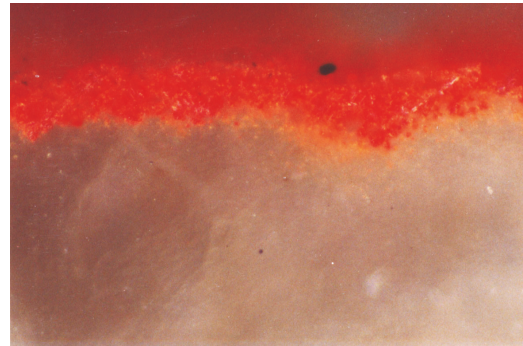
Description of Paint Layers: Bright red vermillion painted directly onto the stone. Note the paint edge. Other areas remained unpainted. The only polychrome scheme found on this stone before being limewashed over

Samples:

14a and 14b: Vermilion on stone x200 and x500



14a



14b

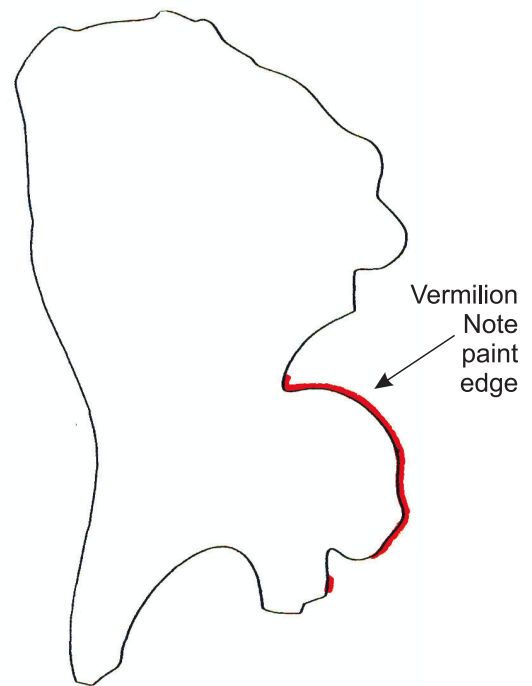


Plate 6 Shaft ring (WS409) with vermillion painted directly onto the stone

fragments contains two fragments of capital sculpture from the infirmary (Franklin 1980, 20, pl.19).

A second interesting group of moulded fragments consists of those with filleted and nibbed rolls which are combined with deeply cut hollow rolls. There is considerable variety and no concerted attempt has been made to sort them into sub-groups. Filleted rolls occur from the early 13th century and nibbed rolls are more commonly used during the 14th century but they are considerably rarer than the filleted roll. The fragments found during the excavations are accompanied by deeply undercut hollow rolls and the roll diameters are fairly large (60 to 100mm). Also there are a few examples with wave mouldings. All this suggests dates towards the very late 13th century and the first half of the 14th century.

It can be assumed that these stones came from a demolished part or parts of the monastic compound. Demolished buildings which could have been the source for the moulded stones are the Lady Chapel (1248 to 1257), the Chapter House (1299 to 1314), the Hostry (mid 13th century) and St Anne's Chapel (1330). The items recovered from site can be directly compared with the standing doorway of the hostry. The mouldings here are smaller in section and less 'busy' or varied than those recovered from the excavation, therefore the hostry is unlikely to be the source of these moulded pieces.

The Lady Chapel (1248–57) was built by Bishop Walter de Suffield as part of a more ambitious plan to rebuild the entire east end of the cathedral (Fernie 1993, 162). The evidence of this intention can be seen where the former chapel abutted the cathedral where the reveals of tall windows survive relating to windows for the Lady Chapel and for the intended, but never carried out, retrochoir. The only other part of the Lady Chapel visible is the foundation of the east wall and the arches of the double entrance into the former chapel and now to the modern chapel since the 1930s. The reconstruction proposed by Arthur Whittingham (1949) suggests quite wide windows which suggest tracery, however the surviving reveals have no indication of the Geometric tracery which would be expected, and thus lancets appear to have been more likely. The earliest tracery at the cathedral can be found in the north windows of the Prior's Hall of 1284. There may be other unpublished evidence on which his reconstruction is based and it seems unlikely that the foundations, at least, would not have been uncovered during the excavations for the new eastern chapel during the early 1930s, as indeed, were those of the original axial chapels. This published excavation (Cranage 1932; 1935) does not mention anything significant about the Lady Chapel and it is disappointing that none of the fragments from the refectory excavation can be associated with the Lady Chapel mouldings which survive on the entrance arches.

The chapter house entrance arches are much closer in dimensions to many of the pieces found during the excavation, and have similar accompanying hollow rolls. Although exact matching has not been attempted there is a possibility that the filleted roll mouldings come from the demolished parts of the 14th century chapter house. The original Romanesque chapter house was entirely demolished following or during the riots of 1272. Detailed documentary evidence (Fernie and Whittingham 1972) indicates that the replacement took place during the episcopacy of Bishop Salmon between 1299 and 1314.

Apart from a featureless section of wall forming the north wall of a modern garage in the deanery garden the only surviving visible evidence is the entrance from the cloister walk. The elaborate tracery of the entrance is similar to a number of mouldings recovered from the excavations in the refectory. Further evidence for the plan of this new chapter house was excavated or recorded by Whittingham (1949) who suggested the east end of the chapter house was rebuilt as a faceted apse.

An interesting large fragment (WS279) (Plate 9) uncovered during the excavation is worthy of special mention and may also be associated with the demolished chapter house. It consists of a pair of parallel engaged shafts separated by a bold wave moulding. From one side slightly towards the back is the springing of an arch. It is difficult to work out exactly which part of a building it may have come from but a possibility is that it formed part of the piers between each of the bays of the former faceted apse of the chapter house.

Discussion by period

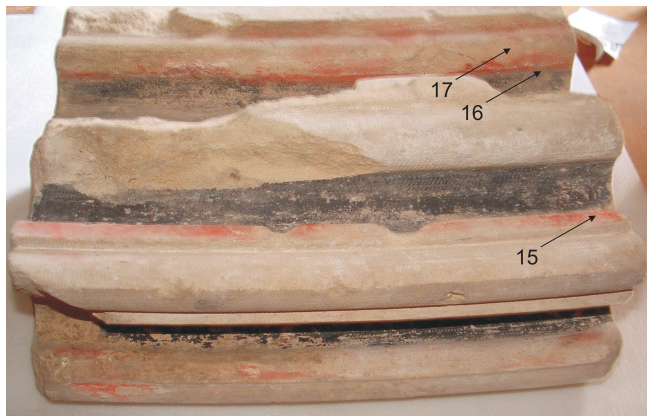
by Heather Wallis

Table 1 presents a summary of the worked stone assemblage according to period. A large number of the pieces (427) were fragmentary or not datable. In addition to this, 129 fragments or segments of column shafts were recorded. For the remainder of the pieces it was possible to identify a date based on the style of moulding, and in some instances to suggest from which building they may have originated.

Over 50% of the datable pieces have been identified as originating in the refectory or being of a 12th-century date. However it is interesting to note that only four of these were found in contexts dated to the time following the suppression of the cathedral priory (Period 4). This suggests that either much of the building remained intact or that any moulded stones taken from the building were removed from the site. In comparison to this, forty-two pieces which may have originated from the chapter house (see Heywood above) or were of a medieval date were found within the deposits of this period. This illustrates that the chapter house was at least in part demolished during this period and although much of the material was probably removed from the close, some pieces were dumped within the area of the former refectory.

The majority of the 12th-century and refectory pieces were found in Period 5 contexts. During this period, and associated with the building and use of the prebendary's residence, it is likely that further alteration or destruction of the architectural features within the refectory took place. More pieces were found within the layers post-dating the domestic use of the area (Period 6). It can be suggested that some of the decorative medieval stonework had been incorporated in the post-medieval buildings only to be demolished at this time. Again contrasting to this, the number of pieces possibly from the chapter house found in Period 5 and 6 contexts is very low.

The other building which was represented in this assemblage, was the infirmary. Although it is known that this building remained largely intact until the 19th century, the evidence from this site suggests that some demolition had occurred in the late 16th to early 17th century (Period 5).



Description: Voussoir

Number: 189

Description of paint Layers: There appears to be evidence for at least two schemes. The schemes are too fragmentary to be certain, however.

Scheme 1: Black paint in all the hollow mouldings and bright red vermillion on some of the mouldings, the samples show this to be directly onto stone, although one localised area appears to be on a limewash ground.

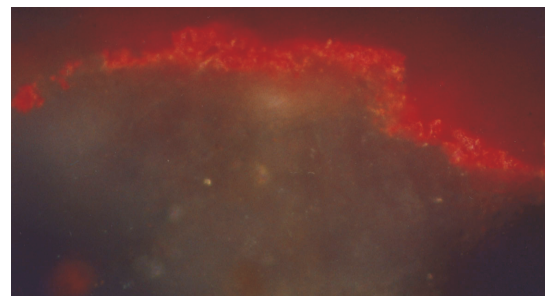
Scheme 2: Black in the hollow mouldings again but on a limewash ground. Traces of red ochre on a limewash ground were noted on one side of a filleted moulding. Possibly yellow on the fillet.

Samples:

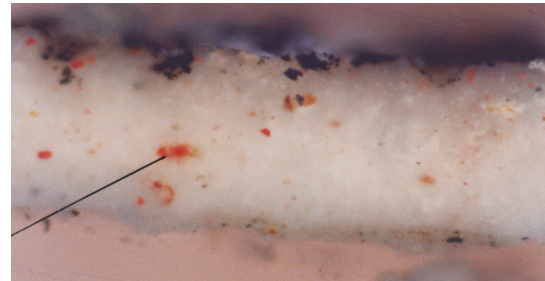
15: Vermilion on stone

16: Charcoal on limewash ground. Vermilion particles were picked up by the limewash layer from the underlying red

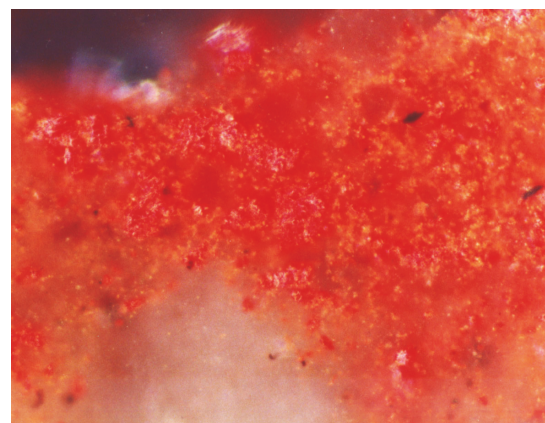
17: Another vermillion on stone



15



16



17

Plate 7 Black and red decorative schemes on voussoir (WS189)

| | Period 2 | Period 3 | Period 4 | Period 5 | Period 6 | U/S | Totals |
|--|----------|-----------|------------|------------|------------|-----------|------------|
| Fragments and plain blocks | 8 | 28 | 155 | 62 | 19 | 10 | 282 |
| Moulded fragment not dated | 1 | 3 | 62 | 30 | 23 | 7 | 126 |
| Column fragments and shaft sections | | 1 | 79 | 13 | 32 | 20 | 145 |
| Sub-total | 9 | 32 | 296 | 105 | 74 | 37 | 553 |
| Moulded pieces possibly from the refectory (c.1125–1145) | | | 1 | 32 | 12 | 6 | 51 |
| Moulded pieces of 12th-century date | | | 3 | 44 | 10 | 9 | 66 |
| Moulded pieces possibly from the infirmary (1183–1190) | | | 14 | 7 | 1 | 1 | 23 |
| Moulded pieces of late 12th-century date | | | 3 | 1 | 1 | - | 5 |
| Moulded pieces possibly from the Chapter House (1299–1314) | | | 41 | 8 | 3 | 2 | 54 |
| Moulded pieces of medieval date | | | 1 | 2 | | | 3 |
| Moulded pieces of late medieval date | | | 2 | 4 | 9 | 1 | 16 |
| Moulded pieces of post-medieval/modern date | | | | 7 | 1 | 2 | 10 |
| Sub-total | 0 | 0 | 65 | 105 | 37 | 21 | 228 |
| Totals | 9 | 32 | 361 | 210 | 111 | 58 | 781 |

Table 1 Quantity of worked stone pieces by period

The polychrome decoration of the building stone

by Andrea Kirkham

Of the worked stone assemblage 104 pieces retain their medieval polychrome beneath layers of limewash and accumulated dirt. Those with the most extensive areas of polychrome were cleaned and paint samples were taken (analysis by Catherine Hassall) to identify the pigments and to establish a stratigraphy. The samples were examined under low magnification, then mounted in resin to be cut and polished as cross-sections. The layers in the sections were compared at magnifications up to $\times 500$. The red pigments, and the brown in the limewash of samples 1–4, were identified using a polarising light microscope at magnification $\times 1000$. The most significant of these are described below. Dating of the stones and possible location within the cathedral precinct is discussed by Stephen Heywood (see above). The decoration identified on the stones consists of broad bands of plain colour, marbling or imitation masonry pattern. This use of imitation material, such as marbling and masonry pattern, is found elsewhere in the cathedral and precinct where it was employed to cover large surface areas and to emphasise architectural features (Park and Howard 1996; also see extant decoration in Norwich Cathedral).

A number of shaft rings, possibly from the infirmary, retain red colour beneath layers of limewash and dirt. On the most complete example (WS409) a sharp paint edge shows that the red was used to enhance specific features, in this case the shaft ring, with the rest of the stone unpainted. The red pigment is vermilion applied directly to the stone with no ground layers and is the only polychrome scheme found on the stone before being covered with limewash (Plate 6).

The voussoirs and a voussoir springer are associated by their polychrome schemes. All have black in the hollow rolls thus emphasising their depth and augmenting the shadow effect. Other mouldings are more difficult to interpret because so much has been lost but red was clearly used for some of the mouldings and, although the evidence is fragmentary, there appears to be two medieval polychrome schemes on two pieces (WS189 (Plate 7) and WS283). The primary scheme uses vermilion for the red areas whereas the secondary scheme employs a cheaper red pigment — red iron oxide on a limewash ground. Somewhat contradictory evidence is found on the voussoir springer (WS275) and voussoir (WS272 and WS273 Plate 8). Both have black in the hollow rolls as described above but neither of these stones seem to have used vermilion for the red areas and the red iron oxide is applied directly to the stone with no limewash ground.

A different polychrome treatment is found on the column with parallel engaged shafts (WS279) (Plate 9) and wave moulding as it relies on extensive areas of white. The stone was completely covered with limewash which acts not only as the background white in those areas not intended to be coloured but also carries the polychrome where this is used on selected features, such as the shafts. One of the cross-sections from this stone (sample 1a) shows three layers of limewash suggesting that the polychrome might be a tertiary scheme. This build up of limewash layers also provides a relatively thick, smooth surface to carry the colour. Pigments identified include red iron oxide and charcoal black applied to the limewash

ground. Plain red is used in the hollow chamfers of the wave mouldings and the engaged shafts were marbled. One shaft has black and red marbling (the background is black with red 'spots' to create the marbling). Another shaft has a red background (unfortunately, the paint is too abraded to establish whether it was marbled) suggesting an alternating colour scheme for the parallel shafts. Marbling was used elsewhere in the cathedral precinct, for instance as a horizontal dado band in the south wall of the chamber over the Dark Entry (Park and Howard 1996, 387–8). It is also used extensively in the eastern arm of the cathedral but here most of the marbling relies on a red and yellow colour combination (see the imitation ribs of the ambulatory vaults) quite unlike that found on WS279.

Amongst the assemblage of worked stones are fragments of ashlar decorated with masonry pattern and stencilled red roses carried on a white limewash ground. A background of white limewash carries the decorative scheme. WS277 has a double line masonry pattern in red (identified as vermilion) and black, with part of a curving stem for a rose. Another piece (WS285) has a rose. WS265 has red iron oxide scrollwork on a white background (Plate 10), probably forming a narrow horizontal band. Traces of black were too fragmentary to interpret but could be a marking out line rather than part of the design.

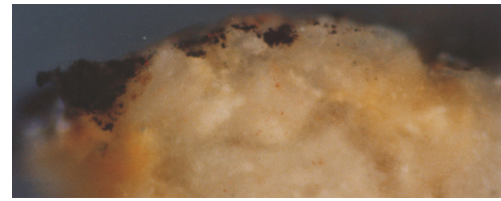
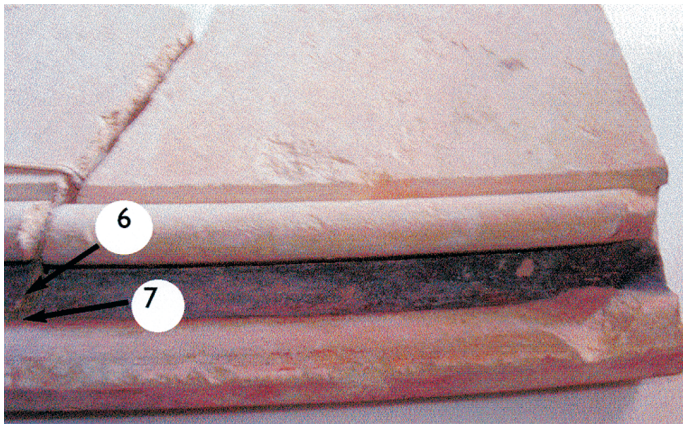
The decoration identified on the worked stones consists of bands of colour applied to emphasise the mouldings or specific features such as shaft rings or shafts. A limited palette(s) was used with the various schemes dependant on reds (vermilion, red iron oxides), blacks (charcoal black) and whites. Vermilion is the most expensive pigment identified. Overall the polychromed stones represent decorative schemes from more than one period and are from more than one building within the cathedral precinct. There is a notable lack of superimposed schemes given a potential timescale of some 300 or more years with the possible exception of the fragmentary evidence already noted on WS189 and WS283.

Ceramic building material

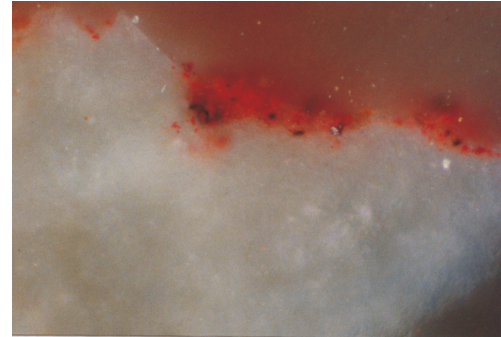
by Sue Anderson

A total of 1633 fragments of ceramic building material weighing 365.448kg was collected. This, however, was only a sample of the large quantity of material found on the site as single examples of bricks only were retained from upstanding structures. Table 2 lists the count and weight quantification of the ceramic building material by category. In addition to this there were 196 fragments of fired clay weighing 7.032kg, and 102 fragments of mortar (13.753kg).

The assemblage was quantified (count and weight) by fabric and form. Forms were identified from previous work in Norwich (Drury 1993), based on measurements. Other form terminology follows Brunskill's glossary (1990). Fabrics were identified on the basis of macroscopic appearance and main inclusions and according to the fabrics identified in the large assemblage from Dragon Hall, Norwich (Anderson 2005a). Two of the white-firing post-medieval fabrics (9 and 14) found at that site did not occur here but two new fabrics (22 and 23, described below) were identified.



6



7

Description: Voussoir

Number: 272 and 273

Description of paint layers: Black in the hollow onto stone. Red iron oxide on the moulding. The red is directly onto the stone. The red has picked up some of the black in sample 7.

Samples:

6: Charcoal black on stone

7: Red iron oxide on stone. There are particles of black mixed with the red.

There are no limewash layers, instead the coloured paint is laid on top of clean stone. The black is coarsely ground charcoal black, the red is iron oxide red.

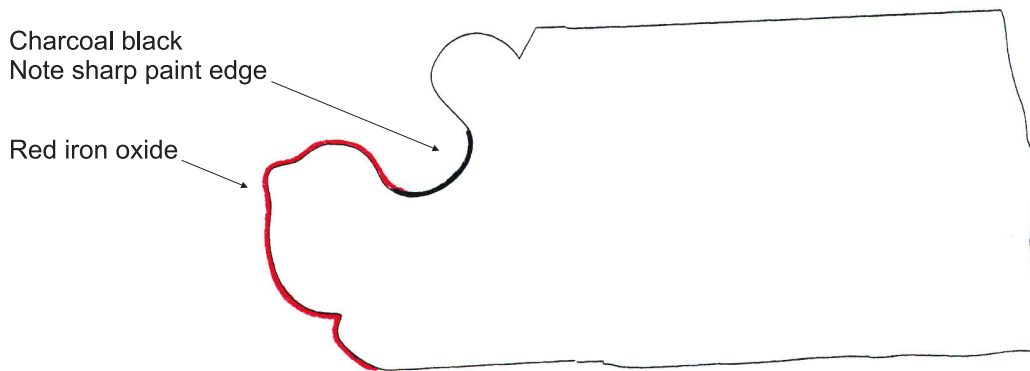
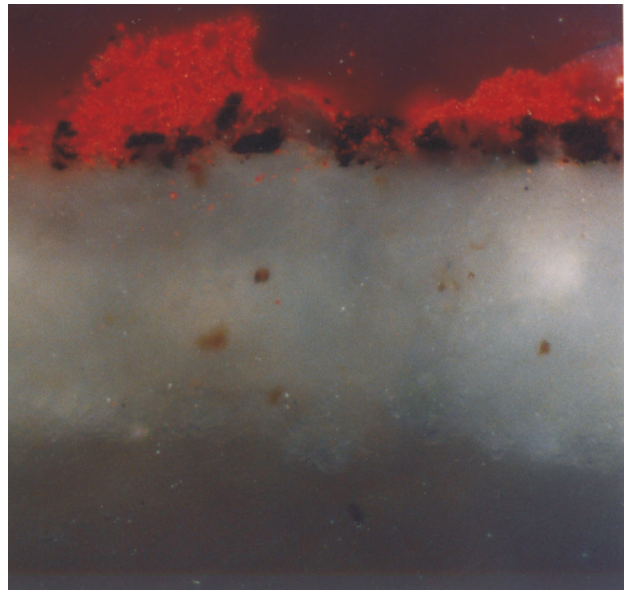
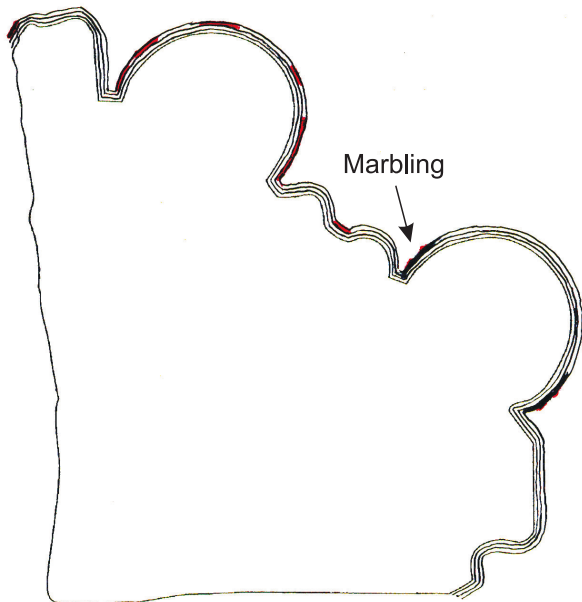


Plate 8 Voussoir with black and red decorative scheme (WS272 and 273)

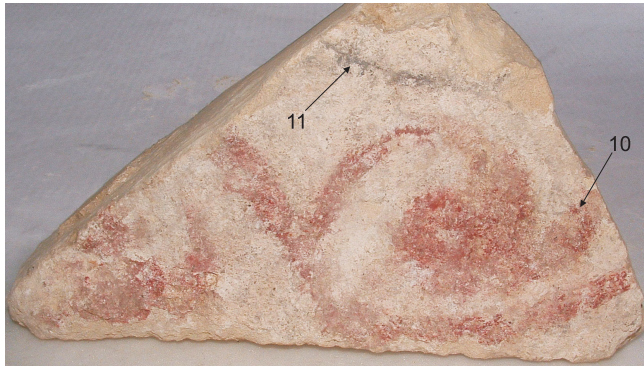


Engaged shafts 279 showing area of marbling - red over black



Section through pigment layers showing marbling

Plate 9 Column with engaged shafts showing area of marbling — red over black (WS279)



Description:

Number: 265

Description of Paint Layers: red ochre scrollwork pattern on a limewash ground. Black line seems to be contemporary with the scrollwork (note similar limewash ground)

Compare limewash ground with the limewash ground seen on the column with engaged shafts, seems similar.

Samples:

10: Iron oxide red over limewash with brown particles, similar to samples 1-5. If there were any earlier layers they became detached in sampling x500

11a&b: Charcoal black over limewash
Brown particles in the limewash
x200 and x500

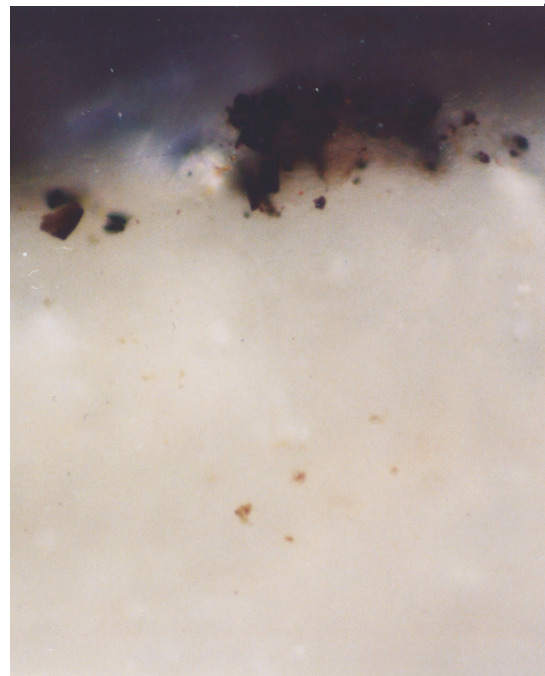
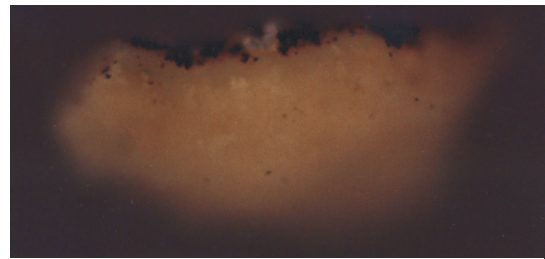


Plate 10 Red ochre scrollwork on a limewash ground (WS265)

- F22** Red sandy. Medium-coarse poorly mixed red and white clays, containing occasional flints and large white clay pellets. Post-medieval?
- F23** Machine-made. Buff with grog and ferrous fragments, glazed dark brown. Stoneware drainpipes. Modern.

Roof tiles and furniture

Plain roof tile (665 fragments, 63.153kg) included peg tiles, nibbed tiles and possibly pieces of ridge tile. Very few medieval ‘estuarine’ fabric tiles were present in this assemblage, the medieval component being made up of medium to coarse sandy red firing fabrics, many of which had reduced cores and were decorated with partial lead glazing (brown, green or colourless). Only eighty-two tiles could be identified as either peg- (seventy-nine) or nib-fixing (three) tiles. It was difficult to record the number of holes present in the pegged tiles due to the fragmentary nature of the material, but eight tiles had two holes, whilst none was identified with a single central hole. Twenty-four had square (as opposed to circular) holes, which is a relatively high proportion for Norwich, but probably simply reflects different techniques used by the various producers of tile.

Many plain roof tiles had mortar adhering to the surface and in some cases this may indicate re-use in a wall or floor, but mortar and plaster were sometimes applied as caulking or ceiling directly to the underside of roof tiles. A few tiles were sooted or burnt; for example, three tiles were sooted on the underside, suggesting that they had been used to roof a structure which was open to the rafters. The only impressions noted in this group of tiles were some kitten footprints on a tile fragment.

Pantiles were considerably less common in the assemblage than plain tiles. A total of fifty-four fragments weighing 15.198kg was identified. Twenty-five ridge tile fragments were identified, although there may have been more among the plain tiles, since the flat sides are often difficult to identify in small pieces. One hip tile fragment in Fabric 7 was identified (0.072kg). Most pieces were plain and similar to Roman imbrices, but a post-medieval date seems more likely in view of the fabrics. Several fragments had knife-trimmed chamfered edges on the underside. None was glazed.

Bricks

A total of 147 fragments weighing 47.187kg were identified as early bricks. All were in estuarine fabrics 1–3. The key characteristics of early bricks have been described by Drury (1993, 163–8), and the estuarine clay bricks from this site exhibited the same range of forms and manufacturing techniques. Many of these bricks were overfired, partially vitrified, cracked and poorly formed. Sanded-based brick, broadly dated to the late 13th to 14th centuries, were in the minority with only eight examples. Thirty-three examples of the 14th- to 15th-century strawed-based bricks were present. Signs of re-use as flooring were noted in several of these bricks, worn surfaces being observed, while others were sooted and burnt.

Late brick fragments were more common than early bricks (161 fragments weighing 142.084kg). The majority of which were in medium and coarse sandy red fabrics while a few white fabric bricks were present although most of these can be classified as floor bricks/paviours (see below). A few red bricks were worn and had been used in flooring. Fifty-eight late bricks were classified

| <i>Category</i> | <i>No.</i> | <i>Wt/kg</i> |
|-----------------|-------------|----------------|
| Roof tile | 665 | 63.153 |
| Pantile | 54 | 15.198 |
| Ridge tile | 25 | 4.747 |
| ?Hip tile | 1 | 0.72 |
| Early brick | 147 | 47.187 |
| Late brick | 161 | 142.084 |
| Brick | 2 | 0.076 |
| Moulded brick | 1 | 1.258 |
| Wall tile | 6 | 0.226 |
| Floor brick | 4 | 3.177 |
| Floor tile | 308 | 62.539 |
| Drain | 2 | 0.086 |
| Pierced tile | 1 | 0.725 |
| Roman | 254 | 24.858 |
| Unidentified | 2 | 0.062 |
| Total | 1633 | 365.448 |

Table 2 Quantification of ceramic building material by category

using Drury’s form series (Drury 1993) (Table 3), although some could be assigned to more than one form due to a high degree of overlapping in sizes.

One brick did not fit into the series, being only 36mm thick and 115mm wide, and is likely to be of ‘Tudor’ date. Most of the LB1 bricks at this site could also belong to this general period. Other late bricks were probably 17th century or later, the LB3 examples possibly even belonging to the 19th century. A few fragments were vitrified and may have been intended for use in Tudor diaper work, but generally the vitrification seems to have occurred throughout the brick, rather than simply at the header, indicating that overfiring rather than deliberate flaring had probably occurred. The majority of bricks were ‘handmade’, pallet-moulded with strike lines on the upper surface. No certain machine-pressed bricks were identified.

Flooring

A total of 312 fragments (65.716kg) was assigned to the floor brick/tile category. Only four floor bricks and four tiles in white-firing fabrics were identified, red bricks being more commonly used in flooring, as the number of examples of late bricks with worn surfaces shows. White-firing bricks/paviours were a common type of flooring in East Anglia from the late 17th to the 19th centuries.

The majority of floor tiles were Flemish types with either yellow glaze over a white slip or green glaze. These would have been used to make ‘chequerboard’ patterned floors in the 14th to 15th centuries and are a common find on medium to high status sites and in churches. Several fragments had been cut in half or quarters to form triangular pieces before firing, and these would have been used as edging pieces. Most of the measurable pieces were small tiles, ranging from 113 to 127mm across. Only a few small fragments of the much larger tiles were present, recognisable by their much greater thickness. Many of these tiles were heavily worn.

Two floor tiles may be of high medieval date. One was from layer 2478 (Period 4, G50) and was very worn with knife-trimmed edges and a reduced core (Fabric 5). The

| <i>Form</i> | <i>No.</i> | <i>Date</i> |
|-------------|------------|----------------------------|
| LB1 | 30 | mid 16th to 18th century |
| LB3 | 9 | late 17th century or later |
| LB4 | 1 | post-medieval |
| LB5 | 1 | 17th century or later |
| LB6 | 14 | 17th century or later |
| LB9 | 3 | (Late)17th to 19th century |

Table 3 Late brick forms

other was a green-glazed fragment in garden feature 1077 (Period 5, *G60*) (Fabric 11).

Roman tiles

The Roman tile assemblage (Table 4) was quite large, 254 fragments being positively identified (24.858kg), although it is possible that there were more pieces of this date amongst the ‘late bricks’.

The majority of Roman tile consisted of fragments of large flat tiles, which is unsurprising as they were probably brought to the site for use in walling. However, only twelve fragments were *in situ* in a wall (1464, Period 5, *G77*), the remainder being recovered from pit fills and layers. A few tiles may have been used for hearth lining as some showed signs of burning. This use of Roman tile is known to have occurred from the Early Saxon period to the 12th century.

Mortar

Nine mortar types were identified among the 102 fragments (13.753kg) available for analysis, the majority of which are post-medieval or modern in date. However, floor bedding material (33 pieces weighing 6.942kg) of a medieval date was scattered in demolition layers and feature fills of Periods 4 and 5. This material was homogeneous and probably represents a single floor. The largest samples were from layer 1234 (Period 4, *G61*) and several contexts in *G56* (Period 4). Fragments were in slabs 35–53mm thick with remains of ceramic building material adhering to the upper surface, and an irregular lower surface which was covered in soil and small stones.

Daub and other fired clay

A total of 196 fragments of fired clay was collected of which several fragments had wattle impressions up to 20mm in diameter, and/or wood impressions, and smoothed outer surfaces. Sixty-four fragments could be identified as probable daub on this basis or from association with larger pieces. Several heavily burnt and vitrified fragments were recovered from contexts in *G30*, possibly suggesting that a building had burnt down in the Late Saxon period.

Discussion

Since material from structural features was only collected as samples, much of this assemblage can be taken to represent secondary use and disposal of ceramic building material, including re-use in walls and intentional burial as hardcore. Clearly it is not representative of the amount of brick originally used on the site, particularly in the post-medieval period.

Much of the Roman tile is associated with Late Saxon (Period 2) use of the site or is redeposited in the foundation trenches of the refectory building (Period 3). Whilst some of the material may have been brought in deliberately for use as hardcore, it could have been used previously in Late Saxon structures or, more likely, hearths. Period 2 also saw the greatest quantity of fired clay deposition, which was largely the remains of burnt daub, suggesting that timber-framed buildings had been burnt down.

The pre-refectory levelling and make-up layers produced twenty fragments of Roman tile, several of which had signs of wear and had probably been used in flooring, perhaps in their original Roman context. They also contained remains of fired clay and daub from Late Saxon structures. The small amount of material from Period 3 features suggest that little ceramic building material was used in the construction of the refectory building. However, by the Dissolution and the demolition of the building, it seems likely that repairs or renovations to this or other monastic buildings had taken place using ceramic building materials, which entered the archaeological record in Period 4. On the evidence available, it seems likely that in its final form it had a glazed tile roof and a Flemish tile chequerboard floor. The presence of straw-based early brick may indicate that some refurbishment had taken place in the 14th to 15th centuries.

Much of this material also found its way into the garden features of Period 5, perhaps deliberately for drainage. The structures of Period 5 contained large quantities of late brick which were all of fairly similar size. A few white-firing bricks were present, but in general the bricks were in medium sandy red fabrics with varying inclusions typical of the region. Many had been overfired and were poorly formed; they could well have been bought more cheaply as a result. Fragments of dark grey and black glazed pantile were present in this period, and suggest that at least some of the structures in this area were re-roofed in the late 18th or 19th centuries. Pantiles were often used for roofing outbuildings, whilst plain tiles continued to be used on domestic structures, and there were large quantities of the latter in the assemblage.

The demolition rubble from Periods 5 and 6 included post-medieval white and red-firing unglazed floor tiles and pavements, and plain white tin-glazed tiles, perhaps providing a hint to the internal appearance of the Prebendary’s house.

| <i>Fabric</i> | <i>Roman tile</i> | | <i>Flanged tegula</i> | | <i>Imbrex?</i> | | <i>Box flue</i> | |
|---------------|-------------------|---------------|-----------------------|--------------|----------------|--------------|-----------------|--------------|
| | <i>No</i> | <i>Wt/kg</i> | <i>No</i> | <i>Wt/kg</i> | <i>No</i> | <i>Wt/kg</i> | <i>No</i> | <i>Wt/kg</i> |
| R1 | 134 | 9.044 | 4 | 1.041 | | | 1 | 0.039 |
| R2 | 70 | 8.128 | 4 | 1.311 | 2 | 0.117 | 2 | 0.105 |
| R3 | 36 | 5.016 | 1 | 0.057 | | | | |
| Total | 240 | 22.188 | 9 | 2.409 | 2 | 0.117 | 3 | 0.144 |

Table 4 Quantities of Roman tile by fabric

Window glass

by David J. King
(Figs 31 and 32)

An assembly of 1615 fragments of window glass was found, of which 743 were painted. Pencil drawings have been made of each fragment with annotations of thickness, colour, edge types and date. Each piece was allocated a catalogue number which is used in this report. The catalogue number is only shown when a piece has been illustrated.

Typology

Figure and drapery

Four fragments appear to have been part of figures, one shows hair (1414), two with hands (862) and eye (815) and a crown is also represented (843). 1515 is the cuff of an ornately decorated sleeve which had a raised arm protruding from it. The scale of these fragments suggests that figures of at least two different sizes were to be seen in the glazing: the eye and sleeve are from a larger figure, the hands are from smaller ones and the hair is difficult to judge, but is probably also from a smaller figure.

Nearly fifty pieces of drapery were found, again showing the same variation in scale as above. (For example, 36, 190, 233, 238, 256, 519, 784, 1263, 1200, 1412). Much of it is painted on pot-metal glass: amber, green (the most common colour), ruby and yellow. No blue drapery was found, although blue glass was frequent in other contexts and some drapery was on clear glass. Back-painting was visible on only two of the drapery fragments, but other examples of this technique have probably been lost through paint loss. Apart from the cuff piece, only one other fragment has any decoration apart from the delineation of the folds: 1330 has what looks like fringe with an 's' shape pattern.

Micro-architecture

About fifteen pieces with micro-architectural motifs were found. Some at least of these probably come from canopy work, but other contexts such as thrones would also be possible. The most probable canopy pieces depict windows, some with quarry glazing (854), some shown as blank recessed arches (260, 270, 656). Two fragments show decorative detail (670, 689), but it is possible that these belong to drapery. Fragment 850 appears to show a large irregular pattern of whorls, such as used to represent masonry. Two other pieces (797, 798) are from late 14th- to 15th-century canopy pedestals.

Grisaille

By far the largest assemblage of identifiable fragments (201 fragments) is from grisaille work. Two main types of grisaille painting were seen in medieval stained glass. The first consisted of unpainted pieces of glass cut and leaded into geometrical patterns more complex than the ubiquitous plain quarry glazing of the late middle ages. The glass used was mainly clear, but highlights in coloured pot-metal glass were also included. The problem with elucidating whether fragments of excavated glass came from such glazing is that it is only the lost pattern of lead which is the deciding clue. However, about two dozen unpainted and grozed pieces of mainly white but also blue, flashed ruby and yellow glass (not included in the total of

201) were found which could have come from such windows, but certainty on this matter is not possible (1004 (clear), 1316 (clear), 1620 (blue), 1369 (ruby), 1522 (yellow)). The other type of grisaille consists of windows made of mainly clear glass, but again with some coloured, painted with foliage and other motifs to make patterns which either extended over the whole window, or which were used as surrounds to figurative or heraldic panels. The foliage designs, consisting of curved stems with foliage terminations, sometimes with fruit attached, started in the 13th century by being conventionalised and known as 'stiff-leaf' foliage, but during the course of the second half of the 13th century and 14th century developed a repertoire of naturalistic motifs based on actual plants such as vine, oak and ivy leaves. An additional indication of date is that up to around the middle of the 13th century (or possibly a little later) the backgrounds to the stiff-leaf designs, or *rinceaux*, were cross-hatched, but after this date they are often plain, although cases of cross-hatching are found up to the end of the century. The grisaille glass found in the cathedral consists predominantly of stiff-leaf *rinceaux* with plain backgrounds, with just seven fragments having an early form of the later naturalistic vine leaf. Just one fragment may be part of some grisaille with cross-hatching (1294). (For discussions of both types of grisaille glazing, see Marks 1993, 127–33, 141–50, and Marks 1996, 111–17)

It is impossible from the surviving fragments to reconstruct the lost window patterns. It is, however, possible to make certain observations. The painted grisaille fragments may be divided into three categories. The first of these and by far the largest, consists of the foliage *rinceaux* with clear backgrounds (638, 868, 1261, 1517). Some variation in the way the stiff-leaf terminations are painted is visible, suggesting that more than one painter was at work on this assembly. Many terminations are the usual trefoil, some without fruiting, some with a single berry attached and some three berries (without fruiting 433, 1223, 1293; single berry 255, 869; three berries 210). A few terminations, fruited and unfruited, have been reduced to a single lobe subdivided by three lines (870, 875). One piece, 872, shows three stems springing from a stiff-leaf trefoil termination. The *rinceaux* were set within geometric forms defined by borders, bosses and leaf patterns of various kinds. Here, the term 'border' is used both for the patterns which framed the edges of windows and those which surrounded individual geometric shapes within a grisaille or medallion window. Of those found in the cathedral, some are almost certainly from a grisaille context, but others may have been borders to figured panels or part of canopies. The former include a scalloped pattern, of which eight pieces were found (258, 1523). This distinctive design, here painted on blue and yellow glass, is found elsewhere, including a section of stiff-leaf grisaille in the parish church of Pulham St Mary the Virgin in Norfolk, presumably moved from the mid 13th-century chancel. There, the design is part of a curved border, but in the cathedral the border was straight. Curved versions are also seen in grisaille from Salisbury Cathedral chapter house, c.1265–70(?) and the parish church of St Michael at Stanton Harcourt in Oxfordshire, c.1260–75, but a variant form was found in glass of the first half of the 13th century excavated at Waltham Abbey. (For Salisbury and

Stanton Harcourt, see Marks 1993, fig. 114; the Waltham Abbey glass is unpublished.)

