

West Cotton, Raunds

A study of medieval settlement dynamics AD 450–1450
Excavation of a deserted medieval hamlet in Northamptonshire 1985–89



Andy Chapman

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East Coker

In my beginning is my end. In succession
Houses rise and fall, crumble, are extended,
Are removed, destroyed, restored, or in their place
Is an open field, or a factory, or a by-pass.
Old stone to new building, old timbers to new fires,
Old fires to ashes, and ashes to the earth
Which is already flesh, fur and faeces,
Bone of man and beast, cornstalk and leaf.
Houses live and die; there is a time for building
And a time for living and for generation
And a time for the wind to break the loosened pane
And to shake the wainscot where the field-mouse trots
And to shake the tattered arras woven with a silent motto.

T S Eliot, *Four Quartets*, 1940
(from *Collected Poems 1909–1962*, 1974 Faber and Faber, London)



This wooden gatepost, with a length of rusty chain still wrapped around it, and its partner even more effectively concealed by hawthorn and brambles, flank a gateway that was abandoned following the introduction of modern farm machinery after World War II, when a more convenient gate was made at the corner of the field.

It lies at the access from Cotton Lane to the West Cotton hamlet, marking 1000 years of continuity of access, now lost.

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RAUNDS AREA PROJECT

Andy Chapman

with major contributions by

Umberto Albarella, Tony Baker, Paul Blinkhorn, Gill Campbell,
Paul Courtney, Simon Davis, Tora Hylton and Mark Robinson

contributions by

Marion Archibald, Pat Chapman, Simon Mays and Barbara Niemeyer

Illustrated by

Tony Baker, Leslie Collet and Alex Thompson



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The excavations were conducted by the Northamptonshire County Council Archaeology Unit. They formed part of a much larger programme of excavation, fieldwork and documentary research, the Raunds Area Project (RAP), a joint initiative between English Heritage (HBMCE) and Northamptonshire County Council. The project was co-ordinated by a management group comprising Varian Denham, Brian Dix, Andrew Fleming, Alan Hannan, John Hinchcliffe, and Mark Robinson, with the support of the successive regional Inspectors of Ancient Monuments, Michael Parker-Pearson and Andrew Fleming. A particular mention must be made of the then County Archaeologist, the late Alan Hannan: it is a great pity that he did not live to see the publication of the Raunds reports as the final fruit of his own efforts, which were central to the creation of the project.

I must also acknowledge that the contribution of Dave Windell cannot be overstated. He was site director throughout the five seasons of excavation and guided the early stages of the post-excavation programme. There were so many inherent complexities in answering to several different funding bodies and functioning within the broader programme of the area project, that keeping West Cotton on the road was a major achievement. In addition, the excavation had to work within the constraints of rescue archaeology while operating on the scale of a major research project, but with the core of the digging team comprising local people with no previous archaeological experience or knowledge. Without Dave's skills of organisation and his determination to keep the project on course the results presented here would not have been achieved.

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Over 300 people worked at West Cotton for periods ranging from a week or two up to months or even years. Andy Chapman, Jo Woodiwiss, Phil Voice and Tony Baker served as site supervisors, while the bulk of the workforce came from schemes under the MSC Community Programme and, in the final year, the Training Commission. Without these schemes it would have been impossible to even consider excavating on the scale that was achieved. Some of the people who started on the MSC projects gained sufficient skills to be retained on a longer-term basis to form the core of the excavation team, and some are still with *Northamptonshire Archaeology* or are working elsewhere in archaeology today. The long-term members of the digging team were mentioned individually in the interim report (Windell *et al* 1990).

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The illustrations of the structural evidence have been prepared by Tony Baker and the finds illustrations are by Lesley Collet. The reconstruction drawings are by Alex Thompson.

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Preface

Through the winter of 1984–85 I shared an office with Dave Windell as he put together his plans for a nine-month excavation of a series of medieval tenements at West Cotton in advance of the construction of the Raunds and Stanwick bypass. I was committed to other projects and remained in the office in the spring as Dave and his team began work on the site.

A few weeks later I happened to be in the main office when Glenn Foard arrived clutching the photographic prints from his first fly-over of the site. These showed a long transect across the settlement with the gleaming white limestone of the rubble-covered buildings and boundary walls emerging as the team cleaned away the debris from the machine stripping. Within the rubble, robber trenches and lengths of standing wall were clearly visible; with three tenements sitting there just waiting to be explored. One glance was enough; this was a project that I just had to be involved with. A few weeks later one of the supervisors left and I grabbed the opening, happily taking a demotion to work for Dave and to be part of this unique opportunity.

I was warned when I took the post that, as a supervisor on the Manpower Service Commission scheme, I was only guaranteed nine-months employment, and there was no promise of being involved with the post-excavation. I am not sure what my reaction would have been then if I could have foreseen that, after five seasons of excavation and four and a half years of post-excavation, 23 years later I would be sitting in another office writing this preface as part of the final stage of editing prior to the report finally going to press.

With the benefit of two decades of hindsight, there are still no regrets that I happened to be in the right place at the right time to see a set of photographs that changed the course of my archaeological career, and my life. The five seasons of weekly commuting from Northampton and living on-site during the week in a caravan with my wife, children and dogs complemented the experience provided by the archaeology. The excavation of West Cotton was a great adventure in many ways, and the world of contract

archaeology in the 1990s and 2000s has not offered a more substantial or more satisfying challenge. The end result was the product of team work involving numerous people, and the quality of the archaeology was always an inspiration, and both the fieldwork and the site record were of high quality.

There is regret that the report did not appear in the mid-1990s, as it might have done, but at that time the whole of the Raunds Area Project lost momentum following the completion of the fieldwork and the departure of many of the central figures that had helped to create it. At that time we were also busy learning how to make a living in the new world of commercial archaeology. As a result, West Cotton has not yet taken its rightful place as a major contribution to medieval settlement studies. However, despite the passing of so many years this is not just an old excavation that requires the formality of some sort of report so we can finally say, job done. The site was well-preserved, produced far more than was ever anticipated, and in those heady early years of the Raunds Area Project, supported by the Manpower Services Commission who provided us with a constant supply of diggers, we had both the time and the people to do justice to the archaeology. In addition, the site does not sit alone, but takes its place within a broader understanding of the medieval settlement of the area generated by the work of the Raunds Survey and the excavation of contemporary settlement within Raunds itself. It also sits within the broader chronological perspective provided by the work on the Mesolithic, Neolithic, Bronze Age, Iron Age and Roman utilisation of the same landscape. It will be a great disappointment if we do not see the data contained in this body of work on the medieval settlements being utilised by students of medieval settlement studies to help progress our understanding of that crucial theme, the origin of the English village.

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Summary

The open area excavation of nearly a half of the small deserted medieval hamlet of West Cotton, Raunds, Northamptonshire has revealed the dynamic processes of constant development in a way that has rarely been achieved on other comparable sites in England. Its origins have been seen to lie in the mid tenth-century plantation of a planned settlement based on regular one-acre plots, which occurred within the political context of the reconquest of eastern England by the Saxon kings and the subsequent reorganisation of settlement and society within the Danelaw. The settlement contained a major holding comprising a timber hall with ancillary buildings and an adjacent watermill, with perhaps a second similar holding and dependent peasants nearby. It was established on the edge of the floodplain at the confluence of a tributary stream with the River Nene, on a major valley-bottom route way.

The processes of redevelopment which led to the rebuilding in stone in the twelfth century, as a small Norman manor house; the probable relocation of the manor buildings in the thirteenth century; and its final form in the fourteenth to mid-fifteenth century as a hamlet of peasant tenements have been well documented by the archaeological evidence. In particular, it has been vividly shown how the final form of the settlement, preserved in earthwork, was merely a fairly brief episode at the end of

this extended process of development, while the historic evidence provides no hint of the higher-status elements that had formed an integral part of the settlement until the final century of its occupation. Desertion appears to have been a gradual process, with the tenements abandoned one-by-one through a century of economic and social disasters, of which the Black Death was the most notable, as families presumably moved to better quality land then readily available elsewhere.

The role of the local environment in the processes of change has also been well documented, with the abandonment of the watermill in the twelfth century resulting from a disruption of the water supply caused by a period of intense flooding and alluviation, when the very survival of the settlement was only ensured by the construction of a protective flood bank.

The excavated structural evidence is of high quality, and has provided numerous complete building plans ranging from the timber halls of the tenth and eleventh centuries, through the manor house of the twelfth to thirteenth centuries, to the well-preserved tenements of the fourteenth century. This is complemented by substantial artefact assemblages, and the consideration of the local economy and environment is largely dependent on the analysis of the faunal evidence and the environmental evidence derived from an extensive programme of soil sampling.

Résumé

La fouille systématique de près de la moitié du hameau médiéval déserté de “West Cotton, Raunds, Northamptonshire”, a révélé les processus dynamiques d’une évolution continue de façon rarement égalée sur d’autres sites comparables d’Angleterre. Les origines du hameau remontent à l’implantation, vers le milieu du dixième siècle, d’un habitat planifié basé sur des parcelles régulières d’un demi hectare chacune environ (1 acre). Cette première occupation des lieux se produisit dans le contexte politique de la re-conquête de l’est de l’Angleterre par les rois saxons, et de la réorganisation de l’habitat et de la société dans les territoires dits du « Danelaw ». Le hameau comprenait une tenure principale dotée d’un manoir en bois avec dépendances, et d’un moulin à eau adjacent. Il est probable qu’une seconde tenure de même caractère, accompagnée de petits lopins paysans, se trouvait à proximité. La colonie fut établie en bord de la plaine inondable, au point de confluence d’un petit cours d’eau avec le fleuve « Nene », sur une voie de passage importante en fond de vallée.

Les résultats des travaux illustrent clairement les processus évolutifs qui conduisirent, au douzième siècle, à la reconstruction en maçonnerie de ce qui devint alors un petit manoir normand, puis au redéploiement des bâtiments manoriaux au treizième siècle et, finalement, au hameau de tènements paysans des quatorzième et quinzième siècles. Il a été démontré de façon particulièrement saisissante comment la phase finale du hameau, préservée par

ensevelissement, ne fut qu’un bref épisode clôturant une longue période de développement. Cependant aucunes des sources historiques existantes ne laissaient présager du rang social élevé de certains des éléments qui firent partie intégrante du village jusque dans le dernier siècle de son existence. Le site fut abandonné graduellement semble-t-il, au cours d’un siècle de catastrophes économiques et sociales, dont notamment la Peste, les lopins étant désertés un par un par des familles migrant vraisemblablement vers de meilleures terres devenues disponibles ailleurs.

Le rôle joué par l’écosystème local dans le processus évolutif est également bien illustré par les preuves archéologiques. L’abandon du moulin hydraulique au douzième siècle fut causé par une perturbation de l’alimentation en eau due à une période d’inondation alluvionnaire intense, alors que le village ne devait sa survie qu’à l’existence d’une digue de protection.

Les vestiges structuraux mis à jour sont de très grande qualité. De nombreux plans complets de bâtiments ont été recouverts, depuis les manoirs en bois des dixième et onzième siècles, en passant par le manoir en maçonnerie des douzième et treizième siècles, jusqu’aux tènements paysans du quatorzième siècle. Ces résultats sont étayés par d’importantes collections d’objets, alors que l’interprétation de l’économie et de l’environnement naturel local s’appuie essentiellement sur l’analyse d’ossements animaux et d’échantillons de sol provenant d’un programme de prélèvement extensif.

Zusammenfassung

Durch die großflächige Ausgrabung von fast der Hälfte der kleinen mittelalterlichen Dorfwüstung von West Cotton, Raunds, Northamptonshire, konnten dynamische Prozesse einer ständigen Entwicklung mit einer Genauigkeit nachvollzogen werden, wie sie auf anderen, vergleichbaren Fundplätzen Englands bisher nur selten erreicht wurde. Die Ursprünge des Dorfes gehen auf die Mitte der 10. Jahrhunderts zurück, als im Zuge der Wiedereroberung Ostenglands durch die sächsischen Könige und der folgenden Neuorganisation der Siedlungsmuster und Gesellschaft des Danelags eine einen Hektar große, geplante Siedlung mit regelmäßigen Parzellen angelegt wurde. Die Ansiedlung umfasste ein größeres Lehensgehöft, das aus einer Holzhalle mit Nebengebäuden und einer daran anschließenden Wassermühle bestand. In der Nähe befanden sich vielleicht ein zweites, ähnliches Gehöft und abhängige Bauern. All dies wurde am Rand der Talaue nahe der Mündung eines Baches in den Fluss Nene errichtet, entlang eines bedeutenden Verbindungsweges auf der Talsohle.

Weitere Entwicklungsprozesse waren gut am archäologischen Material nachweisbar: der Neubau in Stein als kleines, normannisches Herrenhaus im 12. Jahrhundert; die wahrscheinliche Verlegung dieser Gebäude im 13. Jahrhundert; und die endgültige Form des Ortes, vom 14. bis zur zweiten Hälfte des 15. Jahrhunderts, als ein Weiler aus an Bauern verpachteten Grund. Es konnte vor allen Dingen klar aufgezeigt werden, dass die Endform der Siedlung, die oberirdisch als Erdwerk erhalten ist, nur eine relativ kurze Episode am Ende dieses lang andauernden

Entwicklungsprozesses darstellt, während die historischen Quellen keinen Hinweis auf die höhergestellten sozialen Elemente enthalten, die bis zum letzten Jahrhundert der Siedlungstätigkeit eine wesentliche Rolle gespielt hatten. Die Aufgabe des Weilers scheint ein allmählicher Prozess gewesen zu sein. Im Laufe eines Jahrhunderts von wirtschaftlichen und sozialen Katastrophen, allen voran die Pest, wurden die Pachten eine nach der anderen aufgelassen, als Familien wohl auf besseres Land auswichen, das zu dieser Zeit andernorts leicht zu bekommen war.

Die Auswirkungen der örtlichen Umweltgegebenheiten auf diese Veränderungsprozesse konnten ebenfalls gut dokumentiert werden. So lässt sich die Aufgabe der Mühle im 12. Jahrhundert mit einer Unterbrechung der Wasserzufuhr erklären, deren Ursache in einer Periode heftiger Überflutungen und Anschwemmungen zu suchen ist, während der das Überleben der Siedlung selbst nur durch den Bau eines schützenden Hochwasserdammes gesichert werden konnte.

Die ergrabenen Gebäudeüberreste sind von hoher Qualität. Zahlreiche komplette Grundrisse konnten nachgewiesen werden, angefangen von den Holzhallen des 10. und 11. Jahrhunderts, über das Herrenhaus des 12. und 13. Jahrhunderts bis hin zu den gut erhaltenen Gehöften des 14. Jahrhunderts. Sie werden von umfangreichem Fundgut ergänzt. Die Betrachtungen zur örtlichen Wirtschaft und Umwelt beruhen hauptsächlich auf der Analyse der Fauna und auf Erkenntnissen aus den zahlreichen, planmäßig entnommenen Bodenproben.

1 Introduction

A Day on Site

In the morning at the Site everybody comes for work. They take the tools out to the Site and get to work. Some are trowling to clean up so daddy can take a photograph. Some are digging and some are planning. You see you plan a wall so wen it is gon you no wot it was like. Wen I help I choose a person to help trowling or digging. We find pot and bone and put it into a tray, but iron we mesher in and level. The soil we put in the wheelbarrow and push it to the spoilheap and empty it.

We are here becaus Daddy works here as a supervisor. The caravan is next to the Site and we live in it during the week. Every morning we walk up the track to get the milk. In the morning we have to chase a cow out. We have picked Elderflower and blackberry in summer, elderberry in ortum. Later we will pick hawthorn and sloes.

Eleanor Chapman, aged 7, 1985

The Raunds Area Project

The Raunds Area Project was a major programme of archaeological research examining the development of a midland England landscape within part of the Nene valley in Northamptonshire (Fig 1.1). The project area encompassed four medieval parishes, Raunds, Stanwick, Ringstead and Hargrave, covering a total of 40sq km.

The project had developed out of the rescue excavation of Furnells manor in Raunds between 1977 and 1982 (Boddington 1996; Audouy and Chapman 2009). Concurrently, a detailed examination of the priorities for rescue archaeology in Northamptonshire (Foard 1979) had shown Raunds to be the most intact area of historic landscape in the upper Nene valley, but with many of the well-preserved grouping of key sites of prehistoric, Roman, Saxon and medieval date likely to be destroyed during the 1980s. The academic basis and a broad framework for future work was defined in 1983 (Foard 1983) and the Raunds Area Project as a joint venture between Northamptonshire County Council and English Heritage was formally established in 1984.

The research was primarily based on a series of extensive open area excavations conducted in advance of new development, particularly road construction, gravel extraction, and new housing and industrial projects, which

all posed direct threats to a number of identified key sites (Fig 1.2). Each aspect of the project is the subject of a separate major report.

Beside the River Nene there was a group of known early prehistoric ritual and burial monuments, and through the first year of excavation at West Cotton it became apparent that further monuments, previously unknown, lay beneath the medieval hamlet itself (Harding and Healy 2007). Only 1km south of West Cotton there was a major focus of Iron Age and Roman settlement at Stanwick, with further Roman settlement to the north, at Mallows Cotton (Crosby and Neal forthcoming). Finally, there were the important areas of Saxon and medieval settlement at the northern end of Raunds village (Audouy and Chapman 2009) and beside the river at West Cotton, Raunds. The excavations were complemented by documentary research and an area survey, utilising intensive fieldwalking, cropmark analysis, geophysical survey and small-scale excavation (Parry 2006).

For the Saxon and medieval periods the project was conceived as an investigation at the lowest administrative level of society. Systematic field survey and the excavation of key sites threatened with at least partial destruction were to be supported by a programme of documentary research. The published volumes on Saxon and medieval Raunds (Boddington 1997; Audouy and Chapman 2009) and the area survey (Parry 2006) complement the present volume and include details and an overview of the local settlement pattern and topography, and the broader documentary evidence omitted from this volume.

Location and topography

Raunds lies within east Northamptonshire on the eastern margin of the Jurassic uplands of Central England (Fig 1.1). There is undulating higher ground to the west and the low flat landscape of the fens is not far to the east. The drift (Boulder Clay) covered lowland plateau lies at 70–88m OD and is intersected by the River Nene, rising above Northampton and flowing north-east across the county and past Peterborough on its course to the Wash. It forms the western boundary of the study area.

The village of Raunds lies on the western margin of the plateau. It straddles the Raunds Brook which runs westward

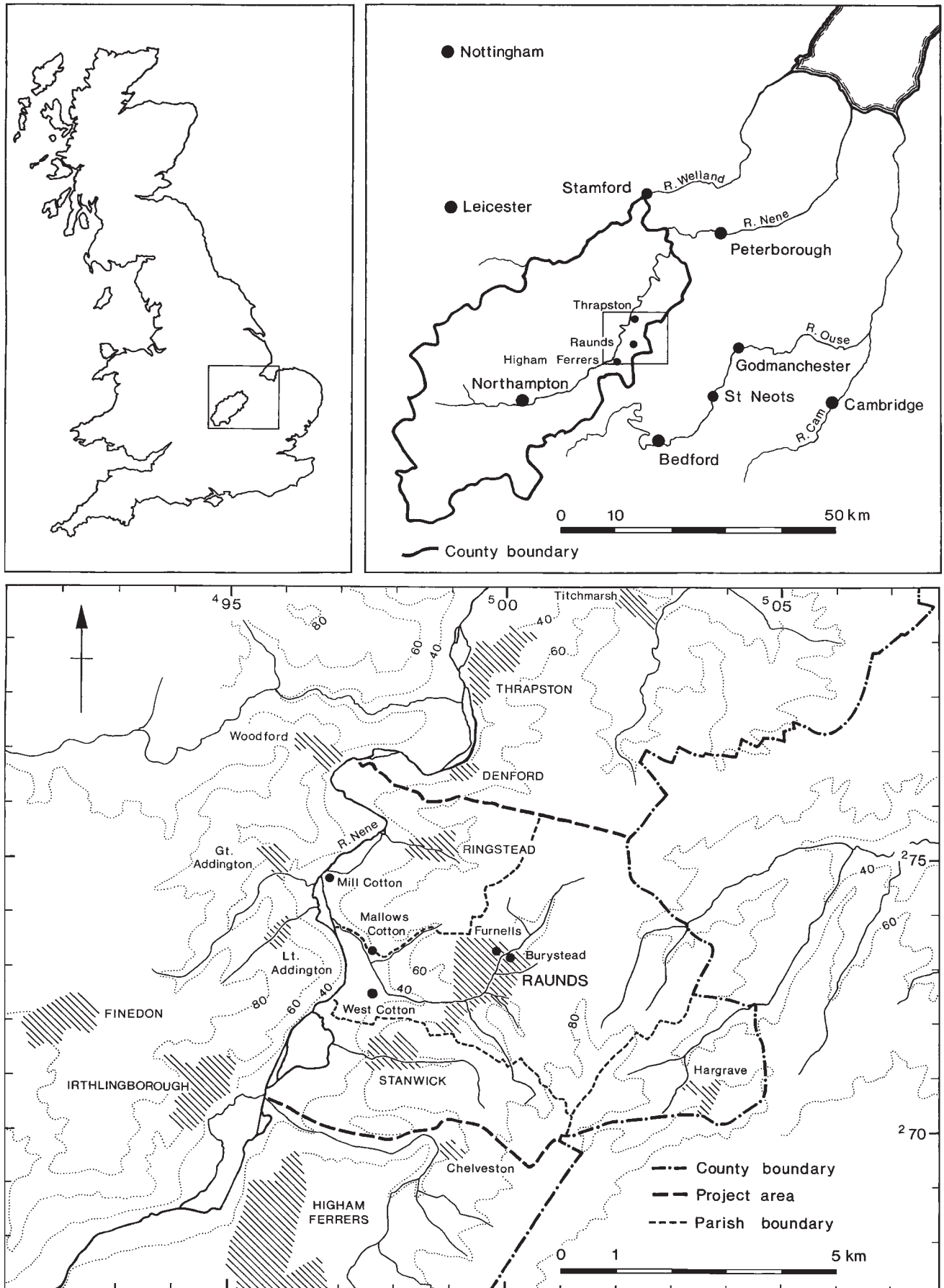


Fig 1.1: Location maps and the Raunds Project area. © Crown copyright. All rights reserved. Northamptonshire County Council: Licence No. 100019331, Published 2009

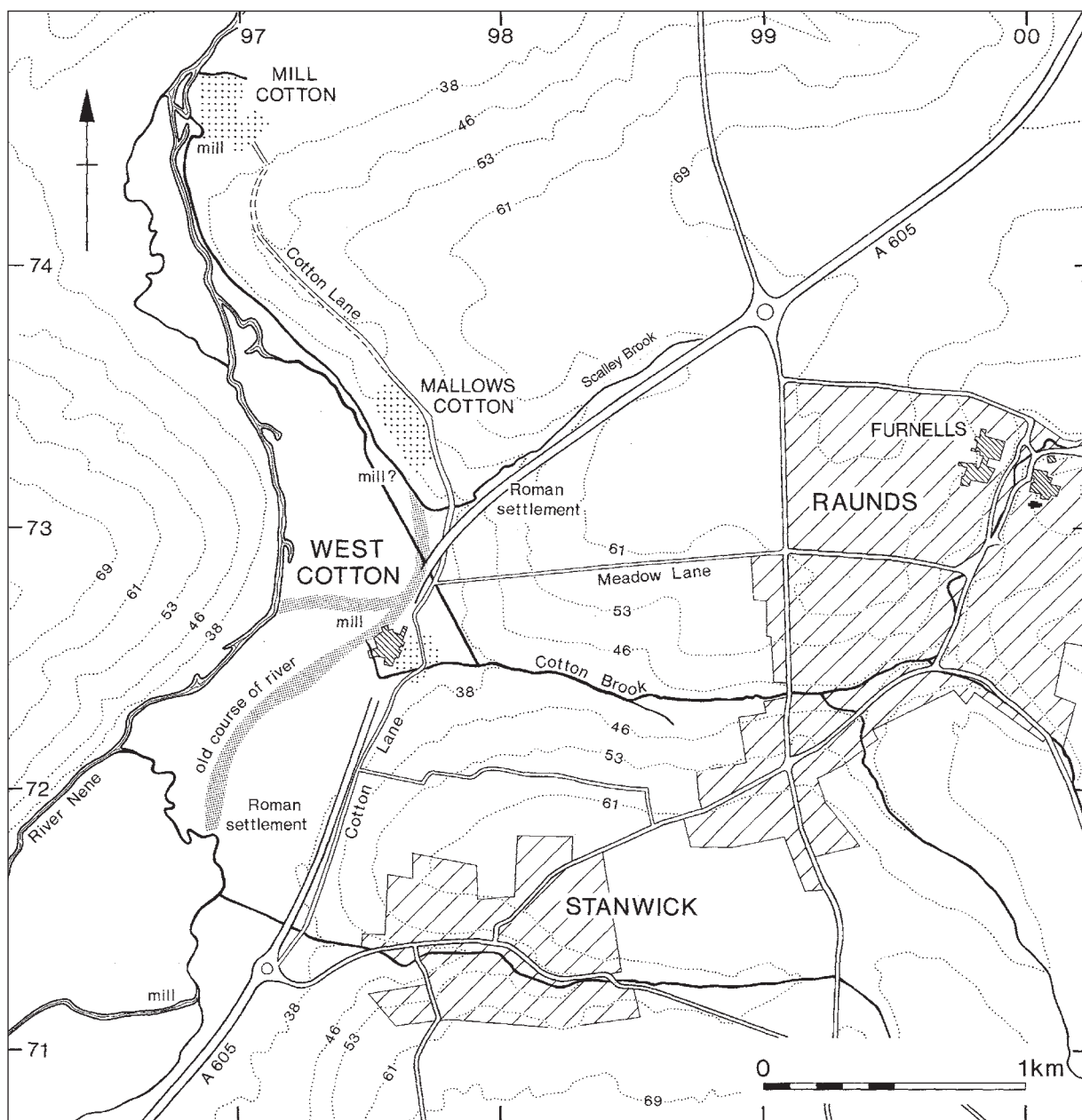


Fig 1.2: The location of West Cotton and other settlements within the Nene valley (contours in m). © Crown copyright. All rights reserved. Northamptonshire County Council: Licence No. 100019331, Published 2009

passing West Cotton, as the Cotton or Tipp Brook, before joining the Nene (Fig 1.2).

The valley slope between Raunds and West Cotton cuts across a complex geological sequence comprising Oxford Clay, Cornbrash, Great Oolite Clay, Great Oolite Limestone, Lower Estuarine Series, Northampton Sand with Ironstone and Upper Lias Clay. These deposits provided a ready source of both limestone and ironstone that has been utilised in the area for building stone from at least the Roman period onward.

West Cotton lay on the eastern margin of the floodplain of the Nene, adjacent to its confluence with the Cotton Brook tributary. It also straddled the Cotton Lane, which

survives here as a farm track, but was once a medieval road running along the edge of the floodplain from Higham Ferrers in the south to Thrapston in the north, and perhaps following a Roman predecessor linking settlements at Higham, Stanwick, MalloWS Cotton and Ringstead (Figs 1.1 and 1.2, Plate 1).

The modern floodplain of the River Nene is locally up to 900m wide and relatively flat, with the river running along the western margin. The general level of the floodplain, prior to the gravel extraction, lay at 36–37m OD while the earthworks at West Cotton lay at the lower level of 34.5–35.0m OD. This anomaly was the result of major hydrological changes in the twelfth century when

the deposition of up to 1.0m of alluvial silts across the valley floor concealed the earlier topography and formed the raised and level floodplain of subsequent centuries. At this time the settlement was surrounded by a clay flood bank to protect it from inundation, which produced the anomaly of the buildings then lying below the level of the floodplain. Prior to this, the settlement had occupied a gravel platform that stood above the valley floor. It was then flanked by a major channel of the River Nene, which had been open from at least the later Neolithic period, but this became redundant by around the end of the twelfth century and was itself buried beneath the alluvial silts (Fig 1.2). The tributary stream has also seen a succession of diversions related to the creation of the mill leats in the tenth century, the alluviation in the twelfth century and a final diversion at the time of enclosure in the eighteenth century (Fig 1.3, the Hog Dyke).

West Cotton: previous fieldwork

The medieval and post-medieval documentary evidence indicates the presence of three deserted settlements in the valley of the River Nene within the parishes of Raunds and Ringstead (Fig 1.2). The location of two of these, Mill Cotton and Mallows Cotton, had long been known as both were described in the mid-eighteenth century by Bridges (1791, 190), and their main earthworks had been depicted on Ordnance Survey maps from the late nineteenth century. The documentary and archaeological evidence for these two settlements has been summarised within the Raunds Survey volume (Parry 2006, 177–195). Both were much larger than West Cotton and are documented as including substantial medieval manors. Much of Mill Cotton, including a moated manor site, was lost to gravel extraction in the early 1970s with only limited salvage excavation, while Mallows Cotton survives intact as a well preserved earthwork site under pasture, and is a Scheduled Ancient Monument.

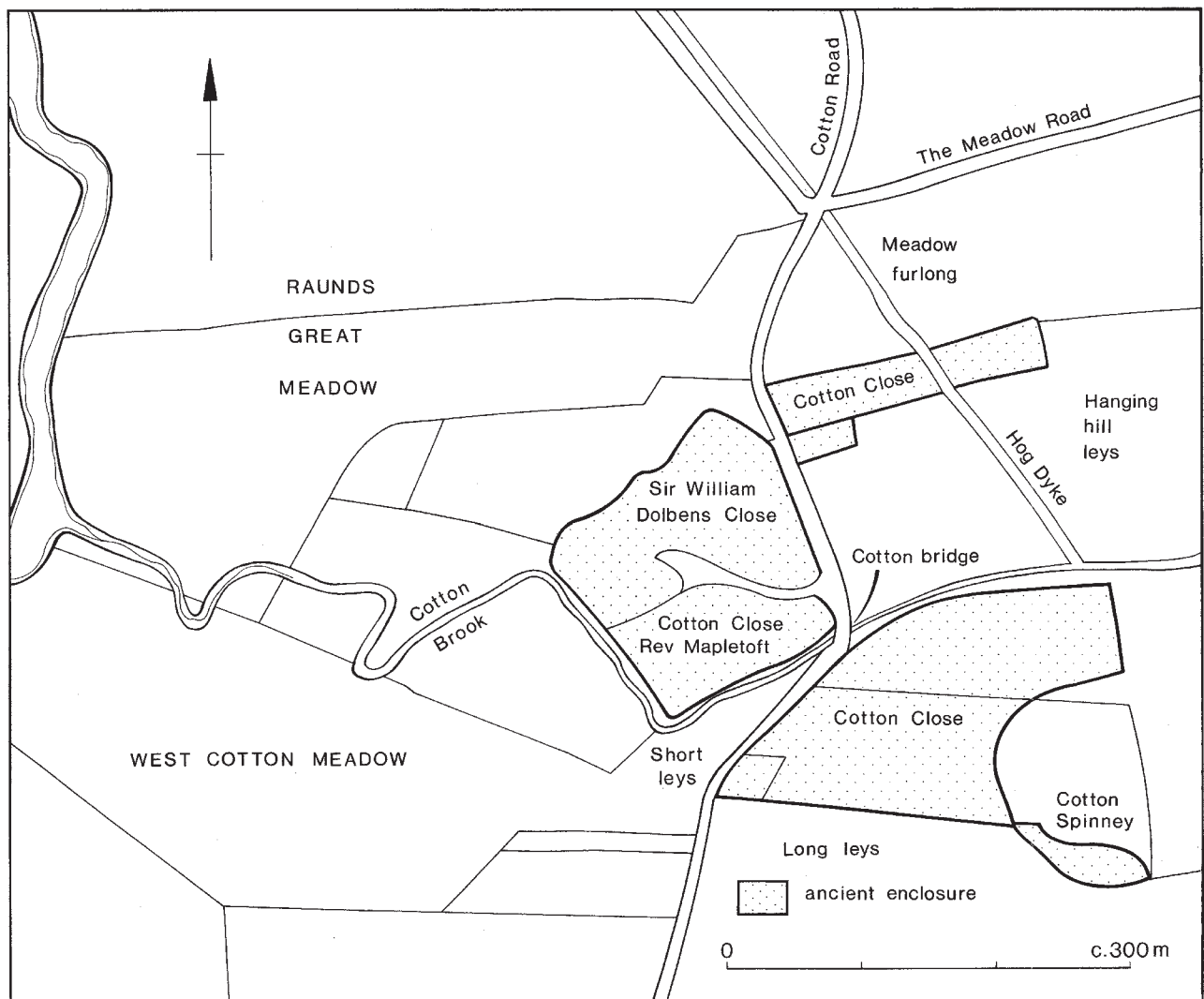


Fig 1.3: West Cotton and its closes from the Raunds Enclosure map of 1798

In contrast, the location of the deserted settlement of West Cotton was not recognised until the 1960s. It was listed as unlocated in *The Deserted Villages of Northamptonshire* (Allison *et al* 1966, 38). However, as David Hall has noted (Hall *et al* 1988, 32), its location could have been easily deduced from the Raunds Enclosure Map of 1798 (NRO and Fig 1.3), and Hall also records that it had been recognised through fieldwork in 1962. The first published reference to its location dates to 1967 (Brown 1967, 28) when the late A E Rowlings recorded the presence of a limestone wall footing, pits and ditches, together with pottery dating to the twelfth to fourteenth centuries, while observing the digging of a new pipe trench to the east of Cotton Lane (Fig 1.4, J).

The survival of the main settlement of West Cotton as low earthworks within a pasture field to the west of Cotton Lane (SP 976 725) was confirmed in 1972 (Hall and Hutchings 1972, 15), and a description and earthwork survey was published in 1975 (RCHME 1975, 81–83). This recorded two building groups (Fig 1.4, F and G,) as

earthwork remains to the immediate west of Cotton Lane, while a third complex in the ploughed field to the east was indicated by an area of building-rubble associated with medieval pottery (H). It was concluded that “the settlement never consisted of more than two or three farmsteads or cottages” (*ibid*, 83). The settlement earthworks and the surviving ridge and furrow of the field system to the immediate south had been surveyed by David Hall in 1973, but the settlement survey was only published in 1988 near the end of the excavations reported here (Hall *et al* 1988, 34, fig 5).

The West Cotton Project

As a largely intact site threatened with partial destruction by road construction, the A605 Stanwick and Raunds bypass, the deserted medieval hamlet of West Cotton was one of the key Saxon and medieval sites of the Raunds Area Project (Foard 1983, appendix 2).

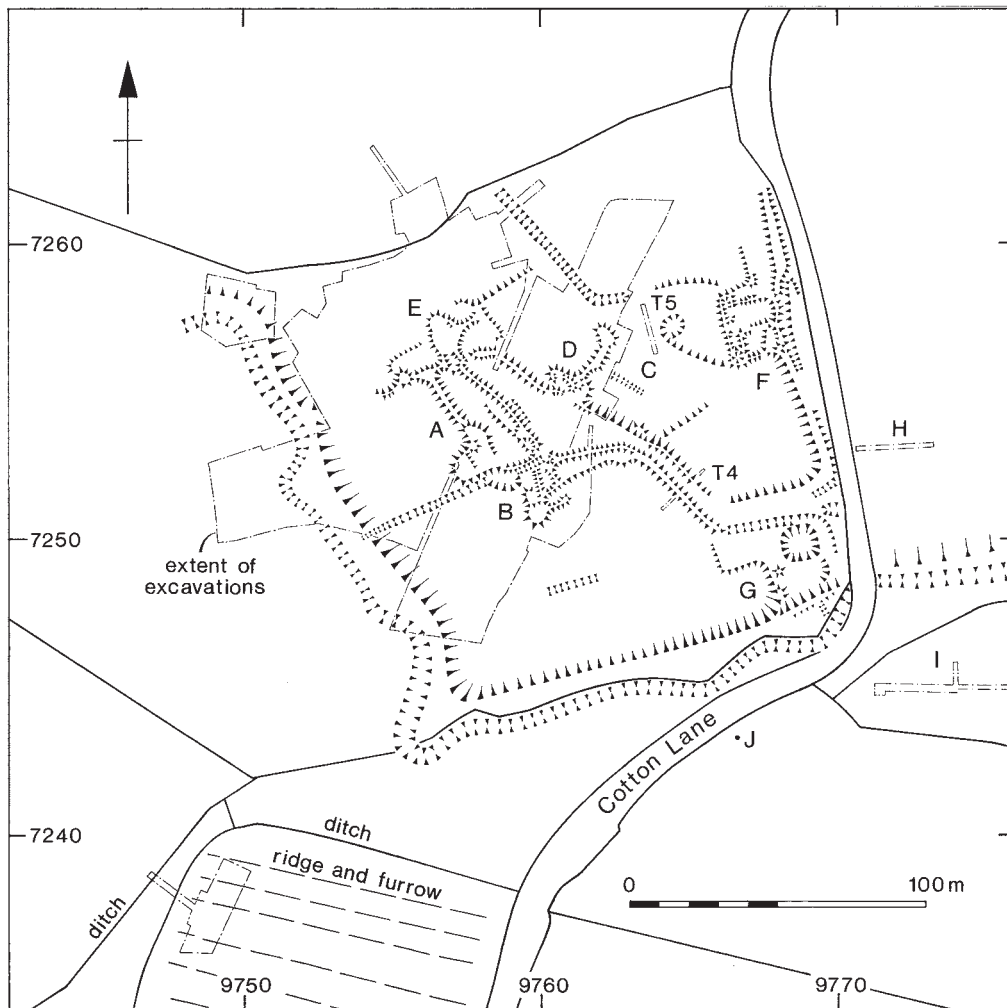


Fig 1.4: West Cotton, the earthworks prior to excavation. © Crown copyright. All rights reserved. Northamptonshire County Council: Licence No. 100019331, Published 2009

Earthworks

Early in 1983 the main earthworks were surveyed by Glenn Foard and Dave Windell (Figs 1.4 and 1.5). This revealed a considerably larger and more complex settlement than had been apparent from the Royal Commission survey. The presence of several discrete tenements was defined by low building platforms set around a central yard (A–E) and flanking the Cotton Lane (F and G). The bank and stream course to the south and west, and the field system to the south were surveyed during the excavations, and some details of the field system are taken from D Hall’s unpublished survey.

The earthworks of the medieval tenements were of fairly low amplitude. Both on the ground and from the air (Fig 1.5) the most prominent feature was the bank surrounding the central yard and flanking the access road, which has been shown to post-date the desertion of the central tenements. The flood bank to the west, flanked by the post-medieval stream course, was also visible, although its rounded profile rendered it less prominent from the air than on the ground. The ridge and furrow of the field system in the field to the south was also evident, along with a series of linear and curvilinear ditches of a later date. Ploughing to the east of Cotton Lane had levelled all former earthworks, with the exception of the flood bank and former stream course.

Evaluation

In November 1983 a “short programme of trial-trenching

was carried out to ascertain the state of preservation, depth of stratification and probable date-range of the earthworks to assess the value of the site” (Windell 1984, 1). Five trenches, each 20m long by 1.75m wide, were sited to reveal the nature of the remains while avoiding severe damage to the apparent building platforms. Three of these trenches were later absorbed within the main excavation area while the other two lay to the east (Fig 1.4, T4 and T5). This evaluation indicated that the earthworks did “represent well-preserved buildings of medieval date” (*ibid*, 2), with a probable late Saxon origin indicated by the tenth to fourteenth-century date range of the recovered pottery.

Aims and objectives

It was anticipated that the excavation of the settlement would contribute to three of the broad academic objectives of the Raunds project:

- a) The investigation of the origins of the medieval nucleated village from the presumed dispersed settlement pattern of the middle Saxon period. To be achieved by establishing the date and form of the original settlement.
- b) The relationship of “daughter” settlements, as represented by the three Cottons, to the main parochial centre at Raunds. To be achieved by establishing the status and the form of the occupation in order to provide comparative data to that obtained in north Raunds.
- c) The desertion of secondary settlements and the



Fig 1.5a: Aerial photograph of the West Cotton earthworks in December 1982, prior to excavation, looking south with Cotton Lane to the east (left) (Glenn Foard, NMR 2221/16, NCC SP9772)



Fig 1.5b: The West Cotton earthworks labelled to show the trackway, *t*, the late drainage ditch, *d*, the pond-like feature, *p*, the medieval tenements surrounding the central yard, A–E, the tenements adjacent to the Cotton Lane, F and G, and the course of the late medieval to post-medieval stream

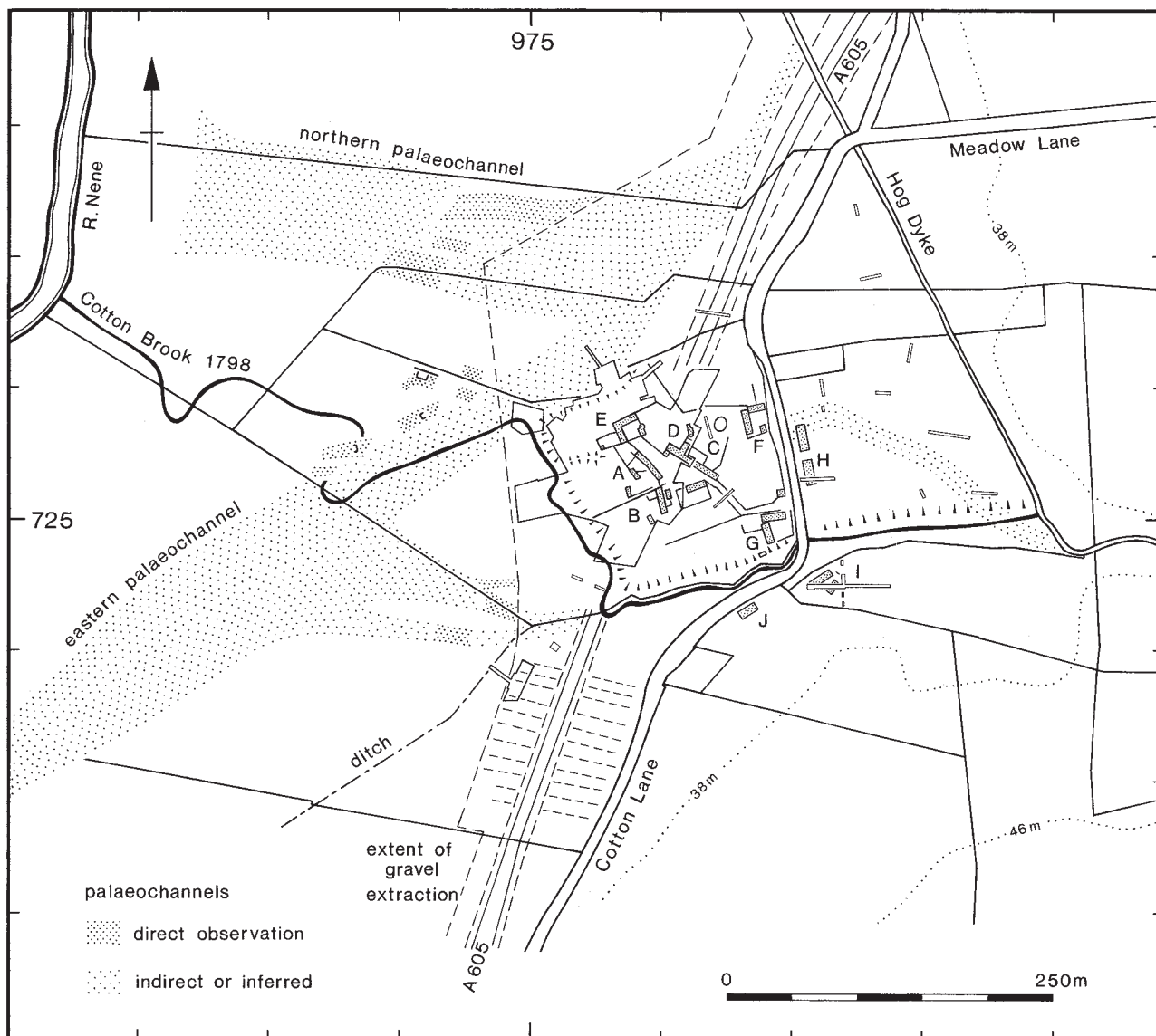


Fig 1.6: West Cotton, showing the medieval tenements, the field system and the palaeochannels. © Crown copyright. All rights reserved. Northamptonshire County Council: Licence No. 100019331, Published 2009

relationship of this to changes at the parochial centre. To be achieved by establishing the date and the processes leading to desertion.

In addition, from the beginning an intensive programme of environmental sampling, determined in consultation with Dr Mark Robinson of the University Museum, Oxford, was undertaken in order to examine both the agricultural economy of the settlement and the wider environmental background.

The excavation

Excavation began in March 1985 with the opening of a single, elongated area along the intended line of the new road. This initial area, 140m long by 30m wide, took in most

of the central medieval tenements (A, B, C and D), as well as parts of the stream courses to the north and south (Figs 1.6 and 1.7, Plates 2, 9–11). It had been anticipated that full excavation could be achieved within a single season of some nine months. However, the medieval buildings were better preserved than expected, while the discovery of partially intact prehistoric mounds beneath added an additional, and completely unexpected, dimension. As a result, the excavation of the initial area of 6000sq m was only completed towards the end of 1986. It was then backfilled prior to the commencement of road construction early in 1987.

In 1987 gravel extraction by ARC (Eastern) began to the north-west, with the extent of the concession including the western margins of the settlement area and the adjacent stream and river palaeochannels. Excavation therefore

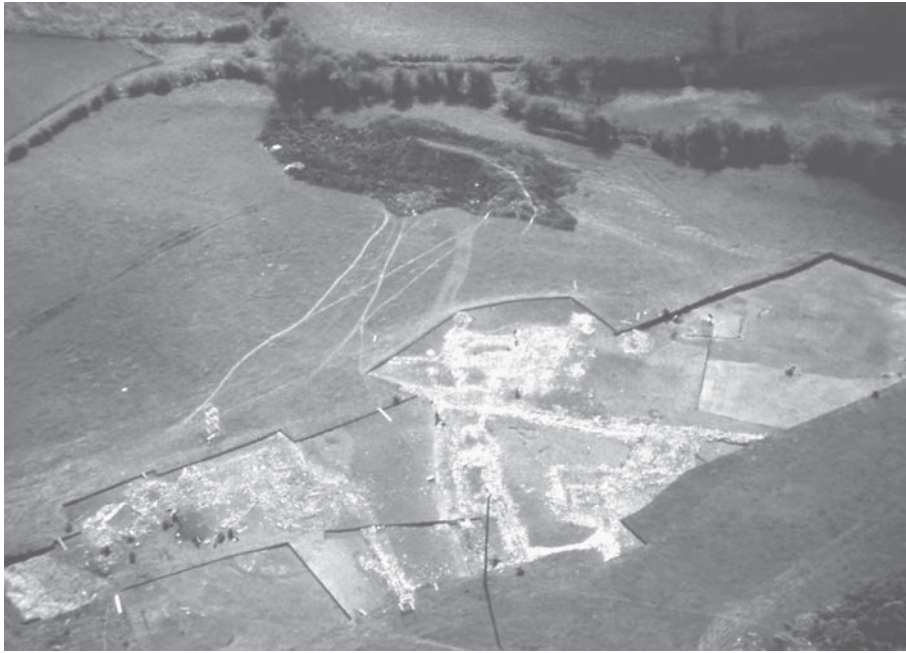


Fig 1.7: West Cotton in May 1985, looking south-east, showing the initial area of excavation with tenements C/D (left), tenement A (bottom centre) and tenement B (top centre) covered by spreads of demolition rubble (Aerial photograph by Glenn Foard for NCC)

recommenced in April 1987 with the opening of a second large area immediately adjacent to, and partly linking with the previous work, and taking in the final central medieval tenement, E (Figs 1.8–1.11 and Plates 1, 3 and 12). Beneath and around this tenement work in 1988 and 1989 explored the stone-built manor house of the twelfth century (Plate 5) and the timber ranges of the late Saxon settlement (Plate 4).

To test for the suspected presence of a watermill, in 1987 a detached trench was opened immediately to the north-west, while a trench was cut across the palaeochannel to the north to obtain environmental samples from the sequence of waterlogged river silts. In addition, smaller areas were opened in the field to the south to investigate further prehistoric monuments. Through the duration of the gravel extraction of the adjacent areas in 1987, an informal watching-brief resulted in the location of parts of the local palaeochannel system (Fig 1.6).

In early 1988 the entire Project was comprehensively reappraised and the Research Design was updated (Foard and Parker-Pearson 1989). With the excavation approaching its conclusion, the results achieved had defined the potential for further and more specific areas of study:

- a) The potential to examine the regular lay-out of the late Saxon settlement together with its internal organisation.
- b) The location of the watermill, at the time suspected but not confirmed, as potentially of national significance given the few excavated examples and the exceptional circumstance of the close relationship with an extensively excavated settlement.

- c) The examination of the nature and the social context of the complex transition from the late Saxon settlement, with only a single building complex within the excavated area, to a medieval peasant hamlet, where five tenements lay within the excavated area.
- d) The continuation of the programme of environmental sampling along with the recovery of waterlogged environmental samples from the adjacent palaeochannel. This was particularly significant given the close physical relationship to the settlement and the results already achieved within the dry-land excavations.

In 1988 the open area was extended northwards to link the palaeochannel with the dry-land excavation, and this led to the discovery of the watermill complex (Fig 1.12 and Plate 6). The further investigation of both the watermills and the palaeochannel led to a succession of further small extensions in 1989. Following the excavation of the watermills and the timber buildings of the tenth-eleventh centuries, work came to an end in December 1989. By this time a total area of 13000sq m had either been fully or extensively excavated, along with accompanying watching brief, salvage recording and trial trenching to the north, west and south.

A total of 46 months had been spent on site, 920 days, and the labour input is estimated at 14000 person days. At current charging rates for site staff in commercial archaeology this would represent over £2 million of labour costs alone. At the time, the site staff employed through the Manpower Services Commission received £10 a week above the basic rate of unemployment benefits.

Other work of relevance was conducted by the Survey



Fig 1.8: West Cotton in June 1987, looking north, with road construction in progress over the initial area of excavation, while a new area has been opened (left), which included medieval tenement E. (Aerial photograph by Glenn Foard for NCC)



Fig 1.9: West Cotton in June 1987, looking east, with road construction in progress over the initial area of excavation, while in the new area to the west (bottom) the demolition rubble covering tenement E has been exposed. (Aerial photograph by Glenn Foard for NCC, NMR 3423/24)



Fig 1.10: Aerial photograph 1987, showing medieval tenement E, arranged around a courtyard and with a walled yard to the west (left). The kitchen/ bakehouse of the earlier manorial range is also visible (top left) (Aerial photograph by Glenn Foard for NCC)



Fig 1.11: Aerial photograph in 1988, looking west, showing the triangle of the unexcavated eastern half of the hamlet (foreground), with the excavated western half surrounded by the quarry (Aerial photograph by Glenn Foard for NCC)



Fig 1.12: West Cotton in May 1989, looking south-west, showing the partially excavated late Saxon timber ranges (centre) and the watermill system and river palaeochannel (bottom left) (Aerial photograph by Glenn Foard for NCC)

team under the direction of Steve Parry. In 1988 trial-trenching to the east of Cotton Lane located previously unknown medieval buildings (Fig 1.6, I). In 1990 a series of trial-trenches in the field to the immediate east of the main settlement investigated the presence of early–middle Saxon features beneath a pottery scatter located in field walking, and a trench immediately beside the lane confirmed the suspected presence of a further medieval tenement or tenements (Fig 1.6, H).

Excavation methodology

The removal of both topsoil and subsoil was achieved using a mechanical excavator with a 5 or 6-foot toothless ditching bucket: a toothed bucket was only used on the deep deposits of intractable clays over the river palaeochannel. Across the building platforms the walls and demolition rubble were usually covered by little more than the turf, requiring careful control of the machine to minimise damage when exposing the rubble spreads. Within the associated yards the upper part of thick soil horizons that had accumulated within them were also removed, with a consequent loss of a small proportion of the pottery, other finds and animal bone.

In 1985 an area north of tenement C/D had been stripped directly to the natural gravel in order to establish at an early

stage the presence and date of cut features pre-dating the buildings (see Fig 7.3). This provided the first recognition of the presence of an earlier boundary ditch system, as well as the unexpected discovery of the ditches encircling a Bronze Age round barrow.

The alluvial clays around the margins of the settlement were also removed by machine in order to expose the buried prehistoric and late Saxon deposits. This included the removal of the twelfth-century flood embankment, which was therefore only seen in section.

Following machine stripping, all areas were cleaned, photographed and planned prior to excavation. With the later medieval buildings and yards the initial approach was to establish running sections, requiring the temporary provision of narrow baulks at each stratigraphic level. Although of some initial use, while the team became familiar with the stratigraphy, these were soon found to be more inconvenient than useful and this method was rapidly abandoned in favour of full area excavation of both the buildings and yards.

All of the stone medieval buildings, apart from some marginal areas that lay beyond the road take, were totally excavated in order to expose the underlying levels. The late Saxon timber buildings were also fully excavated. These posed considerable technical problems as there was a minimal distinction between the wall-trench fills and

the soil horizon into which they were cut. The occasional presence of limestone, largely within the subsidence fills, identified short lengths of wall-trench but, despite careful trowel-cleaning of the surface, it was never possible to define a full building plan in advance of excavation. The approach adopted was to excavate the definable lengths and then to carefully work the sections along into the unknown. This inevitably resulted in some loss of information, particularly the relationships of some intersecting wall-trenches, and it is also likely that at least some evidence for the presence of basal hollows indicative of post positions was also missed.

The tenth to twelfth-century system of boundary ditches was extensively excavated in an attempt to provide broader finds samples to enhance the overall dating and perhaps to define the presence and nature of adjacent activity areas, although this latter objective was not achieved. One of the major problems with the boundary system was the lack of evidence for their individual dates of origin, as recutting had either removed or at least mixed the earlier ditch fills, so that in many cases only their infill dates can be defined. With more careful excavation it might have been possible to define localised pockets of early fills, which were certainly present in places, but in practice ditch excavation was often given to the less experienced site workers who would not have recognised such subtleties. The dating of the origin of the system is therefore primarily based on the pottery assemblages from a few lengths of ditch that were abandoned and filled in at an early date.

In the 1985 and 1986 seasons the importance of the development of the natural watercourses to the overall history of the settlement was not fully appreciated and, as a result, the difficult task of exploring the area of alluvial silts and underlying stream channel deposits at the northern end of the site was not carried through. Similarly, a full section was not obtained of the southern stream when it was exposed in the quarry edge.

Bulk finds of animal bone and pottery were allocated to both context and a 5m grid-square, while other finds were recorded by three-dimensional coordinates. The locations of all bulk soil samples were recorded to context and by coordinate.

Recording systems

The site grid was established on the alignment of the intended new road, with site north to the east of Ordnance Survey grid north. Across the excavated area a grid of metal pegs at 5m intervals was established using the basic theodolite surveying techniques of setting out successive base lines with cross-checking of right-angles and the alignment and lengths of diagonals, using Fibron tapes for the linear measurements. There is an estimated error of $\pm 0.10\text{m}$ between points some 50m or more apart, largely resulting from a systematic error in the original base line. A basic grid of metal rods, driven to ground level and protected by small cairns of limestone, has been left *in-*

situ across the eastern, unexcavated part of the settlement. The site location relative to the Ordnance Survey base was established by tacheometric survey to fixed points within the modern landscape, to an estimated surveying accuracy of $\pm 0.5\text{m}$.

The planning system was based on A2-sized sheets of drafting film, enabling two 5m grid squares to appear on each sheet at a scale of 1:20. Composite plans show the entire palimpsest of contexts exposed at successive stages of the excavation of a given area. Intermediate plans, showing only one or more specific contexts, were used as required, while small details were sometimes recorded on A4 sheets. All areas containing buildings and other major feature groups were planned stone-by-stone at 1:20, but in the later excavation seasons lengths of boundary ditch and some minor features were often planned at 1:50. Some marginal areas or detached trenches were recorded at 1:100. Sections or profiles were drawn of most individual features at 1:10 and major sections, generally those provided by the edges of excavation areas, at 1:20. In total there are around 1700 plans and 1500 section drawings.

The context numbering system comprised a single numerical sequence, running from 1 to 7398. During the first season of excavation there was no allocation of blocks of numbers to specific areas of the site, but in subsequent seasons each supervisor was allocated a block of 1000 numbers. This system had the advantage of providing more rapid access to blocks of related information. A total of 5390 context numbers were allocated to Saxon and medieval contexts, and the remainder are accounted for by either unused numbers at the ends of some blocks and the numbers allocated to the prehistoric elements of the site. All context information was recorded on individual proforma sheets; soil colour descriptions were purely verbal, colour charts were not used.

The allocation of context numbers was pragmatic. An individual posthole, say, might have been given separate context numbers for its cut and fills when these showed some complexity of form, but in other instances a single fill would be subsumed under the feature context. Such simplifications occurred more frequently as the excavation progressed into its later seasons. Context numbers also had a wider usage in defining archaeological actions. Whilst the major areas of the site were allocated letter codes during the course of excavation (A, B, C etc) individual trenches within or beyond the open area excavation were identified by a general context number. A few individual structures or smaller areas of specific investigation, such as box-sections examining ditch intersections or general areas of cleaning, were also given general as well as specific context numbers.

Stratigraphic sequence diagrams, or matrices, were not compiled during the course of the excavation, although sequences for some complex areas were produced between excavation seasons.

Throughout the excavation the normal process of site photography used 35mm single-lens reflex cameras, and

ranged from individual contexts to whole-site photographs, duplicated in black-and-white and colour transparency. From 1987 colour print film was also used for any subjects likely to provide popular shots for use in public displays. Well over 200 films were exposed, producing some 3,500 negatives and 3,500 transparencies offering over a 1000 separate views of the excavations in progress, with two to four images of each view taken in each format. High-level photographs were taken utilising either a high ladder or a scaffolding tower, while on one occasion a mobile hoist was hired. The site photographs are complemented by aerial photographs taken by Glenn Foard during flights sponsored by the Royal Commission on Historic Monuments (England). The colour slides resulting from these flights are deposited with the Northamptonshire Historic Environment Record and the black and white negatives are deposited with the National Monument Record (NMR) at Swindon.

Geophysical Survey

In order to enhance the understanding of the layout of the settlement beyond the excavated areas, a programme of geophysical survey, using both magnetometer and resistivity techniques, was conducted by Andy Payne of the Ancient Monuments Laboratory in 1991 (Figs 1.13–1.15). This was supplemented by further magnetometer (Figs 1.16 and 1.17) and resistivity surveys (not illustrated) in the field to the east of the Cotton Lane, carried out by Peter Masters for Northamptonshire Archaeology. The results of these surveys in defining further medieval buildings and boundary ditch systems have been incorporated within the period and phase plans depicting the overall development of the settlement, while further probable prehistoric monuments were also located (see Harding and Healy 2007, 129, fig 3.65).

Interim publications

Annual summaries or interim statements were published in national, regional and local journals:

Medieval Archaeology: 1987, **31**, 153–4; 1988, **32**, 266–7; 1989, **33**, 204–6; and 1990, **34**, 204 and plate 12A

The Medieval Settlement Research Group Annual Report: 1987, **2**, 23–4; 1988, **3**, 22–3; and 1989, **4**, 41–3

South Midlands Archaeology: 1988, **18**, 51–60; 1989, **19**, 35–9; and 1990, **20**, 45–50

Northamptonshire Archaeology: 1985, **20**, 3–8; 1986–7, **21**, 25–9

Archaeology Review, English Heritage: 1988–89, 18 (plate) and 36

Current Archaeology: 1987, **106**, 337–9.

In addition, a series of short, illustrated leaflets were produced; largely for local distribution to site visitors, organised tours and at the annual public open days.

Following the completion of excavation, a comprehensive interim report was produced to cover both the prehistoric and the Saxon to medieval aspects of the site: Windell, D, Chapman, A, and Woodiwiss, J, 1990, *From Barrows to Bypass: Excavations at West Cotton, Raunds, Northamptonshire, 1985–1989*. This presented an outline interpretation of settlement development based on the empirical understanding that had evolved through the course of the excavations. The major differences between the interim account and the model of site development presented in this report are the more detailed and reliable chronology established by the pottery analysis and the more complex story that has emerged for the conversion from manor to hamlet in the late thirteenth to early fourteenth centuries.

A summary of the site chronology was also published in the Raunds Survey volume (Chapman in Parry 2006, 172–177).

Post-excavation methodology

In the analysis of the context information only a single additional level of post-excavation coding was introduced: the provision of Structure Group codes. For this a mnemonic system was chosen, so that the nature and, in broad terms, the date range of any defined structure group was readily apparent from its code. The buildings were numbered in a single sequence but given a prefix letter defining their building group, which was drawn from the on-site area codes. Thus, the medieval buildings of tenement A are coded A1–A3, while those of tenement B are B4–B7, and so on. The buildings of the post-Conquest manor and the late Saxon timber buildings are prefixed S (stone) and T (timber) respectively. The definition of individual rooms was achieved by a suffix, so building A1 comprises rooms A1/1 to A1/5. The medieval yards have been given an additional Y prefix and are numbered separately within each tenement; thus AY1–AY6 and BY1–BY7. The earlier boundary ditch system and the plots defined by them are coded respectively as LSD's (late Saxon ditches) and LSE's (late Saxon enclosures). Any further definition is by reference to the original context numbers, but the use of these has been kept to the necessary minimum.

A single site context matrix was not compiled, as the site comprised coherent blocks of stratigraphy but with few links between tenements or the detached buildings of a single tenement. A diagrammatic representation of the sites overall development was provided at structure level in combination with the pottery phase dating, and this provided a sufficient tool to explore the complexities of site development.

The full analysis of the archaeological evidence led to the production of a written text, the site narrative, accompanied by post-excavation drawings of all major structures, building groups and general period plans, and most of the final drawings are taken directly from them.

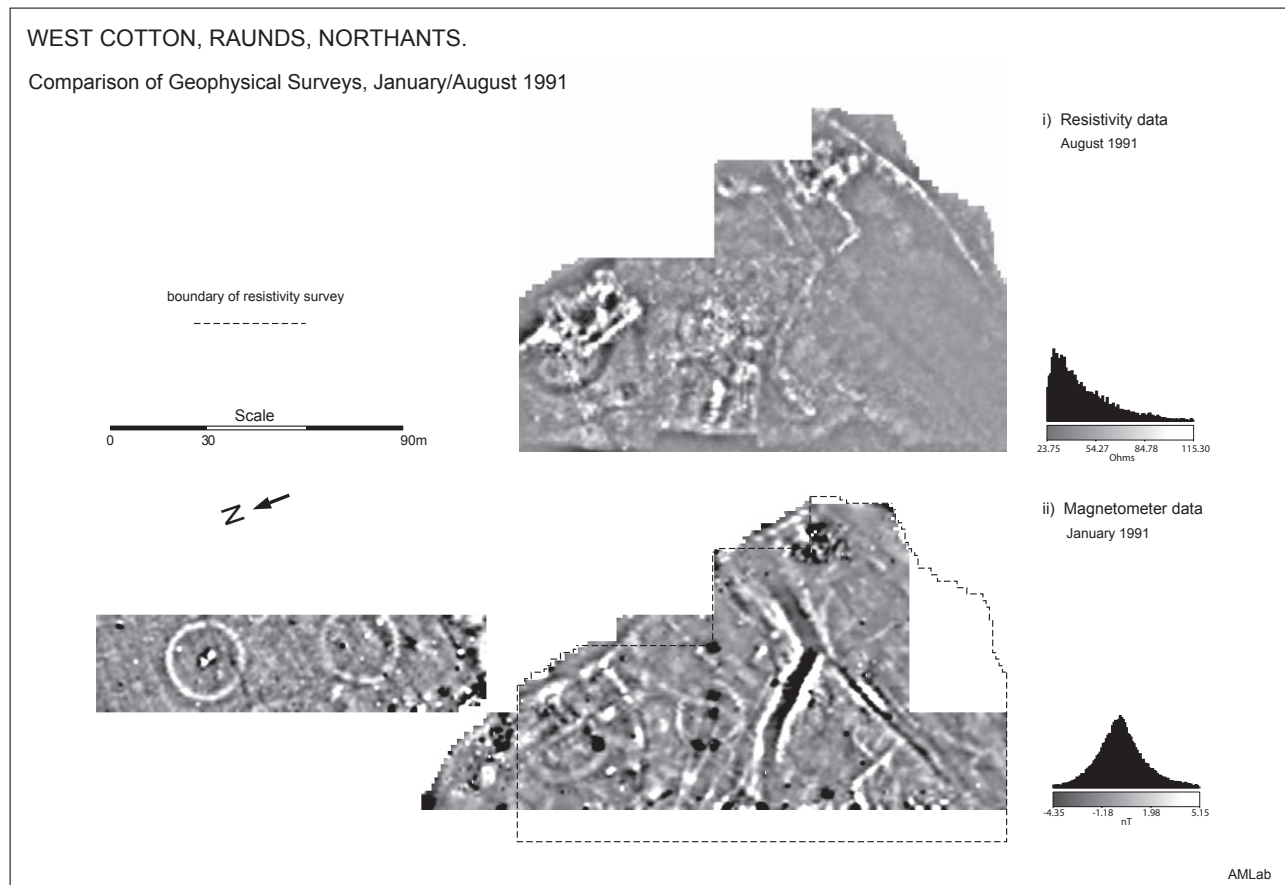


Fig 1.13: Comparison of geophysical surveys, January/August 1991 (Ancient Monument Laboratory)

The site archive

The archive will comprise all the original records generated during the excavation and all the collected finds, which include retained environmental residues although all waterlogged wood has been discarded following analysis. The written notes are largely in the form of individually numbered context sheets, which have been organised in structural groups rather than simple numerical order. The drawn records comprise separately numbered plan and section drawings in numerical order. The photographic archive comprises black-and-white negatives and prints, colour transparencies and some colour-print negatives and prints.