A second border pattern probably from the grisaille work is a palmette frieze, found on only four fragments and in two different sizes (large: 189; small: 645). One of the two smaller pieces is from a curved section of border. The remaining border types are found in more than one context, but may be part of the grisaille glazing. The first is beaded fillet, of which twelve pieces were found, all painted on clear or opaque glass, both from straight and curved sections. Other types of fillet, or thin border, lined and plain, were also found in glass of varying colours. Of the eleven pieces of lined fillet, six were blue, two opaque and one each clear, possibly blue and yellow. Ninety pieces of plain fillet were found, of which thirty-one were blue, nineteen opaque, seventeen ruby, sixteen green plus one possibly green, three yellow, two clear, one amber and nineteen opaque. Fifty of these pieces come from just two contexts, both the fill of a pit with demolition debris (G56). In each case just blue, ruby and green plain fillet were found, possibly a slight indication, since no amber, yellow or clear pieces were included, that the debris from separate windows or groups of windows was dumped in separate pits.

Nine pieces of another pattern were found which is sometimes used in grisaille, but which also appears in canopy work. This is a border design consisting of a relieved pattern of lozenges from which circles are picked out and painted on clear or opaque glass. In canopies, it is used for side-shafting. There are a few other miscellaneous designs which were probably associated with grisaille. Another group of pieces to be linked to this assembly of stiff-leaf grisaille includes those which are relieved foliage, picked out from a matt wash, and which include some painted on coloured glass. These may derive from the side borders of grisaille panels, but may also have been florette bosses in the centre of grisaille panels, or from borders of figured panels. Most are small or medium-sized stiff-leaf trefoil-headed terminations, but there are two large yellow pieces (1513) and also a quatrefoil painted on clear glass (1260).

Finally, and perhaps most interestingly, we come to the seven pieces with naturalistic leaf foliage (1205). They all show the same delicately-painted small vine leaf pattern. As indicated above, the adoption of naturalistic leaf forms occurs in the second half of the 13th century. The earliest and exceptional appearance of these forms is in the Five Sisters window of *c.*1250 in the north transept of York Minster. There, they are 'embryonic' forms alongside normal stiff-leaf forms, and both forms appear together in later windows in this country. The windows of the York chapter house of *c.*1285–90 are the first place where the new forms completely took over, but in the glazing of many lesser buildings the older designs clung on until the end of the century and even beyond (Marks 1993, 133, 143–7). The pieces of vine-leaf found here look not quite embryonic, but certainly like the first attempts of a workshop at the new type. The painting is neat and accomplished, but it is easy to see how the new forms were arrived at merely by turning the trefoil stiff-leaf termination into a cinquefoil and adding cusping to the foils. They still lack the naturalistic freedom of later examples. A date of *c.*1255–80 has therefore been suggested for these seven fragments, within the same date

range as the main body of stiff-leaf grisaille with plain backgrounds.

Colours and technique

The normal range of colours used for 13th-century glass is found in this assembly. Apart from clear glass, pot amber, pot blue, pot green (two shades), pot pink, flashed ruby and pot yellow are used, with blue being the most common colour, followed by ruby, green, yellow, amber and pink. Of course, many pieces are opaque and the colour cannot be retrieved, and the differential rates of decomposition of the various glasses may have affected their survival rate, but the proportions of each colour are as might have been expected given the vagaries of survival. The numbers and percentages of the total are as follows: clear 653 (40.4%); amber 36 (2.2%); blue 96 (5.9%); green 72 (4.5%); pink 5 (0.3%); ruby, 69 (4.3%); yellow 71 (4.4); opaque 610 (37.6%). Pink was normally used for flesh tones, and this was the case for at least one pink piece here.

The glass was cut to shape by having a hot iron placed on the glass to break to the rough shape required, which was then made more precise by the application of a metal hooked tool called a grozing iron. Many of the resulting scalloped grozed edges are seen on the glass here, but also sometimes the plain broken edge was left (designated as 'flat edge' in the catalogue). The normal painting techniques for this period were used, with trace-line, thick matt wash, thin matt wash, relieving and some back-painting. The thin matt wash is now visible on only a few fragments, but, like the back-painting, it was particularly prone to loss by weathering and corrosion. It is seen to good effect on the blue scalloped border pieces. Apart from possibly on the two later fragments with canopy pedestal (797, 798), no traces of yellow stain are seen, confirming a thirteenth-century date for the glass, as this technique was discovered *c.*1300 and used for the first time in England a few years after that (Marks 1993, 38).

Style, provenance and date

The medieval monastic refectory was a large building with many windows built by 1145 (Heywood 1996, 104–6). It was obviously glazed, and this is confirmed by references in the refectorer's rolls to repairs for the glass (Saunders 1930, 143). The refectory was burnt in riots of 1272, so that any surviving glass from there amongst the excavated finds would presumably post-date the fire (Tanner 1996, 260). The grisaille glazing, by far the largest item in the glass finds, can be dated to *c.*1250–80, and could thus fit into a post 1272 reglazing of the refectory. The only other part of the cathedral which was constructed during this time is the Lady Chapel built by Walter Suffield, bishop from 1245 to 1257, which is known to have escaped the damage caused by the riots (Woodman 1996, 158–61; Heywood 1996, 104–6). Thus there are two main possible contexts for the glass, one in the Lady Chapel at the beginning of the *c.*1250–80 date range, and one at the end of it in the refectory itself. Other possibilities are that the glass is from the chapter house, but was not made until some years after it was built, or that it comes from another Norman part of the cathedral damaged in the 1272 riots, such as the infirmary chapel, or that a combination of sources was possible. The latter possibility seems unlikely, however, as, with the exception of the two later medieval fragments, the painted glass is remarkably

homogeneous, despite the slight variations in style noted above.

If it is accepted that the assembly of grisaille is generally homogeneous in style and date, and that the naturalistic forms found fit within the overall proposed date, the dating can be narrowed slightly to *c.*1255–80. One possible area of consideration available for an attempt to discriminate between an early and a late dating of the glass within this range is the style of the drapery fragments. The fragments painted with drapery folds are of two main types. The former show a number of converging lines which diverge and also thicken; these are probably for the most part from the upper part of a fold system. The latter show the drapery as it crumples at the bottom. Here, there are hooked folds which fall in tight clusters. Two fragments have another fold system higher up the drapery with rounded pleats drawn across a limb, almost approaching a damp-fold system. All this can be much more easily compared with English painting of the period *c.*1250–60 than with later 13th-century work, when the more angular broad-fold system became established (Marks and Morgan 1981, 50–69).

The fragments of micro-architecture found are difficult to place in context. Parallels can be found in manuscript painting, for example the Oscott Psalter (*c.*1260–65) (Backhouse 1997, 85), but are difficult to find in English glass-painting. The single piece of masonry pattern (850) is very similar to that in a miniature of *c.*1250 depicting the Resurrection (The Missal of Henry of Chichester, Manchester, John Rylands Library, Ms lat. 24, f. 152v, after 1246. See Marks and Morgan 1981, 54, 56).

The overall rather tentative conclusion, bearing in mind the problems of interpreting corroded and incomplete fragments rather than whole panels, must be that the style of the glass points to a date of *c.*1255–65 for the bulk of the assemblage and thus suggests that it came from the Lady Chapel of *c.*1245–57, rather than from the later reglazing of the refectory. If the chapel was built during the episcopacy of Walter Suffield, it would make sense that the glass would have been painted towards the end of that period, or perhaps shortly after his death in 1257 if the building was only just ready for his burial before the altar there. According to Blomefield (1806, 50–51), King Henry III visited Norwich in 1256. Such visits were often associated with new building work, and it is possible that the king went to see the new Lady Chapel on this occasion. The use of grisaille with some elements of naturalistic foliage would have been very modern at this time, only a few years after its precocious appearance at York Minster, but the Lady Chapel would have been a high status building and Bishop Suffield would have wanted to honour the Virgin Mary with the most up-to-date glass available. Even more precocious would have been the absence of cross-hatching in the grisaille, a little earlier than this type of grisaille at Salisbury, where it has been dated to the late 1260s, although this feature occurs in French glass a few years before (Marks 1993, 141–2).

Very little glass of the 13th century survives in Norfolk, indeed in the whole country outside the major cathedrals of Canterbury, Lincoln, Salisbury and York, and the discovery of at least a little evidence of what high-status glass-painting in Norwich Cathedral was like in the third quarter of the 13th century is a welcome addition to our knowledge (Marks 1993, chapters 6 and 7). What it tells us is that the growing picture of the

importance of grisaille glazing is further confirmed here, and it may give a few clues to the way in which it was used. The Lady Chapel was probably four bays long, and would thus have had nine windows, with one at the east end and four on each side. The east window would certainly have had figured glazing relating to the Virgin Mary. One possible context for the sleeve of an upraised arm (1515) with highly decorated cuff would have been a figure of God the Father raising his arm to the Virgin in a scene of her coronation. Some of the side windows could have been glazed with just grisaille, but it is more probable that some figured panels were present, with the grisaille as background. There is some evidence that this may have been the norm in parish church glazing at this period, and the additional expense of full coloured windows has been brought forward as a reason, but cathedrals too used grisaille as a way of adding more light to the interior (Marks 1993, 127–8, 137).

Catalogue

Figure and drapery (Fig. 31)

- 1414.** Hair. Clear? glass, trace-line, thin matt wash, two grozed edges, 3mm thick. Context 3061, pit fill, Period 4, *G76*, Object date: 13th century.
- 862.** Hand. Clear? glass, trace-line, thick matt wash, relieved design, two grozed edges, 2mm thick. Context 2753, pit fill, Period 4, *G56*, Object date: 13th century.
- 815.** Eye. Opaque glass, trace-line, thick matt wash, relieved design, three grozed edges, 2.5mm thick. Context 2205, pit fill, Period 4, *G56*, Object date: 13th century.
- 843.** Crown. Yellow glass, trace-line, thin matt wash, relieved design, two grozed edges, 3.5mm thick. Context 2753, pit fill, Period 4, *G56*, Object date: *c.*1250 to 1280.
- 1515.** Cuff. Green glass, trace-line, three grozed edges, 3mm thick. Context 3301, fill, Period 4, *G92*, Object date: 13th century.
- 36.** Drapery. Opaque glass, trace-line, thick matt wash, relieved design, one grozed edge, 2mm thick. Context 1234, layer, Period 4, *G61*, Object date: 13th century.
- 190.** Drapery. Yellow? glass, trace-line, one grozed edge, 3mm thick. Context 1233, demolition layer, Period 4, *G56*, Object date: 13th century.
- 233.** Drapery. Opaque glass, trace-line, one grozed edge, 3.5mm thick. Context 1443, unstratified, Object date: 13th century.
- 238.** Drapery. Amber glass, trace-line, thick, thin matt wash, one grozed edge, 3mm thick. Context 1233, demolition layer, Period 4, *G56*, Object date: 13th century.
- 256.** Drapery. Clear glass, trace-line, 3.5mm thick. Context 1233, demolition layer, Period 4, *G56*, Object date: 13th century.
- 519.** Drapery. Ruby glass, thick matt wash, relieved design, two grozed edges, 3mm thick. Context 2890, unstratified, Object date: 13th century.
- 784.** Drapery. Opaque glass, trace-line, one grozed edge, 2mm thick. Context 2502, pit fill, Period 4, *G56*, Object date: 13th century.
- 1263.** Drapery. Ruby glass, trace-line, three grozed edges, 3.5mm thick. Context 2496, cellar fill, Period 5, *G78*, Object date: 13th century.
- 1200.** Drapery. Ruby? glass, trace-line, 1.5mm thick. Context 2799, pit fill, Period 4, *G92*, Object date: 13th century.
- 1412.** Drapery. Opaque glass, trace-line, three grozed edges, 2.5mm thick. Context 3061, pit fill, Period 4, *G76*, Object date: 13th century.
- 1330.** Drapery. Amber glass, trace-line, 2mm thick. Context 2716, pit fill, Period 4, *G58*, Object date: 13th century.

Micro-architecture (Fig. 31)

- 854.** Canopy. Blue glass, trace-line, thick matt wash, three grozed edges, 2.5mm thick. Context 2753, pit fill, Period 4, *G56*, Object date: 13th century.

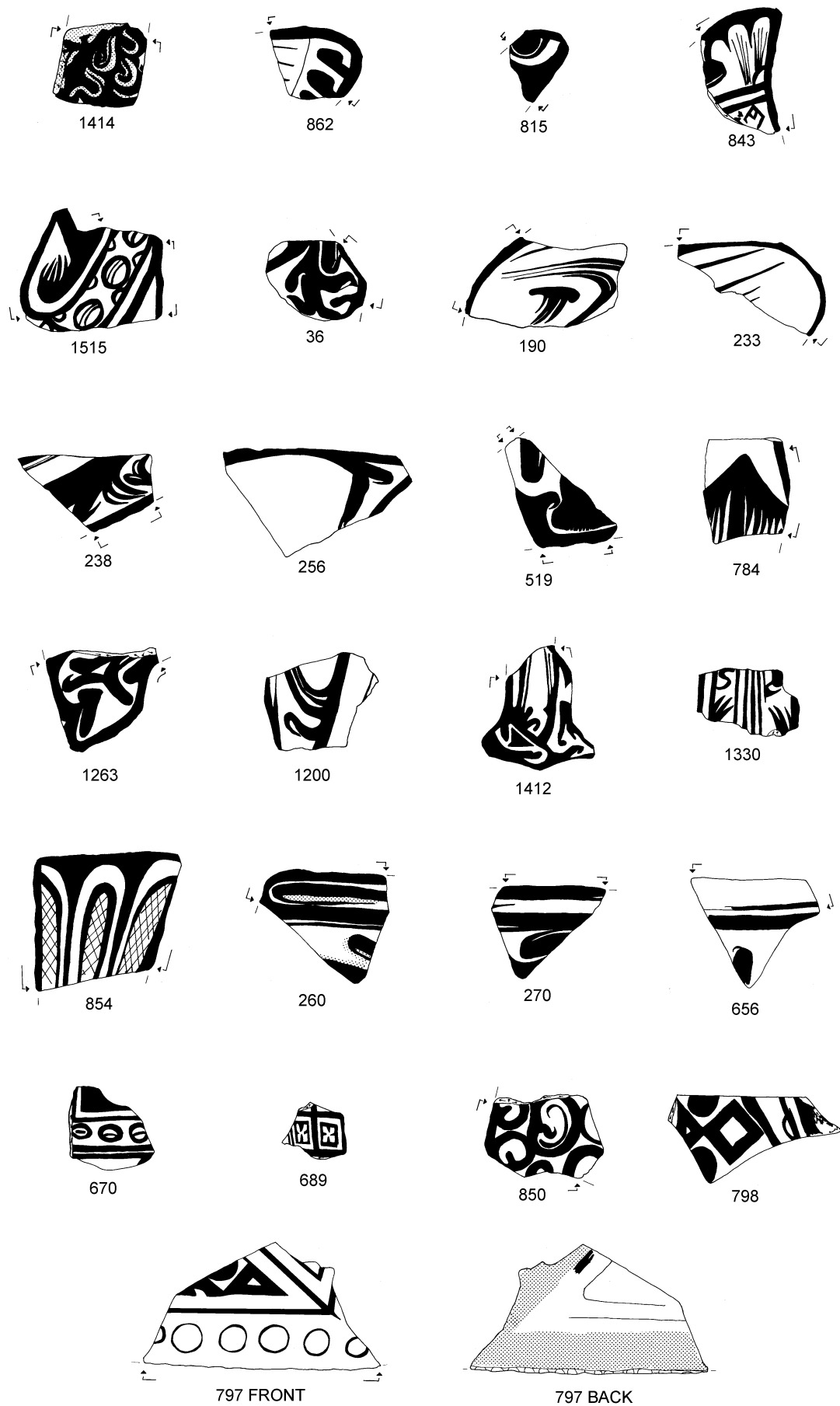


Figure 31 Finds: painted window glass. Scale 1:2

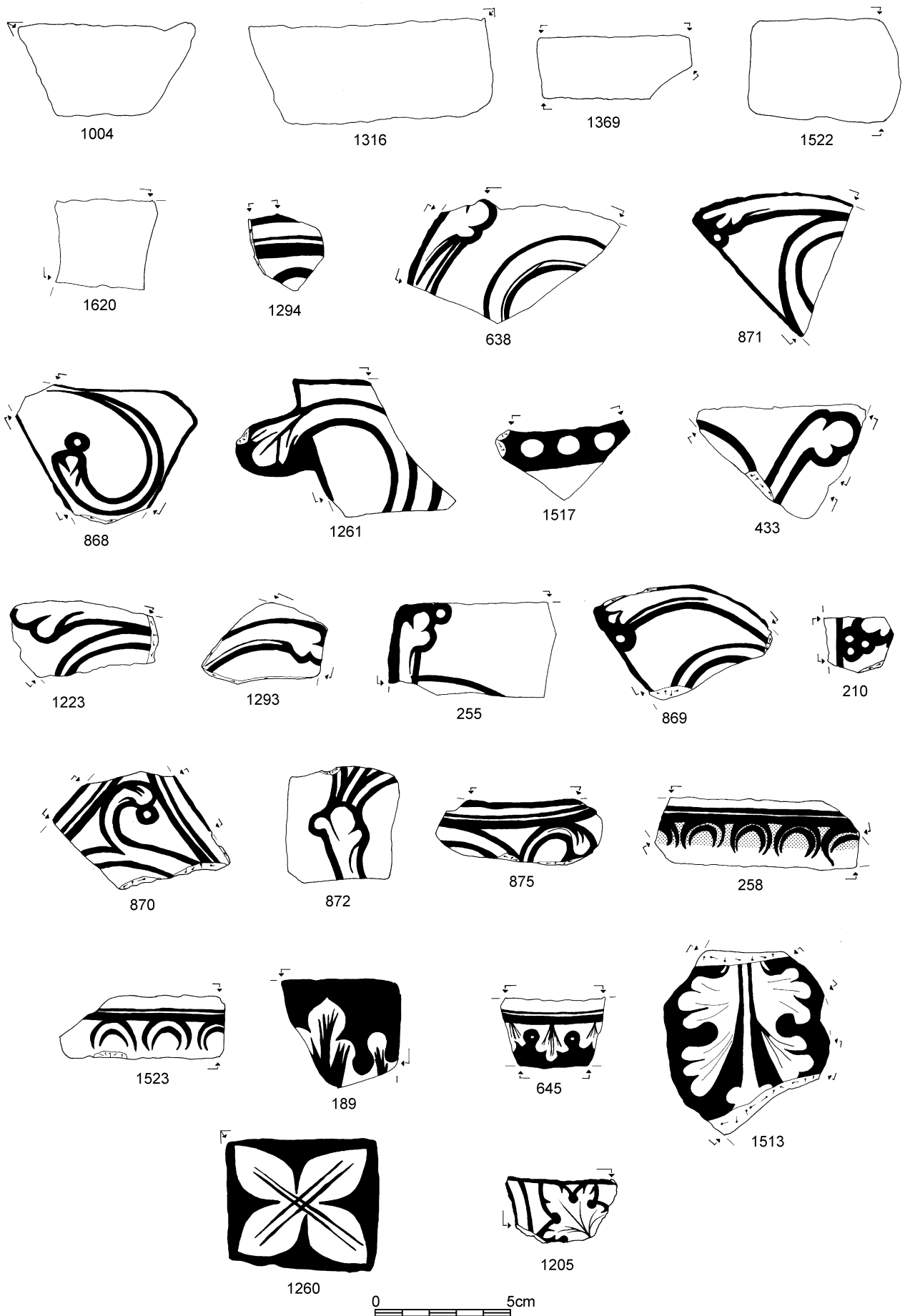


Figure 32 Finds: painted window glass. Scale 1:2

260. Canopy. Amber glass, trace-line, thick, thin matt wash, relieved design, two grozed edges, 2.5mm thick. Context 1233, demolition layer, Period 4, *G56*, Object date: 13th century.
270. Canopy. Opaque glass, trace-line, thick matt wash, relieved design, one grozed edge, 2.5mm thick. Context 1233, demolition layer, Period 4, *G56*, Object date: 13th century.
656. Canopy. Green glass, trace-line, two grozed edges, 3mm thick. Context 1233, demolition layer, Period 4, *G56*, Object date: 13th century.
670. Micro-architecture. Yellow? glass, trace-line, thick matt wash, 2.5mm thick. Context 1233, demolition layer, Period 4, *G56*, Object date: 13th century.
689. Micro-architecture. Opaque glass, trace-line, 2mm thick. Context 1233, demolition layer, Period 4, *G56*, Object date: 13th century.
850. Masonry. Blue glass, trace-line, two grozed edges, 2.5mm thick. Context 2753, pit fill, Period 4, *G56*, Object date: 13th century.
798. Canopy pedestal. Clear glass, trace-line thin matt wash?, back painting?, 1.5mm thick. Context 2293, pit fill, Period 4, *G56*, Object date: 14th to 15th century.
797. Canopy pedestal. Clear glass, trace-line, thin matt wash, back painting, one grozed edge, 2.5mm thick. Context 2293, pit fill, Period 4, *G56*, Object date: 14th to 15th century.

Grisaille
(Fig.32)

1004. Clear glass, all grozed edges, 3.5mm thick. Context 2753, pit fill, Period 4, *G56*, Object date: medieval.
1316. Clear glass, all grozed edges, 4.5mm thick. Context 1233, demolition layer, Period 4, *G56*, Object date: medieval.
1369. Ruby glass, four grozed edges, 2.5mm thick. Context 3022, pit fill, Period 4, *G92*, Object date: medieval.
1522. Yellow glass, three grozed edges, 4mm thick. Context 3301, fill, Period 4, *G92*, Object date: medieval.
1620. Blue glass, two grozed edges, 3.5mm thick. Context 2496, cellar fill, Period 5, *G78*, Object date: medieval.
1294. Cross-hatching. Clear glass, trace-line, one grozed edge, 3mm thick. Context 2890, unstratified, Object date: c.1200 to 1250.
638. Stiff leaf. Opaque glass, trace-line, two grozed edges, 3.5mm thick. Context 1233, demolition layer, Period 4, *G56*, Object date: c.1250 to 1280.
868. Stiff leaf. Clear glass, trace-line, three grozed edges, 3mm thick. Context 2753, pit fill, Period 4, *G56*, Object date: c.1250 to 1280.
1261. Stiff leaf. Clear glass, trace-line, thick matt wash, two grozed edges, 2.5mm thick. Context 2496, cellar fill, Period 5, *G78*, Object date: c.1250 to 1280.
1517. Stiff leaf. Clear glass, trace-line, two grozed edge, 2.5mm thick. Context 3301, fill, Period 4, *G92*, Object date: c.1250 to 1280.
433. Stiff leaf without fruiting. Opaque glass, trace-line, two grozed edges, 4mm thick. Context 1230, layer, Period 5, *G72*, Object date: c.1250 to 1280.
1223. Stiff leaf without fruiting. Clear glass, trace-line, two grozed edges, 3mm thick. Context 2721, pit fill, Period 4, *G56*, Object date: c.1250 to 1280.
1293. Stiff leaf without fruiting. Clear glass, trace-line. three grozed edges, 4mm thick. Context 2890, unstratified, Object date: c.1250 to 1280.
255. Stiff leaf single berry. Opaque glass, trace-line, two grozed edges, 3.5mm thick. Context 1233, demolition layer, Period 4, *G56*, Object date: c.1250 to 1280.
869. Stiff leaf single berry. Clear glass, trace-line. two grozed edges, 3.5mm thick. Context 2753, pit fill, Period 4, *G56*, Object date: c.1250 to 1280.
210. Stiff leaf three berries. Clear glass, trace-line design, one grozed edge, 3mm thick, Context 1391, linear cut fill, Period 4, *G56*, Object date: c.1250 to 1280.
870. Stiff leaf single lobe and berry. Clear glass, trace-line, two grozed edges, 4mm thick. Context 2753, pit fill, Period 4, *G56*, Object date: c.1250 to 1280.
872. Stiff leaf single berry. Clear glass, trace-line, 3mm thick. Context 2753, pit fill, Period 4, *G56*, Object date: c.1250 to 1280.
875. Stiff leaf. Clear glass, trace-line, one grozed edge, 3.5mm thick. Context 2753, pit fill, Period 4, *G56*, Object date: c.1250 to 1280.
258. Border, scalloped pattern. Blue glass, trace-line, thick matt wash, three grozed edges, 4mm thick. Context 1233, demolition layer, Period 4, *G56*, Object date: c.1250 to 1280.
1523. Border, scalloped pattern. Blue glass, trace-line, thin matt wash, three grozed edges, 4mm thick. Context 3301, pit fill, Period 4, *G92*, Object date: c.1250 to 1280.
189. Border, large palmette frieze. Clear glass, trace-line, thick matt wash, relieved design, two grozed edges, 3.5mm thick Context 1233, demolition layer, Period 4, *G56*, Object date: c.1250 to 1280.
645. Border, small palmette frieze. Clear glass, trace-line, thick matt wash, relieved design, two grozed edge, 3.5mm thick. Context 1233, demolition layer, Period 4, *G56*, Object date: c.1250 to 1280.
1513. Stiff leaf. Yellow glass, trace-line, thick matt wash, relieved design, 4 grozed edge, 5mm thick. Context 3301, pit fill, Period 4, *G92*, Object date: c.1250 to 1280.
1260. Quatrefoil. Yellow? glass, trace-line, thick matt wash, relieved design, all grozed edges, 4mm thick. Context 2496, cellar fill, Period 5, *G78*, Object date: c.1250 to 1280.
1205. Naturalistic vine-leaf. Opaque glass, trace-line, two grozed edges, 3mm thick. Context 2799, pit fill, Period 4, *G92*, Object date: c.1255 to 1280.

Lead window comes

by David J. King

Only a small quantity of lead window came was found during the excavation. These have been classified according to the typology established by Dr Barry Knight, as published by King (1987, 39). They consist of five medieval pieces, two Type A and three Type C, and four pieces of post-medieval Type G came.

Chapter 4. The Finds

Introduction

This chapter presents details of the finds assemblages other than building materials. The reader is referred to the introduction of Chapter 3 for a general comment on the finds assemblage.

Coins, tokens and jetons

by Adrian Popescu

A small assemblage of thirty-six coins, tokens and jetons was recovered from the excavations. The group includes two Roman coins while the remainder are post-medieval or modern. With the exception of one silver example, all are copper alloy.

Although the two Roman coins (Nos 1–2) are residual, they are a useful addition to the known corpus from Norwich sites and add to the distribution plot of such finds across the city. The silver sixpence of Queen Elizabeth I (No. 3) could have been lost at any time until the Great Recoinage of 1696–1698. The majority of the numismatic material is concentrated in the 17th century, consisting especially of the ubiquitous royal farthing tokens and jetons. Unfortunately most of the coins are unstratified. The high number of royal farthing tokens (fourteen pieces or 38.88%) deposited on site attest an increase in activity between 1613 and 1644, especially in the second quarter of the 17th century. The jetons (Nos 28–36) were all struck in Nuremberg and are late 16th- or 17th-century losses with one exception (No. 36). Jetons were used as counters but their presence in large numbers, even in the countryside, raises the possibility that they were being used as small change (Palmer and Mayhew 1977, 88) or in board games (Dyer 1997, 40; see also Allen 2004, 35). Of the two tokens one (No. 27) is of special interest as it is part of a rare group produced by William Hall, with reverse type modelled on Nuremberg jetons. The production place is unknown but this example is the only one, to the author's knowledge, with a secure findspot. As far as is known, private tokens had a limited use circulating not too far from the issuer (Berry 1988, 5–6). Despite the fact that most of the copper alloy tokens were produced between 1648 and 1672, a production period between *c.* 1610 and 1635 has been proposed for William Hall's tokens (Mitchiner 1988, 704). The farthing of Charles II (No. 18) may have been deposited at any time between its production date and the demonetisation of pre-1797 copper coinage in 1817.

Catalogue (excluding modern coins)

Items catalogued according to Besly and Bland (1983, Cunetio), Dickinson (1986), Feuadent (1915), Mitchener (1988), North (1991), Peck (1964) and Williamson (1891).

Coins

Roman

1. Central Empire: Claudius II (268–270). Radiate, rev. VIRTUS AVG, Virtus 1, Rome, issue III, Cunetio 2193; 1.93g; 19mm. SF316, Context 1356, garden feature fill, Period 5, *G84*.
2. Gallic Empire: Tetricus I (271–274). Radiate, rev. SPES PVBLICA, Spes 1b, mint I, issue III, Cunetio 2583; 1.62g; 18m. SF157, Context 1002, topsoil.

England/Great Britain

3. Elizabeth I Sixpence, p.m. coronet, 1567, North 1997; bent, two fragments; 2.44g. SF113 and SF126, Contexts 2002 and 1000, topsoil.
4. James I Royal farthing token, 1614–25, p.m. flower, North 2134; 0.73g; 17mm. SF404, Context 2890, unstratified.
5. James I Royal farthing token, 1614–1625, p.m. woolpack, North 2135; 0.44 g; 16 mm. SF145, Context 2002, topsoil.
6. James I Royal farthing token, 1614–25, p.m. ball, forgery as North 2135; bent; 0.45g; 17mm. SF125, Context 1000, topsoil.
7. Charles I Royal farthing token, 1625–34, p.m. crescent with mullet; flawed die, North 2275; 0.53g; 17mm. SF715, Context 3200, unstratified.
8. Charles I Royal farthing token, 1625–34, p.m. annulet, North 2277; bent and cracked; 0.61g; 16mm. SF150, Context 2002, topsoil
9. Charles I Royal farthing token, 1625–34, p.m. cross patonce saltire, North 2277; bent; 0.50g; 17mm. SF169, Context 1001, topsoil.
10. Charles I Royal farthing token, 1625–34, p.m. cross patonce saltire, North 2277; 0.47g; 16mm. SF213, Context 1002, topsoil.
11. Charles I Royal farthing token, 1625–34, p.m. harp, North 2277; 0.44g; 17mm. SF147, context 2002, topsoil.
12. Charles I Royal farthing token, 1625–34, p.m. heart, North 2277; 0.49g; 17mm. SF146, Context 2002, topsoil.
13. Charles I Royal farthing token, 1625–34, p.m. rose, North 2277; 0.65g; 16mm. SF155, Context 1002, topsoil.
14. Charles I Royal farthing token, 1625–34, p.m. uncertain, forgery as North 2277/2278; 0.53g; 17mm. SF149, Context 2002, topsoil.
15. Charles I Royal farthing token, 1634–36, p.m. bell, North 2280; 0.70g; 17mm. SF402, Context 2890, unstratified.
16. Charles I Royal farthing token, 1634–36, p.m. lis, North 2281; 0.62g; 17mm. SF403, Context 2890, unstratified
17. Charles I Royal farthing token, 1636–44, p.m. crescent (on obverse only), North 2291; 1.04g; 14mm. SF148, Context 2002, topsoil
18. Charles II Farthing, 1675, Peck 528; 5.71g; 22mm. SF714, Context 3200, unstratified

Tokens

26. Farthing, George Reeve, Norwich, Williamson 190, 1650–71; 0.91g; 16mm. SF214, Context 1002, topsoil.
27. Farthing, William Hall, without name of locality, Dickinson 38A; 1.38g; 21mm. SF713, Context 3200, unstratified

Jetons: Nuremberg

28. Anonymous, 'French shield' type, *c.* 1500–25, Mitchiner 1069; 3.45g; 28mm. SF525, Context 2324, pit fill, Period 4, *G56*.
29. Anonymous, 'Lion of Saint Mark' type, struck *c.* 1553–59, *cf.* Mitchiner 1118 (same obverse die); 7.50g; 27mm. SF668, Context 3003, construction cut fill, Period 5, *G88*.

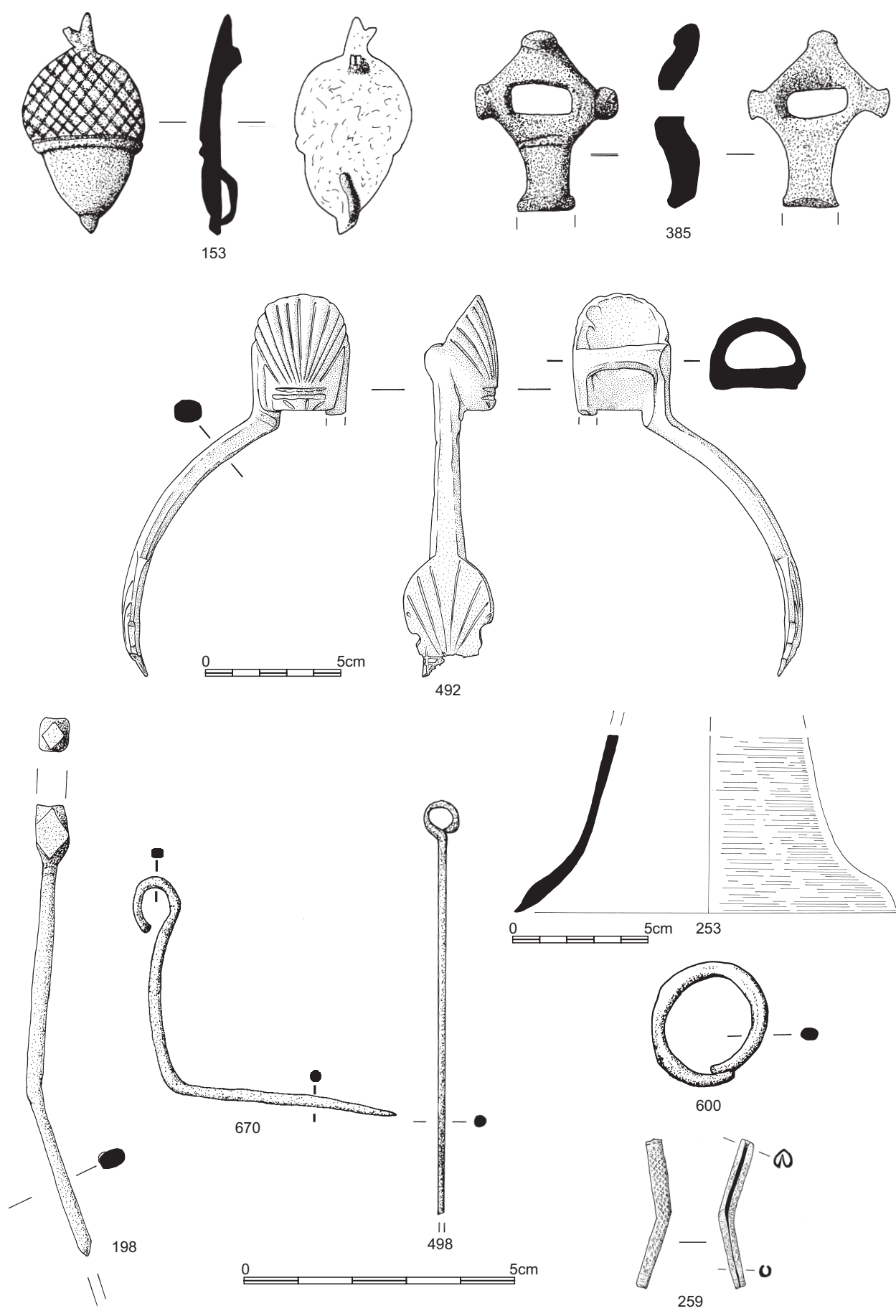


Figure 33 Finds: copper alloy objects. Scale 1:1 except 492 and 235 scale 1:2

30. Hans Schultes II (master 1586–died 1603), ‘Rose/orb’ type, Mitchiner 1388 (same dies); 1.25g; 25mm. SF194, Context 1109, garden feature fill. Period 5, *G60*.
31. Egidius Krauwinkel (master 1570–died 1613), ‘Rose/orb’ type, Mitchiner 1450; nail bore through the center of the flan; 1.40g; 22mm. SF401, Context 2890, unstratified.
32. Hans Krauwinkel II (master 1586–died 1635), ‘Rose/orb’ type, Mitchiner 1522; 1.61g; 22mm. SF712, Context 3200, unstratified.
33. Hans Krauwinkel II (master 1586–died 1635), ‘Rose/orb’ type, Mitchiner 1571 (same dies); 1.52g; 22.5mm. SF503, Context 2168, pit fill, Period 5, *G102*.
34. Mathaus Lauffer (master 1612–died 1634), ‘Rose/orb’ type, struck 1618, Mitchiner 1695; 0.96g; 21mm. SF711, Context 3200, unstratified.
35. Wolf Lauffer II (master 1612–died 1651), ‘Rose/orb’ type, cf. Mitchiner 1707ff; folded; 1.04 g; 20 mm. SF716, Context 3200, unstratified.
36. Lazarus Gottlieb Lauffer (master 1663–died 1709), ‘Show jeton’ French style, struck 1696–1702/3, Feuardent 12762; 3.78g; 25mm. SF144, Context 2002, topsoil.

Copper alloy objects

by Julia Huddle

A total of ninety-two copper alloy small finds were recovered. Four are from Period 3, two from Period 4, thirty-five are from Period 5, twenty from Period 6 and thirty-one are unstratified. The artefacts date from the Late Saxon through to the modern period, with the vast majority being post-medieval. Only a few of the artefacts recovered are of a type which might be expected from an ecclesiastical site, such as part of a hand bell, a book-clasp and a gilded hand from a statuette. Other notable finds include a Late Saxon dress pin, a finger ring and a bridle side link, and an early 16th-century stirrup. Many of the finds comprise pins, lace-tags and miscellaneous fittings such as suspension rings, small tacks and studs. The paucity of some class of finds such as the normally ubiquitous belt and dress fittings is quite unusual for an excavation of this size in Norwich. The items have been classified following Margeson (1993).

Diversions

Horse equipment

A small mount in the shape of an acorn (SF153) is dated to the 18th/19th centuries (Read 1995, 183–5, nos 1249–1260) where they are described as probable horse harness mounts. Part of a bridle side-link was found from a Period 3 context (SF385). For a discussion on this and another example made of iron see ‘Iron Objects’ below.

Copper alloy stirrup

by John Clark

An unusual copper alloy stirrup (SF492) was recovered from a post-medieval context. There are few parallels in Britain for this stirrup, although one was recently found in Essex. This comprised just the top of a similar copper-alloy stirrup with the scallop-shell decorated box. It was not as well-made as the Norwich example, with incised rather than cast ribs on the ‘shell’. Even closer in form to the Norwich find but slightly less complete is a part stirrup found at the site of Clontuskert Priory, County Galway, Ireland (Fanning 1976, 127–8, fig. 9 no. 70), although there seems to be no obvious connection with Ireland (Raghnaíl Ó Floinn, National Museum of Ireland, and Cormac Bourke, Ulster Museum, pers. comms) as, given

the traditional Irish practice of riding without them, stirrups are rare archaeological finds there. The Clontuskert find cannot be used to corroborate the dating of the Norwich example as its context was disturbed (Fanning 1976, 112), and though it contained pottery of apparent 13th- to 14th-century date, it could well relate to the suppression or post-reformation phase of the site.

Copper alloy stirrups do not seem to be common in the archaeological record. A find from Old Romney, Kent published by Gaimster (1990) has some similarities to the present example but the front plate of the attachment for the stirrup leather is in the form of a fleur-de-lys rather than a scallop shell. Gaimster dated this to around 1500.