During post-excavation computerised database catalogues were compiled for most aspects of the site archive and hard copies of these are included in the archive. In addition, there are full narrative descriptions and discussions of all excavated features by period and structural group, accompanied by over 100 plan and section drawings in a single numbered sequence (PE drawings).

Copies of all written and drawn archive material will be available on microfiche in the National Monuments Record. It is intended that the full report will be made available online five years after publication, and a full

digital archive of all the illustrations and photographs will be retained as a resource available for use by other researchers. At the time of writing Northamptonshire does not have an established county archaeological archive, so it is not possible to state where the physical site archive will eventually be deposited. The archive will be retained in temporary store by Northamptonshire Archaeology until a suitable store becomes available.

Further comments on the future availability of the West Cotton material are included in Chapter 8.

Summary of the chronological sequence

The chronological sequence

As an introduction to the description of the excavated evidence, a simple tabulation of the full chronological sequence is provided (Table 1.1 and Fig 1.18). The earliest features at West Cotton date to the early Neolithic, with the sequence of burial monuments running through to the early Bronze Age. These aspects of the site will be briefly summarised in Chapter 3, and are dealt with in detail within

the account of all the prehistoric aspects of the Raunds Area Project (Harding and Healy 2007).

No features or finds of late Bronze Age or Iron Age date were identified, but a late Bronze Age field system and an extensive area of Iron Age settlement lay 1km to the south. There was a considerable scatter of residual Roman finds, and perhaps some specific activity related to the adjacent river palaeochannel, and 1km to the south the earlier settlements were overlain by a major Roman settlement and villa. This and all other aspects of Iron Age and Roman in the Raunds Area will be dealt with in another separate volume (Crosby and Neal forthcoming).

The main excavation located minor episodes of early Saxon occupation, while a further focus in the field to the east of Cotton Lane was defined in the field survey. Middle Saxon activity is apparently limited to use of the adjacent river channel for flax retting, as determined by radiocarbon dating. The early and middle Saxon episodes fall within the broad pattern of dispersed settlement as established by the work of the survey team (Parry 2006).

The archaeological importance of West Cotton lies in it comprising a small settlement of which a large proportion has been excavated. This has provided a sound model for examining many aspects of the processes of village formation and development in Central England from the tenth century onward, and set in the local context of the reorganisation of settlement and society in the wake of the early tenth-century reconquest by the Saxon kings and the subsequent establishment of order within the Danelaw. The evidence from West Cotton also complements the parallel evidence from the village of Raunds itself, where the manorial centre of Furnells manor, with its associated church and churchyard (Boddington 1996), and the parts of the manorial demesne farm of the Burystead manor, adjacent to the present parish church on the opposite side of the Raunds Brook, were also extensively excavated in the 1970s and 80s (Audouy and Chapman 2009).

The 500-year period from the tenth-century settlement formation at West Cotton to the late medieval desertion has been divided into three main periods (Table 1.1 and Fig 1.18a). The late Saxon settlement saw the formation of a new, planned settlement with its timber buildings and watermill. The early twelfth century saw the replacement of the timber buildings with a small Norman manor house in stone, whose prosperity was immediately under threat when a period of flooding and alluvial deposition rendered the watermill redundant and necessitated the building of hundreds of metres of protective floodbank (Fig 1.18b).

The thirteenth century saw a reorientation of the economic base, with an emphasis on crop storage and processing, presumably at least in part to produce marketable cash crops. This was initiated as part of the direct farming of the manorial demesne, but by the middle of the thirteenth century the settlement underwent a major reorganisation in which the manor was relocated away from the redundant river channel and mill, and onto the plots adjacent to Cotton Lane (Fig 1.18c). This episode also

saw the formation of new tenements on the former manor house plots, as the beginning of the end to direct farming of the manorial demesne. By the fourteenth century the buildings of the new manor had been converted to further tenements, and the site was then truly a peasant hamlet, with the production of malt and perhaps the fulling of woollen cloth providing additions to the economic base of arable and pastoral agriculture.

This episode was to be short-lived as the tenements were deserted one-by-one through the fourteenth century and into the fifteenth century as part of the nationwide process of desertions that occurred in the wake of the series of the famines of the early part of the fourteenth century, when a colder and wetter period hit both crop returns and the animal livestock, and the Black Death and subsequent lesser epidemics that so drastically reduced the population and left the marginal settlements unviable when better land was unoccupied and going to waste.

The basis for the site chronology

While a small group of radiocarbon dates provide corroborative evidence, the basis for the site chronology comes from the analysis of the pottery carried out by Paul Blinkhorn. This is fully detailed and discussed in the pottery report, but the broad basis is summarised below for the general reader.

The dating is based on the use of a Relative Seriated Phase Dating System (RSP). This technique was first used during the analysis of the late Saxon and medieval pottery from the sites in north Raunds (Blinkhorn 2009), and was based on the dating of the pottery types that are common to both Raunds and Northampton, where there was an established history of pottery research (Denham 1985). The analysis of the West Cotton pottery has confirmed the original seriation of the major wares, while the assemblage has also provided an opportunity to enhance some areas of the RSP established for the Raunds sites.

The RSP technique establishes a series of ceramic phases defined by the introduction of particular pottery forms, with the commencement of the phase being the *terminus post quem* (TPQ) for the introduction of those particular forms. There are separate ceramic phases for the late Saxon (LS1–LS4) and the medieval pottery (Ph0–Ph5) and these are tabulated below (Tables 1.2 and 1.3):

Throughout the report when dates are quoted they will usually include the ceramic phase date, eg (ph 1, 1150–1225), so that if future research refines the absolute dating of any ceramic phase it would be possible to revise the site chronology derived from the pottery assemblages.

It must also be remembered throughout that, apart from any direct references to documentary evidence, all dates are approximate. However, rather than cluttering the text with a *circa* attached to every date these have often been omitted and the reader is asked to recognise their invisible presence.



Fig 1.15: Resistivity survey showing medieval buildings (AML)



Fig 1.14: Magnetometer survey showing prehistoric ring ditches and medieval boundary ditches (AML)

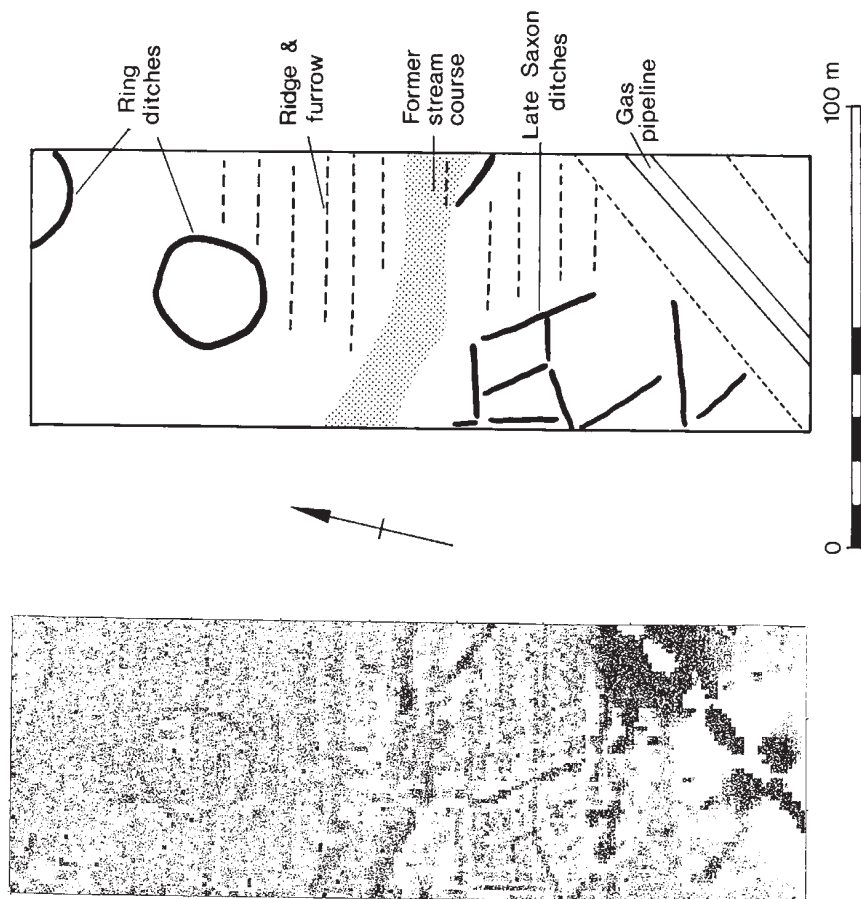


Fig 1.17. Magnetometer plot and interpretation (NCC)

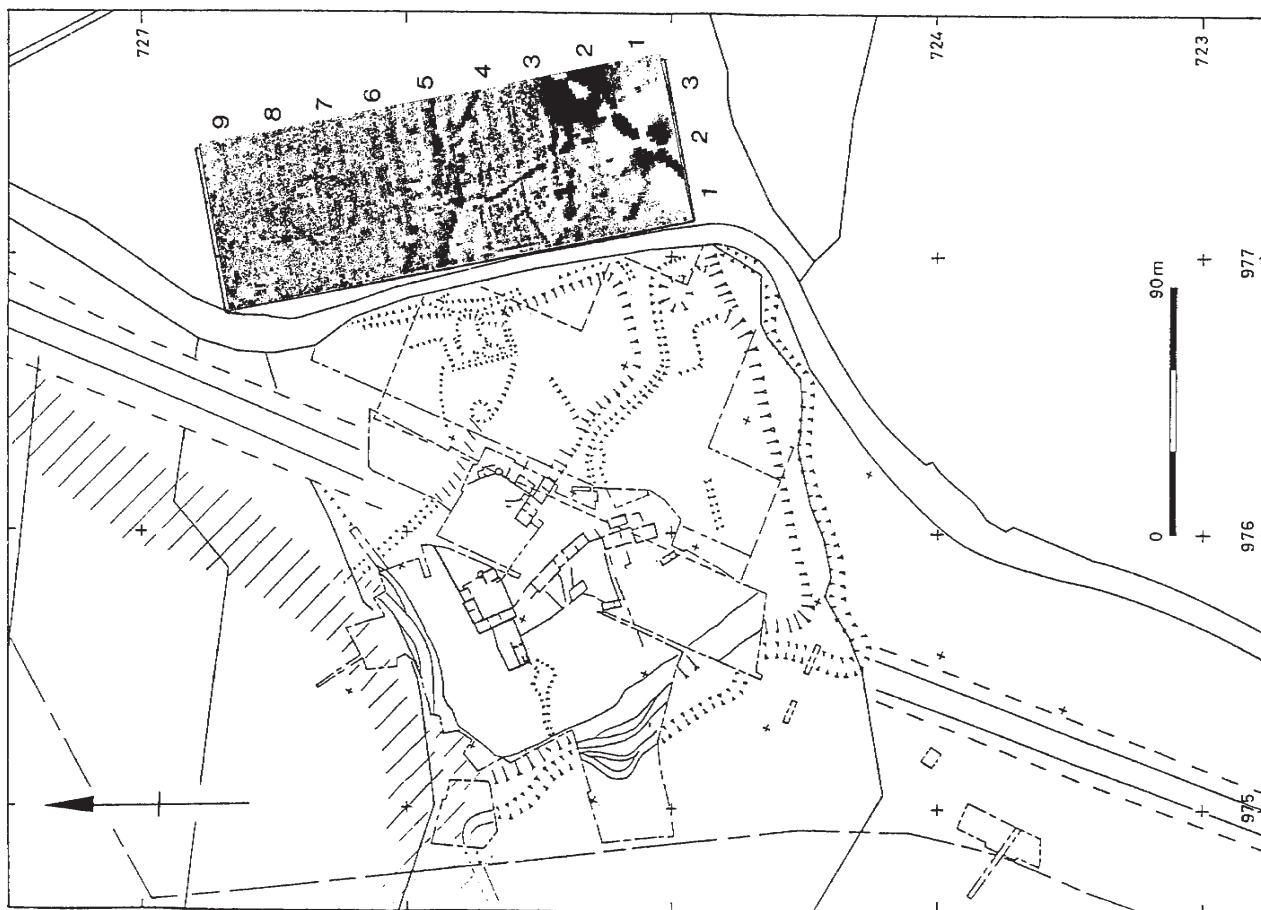


Fig 1.16. Magnetometer survey east of Cotton Lane, showing ring ditches, boundary ditches, possible former stream and gas pipeline (NCC)

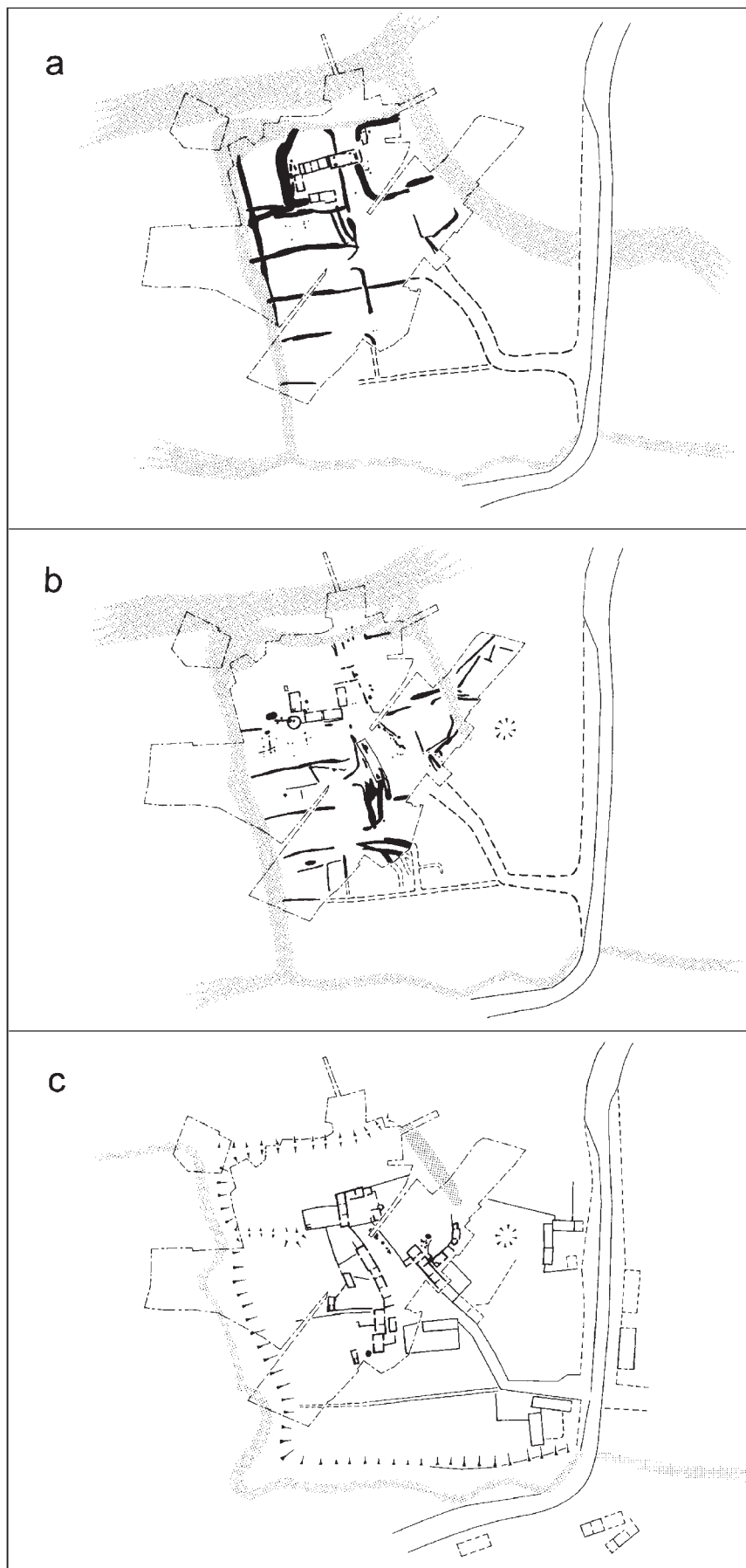


Fig 1.18: West Cotton, the chronological sequence; a) late Saxon settlement (950–1150), b) the medieval manor (1150–1250), c) the medieval manor and hamlet (1250–1450)



Plate 1: Aerial photograph in 1988, showing West Cotton (bottom) with Cotton Lane and the new road running south, with Stanwick Roman villa (centre), the quarry processing plant (top), and the River Nene and the old railway line (top right) (Photograph by Glenn Foard for Northamptonshire County Council (NCC))



Plate 2: Aerial photograph of West Cotton in 1985, looking south-east, showing the initial area of excavation along the proposed road corridor set within pasture fields (Glenn Foard for NCC)



Plate 3: A similar view in 1987, showing the landscape transformed by road construction and quarrying, with West Cotton preserved as a green square in the centre, while the former river and stream channels form raised areas of unexcavated ground within the quarry to the west (right) (Glenn Foard for NCC)



Plate 4: The late Saxon courtyard manor, defined by the wall trenches, looking south, with the leat feeding the watermill complex in the foreground



Plate 5: The medieval manor (AD 1100–1250), looking south, showing the heavily truncated buildings set around a courtyard; hall to left and kitchen range to the right (Glenn Foard for NCC)



Plate 6: The early watermill, M27, with planks simulating the location of the sluice gate and feeder trough, with the metallated and wattle-lined wheel pit in the foreground



Plate 7: Reconstruction of the medieval hamlet as it may have looked in the later thirteenth century, with the manorial barns fronting onto the central yard (left) and the new peasant tenements at the western end (top centre and right) (Alex Thompson)



Plate 8: April 1985, showing the initial cleaning of the demolition rubble over medieval tenement B, with tenement A in the background



Plate 9: Excavation of the domestic range of tenement A, with tenement B in the background and late medieval drainage ditch along the frontage



Plate 10: Excavation of tenements C/D, with tenement A in the background on the opposite side of the central yard, which was filled with alluvial clayey silts



Plate 11: The malt house of tenement C during excavation, showing the circular vat stand with the rectangular oven chamber in the background



Plate 12: Tenement E, following removal of demolition rubble from the buildings and central yard



Plate 13: The carved-stone figure, 'Norman Morris', from a stone-lined bin in tenement D, building D11

Table 1.1: Summary of the chronological sequence

MAJOR PERIODS	DATE RANGE
The prehistoric monument complex	Neolithic to early Bronze Age
Romano-British activity	
Early to middle Saxon occupation	AD 500–800
The late Saxon settlement	AD 950–1100
The formation of the settlement	AD 950–975
The late Saxon settlement	AD 975–1100
The medieval manor	AD 1100–1250
The medieval rebuilding, and abandonment of the watermill system	AD 1100–1200
The initial development of the frontage	AD 1200–1250
The medieval manor and hamlet	AD 1250–1450
The relocation of the manor	AD 1250–1300
From manor to hamlet	AD 1300–1350
The medieval hamlet, decline and desertion	AD 1350–1450
Post-medieval activity	AD 1450 onward

The organisation of the report

Compiling the results of any major long-running excavation into a single document that can both catalogue the mass of data and provide a meaningful overview and discussion, but without becoming so voluminous that it intimidates both the mind and the pocket of the potential reader, is not an easy task. In the draft of the mid-1990s the approach taken was to compartmentalise the data into a series of thematic chapters – comprising a general overview of the development of the site, a period by period cataloguing of the excavated evidence, and then a general discussion of site development processes and specific discussions of particular aspects of building form and use.

This approach necessitated considerable repetition of

some details, and was largely written without the benefit of being able to integrate the results of the various specialist studies, apart from the chronological base provided by the pottery, as the analysis and reporting of the pottery, other finds, the environmental evidence and animal bone were all in progress concurrently. These deficiencies were ruthlessly exposed by the anonymous reader of that draft.

The document presented here has been extensively reordered and revised. The approach taken is to chronicle the development and structure of the settlement period by period, so that each chapter provides a self-contained account of the archaeology of that period.

Following the presentation of the documentary evidence, each period-based chapter begins with a broad overview of the development of the site through the period in question accompanied by an overview of the key points emerging from the specialist studies relating to status and the economic basis of the settlement. There then follows more detailed description of individual elements of the site, with the many well-preserved buildings catalogued in some detail. Broader overviews of building techniques are provided for the timber buildings of tenth and eleventh centuries, and the chapter detailing the conversion from manor to hamlet also provides an overview of all of the stone buildings of the twelfth to fourteenth centuries. At the middle of the thirteenth century the chronological narrative is interrupted by a chapter dealing specifically with the particular evidence for the development and demise of the watermill system, and the associated history of the river palaeochannels.

The story of West Cotton has been left largely in isolation from the rest of the medieval settlement of Raunds, and the reader is referred to both the Raunds survey volume (Parry 2006) and the account of the contemporary settlements in north Raunds to find more extensive descriptions and discussion of the broader pattern of medieval settlement

Table 1.2: The late Saxon Relative Seriated Phase Dating System (RSP)

LS1	LS2	LS3	LS4
St Neots T1(4)	St. Neots T1(3), Stamford Ware	Cotswolds type Oolitic Top Hat Jars	St Neots T1(2)
AD 850–950	900–975	975–1000	1000–1100

Table 1.3: The medieval Relative Seriated Phase Dating System (RSP)

Ph0	Ph1	Ph2/0	Ph2/2	Ph3/2	Ph4	Ph5
T1(2) St Neots SHC, SAC AD 1100–1150	Lyveden A 1150–1225	Lyveden B Brill 1225–1250	Potterspury 1250–1300	RRW 1300–1400	Lyveden D LMR 1400–1450	LMO 1450–1500

SHC, Medieval Shelly Coarseware; SAC, Medieval Sandy Coarseware
RRW, Raunds-type Reduced Ware; LMR, Late Medieval Reduced Ware
LMO, Late Medieval Oxidized Ware

development (Audouy and Chapman 2009, Chapter 3: A panorama of settlement development, 22–50).

The full specialist reports will form Part 2 of this report, and will appear on a data CD attached to the printed volume, as well as being made available online. This approach will not endear the principal author to the specialists who devoted so much time and effort to the project, to whom I apologise, but the decision was taken on the basis that these studies do have a restricted appeal and it has been considered more important to keep the overall volume to a reasonable length, and cost, to attract the less specialist reader.

Various aspects of the specialist studies have already been made available to fellow workers. The function of the pottery vessels within the medieval hamlet has been considered by Blinkhorn (1998–99), and an overview of the principal results from the analysis of the charred plant remains was published in the mid-1990s (Campbell 1994). The animal bone report, containing all the figures, diagrams and plates has been available to interested specialists since the 1990s as an English Heritage Ancient Monuments Laboratory report (AML 17/94), and only the text is reproduced in full in this volume.

2 The Documentary Evidence

by Paul Courtney

As part of the Raunds Area Project, a one-year programme of documentary research was funded, with Professor Christopher Dyer as project advisor. In this volume, only the evidence directly pertaining to the deserted hamlet of West Cotton is considered in detail. The reader is referred elsewhere for fuller discussions of the evolution of the Anglo-Saxon estate, and of the manorial structure of the Raunds area (Courtney 2006). A further volume contains a discussion of the relationship of the manorial building complex on the northern holding at West Cotton to the superior manor at Furnells in Raunds village (Courtney 2009). These discussions are, however, briefly summarised below.

A wide range of documentary sources have been utilised and they are listed below along with the abbreviations used in the text references:

<i>BF</i>	<i>Book of Fees</i>
<i>CFR</i>	<i>Calendar of Fine Rolls</i>
<i>DB</i>	<i>Domesday Book</i>
<i>CIPM</i>	<i>Calendar of Inquisitions</i>
	<i>PostMortem</i> , Public Record Office
<i>CIPM-Rec Comm</i>	<i>Calendar of Inquisitions</i>
	<i>PostMortem</i> , Record Commission
<i>NRO</i>	Northamptonshire Record Office
<i>PRO</i>	Public Record Office
<i>Rot Hund</i>	Rotuli Hundredorum temp. Hen. III and Edw. I, Record Commission
<i>VCH</i>	<i>The Victoria history of the Counties of England: Northamptonshire</i>

Feudal overlords

Raunds is believed to have been a component of a late Saxon estate centred upon Higham Ferrers. By the time of Domesday Book this estate was in a process of fragmentation giving rise to a complex tenurial landscape. Domesday Book indicates that two major holdings dominated the area of the former estate. One fee belonged to the King's thegn Burgred in 1066 and had been granted to the bishop of Coutances by 1086. This estate comprised lands and rents in Raunds, Ringstead and the Cottons and included a manor in Raunds which can be identified with

Furnells (*DB* I, f 220c). It later belonged to the Clares (as part of the honor of Gloucester) and the Staffords. It continued to be known in the post-medieval period as the Gloucester fee. By the twelfth century the Clare/Gloucester fee had its chief court at Denford and the three main post-Conquest manors associated with the Cottons all owed suit to its court leet. The other major fee belonged to the Countess Gytha in 1066 and was in the hands of the Peverel family by Domesday. It was later held by the Ferrers family, the earls of Lancaster and from 1351 as part of the duchy of Lancaster. The manorial centre was at Higham Ferrers, and Raunds, Burystead, which possessed lands and tenants in Raunds, Ringstead, Hargrave and Stanwick, appears to have been a berewick (dependent demesne) in Domesday Book.

Table 2.1: The descent of the two chief Raunds Fees

1066	1086	1200	1300	1400
Burgred	Coutances	Clare	Clare (Gloucester)	Stafford
Gytha	Peverel	Ferrers	earl of Lancaster	Duchy of Lancaster

Documentary sources

Any understanding of the history of West Cotton, and the other Cottons, is severely hindered by the paucity of sources, especially the lack of early manorial documents for the dominant Gloucester fee. The Cottons do not appear in the Domesday Book, where they are subsumed within the larger estates. The first reference is in the twelfth-century Northamptonshire Survey and this only refers generically to "the Cotes" (*VCH*, 1, 377; see also Glover *et al* 1938, 194–5).

The documentation is also highly biased to its feudal overlords with a lack of evidence relating to its medieval peasant inhabitants. The main sources of information include the records of central government, especially *inquisitions post mortem*, taken on the deaths of the feudal tenants, as well as other lists of feudal tenure, but there is a chronological bias to the period after its decline as a settlement. Manorial records are limited to references in the court rolls of the duchy manor of Raunds, from 1349

onwards, and the Clare/Gloucester fee court based in Denford, from 1514 onwards.

The Cottons

Raunds lay within the hundred (or rather hundred and a half) of Higham, which was named after the major estate centre at Higham Ferrers. In the tenth century, the royal manor (*cyninges tun* or *regia villa*) had been replaced as the basis of royal administration by a new system based on the hierarchical units of county, hundred and vill. All the Cottons along with Raunds, Ringstead and the part of Hargrave in Northamptonshire (rather than Huntingdonshire) formed a single vill into the late fourteenth century. It is not therefore normally possible to distinguish the Cottons from the other components of the vill in taxation records. However, in the 1220 carucage Ringstead and Cotes (probably Mill Cotton) were assessed at 9 1/2 ploughs and ‘Cotes and the other Cotes’ (probably Mallows Cotton and West Cotton) were assessed the same (*BF*, 1, 3210). This was a property tax on plough teams (8 oxen), supposedly as yoked on June 21 1220 (Mitchell 1957, 136). The Ferrers lands (later the duchy) seem to have been excluded from the Higham hundred assessments. This taxation, if reliable, seems to imply considerable agrarian resources attached to the Cottons.

The excavations at West Cotton have clearly revealed a high-status site of late Saxon origin and it has been argued that all three Cottons may have had similar origins, not as secondary settlements but as an integral part of the tenth-century re-planning of the landscape (Courtney 2006). In Domesday Book the Cottons were clearly not regarded as manors. However, many such subordinate units (eg the Peverel holding in Raunds) possessed demesnes, subordinate peasantry and presumably halls at which dues and services were rendered. The tenure and social status of the late Saxon holder of West Cotton is far from clear. Nevertheless, it seems likely that its holder would have been a minor thegn, sokeman or freeman. Domesday Book suggests that there was an overlap in economic status between the lesser thegns and the wealthier freemen; Abels (1988, 144) has argued that some sokemen and freemen attended the king’s army alongside thegns, either to discharge their own tenorial obligations or those of their landlord.

One must also distinguish between the hall as an architectural type, as revealed by excavation, and the hall as a legal concept, as revealed by the documents. However, it is possible that West Cotton had its own unfree tenants who rendered rent and labour services at its hall. Indeed, in economic rather than tenorial terms it may have differed little in its operation to Furnells. In regard to the material culture of the two sites, it is not impossible that the residents of the Cottons could have been of a higher status and wealth than the farmer who actually lived at Furnells.

Place names

The place-names *Cotes* and *Cot(t)on* are Middle English plural forms derived from the Old English word for cottage, *cot(e)*. They are normally associated with sites of low status; cottagers and bordars were peasants with only small holdings of land who lived primarily from hiring out their labour. However, Gelling (1976, 924–5) has previously drawn notice to a higher status *Cotes* place name in Buscote, Berkshire. Particularly pertinent is the classic analysis of the surviving 1279 hundred rolls for the south Midlands by the Russian historian, Kosminsky (1956, 256–318). He demonstrated the lesser role of villeins and customary labour in relation to smaller manors, which instead must have been largely dependent on hired labour. This offers an explanation for the co-existence of minor manorial sites and settlements of cottagers. Both Mallows and Mill Cotton appear to have had peasant settlements existing alongside manorial sites in the high Middle Ages. The ‘Cotton’ place-names seem likely, therefore, to be derived from the low-status elements of this settlement pattern. As they are not documented before the twelfth century it is possible that they replaced earlier names. There is no evidence at West Cotton for peasant settlement before the thirteenth century reorganisation of the manorial complex. It is possible, however, that earlier peasant dwellings existed outside the main area of excavation, either within the eastern enclosures or to the east of Cotton Lane (Fig 1.6).

West Cotton appears in the medieval records as West Cotes, Little Cotes and Wilwencotes with various spellings. It is first specifically identified in a feet of fine of 1247 which records the transfer of land and meadow in Raunds and Westcotes; the meadow was probably the portion in West Cotton (PRO CP25(1)/175/36/551). The name Little Cotes (*Parva Cotes*) is first used in the hundred roll of 1274–5 (*Rot Hund*, 2, 10) and *Wylewynecotes* first appears in an inquisition of 1307 (*CIPM*, 4, no. 435). The duchy court rolls show that the form *Cot(t)on* or *Cot(t)en* alternates with *Cotes* from the early fifteenth century (NRO 705–7). West and Little Cotes (Cotton) predominate in the duchy sources and, as far as can be discerned, appear to be interchangeable terms. Wilwencotes is the usual form in the Gloucester fee documents and incorporates the Old English word *welig*, probably in its dative plural form meaning ‘at the willows’ (cf Smith 1956, 2, 266–7 and Wrander 1983, 108).