Among horse equipment generally, similar forms are sometimes to be found made in both iron and copper alloy (Clark 2004, 71). Indeed, scallop shell decoration can be found on several iron stirrups in the Museum of London collections (Guildhall Museum 1908, 264 nos 55–6). These, from Holborn Viaduct (Fleet valley) and from Brooks’ Wharf (River Thames) are tall, with scallop shell decoration on the box plate, but are wrought rather than cast. On two the arms are of oval section at the top, broadening into a flat fan-shape midway (as on the copper-alloy Old Romney find); on the other (7324) the arms are wide and fan-like from the top, as on some of the broad D-shaped stirrups referred to below. Found in the 19th century, there is no associated dating evidence for these stirrups. However, they all have treads of ‘grated’ form, made up of four separate rods of which the two inner ones are twisted and all are riveted to the fan-shaped arms at each end. This form of tread is found on the more common broad but low, D-shaped stirrups of the 16th century (Foulkes 1916, 211–12). It is unfortunate that not enough of the Norwich, Clontuskert or Old Romney examples survives to show the nature of the tread. A grated tread would be difficult to reproduce in cast copper alloy, and Gaimster’s illustrator (1990, fig. 5) reconstructed the Old Romney stirrup with a broad curving foot-rest of more ‘medieval’ type; the inward-curving lower end of the surviving arm of the Norwich stirrup may suggest a similar form. However, a date for the Norwich find in the early 16th century seems likely. In the absence of further parallels it is uncertain whether it is a slightly unusual English form, or a stray from further afield.

Catalogue (Fig. 33)

- SF153** Cast mount in the shape of an acorn with integral lugs. Context 2002, pit fill, Period 5, *G68*, Object date: 18th to 19th century.
- SF385** One half of a bridle side-link with one lozenge-shaped end loop with elongated oval opening and projecting lobes at each corner, incomplete stem, broken at swelling for central boss. The stem is engraved with two lines at the junction of the end loop. Context 2072, layer, Period 3, *G20*, Object date: Late Saxon to medieval.
- SF492** Stirrup, part. A one-piece casting, the attachment for the stirrup leather being of box form, with rod to take the leather at the rear and a curved cover plate extending forward. This is decorated in the form of a scallop shell, the ribs in high relief. One arm of the stirrup is snapped off at the top. The other is of oval cross-section, but towards the bottom it expands in the form of another scallop shell, the ribs incised. It narrows below this shell, where it is broken. It is gently curving inwards at this point, presumably to form the foot-rest. Context 2172, pit fill, Period 5, *G102*, Object date: early 16th century.

Bells

Part of a bell was found from a demolition layer (SF253). It is an open-mouthed clapper bell and, although it is larger

than examples recovered in medieval contexts at Winchester, its profile is very similar to one from a 15th-century context at Brooke Street (Biddle and Hinton 1990, 726, fig. 207, no. 2270D). The cathedral refectory bell is large enough to have been used as a handbell, the various uses of which, in particular those in an ecclesiastical setting, are discussed elsewhere (Biddle and Hinton 1990, 725).

A sheet-metal bell fragment (SF123, not illustrated) is similar to one from Redcastle Furze, Thetford where it is dated to the 15th or 16th century (Andrews 1995, 90, fig. 67 no. 34).

Catalogue
(Fig. 33)

SF253 Cast bell rim fragment, flaring mouth, no collar. Estimated diameter 140mm, thickness at rim 5mm. Context 1196, demolition layer, Period 5, *G106*, Object date: 15th century.

Dress and personal possessions

Pins

A pin with solid faceted head (SF198) was recovered from a Period 5 (post-medieval to modern) context. Other pins with faceted heads are known from Norwich including one from Fishergate (with a collared shaft) from an early 11th-century context (Williams 1994, 14, fig. 9 no. 1) and one at Greyfriars from the disuse fill of a Late Saxon sunken-featured building (Huddle forthcoming a). Several pins with faceted heads were found at Middle Harling, Norfolk and Margeson discusses this type and their occurrence on many Middle Saxon sites (1995a, 55).

Two pins with looped heads were found. One, made from thick wire (SF670), is similar in size to an example from Middle Harling, Norfolk where it is described as being a possible brooch pin (Margeson 1995a, 55, fig. 54 no. 19). The other (SF498) has a shaft similar in diameter to the drawn copper alloy wire pins recovered elsewhere on site. It is similar but longer than, a pin from a 15th- to 16th-century context in Winchester (Biddle 1990, 556, fig. 150 no. 1436).

The remainder of the twenty-nine pins recovered (Period 5) are all small drawn copper alloy wire pins and where it has been possible to determine, they have wire-wound spherical or solid 'blob' heads. Drawn wire copper alloy pins are known from the medieval period up to the early 19th century. They have many uses which are discussed elsewhere (Margeson 1993, 11).

Catalogue
(Fig. 33)

SF198 Dress pin, solid faceted cuboid head, shank tip broken. Context 1105, garden feature fill, Period 5, *G60*, Object date: Middle or Late Saxon.

SF670 Pin, thick wire, looped terminal, shank bent at right angles. Context 3135, layer, Period 3, *G44*, Object date: Late Saxon to medieval.

SF498 Pin, wire-like shaft, bent at the top to form a looped head, tip missing. Context 2293, pit fill, Period 4, *G56*, Object date: 15th to 16th century.

Finger-rings

A penannular finger-ring (SF600) was found. This is of a type well known from 11th-century contexts elsewhere, for example Thetford, Norfolk (Goodall, A.R. 1984, 69, fig. 110, nos 17, 19–21) and the Castle Bailey site in Norwich (Margeson and Williams 1985, fig. 23, no.1, silver, fig. 24, no. 6, copper alloy).

Catalogue
(Fig. 33)

SF600 Finger-ring with tapering terminals. Context 2685, layer, Period 3, *G123*, Object date: 11th century.

Lace-tags

Nine lace-tags were recovered, one with punched decoration (SF259) All have their edges folded or turned inwards to grip the lace, a type which is mainly 16th and 17th century in date (Oakley 1979, 262–3, Type 2).

Catalogue
(Fig. 33)

SF259 Lace-tag edges folded inwards to grip the lace, top third stamped with diamond-shaped dots. Context 1165, layer, Period 5, *G86*, Object date: 16th to 17th century.

Dress fasteners

Five buttons were found. One, a cast openwork button, is almost identical to an example from Norwich dated to the 17th century (Margeson 1993, 20, fig. 11 no. 102), and the rest are all late post-medieval or modern.

Furnishings and household equipment

Book fittings

A book-clasp (SF412) of a type which is riveted onto one book cover with a corresponding 'eye' on the other cover was found. Other Norwich examples are all from unstratified or post-medieval contexts (Margeson 1993, 75 fig. 40 nos 452–5). Others from York are from 15th- and 16th-century deposits (Ottaway and Rogers 2002, 2936–2938, fig. 1503 nos 14480, 15235, 15234).

Catalogue
(Fig. 34)

SF412 Book-clasp with three rivet holes attached to backplate, decorated with concentric circles, one around rivet hole at expanded end, the other around central rivet hole, one remaining copper alloy rivet at hooked end. Context 2017, pit fill, Period 4, *G51*, Object date: 15th to 16th century.

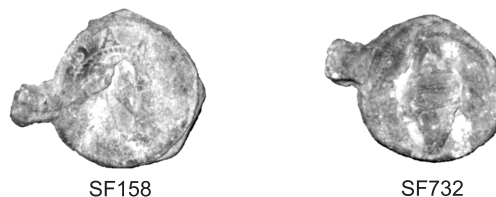
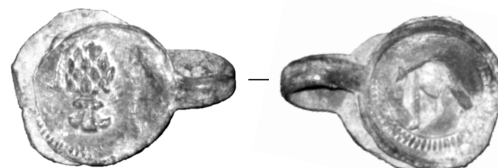


Plate 11 Lead cloth seals and gilded hand of figurine.
Scale 1:1

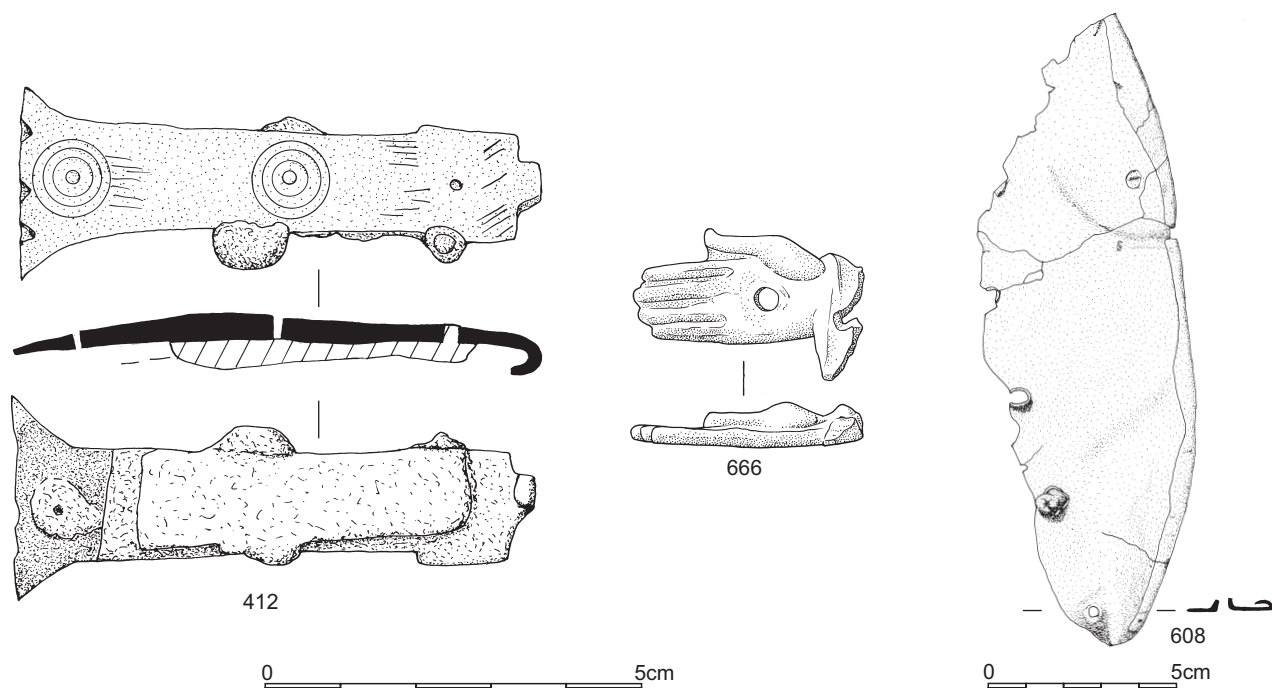


Figure 34 Finds: copper alloy objects. Scale 1:1 except 608 scale 1:2

Devotional object: hand from figurine

by Geoff Egan

This fragment (SF666) is presumably from a Limoges crucifixion figure displayed or used at the cathedral. Typically, a gilded figure of Christ with enamelled details was attached by rivets through the parts nailed (the hands and feet) to a flat, ornately gilded and enamelled cross. The particular manner in which the hand is held is that of 12th- to 13th-century versions (Thoby 1953, 6–7 no. 2). The two holes perhaps suggest a remounting had taken place.

Relatively few complete or nearly complete devotional figurines of Christ crucified in this country (Cherry 2001, 39–41; Egan forthcoming b and c — respectively from Salisbury Cathedral Close and Bermondsey Abbey, London), though fragments are occasionally encountered. A double armed cross was found at Buckenham in Norfolk in the 1840s (Turner 1847). More widely across Europe there are many intact above-ground survivals (Bloch 1992, 148–9, no. 96, pl. 43 for a close parallel).

Catalogue

(Fig. 34, Plate 11)

SF666 Copper alloy, open-palmed right hand (the thumb aligned with the outstretched fingers), gilded on the front, but not the back, which is flat; surviving length 30mm, width 14mm; there is a neat, round hole in the centre of the palm; an edge fragment of a long-sleeved garment survives; broken off at a second hole. The thumbnail is more detailed than the rest of the hand. Context 3008, build up, Period 5, *G103*, Object date: 12th to 13th century.

Implements

Part of a bowl from a skimmer (SF608) was found. Skimmers with perforated bowls and socketed handles made of a cone of sheet metal attached to the reverse to take a wooden handle are known from both medieval and post-medieval illustrations. Perforated bowls are found,

occasionally with the sockets for the handles on the reverse, in late and early post-medieval contexts from sites in and around Norwich.

Catalogue

(Fig. 34)

SF608 Skimmer fragment of bowl with edges turned over at rim, perforated with three holes one with rivet *in situ*. Context 1301, pit fill, Period 6, *G98*, Object date: medieval to post-medieval.

Lead objects

by Julia Huddle

Diversions

Musket balls

Thirteen musket balls were recovered and range from 12 to 15mm in diameter. It is not unusual to find lead shot from archaeological sites in Norwich, although generally they occur from unstratified layers. Twenty-six however, were recovered at Bussey's Garage in Norwich (Emery 2000), predominantly from 16th-century deposits where it has been suggested that they may have some connection with specific events during Kett's Rebellion of 1549.

Industry and commercial activity

Cloth Seals

by Geoff Egan

The diversity of this small assemblage, with the notable absence of local issues, and at least two (probably more) of the five seals representing imports, is its most striking feature. The range of non-Norfolk fabrics consumed by the religious institution is unexpected in the centre of such productive county, though it may be seen as part of a wider pattern that is beginning to emerge at the few religious houses where cloth seals have been found (Egan 2002, 274).

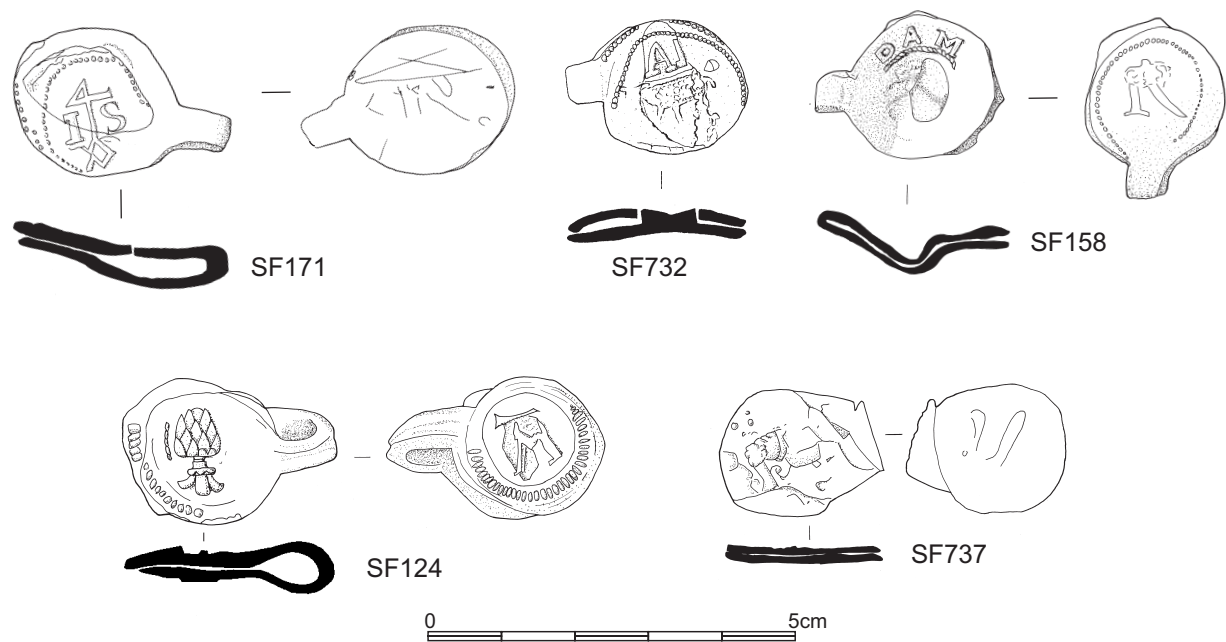


Figure 35 Finds: lead cloth seals. Scale 1:1

Catalogue

(Fig. 35, Plate 11)

All are of the two-disc form so in the following catalogue // indicates the next disc

Weavers'/Clothiers' Seals

SF171 Diameters 20mm // 21mm, (scratches — orientation uncertain) (?)116 over horizontal line // IS privy mark.
The mark (with no lower arm on the usual cross terminal to the right of the conventional '4'-like top) seems to be a previously unrecorded variation on a form known in London. Context 1000, unstratified, Object date: late 16th to 17th-century.

SF732 Diameters 19mm // 19mm, (scratched) 23- // (?)stag passant (coat delineated by field of ringlets, head abraded), AI above (the animal's identification depends on an apparent horn right next to the perimeter of the rivet hole — if this feature is simply damage, then it is a sheep — an appropriate symbol for a cloth seal). Context 3200, unstratified, Object date: late 16th to early 18th century.

Civic Seals from Continental Imports

SF158 Diameters 19mm // 20mm; weakly struck, (obscured by corrosion) R, (legend around) // shield with arms, beaded circle, ...DAM around.
The stamps can be restored from parallels found in London and elsewhere as R (probably RT ligatured), ROTTERDAM around // a shield with arms: a pale (with a wavy outline), on a chief four lions passant, ROTTERDAM around — the arms are those of the city (the pale represents the River Rhine, which flows into the sea having passed alongside the port). The city produced a variety of textiles from the late 16th century onwards. These included plushes, silks and mixed silk fabrics (Kerridge 1985, 221–2). Frizzing (raising the nap) on bays was a local specialism in the late 16th and 17th centuries, which was sometimes carried out on textiles imported from England (Kerridge 1985, 92, nos 111 and 174). New links were made when some Merchant Venturers established clothmaking businesses at Rotterdam using English wool in the 1640s in the face of disruption to the trade in the West Country (Ramsay 1965, 112; Kerridge 1985, 31). Several Rotterdam seals like the present one have been found in London (e.g. Museum of London ONE94 acc. no. 1326 — an unstratified one excavated at Poultry) and elsewhere across southern England to just outside Barnstaple. See Mitchiner 1991, 956 no. 2973 for a larger Rotterdam seal said to have been found in London.

Context 1002, unstratified, Object date: late 16th to 17th-century.

SF124 Diameters 19mm // 20mm, pinecone on tripartite stand with torse // ornate letter A.
A variation on the neatest and commonest form of Augsburg seal, this has a slightly smaller cone (the city badge) and letter (its initial) than most others. The fustian (mixed woollen and cotton fabric) that this seal would have labelled from the south of Germany is the textile import most frequently attested by finds of seals in England (cf. Egan 2001, 70–1 nos 150–4; Egan 2002, 271). Context 1000, unstratified, Object date: late 16th to early 17th century.

Uncertain

SF737 Diameter 18mm // 19mm; flattened and folded, presumably by callendering (though there is no textile imprint), (very uncertain) armoured demi-man facing, issuant from (?)crown, holding a sword angled downwards // (almost illegible) ornate terminal of sceptre *etc.*
What can be made out is not readily paralleled — callendering would suggest a linen or half-linen fabric, so probably a Continental seal for an imported textile. Context 3200, unstratified.

Iron objects

by Julia Huddle

Thirty-seven artefacts make up this assemblage of dress fittings, furnishings and household equipment. It includes knives, a padlock, a handle from a vessel and horse fittings, the latter making up some of the most interesting finds from the site. Thirteen of the iron small finds are unclassified, being either too fragmentary and/or badly corroded to be identified.

Diversions

Horse furniture

A small iron cruciform bridle boss (SF724) was recovered from an 11th-century pit. The fitting which is badly corroded has a central, slightly domed boss, with rivet and

circular rove on the back and four arms which slightly expand at the middle, each with a rounded terminal pierced with a rivet and square rove on the reverse. It is rare for examples to survive with the rivets and more particularly with roves intact. The distance between the back of the mount and roves at the terminals is approximately 2mm, suggesting the thickness of the straps to which the object might originally have been attached. An almost identical bridle boss, with broken rivets, was recovered at Mill Lane, Thetford (Mould with Youngs 2004, 44, fig. 36, no. 348) from a 10th- to 11th-century pit and is compared to an example with pointed arms also from Thetford (Goodall, I.H. 1984, fig. 139 no. 264). This latter example was found on a site where occupation did not extend beyond the end of the 11th century.

A small domed boss (SF639) is possibly a bridle boss, similar to the one from Thetford (Goodall, I.H. 1984, 100, fig. 139, no. 264). A single fiddle-key nail (SF769) with a large head which is semi-circular in profile but of the same thickness as the shank are can be compared to examples from London (Clark 2004, 86, fig. 64a and fig. 74) from mid 11th- to mid 14th-century contexts.

Parts of two double-eyed attachment links from bridle bits (or side-links) were recovered on site. One is iron with non-ferrous plating (SF455), whilst the other (SF385) is copper alloy. Elsewhere they are known from pre-Conquest sites, for example an iron side-link at Winchester (Goodall 1990, 1046, fig. 334, cat. no. 3881), whilst a complete 9th- to 10th-century iron snaffle bit was found at Coppergate, York (Waterman 1959, fig. 8). There is a growing number of these items from post-Conquest contexts such as two recent examples from York (Ottaway

and Rogers 2002, 2958, fig. 1524 nos 13049 and 14122), one from a mid to late 12th-century context, the second from an early to mid 13th-century context. Three iron side-links all with non-ferrous plating are known from elsewhere in Norwich. Two are from medieval contexts, one from Westwick Street and the other from Alms Lane (Goodall 1993b, 225, fig. 172, cat. nos 1820–21). The third similar example has a lozenge-shaped end loop and projecting lobes at each corner and is from an unstratified context at Greyfriars (Huddle forthcoming b). The iron example (SF455) is unusual as the central part is lozenge-shaped with stepped sides, and a central circular motif in the lozenge-shaped plate. This contrasts with the more usual oval or round boss as seen on the example at Greyfriars, Norwich (Huddle forthcoming c) and East Harling, Norfolk (Margeson 1995b, fig. 70, nos 108–9).

No exact parallels for a rowel spur (SF550) have been found. The sides of this begin on a level plane with the neck and then drop almost at right angles (more usually the arms plunge from the junction with the neck and curve up again under the wearer's ankle) and then straighten out again to the terminals.

Catalogue
(Fig. 36)

- SF455** Bridle side-link, iron with non-ferrous plating, short shank 10mm long, circular ring terminal at one end, lozenge-shaped plate with stepped sides and faint circular motif in centre at other, stub of shank for ?second ring terminal at opposite end. Slightly concave profile in the long axis. Context 2069, post-hole fill, Period 3, *G45*, Object date: possibly medieval.
- SF550** Rowel spur. Overall length 115mm, neck 20mm, span 62mm. Corroded remains of rowel pin and star rowel, all points incomplete, ?round-sectioned neck. One complete

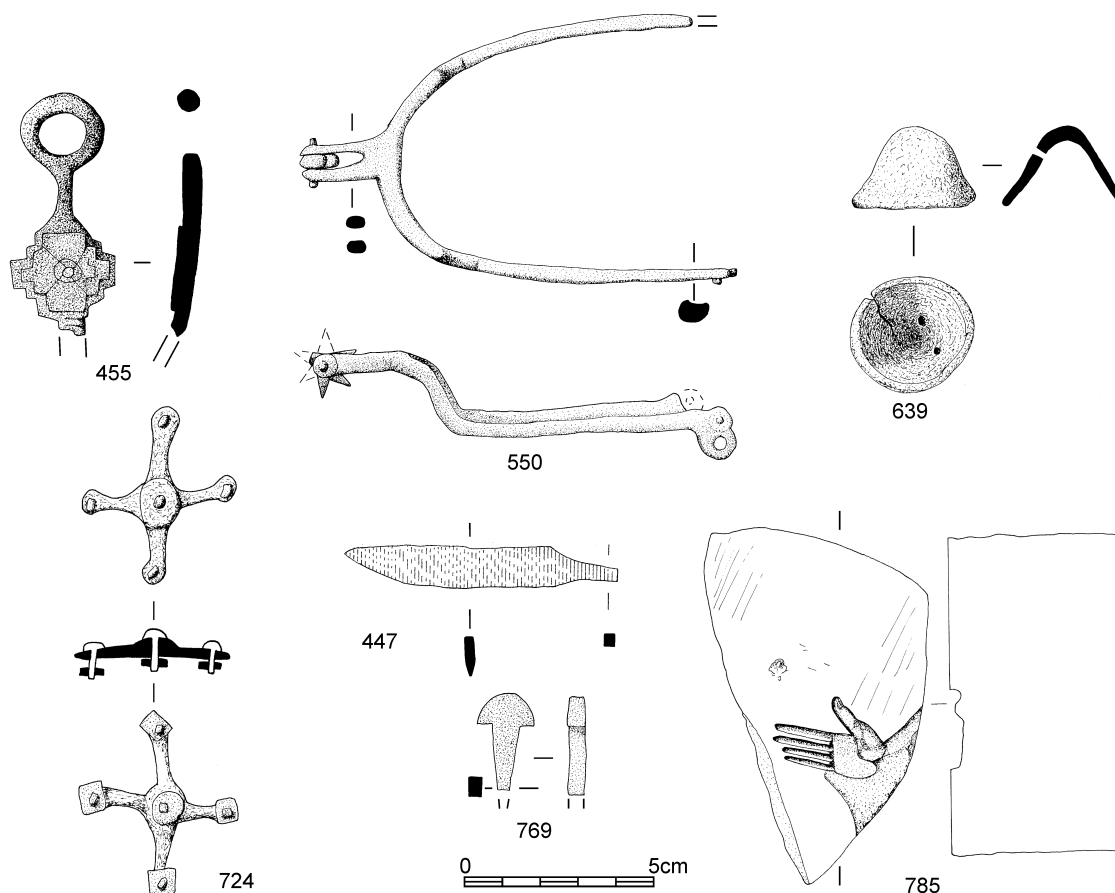


Figure 36 Finds: iron objects and stone object 785. Scale 1:2

figure-of-eight terminal with incomplete iron ring hook of one attachment rusted to terminal. Sides rectangular in section. Context 2526, pit fill, Period 4, *G57*, Object date: ?medieval.

- SF639** Domed boss with flanged rim and two (of originally ?four) holes. Context 2497, layer, Period 3, *G15*, Object date: medieval.
- SF724** Cross-shaped mount. Two pieces riveted together in centre, sub-circular rove on reverse; end of each arm has expanded rounded terminal each with rivet and sub-rectangular rove on reverse, oval-shaped knob at centre of cross, non-ferrous plating. Context 3257, pit, Period 2, *G30*, Object date: Late Saxon.
- SF769** Fiddle-key nail, Context 3374, make up, Period 3, *G46*, Object date: mid 11th to mid 14th century.

Dress fittings

Buckles

Three iron buckles were recovered one of which is 'D'-shaped. These are the most common type of iron buckle known from Late Saxon contexts (Margeson 1995b, 69). The other two buckles are post-medieval in date and from Period 5 contexts.

Catalogue

(Not illustrated)

- SF723** Buckle with D-shaped frame with pin. Context 3257, Pit, Period 2, *G30*, Object date: Late Saxon.

Furnishings and household equipment

Knives

Ten knives or parts of knives were found. Where it can be determined they are all whittle-tanged knives, whereby a pointed tang is inserted into a handle. Three knives are from Period 2 deposits, two of which are fragmentary. The third (SF694), which has a back horizontal to the blade, then angled to the tip is of a type well known from Late Saxon contexts elsewhere (*e.g.* Thetford (Goodall, I.H. 1984, 84, fig 123, nos 54–62). This type of knife also occurs in medieval contexts, such as those from the Norwich Survey excavations (Goodall 1993b, 124) and at York (Ottaway and Rogers 2002, 2753). Three such examples were recovered from Period 3 contexts (SF619, SF447 and SF638). The remaining knife fragments comprise three from Period 5 and one from an unstratified deposit. Only one of these, a post-medieval bone handled knife, is catalogued here, the others are too fragmentary to determine the blade form.

Catalogue

(Fig. 36, SF447)

- SF694** Knife blade fragment, with horizontal back which angles down to tip. Context 3070, layer, Period 2, *G11*, Object date: Late Saxon.
- SF619** Knife blade, cutting edge worn by sharpening, horizontal back angling down to tip, tang broken off. Context 2696, layer, Period 3, *G20*, Object date: medieval.
- SF447** Knife blade with ?incomplete whittle-tang, horizontal back angling down to tip. Context 2072, layer, Period 3, *G20*, Object date: medieval.
- SF638** Knife blade, cutting edge worn by sharpening, horizontal back angling down to tip, badly corroded, tang broken off. Context 2497, layer, Period 3, *G15*, Object date: medieval.
- SF629** Knife with incomplete blade, circular-sectioned tang which runs the entire length of a bone handle with copper alloy decorative terminal. Straight-sided bone handle with expanded rounded top. Context 2168, pit fill, Period 5, *G102*, Object date: post-medieval.

Metalworking debris

by Lucy Talbot

The site produced fifty-seven pieces of metalworking debris weighing 4.878 kg, of which only 0.023kg was copper alloy waste, the rest resulting from the working of ferrous metals. The entire assemblage consists of smithing waste, the majority of which was recovered from secondary deposits, for example layers, dumps, build up and topsoil.

Late Saxon contexts produced hearth bottoms and vitrified hearth lining as well as conglomerate and undiagnostic pieces. This type of assemblage was present in the build-up layers of Period 3 and is almost certainly residual Late Saxon material. Together these two periods produced over 80% of the entire assemblage. The remaining periods produced only undiagnostic and conglomerate material which may also be residual from the early period.

Worked stone objects

Devotional objects: stone mould

by Geoff Egan

A stone mould (SF785) (perhaps re-using a tombstone or paving slab of suitable material), is carved with the negative of an open left hand. The bend of the wrist may be compared with that of the more obviously pendent, crucified Christ in Parisian ivories of the 14th century (Thoby 1953, 6–7 no. 4). On a marginally smaller scale to the metal hand SF666 (see copper alloy above), this mould could in its complete state have produced somewhat similar devotional figurines, either set against a larger item or freestanding. Casting might have been a commercial enterprise for the public at large, or for connected institutions, or just for the cathedral itself.

Three highly accomplished lead hands in the round have been excavated at Bermondsey Abbey (Egan forthcoming c), and there is a similar find from the Seine at Rouen (Berthelot *et al.* 2002, 253 and 301 no. 284). The latter is described as a 'secular badge' of a '*main de justice*' assigned to the 15th century. These were probably in fact for making clay moulds analogous to the present one, stone usually being used in casting lead alloy and clay in casting copper alloy, although either could have been used for precious metals.

Another fragment of the same type of stone, but without any features was found from a Period 3 context.

Catalogue

(Fig. 36)

- SF785** Roughly triangular fragment of parallel-faced slab of mid grey limestone, c.80 x 85mm, thickness varies between 42 and 45mm; one side is chiselled overall, one is broken off in two planes, and the third is curved (probably fortuitously), one main face is flat apart from three parallel chiselled marks at one edge, the other has a fairly simply carved negative of an open left hand, palm outwards (the fingers are plain grooves but the nail of the thumb is shown) with a trace of the arm at an angle to it. There is no obvious sign of heating. Context 3200, unstratified, Object date: 14th century.

Petrological Analysis by G.K. Lott (British Geological Survey) has identified the possible source of this limestone to be the Lower Jurassic Lias Group which crop out continuously from the Dorset coast, through Somerset, Worcestershire, Warwickshire, Leicestershire and Lincolnshire to the Yorkshire coast.

Lava

by Heather Wallis

Only eight pieces of lava were found during the excavations, all of which were fragments of quernstones. Seven of these came from Late Saxon contexts, the one exception coming from make-up layers for the refectory floor which included redeposited Late Saxon material. All are fragmentary pieces from which it is not possible to estimate the size of the querns.

Lava querns are commonly found in Late Saxon deposits in East Anglia and are usually described as Rhenish lava stone although only petrological analysis can establish the precise place of origin. The frequency of occurrence of this material in Late Saxon contexts indicates links to the continent at this time which are not necessarily apparent in artefact assemblages of other material types.

Limestone millstone

by David Buckley

A single piece of a millstone (WS130) was found built into the construction of the post-medieval house (Property 6, Group 77). The stone was flat and 0.16m thick. A precise diameter cannot be determined but with a surviving radial line fracture of 0.48m the original diameter must have been in excess of one metre. There are worn traces of two panels of grooves on an original grinding surface. The opposite face is roughly finished and without any signs of deliberate grooves or tooling, but there are traces of tooling grooves on the outside curving edge of the stone. Petrological analysis by G.K. Lott (British Geological Survey) has identified the stone to be consistent with a source from the Middle Jurassic, Lincolnshire Limestone Formation with the sample showing a Barnack Rag type lithology. Quarrying at Barnack began in the Roman period but the quarry was largely worked out by the 16th century. This stone was frequently used in major buildings including Norwich, Peterborough and Ely Cathedrals and Bury St Edmunds Abbey but is an unusual type for a millstone.

While limestone generally does not appear to be suitable for use for either querns or millstones its use as such is not unknown. Roman examples from Norfolk include one from Brancaster (Hinchliffe 1985, 64, fig.42 no. 147) and one from Feltwell (Gurney 1986, 22, fig. 46). Limestone querns, although rare, were found in Anglo-Scandinavian deposit at Coppergate, York (Mainman and Rogers 2000, 2547–2552). Examples from the medieval period are more scarce and research has concentrated on the trade and use of lava quern and millstones imported from the Rhineland. This dominant use of lava was demonstrated in a survey by Amer (1987) although some examples of limestone were identified.

The fragment of Barnack limestone from the refectory excavations is, therefore, a rare use of this type of stone for milling purposes, despite widespread trade and its use in the east of England for building purposes, particularly in cathedrals, monasteries and churches. A Roman date cannot be totally ruled out, although a medieval date seems more probable. As the quarries at Barnack appear to have gone out of use in the 16th century an earlier medieval date seems more likely. The finding of a millstone within a cathedral precinct is not unusual and a mill is referred to in the Parliamentary survey of 1649, located with the brew house and stable to the east of the Lower Green (Metters 1985, 41).

Vessel glass

by Alice Lyons

This is a relatively large assemblage of well stratified post-medieval vessel glass. The majority consists of wine bottle fragments but it is the tableware assemblage, including goblets, beakers and bowls, that is of particular interest. This group contains vessels manufactured in England, but also imported from the Low Countries, as well as Italy and perhaps Eastern Europe. Although many of these vessel types have been recorded in Norwich before (Haslam 1993; Lyons in prep), a significant number have not. Of particular interest are the sixty fragments of a mid to late 16th-century beaker, possibly produced in the Czech Republic, which is of exceptional interest due to its high status and rarity and which may be a unique find in England.

A total of 278 vessel glass fragments were retrieved, representing a minimum of 181 vessels. The glass was recovered from eight distinct features, consisting mostly of pit fills. The majority of the assemblage (168 fragments, minimum of 126 vessels) consists of the substantial remains of post-medieval wine bottles which is typical of any post-medieval urban assemblage (Haslam 1985, 234). The remainder of the group (110 fragments, minimum of 55 vessels), consists of goblets, beakers, jugs, case bottles, flasks, apothecary bottles and bowls of post-medieval date. These have been recorded according to vessel descriptions as defined by Willmott (2002).

The majority of the vessel glass (100 wine bottles and 44 additional vessels) was recovered from features assigned to Period 5. A significant quantity of the beakers were found within a Period 5 pit (*G102*), a high percentage of the phials were retrieved from the post-medieval walled pit (*G67*) and a lot of the wine bottles were found in deposits associated with the disuse of the prebendary's residence (*G82*).

Drinking vessels

Goblets

Seven incomplete goblets were found. This diverse group of high status drinking vessels, which includes some imported examples, dates to the 17th century and is one of the largest goblet assemblages from a single site in Norwich. All were of a different design, although two similar inverted baluster stemmed types were identified (SF533 and SF745). These are made from clear lead glass with stems containing a decorative inverted tear-drop motif and are an English product which can be dated to the 17th century. The other vessels in this class worthy of note include a clear glass fluted goblet bowl (SF228) that is decorated with horizontal bands of marbled white paint and is a Venetian import dating from the 17th century. Also, the clear goblet foot, stem and base (SF457) where the stem is wrythen and the bowl very ornate with vertical ribs and horizontal rows of raised prunts. Similar types found in Norwich can be dated to the mid to late 17th century. Perhaps the most interesting of all the goblets found is the opaque glass (*lattimo*) hollow flared stem decorated with gold leaf (SF364), probably an import from the Low Countries, or possibly Venice, also of 17th-century date.

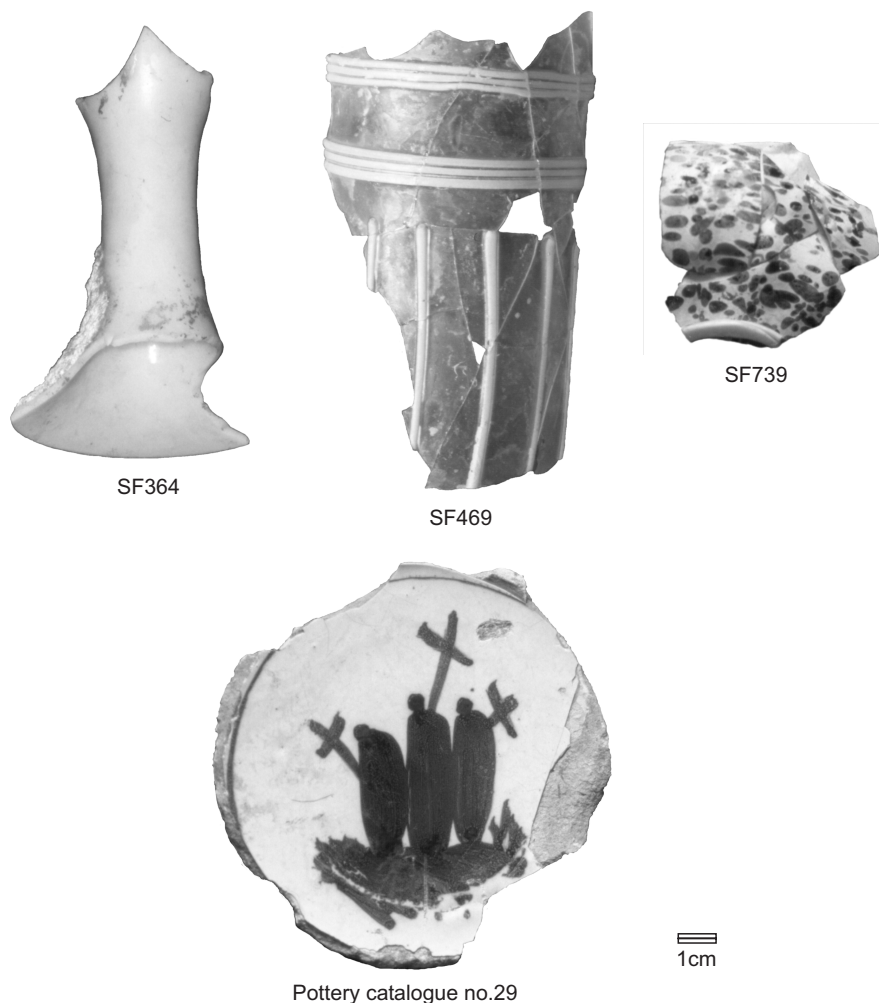


Plate 12 Glass vessels and ceramic dish with religious scene. Scale 1:2

Catalogue

(Fig. 37, Plate 12)

- SF486** Clear mixed alkali glass knopped stem, probably upper part of elongated inverted-baluster type. (Parallel: Willmott 2002, 60, fig. 58 10.4) Context 2151, pit fill, Period 5, *G102*, Object date: first half 17th century.
- SF228** Mixed alkali and soda clear glass bowl, fire rounded rim fragment, ?fluted with horizontal bands of white painted decoration. ?Venetian import. (Parallel: Willmott 2002, 57–8, fig. 53, type f.) Context 1307, unstratified, Object date: 17th century.
- SF457** Clear ‘cristello’ type glass foot, stem and bowl base. Foot incomplete, but slightly splayed with a central solid cylindrical wrythen stem. Bowl very ornate with vertical ribs and horizontal rows of raised prunts. Plain fire-rounded rim. (Parallels: Haslam 1985, 240, fig. 44 no. 19; Haslam 1993, 104 fig. 72 no. 685) Context 2001, pit fill, Period 5, *G67*, Object date: mid to late 17th century.
- SF533** Clear lead glass inverted-baluster goblet, inverted tear-drop within the stem. Unusually, stem externally incised with diagonal line travelling from top to bottom with peak towards the bottom. Narrow bowl, flared foot. Parallels. Haslam 1985, 104, figs 686 and 687). Context 2163, layer, Period 5, *G79*, Object date: 17th century.
- SF364** Opaque hollow flared stem, gold leaf decoration on the edge of foot and top of stem. No direct parallel for form, however, an elaborate opaque glass tankard was recently found at Greyfriars in Norwich (Shepherd forthcoming) for which a 17th-century English origin is suggested. Context 1012, pit fill, Period 6, *G98*, Object date: ?late 17th century. Plate 12.

Beakers

Eleven beakers were found, one of which stands out as particularly unusual.