The manorial descent

The Clare/Gloucester fee manor

The Clare/Gloucester fee dominated the three Cottons. The Northamptonshire Survey of the twelfth century records three lords holding lands ‘in Cotes’ from the fee of Denford (*VCH*, 1, 377). It is not clear who held the ‘fee of Dennford’ at this date and it may have been farmed from the crown.

The three twelfth-century ‘manors’ may correspond to the Domesday holdings of either three named men of uncertain status (Robert and Geoffrey each with 1 hide or Algar with 1 1/2 virgates), or else three un-named sokemen who held two hides between them (*DB*, 1, 220c). The Domesday Book hidages do not equate with those in the Northamptonshire Survey but are likely to represent fiscal units, prone to reassessment, rather than measured acreage.

The three lords of ‘Cotes’ recorded by the Northamptonshire Survey were John Bidun, Gilbert fitz Richard (de Clare) and Frumbold de Denford, and their holdings can be identified (by means of their later descents) with Mill, Mallows and West Cotton, respectively. Frumbold de Denford also held lands in nearby Knuston. It is unclear on what terms, possibly temporary, these lands were initially held but they clearly soon became hereditary holdings. This can be seen as part of the rapidly evolving trend of major lords to sub-infeudate lands to knights in return for homage and military service. The Normanville family had succeeded the de Denford family in Knuston by 1232 (PRO CP25 (1)/172/23/246) and also held land in West Cotton, indicating the identity of Frumbold’s half hide (*VCH*, 4, 22). By the early twelfth century it is clear therefore that West Cotton was a minor manor and the excavated high status building complex of twelfth to early thirteenth century date may possibly be equated with the 1/2 hide of Frumbold de Denford.

The hundred roll of 1274–5 refers to the men of Ralf Normanville in (West) Cotton. However, it also refers to the men of Henry de Albotesk, who is not otherwise documented in West Cotton (*Rot Hund*, 2, 10). This may indicate that Frumbold’s manor had already been split, as is indicated in later documents. The inquisition *post mortem* of Gilbert de Clare in 1314 records that both Richard Chamberlain and Ralf Normanville held 1/40 of a knight’s fee in Wilwencotes (*CIPM*, 5, no 538). In 1373 the fees are described as 1/16 and 1/40 parts, the smaller belonging to Ralph de Normanville, and by 1387 the Chamberlain family was in possession of both (*CIPM*, 13, no 210 and 16, no 454). In 1399, John Wolf, successor to the Normanville family at Knuston, is recorded as possessing the 1/40 part of a fee but is not mentioned again (*CIPM*, 17, no. 1282). In 1397 and 1406 the Chamberlain holding is described as 30 acres of land and meadow and 3s 4d of rent of divers tenants, held by 1/20 of a knight’s fee (*CIPM*, 17, no. 779; *CFR* 1405–13, 39). However, in 1413 the possessions of Johanne (Joan), widow of Richard Chamberlain, held of the earl of Stafford, are described in more detail. They were said to comprise: a messuage, one virgate plus 3 acres of land and a watermill held by 1/8 of a knight’s fee; two other messuages and 1 1/2 virgates held by military service; and one cottage, a virgate, two tofts, nine acres of land and 3s 5d of rent also held by military service (PRO C138/3). These separate units are presumably a reflection of the peasant holdings.

The watermill is not mentioned in a more cursory description in an inquisition of 1496 (PRO C142/11/4).

The Chamberlains also owned manors locally at Ringstead, Denford and both Mill and Mallows Cotton, as well as several manors in adjacent counties. Their main residence from at least the late fourteenth century was the mansion called Chamberlain’s Place (*mansi vocat’ Chamberlainplace*) at Mill Cotton (*CIPM-Rec Comm*, 4, 2).

Wilwencotes manor, along with manors in Mill and Mallows Cotton, Ringstead and Raunds, was sold by Sir Edward Chamberlain to Robert Dormer in 1530. By 1535 they had been purchased by the FitzWilliam family who sold them in 1559 to the Pickering of nearby Titchmarsh (*VCH*, 4, 33; Bridges, 2, 190). After this date Wilwencotes manor ceases to be mentioned and its lands were probably sold off by the Pickering. A deed of 1545 records the sale of a close in West Cotton from Thomas Hopkyns to John Taylarde and notes that it was bounded by a close of Richard FitzWilliam to the north and a close of Thomas Infylde to the south (NRO S of O 63), see discussion of mills below, unfortunately these closes cannot be traced in later documents.

In 1598 only two tenants, both freeholders, were recorded as owing suit to the Clare/Gloucester fee court in Denford; Thomas Harrison and Thomas Tawyer, gent. It is possible that Harrison only held meadow, while the Wilwencotes section of the court rolls records that, between 1601 and 1603, Thomas Tawyer ‘gent’ sold off 36 acres of arable and 3 roods of meadow to 5 individuals. Several of the new owners are subsequently listed as owing suit of court for Wilwencotes (NRO X884 and X887:23–8, p 219). It is uncertain if the arable lay in the close vicinity of West Cotton or was more scattered, being attached to a former messuage there. Unfortunately, none of these holdings can be traced subsequently with any degree of certainty. It seems likely that these lands are the same as those held by the Chamberlains in the fifteenth century, Tawyer having purchased them from the Pickering, but this is unproven.

The Clare/Gloucester court rolls record Wilwencotes as a separate tithing from the earliest surviving Denford court rolls of 1514 until it disappears sometime between 1622 and 1628. A tithing was a group of men who were bound to stand security for each other’s good behaviour. Two tithingmen or officials for the tithing of Wilwencotes were appointed by the court into the seventeenth century (1514–1622), though they repeatedly failed to give suit of court in the reign of James I. An annual ‘cert’ payment of 6d was also paid by the tenants to the Denford court. Several tenants are named as owing suit but there is no evidence that any of them actually lived in the hamlet; in the 1514–21 rolls William Clark was one of the two tithingmen for West Cotton as well as tithingman for Middle (Mallows) Cotton. Occasional references to the inheritance or sale of portions of meadow or pasture in Wilwencotes also occur (NRO X884–5).

Duchy lands

Although the Clare/Gloucester fee dominated the three Cottons, the duchy certainly had meadow and cottagers at both Mallows and Little Cotton. These were not sub-ifeudated, like the Clare/Gloucester fee lands, but were farmed as demesne (land worked by tenants or hired servants for the direct profit of the lord) administered from Burystead. The duchy baliff's accounts regularly record 1 acre and 2 rods of Burystead demesne meadow in West Cotton (eg PRO DL29/324/5292). A duchy court roll of 1349 is the sole survivor from that century and contains a reference to a tenant holding a portion of meadow in West Cotton. Frequent references to holdings of meadow by duchy tenants occur in the court rolls from around 1400 onwards and in the fifteenth century tenants were sometimes ordered to scour ditches in West Cotton or at Cotton Bridge (NRO X705–7); which probably carried Cotton Lane, linking all three Cottons and Stanwick, over the Cotton (Tipping) Brook (Fig 1.6). These include orders in October 1433 for Walter Johnson to repair the ditch at Wilwencotes and in April 1434 to do the same at Litelcotes, demonstrating that the names were interchangeable. The fifteenth-century duchy accounts also include portions of meadow in West Cotton included among the lists of decayed rents for which tenants could no longer be found (eg PRO DL29/326/5344).

A duchy court roll of 1520 (NRO X706) refers to a cottage in 'Little Cotes', formerly belonging to Walter Johnson, with 3 acres of pasture and an acre of willows (later located by the Tipping Brook). The same property is also recorded in the duchy rental of 1552–3, and in court rolls of 1603 and 1723 (NRO X707; FH 565 and QCR 51) where the cottage is described as a message now a close of pasture, indicating desertion. This appears to be the only post-medieval evidence for occupation in West Cotton and suggests abandonment of the cottage in the late sixteenth century, if not before given that time-lag in such documents is always a possibility.

Another problem is posed by the existence of a duchy manor of Cotes held by the Chamberlains. A chancery case of 1378–9 records that the manor was taken into the hands of the king's father (Edward II, 1342–77) because Richard Chamberlain had alienated it without licence to William Mercer and Hugh Seneschal (PRO C44/10/3). Richard argues that the manor was held of the honor of Peverel and not in chief (directly from the crown). Neither the outcome of the case or the location of the manor is known, but it is likely to have been either at Mallows or West Cotton. If the latter was true, it would indicate the presence in West Cotton of a manor belonging to the Duchy fee, in addition to the Clare/Gloucester fee manor.

The eighteenth-century records

A Gloucester fee estate document of around 1735 describes both *Wilwencotes* and *Middlecotes* as 'entirely demolished' (NRO X887 23:12, 2–3). At the time of the 1739 terrier the area to the west of the Cotton Lane appears to have been occupied by two closes. The south close held by Elizabeth Morris and the north close by Lady Dolben, inheritor of the duchy estate of Burystead. Lady Dolben had held 'Cotton Close' in 1723, when it is listed alongside the Burystead estate, suggesting that it was a distinct acquisition (NRO QCR 25). Both closes were almost certainly freehold but their descent prior to 1739 remains obscure. A claim relating to the intended enclosure of Raunds in 1797 (in the possession of Mr T C Smith of Raunds to whom we are grateful for access) indicates that the north close was still in the hands of the Dolben family while the south close was then held by the Rev Mapletoft and his wife, Margaret (Fig 1.3). The enclosure map of 1798 (NRO map 3124) clearly shows that the northern close included the former tenements A, E, C, D and F while the southern close included tenements B and G (Figs 1.3 and 1.6). To the west, the depicted boundary between the closes can be equated with a post-medieval boundary ditch that had replaced the former walled boundary between tenements A and B. The 1797 claim also refers to the Pen Pound and this may equate with the walled enclosure occupying the medieval central yard, also clearly shown on the enclosure map.

The 1798 enclosure map also reveals 'ancient' enclosures to the east of the Cotton Lane. The elongated form of the most northerly enclosure clearly reveals its origins as an open field strip. To the south of the Cotton Brook lay two larger and adjacent closes, both of which are referred to in the 1739 Gloucester fee terrier (NRO ML 124).

Fields and meadows

West Cotton lies on the boundary separating the two ecological zones of the arable and meadow of the medieval and early-modern field system. David Hall has argued that the three Cottons once possessed an independent field system (see Parry 2006) though it appears to have become integrated within the Raunds field system by the late fourteenth century.

The meadows were divided between the two fees. In 1086 both the Bishop of Coutances and William Peverel were assessed as holding 20 acres (probably a fiscal measure) of meadow in demesne. The meadow, like the arable, was divided into strips or doles of intermixed ownership, though the detailed division between the two fees is uncertain. Meadow was an especially valuable resource providing hay to feed the livestock over the winter. After the hay was mown, meadows were laid open for common grazing, often between Lammas (August 1) and sometime in November or December, but regulations were quite variable (see Ault 1972). In 1298, an extent of the lands of the earl of Lancaster

valued (ie when farmed or rented out) the Burystead meadow at 2s an acre, while the arable was only worth 6d (PRO C133/81: Kerr 1925, 34).

There were two meadows in Raunds, West Cotton Meadow and Raunds Great Meadow (NRO ML 124: 1739 terrier) and these, like the arable, were enclosed in 1798 (Fig 1.3). The 1797 enclosure claim clearly locates West Cotton meadow as abutting the Short Leys, an arable/pasture field immediately south of West Cotton. The two meadows were probably separated by the Cotton Brook, which then partly followed the former river channel that may have provided a previous boundary.

In addition, in the same enclosure claim rights of common in the Pen Pound, identified above, and the Great Green were claimed by the Rev Mapletoft, Sir

William Dolben and three others, from Lady Day to Old Midsummer, after which they were laid open as common with the rest of the fields and meadows. A similar right of common was also claimed by a nearly identical list of farmers on the Little Green near Cotton Bridge. Both the Great Green and the Little Green are also recorded in a Terrier of 1768. This clearly indicates that the Great Green lay adjacent to West Cotton Meadow, although its exact location is still uncertain, while the Little Green abutted the southern side of Meadow Furlong, a field to the immediate east of Cotton Lane, identifying it as a part of the former settlement area to the east of Cotton Lane and north of Cotton Brook. These restricted rights of common probably preserve rights held by the medieval inhabitants of West Cotton.

3 The Prehistoric to Middle Saxon Occupation

The prehistoric monument complex

The prehistoric activity at West Cotton has been discussed in a separate volume covering the prehistory of the entire Raunds Area (Harding and Healy 2007), while interim statements were published during and immediately after excavation (Windell 1989 and Windell *et al* 1990). As a result, this evidence is only briefly summarised here.

The group of prehistoric monuments at West Cotton lay at the northern end of a complex that extended south for over 2km and spanned the early Neolithic to early Bronze Age and included a broad diversity of monument types. The group at West Cotton formed the most concentrated cluster, situated on an area of slightly raised gravel immediately adjacent to the easternmost channel of the River Nene (Fig 3.1). At this time the valley floor would have comprised a series of gravel islands between multiple, braided river channels; as explored within the Raunds Area Project and more recently in a watching brief during the final stages of gravel extraction at Stanwick Quarry (Chapman 2004). The monuments were constructed either on the gravel islands or at the margins of the valley floor, as at West Cotton, and there is no evidence to suggest that flooding and alluviation was occurring at this early date.

Wood from one of three pits sealed beneath the western end of the Neolithic Long Mound (Fig 3.1, LM) has been radiocarbon dated to the early fifth millennium BC, and may relate to a short-term or seasonal occupation, perhaps related to tree-clearance.

Monument construction appears to have begun in the early to mid-4th millennium and at West Cotton this included the Long Mound and the Long Enclosure (LM and LE). There was a second period of monument construction in the late Neolithic and early Bronze Age, which comprised a series of round barrows and associated inhumation and cremation burials. At West Cotton there was a triple-ditched round barrow (B), with a central inhumation accompanied by a long-necked Beaker, a flint dagger and a V-perforated jet button. Several unexcavated ring ditches lie to the immediate north-east (Fig 3.1, RD).

In addition, at the edge of the prehistoric river palaeochannel there was a timber platform largely of alder (T), which is dated to the early to mid 3rd millennium BC.

It has recently been suggested that the creation of this platform may have been related to tree-felling by beavers, perhaps with additional human modification (Coles 2006, 90–95), and a beaver bone, radiocarbon dated to the late Bronze Age, was recovered from medieval silts above this (see Chapter 9).

One subject that is of direct relevance to the later settlement history is the prehistoric river system, which will be discussed in more detail in Chapter 6. The location of the Neolithic timber platform shows that the main eastern river channel was stable, and the late Saxon river edge lay only a few metres to the north of its Neolithic predecessor (Fig 6.5c). The difficulty of interpretation relates to the confluence of the Cotton Brook with this channel, as the early history of the watercourses to the north and the south of West Cotton was not resolved by excavation, leaving the sequence of channel evolution undefined. It is suggested by the author that the prehistoric stream course lay to the north (Fig 3.1, northern stream), while the southern channel was of a later date, cutting across the southern end of the Long Enclosure (LE) and eroding the prehistoric ground levels in this area, and was evidently the major channel at the formation of the late Saxon settlement.

There is no evidence of any activity at West Cotton during the middle to late Bronze Age or in the Iron Age. The three excavated prehistoric mounds, two immediately beneath the medieval settlement and one beneath the medieval field system to the immediate south, were all well preserved, standing up to 0.30–0.50m high, and this might suggest that the area had not been subject to long-term arable exploitation during the later prehistoric and Romano-British periods. Most of the evident disturbance of the mounds resulted from activity post-dating the early Saxon period, although it is possible that this could have removed evidence of lesser earlier disturbance.

Romano-British activity

Romano-British settlement within the Raunds area will be considered within a separate volume (Crosby and Neal in preparation). A sparse scatter of residual Romano-British

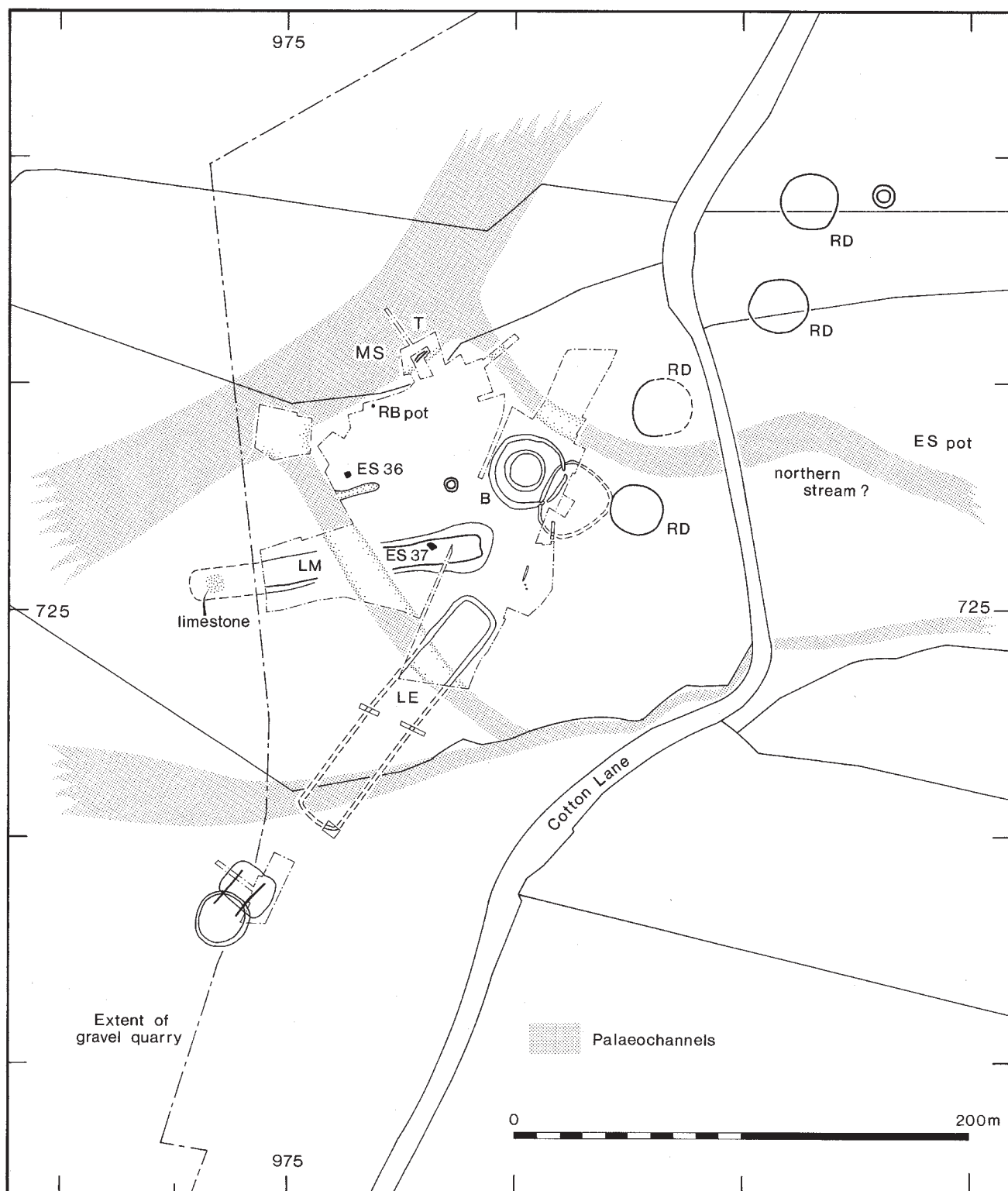


Fig 3.1: West Cotton, prehistoric, Romano-British and early/middle Saxon activity. © Crown copyright. All rights reserved. Northamptonshire County Council: Licence No. 100019331, Published 2009

domestic debris was recovered, including 157 sherds of pottery, 33 coins, other copper alloy finds and some ceramic tiles. This includes some early second-century coins but most of the material is dated to the third to mid-fourth centuries. It can be accounted for as material brought to the site either deliberately or accidentally in the late Saxon and medieval periods from the nearby Roman settlements at Stanwick, 1km to the south, and Mallows Cotton, 0.5km to the north. It is possible that much of the domestic debris came within cart loads of building stone brought to West Cotton along the Cotton Lane from these nearby Roman ruins, which would have provided the nearest sources of building stone.

However, a single near complete pottery vessel of Roman date was recovered from the silts of a watercourse sealed beneath the late Saxon mill leats (Fig 3.1, RB pot). This does suggest the probability of a Romano-British presence in the immediate vicinity of West Cotton. The form this may have taken is unknown, but the presence of small quantities of ceramic tile could suggest that there was a building or buildings not far beyond the excavated area. In addition, even though the lane was not tested by excavation at West Cotton, it seems likely that the Cotton Lane followed, or at least closely respected, the course of a Roman road linking the settlements along the eastern side of the floodplain at Stanwick, Mallows Cotton and between Mill Cotton and Ringstead (Fig 1.2).

Early to middle Saxon occupation (AD 500–800)

There is evidence for two separate episodes of activity within the early to middle Saxon period, occurring in the sixth and eighth centuries respectively.

Early Saxon occupation

The early Saxon occupation comprised a sunken-featured building and another poorly preserved structure some 45m away set on top of the prehistoric Long Mound (Fig 3.1, ES 36 and ES 37). Early/middle Saxon pottery was recovered from both and also from the final fills of a silted watercourse immediately to the south of the sunken-featured building. There was a sparse early/middle Saxon pottery scatter across the remainder of the excavated area. A total of 262 sherds was recovered, mainly small, undecorated body sherds although a few larger rims are present, along with a single stamped sherd and four with incised decoration.

None of the Raunds sites has produced pottery or other finds that can be dated to before the end of the fifth century and this, together with the absence of Maxey and Ipswich-type wares at West Cotton, is consistent with two residual brooches of late fifth to early sixth-century forms and a Kentish-style disk brooch dated to the sixth century. The radiocarbon date from the sunken-featured building provides a broader date range from the early fifth to the

end of the sixth century (420–600 cal AD; 95% confidence; 1548± 333 BP; UB-3418).

In addition to the pottery, the excavated structures produced domestic items such as loomweight fragments and spindle whorls, but the only personal items of this date, two brooches and a decorative mount, were recovered as residual finds in later contexts.

The lack of any further structures, particularly post-built halls, or specific pottery concentrations indicates that these were isolated, individual structures and not merely the only identified elements of a more extensive settlement. However, fieldwalking to the east of Cotton Lane also produced a scatter of early/middle Saxon pottery, suggesting that there may have been contemporary activity of at least a similar nature 200–250m to the east. These two areas lay on either side of the course of the northern channel of the Cotton Brook. The early Saxon activity at West Cotton may therefore have formed one of the bifocal settlements, of which several have been identified from fieldwalking within the Raunds Area, with occupation located on either bank of a stream course (see Parry 2006, 92–94).

The upper levels of the sunken-featured building were partially truncated by an homogeneous soil horizon of red-brown sandy loam with sparse pebble inclusions. This occurred across most of the site and the late Saxon occupation was cut through it. It appears to represent a plough-turned soil derived from a period of arable cultivation occurring sometime between the demise of the sixth-century occupation and the appearance of the main settlement in the tenth century, reinforcing the conclusion that there was no continuity of settlement.

Structure 36, sunken-featured building

The steep-sided, flat-bottomed pit was 2.50m wide by 0.35m deep (Fig 3.2, ES 36). A single posthole, 0.50m deep, lay at the centre of the slightly rounded eastern end, but the southern end had been removed by a later ditch system.

The mixed fills of grey silty clay with gravel contained substantial quantities of Hazel (*Corylus*) charcoal, much of it 50–200mm in length (from which a radiocarbon date was obtained), and an assemblage of early Saxon pottery, three sherds of Romano-British pottery, a spindle whorl, loomweight fragments and a perforated stone block with a worn surface, possibly used as an anvil or hammer stone (see Figs 11.1 and 11.2). The larger charcoal fragments lay above the basal fill and they may have come from carbonized timbers of a floor, or the walls and roof, burnt at demolition and collapsed into the pit. The upper fill was closely comparable to the overlying soil horizon.

To the immediate south of Structure 36 there was a linear ditch, 6.0m wide by 0.40m deep, which was largely filled with mottled water deposited silts (Fig 3.1). Some early Saxon pottery came from the upper fills and continued over and immediately beyond the northern edge, and may derive from external activity associated with the nearby building.

Structure 37

This structure was initially defined by a localised scatter of early Saxon pottery on the surface of the prehistoric Long Mound (Fig 3.1, ES 37). In excavation it was only visible as a shallow and poorly defined oval to sub-rectangular depression, 5.50m long by 3.30m wide and at most 0.12m deep (Fig 3.2, ES 37). The fill of grey to brown sandy loams with some gravel was generally slightly lighter than the underlying mound material. There were two internal postholes 1.25m apart and 0.45 and 0.18m deep. A linear concentration of charcoal, perhaps the remnant of a single short plank, 1.0m long by 0.2–0.3m wide, lay between them. The absence of any other structural postholes leaves the building form uncertain, although the presence of the pottery scatter, a decorated bone spindle-whorl, a ceramic spindle-whorl and fragments of clay loomweight suggest that it had been a roofed structure.

Middle Saxon activity

An episode of middle Saxon activity took place on and adjacent to the river channel, and is dated to the eighth century by three radiocarbon dates. A slight shift of the channel edge had truncated earlier silts and partially re-exposed parts of the Neolithic timber platform. Oak (*Quercus*) stakes were driven, apparently deliberately, into the two largest alder trunks, and flax seeds and capsules

came from silts above these stakes. Any other stakes that had just been driven into the earlier silts might have been lost in the initial machine stripping of the channel silts.

The two oak stakes and the flax debris have given radiocarbon dates between the mid-seventh to late ninth centuries: (650–860 cal AD; 95% confidence; 1297±49 BP; UB-3328); (660–890 cal AD; 95% confidence; 1264±52; UB-3323) and (620–890 cal AD; 95% confidence; 1295±70 BP; OxA-4079). In addition, a displaced hazel stake from the nearby first watermill gave a date in the same range (660–880 cal AD; 95% confidence; 1258 ± 36 BP; UB-3322), and is presumed to be residual within its context.

The consistent date ranges suggest that this was probably a short-lived phase centred on the mid-eighth century, with the flax seeds and capsules in the silts being the debris from flax retting. In this process bundles of flax stems would have been dumped into the water and retained within timber structures supported by stakes driven into the river bank below water level. The flax was left to decay, so that the flax fibres could be easily extracted from the rotted residue. Flax retting is well known to contaminate the water in which it takes place, and for this reason would preferably be carried out at some distance from a settlement, and downstream rather than upstream.

The absence of features and pottery dated to this period from the main excavations supports the interpretation that this activity was limited to the riverside area.

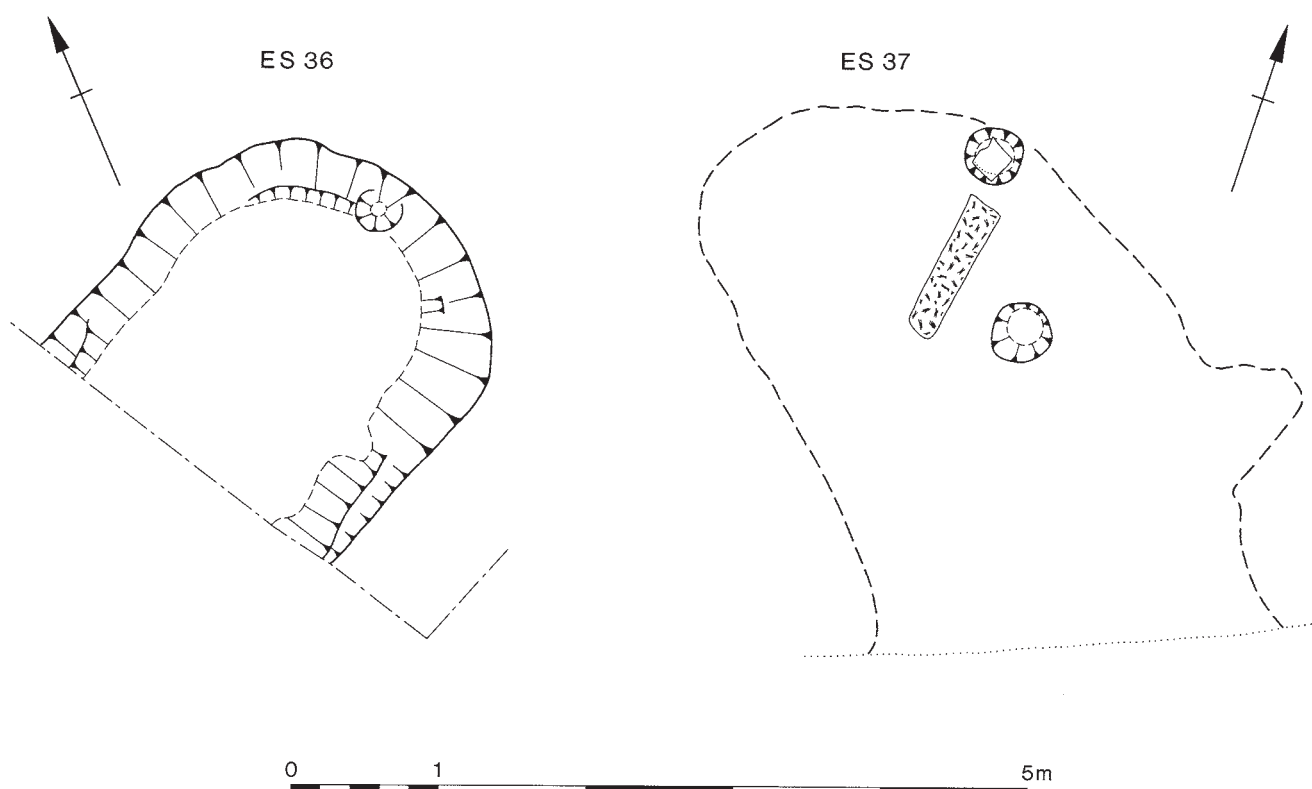


Fig 3.2: The early Saxon buildings, ES36 and ES37

4 The Late Saxon Settlement (AD 950–1100)

While there was evidence for limited occupation at West Cotton in the sixth century and for utilisation of the river channel in the eighth century, there was no indication that the foundation of the settlement in the tenth century owed anything to these previous episodes other than coincidence of common usage of a favourable location. It can therefore be regarded as a new foundation, with the tenth-century arrangement destined to provide the underlying structure for the subsequent development of the site up to its final form as a medieval hamlet 400 years later.

The choice of location was primarily based on the local topography. The settlement was situated on a slightly raised peninsular of gravel terrace that lay near the confluence of a tributary stream, the Cotton Brook, with a major channel of the River Nene (Fig 1.2). The other two deserted settlements to the north, Mallows Cotton and Mill Cotton, also lay adjacent to tributary streams, with Mill Cotton similarly positioned on the edge of the floodplain, while Mallows Cotton lay on slightly higher ground, above a steeper fall to the valley floor.

The raised location at West Cotton was even slightly enhanced in places by the presence of upstanding prehistoric mounds. The settlement was therefore ideally placed to exploit both the valley slope and the river valley environments, and a controllable water supply to power a watermill may well have been a major consideration, as it was at Mallows and Mill Cotton, where there were also watermills.

The new settlement, based on regular plot sizes, containing a high-status complex of timber buildings and standing beside a small watermill, may have been the residence of a minor Saxon thegn. At its formation in the mid-tenth century, the provision of a partially enclosing ditch and a timber palisade harked back to earlier times, with probable Scandinavian influences added to the new concepts of plot layout brought in with the reconquest of the Danelaw by the Saxon kings. However, by the beginning of the eleventh century these semi-defensive elements had been swept away and a new courtyard arrangement marked the emergence of what must be considered to be a proto-manor house.