Beaker SF469

by Hugh Willmott

This tall fluted beaker dates from the mid to late 16th century, was possibly imported from eastern Europe and is an extremely rare and important vessel. It is without exact parallel in England and is made from very good quality glass, suggesting it comes from a high quality manufacturing centre outside England. It does not come from Italy as large beakers are very atypical of production centres there and the heavy prominent (as opposed to marvered) trailing is not a Venetian feature. Heavy opaque prominent trails are much more typical of northern European glass, particularly vessels from the Antwerp region. Tall fluted beakers however, are not normally thought to be in the Antwerp repertoire. Another possibility is it originated from a production centre further into eastern Europe, where this style of decoration and the fluted form are known from ‘Bohemian’ sites such as those in the modern day Czech Republic.

As this vessel is not Italian, the only source for vessel glass imported into England prior to 1550, a date of between 1550 to 1600 seems likely, although typologically it is still possible it could date from the early 17th century.

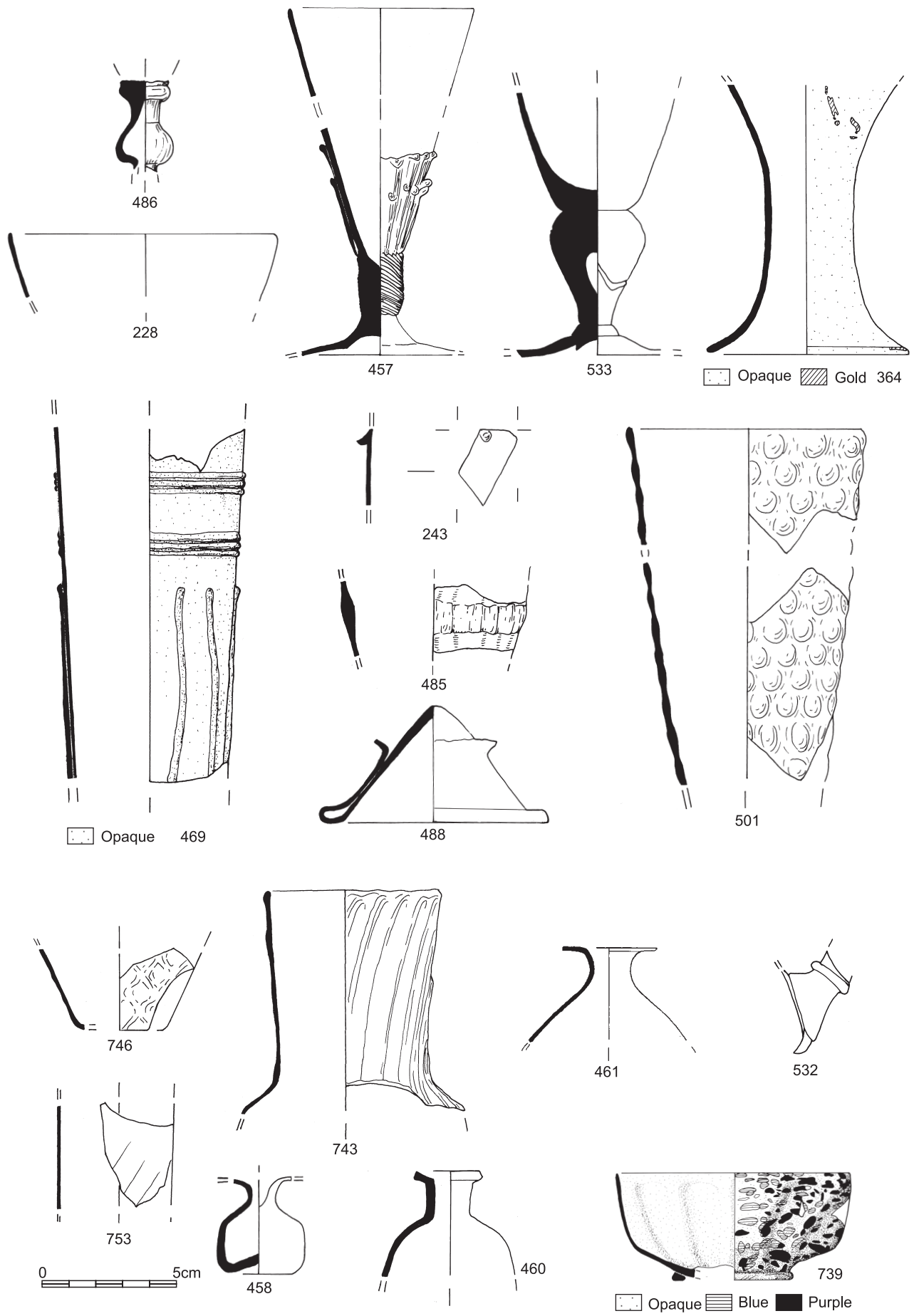


Figure 37 Finds: vessel glass. Scale 1:2

Other beakers

Of the remaining vessels five were retrieved from pit 2161 (*G102*). One vessel is a colourless cylindrical beaker (two fragments found, SF485 and SF506) with thick-cut trailing, a quite common find imported from the Low Countries or Germany and dated to the 17th century. Three green potash kicked pedestal beaker bases (SF487, SF488 and SF489), probably of English manufacture, date from the mid 16th to mid 17th centuries. A colourless cylindrical beaker with optic blown bosses (SF501 and SF507) was probably produced in the Low Countries or possibly Venice and dates to the first half of the 17th century.

Three beakers were recovered from a single pit (*G104*), two of which were fragments of green tinted cylindrical beakers with an optic blown mesh (SF746 and SF753). This is an uncommon English form dated to between the mid 16th and mid 17th centuries. Also found was a clear soda glass vessel fragment (SF748), possibly a beaker, which is also post-medieval in date.

Other beakers found include a clear beaker (SF243) with a single small decorative moulded prunt surviving, possibly an import from Venice dating from the 16th to early 17th century, and a potash pedestal beaker with optic blown ribs, a very common English form dated between the mid 16th and mid 17th centuries.

Catalogue

(Fig. 37, Plate 12)

- SF469** Clear, very good, mixed alkali or soda glass, tall fluted beaker decorated with horizontal and vertical applied white glass trails. Lower half of the body has thick, prominent opaque white vertical trails which terminate below the first of two horizontal bands consisting of three opaque white trails. Although comparable to an example illustrated in Willmott (2002, 52, fig. 42, no. 5.3) this vessel is made of a different type of glass, is slightly more cylindrical in shape and has finer white glass trails. The excellent quality of the glass suggests it came from a high quality manufacturing centre. Context 2478, layer, Period 4, *G50*, Object date: probably 1550 to 1600, but a 17th-century date is also possible. Plate 12.
- SF243** Clear soda glass fragment, single small moulded prunt surviving, possibly Venetian. (Parallel: Haslam 1993, 104, fig. 71, no. 665) Context 1196, demolition layer, Period 5, *G106*, Object date: 16th to early 17th century.
- SF485** Mixed alkali colourless cylindrical beaker, thick-cut trailing, from the southern Low Countries or Germany. Previously recorded in Norwich on several occasions. Same vessel as SF506. (Parallels: Haslam 1993, 106 nos 668 and 670; Willmott 2002, 40, fig. 13, no. 1.9) Context 2151, pit fill, Period 5, *G102*, Object date: late 16th to mid 17th century.
- SF488** Green tinted potash kicked pedestal base, English. (Parallel: Willmott 2002, 47, fig. 30, no. 4.3) Context 2151, pit fill, Period 5, *G102*, Object date: second half of 16th century to first half of 17th century.
- SF501** Colourless mixed alkali and soda cylindrical beaker with optic-blown bosses. Rim is fire-rounded, very slightly everted. Uncommon form, although found in Norwich on several previous occasions. From Low Countries, possibly Venice. Same vessel as SF507. (Parallels: Haslam 1993, 105, fig. 70, no. 663; Willmott 2002, 38, fig. 8, no. 1.4) Context 2168, pit fill, Period 5, *G102*, Object date: first half of the 17th century.
- SF746** Green tinted, potash cylindrical fragment with optic blown mesh. Uncommon English form. Similar to SF753 (Parallels: *Decoration* Willmott 2002, 48, 4.5, fig. 32, *form* Willmott 2002, 48–49, 4.6, fig. 33). Context 3260, ditch fill, Period 5, *G104*, Object date: second half of 16th century to first half of 17th century.

Storage vessels

Case bottles

Case bottles are distinctive due to their square section (or other tessellating shape) that could easily be tightly packed into crates for transportation. The remains of four case bottles, all green-tinted potash glass, square in shape and dating to the late 16th and first half of the 17th century, were recorded.

Medical vessels

Flask

Flasks are vessels for the temporary storage and transfer of liquids. Their form, generally a capacious body with a tall narrow neck, reflects this function. They also have an everted rim which was suited to pouring, although they lack handles. Usually they are made in an utilitarian potash glass (Willmott 2002, 78). Three flask fragments of probable 16th- to 17th-century date were found.

Catalogue

(Fig. 37)

- SF743** Pale green potash vessel neck with optic blown wrythen vertical ribs. Unusually the rim is straight with fire-rounded edge. No direct parallel found. Similar vessels Willmott 2002, 79–80, 20.2 and 20.3, figs 97 and 98. Context 3212, pit fill, Period 5, *G67*, Object date: 16th to first half of the 17th century.

Phials

A relatively large number of phials (sometimes referred to as apothecary bottles) were retrieved and, excluding wine bottles, they were the most common vessel type found. These vessels probably held ointments, perfumes or other precious liquids and are a common find on post-medieval urban sites in Norwich (Lyons in prep). Thirteen were identified, five from the same deposit within the wall-lined pit *G67* which included a miniature 'onion' type bottle (SF458) and cylindrical phials with out-turned fire rounded rims (SF460, SF461, SF741 and SF742). Both these types date to the 17th century and into the 18th century. All other phials found fit within these two categories.

Catalogue

(Fig. 37)

- SF460** Pale green potash cylindrical phial, thick fire-rounded horizontally outplayed rim and curved shoulders. (Parallel: Haslam 1985, 240, fig. 43, no. 20) Context 2001, pit fill, Period 5, *G67*, Object date: 18th century.
- SF461** Pale green cylindrical phial, with a fire-round horizontally outplayed rim and sloping shoulders. (Parallel: Haslam 1985, 238, fig. 42, no. 15) Context 2001, pit fill, Period 5, *G67*, Object date: 17th century.

Tableware

Bowls

The remains of four bowls, all of different kinds, were found. Of particular interest is the opaque white (*lattimo*) glass bowl (SF739), with fluted decoration on the underside of the vessel and decorated with blue and brown blobbed enamel paint. It is a rare vessel, probably imported from the Low Countries or Venice and dated to the first half of the 17th century.

Catalogue

(Fig. 37, Plate 12)

- SF532** Clear soda glass colourless spout, with an applied string course. Neck of spout is made from a separate piece of glass to the body. No parallel identified. Context 2163, fill, Period 5, *G79*, Object date: second half of 17th century.
- SF739** Opaque white ?soda glass bowl with a rolled footing base, with fluted decoration on the underside of the vessel. Blue and brown blobbed enamelled paint decoration. Rare in this form, imported from the Low Countries or Venice. (Parallel: Willmott 2002, 93–94, 27.3, fig. 122). Context 3260, ditch fill, Period 5, *G104*, Object date: first half of 17th century. Plate 12.

Conclusion

This group of glass vessels is a good example of a high status post-medieval urban glass assemblage. It has many parallels with the glass recently found from the Millennium Library excavations in Norwich (Lyons in prep). It also has parallels with other urban assemblages such as the largely 17th-century assemblage from ‘The Old Tavern’, found during excavations at the Priory and Hospital of St Mary Spital, London (Thomas *et al.* 1997, 161). It extends the known type series of vessel glass from Norwich during the post-medieval period. The fluted beaker (SF469) is of national importance as it appears to be a unique find in this country and was probably imported from eastern Europe.

Prehistoric pottery

by Sarah Percival

Five sherds of prehistoric pottery were recovered. Three grog-tempered Bronze Age sherds were found within buried soils (Period 1, *G4*). A comb-impressed Beaker sherd and a single flint tempered sherd of possible Iron Age date were residual in Late Saxon deposits.

Post-Roman pottery

by Richenda Goffin

The excavation produced a total of 4258 fragments of post-Roman pottery weighing 74,869g. The assemblage ranges in date from the Middle Saxon through to the post-medieval period. A breakdown of the quantities of pottery by ceramic period is presented in Table 5 and quantity by fabric in Table 6. The pottery is discussed by ceramic period. Relevant pottery information has been included in the stratigraphic text although a few important groups are discussed in greater detail below.

The ceramics have been recorded according to the guidelines set out for assessment and analysis of pottery by Slowikowski, Nenck and Pearce (2001), and quantified by the number of sherds by fabric present in each context, the estimated number of vessels represented and the weight of each fabric. Fabric type, vessel form and decoration were recorded, and other characteristics such as condition. A provisional overall date range for the pottery in each context was established. The fabric identification is based on Jennings (1981), supplemented by a fabric list compiled for Suffolk County Council Archaeological Service (S. Anderson, unpublished). The Thetford-type ware rims have been catalogued using the initial typology established by Dallas (1984), and the modified typology proposed by Anderson (2004).

| <i>Ceramic period</i> | <i>No.</i> | <i>%No.</i> | <i>Wt/g</i> | <i>%Wt</i> |
|-----------------------|-------------|-------------|--------------|------------|
| Middle Saxon | 2 | 0.04 | 18 | 0.02 |
| Late Saxon | 2506 | 58.9 | 23409 | 31.3 |
| Medieval | 582 | 13.6 | 4620 | 6.18 |
| Post-medieval | 1168 | 27.4 | 46822 | 62.5 |
| Total | 4258 | | 74869 | |

Table 5 Pottery by ceramic period

Middle Saxon ceramics

Two fragments of pottery of Middle Saxon date were recovered. A single unabraded rim of a Sandy Ipswich-type ware jar was present in the buried soil horizon (*G2*) overlying natural. A second fragment of Sandy Ipswich-type ware was found in a Late Saxon pit fill (*G30*). In both cases the pottery was associated with fragments of Thetford-type wares and was residual.

Late Saxon ceramics

The Late Saxon pottery represented nearly a third by weight of the total assemblage (Table 5). Thetford-type ware is the predominant fabric with a total of 2450 fragments of weighing 22,868g being recovered along with a further thirteen fragments of Grimston Thetford-type ware weighing 269g. Although much of the Thetford-type ware was from the sequence of Late Saxon and Saxo-Norman deposits, this fabric forms a substantial element of the pottery in all later phases of the excavation (Table 7). The pattern of high levels of residuality of Thetford-type wares is a feature which is typical of many excavations in central Norwich.

The Thetford-type wares, including Grimston Thetford-type ware made up a total of 99.1% by weight of the Late Saxon assemblage. The other pottery fabrics comprise St Neots-type ware (seventeen fragments weighing 94g, 0.4% by weight) and Stamford Fabric A (four sherds weighing 43g, 0.18% by weight) and two crucible fragments which are possibly vitrified Thetford-type ware, and some undetermined greywares. The proportions and types of fabrics for this period are similar at the Norwich sites of Dragon Hall (Anderson 2005b), Castle Mall (Lentowicz forthcoming a) and Greyfriars (Lentowicz forthcoming b).

A limited range of Thetford-type ware forms is present and the types of vessels represented no doubt reflect the ceramic output of the local kiln sites from Norwich itself. The excavated production sites in Norwich appear to have concentrated on the manufacturing of cooking vessels, although wasters of lamps have also been found (Jennings 1983, 74). The most frequent vessel types at the cathedral refectory are medium-sized cooking vessels or jars (290 rims), with small quantities of lamps (seven examples), undecorated ginger jars (seven examples), bowls (four examples) and pitchers (three examples, including one spouted pitcher). The presence of storage vessels is indicated by a number of body sherds with applied thumbled strips. The most common type of decoration is rouletting, most frequently with diamond shapes, but also with rectangular impressions. A bowl with inturned rim has two rows of triangular rouletting of different sizes (Fig. 38.1). A second bowl has three rows of rectangular rouletting, one along the top of the rim and two on the actual body of the vessel (Fig. 38.2).

Several examples of sub-standard Thetford-type wares were noted. One jar is overfired and has a distorted neck. Although not a perfect specimen, it seems that such a vessel was acceptable, as it is sooted on the rim and has obviously been used.

Two possible Thetford-type ware crucible fragments are present in the assemblage. One was a small greyware sherd with a highly vitrified external surface while four fragments of a larger vessel had been totally modified, preventing any fabric identification, as they had been subjected to a high temperature and had become severely vitrified.

The Thetford-type wares from the earliest periods of activity on site were given particular attention, as they were seen as providing an opportunity to check existing dating chronologies, with a view to establishing whether the wares might be demonstrably of an earlier 10th-century date, or later. Groups which contained no additional 11th-century fabrics such as Early Medieval Ware were chosen. The rims were catalogued using the broad dating sequence suggested by Dallas (1984) for Thetford-type wares recovered from Thetford itself, a work which has been subsequently modified by Anderson (2004). It is, however, worth emphasising the conservative nature of the industry and the fact that there is likely to be a considerable overlap in form types. In addition, the Norwich industries which no doubt supplied a large proportion of the wares may not necessarily have followed the same typological development as the pottery made in the Thetford kilns.

The rim present in the deposit overlying the first road is of a 10th-century type (Dallas AB13; Anderson Type 5). Out of the four rims from 2149 (Period 2, *G11*) associated with the second trackway, two are considered to be of 10th-century date (AB13, AB14; Type 5), and two are of late 10th- to 11th-century date, (AA6, AB10; Types 6 and 7). Of the eleven Thetford-type ware rims recovered from 3070 (also Period 2, *G11*), ten of them are of 10th-century type, and only one is typologically of late 10th- to 11th-century date (AB10; Type 7). Thereafter the Thetford-type wares are accompanied by 11th- to 12th-century fabrics such as Early Medieval Ware and Yarmouth-type ware. There are, however, many examples of Thetford-type vessels in subsequent deposits which have plain flared rims indicative of an 11th-century date, which are similar in type to the Early Medieval Ware forms of the 11th to 12th century. The presence of Thetford-type ware of an apparent 10th-century date in these early deposits is a feature of interest, as it has previously been suggested that large-scale occupation in Conesford was likely to have begun only in the 11th century (Atkin and Evans 2002).

A total of seventeen fragments weighing 94g of St Neots-type ware are present from the whole assemblage; all, apart from one cooking vessel rim, are body sherds. Five of the sherds were found in Period 2 deposits (54g), with a further ten fragments from Period 3. This fabric is a small but constant presence found on many sites in Norwich and is often associated with Thetford-type wares.

A small quantity of whiteware sherds are Stamford wares (four sherds weighing 43g). The fragments are all of Fabric A type dating from the mid 10th to late 11th century (Kilmurry 1980, 8). This fabric is also regularly identified on sites in Norwich in the mid 11th to 12th century and later.

Medieval ceramics

The medieval pottery recovered forms a comparatively small element of the ceramic assemblage making up just over 6% by weight of the overall assemblage, although forming 13.6% of it by sherd count. The medieval component is noticeably weighted towards the earlier part of the period which is dominated by pottery of the 11th and 12th centuries. The assemblage thus reflects the intensive use of the site in the Saxo-Norman period leading up to the construction of the cathedral and the refectory. There is little pottery from the period relating to the lifetime of the refectory, as rubbish was disposed of away from the excavated area. This is demonstrated by the paucity of glazed wares such as Grimston Ware, a fabric which is usually present in Norwich assemblages from the late 12th century onwards. The local coarsewares are also represented mainly by rim types of 11th- to 13th-century date, with no developed rims of 14th-century date or later. Such medieval wares are not even present in any quantity as residual elements in the early post-medieval levels.

Overall 10% by weight of the medieval pottery is made up of Early Medieval Sandwich Ware, comprising mainly body sherds, but also fragments from four pitchers. A high proportion of the medieval pottery consists of sherds of Early Medieval Ware which, since they are light and delicate vessels, are under-represented in the percentage of the medieval pottery by weight, forming only 29%, although they make up 34.6% by sherd count. The vast majority of this ware is made up of body sherds, but many cooking vessels with simple everted rims are present. An unusual vessel is likely to be an Early Medieval Ware variant. It is thick-walled with clear joining marks where the rim has been attached to the body of the pot on the interior; and there are pronounced vertical smoothing marks on the outside, with some knife-trimming (Fig. 38.3). The fabric is comparatively fine and slightly micaceous, but the most striking feature of this vessel is that it is much more robust than the usual types of cooking vessel made in this fabric. Ten examples of ginger jars were identified, three of which are decorated with applied thumb-decoration, and one with a more unusual incised criss-cross decoration (Fig. 38.4). These can be compared with the wider range of decorated ginger jars recorded at the nearby excavation of the Lower Close (Site 300N) (Jennings 2002, 60).

Several types of shell-tempered coarsewares are represented. A total of forty-five fragments weighing 277g of Early Medieval Ware with sparse shell are present, including the rims of two cooking vessels. One fragment of calcareous tempered ware of Ely fabric type was identified. The largest element of this part of the assemblage however, is the 171 fragments of Yarmouth-type ware, weighing 1559g (29.5% of the medieval pottery by sherd count, and 33.5% by weight). This pottery is characterised by a coarse sandy fabric, containing varying degrees of calcareous inclusions, and is similar to pottery recovered from Fuller's Hill in Yarmouth (Mellor 1976). It is usually a consistent element in Norwich assemblages of this date and, given its relative frequency within the city and the fact that it is not commonly found on Yarmouth sites, a rural production site, perhaps in East Norfolk has been suggested (Anderson forthcoming). Eighteen cooking vessel rims are present in the assemblage at the refectory. One of these is decorated with pie-filled thumbing around the rim.

| Fabrics | Period 1 | | Period 2 | | Period 3 | | Period 4 | | Period 5 | | Period 6 | |
|--|----------|------|----------|-------|----------|------|----------|------|----------|------|----------|------|
| | No. | Wt/g | No. | Wt/g | No. | Wt/g | No. | Wt/g | No. | Wt/g | No. | Wt/g |
| <i>Middle Saxon wares</i> | | | | | | | | | | | | |
| Sandy Ipswich ware | 1 | 12 | 1 | 6 | | | | | | | | |
| <i>Late Saxon wares</i> | | | | | | | | | | | | |
| Huy-type ware | | | 1 | 6 | | | | | | | | |
| St Neots-type ware | | | 12 | 54 | | | 1 | 7 | 1 | 2 | | |
| Stamford ware Fabric A | | | 1 | 11 | | | 1 | 12 | 1 | 10 | | |
| Thetford/Grimston-type ware | | | 4 | 51 | | | 2 | 37 | 2 | 52 | | |
| Thetford-type ware | 45 | 398 | 1152 | 11221 | 574 | 4273 | 233 | 2709 | 322 | 2821 | 11 | 100 |
| Late Saxon/Early Medieval Ware | | | | | | | | | | | | |
| Stamford ware | | | | | | | | | | | | |
| <i>Early medieval wares</i> | | | | | | | | | | | | |
| Beauvais ware | | | 1 | 1 | | | | | | | | |
| Early medieval sandwich ware | | | 21 | 268 | | | 7 | 33 | 5 | 20 | | |
| Early medieval shelly ware | | | 3 | 21 | 2 | 13 | 4 | 40 | 1 | 4 | | |
| Early medieval sparse shelly ware | | | 12 | 54 | 20 | 172 | 6 | 26 | 6 | 23 | | |
| Early Medieval Ware/Thetford-type ware | 1 | 1 | 1 | 2 | 1 | 4 | 2 | 7 | 1 | 1 | | |
| Early Medieval Ware | | | 37 | 283 | 120 | 690 | 17 | 105 | 43 | 167 | | |
| Early Medieval Ware/Local medieval unglazed ware | | | 2 | 8 | 2 | 5 | 2 | 16 | 2 | 8 | | |
| Yarmouth-type ware | | | 40 | 478 | 106 | 882 | 15 | 102 | 14 | 115 | | |
| <i>Medieval wares</i> | | | | | | | | | | | | |
| Andenne-type ware | | | 2 | 64 | 4 | 21 | 1 | 8 | | | | |
| Ely-type ware | | | 1 | 8 | | | | | | | | |
| Glazed Grimston-type ware | | | 3 | 11 | 12 | 54 | 2 | 4 | 1 | 4 | | |
| Local medieval unglazed ware | | | | | 8 | 335 | | | 7 | 41 | | |
| Pingsdorf ware | | | | | 2 | 66 | | | 2 | 30 | | |
| Stamford ware Fabric B | | | | | | | | | | | | |
| Stamford ware unglazed | | | 1 | 10 | | | | | | | | |
| Unglazed Grimston-type ware | | | | | 1 | 7 | | | 1 | 8 | | |
| <i>Late medieval wares</i> | | | | | | | | | | | | |
| Dutch redware | | | | | | | 1 | 22 | 24 | 958 | 1 | 10 |
| Koln stoneware | | | | | | | 1 | 10 | | | | |
| Koln/Frechen stoneware | | | | | | | 1 | 36 | 1 | 4 | | |
| Langerwehe stoneware | | | | | | | 2 | 19 | | | | |
| Late medieval transitional ware | | | | | 1 | 4 | 11 | 425 | 62 | 1275 | 1 | 94 |
| Martincamp stoneware | | | | | | | 1 | 28 | 2 | 22 | | |
| Raeren stoneware | | | | | | | | | 6 | 81 | | |
| Raeren/Aachen stoneware | | | | | | | 13 | 557 | | | | |
| Raeren/Koln stoneware | | | | | | | | | 4 | 100 | | |

Table 6 (continued)

| Fabrics | Period 1 | | Period 2 | | Period 3 | | Period 4 | | Period 5 | | Period 6 | |
|--|----------|------|----------|------|----------|------|----------|------|----------|-------|----------|------|
| | No. | Wt/g | No. | Wt/g | No. | Wt/g | No. | Wt/g | No. | Wt/g | No. | Wt/g |
| <i>Post-medieval wares</i> | | | | | | | | | | | | |
| Border Ware | | | | | | | | | 3 | 34 | | |
| Brown Glazed Border ware | | | | | | | | | 2 | 44 | | |
| Chinese porcelain | | | | | | | | | 1 | 2 | | |
| Dutch redware/Glazed red earthenware | | | | | | | | | | | 1 | 128 |
| Dutch slipware | | | | | | | | | | | 1 | 18 |
| English porcelain | | | | | | | | | 2 | 7 | | |
| Frechen stoneware | | | | | | | | | 29 | 2049 | | |
| Glazed red earthenware | | | 1 | 48 | | | | | 390 | 18343 | 17 | 704 |
| Green-glazed Border ware | | | | | | | | | 7 | 75 | | |
| Iron-glazed blackware | | | | | | | | | 14 | 531 | | |
| Iron-glazed blackware / Glazed red earthenware | | | | | | | | | 1 | 10 | | |
| Iron-glazed ware | | | | | | | | | 2 | 236 | | |
| Local early post-medieval ware | | | | | | | | | 4 | 76 | 1 | 24 |
| Local slipware | | | | | | | | | 1 | 4 | | |
| Metropolitan slipware | | | | | | | | | | | | |
| Nottinghamshire stoneware | | | | | | | 4 | 156 | | | | |
| Pearlware | | | | | | | | | 4 | 110 | | |
| Post-medieval redware | | | | | | | | | 3 | 193 | | |
| Post-medieval slipware | | | | | | | | | 1 | 172 | 1 | 84 |
| Red Border ware | | | | | | | | | 10 | 470 | 6 | 414 |
| Spanish olive jars | | | | | | | | | 1 | 136 | | |
| Speckle-glazed ware | | | | | | | | | 12 | 142 | 1 | 12 |
| Staffordshire white salt-glaze stoneware | | | | | | | | | 11 | 143 | | |
| Staffordshire-type slipware | | | | | | | | | 39 | 1192 | 1 | 8 |
| Tin-glazed earthenware | | | | | | | | | 56 | 1681 | 10 | 187 |
| Tin-glazed earthenware B | | | | | | | | | 1 | 12 | | |
| Tin-glazed earthenware C | | | | | | | | | 99 | 2757 | 17 | 536 |
| Unprovenanced glazed ware | | | | | | | | | 1 | 22 | | |
| West Norfolk bichrome ware | | | | | | | | | 5 | 136 | 1 | 74 |
| Westerwald stoneware | | | | | | | | | 44 | 1537 | | |
| Yellow-glazed Border ware | | | | | | | | | 29 | 1143 | 2 | 60 |
| <i>Modern and unidentified wares</i> | | | | | | | | | | | | |
| Creamware | | | | | | | | | 7 | 327 | 1 | 168 |
| Late glazed red earthenware | | | | | | | | | 1 | 40 | 1 | 20 |
| Late post-medieval earthenware | | | | | | | | | 4 | 108 | | |
| Late slipped redware | | | | | | | | | | | | |
| Refined white earthenware | | | | | | | | | 1 | 46 | 4 | 96 |
| Transfer printed ware | | | | | | | | | 25 | 706 | 5 | 114 |
| Unidentified | 3 | 13 | 15 | 107 | 7 | 38 | 6 | 23 | 9 | 1659 | | |

Table 6 Pottery by fabric

| Period | Total | | Thetford-type ware | | |
|--------------|-------------|--------------|--------------------|--------------|------|
| | No. | Wt/g | No. | Wt/g | % Wt |
| Period 1 | 11 | 84 | 9 | 71 | 84.5 |
| Period 2 | 1289 | 12565 | 1152 | 11221 | 89.3 |
| Period 3 | 900 | 6955 | 571 | 4255 | 61.2 |
| Period 4 | 337 | 4588 | 233 | 2709 | 59.1 |
| Period 5 | 1346 | 40396 | 322 | 2821 | 7.0 |
| Period 6 | 87 | 3649 | 11 | 100 | 2.7 |
| Unstratified | 288 | 6632 | 152 | 1691 | 25.5 |
| Total | 4258 | 74869 | 2450 | 22868 | |

Table 7 Quantity of Thetford-type ware by period

Only forty fragments of Yarmouth-type ware weighing 478g were recovered from Period 2 deposits (3.8% of the Period 2 pottery by weight), and a further forty-one weighing 381g from Period 3, showing that many fragments are residual or unstratified. Yarmouth-type wares are also a consistent feature in the 12th-century deposits (Period 4.1) from the nearby excavations at the Lower Close, Site 300N (Jennings 2002, 57).

Small quantities of local medieval unglazed ware were also identified (twenty-seven fragments weighing 141g) including five cooking vessels/jars with rims of 11th- to 13th-century date but none of the highly developed 13th- to 14th-century type. One fragment has a thumbled pie-frilled rim. None of the other forms associated with the Local Medieval Unglazed repertoire such as jugs, bowls or curfews are present.

Two fragments of Grimston coarseware were recorded (15g). This fabric is commonly found in small quantities in Norwich, where local medieval unglazed wares are the predominant local coarseware. Only a single fragment of glazed Grimston Ware was present with a second glazed jug sherd which has a combed decoration. Very few sherds of medieval Stamford fabrics were identified. These include a small strap handle from a jug and the rim of a collared vessel, likely to be a spouted pitcher.

The quantity of imported vessels during this period is also small, and the range of fabrics found on other sites in Norwich is only partially represented. Small quantities of Andenne-type whitewares from the Meuse valley are present, including the rim of a collared pitcher, a single sherd of Beauvais-type ware from Northern France as well as ten fragments of Pingsdorf stoneware, including thumbled bases from three different pitchers.

Post-medieval ceramics

The post-medieval element of the ceramic assemblage forms the largest part of the total by weight (62.5%), but not by sherd count (27.4%). Although some early post-medieval wares are present, this part of the assemblage is dominated by pottery which is considerably later.

The earliest of the post-medieval wares comprise locally made and Dutch-type redwares, together with Rhenish stonewares dating to the late 15th and early 16th centuries. These wares give some indication of the pottery which was in use in the period preceding the suppression of the priory. Small quantities of Langerwehe stoneware are present, with larger amounts of Raeren/Aachen stoneware including a fragment from a Raeren/Aachen piper jug. Such jugs are decorated with applied and incised elements which make up rudimentary faces,

together with arms and hands which hold a bagpipe. The only diagnostic fragment from the vessel at the cathedral shows part of a bent arm which has an incised decoration (Fig. 38.5). Although the dating of such jugs is uncertain, they can be found in deposits dating to the late 15th century and early 16th century (Hurst *et al.* 1986, 192). A piper jug dating to pre-1538 was present at St Augustine's Abbey Canterbury (Hurst *et al.* 1986, 192). A second Raeren/Aachen jug with collared rim of a similar date was found (Fig. 38.6).

The locally made and Dutch redwares include late medieval and transitional ware cooking vessels such as a skillet and a dripping dish, and a Dutch or Dutch-type pipkin. Other late medieval and transitional wares comprise fragments of storage jars, with one example of a local early post-medieval dish.

In addition to the ceramics described above which were found in deposits associated with Period 4, a number of other pottery types of a similar date were present in the Period 5 assemblage. These include redwares which can only be dated broadly to the 16th century, as well as some imported vessels which have a tighter date range. Examples of these include the fragment of Martincamp stoneware from Northern France which was found in a layer sealing the early post-medieval pits (*G61*), the Raeren drinking vessel in *G60*, and the small Raeren or Cologne jug in *G72*, which are all likely to pre-date the suppression of the priory.

A large proportion of the post-medieval pottery is made up of ceramics dating to the 17th and early 18th centuries. Glazed red earthenwares predominate, with vessels of a utilitarian nature such as dishes, jars, bowls, and chamber pots appearing most frequently. Several examples of more specialised ceramic forms are present which supplement the archaeological evidence for part of the site being used as a garden including the bases of four redware garden pots, described below (Figs 38.7, 38.8, 38.9 and 38.10). Speckle-glazed ware, a local redware which was made in a limited range of forms such as mugs and cups, is also present in the assemblage, and dates to the end of the 17th and into the 18th century in Norwich (Jennings 1981, 155).

In addition to the predominating locally produced redwares, a feature which is usual for assemblages from Norwich for the most of the post-medieval period, a number of regional and imported wares provide closer dating evidence for the deposition of the fills. The main types of fabric which are particularly well represented in the refectory assemblage are described below.

Glazed red earthenware horticultural vessels

The remains of three different glazed redware horticultural vessels were identified in 1174 (*G65*, Period 5). Two have multiple perforations on the base which were made before firing (Fig. 38.7 and 38.8). Both pots have a full iron-flecked brown glaze on the exterior, and one has more pronounced cordons. A third vessel with a simple base and globular body, has a single wide perforation apparently cut into the pot after the firing (Fig. 38.9). The vessel is made of a more micaceous fabric, and has a splashed glaze on the interior, with a few small splashes of lead glaze on the exterior. It is possible that these are the remains of garden water sprinkler pots. Such vessels have a small neck and rim aperture, which can be covered over with the thumb when filled with water. These horticultural vessels

have been identified in Glazed red earthenware fabrics from Norwich elsewhere (Jennings 1981, fig. 80, nos 1343, 1344 and 1351). However the size of the bases does appear to be slightly incongruous with what must have been a small aperture at the top of the narrow-necked jugs or bottles, and it is perhaps more likely that they are the bases of flowerpots. The form of the third pot is slightly unusual too, as it has a narrow base by comparison with the globular body, a variant which is not normally represented by glazed red earthenwares. Other sherds in the same context suggest that the deposit may be as late as the 18th century. Several Nottingham or Nottingham-type stoneware vessel bases are present, including a lathe-turned decorated bowl with footring. A single fragment of white salt-glazed stoneware suggests a date after 1720 for the deposition of this assemblage.

A further vessel with a horticultural function was present (*G75*, Period 5). A large fragment from the base of a red earthenware pot has a single perforation on the outer edge of the base towards the wall of the vessel, and indications of a second perforation on a similar alignment (Fig. 38.10). The vessel is partially glazed inside with further splashes on the base and exterior. In view of the large size of the perforations in the base, it is probable that this is a plant pot with drainage holes. The associated ceramics consist of 16th-century wares such as late medieval and transitional ware and Raeren and Cologne stonewares, but also a small quantity of Glazed red earthenware and a fragment of a yellow glazed Border Ware porringer which suggest a date of the second half of the 16th century or later.

Stonewares

Several post-medieval features contain a number of different Westerwald straight-sided tankards or *humpen* (Fig. 39.11–39.16). Although such drinking vessels have been found in some quantity in Norwich, the group from the refectory substantially adds to the catalogue initially drawn up by Jennings (1981, 123–125).

Perhaps the most colourful of these Rhenish tankards is decorated with incised curvilinear decoration with both cobalt blue and manganese purple glaze. The overall standard of workmanship is poor, as the handle is crudely applied and the incised decoration roughly executed (Fig. 39.11). The vessel is substantially smaller than the others which are approximately of a similar height and capacity. One mug is embellished with cobalt blue bands (Fig. 39.12). Two further mugs are decorated in monochrome with incised scrolling motifs and applied pads of intricately moulded flowers (Figs 39.13 and 39.14). The most complete vessel has a simple scrolling decoration in monochrome and a handle pierced for the attachment of a lid (Fig. 39.15). A similar mug with scrolling decoration and ‘thistleheads’ on a cobalt blue background was recovered from Temple Balsall in Warwickshire dating to *c.*1700 (Goeder 1984, 189, fig 19). Another tankard of a slightly different style is plain except for a single thick cordon with shallow cordons regularly spaced down the sides of the vessel. A similar type of tankard has been illustrated in Jennings (1981, 124, fig 51, no. 842).

The use of manganese purple as well as cobalt blue on Westerwald stonewares occurred after 1665 and continued to be popular throughout the first half of the 18th century. In Norwich such stonewares are commonly found towards the end of the 17th and into the early 18th

centuries, being present, for example in Phase IV of the well group at St Stephens (Jennings and Atkin 1984, 20).

The remains of another Westerwald type in the form of a globular mug with manganese glaze was found. It has heavy concentric rilling on the neck, whilst the body of the vessel is decorated with incised foliate designs, infilled mainly with cobalt blue but with some manganese (Fig. 39.17). This comparatively simple decoration (by comparison with the more ornate earlier wares) appears to have been common ‘from at least the second quarter of the 18th century’ (Gaimster 1997, 252). The shape of the mug however, closely resembles one ornamented with an applied medallion which has been dated to *c.*1690 (Gaimster 1997, cat. no. 121, right, 264–5).

In addition to German stoneware drinking vessels, a small quantity of stoneware mugs of English origin were found in three deposits. These globular mugs or ‘gorges’ were produced as copies of the equivalent German stoneware form. One vessel, present in *G79*, a dumped deposit on which the Prebendary’s house was built, has a cylindrical rilled neck and is covered with a dark brown glossy glaze on the outside (Fig 39.18). It is similar to fragments from two other tavern mugs identified in *G67*. One of these survives as part of a flat bead-foot, which has a reddish-brown fine salt-glaze (Fig 39.19). A further fragment of the rilled cylindrical neck of a similar if not the same vessel was found in another context (Fig. 39.20). These ceramics can be compared with English stoneware vessels dated *c.*1685–90 found in excavations at Fulham (Green 1999) and are similar in form to a globular mug made in Southwark or Fulham *c.*1680–90 (Gaimster 1997, 320, no.175).

Slipwares

A second English ceramic industry of late 17th- to 18th-century date which is particularly well represented in the assemblage is Staffordshire-type slipware. A wide range of utilitarian and ornamental forms was produced in Staffordshire and the Midlands, although such slipwares were also made elsewhere, for example, in Bristol. In Norwich such pottery is commonly found in deposits dating to the 18th century, although they may be found as early as the late 17th century (Jennings and Atkin 1984, 20).

The substantial remains of two unusual slipware vessels were found including a large handled cup or mug. This vessel, which was substantially found in pit fill 3260, has a handle low down on the side of the cup. In view of its size, it is likely that originally it was two-handled, and was similar in form to the large vessels known as loving cups. It is decorated with brown and yellow slip on the inside surface only, the exterior being a plain yellow (Fig. 40.21). An almost complete combed slipware jug was also found in this fill (Fig. 40.22). It is globular in shape with a strap handle. The combing decoration is only on the body of the vessel rather than the neck or rim, and the interior is covered with yellow slip and glaze. Staffordshire slipware is commonly found in Norwich, especially in the form of dishes and cups, but it is unusual to find either of these vessels in an archaeological context.

A third vessel in the form of a Staffordshire slipware handled cup has the remains of an initial (Fig. 40.23). The decoration was achieved by applying small blobs of contrasting clay over a contrasting background, a practice known as jewellery. The vessel is not dissimilar to a posset

pot recovered from the Castle Mall excavations (Lentowicz forthcoming a). Three different Staffordshire-type slipware vessels, comprising two combed slipware cups of classic type, and a shallow moulded dish with slight pie-frilling around the rim were also found (Fig. 40.24 and 40.25).