The formation of the settlement (AD 950–975)

The date of the formation of the settlement is crucial to placing the site within its historical context, but the dating is necessarily largely dependent on the pottery evidence, which is not as precise as would be wished. However, it was possible to isolate a few lengths of boundary ditch that had been backfilled early in the life of the settlement. The earliest watermill and the backfilling of the area prior to the digging of a new mill leat was another early event. Within these assemblages an earlier form of St Neots ware bowl was absent but a later bowl type was relatively common. At Northampton, these types have been dated respectively to AD 800–950 and AD 900–1150, indicating that the occupation probably began in the decades around AD 950.

It is therefore likely that the establishment of the settlement post-dated the reconquest of the Danelaw, which occurred between AD 918–24, and West Cotton can be seen to be part of a widespread episode of social and economic reorganisation of the Danelaw in the following decades. Part of this process may be typified by the appearance of new planned settlements with a regular arrangement of ditched plots, which echo in form and dimensions elements of late Saxon town planning.

The planning and metrology

The main settlement area was near square in plan form, occupying 2.4 hectares or about six acres (Fig 4.1). It was bounded to the east by the Cotton Lane, which may have respected a Roman predecessor linking the valley bottom settlements at Stanwick, to the south, and Mallows Cotton and Ringstead, to the north. At West Cotton the road was diverted eastward and then back northward at two dog-legged turns. This may have been a deliberate realignment to help accommodate a square settlement area, and these are the most marked deviations in the course of the lane along this length of the valley. Any evidence for a former linear road would lie beneath the unexcavated eastern half of West Cotton, although a metalled surface was not evident on the geophysical survey of this area.

To the south the settlement was also bounded by the Cotton Brook, while a western limit was created by the

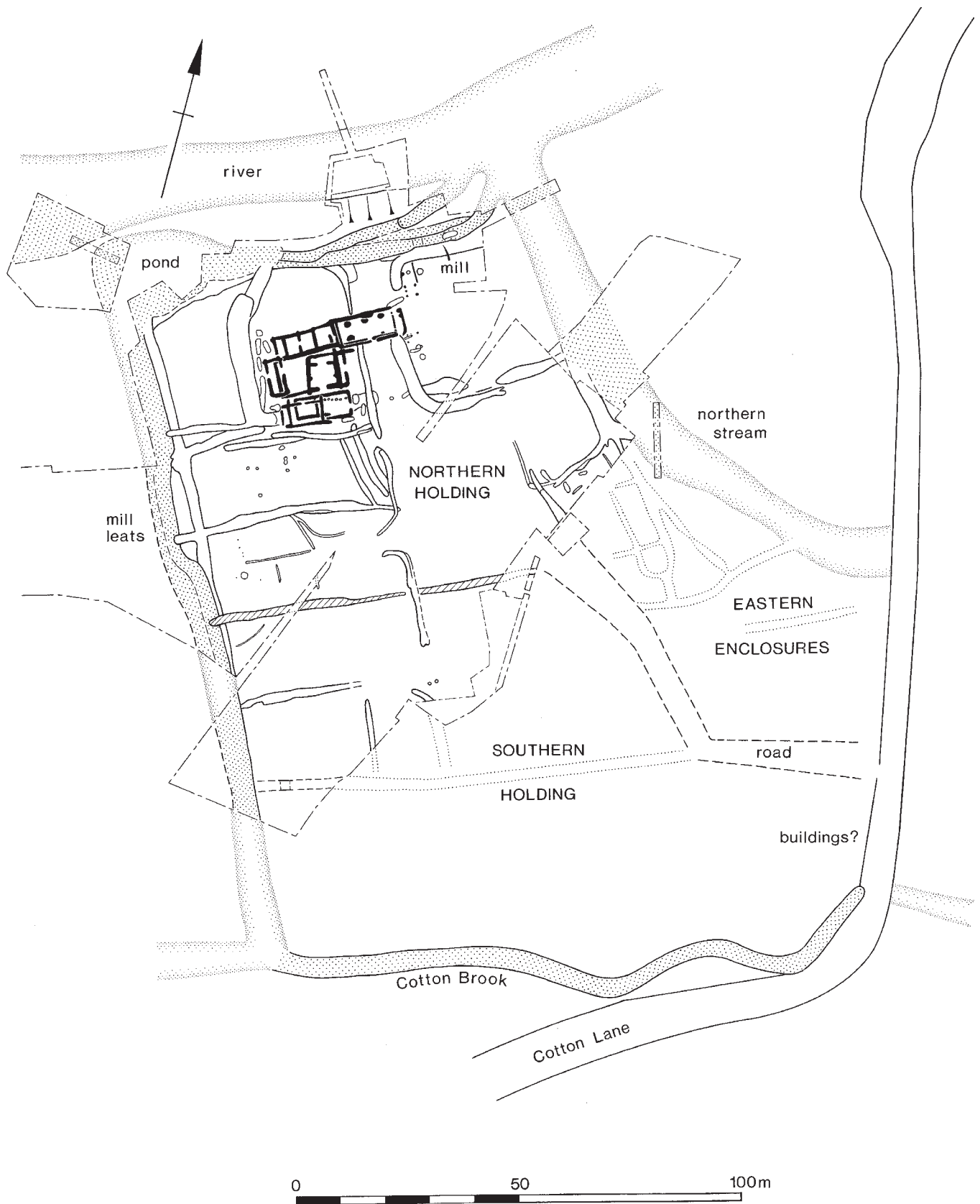


Fig 4.1: The late Saxon settlement, 950–1100

establishment of an artificial leat system to divert water northward to a pond and watermill. The northern boundary was provided by the watermill system and the adjacent river channel. The only deviation from a rectilinear plan lay to the north-east, where a largely redundant stream channel, the northern stream, cut diagonally across the site, and clearly influenced the setting out of the nearby boundary ditches. This channel was probably not carrying any stream flow at this time, but it may have held seasonal water and back flow from the river during times of flood.

Within the settlement rectangular plots were defined by a system of linear boundary ditches. Excavation at the northern end of Raunds village has shown the appearance of similar boundary systems at around the same date across an extensive area either side of the valley, taking in two manorial centres and plot systems beyond (Audouy and Chapman 2009). West Cotton, where the evolution of the boundary system has been most clearly established, provides a good model for the process of creating such regular plot systems in the mid-tenth century.

In particular, the regular rectangular plots along the western side of the site enable a full metrical analysis of the system to be undertaken (Figs 4.1 and 4.2). The western ditches were spaced at close to 20m centre-to-centre. Taking the rod of 16.5 feet (5.03m), as defined in many later medieval documents (Zupko 1968, 144–5), a 4-rod length of 20.13m closely fits the measured ditch spacing. It is more difficult to establish a precise metrology for the length of the western enclosures. While the eastern end is defined by an original linear ditch system, the western end could have lain anywhere within the broad expanse of the westernmost boundary ditch and the adjacent mill leat. If the mill leat system is adopted, it may be suggested that the intended length was 50m or 10 rods. This provides idealised dimensions for the smallest plots of 4 by 10 rods, and this immediately suggests a connection with a standard medieval land measurement, the statutory acre. This is defined in later medieval documents as a field strip 4 rods wide by 40 rods long (Zupko 1968, 3). The 40-rod length is 1/8 of a mile, the furlong or furrow length. The small western enclosures were therefore quarter-acre plots, a quarter the length of a statutory acre.

However, the internal partitioning of the site may actually have been founded on the three principal east-west ditches, which were spaced at 40m or 8 rod intervals with the same spacing to the northern and southern settlement boundaries. These ditches may be modelled on a length of 100m or 20 rods, twice the length of the quarter-acre western enclosures, even though they actually terminated at an irregular line formed by either the northern stream or the access road, showing how the metrical model was necessarily modified by the site topography.

The general argument is therefore that the primary settlement arrangement comprised a line of four one-acre plots to the west, each 8 rods wide by 20 rods long, half the length and twice the width of the statutory acre (Fig 4.2). To the east, the addition of a further two one-acre

plots provides an idealised, near-square plan of six acres. However, given the presence of the northern stream, which lay at an oblique angle, it was necessary to modify the model layout in order to fit a plot beside the stream. To achieve this, the line of the access road departed from the rectilinear to allow some extra space for the provision of a roughly rectangular, nominal one-acre plot set between the access road, the northern stream and Cotton Lane. The end result was that this obliquely aligned eastern plot was actually slightly less than an acre in extent as a result of accommodating the site topography.

While it has not been established whether there was any tenth-century occupation beyond this main settlement area, it is suggested that the coherence of the plan indicates that this probably formed the full extent of the original planned settlement, with the spread of settlement to the east of the Cotton Lane resulting from subsequent expansion.

Having established a simple model for the original plan form, it is of immediate interest to note how this was modified through the subsequent development of the site, so that only a few clues to its presence survived to the final period of occupation, the medieval hamlet, the earthworks of which were available for study and interpretation without excavation. The eastern boundaries of the regular western plots were to show a steady eastward drift, so that the plot length, the most uncertain of the original measurements, was lost, although the medieval tenement boundaries did run on much the same lines as their late Saxon predecessors and therefore retained a recognisable spacing at 40m or 8 rod intervals, although there was a loss of regularity resulting from slight drifting of the boundaries through time.

As a result, given only the medieval evidence, it would be possible to suggest the provision of regular widths for the western tenements, but the extent of the later changes left no clue that the original planning had been based on regular plot sizes based on the statutory acre. Analysis of earthwork plans showing the final settlement arrangement is therefore unlikely to provide a full understanding of the principles underlying the original settlement organisation.

The arrangement of the settlement

From the available evidence the settlement area appears to have comprised three principal zones; the northern holding, the eastern enclosures and the southern holding, which are a combination of the tenurial and functional divisions of the original settlement arrangement (Fig 4.1).

The northern holding

This was the only area to be fully excavated, and the core of the description of the late Saxon settlement is the story of the development of the northern plot system (Figs 4.3 and 4.4). It comprised a high-status building complex set within the northern one-acre plot. To the south-east there was an open yard, with a nominal area of a half-acre, and to the south-west there were two quarter-acre plots, both with



Fig 4.2: The metrology of the late Saxon settlement boundaries

access onto the yard, at least one of which was probably used for stock control. In addition, a watermill lay on the leat system running along the northern margin of the plots.

On the basis of several pieces of circumstantial evidence, it is suggested that this two-acre plot system constituted the major part of a single holding. In particular, the southern boundary of the holding was formed by a continuous ditch

that was the only boundary to be closely respected not only throughout the lifetime of the medieval hamlet, when it was the only boundary marked by two parallel walls, but through to the end of the eighteenth century, when it was the tenorial boundary between two separately held closes (see Fig 1.4). Another significant factor relating to this boundary was the complex sequence of reordering at its

western end, which ran down to metalled fords providing passage across the mill leats, and perhaps located here as a crossing shared by both the northern and southern holdings (Figs 6.2 and 6.6).

The exact status of the individual who farmed this holding eludes us but, as concluded in the study of the documentary evidence (Chapter 2), it is most likely to have been held by a freeman/sokeman or a minor thegn, although we have no documentary evidence to confirm this.

The eastern enclosures

The eastern enclosures comprised the less regular plots, with a nominal area of one acre, set between the access road, the northern stream and Cotton Lane. Very little of this area was excavated, so its form and function is undefined. The excavated boundary ditches at the northern end showed a complex pattern of recutting, and initially there may have been a bridged crossing (Fig 4.1). The ditches also contained quantities of domestic debris of tenth and eleventh-century date, which may have come from nearby occupation. A scatter of postholes and small pits within the small area of the interior that was excavated perhaps provide an indication of the broader pattern of activity (see Fig 4.36). The only evidence for the interior arrangement comes from geophysical survey. This suggests the presence of a central sub-division, and numerous linear features within the northern half may include both ditch lines and the walls of timber buildings.

It is suggested that this occupation may have been associated with peasant settlement related to, and probably dependent on, the domestic focus of the northern holding. A later connection between the northern holding and the eastern enclosures was evident in the way that the twelfth-century manor on the northern holding was relocated in the thirteenth century onto the eastern enclosures, and it is considered most likely that they were always parts of a single holding.

The half-acre or so of land at the northern corner of the settlement, beyond the northern stream, might also be included. Any early features would have been sealed by alluvial silts deposited in the early twelfth century, and these were not excavated. As a result, the nature of any activity here in the tenth and eleventh centuries has not been established, but as it was largely low-lying it seems unlikely that there was any significant domestic activity within an area which must always have been prone to flooding.

The full extent of the northern holding and the eastern enclosures therefore comprised 3.5 acres, over a half of the original settlement area.

The southern holding

Only part of the southern holding was excavated, but it is suggested that it may have been a near mirror image of the northern holding. To the north, it comprised two quarter-acre plots that may have opened into a half-acre

yard to the east. The smaller plots contained few features, although there was a transverse sub-division within the southern plot (Figs 4.1 and see 4.28).

On the basis of the mirror imaging of the smaller plots and the yard, it is suggested that the unexcavated southern plots, totalling 1.5 acres, may have contained a building complex of similar size to that within the northern holding. With a total extent of 2.5 acres, the southern holding can be seen to have been only slightly smaller than the northern holding, indicating that it was perhaps of similar status.

The idea that the original settlement held two high-status holdings may be supported by the documented presence of two overlords throughout the medieval period and beyond. It is suggested that the physical expression of this tenurial division lay at the heart of the original settlement, and the analysis of subsequent periods of activity shows that this fundamental division was maintained throughout the lifetime of the settlement.

The early development of the northern holding (AD 950–975)

As the whole of the northern holding was excavated its development can be reconstructed in some detail. In the later tenth century it comprised a yard to the south giving access to two smaller enclosures to the west (Fig 4.3). These areas were separated from the main domestic buildings and the watermill by a substantial ditch system. With this arrangement it seems to fall halfway between being a fully enclosed settlement, as would often have been constructed up to this time, and an open settlement form going with the introduction of regular plots. What may have been an initial suspicion of the new open settlement form evidently faded, as through the eleventh century the major ditches were progressively abandoned and the arrangement of the buildings similarly became more open, taking on a simple courtyard form (see Figs 4.5 and 4.8).

The original arrangement of the buildings comprised a single square building set within a rectangular, timber palisade (Fig 4.4a). For a brief period this building may have stood alone, and it was perhaps only ever intended to be a temporary structure; perhaps the equivalent of living on-site in a caravan while building a house. It was closely followed by the construction of the timber palisade, which to the west and south was flanked by a substantial broad, U-shaped ditch, up to 4.0m wide by 1.0m deep. These dimensions may be contrasted with the 2–3m wide by 0.4–0.7m deep ditches forming the other ditched boundaries. A bank may have been thrown up against the western and southern sides of the palisade, but no traces survived.

The lengths of shallow ditch to the north of the palisade lay nearly 20m from the main boundary, and may have been part of the initial establishment of the plot boundary layout. They would have been rendered obsolete by the new defensive ditch and the construction of the main domestic buildings.

The construction of the main timber hall probably followed fairly closely (Fig 4.4b). This entailed the removal of the north-eastern corner of the timber palisade, which was then closed by new transverse walls extending from the north-east corner of the original building, which was also rebuilt. The provision of principal posts perhaps suggests that an upper storey was added as part of the rebuilding.

The domestic range abutting the western end of the hall was probably the last to be constructed, as the culmination

of the initial phase of development (Fig 4.3). The northern side of the palisade would have been demolished, but the remainder appears to have been retained, abutting the end walls of both the hall and the domestic range. The building within the palisade was demolished, its provision of temporary on-site accommodation being no longer required. There was little direct evidence for the constructional details of the timber buildings, but what there is indicates that they were stave-built, with timbers

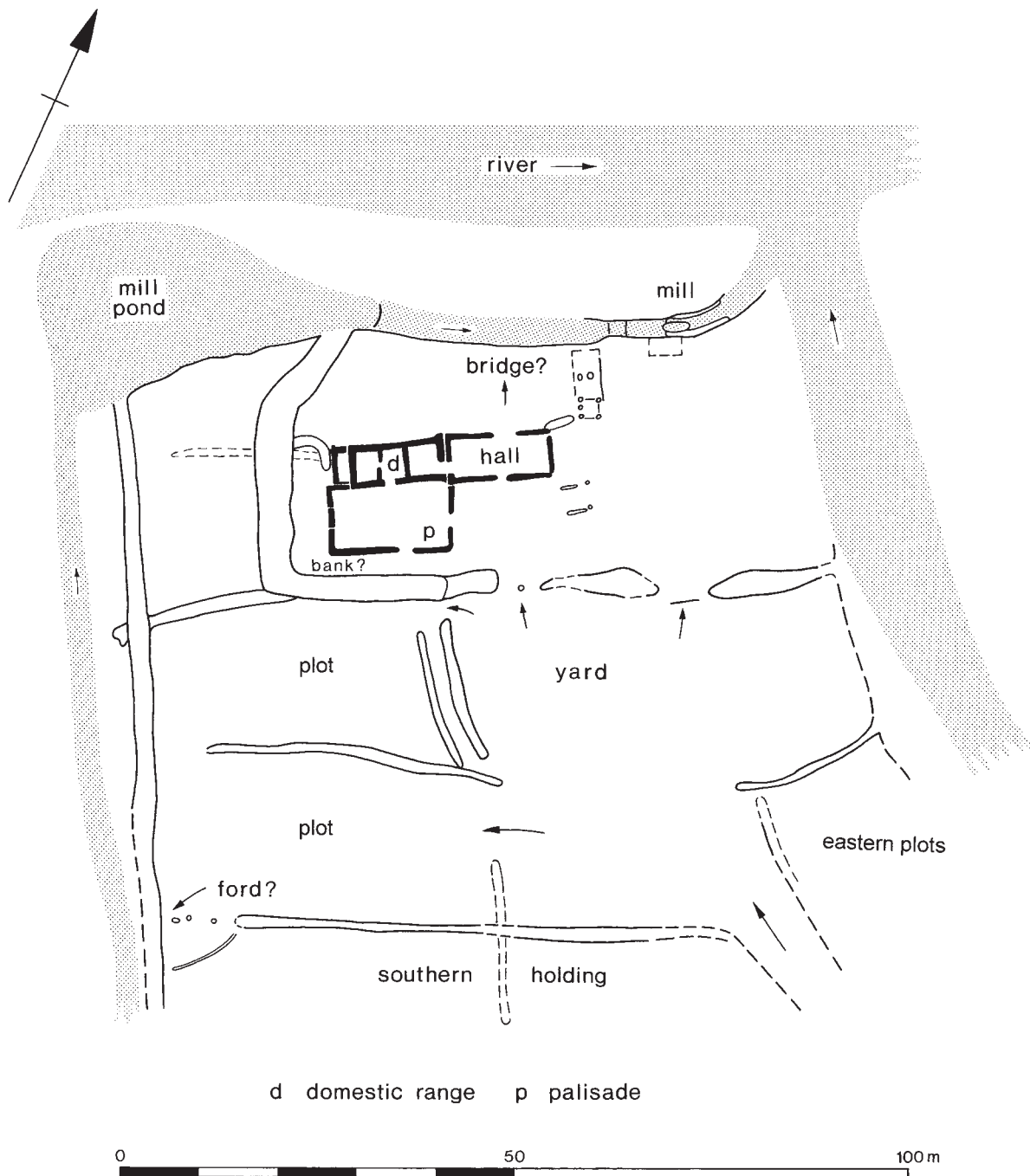


Fig 4.3: The buildings and boundaries of the northern holding, late tenth century

of near equal dimensions but including more deeply-set posts for at least some of the doorways.

While the palisade, the ditch and the possible bank would have formed an imposing facade that could have provided some degree of defensive protection, this would have been largely negated by the more open aspect to the east. Here, the boundary ditch system was less substantial and was broken in two places, including a direct access to the hall. The defensive ditch originally ended in line with the palisade, to leave a broad opening, 11.5m wide (Fig 4.4a). This was later narrowed to 5.0m by the addition of a large pit at the end of the defensive ditch. A central post-pit in this opening may suggest the provision of a gated entrance (Fig 4.4b). The earliest surviving metallised surface along the access to the hall was of compacted gravel. It contained pottery dated to the earlier twelfth-century, although the road may have had an earlier origin.

The separate opening to the east may have provided direct access to the watermill. The watermill flanked the

northern side of the holding, with the mill pond to the west. It was a vertical-wheeled, undershot mill. Millstone Grit, lava and at least one finer sandstone millstone were recovered from the leat fills, confirming its use as a corn mill. Given the complex sequence of activity relating to the form and development of the watermill system spanning the mid-tenth to mid-twelfth centuries, a chapter has been devoted to this topic, Chapter 6. A small timber building, more lightly built than the other contemporary ranges, lay between the hall and the mill and seems most likely to have related to the use of the mill (Fig 4.3). Its exact function is unknown, but large internal post-pits might have held a timber frame for lifting heavy weights, such as millstones, suggesting that it may have been a workshop used for preparing and recutting millstones.

The southern half of the northern holding was probably divided from the beginning between an open yard to the east and two smaller plots to the west, but the earliest pottery assemblages from these boundary ditches are

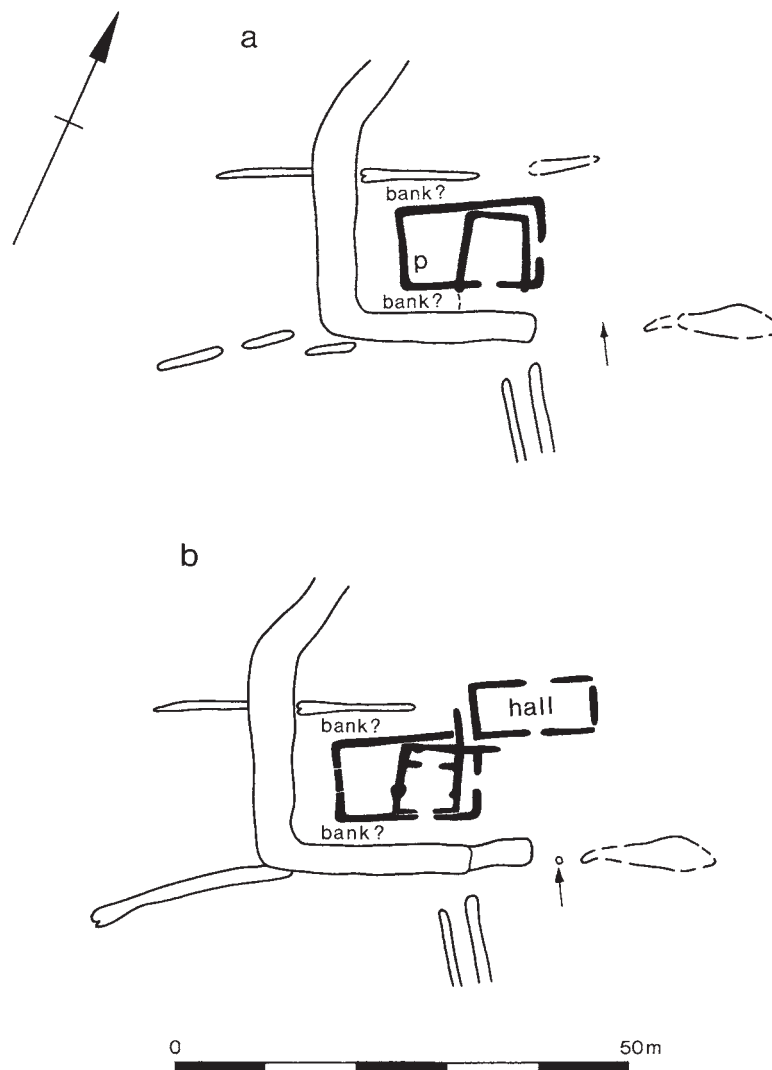


Fig 4.4: The initial development of the late Saxon buildings; a) the palisade enclosure, b) the addition of the hall

only eleventh-century in date. Initially, the northern plot seems to have been closed off from the yard by a double ditch system, while the southern plot opened directly onto the yard. To the west the plots were separated from the western mill leats by a ditch system that became filled with water deposited, homogeneous clayey silts, presumably as a result of flooding from the mill leats, and this back boundary was redundant by the early eleventh century.

At the western end of the ditched boundary between the northern and southern holdings there was a line of post-pits, and a later date there is evidence that there was a ford across the mill leat here, probably shared by both holdings.

The redevelopment of the northern holding (AD 975–1000)

The defining feature of the second phase of the pre-conquest settlement was the reorganisation of the buildings of the northern holding at the end of the tenth century. In this reorganisation most of the former defensive features were removed and new buildings were introduced to create a complex set around a central courtyard (Fig 4.5 and Plate 4). There were also associated modifications to the boundary system.

With the reorganisation of the domestic buildings into a

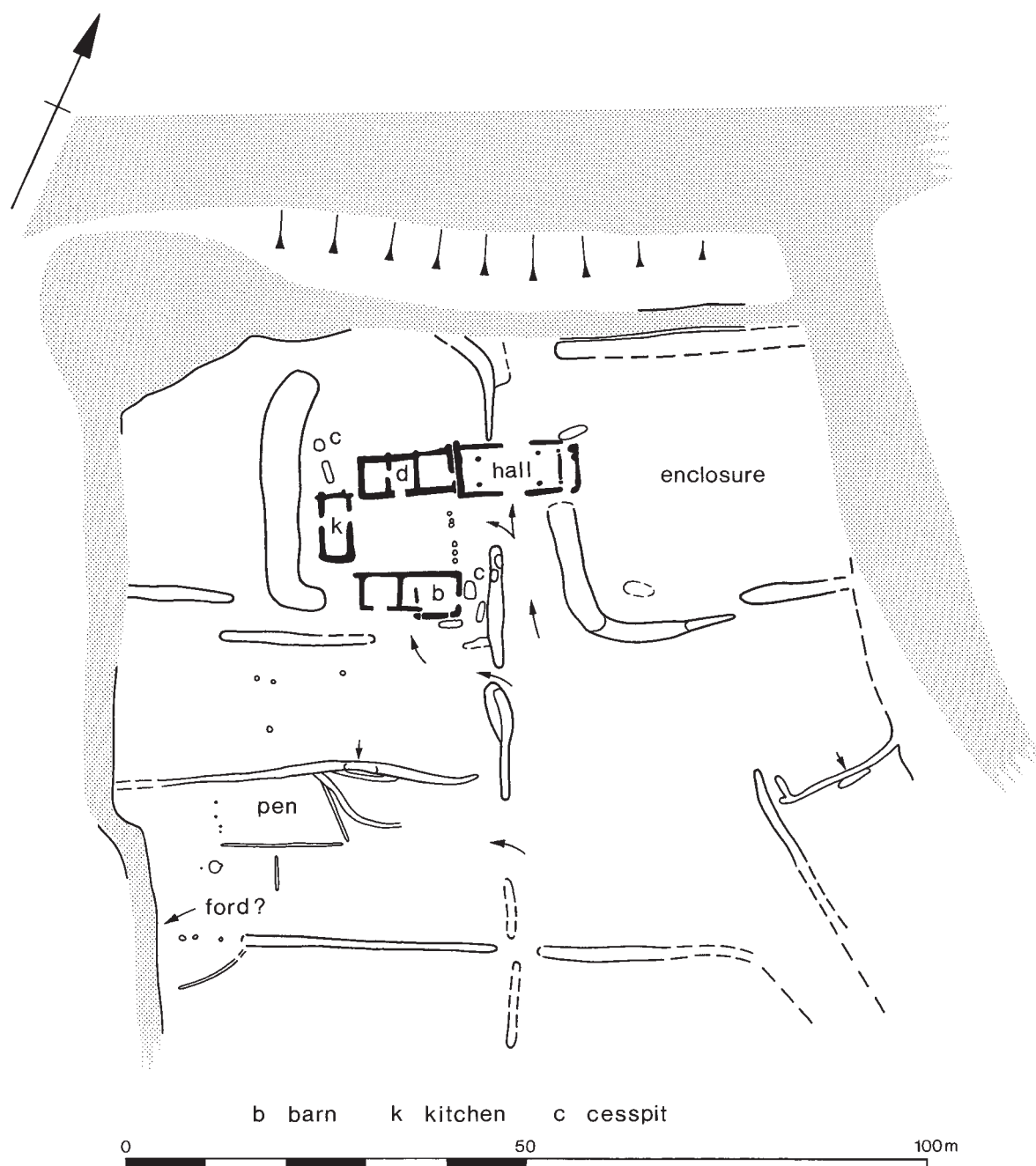


Fig 4.5: The buildings and boundaries of the northern holding, earlier eleventh century

courtyard arrangement, comprising a hall, domestic ranges, a detached kitchen and a barn, and a new watermill (Fig 4.6), we can see the northern holding in its fully developed form; clearly possessing the attributes of what in post-conquest terms would be regarded a small manor house (Fig 4.7). The evolution of this plan form through the second half of the tenth century may be a physical expression of how the concepts of social organisation and the origins of the feudal system were developing within England in the century prior to the Norman Conquest.

The southern arm of the semi-defensive ditch system was backfilled with clean sand and gravel, probably derived from the levelling of an associated bank, and the timber palisade was also removed. This created space for the provision of the central courtyard and the addition of new building ranges (Fig 4.5). To the west a smaller range with opposed central doors was probably a detached kitchen range, as its stone successor certainly was. To accommodate this building the small westernmost room of the domestic range was removed, but otherwise this range was largely unaltered.

The eastern end the new courtyard was separated from the access road by both a fence, defined by several post-pits, and by a ditch blocking the southern half of the opening. Two possible post-pits in the base of the ditch terminal may suggest that a fence with deep terminal posts may have preceded the ditch. The courtyard area therefore served only the domestic ranges, and was kept physically separate from the access to the hall.

On the southern side of the courtyard a range was

constructed over the backfilled ditch. The main doors of this building faced south into the adjacent plot, rather than into the courtyard. The eastern room, with its broad southern doorway and projecting porch, may have served as a barn or byre, but there was probably also a small door in the northern wall to give access from the courtyard. The ditched boundaries to the south were modified to provide and control access to the new building.

The hall was also rebuilt during the eleventh century. It was widened slightly, with the new southern wall lying south of its predecessor, and internal principal posts were also introduced. These were not fully paired-posts, suggesting that they supported upper end chambers, rather than forming an aisled hall. The narrow bay at the eastern end of the hall was possibly the foundation for an external stairway serving these upper chambers.

The introduction of new ditch systems flanking the access to the hall made the approach narrower and more restricted, and a ditched plot, possibly with a gated entrance onto the yard to the south, was formed to the east of the hall. A ditch system along the northern side kept this plot separate from the watermill system to the north.