Tin-glazed wares

Tin-glazed earthenwares also form a significant part of the post-medieval assemblage, and are present in many of the late 17th- to early 18th-century deposits. Most of the vessels are likely to have been made at English production centres in London such as Southwark and Lambeth, but some of the drug jars and one of the polychrome dishes may have been made in the Netherlands.

Two polychrome waisted drug jars or *albarelli* may have been made in the Netherlands, rather than being London copies. One of these has a more waisted profile than many of the English jars and an abstract decoration in blue, purple and orange which is comparatively carefully accomplished (Fig. 40.26). The second jar which has a wider diameter, is decorated in blue and orange bands. Small quantities of blue and white tin-glazed earthenware are also present in the same context. A moulded bowl is decorated on the inside with a bird singing on a flowering plant, a design which is accomplished with thin brushstrokes which are infilled. The bird is framed within a lightly sketched octagon (Fig. 41.27). The exterior of the vessel is further decorated, probably with more flowers and birds, although only slight evidence of this remains. The provenance of this dish is not certain, but stylistically it dates to the late 17th to 18th century.

A tin-glazed blue and white dish with a central decoration of a bird surrounded by an all-over pattern of leaf forms, stars and dots of 18th-century date was present in *G86*, one of the levelling deposits to the west of the garden boundary wall (Fig. 41.28). The exterior of the vessel is undecorated. A single fragment of plain creamware from the same fill suggests a mid to late 18th-century date.

The most unusual and possibly the most significant fragment of tin-glazed earthenware was found in modern deposits (Fig. 41.29, Plate 12). A single fragment from the base of a dish is decorated with a religious theme. Three figures are depicted in dark blue on the base; they are all carrying crosses and are slightly bent over. The scene is executed in a minimalist style which is very effective. The figures themselves are made up of little more than single blocks of colour which have a deeper intensity of colour at the bottom towards the feet. The heads are suggested by plain rounded blocks of dark blue, the crosses are shown with two simple lines each and are all held at an angle. The foreground is an irregular expanse of blue. The scene is framed by a blue circle of varying width. The underside of the vessel is also covered with a thick tin-glaze, which has a slightly blueish tinge. A small blue line also encircles the junction of the footring with the main body of the vessel on the underside. The earthenware itself is a uniform creamy buff colour.

Although certain religious symbols and biblical scenes were used to decorate tin-glazed earthenware, this particular treatment of one of the scenes of the Passion, showing the walk to Calvary with the two other condemned men, does not seem to have been commonly represented. Scenes of Christ carrying the cross and the

crucifixion itself are known on 18th-century tin-glazed wall tiles, but these are very different in style (Horne 1989, 105–6; Britton 1986, 183). The crucifixion is also depicted on tin-glazed earthenware plates (Lipski 1984).

The style of the iconography of this particular fragment and its provenance remains still a matter for further research. Preliminary investigations with ceramic specialists working in Italy and the Netherlands have so far drawn a blank for any comparative material, although it has been suggested that the type of painting style may be reminiscent of some Ligurian pottery.

Discussion of the ceramics from Period 5 G67

Seven hundred and nine fragments weighing 30,888g of pottery of post-medieval date (Table 8) were recovered from four different fills within the walled pit by the west side entrance. Unlike many of the other features of this period, very little residual material is present in this feature. The pottery appears to be roughly homogeneous in terms of deposition date, with a little early post-medieval ware mixed in.

Fill 2001, the upper fill contained the largest quantity of pottery (299 sherds weighing 12,692g). With the exception of three residual sherds the pottery can be dated from the second half of the 17th century into the 18th century. Over half the assemblage by weight is made up of glazed red earthenwares, comprising a range of dishes, jars, bowls, with one pancheon and one chamberpot. Further chamber pots are made of speckle glazed ware, which appear towards the end of the 17th and early 18th centuries (Jennings 1981, 155–156).

The regional and imported wares provide closer dating evidence for the deposition of the fill. Two types of German stoneware are present. Nine fragments of Frechen include a substantial part of a 17th-century *bartmann* with hour-glass type mouth and stylised central medallion. Several small Westerwald *humpen*, or cordoned straight-sided mugs are also present in the assemblage (described above).

The quantities of yellow glazed Border Ware are small, perhaps indicating that the pottery may have been deposited around the turn of the century towards the end of this long-lived whiteware industry on the Surrey-Hampshire border. Three sherds of a Metropolitan slipware dish have a date range from c.1630 up to the end of the 17th century. Three different Staffordshire slipware vessels comprise two combed slipware mugs of classic

| <i>Fabric</i> | <i>No.</i> | <i>Wt/g</i> |
|-------------------------------|------------|-------------|
| Yellow-glazed Border ware | 5 | 80 |
| Dutch redware | 1 | 20 |
| English stoneware | 2 | 26 |
| Frechen stoneware | 14 | 1413 |
| Glazed red earthenware | 142 | 859 |
| Iron-glazed blackware | 4 | 380 |
| Metropolitan slipware | 3 | 136 |
| Speckle-glazed ware | 8 | 97 |
| Staffordshire-type slipware | 7 | 172 |
| Tin-glazed earthenware | 22 | 865 |
| Tin-glazed earthenware Type C | 28 | 831 |
| Westerwald stoneware | 31 | 844 |

Table 8 Summary of major pottery fabrics from Period 5 Group 67

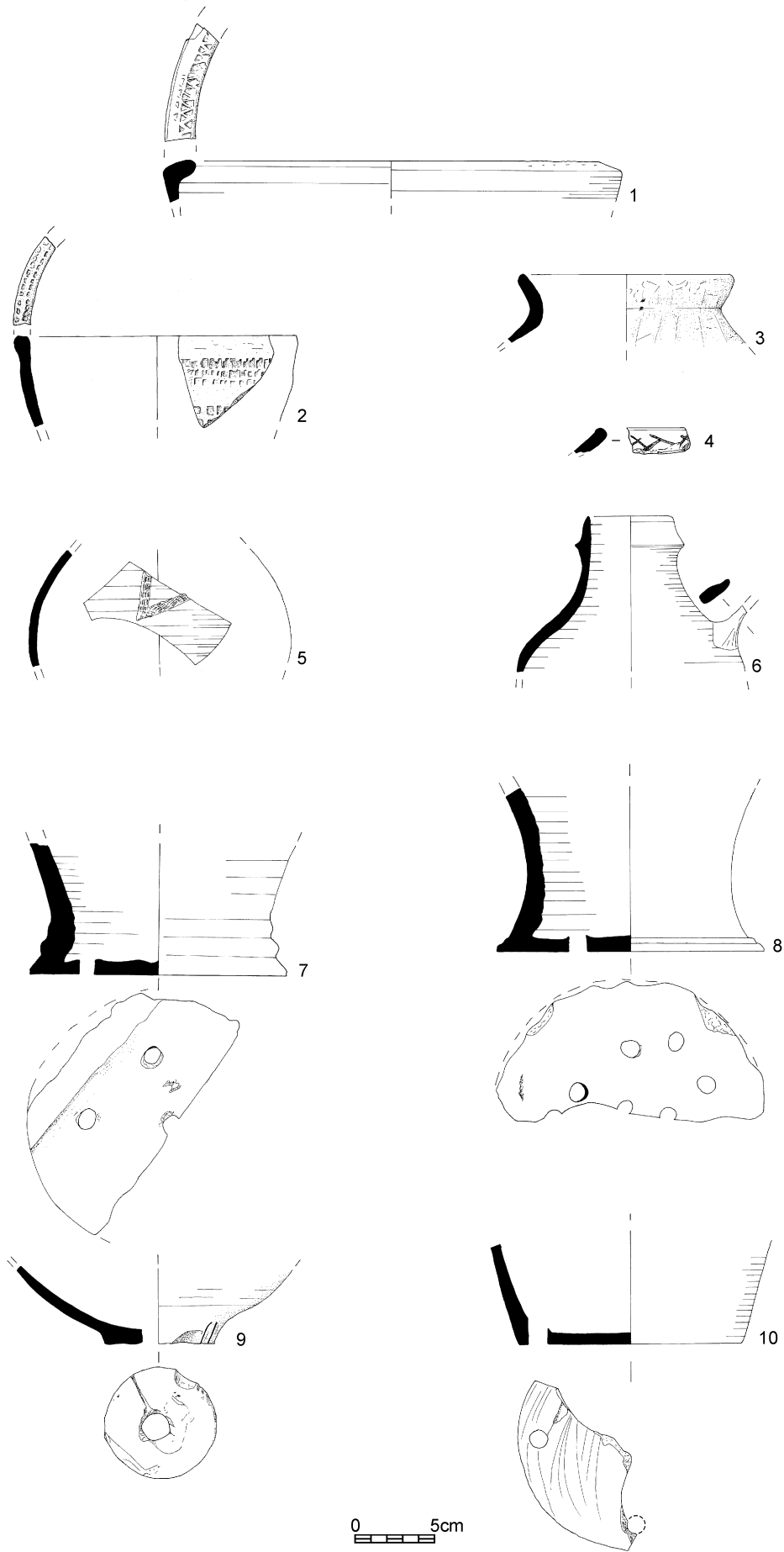


Figure 38 Finds: pottery. Scale 1:4

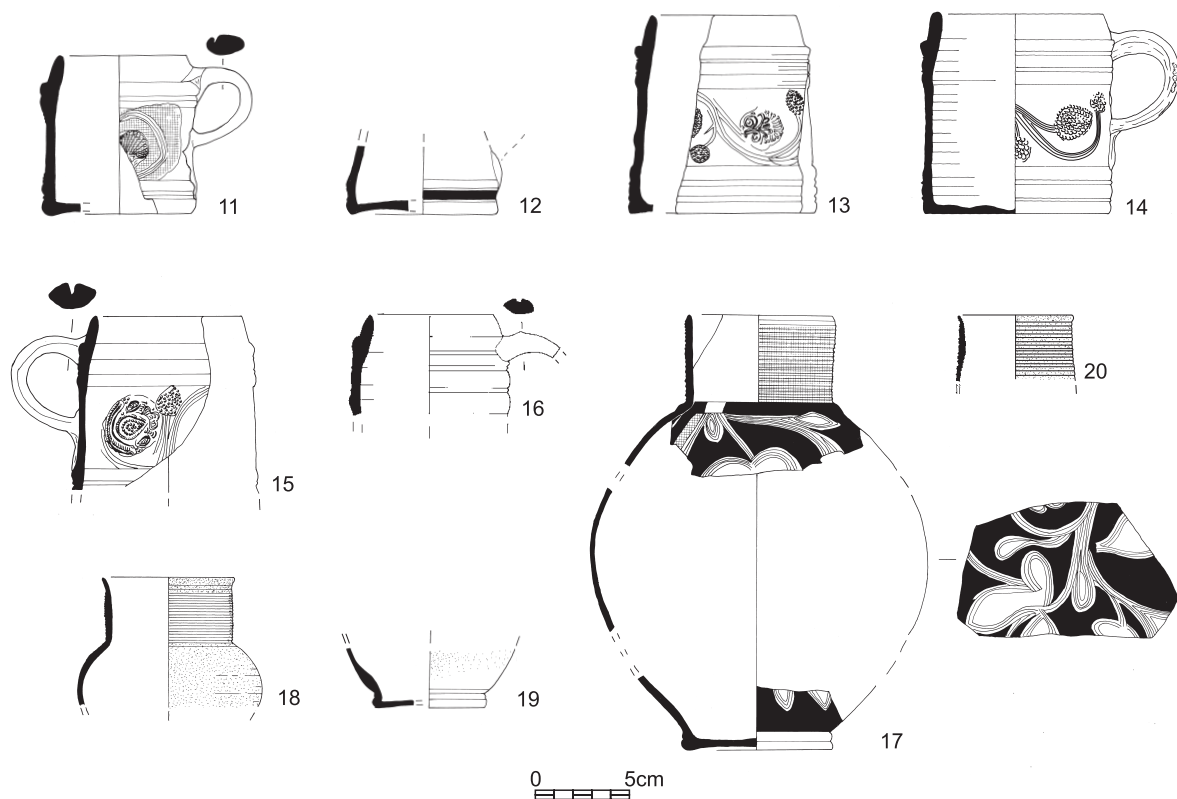


Figure 39 Finds: pottery. Scale 1:4

type, and a shallow moulded dish with slight pie-frilling around the rim (Fig. 40.25). Such slipwares are found in 18th-century deposits in Norwich, although they may also be of late 17th-century date (Jennings 1981, 104).

Comparatively small quantities of tin-glazed earthenware are present, and much of these are undecorated plain white fragments. The largest surviving fragment comes from part of the base of a very large albarelo-shaped waisted drug jar, decorated in manganese purple bands as well as a blue abstract design. The vessel is similar to one recorded from the assemblage at Aldgate in London, which forms part of a group which is dated to the second half of the 17th and early 18th century (Orton and Pearce 1984, 54, fig. 24, no. 105). The quality of the decoration is not good, and it seems likely that the vessel was produced in London rather than being made in the Low Countries. The only other polychrome tin-glazed sherd is part of a dish decorated with a scheme of 'chinaman among grasses' type in purple and green (Orton and Pearce 1984, 56). The fragment has a thick smooth white glaze and is similar both in glaze type and decoration to a plate identified as Lambeth Polychrome in the Aldgate assemblage, dated to the first decade of the 18th century (Orton and Pearce 1984, 56). More generally this type of decoration is dated to the late 17th century in London assemblages (Orton and Pearce 1984, 56). The lack of Staffordshire white salt-glazed stonewares which were produced *c.* 1720 may suggest that the pottery from the fill 2001 can be dated to *c.* 1680–1710.

Such a large ceramic assemblage from this deposit can be compared to other recently excavated groups from within the city of Norwich. The infilling of the cellar at St

Peter's Street, for example, is comparatively close in terms of its date (Goffin 2005). Here the pottery includes many of the same fabrics. In addition however, there are small quantities of Staffordshire manganese glazed wares and Chinese porcelain, indicating a deposition date of the late 17th to early 18th century. The ceramics are accompanied by three halfpenny coins of William III (1689–1702).

Fill 3212, a lower deposit, contained a further seventy-three fragments weighing 3857g. The fabric types present in this fill are similar, although there are less of them. Thirty-nine fragments of Glazed Red earthenwares include two storage jars and two pipkins, as well as two bowls and a dish. The base of an Iron Glazed Blackware *tyg* is also present, albeit abraded and possibly residual. Five fragments of Frechen stoneware include the bottom part of a *bartmann* with stylised armorial medallion. Five Westerwald vessels consist of a chamberpot, the rim of an ovoid mug of late 17th-century date, and three different monochrome tankards or *humpen*. One of these has a perforated handle for a lid attachment. In addition to the German stonewares, the base of an English stoneware tavern mug or 'gorge' was identified.

Small quantities of tin-glazed wares are also present. Two polychrome waisted drug jars may have been made in the Netherlands, rather than being English. The best preserved jar has a more waisted profile than many of the English jars and has a comparatively elaborate abstract decoration in blue, purple and orange (Fig. 40.26). The second one has a wider diameter and is decorated in blue and orange bands. Some blue and white tin-glazed earthenwares are present. These include a dish with



Figure 40 Finds: pottery. Scale 1:4

'chinaman in grasses' design is similar to the fragment recovered from context 2001, and two vessels decorated with a duck-egg blue tin-glaze, one of which is also decorated with 'chinaman in grasses'. The second is the base of a small moulded bowl. The inside is decorated with a bird singing on a flowering plant, accomplished with thin brushstrokes with infilling. The bird is framed with in a lightly sketched octagon. The provenance of this dish is not certain, but stylistically it is likely to date from the late 17th to 18th centuries.

Twenty-two further fragments of pottery (1204g) of a similar date were found in the lower fills (3214 and 3215). Twelve sherds of Glazed red earthenware include a jar, a

chamber pot, a bowl and the base of a chafing dish (two sherds) a perforated dish attached to a base with a handle scar. A fragment of the same tin-glazed albarello-type jar in 3212 was also identified, together with a fragment of a plain tin-glazed porringer with a moulded handle which is not the usual heart-shape. Perhaps the most substantial vessel is a Westerwald globular mug which has heavy concentric rilling and is glazed with manganese purple. This type of decoration is also likely to date from the late 17th to first half of the 18th century. A small fragment of the rilled rim of a second English stoneware mug is present in this context and is also likely to be of a similar date.

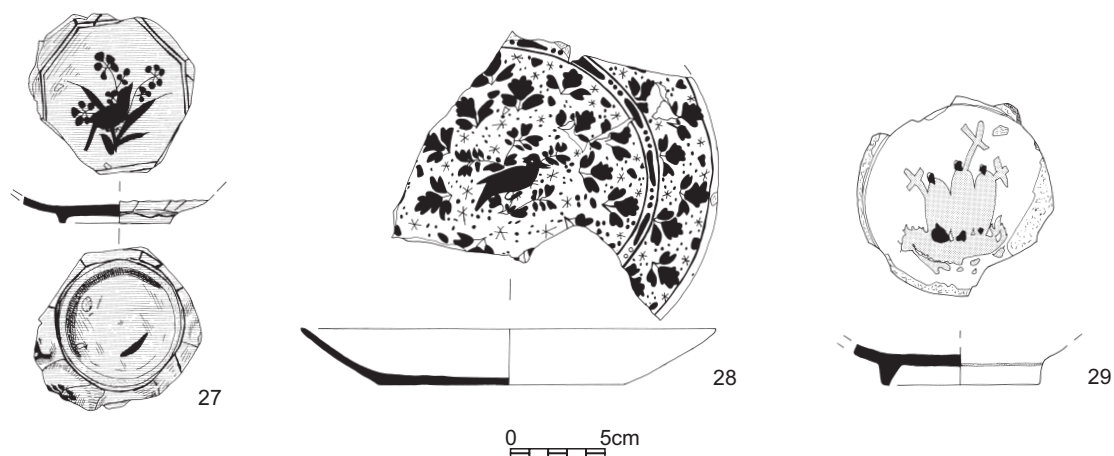


Figure 41 Finds: pottery. Scale 1:4

Conclusions

The ceramic assemblage from the refectory excavations provided ample evidence for the Late Saxon and late 11th-century activity which pre-dated the construction of the cathedral, both recovered from stratified features and also as residual pottery deposited into later features. By contrast the quantity of pottery which can be dated to the period covering the lifetime of the refectory building itself is small, and restricted to certain 15th- and early 16th-century groups. Some significant post-medieval groups provide valuable evidence for the history of the site during the period following the Reformation.

Catalogue (Figs 38–41)

1. Thetford-type ware stamped bowl. Context 2099, Period 3, *G45*.
2. Thetford-type ware stamped bowl. Context 2481, Period 3, *G20*.
3. Early Medieval Ware jar. Context 2149, Period 2, *G11*.
4. Early Medieval Ware decorated ginger jar. Context 3089, Period 4, *G92*.
5. Raeren/Aachen piper jug fragment. Context 2754, Period 4, *G56*.
6. Raeren/Aachen jug. Context 2502, Period 4, *G56*.
7. Redware horticultural vessel (3 holes visible). Context 1174, Period 5, *G65*.
8. Redware horticultural vessel (4 holes visible). Context 1174, Period 5, *G65*.
9. Redware horticultural vessel. Context 1174, Period 5, *G65*.
10. Redware garden pot (1 hole off-centre), Context 1481, Period 5, *G75*.
11. Westerwald stoneware tankard. Context 2001, Period 5, *G67*.
12. Westerwald stoneware tankard base. Context 2001, Period 5, *G67*.
13. Westerwald stoneware tankard. Context 3074, Period 5, *G104*.
14. Westerwald stoneware tankard. Context 3260, Period 5, *G104*.
15. Westerwald stoneware tankard. Context 3260, Period 5, *G104*.
16. Westerwald stoneware tankard, Context 2001, Period 5, *G67*.
17. Westerwald stoneware mug. Context 3214, Period 5, *G67*.
18. English stoneware mug. Context 2163, Period 5, *G79*.
19. English stoneware mug base. Context 3212, Period 5, *G67*.
20. English stoneware mug. Context 3214, Period 5, *G67*.
21. Staffordshire-type slipware cup. Context 3260, Period 5, *G104*.
22. Staffordshire-type slipware jug. Context 3260, Period 5, *G104*.
23. Staffordshire-type slipware cup with initial. Context 2003, Period 5, *G68*.
24. Staffordshire-type slipware cup. Context 2001, Period 5, *G67*.
25. Staffordshire-type combed slipware dish. Context 2001, Period 5, *G67*.
26. Tin-glazed earthenware *albarello*. Context 3212, Period 5, *G67*.
27. Tin-glazed earthenware dish of bird amongst foliage. Context 3212, Period 5, *G67*.
28. Tin-glazed earthenware dish of leaves and bird. Context 1226, Period 5, *G86*.
29. Tin-glazed earthenware dish base decorated with religious scene. Context 3076, unstratified.

Ceramic tobacco pipe

by John Ames

The clay tobacco pipe assemblage consists of bowls, stems and mouthpieces, recovered from fifty-eight contexts. These deposits produced 225 fragments with a total weight of 3.124kg. The dating of the assemblage has been principally based on the London-type series of bowl forms (Oswald 1975) and the previously published and analysed material from Norwich (Atkin S. 1985; Atkin and Peacey forthcoming).

The typological date range for the assemblage falls between the early 17th and 20th centuries, the majority falling between the early 17th and late 18th centuries. The origin of manufacture for the assemblage is likely to have been London as no bowls with makers initials relating to Norwich or any other local manufactures were recovered. However the possibility of clay pipes within the assemblage being manufactured in Norwich cannot be ruled out as it is known that clay tobacco pipe was locally produced towards the end of the 17th century (Atkin S. 1985). Further evidence for this has been recovered from two other sites (26576N and 26581N) within The Close (Ames 2001) where Masonic bowls, makers marks, kiln debris and pipe mould fragments were found.

As may be expected the vast majority of the assemblage was found in Period 5 contexts (sixty-six bowls, two mouthpieces and 226 stems). Of this the largest single assemblage came from *G67* and consisted of 109 stems, two mouthpieces and forty-three bowls. Of these, four were bulbous bowls (1610–1650), twenty-three were thick-walled upright bowls (1660–1680) while the remainder were upright bowls with either heart-shaped heels (early to mid 17th century) or rounded heels (late 17th to early 18th century).

Overall the majority of the assemblage from the refectory is of an earlier date than those recovered from the other sites in the close and the presence of small bulbous/waisted bowls with stamped Tudor Roses or variants on their bases indicates London was the probable origin of manufacture for many of them.

Catalogue (not illustrated)

1. Four bowls with markers initials and indented decorated heels. The initials on the bowl are [IS] and the decoration is of a Tudor rose and crown in relief. Maker unidentified. Context 1096, dump, Period 5, *G81*, Date range: early to mid 17th century. One small bulbous with a rounded marked bowl. The relief stamped in the base is possibly a Tudor rose or a variant. The origin of manufacture is likely to be London but the maker is unidentified. Context 1189, Layer, Period 5, *G84*, Date range: c.1610–40.
2. Two small bulbous marked bowls. The relief stamped in the base is possibly a Tudor rose or a variant. The origin of manufacture is likely to be London but the maker is unidentified. Context 1226, make up, Period 5, *G86*, Date range: c.1610–40.
3. One upright bowls with the maker's initials [IN] incorporated into a heart shaped base. Maker is unidentified. Context 1226, make up, Period 5, *G86*, Date range: c.17th century.
4. One small bulbous/waisted bowl with a rounded base and a Tudor Rose or variant stamped into the base. The maker's name had been impressed into the stem (Robert B—tbon) with a small fleur-de-lys after the surname. Maker unidentified. Context 1287, garden feature fill, Period 5, *G74*, Date range: early 17th century.

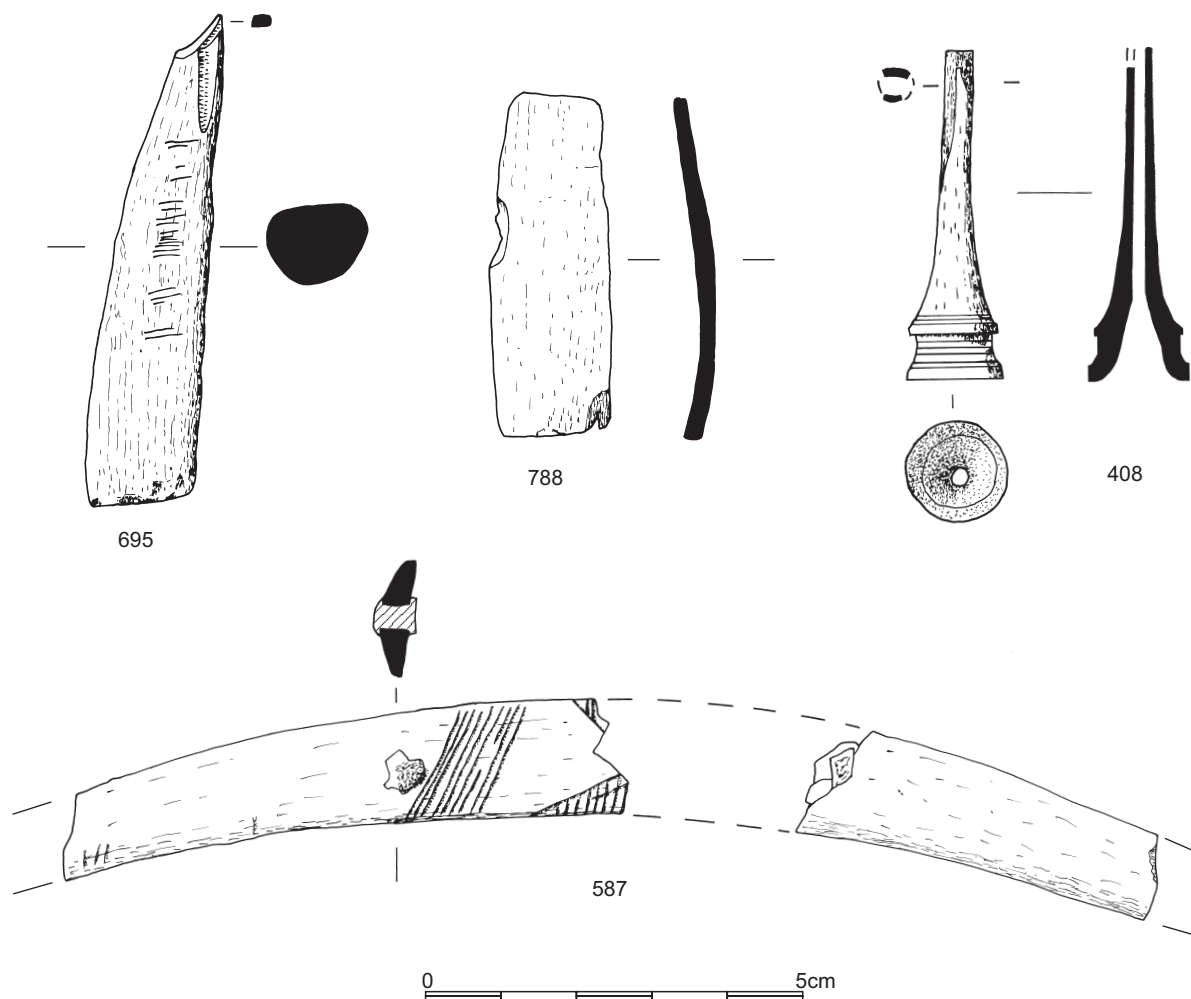


Figure 42 Finds: bone, ivory and antler objects. Scale 1:1

Antler, bone and ivory

by Julia Huddle

Antler working

Eleven pieces altogether of sawn or worked antler were found, including both primary waste (ten pieces) and secondary waste (one piece). The secondary waste was a strip (SF788) that may have been intended to form a tooth plate for a comb. Elsewhere antler working recovered from excavations is associated with the manufacture of composite combs (see SF587 below for an example) which accounted for the bulk of the output of the pre-Conquest antler industry (MacGregor 1991).

A sawn-off tine, trimmed at the tip to form a pointed end, with knife cuts present on sides and top (SF695) is indicative of use perhaps as a wedge. Antler wedges used in the splitting up the thick beams of antler are known from Late Saxon contexts from Norwich and elsewhere in England as well as on the continent.

Bone working

A perforated bone strip (SF653, not illustrated) is similar to the bone strips often found in pairs and held together with iron rivets. Although there is some debate as to the function of these items (Mainman and Rogers 1999, 1952–4), they possibly form the side plates for Saxo-Norman horn combs.

Dress and personal possessions

Part of a composite single-sided antler comb decorated with incised linear decoration was found (SF587). This type is well known from Late Saxon contexts in Norwich and elsewhere, many of which are decorated with incised linear ornament in a similar style to the example here, with lines often occurring in groups. Composite single-sided combs are particularly well represented amidst the combs found at Thetford (Rogerson and Dallas 1984, 167–9, figs 186–7).

Part of an ivory double-sided simple comb with the customary fine and coarse teeth is from a Period 5 context (SF405, not illustrated). This type of ivory comb is dated to the 16th and 17th centuries (Margeson 1993, 66).

Furnishings and miscellaneous household equipment

Part of a bone scoop or corer is from a Period 6 deposit (SF362, not illustrated). Stratified examples from Norwich and elsewhere are from 17th-century and later deposits. Margeson (1993, 120) discusses their various possible uses including cleaning out tobacco pipes, apple corers or cheese scoops.

A turned ivory handle, perhaps for a knife, with moulded finial is from a Period 5 context (SF722, not illustrated), it has a whittle tang which is broken at the end.

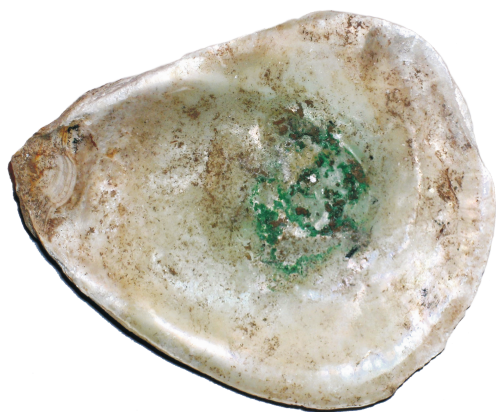


Plate 13 Oyster shell palette showing pigment residue. Scale 1:1

Unclassified

A fragment of butchered bone (SF586, not illustrated) was found in a post-medieval pit fill. It has some roughly cut-out ?initials on one extant outer surface.

A finely turned cylindrical hollow ivory object expanded at one end with neatly incised ?turned parallel circumferential lines is from a construction level (SF408) and is so far unidentified. A number of lathe-turned bone objects from 13th- or 14th-century deposits have been described as 'bone thread-reels'. Those from York share some similarities with the cathedral piece, some are hollow, one has a flared end and all have turned if somewhat more deeply cut circumferential decoration. Walton Rogers discusses the possible function of these and other known examples (Walton Rogers 1999, 1968, fig. 925, nos 6689–6691 and 8021). The overall shape of the York objects differs from the Norwich find as they are almost symmetrical whilst the object from the refectory is finely tapered beyond the flared end.

Catalogue (Fig. 42)

- SF695** ?Wedge. Sawn-off tine, trimmed at tip to form a pointed end. Also knife cuts on sides and ?top, indicative of use. Context 3070, layer, Period 2, *G13*.
- SF788** Strip, flattened on both sides. Secondary waste. Context 1564, metalling, Period 2, *G11*.
- SF587** Comb. Incomplete connecting plate from single-sided composite comb, broken in half with iron rivet and incised linear decoration. Context 1564, metalling, Period 2, *G13*.
- SF408** Turned hollow cylindrical object fragment, with incised circumferential lines around flared end. Context: 2073, Fill, Period 3, *G47*.
(not illustrated)
- SF362** Apple corer, distal end of sheep metatarsal shaft with incised cross-hatching below distal end on both sides, 'gouge' towards proximal end broken off. Context 1002, unstratified.
- SF586** Fragment of butchered bone with graffiti of ?initials 'EJ' cut three times into surface. Context 1301, pit fill, Period 6, *G98*.
- SF653** Perforated bone strip. Context 2448, layer, Period 2, *G46*.
- SF405** Fragment of a double sided simple ivory comb with one fine tooth and three coarse teeth remaining. Context 1093, spit, Period 5, *G73*.
- SF722** Cylindrical handle with moulding at domed top; whittle tang *in situ*. Context 3213, pit fill, Period 5, *G67*.

Oyster shell palette

Analysis

by Sharon Cather

An oyster shell palette with remains of paint on its internal surface was found in a post-medieval pit. A sample of the pigment was analysed by Prof. David A. Scott (Chair, University of California at Los Angeles/Getty Program in Archaeological and Ethnographic Conservation), using General Area Detector Diffraction System (GADDS-XRD) (more commonly known as X-ray powder diffraction). The results of this showed the pigment to be malachite ($\text{Cu}(\text{CO})(\text{OH})$) a naturally occurring copper carbonate mineral (see <http://webmineral.com/data/Malachite.shtml>) which has been used in painting since antiquity.

Curiously, malachite is not very commonly found in English medieval wall paintings and far less often in post-Reformation paintings. More often, the synthetic alternatives are found, such as verdigris, a basic copper acetate ($\text{Cu}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 2\text{Cu}(\text{OH})_2$); or 'salt green' which can be any of a number of forms of copper chloride. Most of the reasonably firm identifications of malachite are early (Kempley, Glos *c.*1130; Canterbury Cathedral, St Anselm's Chapel, *c.*1140; Chichester Cathedral, north transept *c.*1140; Sherborne Abbey, Dorset *c.*1180).

As GADDS-XRD is a reliable instrumental analytical identification this, together with the nature of the palette and lack of evidence for its use in the post-medieval period, suggests it is a medieval palette.

Discussion

by Spike Bucklow with Andrea Kirkham

The discovery of a shell palette in a context that suggests a 16th-century origin is unusual as most shell palettes appear to be 14th-century or earlier. The only other similarly dated shell palette known is from Acton Court (Hughes and Strong 2004). It is significant that from around 1400 depictions of wooden palettes in paintings of artists at work are increasingly common (van der Wetering 1997, 142).

The identification of malachite is also unusual. No malachite has been identified in painting schemes in the immediate vicinity of the find (Howard and Park forthcoming; Howard 2003, table 2). However, it should not be forgotten that the analysis of paintings is undertaken on objects that are far from their original condition. A survey of what survives may not accurately reflect the materials employed by the artist. Different mixtures of pigments and media have different survival rates. For example, verdigris in oil often suffers disproportionately high loss (Kirkham 2005, 2; Bucklow 2003, 212). On the other hand, malachite in glue-size has been reported as a relatively robust mixture (Lindburg 2001). So, if malachite had been used then (depending upon medium) we might expect it to have survived.

The absence of malachite in reported technical analyses is accompanied by its absence in the associated accounts. An alternative green pigment, verdigris, is present in both the accounts and the results of technical analysis of the pigments from the vault and western arch of the Ante-Reliquary chapel at Norwich Cathedral (Howard 2003, 233). This suggests that the artists had a choice of greens and that significant quantities of malachite were not employed. Malachite was more

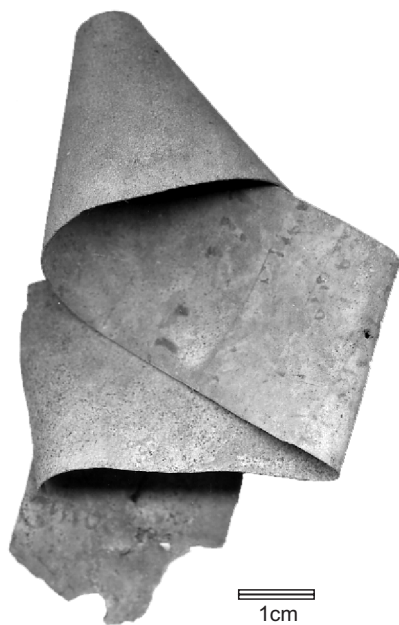


Plate 14 Parchment. Scale 1:1

expensive than verdigris, but the artists' choice was probably not determined by cost alone. Malachite's sister pigment, azurite, was also expensive, yet it is present in both the accounts and the results of technical analysis (Howard and Park 1996, 401).

The presence of malachite in the shell and its absence from the accounts and painting schemes may be explained by the scale of material employed. Accounts might be expected to record relatively large purchases associated with decorative schemes that consumed significant quantities of pigments. However, small scale purchases may have been accounted separately and small scale use may have been associated with the decoration of portable objects.

The traces of malachite in the shell are evidently the residues of mixing paint or storage of very small quantities of them, rather than storing pigment. It is therefore difficult to gauge the quantity of malachite employed by the artist. It may have been in the order of a few grams, sufficient to paint only a relatively modest area. This

suggests that we should consider what kind of surface may have been painted using the malachite in the shell palette.

It has been reported that a 14th-century shell palette from Boyton Church, Wiltshire, was used in the painting of a polychrome tomb (Howard and Park forthcoming, Appendix 6). A shell palette from Hardham Church, West Sussex, is recorded as containing, amongst other pigments, chalk. The chalk in the palette is not 'compatible' with the 'very complete scheme' of wall paintings with which it was associated (Howard and Park forthcoming, appendix 6). Such a history of use indicates that it is quite possible that the malachite in the shell palette was associated with a small portable object rather than with a large fixed scheme.

Identification of the medium may clarify the possible use of the paint. Technical analysis has increasingly associated the use of media such as oil and resin with wall painting schemes, in addition to their established use in easel paintings. However, the use of gum might indicate a use on paper, parchment, ivory or wood, or that the shell was being used for the storage of a gum paint rather than for pure pigment.

Catalogue (Plate 13)

SF656 Context 2172, pit fill, Cut 2161, Period 5, *G102*.

Parchment by Heather Wallis

A strip of parchment was found during the watching brief within the fabric of a wall which lined pit 3260. This long narrow strip had been contorted with several loose folds and twists. Examination of this by Mark Hingley (Conservator, formerly of Norfolk Records Office) revealed that the parchment had become minerally enriched. This was the result of having been in close contact with lime from the wall in which it was found. There appears to be some writing on this strip although no clear words could be identified.

Catalogue (Plate 14)

SF790 Strip of parchment, contorted, 0.028m wide, estimated length 0.187m. Context 3260, pit wall, Period 5, *G104*.

Chapter 5. Faunal and Environmental Evidence

Animal, bird and fish bone

by Julie Curl
(Plate 15)

Introduction

A total weight of 111.808kg of faunal remains, consisting of around 6000 pieces, was found with the greatest quantities of bone coming from Period 2 and Period 5 contexts, each accounting for over 30% of the overall assemblage by weight (Table 9). The site produced thirty-six species (Table 10) of mammal, bird and fish and included unusual species such as porpoise and seal. The presence of the porpoise and many of the wild species of wild bird are indicative of high status consumption.

| <i>Period</i> | <i>Wt/kg</i> | <i>%Wt</i> |
|---------------|----------------|------------|
| 1 | 0.771 | 0.7 |
| 2 | 38.606 | 34.5 |
| 3 | 19.865 | 17.8 |
| 4 | 5.042 | 4.5 |
| 5 | 36.421 | 32.6 |
| 6 | 1.472 | 1.3 |
| Unstratified | 9.631 | 8.6 |
| Total | 111.808 | |

Table 9 Quantities of bone (by weight) by period

Methodology

All of the mammal bones were recorded using a modified version of a system devised by Simon Davis for recording faunal assemblages (Davis 1992). More detailed analysis, including measurements, was carried out on the assemblages from Periods 1, 2 and 3 and the canid bones from Period 5. Total counts were made for the number of bones identifiable to a species and those considered countable and measurable. Butchering was also recorded, noting the type of butchering, such as cut, chopped or sawn. All pathologies of archaeological significance were also recorded along with any other modifications, such as any possible working or animal gnawing.

Species recovered

Of the thirty-six species identified (Table 10) by far the most common were the domesticated mammals: cattle, sheep/goat and pig; although the assemblage also included a range of wild mammals such as hare and deer. A total of fifteen species of bird was identified, many of which were wild species used for food. Several species of fish were identified and two species of marine mammals, Common Seal and porpoise.

Cattle

Cattle were the most commonly identified species in Periods 1 to 5, representing 44% of the identifiable remains and 41% of the countable elements. The data shows that the use of cattle changed over the centuries. Period 2 produced far more primary butchering waste,

meat waste, evidence of tongue removal, marrow extraction (chopped and split metapodials), skinning and hornworking. During Period 3 the amounts of primary and secondary butchering waste were roughly equal; further skinning was noted, along with marrow extraction. Period 5 saw a sharp rise in the number of good quality meat-bearing bones recovered and a drop in the quantity of primary butchering waste.

The ages of the cattle at death also varied between periods. Most cattle in Period 2 were adult, with some mature animals exhibiting age-related diseases such as arthritis and periodontal disease. The number of juveniles increased during Period 3 and included neonatal bones that are indicative of local or on-site breeding. There were still mature adult cattle in Period 3 and several occurrences of age-related disease, including arthritis on the vertebrae and limb bones. By Period 5 the numbers of adult cattle had dropped dramatically and the numbers of juveniles had increased and far fewer pathological specimens were noted.