The development of the watermill system cannot be precisely paralleled with the redevelopment of the domestic buildings, and there is no reason why they should have been developed directly in parallel. However, at around the end of the tenth century the original mill was demolished and the leat was backfilled with sand and gravel. It is possible that following this there was a period without a functioning



Fig 4.6: The late Saxon timber buildings, looking east, with the mill leat (left) and the defensive ditch (foreground)

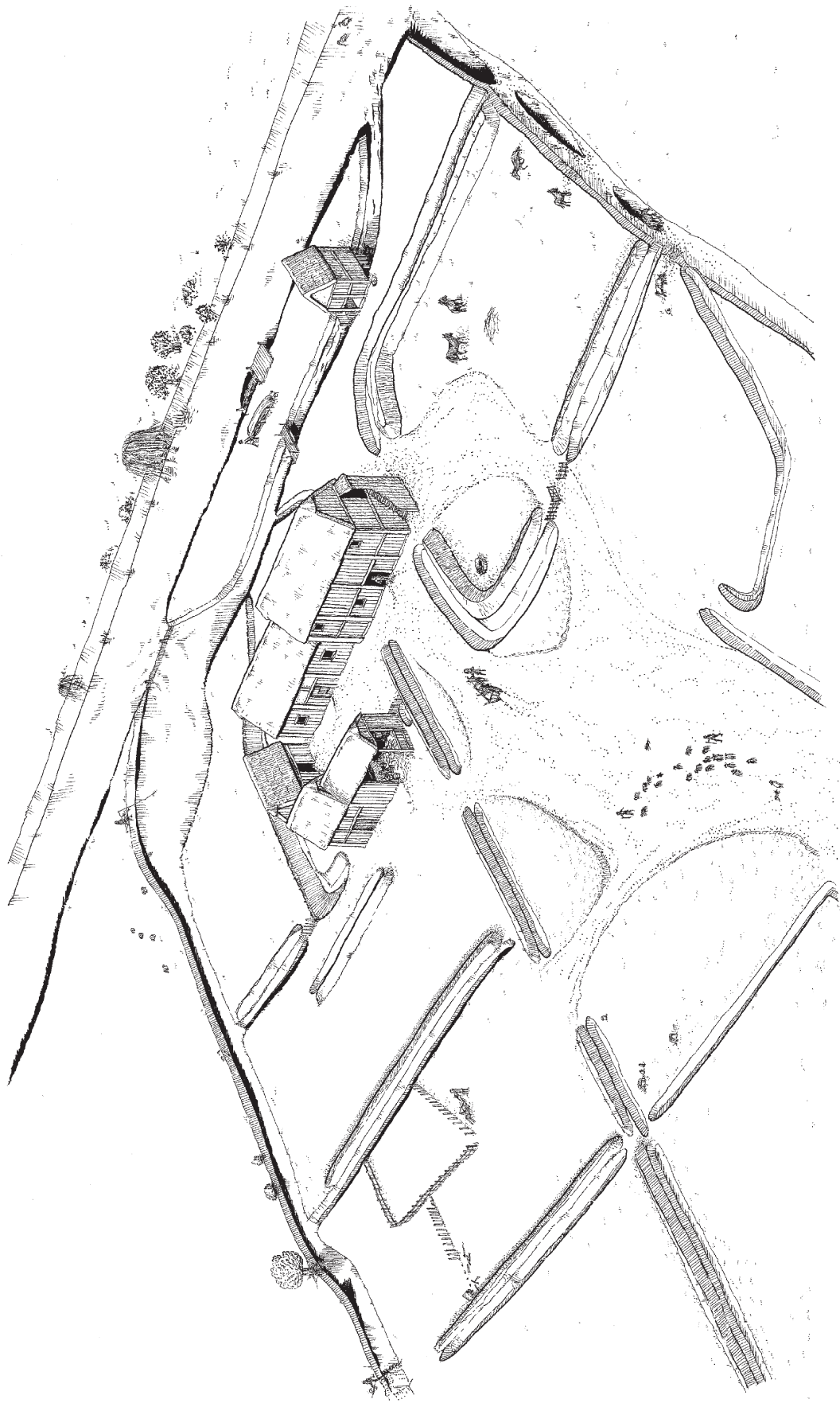


Fig 4.7: West Cotton as it may have looked in the eleventh century (Alex Thompson)

mill. A boundary ditch and a broad flat-bottomed leat to its immediate north both partly overlay the early mill (Fig 4.5). This new leat may have functioned as a water channel carrying the surplus outflow from the pond, and a temporary absence of a mill might provide a context for the subsequent change in the mill technology, from a vertical to a horizontal wheel.

Later alterations to the northern holding (AD 1000–1100)

Through the eleventh century there were further modifications to the buildings, the boundaries and the

watermill system (Fig 4.8). After the probable period of disuse, a new mill was probably constructed quite early in the eleventh century. This was poorly preserved but was probably a horizontal-wheeled mill, as was its successor, which had been constructed by the mid-eleventh century (Fig 4.8). It is possible that it was this mill that appears as the lesser of the two Raunds mills in the Domesday Book, valued at 12d. With the continued use of the ditched plot to the south of the mill, access to the mills was restricted, with direct access only through the hall itself. There was also a bridged crossing of the mill leat to provide access to the river beyond.

The ditch at the western end of the courtyard, the final remnant of the earlier more defensive arrangement, was

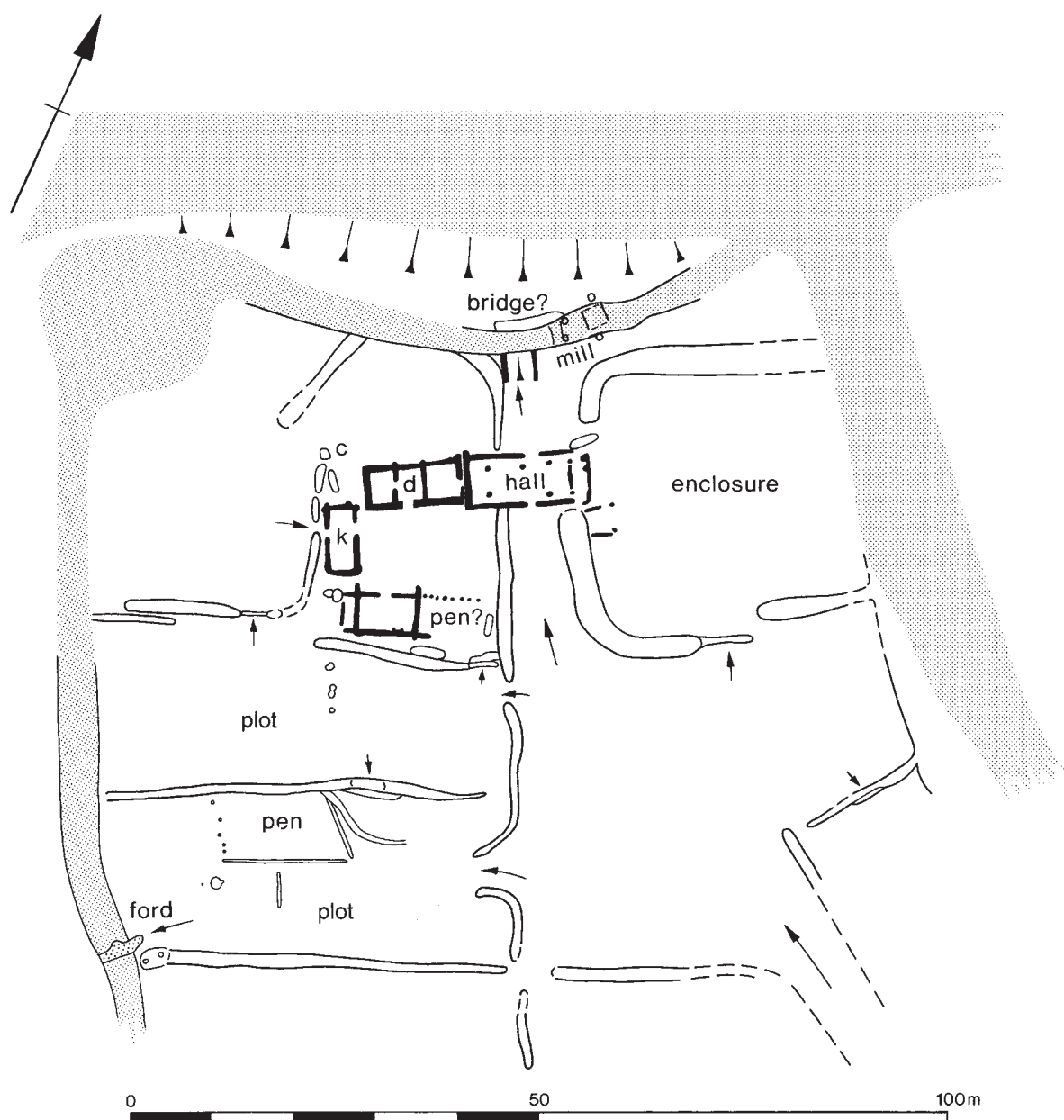


Fig 4.8: The buildings and boundaries of the northern holding, later eleventh century

probably backfilled quite soon after the construction of the adjacent kitchen range. It was replaced by a much smaller ditch, with an opening providing access to the western door of the kitchen range.

The southern range was also replaced, and the new single-roomed building had a northern doorway giving access into the central courtyard (Fig 4.8). A line of post-pits suggest that a fence extended eastward, perhaps to form a pen, and there was a new boundary ditch to the south of the building and the pen. Within the plot to the south of the buildings, a line of post-pits indicate that a fence formed a partial transverse sub-division.

The southern plot contained many more internal features (Fig 4.8). A sub-rectangular pen abutted the northern boundary, and to its south there was a partial transverse sub-division. To the east of the pen the open boundary ditch may have been spanned by a timber bridge founded in the base of the ditch. The entrance from the open yard to the east was refashioned, with the ditches curving inwards to form a funnelled entrance. The control of the access and the provision of sub-divisions suggest that the plot was used for stock penning.

At the western end of the southern boundary ditch a raised metallised surface of compacted limestone within the mill leat provided a fording point giving access to the west (Fig 4.8 and see Fig 6.2).

The material and environmental evidence

The full reports on the pottery by Paul Blinkhorn, the other finds by Tora Hylton, the environmental evidence by Gill Campbell and Mark Robinson, and the faunal evidence by Umberto Alberella and Simon Davis, are available in Part 2 of the report, but some significant general points will be summarised within each period overview to characterise the domestic activity and the economic base of the settlement.

The pottery in use through the tenth and eleventh centuries was dominated by St Neots-type wares, with over 8000 sherds recovered of this shelly coarseware for daily functional use. It formed the primary pottery style for the region at this date and, while kiln sites are rare, pottery of this type is believed to have come from multiple production sites in the eastern counties, and was evidently traded over a wide area. The vessel types included jars and bowls, with the occasional spouted or socketed bowl. The distinctive Top Hat jars, with their near vertical sides, were common in St Neots ware fabrics, but also continued until the mid-twelfth century in medieval Shelly Coarseware, when some primary groups of discarded vessels were found dumped in the boundary ditches. These particular vessels have been recovered in quantity within the Raunds sites, and had seemed to be confined to this area, but examples are now being found more widely, including sites to the south and east at Milton Keynes and Bedford. The smoking

and burning on the exterior of these jars and organic lipid residues suggest that they were specialist cooking vessels, set in the hot ashes as slow cookers, and with the inturned rim bowls potentially acting as lids. Similar ranges of utilitarian vessels, but in much smaller quantities, were also being obtained from production centres to the west, the Cotswold-type Oolitic wares.

The finer glazed Stamford ware, for the table, made up the rest of the late Saxon assemblage, although most of the Stamford ware came from twelfth-century deposits. There is a limited number of vessel forms, mainly jugs and pitchers, together with jars and flange-rim bowls. A single pedestal-based cresset lamp was also found.

A further pottery type produced in the eastern counties, Thetford ware, was present but in small quantities, and only from twelfth-century deposits. It had come from no more than half-a-dozen of the distinctive handled, large storage jars, products of the kilns in Thetford itself, which had perhaps been used for transporting goods to the site.

While late Saxon pottery was plentiful, the majority of it had been recovered from deposits of later date due to the lack of surviving floor levels and other undisturbed late Saxon deposits. This effect made it even more difficult to securely attribute many other finds to this period. The only individual items of note are a small barrel padlock key from the cess pit at the eastern end of the timber southern range (T34), parts of two barrel padlocks from the floors of the overlying building (T33), and a whittle-tang knife with copper alloy hilt fittings from the fills of the second mill leat (M26). In addition, there is a single pre-Conquest coin, a penny of Cnut from the Stamford moneyer, Oswe, dated to around AD 1024–30. The only other finds group of late Saxon date is the assemblage of millstone fragments from the watermills, which are summarised in Chapter 6.

The agricultural economy of the settlement involved a mixed farming regime. Wheat was plentiful in the charred plant remains and of particular importance was the recovery of tetraploid free-threshing wheat, probably rivet wheat (*Triticum turgidum*), from ditches filled in by the end of the tenth century, making it the first pre-Conquest record for this type of wheat in Britain. Its appearance at this time may be associated with the laying out of the open fields and the adoption of a new agricultural system.

None of the sampled assemblages produced only hexaploid or tetraploid free-threshing chaff, which may suggest that the two were grown as a mixture, and cultivation experiments have shown that both will ripen together.

Charred seeds and chaff indicate that barley, oats and rye were also grown. The barley and oats could have been grown together as a mixture, and sown in the ratio 1:1 it was known as dredge or drage in the medieval period, and was typically spring sown. From the twelfth century onward there were specific malt ovens attached to the major building groups, in which sprouted barley and oats was dried to produce the malt for brewing, with this a major product of the settlement for some centuries. No malt ovens can be

dated to the tenth and eleventh century settlement, but a dump of burnt debris on the raised river bank adjacent to the watermills, and broadly contemporary with them, contained charred germinated barley and oat grain. This may suggest that malting was being carried out as early as the eleventh century, but as the feature can only be broadly dated to the eleventh to mid-twelfth century this is still uncertain.

The faunal assemblage that can be securely assigned to the tenth and eleventh centuries is too small to draw any general conclusions, although it is dominated by cattle, sheep and pig, with horse present in smaller numbers.

The late Saxon timber buildings

This section provides a catalogue and discussion for the seven timber buildings within the northern holding that were constructed and in use during the period AD 950 to AD 1100 (Figs 4.9 and 4.10). They were demolished within the first half of the twelfth century as they were progressively replaced by the buildings of the new medieval manor, which were largely stone-built.

These buildings were characterised by continuous, linear wall-trenches, indicating that they were post-in-trench structures, and most probably stave-built, comprising similar-sized timbers along the entire wall line. More deeply-set timbers, probably of greater diameter, were sometimes provided as door-jamb posts and in some instances at corners and wall junctions, where they may indicate the provision of principal posts in buildings with upper storeys. The eleventh-century rebuilding of the hall (Fig 4.11, T29), with the introduction of internal principal posts may provide further evidence for the presence of upper storeys.

The hall (T29) and the domestic apartments (T30)

The hall, T29

The hall was up to 15.5m long by 6.5m wide (Fig 4.11). To the west it adjoined the narrower domestic range, T30, to form a building complex 30m long. The junction of the two buildings was not fully understood, but the differing building widths and the double wall-trenches indicate that they were separate and abutting structures. There were two distinct constructional phases.

Phase 1 (Fig 4.12, a)

The original hall was 14.0m long by 6.2m wide, with a floor area of 61.5sq.m measuring 12.3m by 5.0m. The long walls were founded in deep wall-trenches, 0.60–0.70m wide by 0.30m–0.45m deep. Closely-spaced oval hollows in the base of the trenches indicate that they were stave-built (Figs 4.11 and 4.13, and see Fig 4.26). There was a central doorway defined by a 1.0m-wide break in the southern wall trench, with shallow post-pits at the inner

edge. A central doorway in the northern wall was defined by a construction pit, 3.30m long by 0.45m deep, both broader and deeper than the wall trench. Terminal post-pits to hold timber door jambs, cutting down a further 0.05–0.10m, indicate that the doorway was 1.80m wide. This doorway may have belonged to the second phase, with its construction removing all traces of an earlier, less substantial door surround.

The end walls of the building were founded in shallower wall-trenches, 0.40–0.60m wide and 0.15–0.30m deep, indicating that the end walls were of a lighter construction. There may have been a doorway at the southern end of the western wall, where there was a break in the wall trench of the domestic range. A pair of post-pits in the eastern wall trench may have held the jambs of a narrow central doorway.

A floor surface of compact gravel pebbles in a matrix of orange-brown sand survived at the north-eastern end of the building, sealing a small internal posthole, 0.25m deep, to the east of the northern doorway. Across the western half of the building later disturbance had removed any floor surfaces, but there was a remnant of a hearth, up to 0.90m in diameter, comprising cobbles and pieces of limestone with worn edges set within a shallow hollow in a matrix of pale yellow clay. The surface was only lightly scorched, suggesting that hearth surface had been lost. The floor and hearth could belong with either building phase.

Phase 2 (Fig 4.12, b)

The new southern wall lay 0.50m south of its predecessor and, at 0.30–0.40m deep, the wall-trench was 0.10m shallower. A central doorway was defined by a break in the wall-trench, but this was disturbed by later activity. A possible western door-jamb post-pit, 0.60m deep, may suggest that the doorway was originally 2.5m wide. The continuation of the wall-trench to the east of this indicates that the doorway was either always 1.50m wide or was later narrowed by relocating the western door jamb.

The northern wall was either retained or rebuilt within the original wall trench. The broad northern doorway, with timbers set in a construction pit, may have been part of this rebuilding. However, the second post-impression in the base the construction pit at the western end, might suggest that the doorway was narrowed at some stage, most probably at the introduction of the internal principal posts, as one of these would have partially blocked access to the full width doorway.

There were two sets of opposed pairs of principal posts at either end of the hall. They were set 3.90m apart and defined end chambers 2.50m long. Along the northern wall there was also a central post-pit, the one partly blocking access to the northern doorway, but this was not paired with a southern post. The arrangement therefore falls short of forming an aisled hall, and it is suggested that the introduction of the principal posts was to support upper storeys over the two end bays of the hall.

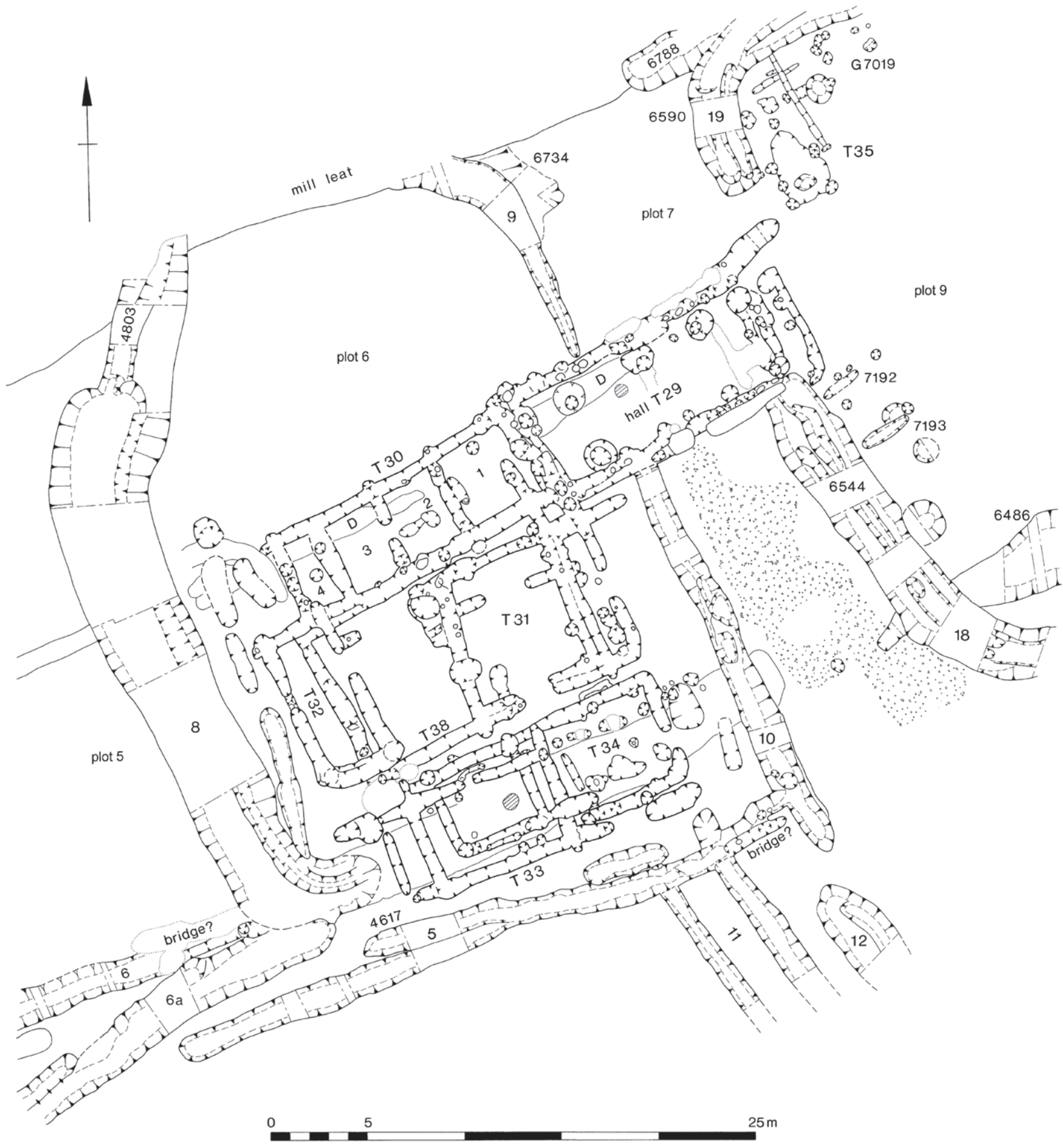


Fig 4.9: The late Saxon timber buildings of the northern holding



Fig 4.10: The timber buildings of the northern holding looking west

The post-pits were typically circular or sub-rectangular, 1.50–1.70m in diameter and up to 0.45–0.55m deep (Fig. 4.27). In most, the post location was indicated by a 0.10–0.20m deep circular hollow within the base of the cut, suggesting that the posts were probably around 0.40m in diameter. The fills of the post-pits contained varying quantities of tumbled limestone, including larger slabs probably from displaced packing. In one instance, the central post-pipe had been filled with a stack of flat-laid limestone slabs. In the central post-pit on the northern side the post position was particularly well defined by vertically pitched slabs of limestone, indicating that it had held a squared post measuring 400mm by 350mm.

The new eastern wall was set in a shallow wall-trench, 0.15m deep, running between two principal posts. The northern end cut the fill of the post-pit, indicating that it post-dated the erection of the principal post. A second shallow wall-trench lay a further 2.50m to the east, flanked on its inner edge by shallow postholes. These eastern wall-trenches formed a sub-chamber or outshot, 2.00m wide, giving the building a total length of 15.5m.

The western wall-trench was more substantial and contained both principal posts and posts of similar dimensions at the corners of the building. In addition, there was a central doorway opening defined by hollows that had held the door jamb posts.

In the new arrangement, the central bay was 7.50m long, presumably still open to the roof, with two narrower, 2.5m long, end chambers with first-floor rooms above. It

is suggested that the narrow bay at the eastern end of the building held an external timber stairway giving access to the eastern upper chamber. The solitary principal post near the northern doorway is difficult to explain, unless it supported a narrow gallery running along the northern wall of the building to provide access to the upper chamber at the western end of the building.

Immediately beyond the north-eastern corner of the building there was an elongated pit, 4.00m long by 0.40m deep, which closely abutted the wall-trench. This may have been merely a short length of ditch, blocking access between the hall and the boundary ditch to the north-east. Alternatively, it may have served as a cess-pit for the hall, although the fills provided no evidence of such a function.

The later cut of the southern wall-trench produced 24 sherds of St Neots-type pottery, mainly the later type, and the post-pits produced a smaller, but similar assemblage. This suggests that the refurbishment of the building occurred within the eleventh century (ph LS3/2, 1000–1100). It was demolished in the earlier twelfth century (ph 0, 1100–1150), when the overlying timber building (T28) was constructed.

The domestic range, T30

The domestic range adjoined the western end of the hall, T29, and had a total length of 14.5m and a width of 5.5m, with rooms 3.9m wide. The three main rooms, 1–3,

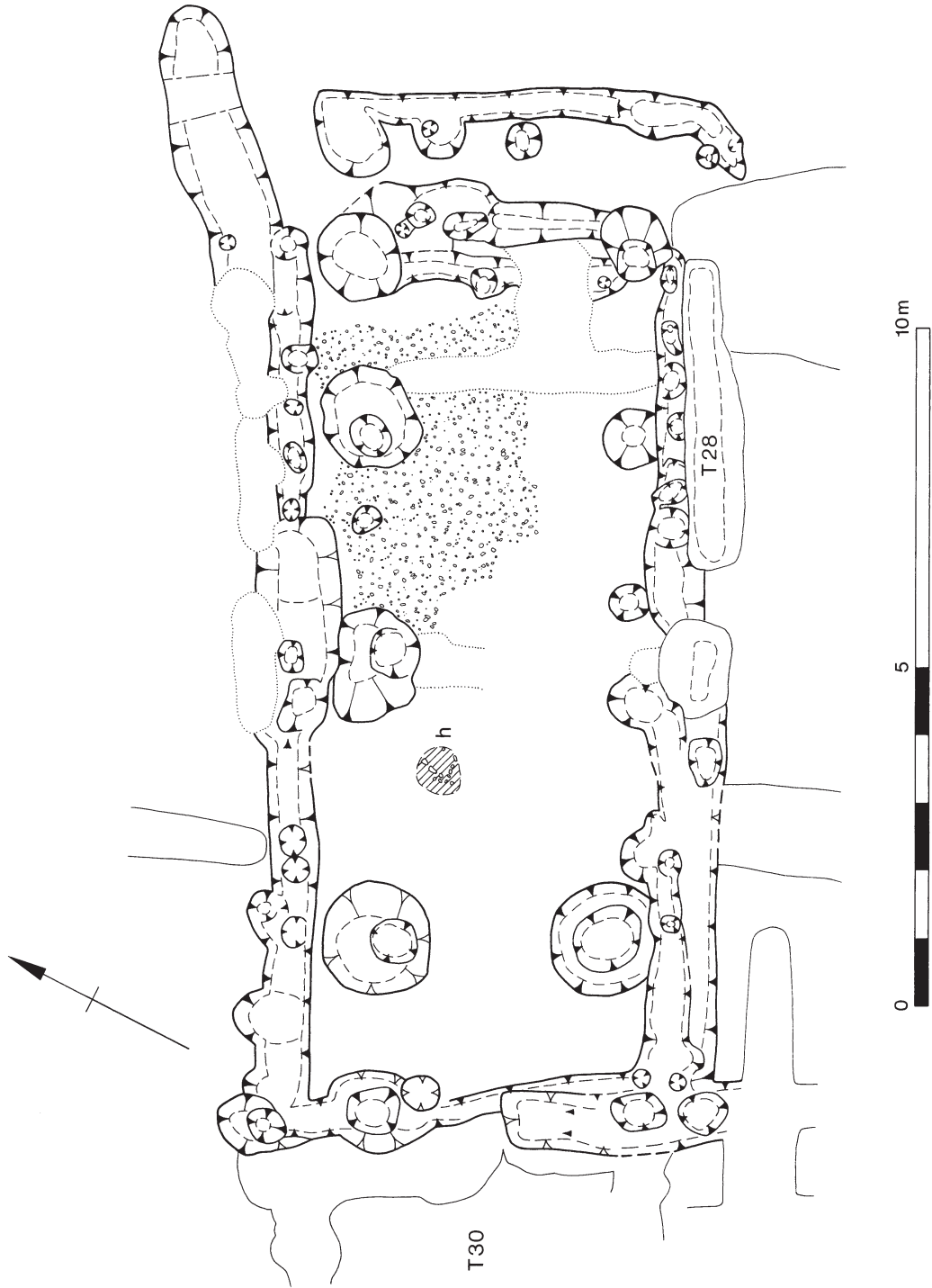


Fig 4.11: The late Saxon timber hall, T29

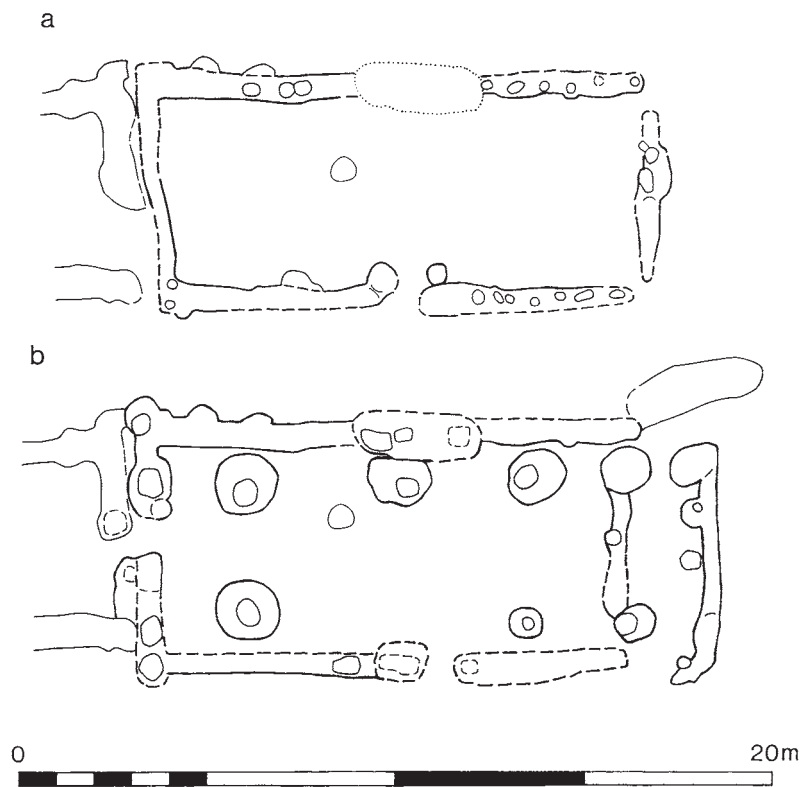


Fig 4.12: The development of the hall, T29; a) stave built, tenth century, b) principal post construction, eleventh century



Fig 4.13: The timber hall, T29, looking west

were of a single build, at a length of 12.3m, with a small chamber, 4, attached to the western end of the range (Figs 4.14 and 4.15).

The northern wall-trench was 0.70m wide by 0.20–0.30m deep. The southern wall-trench was slightly wider but this was a result of the southern wall running along the line of the earlier timber palisade, T38, and the recutting of the earlier trench was evident in section. The lower fills of the wall-trenches were clean sands and gravel containing little evidence for any timbers.

The northern wall-trench contained no deeper post settings to suggest the location of a doorway. At the centre of the southern wall trench, a pair of post-pits, 0.65m deep, may have held the jambs of a 1.00m wide doorway opening into Room 2.

The northern end of the eastern wall-trench was of comparable depth to the long walls. To the south, a pair of post-pits indicates the position of a doorway giving access to the hall. The wall-trench between Room 3 and Room 4 was of the same depth as the main wall-trenches, suggesting that this was the original end wall of the building, with Room 4 abutted against it, and founded in wall-trenches of similar depth. The westernmost trench contained hollows for the provision of at least three principal posts, presumably related to successive door jambs. This wall-trench was partially backfilled with flat-laid limestone, particularly to the south. The stone had

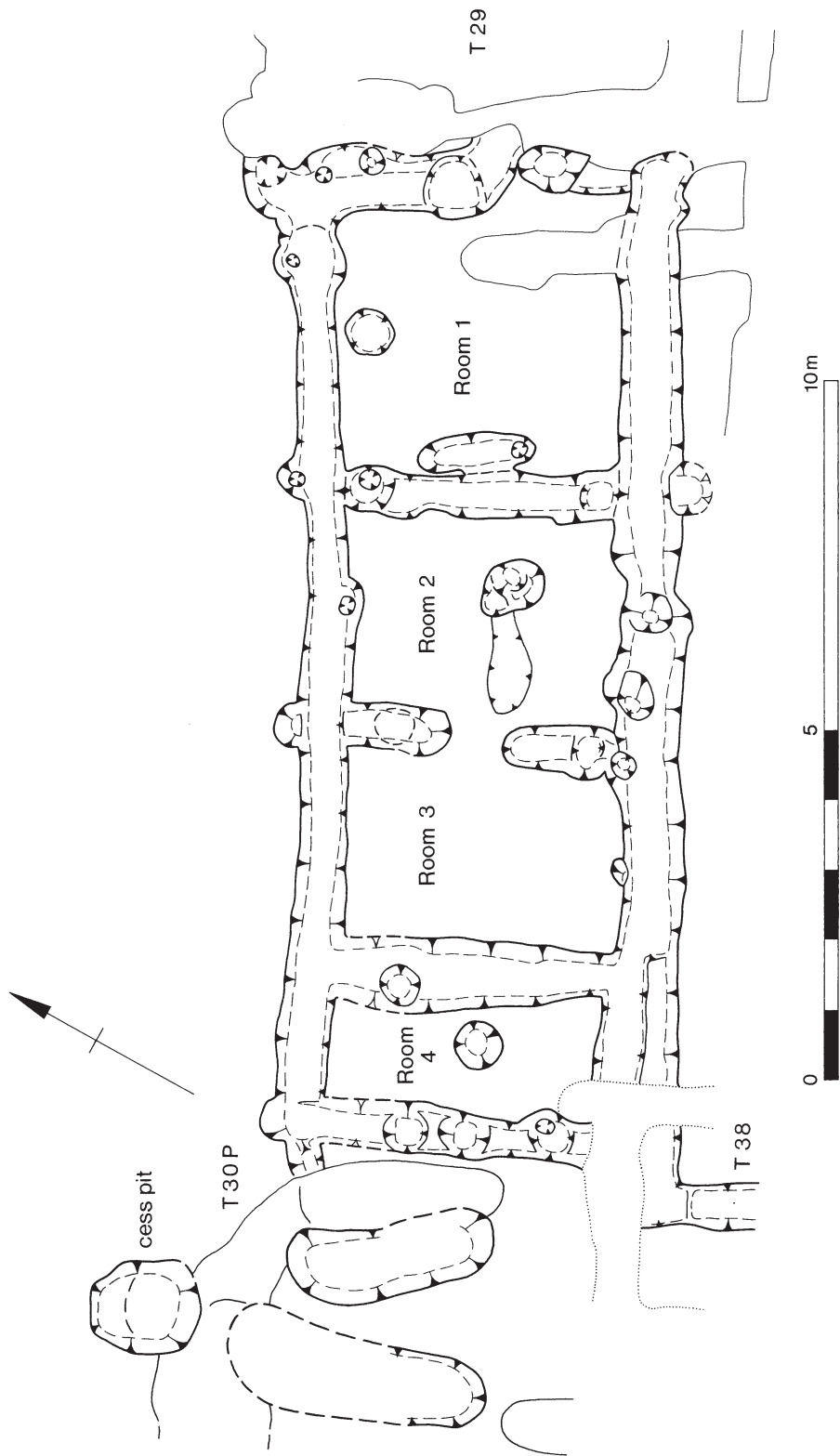


Fig 4.14: The late Saxon domestic range, T30



Fig 4.15: The late Saxon domestic range, T30, looking south, with building T32 (right) and T34 (top)

probably been introduced to consolidate the backfill when the end chamber was levelled to permit the building of an adjacent kitchen range, T32.

The two internal wall-trenches, separating Rooms 1, 2 and 3, were 0.10m shallower than the main walls. Basal hollows at three of the four junctions with the main walls indicate that the internal walls terminated at principal posts abutting the long walls.

Room 1, to the east, was near square in plan, at 3.80m long. To the west, a shallow, stone-lined, construction slot, with a 0.20m-deep posthole at the southern end, lay adjacent to the partition wall and was presumably related to the framing of a central doorway. A 0.25m deep pit on the northern side of the room might be a later feature.

Room 2, the central room, was 2.80m long. To the west, a 0.75m-wide break in the partition wall indicates the provision of a central doorway. Immediately south of the central doors, a shallow linear hollow, 0.15m deep, which terminated to the east at a complex post-pit up to 0.25m deep, may have held a partition wall. The fills of both features contained burnt loams, ash and charcoal, perhaps derived from a hearth either within this or an adjacent room. This internal partition may have screened access to the doorway opening into the central courtyard to the south.

Room 3, to the west, was 2.60m long, and contained no internal features. A possible post-pit in the western wall-trench may indicate that there was a central doorway opening into the western chamber. Room 4 was only 1.50m long, and the internal pit might be a later feature.

No floor levels survived in any of the rooms, making it difficult to define the construction and occupation dates. Pottery from the upper fills of the wall-trenches is dated to the first half of the twelfth century (ph 0, 1100–1150), and defines the demolition date.

To the west of the building there was a complex of pits and ditches. An L-shaped length of ditch (Fig 4.14, T30P) flanked the west wall of Room 4 and turned westward towards the main enclosure ditch, perhaps serving to close the gap between the building and the ditch. It comprised two elongated pits, each 0.45m deep, linked at the corner by a shallower arc of ditch.

Three pits partially cut into the ditch fills. A sub-square pit to the north, near vertical-sided and flat-bottomed, 1.55m diameter by 0.65m deep, had a distinctive primary fill of yellow-green silts indicative of its use as a cess pit. The two elongated pits to the south, were up to 0.50m deep, and may also have served as cess pits, but there was no clear indication of this within their fills.

Building T31

This building lay at the centre of the complex and was closely related to the timber palisade, T38, as part of the first phase of building development (Figs 4.16 and 4.17). It was up to 8.7m long and from 7.2m to 7.9m wide, with a trapezoidal plan, widest to the south. No contemporary floor surfaces survived. The recutting of the eastern wall-trench indicates that there were two phases of building.

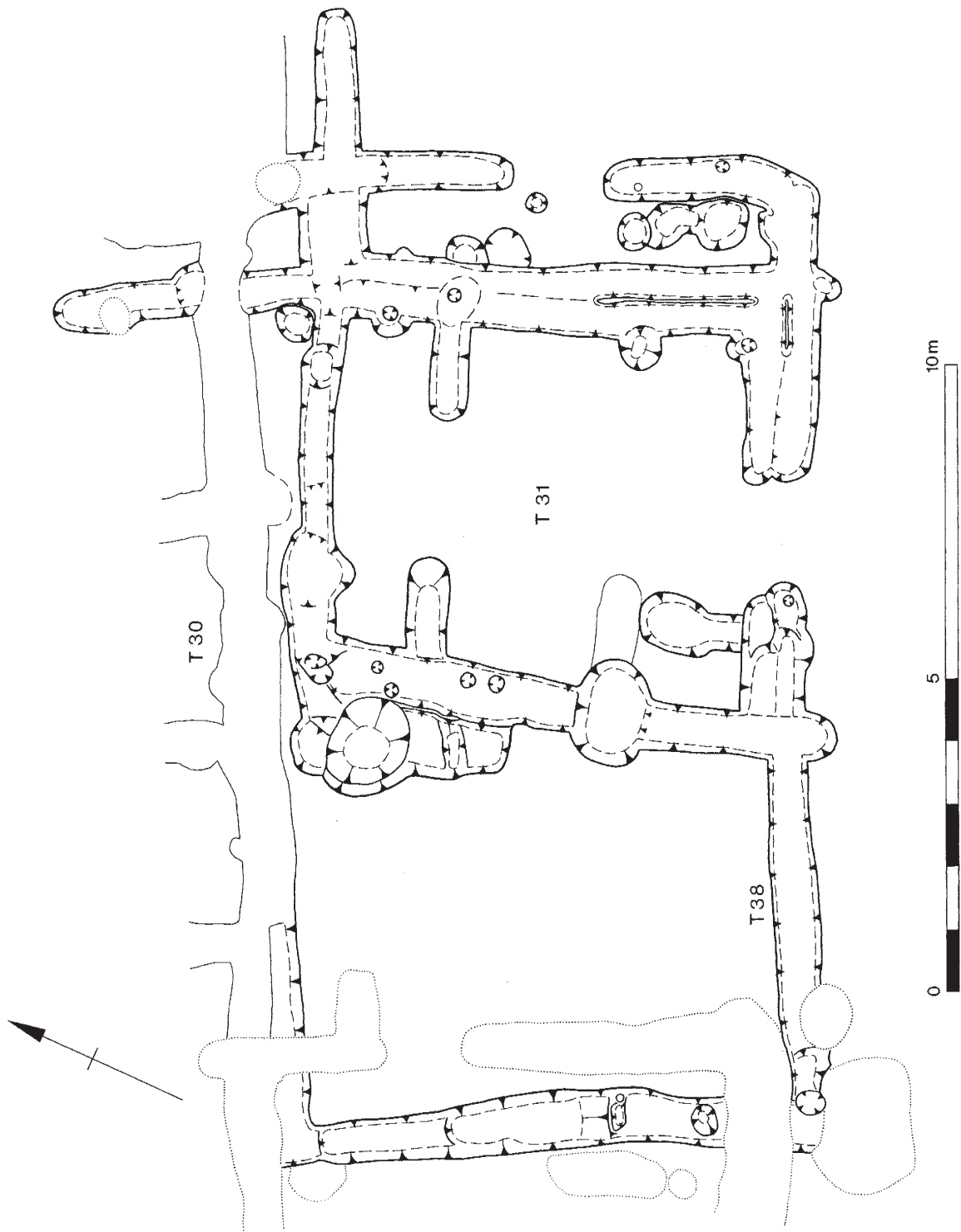


Fig 4.16: The late Saxon timber palisade, T38, and building T31



Fig 4.17: The palisade and building T31, looking west

The original building probably possessed a single open room with internal dimensions of 6.40m north-south and 5.50–6.60m east-west, a floor space of 38sq.m. The main entrance was a 1.70m wide opening within the southern wall-trench. Hollows towards either end of the northern wall-trench may have held principal posts forming a 2.5m wide doorway belonging to either or both phases of use. The wall-trenches were 0.55–0.75m wide and 0.35–0.45m deep.

In the second phase, a new eastern wall lay inside its predecessor, reducing the width of the building to 5.10–5.90m, a floor space of 34.5sq.m. In addition, there were paired internal slots towards the north, and to the south there were post-pits against the internal wall faces. These features define a central bay, 3.00m wide, and they may have held principal posts, independent of the main walls and perhaps supporting an upper storey raised over the central bay. An external construction pit abutted the northern end of the western wall, and contained two post-pits. The southern setting was elongated east-west suggesting that it had held a transverse post or plank, while the large circular pit to the north may have been a result of the digging out of the post. It is suggested that this feature held a ladder-like stairway providing access to an upper storey.

From the north-east corner of the building construction trenches extended 4.0m to both the north and east. They ran less than 1.00m from the walls of the hall, T29. They were probably introduced when this corner of the original timber palisade was removed to permit the construction of the hall. They may have held a new L-shaped length of timber palisade to reinstate the removed corner.

The palisade, T38

The palisade comprised surviving linear construction trenches to the east, south and west. The northern trench had largely been removed at the building of the domestic range, T30 (Figs 4.16 and 4.17). The palisade enclosed an area 14.0–14.5m long, 7.6m wide to the west and 8.3m wide to the east; an area of 114sq.m. More than half of this was occupied by the central building, T31, leaving a narrow space, 1.00m wide, to the east and an open space to the west 5.50m long.

The construction trench was typically 0.60–0.70m wide and 0.30–0.45m deep, and the only evidence for any timber settings was a couple of post or plank impressions in the base of the western arm. There were simple openings through the palisade to the east, 1.40m wide, and south, the

latter coinciding with the doorway to the central building, T31. In addition, a central deepening on the western trench and a differential fill above this, may indicate that there was a western entrance, perhaps inserted at a later stage.

To the south the palisade lay 2.50–2.80m from the inner edge of the enclosing ditch, and to the west it was 4.50–5.00m from the ditch (Fig 4.9). Given the width of this berm, it is possible that a bank had been thrown-up against the palisade to the south and west, although no evidence for this was obtained. The combination of ditch, bank and timber palisade would have created an imposing facade.

The courtyard fence

Following the demolition of the central building, T31, and the palisade, T38, the enclosed compound became an open courtyard. A rough line of small post-pits to the east of Building T31 may have formed a post-built fence, with a central opening, that would have closed the eastern end of the new courtyard (Fig 4.16). Some of these post-pits must have cut the fills of the wall-trenches forming Building T31 but, given the similarity of the clean fills, these relationships were not seen in excavation. To the

south, there was a group of four pits, from 0.10–0.40m deep, while a similar group to the north were largely lost in the fills of the earlier wall-trench. There was a central entrance, 1.5m wide.

The kitchen, T32

This building lay at the western end of the central courtyard (Fig 4.18). It is interpreted as a kitchen on the basis that its stone-built successor was a kitchen range. It was 9.0m long by 4.2m wide, with a floor space of 22.5sq.m measuring 7.5 by 3.0m. The wall-trenches were 0.60–0.80m wide and 0.35–0.40m deep. Towards the southern end of the eastern wall, a slightly darker fill defined a central slot tapering from 0.50m wide at the surface to 0.15m wide at the base. This may indicate that the wall timbers were at least 150mm thick. The southern wall-trench was slightly curved and both wider and deeper, at 1.10m wide by 0.50m deep, probably terminating at principal posts. This may indicate that this wall had been rebuilt. To the north the wall trenches extended beyond the corners by up to 0.40m, and a deepening in the base of one of these extensions may indicate that it held a rectangular post or plank.

Opposed doorways were set to the north of centre. The

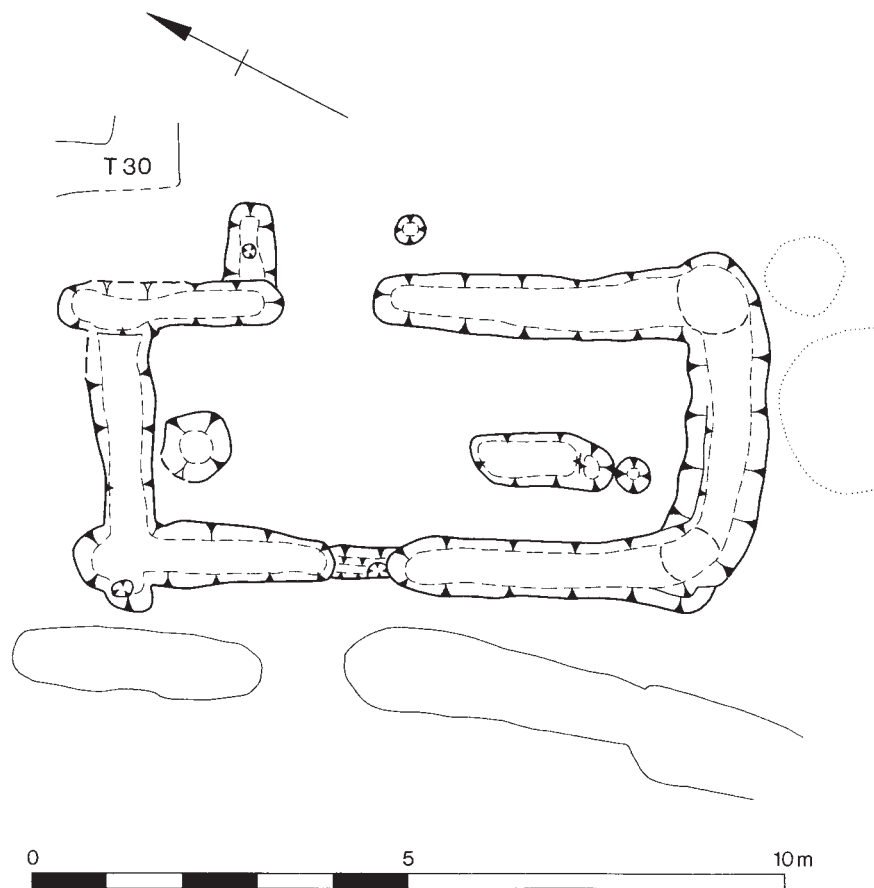


Fig 4.18: The possible late Saxon kitchen, T32,

eastern doorway was 1.15m wide and was screened on at least its northern side by a short external stub-wall, set in a slot 0.28m deep. The western doorway was narrower, at 0.85m wide, and a 0.18m-deep slot across the threshold would have held a sill beam.

No floor surfaces survived. There was a shallow pit, 0.35m deep, at the northern end of the room, and an elongated pit and an adjacent posthole, 0.25m deep, lay to the south. These features lay beneath the eastern wall of a later building (S21) and it is possible that they were related to the construction of that building.

Very small groups of pottery from the wall trenches date its demolition to the earlier twelfth century (ph 0, 1100–1150).

The southern range, T34

This two-roomed building, 12.8m long (Figs 4.19 and 4.20), was constructed over a backfilled ditch. The probable broad doorway in the eastern room indicates that it was an agricultural building, probably a barn or byre.

Room 1, to the west, was near square at 5.3m long by 4.9m wide, with a floor space of 14.8sq.m, measuring 4.1 by 3.6m. The wall-trenches were 0.55–0.70m wide by 0.3–0.4m deep, although the southern wall-trench was 0.10m shallower. The corner post-pits were 1.00m in diameter by up to 0.60m deep, generally 250mm deeper than the wall-trenches. Their fills differed from the wall-trench fills in containing pieces of limestone, with particular concentrations in the southern two.

A central doorway within the southern wall-trench was 1.30m wide, defined by a linear slot with terminal postholes. A floor of gravel in a matrix of orange-brown sandy loam partially survived, and a hearth was defined by a circular area of burning, 0.85m in diameter. Surface patches of brown loam with charcoal inclusions and a scatter of pottery and animal bone appear to represent trampled occupation debris. The internal postholes to the west could belong with either this or the later building.

Room 2, to the east, was 7.5m long and from 5.0–6.0m wide, with a floor space of 26.2sq.m, measuring 6.9 by 3.8–4.7m. The northern and eastern wall-trenches were 0.70–0.80m wide by 0.35–0.45m deep. The offset wall-trench forming most of the southern wall was slightly deeper, at 0.55m. This plan form is assumed to indicate the presence of a projecting doorway, 4.00m wide and founded on a sill beam, presumably to add support to a heavy timber door surround and a set of heavy wooden barn doors. Two internal post-pits, 0.30–0.40m deep, with an irregular feature between them, might have held posts supporting the main roof at its junction with the projecting doorway structure. At a later date, the width of the doorway was probably reduced, with a post-pit just east of centre in the wall-trench holding the new eastern jamb of a doorway 2.00 or 2.50m wide.

There may also have been successive doorways in the northern wall. A doorway, 1.30m wide, was defined by an

external slot with terminal postholes, while two post-pits set on the inner edge of the wall-trench may have framed a broader doorway, 1.70m wide. The break in the eastern wall-trench indicates the provision of an end door at least 1.00m wide. No floors survived. A slot to the west of the southern doorway may have held a partial subdivision, forming a western chamber, only 1.70m wide.

There were three external pits at the eastern end of the building (Fig 4.19, cess pit). A pit adjacent to the eastern wall, 2.80m long by 1.50m wide and 0.65m deep, had a distinctive lower fill of fine, dark green to grey-green silty sand, characteristic of a cess deposit, and it also contained a substantial pottery assemblage. A group of shallow postholes around the northern end suggest the provision of a light wooden screen. A pit adjacent to the southern wall, 3.00m long by 1.15m wide and 0.40m deep, was introduced after the narrowing of the doorway, but the fill gave no indication that it had been used as a cess pit. Further to the east there may have been another broadly contemporary pit, but it lay beneath a later building (S20) and was not clearly defined in excavation; it was 2.50m long by 0.80m wide and 0.30m deep, and filled with orange-brown sandy loam with some blackened (burnt) loam.

The internal features of Room 2 and the cess pit adjacent to the eastern wall were sealed by a distinctive layer of grey-brown loam heavily mottled with fine grey ashy material including much charcoal. A similar deposit was also present beyond the western end of Room 1. These deposits appear to derive from the destruction of the building.

The pottery from the floor of Room 1 and from the fills of the cess pit to the east comprised over 200 hundred sherds of St Neots-type ware, including the later style bowl rims, suggesting that it was constructed in the later tenth century (AD 975). It continued in use into the earlier eleventh century.

The new southern range, T33

The original range, T34, was demolished and replaced by a new building (Fig 4.21). This was 9.7m long by 5.3m wide, comprising a rectangular room of 6.7m by 4.0m, an internal floor space of 26.8sq.m, with a narrow, 1.20m wide, bay attached to the western end.

The wall-trenches were 0.60–0.75m wide by 0.45–0.60m deep. A post-pit at the north-eastern corner, identified by differential filling, may suggest the provision of principal posts at the corners. There were extended slots, from 1.30–2.00m long, at the corners. To the west, the extended wall slots and a shallower slot, 0.16m deep, beyond the western wall, suggest the provision of a narrow lean-to.

A narrow break in the wall trench, 0.45m long, and an external threshold slot ending at small postholes, defines a 1.0m wide doorway in the northern wall.

A floor of mixed grey-brown loam with some burning, clean orange sand and gravel with some pieces of limestone, partially survived. Postholes against the southern and northern walls may indicate that there were internal fittings.

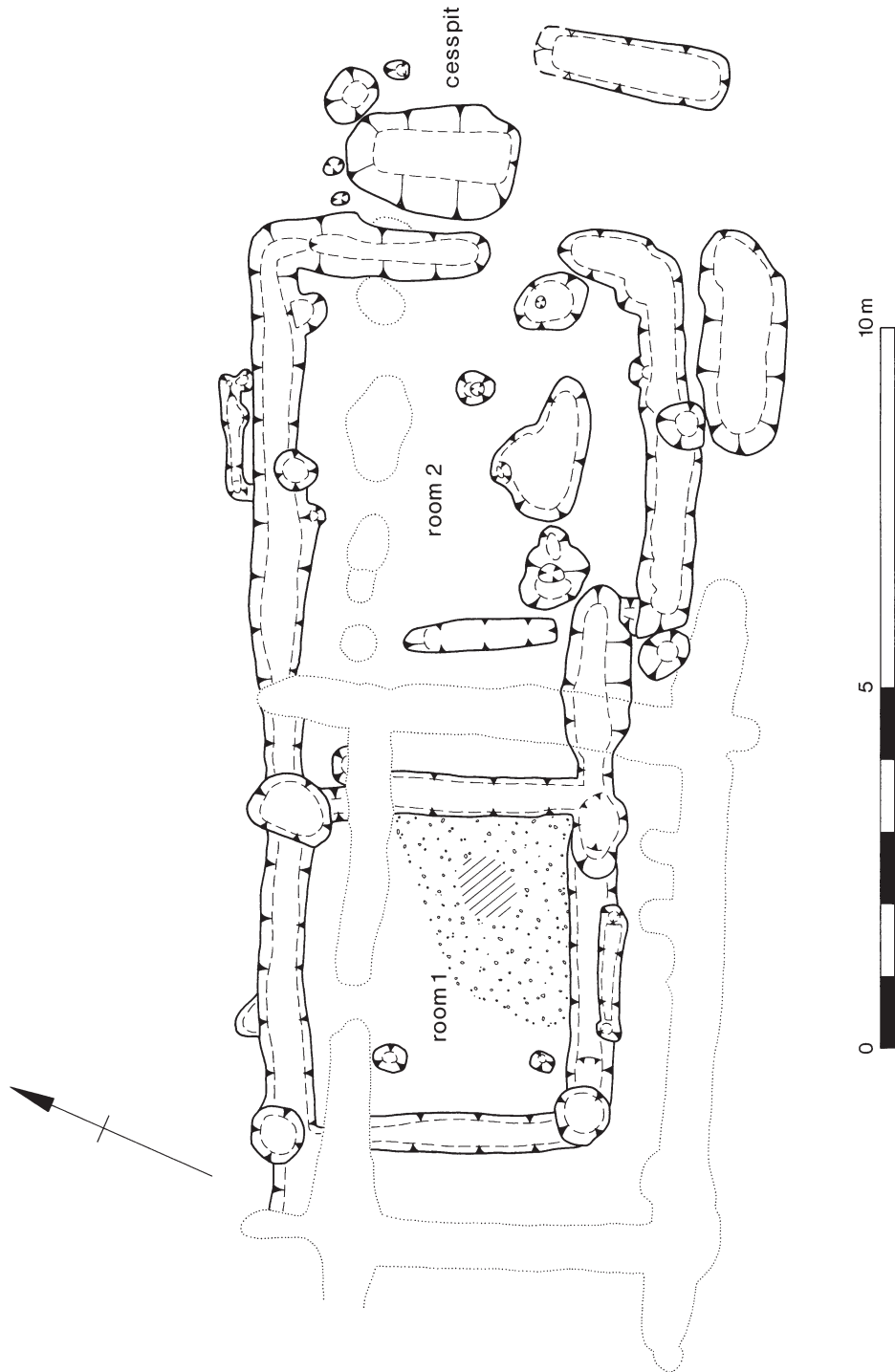


Fig 4.19 : The late Saxon southern range, T34



Fig 4.20: The southern ranges, T34 and T33, looking west

To the north-west two external pits, 0.20 and 0.40m deep, may have been contemporary with the building. They were filled with orange-brown sandy loam with some gravel and the larger of the two contained quantities of limestone.

A line of seven or eight post-pits, 0.20–0.40m deep and spaced 0.70–1.70m apart, ran eastward for at least 7.0m, and probably held posts supporting a substantial timber fence. Three smaller, but truncated postholes may represent a southward return to form a small pen, bounded to the south by a ditch system, 5.

A later stone-built range, S20, lay largely to the east of this building, but with its western wall directly overlying the eastern wall-trench. It is therefore possible that the timber range could have been retained to abut the new stone-built range (see Fig 5.17).

The assemblage of 84 sherds from the floor indicates that the building was in use in the eleventh century (ph LS3/2, 1000–1100). Later pottery from the wall-trench fills might support the postulated retention of the building into the twelfth century (ph 0, 1100–1150).

The ancillary mill building, T35

This building was of a much lighter construction than the other contemporary structures (Fig 4.22 and 4.23). It lay beside the watermills and is assumed to have been part of the mill complex, with its distinctive constructional form perhaps suggesting that it had some specialised function.

The large post-pits within the building might indicate the provision of a timber frame capable of carrying a substantial weight, so one possibility is that it may have been used for the preparation and maintenance of the millstones.

The northern end and western wall had been destroyed by ditch system 19, and truncation had lowered the ground level by up to 200mm, down to the surface of the natural gravel. The building was in excess of 7.8m long and Room 1 was 4.0m wide. A linear setting of flat-laid limestone slabs within the upper fill of the adjacent boundary ditch, 19a, lay on the line of the western wall at the same level as the base of the eastern wall-trench. They might indicate that the building had extended over the early phase ditch, to a total length of 10m, which would make it contemporary with the second watermill, M26, and dated to the eleventh century. Following abandonment, a good group of earlier twelfth-century pottery (ph 0, 1100–1150) was deposited in the filling of both the sunken-floor and within ditch system 19.

The wall-trench of Room 1 was 0.30–0.40m wide and 0.20m deep. To the south it terminated at a short transverse slot, 0.13m deep, which probably held a plank, and part of a similar transverse plank-slot was all that survived of the western wall. Within the room there were two large post-pits, 0.35m deep, and the western pit contained a possible post-pipe of 250–300mm diameter.

Room 2, to the south, was a narrower, sunken-floored chamber, 2.80m square, with a floor area of only 4.8sq.m.

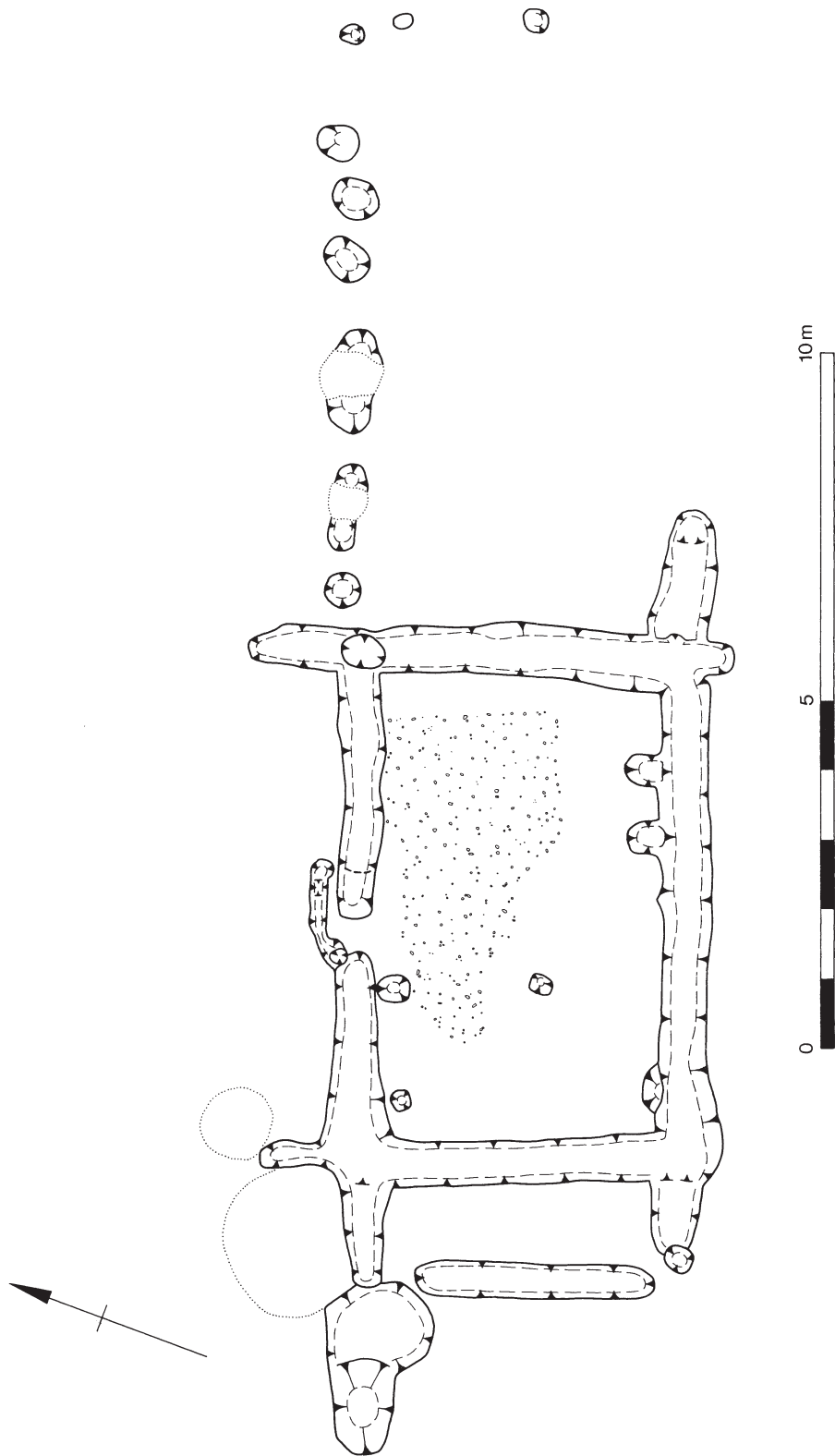


Fig 4.2.1: The rebuilding of the southern range, T33

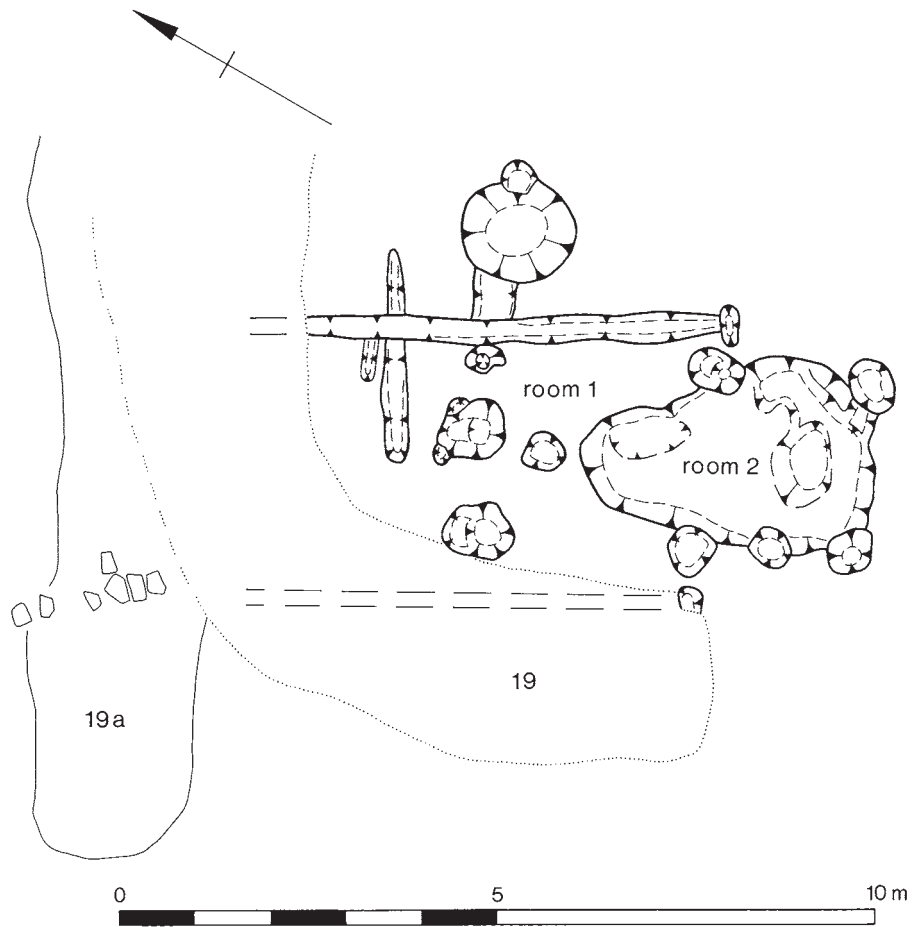


Fig 4.22: The ancillary mill building, T35



Fig 4.23: Building T35, looking west, with ditch system 19 in the background

It was of separate build, founded on four principal posts, with the post-pits 0.35–0.40m deep. A central post-pit in the western wall, 0.25m deep, may have held a door jamb. The sunken floor was 0.30m deep, with an uneven and undulating surface. The hollow was steep-sided, except to the north where a shallower slope extended into Room 1, indicating that they were interconnected.