Sheep/Goat

Sheep/goat were the second most common species in terms of bones identified to species but in terms of 'countable' elements they were the most common species in Period 5. All parts of the sheep/goat were recovered from Period 2, although with slightly fewer of the main meat bearing bones. There were also more of the bones from the front part of the animal in Period 2. It is quite probable that some of the main cuts of meat were consumed elsewhere.

Several sheep and goat chopped horncores were found from this period indicating hornworking activities in the area at the time. It is interesting to note however that few positive identifications of actual goat bones were recorded; this may suggest that the goat horncores were brought to site separately or even attached to the goat skin (Albarella 1997a; Albarella 1997b). The hornworking evidence includes part of the skull of a four-horned sheep from Period 3. This may be one of the Jacob breed of four-horned sheep which is more common in the northern and western parts of the country. It is possible that the four-horned specimen from this site was local or may have been bought as a skin with head and horns still attached.

Sheep are a popular species as they have so many uses, they are kept for wool, milk (and cheese), breeding, lanolin, parchment and, obviously, meat; even their bones would be used for making objects such as handles and apple corers. The importance of this species and of the wool industry is shown in the increase in the number of sheep during the medieval and post-medieval periods at this site and many others countrywide.

Pig

Pig remains accounted for almost 12% of the assemblage, and as with the other domesticated food species, they were more frequent in Periods 2 and 5. Pig were consistently the less common food animal, always third place to cattle and

| | <i>Period 1</i> | | <i>Period 2</i> | | <i>Period 3</i> | | <i>Period 4</i> | | <i>Period 5</i> | |
|--------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|
| | <i>Total</i> | <i>Countable</i> | <i>Total</i> | <i>Countable</i> | <i>Total</i> | <i>Countable</i> | <i>Total</i> | <i>Countable</i> | <i>Total</i> | <i>Countable</i> |
| <i>Mammal</i> | | | | | | | | | | |
| Cattle | 3 | 3 | 270 | 149 | 152 | 94.5 | 36 | 27 | 227 | 125.5 |
| Sheep/Goat | 1 | 1 | 145 | 94.5 | 77 | 57 | 24 | 22 | 199 | 161.5 |
| Pig/Boar | 1 | 1 | 99 | 44 | 40 | 22 | 11 | 7 | 66 | 41 |
| Canid (Dog) | | | 4 | 3.5 | 1 | 1 | | | 106 | 40 |
| Cat | | | 1 | 1 | 2 | 2 | | | 14 | 9 |
| Equid | | | 6 | 5 | 1 | 1 | | | 2 | 2 |
| Rabbit | | | | | | | 5 | 3.5 | 40 | 33 |
| Hare | | | | | | | | | 4 | 2 |
| Deer: Red & Fallow | | | 10 | 4.5 | 4 | 2 | 5 | 3 | 3 | 1.5 |
| Deer: Roe | | | 1 | 1 | | | | | | |
| Rat | | | | | | | | | 1 | 1 |
| Porpoise | | | | | 1 | | | | 1 | |
| Common Seal | | | | | | | | | | |
| <i>Bird</i> | | | | | | | | | | |
| Crow | | | | | | | | | 1 | 1 |
| Galliformes | | | 22 | 22 | 22 | 21 | 15 | 15 | 45 | 44 |
| Geese | | | 3 | 3 | 6 | 6 | 11 | 10 | 28 | 25.5 |
| Jackdaw | | | | | | | | | 1 | 1 |
| Jay | | | | | | | 1 | 1 | | |
| Lapwing | | | | | | | 1 | 1 | 1 | 1 |
| Magpie | | | | | | | | | 1 | 1 |
| Mallard | | | | | | | | | 6 | 6 |
| Partridge | | | | | | | | | 1 | 1 |
| Pigeon | | | | | | | | | 1 | 1 |
| Pigeon (wood) | | | 1 | 1 | | | | | 1 | 1 |
| Swan | | | | | | | 2 | 2 | 27 | 13 |
| Teal | | | | | | | | | 1 | 1 |
| Turkey | | | | | | | | | 2 | 2 |
| Woodcock | | | | | | | 1 | 1 | | |
| <i>Fish</i> | | | | | | | | | | |
| Eel | | | 2 | | | | 4 | | 3 | |
| Pike | | | 2 | | | | 1 | | | |
| Rockling | | | 1 | | 2 | | | | | |
| Perch | | | | | | | | | 2 | |
| Salmon | | | | | 3 | | | | 13 | |
| Trout | | | 7 | | 16 | | | | | |
| Cod | | | 4 | | 2 | | 1 | | 12 | |
| Cod sp. | | | | | | | 1 | | | |
| Totals | 5 | 5 | 578 | 328.5 | 329 | 206.5 | 109 | 92.5 | 809 | 515 |

Table 10 Quantities of the species recovered. Totals are given for all bone identified to each species and the total classed as 'countable' (see methodology)

sheep/goat and even less common than galliformes in Period 4.

Period 2 produced more primary butchering of pig and fewer good cuts of meat. The most common elements of pig in Period 3 were mandibles and lower limb bones; this lack of meat-bearing bones in these Periods suggests that the good quality cuts of meat were being consumed elsewhere. Period 5 saw a dramatic change in the types of elements present with less primary butchering waste and a higher number of good quality meat producing bones, such as the humerus. Most remains were butchered and cuts on the lower limb and foot bones were most frequent in Period 3, which may indicate a greater interest in the hides at this time. Period 5 shows very heavy butchering

throughout the animal indicating an emphasis on producing good quality meat.

Juveniles and adults were present throughout the assemblage, although a higher number of juveniles was found. This is commonly encountered as pigs are usually culled by the time they are one and a half years old as they have few uses other than for meat. Neonatals started to appear in Period 3 and were more frequent by Period 5, which strongly suggests that they were bred locally from Period 3 onwards. Some of the neonatal pig bones in Period 5 exhibit butchering marks that clearly show that they were used for meat; suckling pig would have provided a popular addition to the diet.

Canid

Canid remains were recovered from just two periods and totalled 4.5 % of the bone identified to species. A few elements were found in Period 2 deposits, the remains of which had been butchered. Cut marks show that skinning had occurred and one chopped tibia suggests that meat may have been consumed, possibly by people or maybe by other dogs.

Period 5 produced numerous canid bones, most belonging to small to medium sized dogs. Several bones were recovered from three contexts within the walled pit (G67), possibly all belonging to one small dog. An almost complete skeleton of a terrier-sized dog was recovered from make up layers in Property 36 (G86); the presence of the baculum bone shows that this was a male. A further male terrier-sized dog was found in garden contexts (G84). The presence of these small dogs in Period 5 could indicate animals kept as lap dogs or maybe they were kept for hunting.

Cat

Small quantities of cat bone were recovered from Periods 2, 3, 5 and 6. While some cats could have been kept as pets, many would have lived a semi-wild existence and been tolerated for their ability to control rodent pests. Most of the feline remains were retrieved from Period 5 and included one bone which showed cut marks that suggest the animal was skinned and possibly eaten. Another butchered cat bone was recovered from Period 2 (G12), the chopped humerus strongly indicating that the cat had been prepared for eating.

Butchering of cats is not that uncommon in medieval contexts; animals often show cuts from skinning (Garcia 1995) and may well have been eaten, as their meat is supposed to taste like rabbit.

Equid

Sparse remains of equid were found in Periods 2, 3 and 5. They accounted for less than one percent of the identifiable bone, most were single finds and some had been butchered. A chopped and trimmed scapula from Period 2 suggests that equid meat was consumed. Chopped and cut metacarpals were produced in Periods 2 and 5 (Plate 15a); these may have been from primary butchering and/or for use in bone working.

Deer

Roe deer was only recovered in Period 2 and was represented by a single chopped metacarpal. Red and fallow deer were retrieved from Periods 2, 3, 4 and 5 and were found in equal numbers. More deer was recovered from Period 2, which indicates that hunting of deer was either more popular or more easily carried out at this time, possibly as the surrounding area was less urbanised.

Many of the deer remains were butchered, clearly showing they had been utilized. Most of the butchering (other than antler working waste) was in the form of cut marks made when animals are skinned (Plate 15b). Some small fragments of antler were found during the analysis of the faunal remains most of which were recovered from Period 2 and are discussed below.

Porpoise

One vertebra of a porpoise was found in a Period 3 (G47) context (Plate 15c). A further probable porpoise vertebra

fragment was recovered from Period 5 (G74). The latter showed a clear chop mark, but the vertebra from Period 3 did not show any clear signs of butchering.

The presence of porpoise is interesting and relatively rare in the archaeological record, although not totally unexpected. There are numerous written records from the medieval period of porpoise being eaten. The Communal Rolls of 1316–17 record porpoise being bought (Fernie and Whittingham 1972, 92) and these were listed as some of the most expensive food items purchased. Records for medieval Ipswich also refer to the sale of porpoise as luxury items on the fish market, along with other sea-life such as sturgeon and even whale (Alsford 1998). Porpoise is also referred to in records for York (O'Connor 1999, 417–8), where porpoise and whale meat are classed as 'fish for fasting purposes'.

Seal

A single mandible from a young Common Seal (*Phoca vitulina*) was recovered from Period 3 (G46). The Common Seal is frequently found around the coast of Britain and colonies still exist on the Norfolk coast.

As with the porpoise, seal is uncommon on archaeological sites so its presence in the same period and group as the porpoise is interesting. It is possible that both were additional catches on a fishing trip, retained for food and possibly fur. They would have been classed as fish and so allowed at the table when other forms of meat could not be consumed.

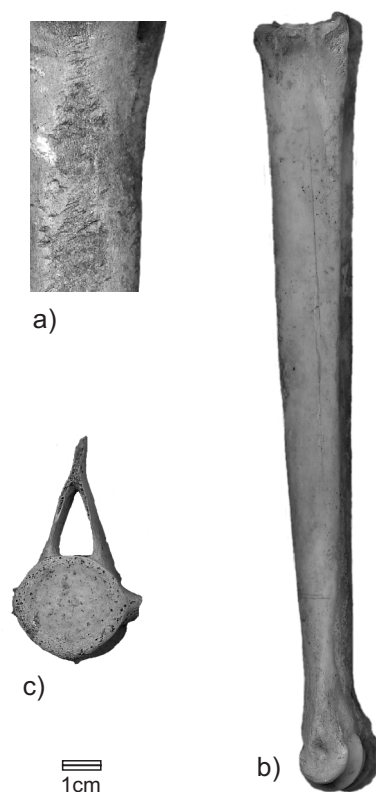


Plate 15 Animal bone, scale 1:2 (a) Equid metatarsal with numerous chop and cut marks, Period 2 G13 (b) Fallow deer metatarsal with knife cuts from skinning, Period 2 G101 (c) Porpoise vertebra, Period 3 G46

Other wild mammals

Rabbit was recovered in Periods 4 and 5, with most elements retrieved from Period 5 accounting for 3.7% of the identified remains. Many of the remains had been butchered for food and it is probable that the skin/fur would have been removed for making clothes. One mandible did have cut marks consistent with skinning. Hare was also identified but in much lower numbers, less than one percent of the identified material. Three hare bones were recorded in Period 5 and a further bone in Period 6; the bone in Period 5 had been chopped, presumably for meat, although as with rabbit, it may have been used for fur too. A single rat scapula was retrieved from Period 5 (*G67*). Rats would have been quite common around urban areas and their numbers would probably have been kept down by the local cats and dogs.

Domesticated birds

Both galliformes and geese were present from Period 2 onwards. Galliformes represented over 5% of all of the material identified to species. The galliformes were found in greatest quantities in Periods 5, approximately half the amount in Periods 2 and 3 and far fewer in Period 4. Geese were present in low numbers in Periods 2 to 4 and their numbers increased to half that of the galliformes by Period 5.

Many of the galliforme remains were butchered, clearly demonstrating that they were used for meat. All periods produced evidence of males and females and it is probable they were kept for breeding and egg production. Two pathologies were noted; arthritic problems were seen on a tarsometatarsus and on the distal end of a tibiotarsus.

Two turkey bones were also recovered from Period 5; a chopped femur from a late 16th- to 17th-century context (*G60*) and a humerus found in a late 17th- to early 18th-century context (*G67*). Turkeys were introduced into Britain in the 16th century and have been recovered from other 16th- to 17th-century deposits in Norwich such as at Alms Lane (Harman 1985) and Castle Mall (Albarella *et al.* 1997), as well as in a late 17th-century deposit in York (O'Connor 1999). When first introduced to this country, turkeys would have been expensive and only available to the wealthy, so the presence of butchered turkey is further indication of high status eating. The turkey originated from America and was thought to be introduced from there or from stock taken to Europe during the 16th century.

Wild birds

Twelve species of wild bird were identifiable, which does not include the possibility that some of the geese present were obtained from a wild rather than a domestic source. This does not take into account the possibility that some of the birds traditionally thought of as wild could have been kept in captivity. Many of the bird remains were found in the same groups and often alongside domestic bird or juvenile or small mammal, which could indicate the remains of large or high status meals.

The fill of a pit dating to the mid to late 16th century (*G50*) produced remains of duck, woodcock, lapwing and jay, in association with goose and veal; the lapwing bore clear cut marks while the fills of the wall-lined pit (*G67*) yielded numerous butchered elements from swans, turkey, mallard, geese and galliformes.

The most interesting and varied bird remains were produced from at 17th-century pit (*G102*) where swan, wood pigeon, jackdaw, magpie and crow were identified alongside geese and galliformes. In addition, this pit also produced remains of sheep, juvenile and neonatal pigs, rabbits and eel.

Other bird bone from Period 5 consisted of single bones from partridge, pigeon and teal. The only wild species of bird from Period 4 was a swan, represented by a single bone. Period 3 gave evidence of jay, butchered lapwing, mallard and woodcock. Further remains of swan and wood pigeon were retrieved from Period 2.

Fish

The fish bone recovered from the cathedral refectory excavations accounted for just 4.1% of all bone identified to species and less than 1% of the assemblage as a whole. Much of the bone was not identifiable to species. Period 2 produced elements from eel, pike, rockling, trout and cod. Period 3 also produced five species: rockling, salmon, trout, cod and cod sp. Period 4 yielded several elements of salmon and sparse remains of eel, pike and cod. Further elements from cod were recovered from Period 5 along with a few bones from eel and perch.

Bone, horn and antler working evidence

Most evidence of working came from Period 2, which produced red and fallow deer antler working waste, cattle, sheep and goat hornworking and skinning of cattle, sheep/goat and canid. Skinning marks were present on cattle, sheep/goat and dog bones, although these were only found in a few context groups (*e.g. G14*). Likewise, horn and antler working evidence was recovered from two main groups in Period 2; *G11* yielded fragments of red deer antler alongside horn waste from cattle. Sheep and goat horn working waste was found with sawn fragments of fallow deer antler in *G27*.

Period 3 produced sparse remains of cattle horn and red deer antler working waste. A single piece of cattle bone also appears to have been associated with working; the tibia shows numerous chopping and cutting marks round the distal end of the shaft and many small knife cuts around the shaft. It is possible that the tibia was intended for use as a handle and left unfinished or was merely a 'practice piece'.

A possible unfinished skate was recovered from Period 5 (*G60*); this cattle metatarsal was heavy chopped at the distal end. It does not show the polished surface that is expected with a used skate, so was probably never finished and certainly never used. Cattle hornworking waste was noted in *G103* and possible sheep hornworking was noted in *G67* in the form of a young skull with the horn removed.

Discussion by period

Late Saxon: 10th to late 11th century (Period 2)

This period produced the largest quantity of bone (34.53% by weight). Seventeen different species were identified, but particularly noticeable was the low numbers of birds and wild mammal. In contrast, more species of fish were identified from this period than any other, although this does not necessarily suggest that fish were more important in the diet at this time.

More bones from primary butchering with evidence of skinning and preparation of carcasses were present and there were less elements from the good quality cuts of meat, which would suggest this was more of a production site. Numerous metapodials were recovered that had been chopped and split lengthways for marrow extraction, a butchery method common in Late Saxon contexts. This period also produced greater quantities of sheep, goat and cattle hornworking along with the majority of the antler working waste.

Medieval: late 11th century to 1538 (Period 3)

A total of 19.865kg of faunal remains was recovered, forming almost 18% of the assemblage. The assemblage is similar to that for Period 2, a not unexpected result considering the high proportion of residuality. One noticeable change was the increase in the number of juvenile animals and the presence of neonatals of cattle and pig, which would suggest local breeding of these animals.

An unusual inclusion in the assemblage was the presence of a single porpoise vertebra (*G47*). This species was considered a luxury item during the medieval period and its presence in this period alongside a prized food bird such as the woodcock (Albarella and Davis 1996; Simon 1944) clearly indicates that high status meals were being consumed at this site.

The lack of evidence for the products consumed during this period is not surprising as most of the food preparation and the disposal of waste would have taken place away from the refectory building itself.

Early post-medieval: 1538 to late 16th century (Period 4)

Relatively little bone came from Period 4 (5.042kg, 4.5% of the assemblage). Some skinning was noted, but most bone was from secondary butchering and food waste. Most of the remains were derived from butchered cattle, sheep/goat and pig; galliformes, geese, hare, deer and a single swan bone were also recovered. Salmon and sparse remains of eel, perch and cod were also identified. Again there is a strong possibility that much of this is residual material.

Post-medieval to modern: late 16th century to 1873 (Period 5)

This period produced the second greatest quantity of bone in terms of weight (36.421kg) forming over 30% of the assemblage and the largest number of species, twenty-seven in total. This assemblage better reflects the foodstuffs consumed as the amount of residual material within the finds assemblages is greatly reduced.

There was clear indication of wealth at this site during this time, which is demonstrated by the range of animals, the good quality meat bones and the range of wild species brought to the table. The quantity of sheep/goat increased while that of cattle saw a slight decrease. It was evident that it was important to provide quality and whenever possible, provide more unusual and expensive additions to the already rich diet with costly purchases such as that of the porpoise and meals including the turkey which was newly introduced to this country during this period. There were also the remains of at least three terrier-sized dogs which were probably kept as pets or pest control to keep down the number of rats.

Conclusions

The vast majority of the assemblage consisted of the main domestic food species of cattle, sheep/goat and pig. Birds were found in the Late Saxon assemblage onwards and the importance of wild birds in the diet increased considerably in the post-medieval period. Fish, both freshwater and marine obviously contributed to the diet. The more unusual species such as porpoise and seal would have been expensive items to buy, as would some of the wild birds.

There are many similarities when comparing this assemblage with the other main high status site in Norwich, the Castle Mall excavation. Both sites produced a large range of species, which included many wild birds and mammals, characteristic of feasting food waste in the medieval period. It is interesting to note that the barbican well excavated at Castle Mall (Moreno-Garcia forthcoming) produced two dolphin vertebrae. Dolphin provides similar meat to the porpoise and, similarly, may have been caught by chance on a fishing trip and sold at a high price in Norwich.

Cetacean bone was also recovered from another high status site at Launceston Castle in Cornwall where small cetacean (porpoise?), whale and dolphin vertebrae were recovered from 15th-century deposits. It is mentioned that these small cetacean bones are rare in archaeological deposits (Albarella and Davis 1996). As with Castle Mall, Launceston Castle produced many of the wild birds recovered from the cathedral refectory site, including swan, lapwing and woodcock, which are indicative of high status eating.

The faunal assemblage reflects the changes in site use from being part of the Late Saxon town and providing meat, skins, horn for working and other animal products to being more of a consumer site; with a wide range of species and good cuts of meat being bought in to provide high status meals.

Soil micromorphology, chemistry and magnetic susceptibility

by Richard I. Macphail and John Crowther

Introduction

During the excavations a possible buried soil 2480 (Monolith 10, *G2*) of pre-Late Saxon date and buried disturbed ground within a Late Saxon wheel rut 2194 (Monolith 21, *G9*) were identified. It was suggested that soil analyses could help confirm these identifications. Such investigations could also potentially determine any earlier (pre-Late Saxon) impact on the buried soil and give more detail on the Late Saxon traffic and local landuse. Two soil monoliths from the 2002 excavation were received in early 2003, and subject to limited soil micromorphological (two thin sections) and bulk analysis (two samples), to investigate the above-mentioned topics.

Samples and methods

Heather Wallis undertook the sampling of the buried soil context 2480 (monolith 10) and supposed wheel rut context 2194 (monolith 21), and these were sent to Richard Macphail at the Institute of Archaeology. After description, the uppermost parts (*c.* 75mm) of the buried soil and wheel rut were sub-sampled for bulk analysis, and then air-dried, impregnated with a cristic resin mixture at the Institute of Archaeology, UCL and manufactured into

| Sample no. | Description | LOI (%) | Carbonate (%) | Phosphate- P_o ($mg\ g^{-1}$) | Phosphate- P_i ($mg\ g^{-1}$) | Phosphate- P ($mg\ g^{-1}$) | Phosphate- $P_o:P$ (%) | Phosphate- $P_i:P$ (%) | χ (10^{-8} SI) | χ_{max} (10^{-8} SI) | χ_{conv} (%) |
|------------|-------------|---------|---------------|-----------------------------------|-----------------------------------|---------------------------------|------------------------|------------------------|------------------------|------------------------------|-------------------|
| 10 | Soil | 0.990 | 0.5 | 0.345 | 1.34 | 1.675 | 20.5 | 79.5 | 21.2 | 619 | 3.42 |
| 21 | Wheel rut | 1.13 | 1.0 | 0.359 | 3.50 | 3.859 | 9.3 | 90.7 | 29.5 | 486 | 6.07 |

Table 11 Chemical and magnetic susceptibility data

two medium-size (75 × 55 mm) thin sections at Spectrum Petrographics, Oregon, USA (Murphy 1986). Thin sections (see Table 11) were viewed at a number of magnifications from ×1, up to ×400 under the polarising microscope and employed plane polarised light (PPL), crossed polarised light (XPL), oblique incident light (OIL) and blue light (fluorescence microscopy). The combined use of these different forms of illumination permit a large number of optical tests to be made, enabling more precise identifications of the materials under study (Bullock *et al.* 1985; Stoops 1996). On the other hand, organic and burned soil display no birefringence or very low interference colours compared to calcite ash crystals and the biogenic calcite of earthworm granules (Canti 1998). OIL is useful in identifying the burned soil (*e.g.* fired clay) by its red colours. Very rare inclusions of bone were found to be autofluorescent under blue light.

Analysis was undertaken on the fine earth fraction (*i.e.* <2mm) of the samples. LOI (loss-on-ignition) was determined by ignition at 375°C for 16hrs (Ball 1964). Phosphate- P_i and phosphate- P_o were determined using a two-stage adaptation of the procedure developed by Dick and Tabatabai (1977) in which the phosphate concentration of a sample is measured first without oxidation of organic matter, using HCl as the extractant (P_i); and then on the residue following alkaline oxidation with NaOBr (P_o). A Bartington MS1 meter was used for magnetic susceptibility measurements. χ_{max} was achieved by heating samples at 650°C in reducing, followed by oxidising conditions. The method used broadly follows that of Tite and Mullins (1971), except that household flour was mixed with the soils and lids placed on the crucibles to create the reducing environment (after Graham and Scollar 1976; Crowther and Barker 1995). An estimate of the carbonate content was gained by observing the reaction when 10% HCl was added (Hodgson 1974).

Results

The monolith descriptions are as follows:

Monolith 10 (context 2480 – buried soil), 0–120mm: Brown (7.5YR4/4) medium sands with frequent very dark grey (7.5YR3/1) humic burrows; rare gravel and charcoal; gradual boundary. 120–500mm: Strong brown (7.5YR5/6) weak sands.

Monolith 21 (context 2194), 0–200mm: Generally a dark brown (7.5YR3/2) medium sand with both grey (7.5YR5/1) and yellowish mottling; inclusions of gravel and coarse sand with rare charcoal and red burned grains; gradual, uneven boundary. 200–480mm: Brown (7.5YR4/4) medium sands.

These findings and the soil micromorphology (see below) indicate that the soils are typical brown sands (Newport soil series within Newport 3 and 4 soil associations) formed on glaciofluvial drift.

Bulk analyses

The results are presented in Table 11. Both samples (10 and 21) are largely minerogenic and contain only small

concentrations of organic matter (LOI: range, 0.990–1.13%). It seems unlikely that the soils would originally have contained so little organic matter, and that this is the result of subsequent decomposition under well-aerated conditions.

The most interesting feature of the results is the much higher phosphate-P concentration (3.86mg g⁻¹) recorded in the wheel rut sample compared with the adjacent soil (1.68mg g⁻¹). This clearly indicates phosphate enrichment in the wheel rut, which might possibly be associated with animal inputs. It should be noted that the phosphate-P concentration recorded in the wheel rut sample is very high for such sandy soils, which generally have a low phosphate-retention capacity. In both samples the phosphate present is largely in the inorganic form, which is in keeping with the relatively low organic matter content.

In terms of magnetic susceptibility, the wheel rut sample also stands out as having a higher χ (29.5 × 10⁻⁸ SI) and χ_{conv} (6.07%) than the soil. This suggests that the material present has been subject to some degree of magnetic susceptibility enhancement, probably as a result of burning or the inclusion of burned material. The χ_{max} values are both relatively low, suggesting a fairly low Fe content.

Clearly, caution must be exercised in interpreting data from just two samples. However, on the basis of the results the sample from the wheel rut does appear to show quite strong signs of anthropogenic activity compared with the soil. Soil micromorphology findings are presented in Table 12.

Discussion

Context 2480 appears to represent a probable, slightly truncated humic and biologically active (naturally acidic) topsoil of a brown sand soil, showing burrow mixing of small amounts anthropogenic debris, including wood charcoal, relict ash, and burned soil and mineral grains, and trace amounts of burned bone and stained bone, burned biogenic calcite and mortar; and minor inwash of iron-rich water. This is consistent with the measurements of LOI, phosphate-P (*e.g.* bone), CaCO (*e.g.* mortar and ash) and magnetic susceptibility (burned inclusions). The natural humic topsoil that had developed prior to the pre-Late Saxon period was probably truncated by Late Saxon activity. It can be noted here that the soil shows no evidence of ever being podzolised, as is the case for some sandy soils in Norfolk, although it is quite clear from soil analogues at nearby Colney and further afield at Broome Heath that these soils were acidifying from the Neolithic and Bronze Age periods. It is likely that the small amounts of anthropogenic inputs are related to Late Saxon activity that includes fires, construction, food waste and probable toilet waste disposal.

The soil micromorphology of the wheel rut shows evidence of very concentrated wash that appears to have

led to important secondary iron-phosphate deposition which is fully supported by the bulk sample measurement of phosphate-P concentrations. These findings clearly reflect the expected focus of drainage water contaminated by liquid waste in this wheel rut, for example from trafficking/draught animals, and the leaching of anthropogenic materials incorporated into the trafficked soil surface. This can be compared, for example, with micromorphological and bulk chemical evidence of amorphous (and crystalline — vivianite) phosphate deposition in roadside gullies in Roman Worcester and London, probable phosphate-rich clay deposition in an Iron Age wheel rut in Scania, Sweden and anthropogenic road-fill accumulations over two Saxon roads at Whitefriars, Canterbury (Macphail and Crowther unpublished data). In the last case, the amounts of anthropogenic inputs were extremely high, producing an almost total anthropogenic deposit with approximately 2–4 times as much phosphate-P (though the naturally low

phosphate-retention capacity of sandy soils in the present study must be borne in mind) and 3–7 times higher values for χ_{conv} . At Norwich Cathedral, the wheel rut is soil- (sand-) dominated, with many fine charcoal, rare fine bone that includes burned, stained and bleached varieties; and examples of eggshell (60 μ m wide), fine fragments of mortar, a 500 μ m fragment of ash and a 3mm size piece of weathered shell. Again, materials from fires, constructional activity, and food and possible toilet waste, are in evidence. The intensity of occupation however, is much lower than recorded at Saxon Canterbury. It is also less intensive than found within the early medieval settlement (e.g. AD1050–1120) located at the London Guildhall site (Macphail *et al.* forthcoming), indicating that the Norwich Cathedral refectory site during the initial stages of activity (Period 2 Phase 1) was peripheral to more intensive occupational activity in Late Saxon Norwich, or for example described from early medieval Lacon's Brewery, Great Yarmouth (Macphail in prep).

| Material | Sample Number examples | Sampling depth, soil micromorphology (SM) | Comments and interpretation |
|------------------------------------|------------------------|---|--|
| Soil Microfabric 1 / Microfacies 1 | M10 | 0–75mm SM: mainly homogeneous; Structure: structureless to poor subangular blocky, with burrows; 30% voids, dominant medium open vughs, channels (some coarse), poorly accommodated planar voids and complex packing voids; Coarse Mineral: C:F (limit at 10 μ m), 75:25; very dominant moderately well sorted coarse silt to medium sand-size quartz with rare traces of mica; Coarse Organic/ Anthropogenic: occasional sand-size burned flint, many wood charcoal up to 5mm in size; rare traces of fine sand-size stained coprolitic bone, bone, grey burned bone, burned fragments of biogenic calcite (possible Arionid/earthworm), and melted vesicular quartz (burned sand), and examples of roots, rounded coarse sand size silt loam fragment, fine sand size chalk and possible mortar; Fine Fabric: dominant microfabric 1 — dark yellowish brown, dotted (PPL), isotropic with patches of high interference colours (coarse monic/single grain and enaulic/loose aggregates, undifferentiated and crystallitic b-fabric, XPL), greyish brown (OIL); many amorphous and charred organic matter, with occasional fine ash crystals and phytoliths in upper slide and burrows; lower slide — many amorphous fine organic matter with rare traces of charred OM; Pedofeatures: rare traces of very thin (10) dusty clay coatings, associated with rare ferruginous hypocoatings; rare iron impregnations also present; very abundant dark, very thin (50+ μ m) organic excrements, commonly with very fine mineral (e.g. ash) inclusions, becoming more brown and commonly aggregated (150 μ m) in lower half of slide. | 226N 564 Late Saxon buried soil A probable slightly truncated humic and biologically active (naturally acidic) topsoil of a brown sand soil, showing burrow mixing of anthropogenic debris, including wood charcoal, relict ash, and burned soil and mineral grains, and trace amounts of burned bone and stained bone, burned biogenic calcite and mortar; and minor inwash of iron-rich water. <i>in situ</i> humic topsoil moderately influenced by burned anthropogenic debris. |
| Soil Microfabric 2/Microfacies 2 | M21 | 0–75 mm SM: homogeneous; Structure: massive/structureless, with traces of weak subangular blocky in uppermost 10 mm, possible crumbs in lower slide, and many burrows; 40% voids, with common patches of 25–30% voids; dominant medium open vughs, channels, poorly accommodated planar voids and complex packing voids; Coarse Mineral: C:F (limit at 10 μ m), 80:20; as M10, Coarse Organic/ Anthropogenic: many fine charcoal, rare fine bone — burned, stained and bleached varieties; examples of eggshell (60 μ m wide), fine fragments of mortar, a 500 μ m fragment of ash and weathered shell (3mm, porous with aragonite and calcite); Fine Fabric: dominant microfabric 2 — dark greyish brown, dotted (PPL), isotropic with patches of high interference colours (coarse monic/single grain and enaulic/loose aggregates, undifferentiated and crystallitic b-fabric, XPL), greyish brown (OIL); rare to occasional amorphous and charred organic matter, with rare to occasional fine ash crystals and phytoliths in upper slide and burrows; Pedofeatures: very abundant amorphous yellow iron (and phosphate?) cementation of matrix (up to 2mm in width), mostly relating to channel and burrow features (yellow to blackish yellow, the last bright yellow under OIL, non-birefringent, sometimes embedding/forming nodule around bone); abundant fabric mixing by burrows around 2mm in width, abundant broad 1–2mm organo-mineral excrements and thin (200 μ m) excrements. | 226N 513 Late Saxon wheel rut A likely mainly truncated brown sandy soil, with both burrow mixing of anthropogenic debris (that includes charcoal, ash, food waste, scat and latrine waste?) and major deposition of probable iron and phosphate. Late Saxon wheel rut that truncates the <i>in situ</i> soil, and which is characterised by faunal mixing of anthropogenic waste and downwash of iron and probable phosphate-rich water. |

Table 12 Soil micromorphology and microfacies analysis

Chapter 6. Watching Brief Observations to the South and East of the Refectory

Introduction

During construction work a watching brief was undertaken on the trenches dug in order to take the main services into the new building. Three trenches were excavated (Fig. 2) in two distinct periods of work: Trenches 1 and 2 over a two week period in August 2003 and Trench 3 over a three week period in November 2003. This piece of work was issued with its own HER number, 39590N. Trial work for these trenches was undertaken in October 2002 and this is recorded under HER number 226N contexts 3340 to 3359. All excavation was undertaken by mechanical excavator, that of Trenches 1 and 2 with a toothed bucket, and that of Trench 3 with a flat bladed bucket, to a set formation level.

Trench 1 ran in a southerly direction from the eastern entrance of the refectory for 3m before turning eastwards and crossing the area which formed the east cloistral range. Trench 2 ran in a northerly direction at a depth of 0.6m from a point to the south of the infirmary, passing through the area once occupied by St Nicholas's Chapel



Plate 16 Medieval floor surface including tiles and tile impressions, scale rod 2m

and part of the dormitory range. Trench 3 ran from Trench 1 in a northerly direction along a line approximately central to the dormitory range. From here it continued in a north-easterly direction crossing the site of the chapter house and into an area known as Life's Green, where it turned westwards taking the services into the cathedral via the Sacrists chambers, entering the building at the same point as existing services. The depth of the first section of the trench was 0.9m while the second and third segments were only 0.6m deep.

The deposits from these trenches have been allocated to the same periods as for the main excavation with one exception, that Periods 4 and 5 have been amalgamated because distinct datable phases of demolition were not apparent. It should be noted that the retrieval of artefacts was reduced by the machine excavation of the trenches.

Late Saxon: 10th to late 11th centuries (Period 2)

Deposits of this date were noted in four small areas within Trench 3 and one in Trench 1. It can be assumed that Late Saxon deposits once extended across the whole area but were not seen elsewhere because of later truncation or the limited depth of excavation. These deposits included a possible buried soil horizon and rubbish pits. A layer of gravelly material was also noted which may have been a continuation of the road identified during the main excavation. Three post-holes were present and immediately to the south of the refectory a burnt hearth deposit was noted.

Medieval: late 11th century to 1538 (Period 3)

A number of flint and lime mortar walls were recorded which, along with some evidence of tiled surfaces, form the limit of the evidence for this period. The dating of these walls to the medieval period is based primarily on the materials of their construction which did not include any brick. The stratigraphic relationship of these walls was often not fully established due to the limited depth of the excavations.

East cloistral range

The most substantial wall recorded was the continuation of the west dormitory wall to the south of the Dark Entry. This was 1.9m wide and survived to just below the present ground surface. Eight other medieval (or possible medieval) walls were recorded within the area of the dormitory range, seven of which crossed the trench on an east-to-west alignment, and most of which were on the approximate location of supporting piers suggested by Whittingham (1949).

Both of the walls which formed the passage to the Prior's Hall were found, and surviving in the area between them was evidence of a tiled floor. In places only the impressions of tiles in the bedding mortar were present, in others the tiles survived, but had had a grey render applied to their surface (Plate 16). None of the remaining tiles were lifted as this area was not to be further disturbed. However, they appeared to be similar to those found within the refectory excavation where they were identified as Flemish and of a 14th- to 15th-century date. This floor was at a level of 3.75m OD, *c.*1.45m below that of the refectory and *c.*0.9m below the level of the cloister walk.

The area to the south of this passage is an area of uncertain function, but Whittingham suggests it may have been handed over to the novices. The presence of walls within this area suggests some internal divisions. One east-to-west wall was recorded, located (again) to coincide with Whittingham's suggested piers. At its west end it was bonded into the west wall of the range, illustrating that it was an original feature of the range. To the north of this and between this wall and the south wall of the Priors passage a north-to-south aligned wall was recorded, further dividing the internal space.

One cut feature of this period was located and partially excavated. This was a pit (59) which was mainly backfilled with flints and contained a quantity of 13th- to early 15th-century pottery. Both its date and its location with a building range are somewhat surprising.

Chapter house

Trench 3 passed through the area known to be the chapter house. There was no evidence of the south wall of this building, which was probably destroyed during the latter part of the post-medieval period (see below). The north wall, however was recorded just 0.2m below the current ground level. The full width of this wall was not established, partly due to the angle at which the trench crossed it and partly due to it having been truncated by an earlier service trench. It seems to be in excess of 2.5m, which is wider than many of the other major buildings, although there is a possibility that this width of wall contained two different builds, as the mortar colour for the southern (1.1m in width) differs slightly from that of the northern part. Either this represents two different but contemporary builds or it may represent the primary apsidal-ended chapter house and its later replacement. It must be stressed that modern truncation of this wall has made any confident interpretation of the details impossible.

No evidence of the internal floor surface was seen, although its approximate level was indicated by the presence of Late Saxon deposits at *c.*4.9m OD which lay beneath the floor level of the chapter house.

Infirmary garden

Two other walls of probable medieval construction were recorded in the area known as the infirmary garden, between the infirmary and the refectory. One of these (3345 site 226N) was 0.6m wide and ran on an east west axis parallel to and 3.1m south of the refectory. This south face of this wall was constructed of regularly arranged flint cobbles while the north face had a yellow mortar render, suggesting that this was the interior face of the wall. Any surface associated with this would have been above *c.*4.3m the level where Late Saxon deposits were

encountered. The second wall (35) was at right angles to this, on a north-to-south alignment, was 0.8m wide and was located *c.*1.9m west of the dormitory range.

If the two lines of these walls are projected it can be suggested that they may have supported an arcade around the edge of the garden, perhaps even forming a second small cloister. This interpretation can only be confirmed by further excavation in this area (an area severely damaged by bombing raids in the Second World War).

Post-medieval to modern: 1538 to 1873 (Periods 4 and 5)

Evidence for post-medieval buildings was recorded relating to Properties 17, 48 and 22 (as defined by the Parliamentary survey of 1649 (Metters 1985)) as well as other structures.

Property 17

This was located in the angle formed by the south wall of the chapter house and the east wall of the cloister, so lying within the north-west corner of the dormitory range. It is described as having one room on the first floor with six chambers over it which also spread out over the cloister itself (Metters 1985, 34). It can be seen in a watercolour by Hodgeson (*c.*1830, Plate 17) and served as the Chapter office until 1828 (Whittingham 1985, 108). The east wall of this building formed the eastern section of the excavated trench. The south wall crossed the excavation while it is likely that the north wall used the alignment of the south wall of the chapter house. In the excavated trench, however, there was no evidence of either the north wall or the chapter house wall surviving.

The south wall was built of large flints in a very white mortar, and appeared to have been very carelessly constructed with large broken and irregular flints, probably reusing material reclaimed from the demolition of the monastic buildings. There is a possibility that this lower part of the wall was medieval in construction. Sitting on this flint wall was a red brick wall which survived to within 0.25m of the existing ground surface. It is possible to suggest that this change of build could indicate the ground surface at the time of construction which would have been at *c.*4.5m OD, a level also indicated by the remains of a pavement floor to the north of this wall.

Property 48

This property stood in the area between the refectory and the infirmary. It was built in 1632, the house being *c.*10 feet wide and 54 feet long, and was demolished in 1804 (Whittingham 1985, 114). It consisted of a three-storey house with three rooms on both the first and second floor and a garret with a yard adjoining (Metters 1985, 44). Prior to the post-medieval construction in this area a distinct horizon of demolition and levelling was noted. This did not appear to raise the general level of the ground but rather truncate and level the medieval horizon. One wall of a building was seen and this utilised a medieval wall as its foundation. A floor surface using reclaimed medieval as well as contemporary tiles was also recorded. A rectangular soakaway was located close to the south wall of the refectory.

Other walls

Three post-medieval walls crossed Trench 2 further to the south. One of these which was made of flint set in a hard white mortar, lay on the line of the south wall of St Nicholas's Chapel. Such preservation of alignment into the post-medieval period suggests that the 13th-century wall of the chapel may survive at a lower depth. A second alignment which was maintained was that of the north wall of the Prior's passage, alongside which an apparently insubstantial wall of flint and brick in a grey mortar was constructed.

The finds

Post-Roman pottery

by Richenda Goffin

A total of 142 fragments of pottery weighing 1.406kg was recovered from the of the service trenches. The material ranged from the Late Saxon through to the post-medieval periods. Methodology followed that of the main assemblage (Chapter 4).

Late Saxon ceramics

Seventeen fragments of Thetford-type ware of Late Saxon date were recovered, weighing 0.216kg. Seven sherds of this fabric were found in a Late Saxon horizon in Trench 3. Although mainly body sherds, a single rounded wedge-shaped rim fragment from a sooted jar was present. Such a rim type may date to the late 10th to 11th centuries rather than earlier, based on the provisional typology established by Anderson (2004). A body sherd of Thetford-type ware with diamond rouletted decoration was also found in this context.

A single fragment of Thetford-type ware was recovered from a buried soil horizon and another one in the fill of a post-hole in the same trench. A further eight fragments were found in a levelling deposit.

Medieval ceramics

The majority of the pottery by sherd count and weight is medieval in date (113 fragments weighing 1.012kg). Many of the sherds originated from two vessels, which were deposited into pit 59. The substantial remains of a Grimston-type ware jug were present, broken into many fragments. The vessel had a bevelled collared rim, and a rod handle with spiral incised decoration indicative of the later period of Grimston production (13th to 14th century). A second Grimston jug which had a plain olive lead glaze and a bevelled collared rim, was also recovered from the fill, along with a rim of a collared jug or pitcher

made from a hard redware which had a few spots of clear lead glaze. The latter is likely to be an import from the Low Countries, as small quantities of such wares were reaching Norwich during the late 14th to early 15th centuries (Jennings 1981, 32). Two greyware sherds were also found in the pit fill. These are likely to be of medieval date, that is 11th to 14th century.

Post-medieval ceramics

Twelve further fragments of pottery are post-medieval in date (0.178kg). The pottery was all recovered from subsoil or topsoil deposits and covers a range of dates. Several post-medieval redwares are present in the form of glazed red earthenware, iron glazed earthenware and speckle glazed ware. In addition four different tin-glazed earthenware vessels were identified. Two sherds are decorated with a blue and white pattern, whilst other wares are plain white. Two fragments of ironstone china indicate a later date for the deposition of this material, in the 19th century or later.

Conclusions

The pottery recovered during the watching brief reflects to some extent the ceramic assemblage which has been analysed from the main part of the excavation (see Chapter 4).

The medieval wares identified in pit fill 59 are of interest since they clearly date to before the Dissolution and are contemporary with the use of the monastic buildings themselves. Few deposits of this date were actually recorded from the main part of the excavation although there are many groups of pottery which date to the mid 11th-12th century as well as shortly before the suppression.

The post-medieval pottery from the watching brief comprises a range of red earthenwares and tin-glazed earthenwares which are amply represented in the main excavation, and which are likely to be mainly of 17th-century date.

Animal bone

by Julie Curl

A total of 654g of faunal remains, consisting of 59 pieces, was recovered from the service trenches. Five species were identified, the most frequent being cattle. Sheep/goat and galliformes were recovered in equal numbers; single bones from goose and rabbit were also retrieved. Almost all of the remains were butchered in some way and the assemblage clearly represents general butchering and food waste.

Chapter 7. Conclusions

Introduction

Many surprising discoveries were made during this project. These have altered our perception of the archaeological remains which pre-date the cathedral, enhanced our understanding of the construction of the refectory and enlightened us as to the post-medieval use of the area.

The natural topography of the area has been more closely established and the position of the Late Saxon settlement and the Norman cathedral can be seen to take advantage of a natural terrace within the broad valley of the River Wensum. Prior to the Late Saxon period there was only scant evidence of activity in the area with the presence of a few possible prehistoric features, three sherds of Bronze Age pottery, one Beaker sherd, one Iron Age sherd and two Middle Saxon sherds. The early development of this area is discussed elsewhere (Atkin and Evans 2002; Evans and Atkin 2002).

Late Saxon

The results of the current excavation illustrate that during the Late Saxon period this area was far from peripheral to the town, with a well maintained road crossing the site and structural evidence across the whole area. The establishment of the road and associated small scale occupation has been dated, by the pottery assemblage, to the 10th century (Period 2, Phase 1), adding to the expanding body of evidence of 10th-century occupation to the south of the river (*e.g.* Castle Mall, Shepherd Popescu forthcoming). Occupation on the site intensified in the early and middle years of the 11th century, when this area became part of the heart of the urban centre with Late Saxon market places at Tombland to the west and Palace Plain to the north (Fig. 1).

The extent of occupation was, however, limited by the natural topography, and the presence of low lying marshes to the east. Atkin (Atkin and Evans 2002, 66) has suggested that the majority of settlement lay above the 9m contour, possibly spreading down to the 6m contour. This has been extended by the results of the current excavation which show occupation as low as the 3.5m contour. It is, however, unlikely to have spread much further onto the more marginal riverside land, as shown by the lack of evidence from previous excavations in the Lower Close (Atkin and Evans 2002, Site 300N).

The suggested street pattern of Late Saxon Norwich is continuously being refined by excavations within the city, and the discovery of a metalled road during this excavation has contributed an additional element to the current plan. A gridded pattern of streets has been suggested (see Atkin 1993), and is supported by evidence from recent excavations at Greyfriars (Emery forthcoming) and Castle Mall (Shepherd Popescu forthcoming). The former suggests the presence of a major north-to-south road which aligns with the cathedral transepts. The north-east to south-west road under the refectory runs at an angle to this, suggesting either that the gridded pattern did not extend

into this area of town or that it was further enhanced by an additional road running across it, from Bishopgate to the south-east corner of the Tombland market place. This is parallel to and *c.*90m to the north of a possible track identified during excavations in the Lower Close (Atkin and Evans 2002).

The use of this road continued throughout the Late Saxon period, without variation to its alignment. Its importance was emphasised by the constant renewal and repair of the metalled surface. This feature therefore formed the spine for the growth of settlement to either side. The excavation showed that both buildings with possible yard surfaces as well as pits for rubbish disposal were present. The majority of the buildings were based on post-hole construction, although some buildings incorporated beam slots, the latter form of construction being more common in the later phase of occupation. However, due to the limited extent of the deeper excavations, no complete building plans were recovered. It was apparent that Roman ceramic building material was re-used during this period, probably for hearths. Similar occurrence of Roman tile within Late Saxon contexts was seen at Greyfriars (Emery forthcoming). Wattle and daub was used for the construction of structures as fragments of fired clay with wattle impressions were found along with other pieces which exhibited a deliberately smoothed exterior surface.

The earliest phase (Phase 1) of structural activity is limited to pits and post-holes adjacent to the road. Later activity (Phase 3) shows that the majority of the structural evidence was ranged alongside the road, with pits being located behind. The final phase (Phase 5) is made up almost exclusively of structural features, surfaces and hearths. This indicates denser occupation and an expansion of the area utilised for buildings. The lack of rubbish pits suggests that this expansion has forced the deposition of rubbish to take place further from the road frontage and hence beyond the area of excavation.

The economy of the Late Saxon town has been largely established by previous archaeological work, and the results from this excavation produced no surprises. This site shows a population reliant on the immediate hinterland for its survival with a diet based on cattle, sheep/goat and pig and presumably arable crops. Birds and wild animals played a small part in the diet along with both salt water and riverine fish. Evidence of imported goods was limited; only the presence of Rhenish lava quern stones indicates any link with the Continent, although the pottery shows the use of more regional wares as the 11th century progressed. Small scale craft activities are illustrated by the presence of metalworking debris (including crucible fragments) and antler and bone working waste. Evidence of these crafts has been found on many sites in Norwich indicating that these activities took place on a self-sufficient basis rather than relying on specialised and the distinct zoning of activity. A few mis-shaped sherds of Thetford-type ware are testament to the local pottery industry.

The development of Norwich, a thriving market town, was radically altered in the years following the Conquest as the Norman aristocracy asserted their dominance over the local population with the construction of the cathedral, the castle and its associated baileys and a new borough. The exact date of the abandonment of the Late Saxon settlement underlying the refectory could not be firmly established. There was, however, no archaeological evidence for the area lying fallow for any notable period of time between the destruction of the Late Saxon settlement and the construction of the monastic landscape, despite the area being held by the See for up to 20 years prior to the commencement of building works. This indicates that the Late Saxon culture continued for several years after the Conquest.

Monastic

The location of the cathedral appears, on initial consideration, to be somewhat out of keeping with its status, being in a low lying position within the Wensum valley. However its modern day appearance belies its impact on the prospect of the city and surrounding landscape in the 12th century. Low-lying sites close to a river were frequently chosen for the newly founded post-Conquest monasteries. Factors influencing their location within an urban landscape would include land ownership and tenurial arrangements (Aston 1993, 88), as well as the ease of access to building materials. Dominating the river valley, Norwich Cathedral was also close to a thriving port which could be utilised for the importation of building materials for the cathedral, castle and other churches within the city.

The excavated area lies within the land granted for the See in 1075 (Tillyard 1987, fig. 96). It can be suggested that 1094, when the See was formally moved to Norwich, was the year when the citizens of Norwich first felt the dramatic effects of the Norman ecclesiastical establishment on their town although Heywood (1996, 74) has suggested that construction work could have started as early as 1091. In either case, construction work must have been well underway by 1096 when Bishop Herbert laid the foundation stone (Heywood 1996, 73–4). Evidence of an axial chapel, underlying the most eastern part of the cathedral was uncovered by Dean Cranage in 1930 (Cranage 1932). Fernie (1993, 19–23) suggests that this was intended to form the east end of the Norman cathedral, but a change in design led to a re-alignment and the construction of the horseshoe-shaped St Saviour's Chapel. This re-alignment also indicates that building work on the site may well have commenced before 1096 (Heywood 1996, 82–84). As noted above there is no evidence of a period of abandonment between the Late Saxon townscape and preparation of the ground for construction of the refectory, the building of which did not commence until c.1120, twenty-four years after the laying of the foundation stone. There was also no indication of the site being utilised for any specific function during this period, unlike part of the Lower Close which may been the location for a smithy producing metal fixings for the cathedral construction (Atkin and Evans 2002, 65). The refectory building was completed by 1145.

The refectory

The lowering of the ground level during this excavation revealed the lower parts of the refectory walls which had not been affected by later alterations and demolition. The original internal faces of the north, east and south walls were observed. The flintwork was seen to be evenly coursed with the inclusion of some ashlar blocks. Put-log holes for supporting scaffolding were also present in the south wall.

Other excavated evidence included construction details for the walls and for two respond bases. The technique employed in the wall foundations, of banded layers of flint with sand and clay, is one frequently seen in Norwich for Norman buildings. Similar methods were recently seen in the foundations for the Keep at Norwich Castle (Wallis 2003) and also in a later construction at Norwich Greyfriars (Emery forthcoming). Footings for the respond bases adjoining the north and south walls at the east end of the refectory were of the same construction. They were built after the foundations for the main walls had been completed, although the above-ground structures were contemporary with the wall, demonstrating that from an early stage they were part of the design of the building. It is probable that these responds supported an internal north-to-south arcade which divided the 'high end' of the refectory from the remainder of the hall. The presence of such an arcade has already been suggested by Heywood (Pevsner and Wilson 2002) based on the presence of a buttress on the north side of the north refectory wall which would only have been necessary if such an arcade had existed. The presence of a recess in the south face of the north wall also supports this theory, as this recess would allow the intra-mural passage to pass behind the upright of an arcade (Fig. 43).

The dimensions of the building suggest that a tripartite arcade was necessary to span the width of the refectory and give the necessary height, a design which would have also allowed a line of sight down the centre of the building to and from the high end (cover image). Unfortunately later truncation had destroyed any evidence of other pillar bases which could have confirmed this interpretation or suggested an alternative.

The floor level within the refectory was identified at c.5.2m OD, despite the fact that later truncation had removed much of the evidence. The remnants found were unlikely to be from the original floor, but could represent the paving of the refectory documented as occurring in 1455 (Gilchrist 1997, 12). The floor may have consisted of 14th- to 15th-century Flemish yellow and green tiles (which were found in later contexts), but as none was found *in situ* it is possible that the tiles originated from another monastic building.

A section of a lead water pipe leading between the refectory and the cloister and probably passing under the threshold of the west door into the cloister was found. This probably served the *lavatorium* which was located in the south-west corner of the cloister. Cleanliness was an important principle of the Benedictine Rule (Doyle 1948) and all monasteries had provision for washing close to the refectory entrance. The location of rectangular troughs in the cloister by the refectory door with cupboards on the other side of the door in which 'sweet and clean' towels were kept (Greene 1992, 116) was not uncommon. Such cupboards are present within the structure of the north wall of the refectory at Norwich. The presence of a

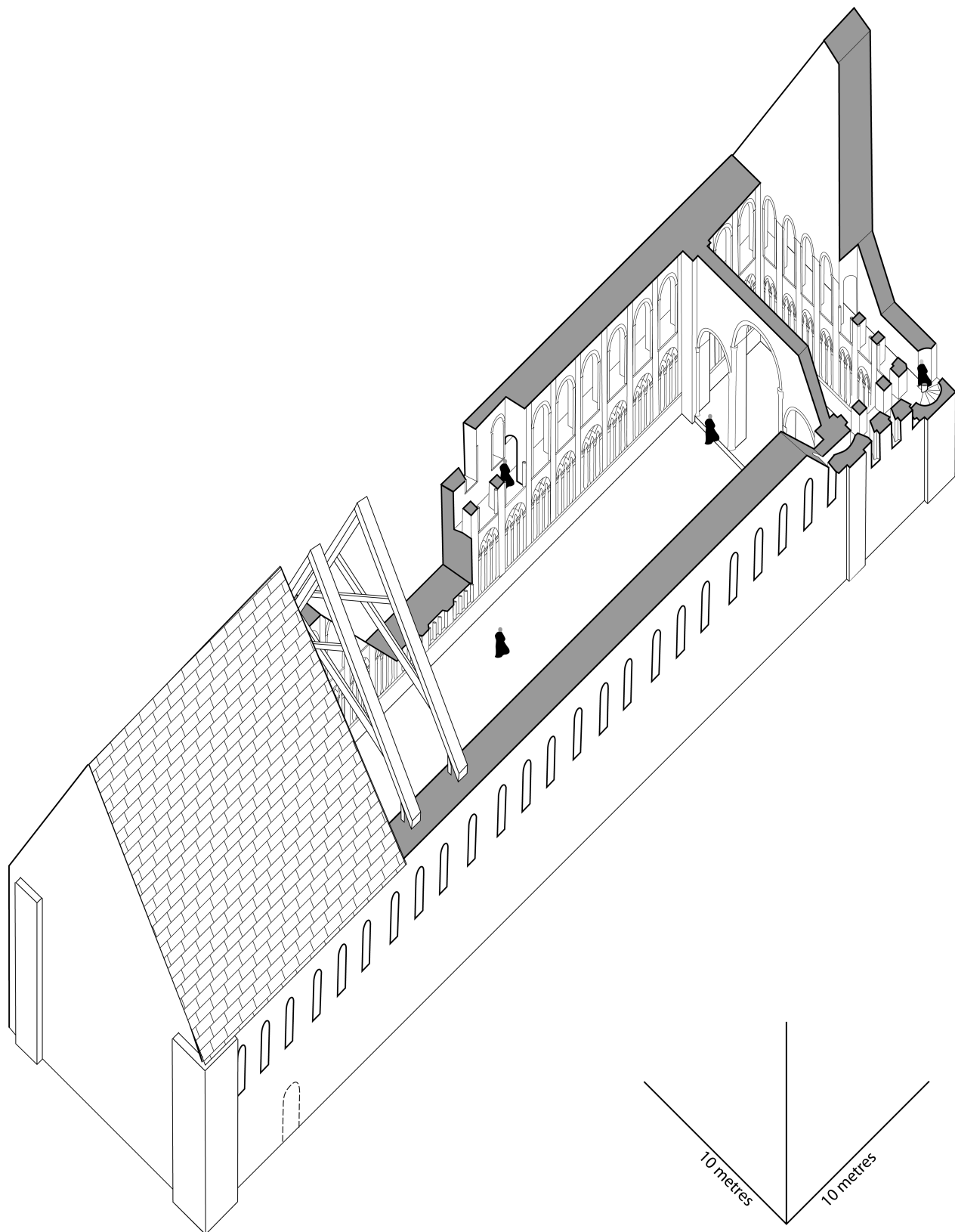


Figure 43 Axonometric reconstruction of the refectory of Norwich Cathedral Priory as it may have appeared before the fire of 1272. *Reproduced with permission from Gilchrist (2005); drawn by Margaret Mathews, copyright retained.*

beamslot, in line with the east door jamb, suggests that a screen may have separated this entranceway and the cupboards from the remainder of the hall.

It is unlikely that the pipe dated to the original build of the refectory as lead pipes were not in common use at this time. It is not known when the water management system

was instigated at Norwich but a segment of a Great Drain uncovered within the Close dates from the latter part of the 12th century (Percival 2001, 12), a time when a number of monasteries were introducing such systems (Bond 2001, 112). It is possible that this pipe could have been inserted at this time, although it is perhaps more likely to date from the

early 15th century when the doorway between the refectory and the cloister was enlarged and the present *lavatorium* basins inserted (Pevsner and Wilson 2002, 216). A storeroom with a pipe leading to it is also referred to in the Communar Rolls of the 15th century (Gilchrist 1997, 12).

The other unusual features encountered during the excavation were two below-ground stone-lined chambers. No parallels for this type of feature within a refectory have been found by the author in the published archaeological record. It is apparent that these stone-lined chambers were not backfilled in any way prior to the disuse of the refectory at the suppression. As no debris had accumulated within them during the medieval period it must be assumed that they were covered, perhaps by floorboards. The larger, more westerly of these chambers included moulded stonework of late 13th- to 14th-century date, illustrating that it was not contemporary with the original build. The eastern chamber did not survive as well and contained no dating evidence for its construction. It is therefore uncertain whether these were contemporary or consecutive features. Despite their similar construction it is possible that each served a different purpose.

One suggestion is that they were sounding boxes designed to help project the voice of a reader who would have recited to the monks while they maintained silence when taking their meals (Doyle 1948). Such underground chambers are not unknown, although they usually contain pottery vessels to amplify the sound. An example of such acoustic pots located in a hollow space under the floorboards has been recorded in the choir of St Peter's per Moutergate, Norwich (Merrifield 1987, 122, fig.5). One of the walls of the eastern chamber survived to a height above that of the projected floor level, suggesting that it may have supported an above ground structure, possibly a pulpit. A pulpit or lectern was provided for readings, a cover for which was purchased in 1306 (Gilchrist 1997, 12). An alternative suggestion is that either one or both of these pits could be secure storage chambers used for the safe keeping of the monastery's precious objects (Gilchrist 2005, 129). An underground chamber, possibly of 14th-century date, for the safe keeping of money, gold and silver exists at the papal palace at Avignon.

Other monastic buildings

Evidence for the fenestration of the Lady Chapel, which was built by Bishop Walter de Suffield (1247–57), was found during the excavation. Very little is known of this chapel as it fell into disrepair shortly after the suppression of the cathedral priory and was later demolished. Not enough of the window glass was present in the excavated deposits to allow a reconstruction of the designs, although figures and architectural features were present along with grissaille work.

Similarly very little is known about the chapter house at Norwich Cathedral. In its original form it had a semi-circular apse which was revealed by excavations in 1889 (Bensley 1908, 44). This was damaged during the riots of 1272 and, over the following 20 years, work took place to rebuild it with a polygonal apse at the east end. Again little is known about this second chapter house but what can be deduced is summarised by Woodman (1996, 163–5).

The watching brief encountered the north wall of the chapter house which was almost 2.6m wide. This is very thick for a single wall and either represents a point where the early and late builds diverged or a point where there is a

thickening of the wall to accommodate part of an architectural design such as a respond. Much of the medieval moulded stone with polychrome painted designs found during the main excavation probably originated from the chapter house. This conclusion has been reached by the similarity of the decorative mouldings found with those from the only extant part of the building, the entrance to the chapter house from the cloister. At least two differing black and red schemes were noted on the painted stonework with a third scheme being mainly based on white. The unifying theme was to highlight the contours of the mouldings. Three other decorative patterns were noted; scrollwork design; masonry pattern; and rose with stem. These are on flat ashlar blocks so their provenance cannot be determined.

The east range was a two-storey building constructed in the early 12th century with two stairways leading from the cloister, one up to the monks' dormitory and the other down to the undercroft. The northern part of the undercroft at Norwich was used as a warming house while the southern part may have used for the novices or as a storage area. These two areas were separated by a passage (built in the 13th century) linking the Dark Entry to the Priors Hall. The remains of the undercroft were depicted in a water-colour painted by David Hodgeson in 1832 (Plate 17). Whittingham (1938) has suggested that such vaulting continued for the full length of the east range extending beyond the limit of the south claustral range towards the infirmary.

Sections of medieval walls, crossing the width of the range were identified, the locations of which broadly align with Whittinghams suggested location of pillars of the undercroft arcade. The width of these walls was not great and so suggests that they were not load-bearing. Their presence indicates that the warming room may have been divided into a number small areas. As the date for these walls was not established it is possible that they represent later alterations and subdivisions. The two walls defining the Prior's passage were identified and evidence of the tiled floor within this passage revealed. For the first time the level of the floor was identified, laying at *c.*3.75m OD (*c.*1.45m below that of the refectory and *c.*0.9m below the floor of the cloister walk). To the south of this passage a north-to-south wall was recorded along with other east-to-west divisions. These show that this area, thought to be used by the novices, was divided into a number of smaller spaces. The most southerly of the medieval walls recorded, which was not particularly substantial, aligns with the possible south end of St Nicholas's Chapel as indicated by Whittingham. However its lack of width suggests that it was not a major structural element.

Watching brief work to the south of the refectory revealed medieval features including walls parallel with both the south refectory wall and the west dormitory wall. From these it can be suggested that a walkway was present running along the south of the refectory and the west of the dormitory. It is possible that they border an open space and one interpretation is that they were part of a second, smaller cloister.

Evidence for the infirmary itself was also represented by the presence of stone mouldings, some of which had been decorated with a red vermilion wash. This scrap of evidence can be added to that recorded in 1806 by Repton (Pierce 1968) when he illustrated the still extant parts of the infirmary.



Plate 17 Watercolour looking towards the south transept by David Hodgeson c.1832. *With permission of the Norfolk Records Office and the Chapter of Norwich Cathedral, NRO DCN 128/1*

Evidence relating to daily life and religious belief

A few items relating to the daily life and religious belief of the monks were found, the richest of which was a hand of a figurine from an enamelled cross made in Limoges, France. The production of religious items was established in Limoges during the second half of the 12th century and had become a thriving industry by the early years of the 13th century with products being exported across the whole of Europe (Cherry 2001). Despite the large number of such devotional objects being manufactured this remains a rare archaeological find. Other items from this site which are often found in religious contexts included hand bells and a book clasp.

Objects of daily use included items of riding equipment as well as simple pins probably used to fasten robes. One fragment of a stone mould is the only evidence of any craft activity being carried out in the vicinity.

As far as the diet of the monks is concerned, it is known that it was limited by the Rule of St Benedict which decreed that 'all except the sick who are very weak should

abstain entirely from eating the meat from footed beasts' (Doyle 1948, ch. 39). By the 14th century, however, this instruction seems to have been evaded by applying the ruling only to meals taken in the refectory, and in many monasteries a second dining area was made although there is no architectural or documentary evidence for this at Norwich. According to Dodwell (1996, 238) one must assume the refectory was divided in some way because by the end of the 13th century pork, mutton and beef were being bought for the monks at Norwich to be consumed on the four meat days. On fish days, herring, whiting, cod, roach and eels predominated (Nichols 1999, 12, based on Dodwell 1996). The evidence from the site, though scant, suggests a high-status diet, with porpoise, lapwing and woodcock as well as fish. A better idea of medieval diet in the monastery could be gained by excavation in areas beyond the living quarters of the monks.

Early post-medieval

The suppression of the cathedral priory in 1538 saw the demolition of many of the communal buildings. It is clear that with the demolition of the upper parts of the refectory, entranceways were made into the area through the south wall of the building. This would have permitted the materials recovered from the refectory to be easily removed from site and allowed access to the area for the dumping of materials from other demolished buildings. Much of the building stone, roofing and window lead, tiles and fixtures and fittings were reclaimed. The lack of such items within the demolition deposits indicates the magnitude and success of the salvage effort.

Many of the large pits containing demolition debris were dug for the express purpose of disposing of this waste material. It is possible, however, that the larger pits located towards the east end of the refectory may have been dug in order to undermine the arcade separating the high end from the remainder of the hall. Such features have recently been recorded during excavations at Norwich Whitefriars (Shelley 2004, 14)

Elements from the chapter house, infirmary and Lady Chapel were found in the demolition deposits within the refectory. The exact date of the demolition of these buildings cannot be firmly established, but documentary evidence suggests that the chapter house was destroyed shortly after the suppression, with the area being totally cleared by 1569 when it was let to William Cantrell. This area was described in the Minute Books as 'the parcel of voyd ground late builded called the chapter house' (Williams and Cozens-Hardy 1953). This is supported by the presence of several architectural fragments, which possibly originated from the chapter house, in contexts dating to the period following the Dissolution. Demolition of the Lady Chapel occurred during the reign of Elizabeth I (1558–1603) when the lead was stripped from the roof and the Lady Chapel fell down (Sansbury 1994, 32). Again the presence of demolition debris, this time in the form of window glass, accords with the documented date of demolition. Much more of the infirmary building remained intact throughout this and the post-medieval period, although the presence of some worked stone from this building indicates that some demolition took place at this time.

Post-medieval

Property 36

Built *c.* 1620, this house occupied much of the area which once formed the refectory. Prior to the creation of this property the ground level was raised. This process was carried out with some consideration to the future use of the land, as soils containing a higher percentage of building rubble were deposited in the area which was to be the building plot, while the remainder of the area was built up using soils more suitable for cultivation. In the survey of 1649 the house itself is described as lying in part over the Dark Entry, containing four rooms on the first floor and a fair cellar under the kitchen, with five small chambers over them and a garret, with a yard, garden plot and orchard enclosed with a stone wall (Mettters 1985, 39).

A description of the property in 1861 indicates that the buildings in the garden included a wash-house, three privies and a dustbin, a small building used as a tool-house

and a 'building in the garden attached to this house being a second kitchen and workshop under it' (Gilchrist 1997, 13). This house is also illustrated by David Hodgeson *c.* 1832 (Plate 17 on the left) and at the time of its demolition in 1873 by John Henry Brown (Plate 5).

The excavated elements consisted of the cellar and some remnants of the outbuildings. Additional features uncovered included a large 'cool house', a walled refuse pit and a number of water management features. The layout of the garden was also recorded. Initially the garden consisted of a series of linear beds containing well draining soils. This, along with the south-facing aspect of the garden, suggests that sun-loving species, perhaps herbs, were planted, forming both an attractive and useful garden. An alteration to this layout occurred which saw the linear beds replaced by a series of smaller individual planting holes containing a large proportion of ash. One suggestion of an ash-loving plant is the rose, which would indicate a move towards a more visually attractive but less productive garden.

Trade, economy and daily life

The wealth of the local community was indicated by the number of imports dating from the late 16th century through to the 18th century. Pottery came not only from across England but also from the Continent (Germany, the Netherlands and France), while the glass items were also imported from the Low Countries, Germany, the Czech Republic and Italy (particularly Venice). The cloth seals also show that even in a region where cloth production formed one of the major industries, continental materials were still imported.

Other items from the post-medieval deposits reflected the mode of dress and included pins, lace tags and an ivory comb. Domestic items were well represented in the pottery assemblage with many utilitarian items being present (jars, bowls, dishes, chamber pots, watering cans) as well as a metal skimmer, a bone apple corer or scoop (17th century) and clay tobacco pipes (17th to 18th century). All of the glassware found would have been used in domestic situations, as table wares and storage vessels. This assemblage highlighted the wealth of the inhabitants, a fact which is also supported by the more decorative stonewares, slipwares and tin-glazed wares in the pottery assemblage.

Late 19th to early 21st century

Domestic use of the cloister and adjacent buildings came to an end in 1873 when the Dean and Chapter put into practice a plan which involved the demolition of buildings over and around the cloister. This was carried out with the express purpose of reducing the risk of fire in the cloisters. With the demolition of the house and outbuildings came the restoration of the Norman windows in the north wall of the refectory. The area was transformed into an open space albeit surrounded by the remains of the refectory walls. Since then the only alterations have been the addition of a stone stair turret in the north-east corner, built in 1915, and concrete stairs in the east end built in 1975.

This area remained an open space until the commencement of this archaeological project. A new refectory now stands on the site. The restored Norman windows in the north wall can be admired, as can the only remaining section (in the south east corner) of the

decorative blind-arcade which once extended around the interior of the medieval building. The north respond base for the arcade separating the greater part of the building from the high end has been preserved, and is visible. The

new floor level is 0.7m above that of the original refectory, and although an upper floor has been inserted into the space it is easy to see and reflect on the size and splendour of its medieval predecessor.

Bibliography

- Albarella, U., 1997a *The Medieval Animal Bones Excavated in 1996 from Coslany Street, Norwich, Norfolk*, AML Report 86/97 (London, English Heritage)
- Albarella, U., 1997b 'Size, power, wool and veal: zooarchaeological evidence for late medieval innovations', in De Boe, G. and Verhaeghe, F. (eds), *Environment and Subsistence in Medieval Europe: Papers of the 'Medieval Europe' Conference, Brugge 1997*, Vol. 9 (Zellik, I.A.P. Rapporten), 19–30
- Albarella, U., Beech, M. and Mulville, J., 1997 *The Saxon, Medieval and Post-Medieval Mammal and Bird Bones Excavated 1989–91 from Castle Mall, Norwich, Norfolk*, AML Report 72/97 (London, English Heritage)
- Albarella, U. and Davis, S., 1996 'Mammals and birds from Launceston Castle, Cornwall: decline in status and the rise of agriculture', *Circaea* 12 (1994), 1–16
- Allen, M., 2004 'The English currency and the commercialization of England before the Black Death', in Wood, D. (ed.), *Medieval Money Matters*, 31–50 (Oxford)
- Alsford, S., 1998 'History of medieval Ipswich', <<http://www.trytel.com/~tristan/towns/ipswic13.html>> [Last modified 11 November 2002]
- Amer, M., 1987 *'A study of medieval hand-querns in England'* (unpubl. undergraduate dissertation, Univ. of Southampton)
- Ames, J., 2001 'Clay tobacco pipes, kiln debris and clay moulds', in Percival, J.W., *Archaeological investigations at Nos 64 and 63/65 The Close, Norwich*, Norfolk Archaeological Unit Report 631
- Anderson, S., 2004 'Pottery', in Wallis, H., *Excavations at Mill Lane, Thetford 1995*, E. Anglian Archaeol. 108, 67–85
- Anderson, S., 2005a 'Ceramic building material', in Shelley, A., *Dragon Hall, King Street, Norwich: Excavation and Survey of a Late Medieval Merchant's Trading Complex*, E. Anglian Archaeol. 112, 89–96
- Anderson, S., 2005b 'Pottery', in Shelley, A., *Dragon Hall, King Street, Norwich: Excavation and Survey of a Late Medieval Merchant's Trading Complex*, E. Anglian Archaeol. 112, 129–52
- Anderson, S., forthcoming 'The pottery', in Donald, N. and Shelley, A., 'Excavations at Lacon's Brewery, Fuller's Hill, Great Yarmouth', *Norfolk Archaeol.*
- Andrews, P., 1995 *Excavations at Redcastle Furze, Thetford, 1988–9*, E. Anglian Archaeol. 72
- Aston, M., 1993 *Monasteries* (London, Batsford)
- Atherton, I., 1996 'The Close', in Atherton, I., Fernie, E., Harper-Bill, C. and Smith, H. (eds), *Norwich Cathedral. Church, City and Diocese, 1096–1996* (London, Hambledon Press), 634–64
- Atherton, I. and Morgan, V., 1996 'Revolution and Retrenchment: the Cathedral, 1630–1720', in Atherton, I., Fernie, E., Harper-Bill, C. and Smith, H. (eds), *Norwich Cathedral. Church, City and Diocese, 1096–1996* (London, Hambledon Press), 540–75
- Atkin, M., 1993 'The Norwich Survey 1971–1985: a retrospective view', in Gardiner, J. (ed.), *Flatlands and Wetlands: Current themes in East Anglian Archaeology*, E. Anglian Archaeol. 50, 127–43
- Atkin, M. and Evans, D.H., 2002 'Excavations in Northern Conesford, in and around the Cathedral Close', in Atkin, M. and Evans, D.H., *Excavations in Norwich 1971–1978 Part III*, E. Anglian Archaeol. 100, 7–67
- Atkin, S., 1985 'The clay pipe making industry in Norfolk', *Norfolk Archaeol.* 39, 118–49
- Atkin, S. and Peacey, A., forthcoming 'Clay tobacco pipes and kiln material', in Shepherd Popescu, E., *Norwich Castle: Excavations and Historical Survey, 1987–98*, E. Anglian Archaeol.
- Ayers, B.S., 1996 'The Cathedral Site before 1096', in Atherton, I., Fernie, E., Harper-Bill, C. and Smith, H. (eds), *Norwich Cathedral. Church, City and Diocese, 1096–1996* (London, Hambledon Press), 59–72
- Ayers, B.S., 2003 *Norwich: 'A Fine City'* (Stroud, Tempus)
- Backhouse, J., 1997 *The Illuminated Page: ten centuries of manuscript painting in the British Library* (London)
- Ball, D.F., 1964 'Loss-on-ignition as an estimate of organic matter and organic carbon in non-calcareous soils', *J. Soil Sci.* 15, 84–92
- Bensley, W.T., 1908 'The Diocese and Cathedral Church of Norwich', in Astley, H.J. (ed.), *Memorials of Old Norfolk* (London, Bemrose and Sons)
- Berry, G., 1988 *Seventeenth-Century England: Traders and their Tokens* (London)
- Berthelot, S., Marin, J-Y. and Rey-Delqué, M., 2002 *Vivre au Moyen Age: Archéologie du Quotidien en Normandie, XIIIe–XVe Siècles*. (Milan, catalogue of exhibition held at Caen, Toulouse and Evreux)
- Besly, E. and Bland, R., 1983 *The Cunetio Treasure. Roman Coinage of the Third Century AD* (London)
- Biddle, M., 1990 'Dress and Hair Pins', in Biddle, M. (ed.), *Object and Economy in Medieval Winchester* (Winchester Studies vol. 7, ii), 552–60
- Biddle, M. and Hinton, D.A., 1990 'Copper-alloy bells', in Biddle, M. (ed.), *Object and Economy in Medieval Winchester* (Winchester Studies vol. 7, ii), 725–8
- Bloch, P.A., 1992 *Romanische Bronzekruzifixe, Denkmäler Deutscher Kunst, Bronzegeräte des Mittelalters vol. 5* (Berlin, Deutscher Verlag für Kunstwissenschaft)
- Blomefield, F., 1806 *The History of the City and County of Norwich, Part 2* (Norwich)
- Bond, J., 2001 'Monastic water management in Great Britain: a review', in Keevil, G., Aston, M. and Hall, T. (eds), *Monastic Archaeology: Papers on the Study of Medieval Monasteries*, (Oxford, Oxbow), 88–136
- Braunfels, W., 1993 *Monasteries of Western Europe. The Architecture of the Orders*, 1993 edition (London, Thames and Hudson)
- Britton, F., 1986 *London Delftware* (London, Jonathan Horne)
- Brown, P. (ed.), 1984 *Domesday Book: Norfolk* (Chichester)
- Brunskill, R.W., 1990 *Brick Building in Britain* (London, Victor Gollancz)

- Bucklow, S., 2003 'Patterns of Loss', in Massing, A. (ed.), *Thornham Parva Retable* (London, Harvey Miller)
- Bullock, P., Fedoroff, N., Jongerius, A., Stoops, G. and Tursina, T., 1985 *Handbook for Soil Thin Section Description*. (Wolverhampton, Waine Research Publications)
- Campbell, J., 1996 'The East Anglian Sees before the Conquest', in Atherton, I., Fernie, E., Harper-Bill, C. and Smith, H. (eds), *Norwich Cathedral. Church, City and Diocese, 1096–1996* (London, Hambledon Press), 3–21
- Canti, M., 1998 'Origin of calcium carbonate granules found in buried soils and Quaternary deposits', *Boreas* 27, 275–88
- Chase, W., 1783 *The Norwich Directory* (Norwich)
- Cherry, J., 2001 'Enamels', in Saunders, P. (ed.), *Salisbury and South Wiltshire Museum Medieval Catalogue 3* (Salisbury and South Wiltshire Museum), 38–42
- Chibnall, M., 1993 *Anglo-Norman England 1066–1166* (Oxford, Blackwell)
- Clark, J. (ed.), 2004 *The Medieval Horse and its Equipment c.1150–c.1450*, new edition (Woodbridge, The Boydell Press)
- Cocke, T., 1996 'Changes not decay: an account of the post-medieval fabric', in Atherton, I., Fernie, E., Harper-Bill, C. and Smith, H. (eds), *Norwich Cathedral. Church, City and Diocese, 1096–1996* (London, Hambledon Press), 705–27
- Cranage, D.H.S., 1932 'Eastern chapels in the cathedral church of Norwich', *Antiq. J.* 12, 117–36
- Cranage, D.H.S., 1935 'Eastern chapels in the cathedral church of Norwich', *Norfolk Archaeol.* 25, 71–82
- Crowther, J. and Barker, P., 1995 'Magnetic susceptibility: distinguishing anthropogenic effects from the natural', *Archaeological Prospection* 2, 207–15
- Dallas, C., 1984 'The pottery', in Rogerson, A. and Dallas, C., *Excavations in Thetford 1948–59 and 1973–80*, E. Anglian Archaeol. 22, 117–66
- Davis, S., 1992 *A Rapid Method for Recording Information about Mammal Bones from Archaeological Sites*, AML Report 71/92 (London, English Heritage)
- Dick, W.A. and Tabatabai, M.A., 1977 'An alkaline oxidation method for the determination of total phosphorus in soils', *J. Soil Sci. Soc. Am.* 41, 511–14
- Dickinson, M., 1986 *Seventeenth Century Tokens of the British Isles and their Values* (London)
- Dodwell, B., 1996 'The Monastic Community', in Atherton, I., Fernie, E., Harper-Bill, C. and Smith, H. (eds), *Norwich Cathedral. Church, City and Diocese, 1096–1996* (London, Hambledon Press), 231–54
- Doyle, L.J., 1948 *St Benedict's Rule for Monasteries* (Collegeville, Minnesota, The Liturgical Press)
- Drury, P., 1993 'Ceramic building materials', in Margeson, S., *Norwich Households: Medieval and Post-Medieval Finds from Norwich Survey Excavations 1971–78*, E. Anglian Archaeol. 58, 163–8
- Dyer, C., 1997 'Peasants and coins: the uses of money in the Middle Ages' *Brit. Numis. J.* 68, 30–47
- Egan, G., 2001 'Cloth seals', in Saunders, P. (ed.), *Salisbury and South Wiltshire Museum Medieval Catalogue 3*, (Salisbury and South Wiltshire Museum), 43–86
- Egan, G., 2002 'Cloth seals: archaeological evidence for an aspect of regulation in the textile trade in the late Middle Ages and the early modern era', in Helmig, G., Scholkmann, B. and Untermann, M. (eds), *Preprinted Papers for Medieval Europe, Basel 2002* (1.2 Innovation, Communication, Interaction), 268–77
- Egan, G., forthcoming a 'Lead Water Pipes', in Emery, P., *Norwich Greyfriars, Excavations at the Former Mann Egerton Site, Prince of Wales Road, Norwich 1992–5*, E. Anglian Archaeol.
- Egan, G., forthcoming b *Salisbury and South Wiltshire Museum Medieval Catalogue*. Part 4.
- Egan, G., forthcoming c Report on finds from the site of Bermondsey Abbey, Museum of London Archaeology Service Monograph
- Emery, P., 2000 *Report on an Archaeological Evaluation at Busseys Garage, Palace Street, Norwich*, Norfolk Archaeological Unit Report 498
- Emery, P., forthcoming *Norwich Greyfriars, Excavations at the Former Mann Egerton Site, Prince of Wales Road, Norwich 1992–5*, E. Anglian Archaeol.
- Evans, D.H. and Atkin, M., 2002 'General Discussion', in Atkin, M. and Evans, D.H., *Excavations in Norwich 1971–1978 Part III*, E. Anglian Archaeol. 100, 235–46
- Fanning, T., 1976 'Excavations at Clontuskert Priory, Co. Galway', *Proc. Roy. Ir. Acad.* 76.C.5, 97–169
- Fernie, E.C., 1981 'Two aspects of Walter de Suffield's Lady Chapel at Norwich Cathedral', in Omrod, W.M. (ed.), *England in the Thirteenth Century*, Proceedings of the 1984 Harlaxton Symposium (Harlaxton), 52–5
- Fernie, E.C., 1993 *An Architectural History of Norwich Cathedral* (Oxford, Clarendon Press)
- Fernie, E.C. and Whittingham, A.B., 1972 *The Early Communal and Pitancer Rolls of Norwich Cathedral Priory with an Account of the Building of the Cloisters*, Norfolk Record Soc. 41
- Feuarent, F., 1915 *Jetons et mereaux depuis Louis IX jusqu'a la fin du Consulat de Bonaparte*, Volume III (Paris)
- Ffoulkes, C.J., 1916 *Inventory and Survey of the Armouries of the Tower of London* (London, HMSO)
- Franklin, J., 1980 'Twelfth Century', in Borg, A., Franklin, J., Sekules, V., Sims, A. and Thomson, D., *Medieval Sculpture from Norwich Cathedral* (Norwich, Sainsbury Centre for Visual Arts)
- Gaimster, D., 1990 'A late medieval cast copper-alloy stirrup from Old Romney, Kent', *Medieval Archaeol.* 34, 157–60
- Gaimster, D., 1997 *German Stoneware 1200–1900. Archaeology and cultural history* (London, British Museum Press)
- Gilchrist, R., 1994 *An Archaeological Desk-based Assessment of Three Areas of Proposed New Development at Norwich Cathedral* (unpublished)
- Gilchrist, R., 1997 *Norwich Cathedral Archaeology: Archaeological Report to accompany Planning Application for Visitors Centre* (unpublished)

- Gilchrist, R., 2005 *Norwich Cathedral Close: the Evolution of the English Cathedral Landscape* (Woodbridge, The Boydell Press)
- Goffin, R., 2005 'The pottery', in Shelley, A. and Tremlett, S., 'Excavations at St Peter's Street, Norwich, 2001', *Norfolk Archaeol.* 44, 662–666
- Goodall, A.R., 1984 'Non-ferrous metal objects' in Rogerson, A. and Dallas, C., *Excavations in Thetford 1948–59 and 1973–77*, E. Anglian Archaeol. 22, 68–75
- Goodall, I.H., 1984 'Iron objects', in Rogerson, A. and Dallas, C., *Excavations in Thetford 1948–59 and 1973–77*, E. Anglian Archaeol. 22, 76–105
- Goodall, I.H., 1990 'Bridle bits and associated strap-fittings', in Biddle, M. (ed.), *Object and Economy in Medieval Winchester* (Winchester Studies vol. 7, ii), 1043–6
- Goodall, I.H., 1993a 'Structural Ironwork', in Margeson, S., *Norwich Households, Medieval and Post-Medieval Finds from Norwich Survey Excavations 1971–78*, E. Anglian Archaeol. 58, 143–8
- Goodall, I.H., 1993b 'Iron horse equipment', in Margeson, S., *Norwich Households, Medieval and Post-Medieval Finds from Norwich Survey Excavations 1971–78*, E. Anglian Archaeol. 58, 223–5
- Gooder, E., 1984 'The finds from the cellar of the Old Hall, Temple Balsall, Warwickshire', *Post-Medieval Archaeol.* 18, 149–249
- Graham, I.D.G. and Scollar, I., 1976 'Limitations on magnetic prospection in archaeology imposed by soil properties', *Archaeo-Physika* 6, 1–124
- Green, C., 1999 *John Dwight's Fulham Pottery: excavations 1971–79* (London, English Heritage)
- Greene, J.P., 1992 *Medieval Monasteries* (Leicester, Leicester University Press)
- Guildhall Museum, 1908 *Catalogue of the Collection of London Antiquities in the Guildhall Museum*, 2nd edition (London, Corporation of London)
- Gurney, D., 1986 *Settlement, Religion and Industry on the Fen Edge; Three Romano-British Sites in Norfolk*, E. Anglian Archaeol. 31
- Harman, M. (with Baker, J. and Bramwell, D.), 1985 'The birdbones', in Atkin, M., Carter, A. and Evans, D.H., *Excavations in Norwich 1971–78 Part II*, E. Anglian Archaeol. 26, 222–3
- Haslam, J., 1985 'The glass', in Hassall, T.G., Halpin, C.E. and Mellor, M. 'Excavations in St Ebbe's, Oxford, 1967–1976 Part II: post-medieval domestic tenements and the post-Dissolution site of the Greyfriars', *Oxoniensia* 49, 232–49
- Haslam, J., 1993 'Glass Vessels', in Margeson, S., *Norwich Households: Medieval and Post-Medieval Finds from Norwich Survey Excavations 1971–78*, E. Anglian Archaeol. 58, 97–112
- Heywood, S., 1996 'The Romanesque Building', in Atherton, I., Fernie, E., Harper-Bill, C. and Smith, H. (eds), *Norwich Cathedral. Church, City and Diocese, 1096–1996* (London, Hambledon Press), 73–115
- Hinchliffe, J., 1985 *Excavations at Brancaster 1974 and 1977*, E. Anglian Archaeol. 23
- Hodge, C.A.H., Burton, R.G.O., Carbett, W.M., Evans, R., George, H., Heaven, F.W., Robson, J.D. and Seale, R.S., 1983 *Sheet 4 Eastern England. Soils of England and Wales* (Southampton, Ordnance Survey)
- Hodgson, J.M., 1974 *Soil Survey Field Handbook*, Technical Monograph 5 (Silsoe, Soil Survey and Land Research Centre)
- Horn, W. and Born, E., 1979 *The Plan of St Gaul (3 vols)* (Berkeley, University of California Press)
- Horne, J., 1989 *English Tin-glazed Tiles* (London, Jonathan Horne)
- Houlbrooke, R., 1996 'Refoundation and Reformation', in Atherton, I., Fernie, E., Harper-Bill, C. and Smith, H. (eds), *Norwich Cathedral. Church, City and Diocese, 1096–1996* (London, Hambledon Press), 507–39
- Howard, H., 2003 *Pigments of English Medieval Wall Paintings* (London, Archetype)
- Howard, H. and Park, D., 1996 'The Medieval Polychromy', in Atherton, I., Fernie, E., Harper-Bill, C. and Smith, H. (eds), *Norwich Cathedral. Church, City and Diocese, 1096–1996* (London, Hambledon Press), 379–409
- Howard, H. and Park, D., forthcoming 'Medieval oyster shell palette' and 'Appendix 6: medieval paint palettes', in Emery, P., *Norwich Greyfriars: Excavations at the Former Mann Egerton Site, Prince of Wales Road, Norwich, 1990–95*, E. Anglian Archaeol.
- Huddle, J., forthcoming a 'The copper alloy', in Emery, P.A., *Norwich Greyfriars: Excavations at the Former Mann Egerton Site, Prince of Wales Road, Norwich, 1990–95*, E. Anglian Archaeol.
- Huddle, J., forthcoming b 'Side link', in Emery, P.A., *Norwich Greyfriars: Excavations at the Former Mann Egerton Site, Prince of Wales Road, Norwich, 1990–95*, E. Anglian Archaeol.
- Huddle, J., forthcoming c 'Horse harness pendants and mounts', in Emery, P.A., *Norwich Greyfriars: Excavations at the Former Mann Egerton Site, Prince of Wales Road, Norwich, 1990–95*, E. Anglian Archaeol.
- Hughes, H. and Strong, S., 2004 'A shell containing pigment', in Rodwell, K. and Bell, R., *Acton Court, the Evolution of an Early Tudor Courtier's House* (London, English Heritage), 282–4
- Hurst, J., Neal, D.S. and van Beuningen, H.J.E., 1986 *Pottery produced and traded in North-West Europe, 1350–1650*, Rotterdam Papers 6
- Hutcheson, A. and Gilchrist, R., 2001 *Brief for Archaeological Excavation and Recording at Norwich Cathedral* (unpublished)
- Hutcheson, A. and Gilchrist, R., 2002 *Norwich Cathedral Refectory New Development: Archaeological Brief for Main Construction Phase* (unpublished)
- Jennings, S., 1981 *Eighteen centuries of pottery from Norwich*, E. Anglian Archaeol. 13
- Jennings, S., 1983 'The pottery', in Atkin, M., Ayers, B. and Jennings, S., *Thetford-type Ware Production in Norwich*, E. Anglian Archaeol. 17, 74–91
- Jennings, S., 2002 'The pottery', in Atkin, M., 'Excavations on the lower Close, Site 300N', in Atkin, M. and Evans, D.H., *Excavations in Norwich 1971–1978 Part III*, E. Anglian Archaeol. 100, 56–61

- Jennings, S., and Atkin, M., 1984 'A 17th-century well-group from St Stephen's Street, Norwich (Site 301N)', *Norfolk Archaeol.* 39, 13–37
- Kerridge, E., 1985 *Textile Manufactures in Early Modern England* (Manchester University Press)
- Ketton-Cremer, R.W., 1985 *Norfolk in the Civil War. A Portrait of a Society in Conflict* (Norwich, Gliddon Books)
- Kilmurry, K., 1980 *The Pottery Industry of Stamford, Lincs, c. AD 850–1250*, Brit. Archaeol. Rep. (British Series) 84
- King, D.J., 1987 'Window leads and ties', in Rogerson, A., Ashley, S.J., Williams, P. and Harris, A., *Three Norman Churches in Norfolk*, E. Anglian Archaeol. 32, 39–40
- Kirkham, A., 2005 *St Peter and St Paul, Bardwell, Suffolk, Emergency Stabilisation of the Polychrome on Two Hammerbeams during Building Work* (unpublished)
- Lentowicz, I., forthcoming a 'The pottery', in Shepherd Popescu, E., *Norwich Castle: Excavations and Historical Survey, 1987–98*, E. Anglian Archaeol.
- Lentowicz, I., forthcoming b 'The pottery', in Emery, P., *Norwich Greyfriars, Excavations at the Former Mann Egerton Site, Prince of Wales Road, Norwich 1992–5*, E. Anglian Archaeol.
- Lindburg, H., 2001 'Painted boards from Björsäter, Sweden', *COMPOTEC Project Seminar* (Peterborough)
- Lipski, L., 1984 *Dated English Delftware: tin-glazed earthenware 1600–1800* (London, Sotheby Publications)
- Lyons, A., in prep. 'The glass', in Percival, J.W. and Hutcheson, A.H., *Excavations within the French Borough (between Theatre Street and Bethel Street), Norwich, 1998–9*, E. Anglian Archaeol.
- MacGregor, A., 1991 'Antler, bone and horn', in Blair, J. and Ramsey, N., *English Medieval Industries, 355–78* (London, Hambledon Press)
- Macphail, R.I., 1994 'The reworking of urban stratigraphy by human and natural processes', in Hall, A.R. and Kenward H.K. (eds), *Urban-Rural Connexions: Perspectives from environmental Archaeology* (Oxford, Oxbow), 13–43
- Macphail, R.I., in prep. 'Micromorphology', in Donald, N. and Shelley, A., 'Excavations at Lacon's Brewery, Fuller's Hill, Great Yarmouth', *Norfolk Archaeol.*
- Macphail, R.I., 2003 *Scanian Road profiles (A1316 and A1317): Soil Micromorphology (with reference to chemistry)*, Laboratory for Environmental Archaeology, University of Umeå, Umeå
- Macphail, R.I. and Crowther, J., forthcoming 'Soil micromorphology with discussion of chemistry', in Whitmore, M., 'Excavations at the John Innes Centre, Colney, Norfolk', *Norfolk Archaeol.*
- Macphail, R.I., Crowther, J. and Cruise, G.M., forthcoming 'Microstratigraphy: soil micromorphology, chemistry and pollen', in Bowsher, D., Holder, N., Howell, I. and Dyson, T. (eds), *The London Guildhall: the archaeology and history of the Guildhall precinct from the medieval period to the 20th century*, (London, Museum of London Archaeological Service)
- Macphail, R.I. and Linderholm, J., in press 'No. 1, Poultry (Roman): soil micromorphology', in Hill, J. (ed.), *Roman Poultry* (London, Museum of London)
- Mainman, A.J. and Rogers, N.S.H., 1999 'Craft and Industry', in MacGregor, A., Mainman, A.J. and Rogers, N.S.H., *Craft, Industry and Everyday Life: Bone Antler, Ivory and Horn from Anglo-Scandinavian and Medieval York*, The Archaeology of York 17/12, 1903–22 (York, CBA)
- Mainman, A.J. and Rogers, N.S.H., 2000 *Craft, Industry and Everyday Life: Finds from Anglo-Scandinavian York*, The Archaeology of York 17/14 (York, CBA)
- Margeson, S., 1993 *Norwich Households: the Medieval and Post-Medieval Finds from Norwich Survey Excavations 1971–1978*, E. Anglian Archaeol. 58
- Margeson, S., 1995a 'The non-ferrous metal objects', in Rogerson, A., *A Late Neolithic, Saxon and Medieval Site at Middle Harling, Norfolk*, E. Anglian Archaeol. 74, 53–68
- Margeson, S., 1995b 'The iron objects', in Rogerson, A., *A Late Neolithic, Saxon and Medieval Site at Middle Harling, Norfolk*, E. Anglian Archaeol. 74, 69–78
- Margeson, S., Seillier, F. and Rogerson, A., 1994 *The Normans in Norfolk* (Norfolk Museums Service)
- Margeson, S. and Williams, V., 1985 'The artefacts', in Ayers, B.S., *Excavations within the North-East Bailey of Norwich Castle, 1979*, E. Anglian Archaeol. 28, 27–48
- Marks, R., 1993 *Stained Glass in England During the Middle Ages* (London, Routledge)
- Marks, R., 1996 'The thirteenth-century glazing of Salisbury Cathedral', in Keen, L. and Cocke, T. (eds), *Medieval Art and Architecture at Salisbury Cathedral* (British Archaeological Association Conference Transactions 17), 106–120
- Marks, R. and Morgan, N., 1981 *The Golden Age of English Manuscript Painting 1200–1500* (New York, Braziller)
- Meeres, F., 1998 *Guide to the Records of Norwich Cathedral* (Norwich)
- Mellor, M., 1976 'The pottery', in Rogerson, A., *Excavations on Fuller's Hill, Great Yarmouth*, E. Anglian Archaeol. 2, 169–96
- Merrifield, R., 1987 *The Archaeology of Ritual and Magic* (London, Batsford)
- Mettters, G.A. (ed.), 1985 *The Parliamentary Survey of Dean and Chapter Properties in and around Norwich in 1649*, Norfolk Record Soc. 51
- Mitchiner, M., 1988 *Jetons, Medalets and Tokens 1: the medieval period and Nuremberg* (London)
- Mitchiner, M., 1991 *Jetons, Medalets and Tokens 2: the Low Countries and France* (London)
- Moreno-Garcia, M., forthcoming 'Mammal and avian bone', in Shepherd Popescu, E., *Norwich Castle: Excavations and Historical Survey, 1987–98*, E. Anglian Archaeol. chapter 9
- Mould, Q. with Youngs, S., 2004 'Harness fittings', in Wallis, H., *Excavations at Mill Lane, Thetford 1995*, E. Anglian Archaeol. 108, 43–4
- Murphy, C.P., 1986 *Thin Section Preparation of Soils and Sediments*. (Berkhamsted, AB Academic Publishers)
- Nichols, J., 1999 *The Black Monks' Workshop: an introduction to Norwich Cathedral Cloister and Priory* (Norwich)

- North, J.J., 1991 *English Hammered Coinage. Volume 2: Edward I to Charles II, 1272–1662* (London)
- O'Connor, T.P., 1999 *Bones from Anglo-Scandinavian Levels at 16–22 Coppergate, The Archaeology of York 15/3* (London, CBA)
- Oakley, G., 1979 'The copper alloy objects', in Williams, J., *St Peter's Street, Northampton Excavations 1973–1976*, Northampton Development Corporation Archaeological Monograph 2, 248–64
- Orton, C. and Pearce, J., 1984 'The pottery', in Thompson, A., Grew, F. and Schofield, J., 'Excavations at Aldgate, 1974', *Post-Medieval Archaeol.* 18, 34–68
- Oswald, A., 1975 *Clay Pipes for the Archaeologist*, Brit. Archaeol. Rep. (British Series) 14
- Ottaway, P., 1992 *Anglo-Scandinavian Ironwork from Coppergate, The Archaeology of York 17/6* (London, CBA)
- Ottaway, P. and Rogers, N., 2002 *Craft, Industry and Everyday Life: Finds from Medieval York, The Archaeology of York 17/15* (London, CBA)
- Palmer N.J. and Mayhew N.J., 1977 'Medieval coins and jettons from Oxford excavations', in Mayhew, N.J. (ed.), *Edwardian Monetary Affairs (1279–1344)*, 81–95 (Oxford)
- Park, D. and Howard, H., 1996 'The medieval polychromy', in Atherton, I., Fernie, E., Harper-Bill, C. and Smith, H. (eds), *Norwich Cathedral. Church, City and Diocese, 1096–1996* (London, Hambledon Press), 379–409
- Peck, C.W., 1964 *English Tin and Bronze Coins in the British Museum, 1558–1958* (London)
- Percival, J.W., 2001 *Archaeological Investigations at Nos 64 and 63/65 The Close, Norwich*, Norfolk Archaeological Unit Report 631
- Pevsner, N. and Wilson, B., 2002 'The Cathedral of the Holy and undivided Trinity as revised by Stephen Heywood', *The Buildings of England. Norfolk 1: Norwich and North-East*, 188–231
- Pierce, S.R. (ed.), 1968 *John Adey Repton and Norwich Cathedral at the end of the Eighteenth Century* (Farnborough, Gregg Press)
- Ramsay, G.D., 1965 *The Wiltshire Woollen Industry in the 16th and 17th Centuries* (Oxford)
- Read, B., 1995 *History Beneath Our Feet* (Ipswich, Anglia Publishing)
- Rogerson, A. and Dallas, C., 1984 'The bone and antler objects', in *Excavations in Thetford 1948–59 and 1973–80*, E. Anglian Archaeol. 22, 167–84
- Sansbury, E., 1994 *An Historical Guide to Norwich Cathedral* (Wymondham)
- Saunders, H.W., 1930 *An Introduction to the Obedientary and Manor Rolls of Norwich Cathedral Priory* (Norwich)
- Shelley, A., 1996 *An Evaluation and Survey at the South and West Ranges of Norwich Cathedral Cloister*, Norfolk Archaeological Unit Report 200
- Shelley, A., 2001a The Refectory, Norwich Cathedral: Project Design for Archaeological Excavation and Recording, AS/1157/B
- Shelley, A., 2001b The Refectory, Norwich Cathedral: Project Design for Phase 2 Archaeological Excavation and Recording, AS/1157/D
- Shelley, A., 2002 Norwich Cathedral Refectory: Project Design for Phase 3 Archaeological Excavation and Monitoring, AS/1157/F
- Shelley, A., 2004 *Excavations and Building Recording at Jarrolds Printing Works, Whitefriars, Norwich: Assessment Report and Updated Project Design* Norfolk Archaeological Unit Report 908
- Shepherd, J.D., forthcoming 'Vessel Glass', in Emery, P., *Norwich Greyfriars, Excavations at the former Mann Egerton Site, Prince of Wales Road. Norwich 1992–5*, E. Anglian Archaeol.
- Shepherd Popescu, E., forthcoming *Norwich Castle: Excavations and Historical Survey, 1987–98*, E. Anglian Archaeol.
- Simon, A.L., 1944 *A Concise Encyclopaedia of Gastronomy. Section VI Birds and their eggs* (London, Wine and Food Society)
- Slowikowski, A., Nenk, B. and Pearce, J., 2001 *Minimum standards for the Processing, Recording, Analysis and Publication of Post-Roman Ceramics*, Medieval Pottery Research Group Occ. Pap. 2 (London)
- Smith, R., 1996 *Evaluation of Standing Buildings in relation to proposed new development on the sites of the former Hostry and Refectory* (unpublished)
- Stoops, G., 1996 'Complementary techniques for the study of thin sections of archaeological materials', in Castelletti, L. and Cremaschi, M. (eds), *XIII International Congress of Prehistoric and Protohistoric Sciences Forli-Italia-8/14 September 1996*, 175–82 (Forli, ABACO)
- Tanner, N., 1996 'The Cathedral and City', in Atherton, I., Fernie, E., Harper-Bill, C. and Smith, H. (eds), *Norwich Cathedral. Church, City and Diocese, 1096–1996* (London, Hambledon Press), 255–80
- Thoby, P., 1953 *Les Croix Limosins de la Fin du 12e Siècle au Debut du 14e Siècle* (Paris)
- Thomas, C., Sloane, B. and Phillpotts, C., 1997 *Excavations at the Priory and Hospital of St Mary Spital, London*, MoLAS Monograph 1 (Museum of London Archaeology Service)
- Tillyard, M., 1987 'Documentary evidence', in Ayers, B.S., *Excavations at St Martin-at-Palace Plain, Norwich, 1981*, E. Anglian Archaeol. 37, 134–50
- Tite, M.S. and Mullins, C.E., 1971 'Enhancement of magnetic susceptibility of soils on archaeological sites', *Archaeometry* 13, 209–19
- Turner, D., 1847 'On the subject of the crucifix discovered at Buckenham', *Norfolk Archaeol.* 1, 300–4
- Wainwright, G.J., 1972 'The excavation of a Neolithic settlement on Broome Heath, Ditchingham, Norfolk, England', *Proc. Prehist. Soc.* 38, 1–97
- Wallis, H., 2002a *Norwich Cathedral Refectory Phases 1 and 2: Assessment Report and Updated Project Design*, Norfolk Archaeological Unit Report 723
- Wallis, H., 2002b *Norwich Cathedral Refectory Phase 3. Assessment Report and Updated Project Design*, Norfolk Archaeological Unit Report 733
- Wallis, H., 2003 *Norwich Castle Redevelopment: Assessment Report and Updated Project Design*, Norfolk Archaeological Unit Report 755
- Walton Rogers, P., 1999 'Textile Making Equipment', in MacGregor, A., Mainman, A.J. and Rogers, N.S.H., *Craft, Industry and Everyday Life: Bone Antler, Ivory and Horn from Anglo-Scandinavian and*

- Medieval York, The Archaeology of York 17/12* (York, CBA), 1964–71
- Waterman, D.M., 1959 'Late Saxon, Viking and Early Medieval finds from York', *Archaeologia* 97, 59–105
- van der Wetering, E., 1997 *Rembrandt* (Amsterdam University Press)
- Whittingham, A.B., 1949 'Plan of Norwich Cathedral Priory', *Archaeol. J.* 106, 86 (also published as a separate sheet in 1938, and amended in 1975)
- Whittingham, A.B., 1985 'Description of the properties within the Cathedral Precinct', in Metters, G.A. (ed.), *The Parliamentary Survey of Dean and Chapter Properties in and around Norwich in 1649*, Norfolk Record Soc. 51
- Williams, V., 1994 'Non-ferrous metal objects', in Ayers B.S., *Excavations at Fishergate, Norwich, 1985*, E. Anglian Archaeol. 68, 14
- Williams, J.F. and Cozens-Hardy, B., 1953 *Extracts from the two earliest Minute Books of the Dean and Chapter of Norwich Cathedral, 1566–1649*, Norfolk Record Soc. 24
- Williamson, G.C., 1891 *Trade Tokens Issued in the Seventeenth Century in England, Wales, and Ireland, by Corporations, Merchants, Tradesmen, etc*, Volume II (London)
- Willmott, H., 2002 *Early Post-Medieval Vessel Glass in England c. 1500–1670*, Counc. Brit. Archaeol. Res. Rep. 132
- Wilson, R.G., 1996 'The Cathedral in the Georgian Period, 1720–1840', in Atherton, I., Fernie, E., Harper-Bill, C. and Smith, H. (eds), *Norwich Cathedral. Church, City and Diocese, 1096–1996* (London, Hambledon Press), 576–614
- Wilson, D.M. and Hurst, J.G., 1957 'Medieval Britain in 1956' *Medieval Archaeol.* 1, 147–78
- Woodman, F., 1996 'The Gothic Campaigns', in Atherton, I., Fernie, E., Harper-Bill, C. and Smith, H. (eds), *Norwich Cathedral. Church, City and Diocese, 1096–1996* (London, Hambledon Press), 158–96

Index

Note: page numbers in *italics* refer to illustrations, there may also be textual references on these pages. Locations are in Norwich unless otherwise stated.

- Alms Lane (Norwich) 54, 77
animal bones *see* bones, animal
antler working 10, 12, 18, 71, 72, 77, 78, 84
Antwerp, vessel glass from 57
ashlar 19, 21, 29, 30, 32, 36, 85, 87
Avignon (France), papal palace 87
- bakery 3
Barnack stone 32, 56
bells, copper alloy 49, 50–1, 88
Benedictine monastic order 1, 85, 88
Bermondsey Abbey (London) 52, 55
Bishopgate (Norwich) 84
Blomefield, F. 44
bombing raids, Second World War 82
bone objects 55, 71, 72
bone working 77, 84
bones, animal 14, 74–8, 84
 butchered 9, 10, 12, 14, 72, 74, 75, 76, 77, 78, 83
 pathology 74, 77
 birds, domesticated 77
 birds, wild 74, 77, 78
 canid 74, 76, 77, 78
 cat 76
 cattle 74, 77, 78, 83
 deer 74, 76, 77, 78
 dolphin 78
 equid 76
 fish 74, 77, 78
 galliformes 77, 78, 83
 geese 77, 83
 hare 74, 78
 pig 74–5, 77, 78
 porpoise 74, 76, 78
 rabbit 77, 83
 seal 74, 76
 sheep/goat 74, 75, 77, 78, 83
 turkey 77, 78
 whale 78
book-clasps, copper alloy 50, 51, 52, 88
bottle glass *see* vessel glass
Boyton Church (Wilts) 73
Brancaster (Norfolk) 56
brewhouse 3
brick and tile, Roman 9, 14, 18, 41, 84
bricks, medieval and post-medieval 26, 27, 29, 36, 40, 41
bridle boss, iron, Late Saxon 18, 53–4, 54, 55
brooch? pin, copper alloy 18, 49, 51
Brown, John Henry, prebendary's residence (illustr.) 27, 89
Buckenham (Norfolk) 52
buckles, iron 14, 55
Bussey's Garage (Norwich) 52
- Caen quarries, Normandy 32
came, lead 24, 47
Canterbury (Kent)
 Late Saxon activity 80
 St Augustine's Abbey 64
Cantrell, William 89
Castle (Norwich) 85
Castle Mall (Norwich) 60, 66, 77, 78, 84
Castleton, Prior William 3
Cathedral 2, 44, 81, 84, 85
 Ante-Reliquary chapel 73
 Civil War damage 3
 geology and topography 1
cellars 22, 26–7, 29
ceramic building materials 9, 14, 18, 20, 21, 23–4, 26, 36, 40–1
chapter house 1, 82, 87
 destruction of 3, 89
 glass from 43
 stone from 24, 26, 34
 chemistry 78–80
 Civil War 3
 clay tobacco pipes 26, 27, 29, 70, 89
 clench bolts, iron 15, 31, 32
 cloisters 2, 81, 87
 Clontuskert Priory (Co. Galway) 50
 cloth seals 51, 52–3, 53, 89
 coins
 Roman 9, 48
 English/British 48, 68
 see also jetons; tokens
 combs, antler 10, 71, 72
 Communar Rolls 3, 76, 87
 Conesford (Norwich) 61
 'cool house' 26, 27, 29, 89
 copper alloy objects 18, 26, 48, 49, 50–2, 51, 52
 Coppergate, York 31, 54, 56
 Cranage, Dean 85
 crucible fragments 10, 84
 Czech Republic, vessel glass from 57, 89
- Danish influence 1
Dark Entry 22, 26, 36, 81, 87, 89
daub 10, 14, 18, 41, 84
desk-based assessment 1
devotional objects 50, 51, 52, 54, 55, 88
diet *see* bones, animal; food and diet
Dissolution of the monasteries 3, 6, 22, 23, 34, 41, 89
Domesday book 2
dormitory 1, 3, 81, 82, 87
Dragon Hall (Norwich) 36, 60
drainage *see* soakaways; water management and drainage
dress fittings
 copper alloy 18, 26, 49, 50, 51, 89
 iron 14, 55
- East Harling (Norfolk) 54
Elizabeth I, Queen 3, 89
Elmham (Norfolk), Saxon See 2
excavation methods 4, 5, 6
- figurine/statuette, gilded hand from 50, 51, 52, 88
finger-rings, copper alloy 49, 50, 51
fire episode (1272) 3
fired clay 10, 14, 15, 18, 36, 41, 84
fish bones *see* bones, animal
Fishergate (Norwich) 51
flintwork, in building 10, 18, 19, 21–2, 26, 81, 85
flooding 1
food and diet
 Late Saxon population 84
 monastic 88
 see also bones, animal
food storage 27, 29
- Gall, Saint 1
garden features 26, 27, 29, 30, 41, 82, 89
 ceramics associated with 64–5, 67, 70
Gardiner, Dean 22
geology 1, 9
Germany
 vessel glass from 59, 89
 see also pottery
glass remains 24
 see also vessel glass; window glass
granary 3
Greyfriars (Norwich) 54, 60, 84, 85
- Hall, Bishop Joseph 3
Hall, William, tokens 48
Hardham Church (West Sussex) 73
harness mounts 14, 49, 50
hearths, Late Saxon 11, 15, 41, 55, 81, 84
Henry III, King 44

- Henry VIII, King 3, 22
Henry of Chichester, Missal of 44
Herbert de Losinga, Bishop 2, 85
Herfast, Bishop 2
hinge pivots 31, 32
Hodgeson, David, watercolour 88, 89
hornworking 74, 77, 78
horse equipment
 copper alloy 26, 49, 50
 iron 14, 18, 24, 53–5, 54
hostry 1, 3, 34
Hoxne (Suffolk), Saxon See 2
- infirmary 81, 87, 89
 adaption and re-use 3
 destroyed by fire 3
 garden 82
 stone from 32, 34, 36
Ipswich, medieval period 76
iron objects 19, 53–5, 54
 Late Saxon 9, 10, 14, 15, 18
 post-medieval 24, 26, 29
iron, structural 15, 31–2, 31
ivory objects 19, 71, 72, 89
- jetons, Nuremberg 24, 26, 48–9
John of Oxford, Bishop 32
- Kett's Rebellion 52
kitchen 3
knives
 iron 9, 10, 18, 26, 54, 55
ivory handle for 71, 72
- lace tags, copper alloy 26, 49, 50, 51, 89
Lady Chapel
 demolished 3, 87, 89
 stone from 32, 34
 window glass from 23, 26, 43, 44
Lanfranc, Archbishop 2
Launceston Castle (Cornwall) 78
lavatorium 22, 85, 87
lead objects 22, 23, 24, 32, 47, 51, 52–3, 53, 85, 86
leadworking 24, 32
Limoges (France) 52, 88
London
 Aldgate 68
 Bermondsey Abbey 52, 55
 Priory and Hospital of St Mary Spital 60
looped spikes, iron 31, 32
Low Countries
 pottery from 68, 83, 89
 vessel glass from 56, 59, 89
- magnetic susceptibility 78–80
market places, Late Saxon 1, 84
medieval period 16–22, 78, 81–2, 85–8
 see also pottery
metalworking 24, 55, 84
Middle Harling (Norfolk) 51
millstones 56
monastic buildings
 plan 2
 see also individual buildings
mortar 19, 20, 36, 40, 41, 81
musket balls, lead 52
- nails, iron 19, 31
 Late Saxon 14, 15
 post-medieval 24, 26, 29
Nesbit, Canon 30
Norwich, as bishopric 2, 85
- Old Romney (Kent) 50
Oscott Psalter 44
ovens, medieval 23
oyster shell palette 72–3, 72
- Palace Plain (Norwich) 1, 84
palette, oyster shell 72–3, 72
- parchment 29, 73, 74
pathology, animal bone 74, 77
photogrammetric survey 6
pilasters, stone 26
pins, copper alloy 18, 49, 50, 51, 89
pipes
 ceramic drainage 29
 lead 22, 23, 32, 85, 86
pipes, clay tobacco *see* clay tobacco pipes
pits
 Late Saxon 11, 12, 14, 23
 medieval stone-lined 20–2, 21, 22, 24, 29, 87
 early post-medieval 12, 24
 post-medieval 26, 29
polychrome decoration *see* stone, worked and moulded
post-holes
 Late Saxon 10–11, 15, 16, 84
 medieval 19
 see also structures
post-medieval period 7
 early 22–6, 78, 89
 post-medieval to modern 25–30, 78, 82–3, 89–90
 see also pottery
pottery
 Beaker 60, 84
 Bronze Age 9, 60, 84
 Iron Age, poss. 60, 84
 Roman 9, 10
 Middle Saxon 62, 84
 Ipswich-type ware 1, 14, 60
 Late Saxon 62
 Grimston Thetford-type ware 60
 St Neots-type ware 61
 Stamford wares 61
 Thetford-type wares 6, 9, 10, 11, 12, 14, 15, 18, 19, 24, 60–1, 64, 67, 70, 83, 84
 medieval 62
 Andenne-type ware 64
 Beauvais-type ware 64
 Early Medieval Sandwich Ware 61
 Early Medieval Ware 6, 10, 11, 14, 18, 24, 61, 67, 70
 Grimston Ware 61, 64, 83
 Pingsdorf stoneware 64
 Raeren/Aachen wares 24, 67, 70
 Stamford wares 64
 Yarmouth-type ware 61, 64
 post-medieval 26, 27, 29, 63, 89
 Chinese porcelain 68
 Cologne stoneware 64, 65
 Dutch-type redwares 64
 English stoneware 65, 68, 69, 70
 Frechen stoneware 24, 66, 68
 glazed Border Ware 65, 66
 glazed red earthenware 29, 64–5, 66, 67, 68, 69, 70, 83
 Iron Glazed Blackware 68
 iron glazed earthenware 83
 Lambeth Polychrome 68
 Langerwehe stoneware 64
 Martincamp stoneware 24, 64
 Metropolitan slipware 66
 Nottingham/Nottingham-type stoneware 65
 Raeren stoneware 64, 65
 Raeren/Aachen stoneware 64
 speckle-glazed ware 64, 66, 83
 Staffordshire manganese glazed wares 68
 Staffordshire white salt-glazed stoneware 65, 68
 Staffordshire-type slipware 65–6, 68, 69, 70
 tin-glazed earthenware 66, 68–9, 69, 70, 83
 Westerwald stoneware 65, 66, 68, 69, 70
 see also ceramic building materials; clay tobacco pipes
prebendary's house 26, 27, 29, 34, 41, 65
prehistoric features 8, 9, 84
Prior's Hall 34, 82, 87
project aims 4
Property 6 26, 29–30
Property 17 82
Property 36 26–9, 89
Property 48 82
Pulham (Norfolk), St Mary the Virgin, parish church of 42

- querns, lava, Late Saxon 10, 56, 84
- Redcastle Furze, Thetford (Norfolk) 51
- refectory *ii* 2, 86
 - alterations 20–2
 - construction 18–19, 41, 85
 - destruction 3, 22, 24, 26
 - original architectural features 1, 3
- religious iconography
 - figurine/statuette 50, 51, 52, 88
 - stone mould 54, 55
 - tin-glazed earthenware 66
 - vessel glass 57
- Repton, John Adey 32
- Rhenish lava 56, 84
- roads
 - Roman 1
 - Late Saxon 9–10, 10, 11, 14, 78, 84
- Roman period 9, 14, 18, 41, 84
 - road 1
- rowel spur, iron 24
- St Anne's Chapel, stone from 34
- St Benet's Abbey (Norfolk) 3
- St Nicholas's Chapel 81, 83, 87
- St Peter's per Mountergate (Norwich) 87
- St Peter's Street (Norwich) 68
- St Saviour's Chapel 85
- Salisbury Cathedral 42, 44, 52
- Salmon, Bishop 34
- Saxon period
 - general*, ecclesiastical Sees 2
 - Early Saxon 9
 - Middle Saxon 9
 - Late Saxon 1, 6, 8, 9–16, 18, 81, 84–5
 - animal bone 77–8
 - wheel rut, scientific analysis 9, 78–80
 - see also* pottery
- scallop shell, as metalwork decoration 50
- seals, lead cloth 51, 52–3, 53, 89
- shaft rings 24, 32, 33, 36
- silver coins 48
- site phasing 6
- skimmer, from bowl 52, 89
- soakaways 29, 30, 82
- soil micromorphology 9, 78–80
- stair turrets 1, 26, 89
- Stanton Harcourt (Oxon), St Michael's parish church 42
- stirrups, copper alloy 26, 49, 50
- stone, worked and moulded 21, 23, 24, 26, 30, 31, 32–6, 32, 33, 35, 37–9, 87
 - polychrome decoration 33, 35, 36, 37–9, 87
- stone objects
 - stone mould 54, 55
 - see also* millstones; querns
- storage tanks 29
- storerooms 3, 29
 - see also* 'cool house'
- structures
 - Late Saxon 10–11, 14–15, 15, 41, 84
- see also* cellars; 'cool house'; prebendary's house; Property 6; Property 17; Property 36; Property 48
- Suckling, Dean 3
- Suffield *see* Walter de Suffield
 - cloth seals 51, 52–3, 53, 89
 - wool 74
- Thetford (Norfolk) 51, 71
 - Mill Lane 54
 - Redcastle Furze 51
 - as Saxon *See* 2
- tiles
 - floor
 - medieval 20, 21, 24, 29, 40–1, 81, 82
 - Flemish type 20, 40, 41, 82, 85
 - roof 40, 41
 - see also* brick and tile; bricks
- timber *see* wood
- tokens 48
- Tombland (Norwich) 1, 84
- topography 1, 84
- trackways *see* roads
- undercroft 87
- Venice, vessel glass from 56, 59
- vessel glass, post-medieval 26, 27, 29, 89
 - beakers 24, 57–9, 57, 58, 60
 - bowls 57, 58, 59–60
 - case bottles 59
 - flasks (medical) 58, 59
 - goblets 56–7, 57, 58
 - phials 58, 59
- voussoirs 24, 26, 32, 35, 36, 37
- Walter de Suffield, Bishop 32, 34, 43, 44, 87
- Waltham Abbey (Essex) 42
- war damage 82
- warming room 87
- Watching Brief 4, 6, 81–3, 87
- water management and drainage 22, 23, 29–30, 32, 82, 85, 86–7, 89
- water-pipe trench, medieval 22, 23
- wattle, Late Saxon 10, 14, 84
- weavers'/clothiers' seals *see* cloth seals
- well, post-medieval 29
- Wensum, River 1, 84
- Westwick Street (Norwich) 54
- wheel rut, Late Saxon, scientific analysis 78–80
- Whitefriars (Norwich) 89
- Whittingham, Arthur 34, 81, 82, 87
- William I, King 2
- William III, King 68
- Winchester (Hants)
 - pre-Conquest finds 54
 - medieval finds 51
- window comes, lead 24, 47
- window glass 23, 24, 26, 42–7
 - figure and drapery 42, 44, 45
 - grisaille 42–4, 46, 47, 87
 - micro-architecture 42, 44, 45, 47
- wood
 - medieval pits 21
 - poss. structure 26
 - wool 74
- Yarmouth, Great (Norfolk)
 - Fuller's Hill 61
 - Lacon's Brewery 80
- York
 - Coppergate 31, 54, 56
 - Minster 43, 44
- Temple Balsall (Warwicks) 65
- textiles

East Anglian Archaeology

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

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

Reports available so far:

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

- No.93, 2001 Norfolk: Excavations on the Snettisham Bypass, 1989
 No.94, 2001 Lincolnshire: Excavations at Billingborough, 1975–8
 No.95, 2001 Suffolk: Snape Anglo-Saxon Cemetery: Excavations and Surveys
 No.96, 2001 Norfolk: Two Medieval Churches in Norfolk
 No.97, 2001 Cambridgeshire: Monument 97, Orton Longueville
 No.98, 2002 Essex: Excavations at Little Oakley, 1951–78
 No.99, 2002 Norfolk: Excavations at Melford Meadows, Brettenham, 1994
 No.100, 2002 Norwich: Excavations in Norwich 1971–78, Part III
 No.101, 2002 Norfolk: Medieval Armorial Horse Furniture
 No.102, 2002 Norfolk: Baconsthorpe Castle, Excavations and Finds, 1951–1972
 No.103, 2003 Cambridgeshire: Excavations at the Wardy Hill Ringwork, Coveney, Ely
 No.104, 2003 Norfolk: Earthworks of Norfolk
 No.105, 2003 Essex: Excavations at Great Holts Farm, 1992–4
 No.106, 2004 Suffolk: Romano-British Settlement at Hacheston
 No.107, 2004 Essex: Excavations at Stansted Airport, 1986–91
 No.108, 2004 Norfolk: Excavations at Mill Lane, Thetford, 1995
 No.109, 2005 Fenland: Archaeology and Environment of the Etton Landscape
 No.110, 2005 Cambridgeshire: Saxon and Medieval Settlement at West Fen Road, Ely
 No.111, 2005 Essex: Early Anglo-Saxon Cemetery and Later Saxon Settlement at Springfield Lyons
 No.112, 2005 Norfolk: Dragon Hall, King Street, Norwich
 No.113, 2006 Norfolk: Excavations at Kilverstone
 No.114, 2006 Cambridgeshire: Waterfront Archaeology in Ely
 No.115, 2006 Essex: Medieval Moated Manor by the Thames Estuary: Excavations at Southchurch Hall, Southend
 No.116, 2006 Norfolk: Norwich Cathedral Refectory