A steep-sided pit, 0.45m deep, to the east of the building was linked to the wall-trench by a broad but shallow slot. The shallow slots further north post-dated the filling of the wall-trench and derive from later activity.

The timber buildings: general discussion

The hall

The timber halls at a number of broadly contemporary settlements show a similar pattern of development to the West Cotton hall (Fig 4.24). At Goltho (Beresford 1987) successive stave-walled, open halls (Period 3) were replaced by successive aisled halls (Period 4) and finally by a hall of principal-post construction (Period 5). At Faccombe Netherton (Fairbrother 1990, fig 4.55, 185) there was a transition from a pre-Conquest stave-built hall (building 9) to an aisled hall with walls comprising infilling between intermittent principal posts (building 11). At Furnells manor, Raunds the original open hall was also replaced by an aisled hall of significantly greater width (Audouy and Chapman 2009). In all of these instances the halls were adjoined by a further range, typically narrower and often sub-divided into several small chambers that are believed to provide domestic apartments; they are referred to as the camera at Faccombe Netherton and the bower at Goltho (see Audouy and Chapman 2009, 55, fig 4.2, for comparative plans of these halls).

The close comparability of general form between the halls and domestic apartments at West Cotton and Furnells manor (the long range) has previously been noted (Audouy and Chapman 2009, fig 4.2), but it is possible that the comparison may be valid at the more fundamental level of the actual building dimensions. At Furnells manor the complex sequence of later rebuilding left the constructional form of the original hall uncertain. The stated length of 19.0m exceeds the 15.5m length of the hall at West Cotton. However, at Furnells the total length includes a broader northern chamber and the length of the West Cotton Hall includes the possible external stairway that belongs with the second phase of building. If these elements are ignored, the basic structures of both halls are closely comparable at about 13.0m long. The internal widths of both halls are closely comparable at 5.00–5.50m, although the loss, or reuse, of most of the southern wall at Furnells has left the original width uncertain. The internal width of the associated domestic apartments is precisely comparable, at 3.90m. The main chamber of the domestic apartments

at Furnells, Room 2, was 11.5m long, closely comparable to the 12.0m length of Rooms 1–3 in the West Cotton apartments. The differing overall lengths of 14.5m at West Cotton to 19m at Furnells, may be accounted for by the provision of only a short end bay at West Cotton as opposed to two extra, near square rooms at Furnells.

It may be that the ranges at West Cotton and Furnells were constructed independently to similar specifications, but the close comparability of dimensions does raise the possibility that they were based on common specifications, perhaps even constructed by the same builder and they may even have utilised pre-cut timbers prepared off-site to standard dimensions. This suggestion, that the respective halls and apartments were effectively off-the-peg constructions utilising prefabricated timbers but with additional individual tailoring in the form of extra chambers added to the ends of the core buildings, may be seen in the context of the construction of both halls as part of the same episode of reorganisation of settlement at around the middle of the tenth century.

The speculative suggestion is that the provision of these buildings at West Cotton and Furnells may have occurred within such a short time-span that it was achieved through intensive, off-site prefabrication of semi-standardised buildings. Thereafter, the respective halls and apartments at West Cotton and Furnells were redeveloped in distinctly different ways, presumably reflecting their subsequent differences in status and prosperity. If this hypothesis has any validity, it would suggest that other contemporary settlements within the Raunds area would also possess hall and apartment complexes not only of similar form but also of closely similar core dimensions.

Building dimensions

Many studies of Saxon timber buildings have examined their size ranges and proportions, often whilst seeking to determine the possible use of certain standard length measurements (eg Fernie 1991; Huggins 1991; Marshall and Marshall 1991). The West Cotton buildings (Fig 4.24) can be compared to the results from these studies and, given the use of the 16.5-foot rod (5.03m) in the setting out of the plot system there is also a need to examine the possible utilisation of this particular measurement. In addition, we may test for the possible presence of the Germanic rod of 4.65m, as apparently utilised in the early Saxon buildings at Mucking, Essex (Huggins 1991). However, a major difficulty in attempting to define the use of any specific length measurement is that with the wall trenches having basal widths of 0.35–0.50m, the buildings have a range of 0.75–1.0m in the measurable dimensions (Table 4.1).

The widths of the buildings had an extreme range of 2.9–6.7m, but three buildings, T34, T33 and T30, lay within a narrower range of 4.9–5.2m. These values agree with the major grouping identified by Marshall and Marshall (1991, 35–6 and fig 4) of widths between 4.5 and 5.5m, while the width of the later hall, at 5.7–6.7m, falls within their

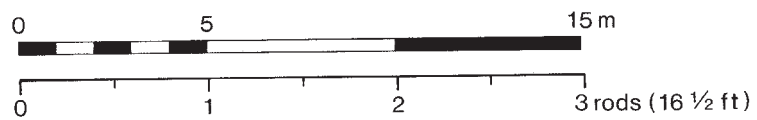
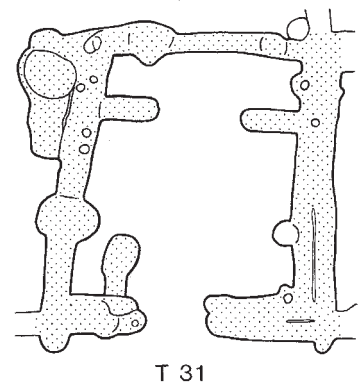
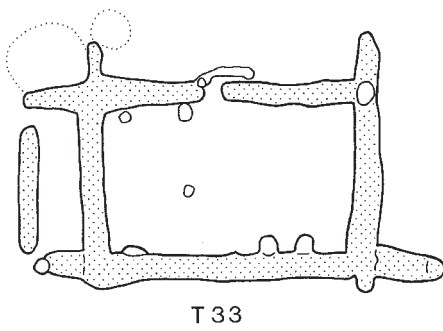
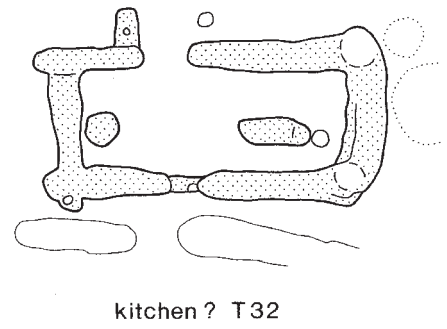
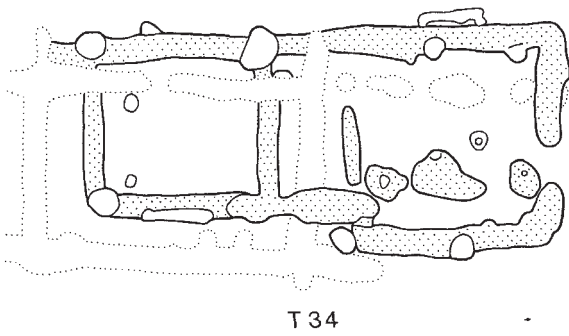
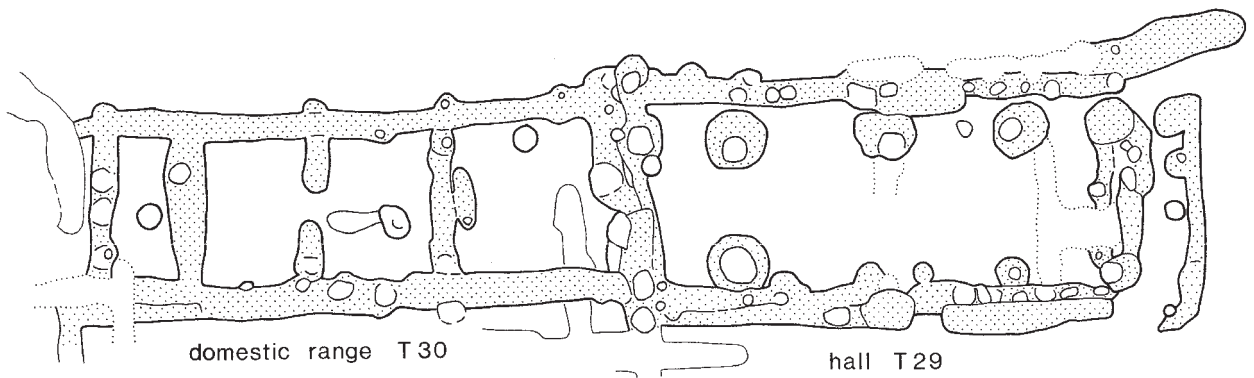


Fig 4.24: The late Saxon timber buildings, comparative plans

Table 4.1: The late Saxon timber buildings; dimensions and length/width ratios

Building	Width (m)	Length (m)	Length/width ratio
Western range (T32)	2.9–3.7	7.6– 8.5	2.3–2.6
Early southern range (T34)			
room 1	3.8–4.9	4.4– 5.1	1.0–1.2
room 2	3.8–4.9	7.1– 7.8	1.6–1.9
Later southern range (T33)	4.3–5.0	7.0– 7.8	1.6
Domestic range (T30) rooms 1–3	4.2–5.2	10.6–11.8	2.3–2.5
Early hall (T29 phase 1)	5.3–6.2	12.6–12.9	2.1–2.4
Later hall (T29 phase 2)	5.7–6.7	12.1–12.8	1.9–2.1
The palisade (T38)	7.8–9.5	14.5–15.7	1.7–1.9
Building T28	6.1–7.0	6.4– 6.5	0.9–1.0

secondary grouping of 6.0 to 6.5m. The western range lies within their lowest width grouping, of 3.0 to 3.5m.

The building lengths range from 7.0–12.8m, although if the narrower end chambers of both the domestic range and the later hall are included these buildings would measure 14.5 and 15.5m respectively. This is in good agreement with the typical range of 6m to 15m identified by Marshall and Marshall (1991, 37–39 and fig 6), and there is some support for their suggested clusters at 7–8m, buildings T32 and T33, and 14–15m, the hall, T29 and domestic range, T30.

While the building widths provide no convincing conformity to any set unit of measurement, the clustering of lengths at 7–8m, 10–11m, and 14–15m identified by Marshall and Marshall suggests a possible relationship to the 16.5ft rod (5.03m); at lengths of 1.5, 2.0 and 3 rods. This appears to be confirmed by individual buildings at West Cotton. The early southern range, T34, had room lengths of 1 and 1.5 rods, while the later southern range, T33, was 1.5 rods long. The hall, T29, was also 2.5 rods long, while the inclusion of the end bay would extend this to 3 rods. The spacing between the principal posts of the enlarged hall, at 2.5m (0.5 rod), with the central span measuring 7.5m (1.5 rods), may also confirm this. The particularly short and narrow western range, T32, does not appear to fit this scheme, and neither does the domestic range, T30.

This analysis of the building dimensions does suggest that at least the lengths of some major buildings at West Cotton may have been set out as simple multiples of the 16.5ft rod (5.03m) (Fig 4.24).

Stave-walled buildings

The linear wall-trenches had been cut down through a pre-building soil horizon of sandy loam so that they bottomed on or up to 100mm into the underlying natural gravel (Fig 4.25). The consistency of the bottom levels in relation to the gravel, despite variations in the depth at which it was encountered, suggests that the trenches were quite deliberately cut to the gravel, most probably to provide both a solid base and the best possible drainage at the base of the wall timbers. The trenches were typically steep-sided and flat-bottomed, from 0.60–0.80m wide at

ground level and 0.35–0.50m wide at the bottom; they ranged from 0.20–0.60m deep, although the shallower examples had probably all been truncated by later lowering of the ground surface.

The wall-trenches and their fills provided little direct evidence for the nature of the timbers that had been set within them. As excavated, the base of the wall-trenches were roughly level, although it is probable that basal hollows derived from post impressions were missed in at least some instances through overcutting. This was largely a result of the excavation technique of working along the trenches, rather than excavating longer lengths in plan, a method necessitated by the difficulty encountered in defining the wall-trenches in plan at ground level.

The only clear evidence for a sequence of individual post positions came from the long walls of the original timber hall, T29. The bottoms of both the northern and southern wall-trenches contained well-preserved oval depressions, 0.40–0.60m in diameter, 50–200mm deep and spaced on average at intervals of 0.75m centre-to-centre (Fig 4.26). The consistency of size and spacing suggests that this was a stave-built wall, comprising closely-spaced timbers of similar size, rather than comprising lighter infilling between more widely spaced principal posts.

The spacing of the individual staves suggests that more shallowly founded timbers would have been required as infilling between them, and if the staves had measured 350–450mm, then there would have been a further 300–400mm of infilling between them, so that the walls may have comprised alternating posts of two sizes. A similar, but better preserved, pattern of rectangular post impressions was recorded along a length of wall-trench in the ‘weaving shed’ at Goltho (Beresford 1987, 56–57, figs 55 and 56) and the reconstructed wall elevation (*ibid*, fig 56B) is probably indicative of the form of the hall walls at West Cotton.

The wall-trench fills were of homogeneous, clean sandy loams with some gravel but rarely containing other inclusions or artefacts. This suggests that they comprised the material originally excavated from them used as a backfill around the inserted timbers. The absence of distinct post-impressions within the fills indicates that the timbers had not been left to decay *in situ*, implying that

the buildings had all been systematically dismantled. In a number of buildings it was noted that the fills against the trench sides were both cleaner and more compact than the central fills, and a central core of darker fill was quite clearly defined along part of the eastern wall of the kitchen range, T32, tapering from 0.50m wide at the surface to 0.15m wide at the base of the slot. This suggests that the timbers had generally been set centrally and not against one side of the trench. The relatively undisturbed nature of the fills also indicates that base plates had not been set along the bottoms of the wall-trenches, as either their decay in-situ would have left clear evidence or their removal would have involved the digging out of the original backfill resulting in more mixed fills than were encountered.

In some buildings the wall-trenches extended beyond the wall line by between 0.50m and 1.75m (Fig 4.23; T30, T32 and T33). Similar features have been noted in buildings at Faccombe Netherton, where it was suggested that ‘this results from the preliminary setting out, where the end walls were not positioned until the long walls were determined and the post positions established’ (Fairbrother 1990, 193). Similar features also appear on a few buildings at Furnells, Raunds (Audouy and Chapman 2009, figs 5.22 and 5.24).

At West Cotton, extensions to both long and end walls were recorded, suggesting that the explanation proposed for Faccombe Netherton is inadequate. It seems more likely that these features had a definite structural function, and in one instance, building T32, the extension contained a transverse, elongated slot suggesting that it may have



Fig 4.25: A typical length of steep-sided wall trench, bottoming just into the natural gravel

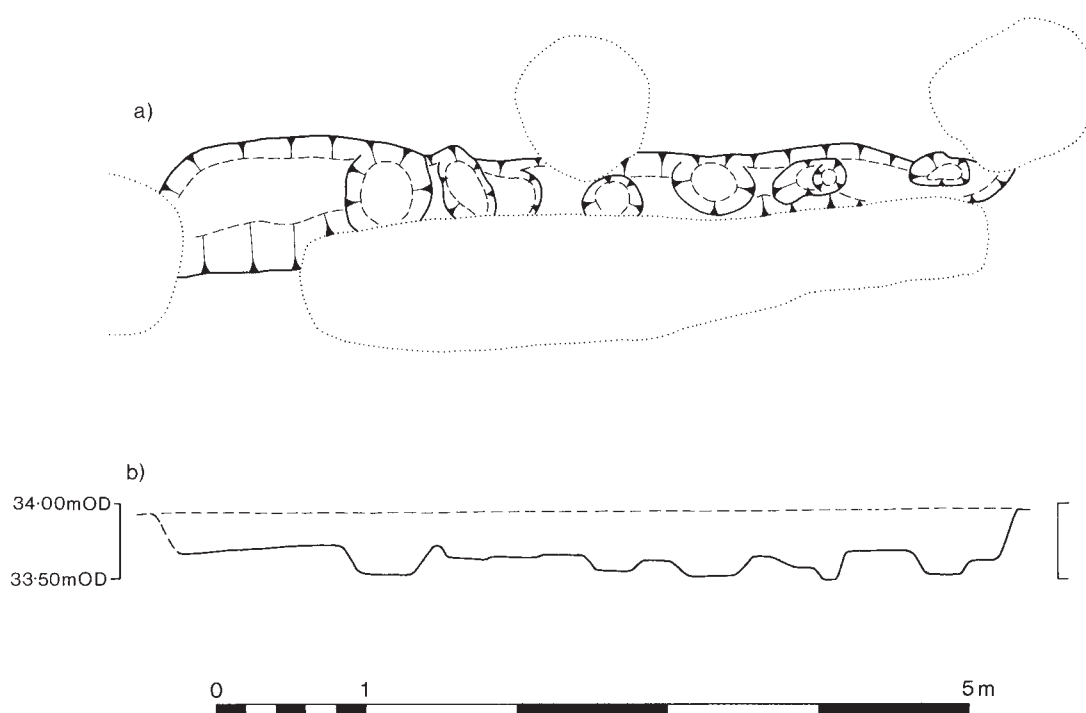


Fig 4.26: The wall trench of the hall, T29, showing stave construction; a) plan, b) reconstructed longitudinal profile

held a rectangular post or plank. Such external posts may have provided additional support to either wall corners or, as in the domestic range T30, at major wall junctions. No structural details were recovered from the longer extensions on building T33, but perhaps here we can suggest the provision of major corner buttresses. Whether these would have been original features or later additions to support points of developing structural weakness has not been established.

The provision of upper storeys

Sub-circular hollows in the bottoms of the wall-trenches indicate the occasional provision of principal posts, probably squared posts of 300–400mm diameter, set up to 200mm deeper than the main wall timbers. Some were clearly door jambs, see below, but others occurred either at corners (Fig 4.24, T34) or immediately inside the external wall lines at apparent internal divisions, T30 and T31. In most instances these post-pits were also defined by differential fills, typically darker and looser and usually including some limestone, probably from displaced packing. The use of principal posts within otherwise stave-built walls may indicate that some buildings required additional structural support, and this may suggest the presence of partial or even full upper storeys in a few buildings.

The corner posts of the square western room of the southern range provided a simple provision of larger corner posts (Fig 4.24, T34). However, building T31, within the palisade enclosure, had a more complex arrangement of short internal wall trenches and post-pits, defining a central bay, with posts set inside the line of the main wall. There was a

similar arrangement around the central room of the domestic range, T30, with post-pits set in the internal partition wall trenches immediately inside the main wall line.

Most elaborately, when the hall, T29, was rebuilt, there were free-standing principal posts within the hall (Fig 4.27), and principal posts on the same lines were also set within the end walls. This rebuilding only increased the width of the hall by 0.50m, to 6.7m wide, so the introduction of arcade posts to carry the roof load, as in an aisled hall, was not necessary. It may also be noted that the central principal post to the north had no partner on the opposite side of the building. It is therefore suggested that the principal posts were related to the provision of first-floor chambers over the end bays. The narrow bay at the eastern end of the building may have contained an external stairway giving access to the upper chamber at this end of the building, with perhaps a gallery running along the north wall to the opposite chamber.

The halls of similar structural form at both Faccombe Netherton (Fairbrother 1990, building 11, fig 4.20) and Goltho (Beresford 1987, fig 65) have been reconstructed as single-storey buildings but Beresford noted that there was no apparent reason for the adoption of such a narrow-aisled hall at Goltho as ‘very little extra width was gained by the change of construction’ (*ibid*, 67).

Doorways

The simplest doorway form was a plain opening in an otherwise continuous wall-trench (Fig 4.24, T31 and T32). In these instances it would appear that the door jambs were provided by terminal stave-posts that were not

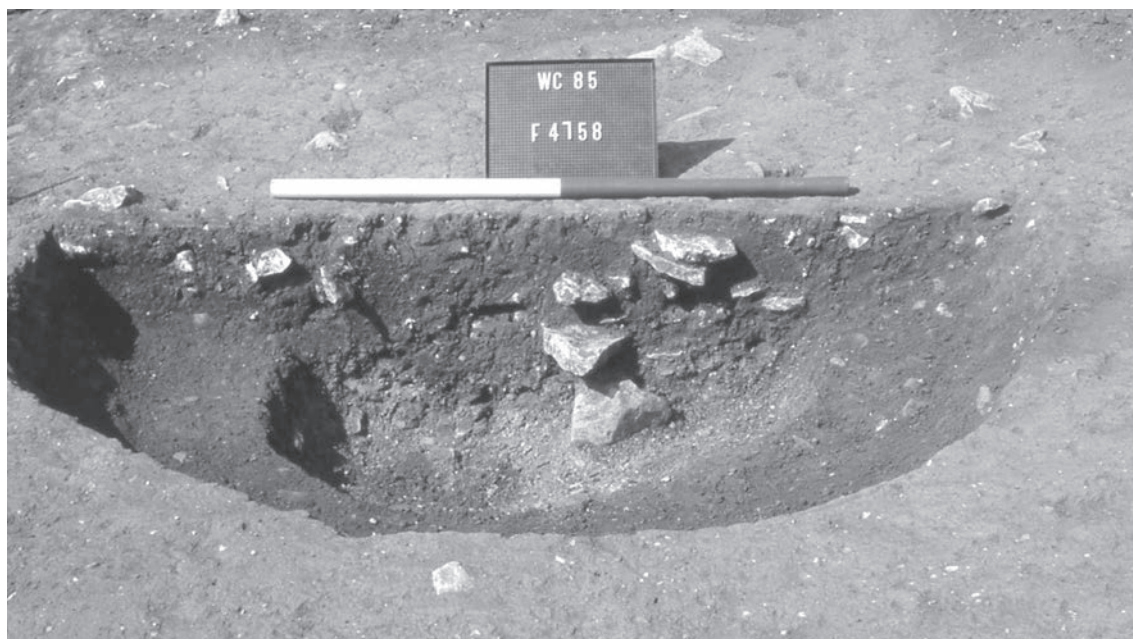


Fig 4.27: Section of post-pit holding arcade post in the timber hall, T29

significantly larger or more deeply set than the rest. The opposed doorway of building T32 was of the same basic form, but a shallow, steep-sided slot running across the opening indicates the additional provision of a sill beam between the jambs.

In three instances doorways comprised shallow sill-beam slots with terminal postholes, containing timbers 100–150mm in diameter, set at or just beyond the external wall face, indicating the provision of shallow porches. In building T34, two such porches flanked continuous wall-trenches, and provided the only indication of the presence of doorways, while in building T33 a sill-beam slot flanked a simple opening in the wall-trench.

The southern doorway of the central room of the domestic range, and a doorway at the western end of the same building (Fig 4.24, T30) were defined by post-pits deeper than the continuous wall-trenches, and their fills contained limestone probably from displaced packing. These probably held substantial door jamb posts, possibly with sill beams set between them, and in these instances it is suggested that the lintels may have been raised above eaves height.

The original southern doorway of the hall (Fig 4.24, T29) appeared to have had a plain opening, with small internal postholes suggesting either that the door was recessed or that there were short internal screens. Following the rebuilding, the new doorway was probably flanked by deeply-set door jamb posts, while the opposed northern doorway possessed substantial door jamb posts set at either end of a construction pit. Both of these doorways were later narrowed by resetting the western posts. As in the domestic apartments, we may suggest the provision of elaborate doorways with raised lintels.

The broad doorway of building T34, which was 4.0m wide, possessed the most complex structural form. The continuous wall-trench with terminal posts appears to denote the presence of a broad, barn-like doorway set forward of the main wall line by 1.0m, perhaps to form a porch raised above eaves height. Subsequently, this doorway was apparently narrowed to some 2.5m wide by the insertion of a new eastern door jamb post.

Floors

The floor surfaces had been lost in all of the early buildings with the exception of the southern ranges, T34 and T33, where floor and occupation levels had survived as a result of subsidence of the underlying ditch fills. These floors comprised gravel in sandy loam, and with the ready availability of gravel from the boundary ditches this may also have been used for the floors in other buildings.

Repairs

The kitchen (Fig 4.24, T32) had terminal post-pits at the ends of a wide and curving wall-trench, which bore little resemblance to the other end of the building. These

differing forms may suggest that this end wall had been rebuilt, with the digging out of the old timbers and the insertion of the new wall explaining the width of the trench, while the corner posts would have provided the structural link to the existing walls. No other buildings show a similar rebuilding of a single wall, as the other instances all appear to have involved a total rebuild of the entire structure.

Roof form

There may be an indirect indicator of the possible form of the roofs. The wall-trenches for the end walls were generally slightly shallower than those for the long walls, but there was no substantial distinction between them, except in the shallow and irregular wall-trenches forming the end walls of the hall (Fig 4.24, T29). This suggests that in most buildings the long and end walls probably contained timbers of closely comparable size and load-bearing capacity. In a gabled roof the weight would be fully carried by the long walls, so that the end walls need be no more than a light weight, non-structural infilling, as is apparent in the hall. In the other buildings, as the end walls could have provided structural support equal to that of the long walls, it is suggested that they may have had hipped roofs.

The boundary and plot systems

This section provides a discussion and catalogue of the evidence for the development of the boundary and plot system, which has been central to modelling the general development of the site between the tenth and twelfth centuries (Fig 4.28). It should be noted that the later phases of both the boundary system and the features within the plots were contemporary with the medieval manor and, whilst illustrated here, they will only be seen in context within the following chapter discussing the medieval manor and its form and development.

The ditched boundary system

In post-excavation each individual boundary ditch system was numbered in sequence running from south to north for both the western and eastern halves of the ditch system: Late Saxon Ditches (LSD) 1–21. Similarly, the enclosed plots were also numbered in sequence from south to north: Late Saxon Enclosures (LSE 1–13) (Fig 4.28).

In formulating the strategy for post-excavation analysis it initially appeared that the detailed development of each individual ditch system could be given a fairly cursory examination, but this conclusion was shown to be false. Ditch recutting was found to be not just a product of re-establishing ditches that were silting, but was often a result of realignments and slight modifications of the ditch systems that reflected aspects of settlement

structure and reorganisation, including redevelopment of the buildings.

It was therefore the combination of all aspects of the archaeological record that allowed the development of the settlement to be described in such detail. A distinct contrast may be drawn between West Cotton and Furnells manor, Raunds (Audouy and Chapman 2009), where the analysis of the site within discrete structural groups, with insufficient consideration of the relationship of buildings and boundaries, limited the scope for a detailed interpretation and modelling of the overall site development, leaving the buildings stranded within a palimpsest of multi-phase ditches, sometimes with no apparent access to adjacent plots. In addition, given the limited dating evidence from

the timber buildings, the larger quantities of pottery from the ditches, and the presence of a few sealed assemblages from lengths of ditch abandoned early in the development of the settlement was crucial in defining the overall chronology.

These conclusions have important implications for the excavation of boundary ditches on comparable sites. The resolution achieved was only possible because the boundary systems had been extensively excavated, revealing details of realignments, the presence of earlier openings, relocated ditch terminals defining entrances, as well as possible bridging points spanning the open ditches. It is therefore suggested that at any major late Saxon settlement site it is essential to understand the detailed form and development

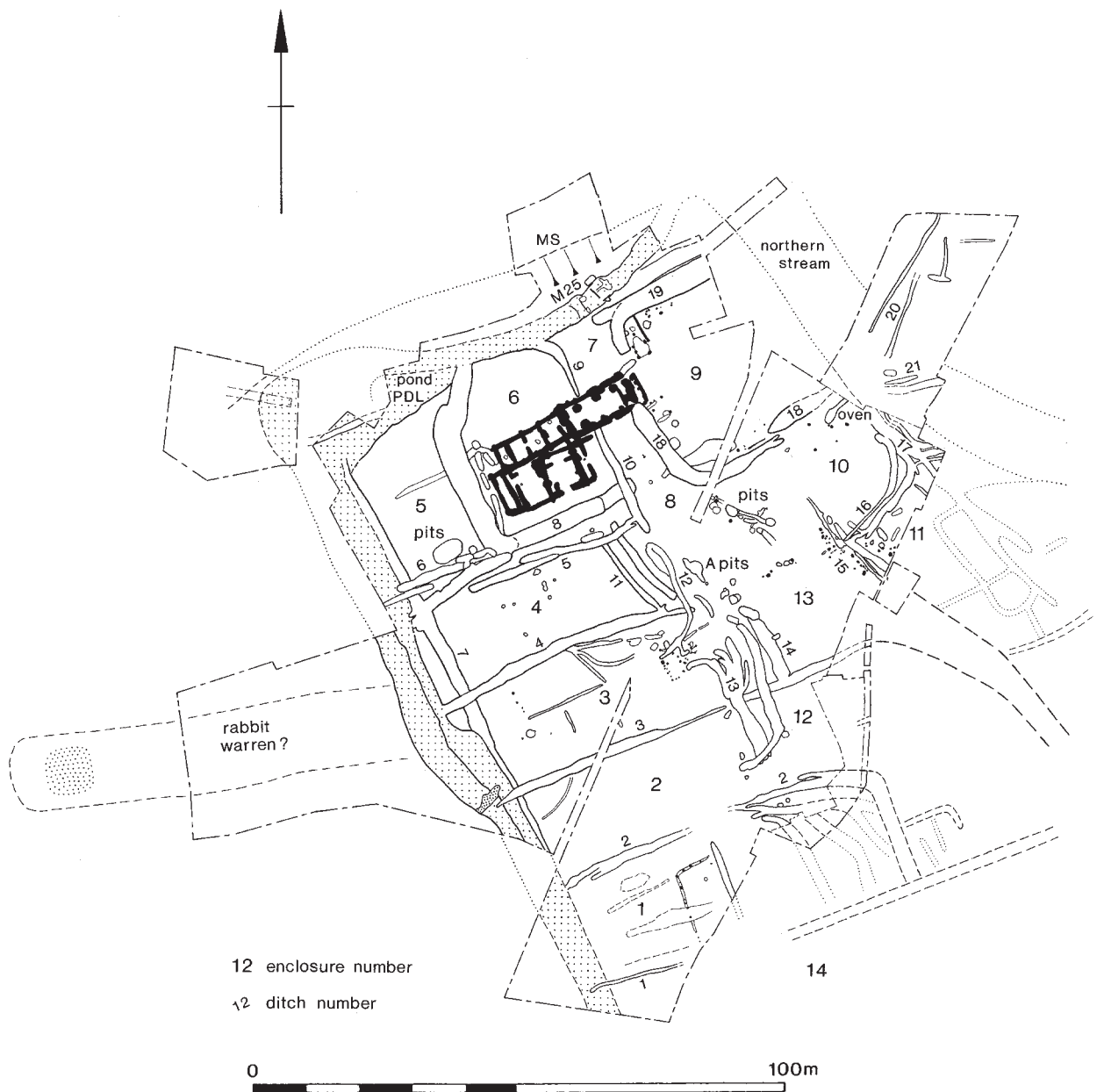


Fig 4.28: The late Saxon settlement, showing ditch system (small font, angled) and plot numbers (large font, upright)

of the individual boundary systems in order to build a comprehensive understanding of the whole site.

Probable bridging points

In three instances distinctive features within and alongside boundary ditches are interpreted as indicating the provision of small timber bridges spanning the open ditches. All three shared common features including distinct basal slots, narrow lengths of ditch with multiple recuts converging from either side, as if respecting a fixed point, and flanking lengths of ditches or slots beside the main ditch, sometimes associated with postholes (Fig 4.29, a–c).

At the eastern end of ditch system 5 (Fig 4.29, a), the

ditch terminal contained a steep-sided slot, 3.50m long and 0.10m deep, total depth 0.55m, with probable postholes set towards either end, 1.50m apart centre-to-centre. The upper fill contained a concentration of limestone, which was only sparsely present within the ditch fills further west. Within ditch system 4 (Fig 4.29, b) there was a similar basal slot, 4.20m long by 0.20m deep, total depth of 0.75m, although no evidence for postholes was recovered. There was an adjacent length of shallower ditch or slot, up to 0.40m deep, with steep sides and a flat base, which at either end deepened and turned abruptly towards the ditch. Multiple recuts converged at either end of this length. The third example lay on the northern boundary of the eastern enclosures (16) (Fig 4.29, c). Within the ditch there was

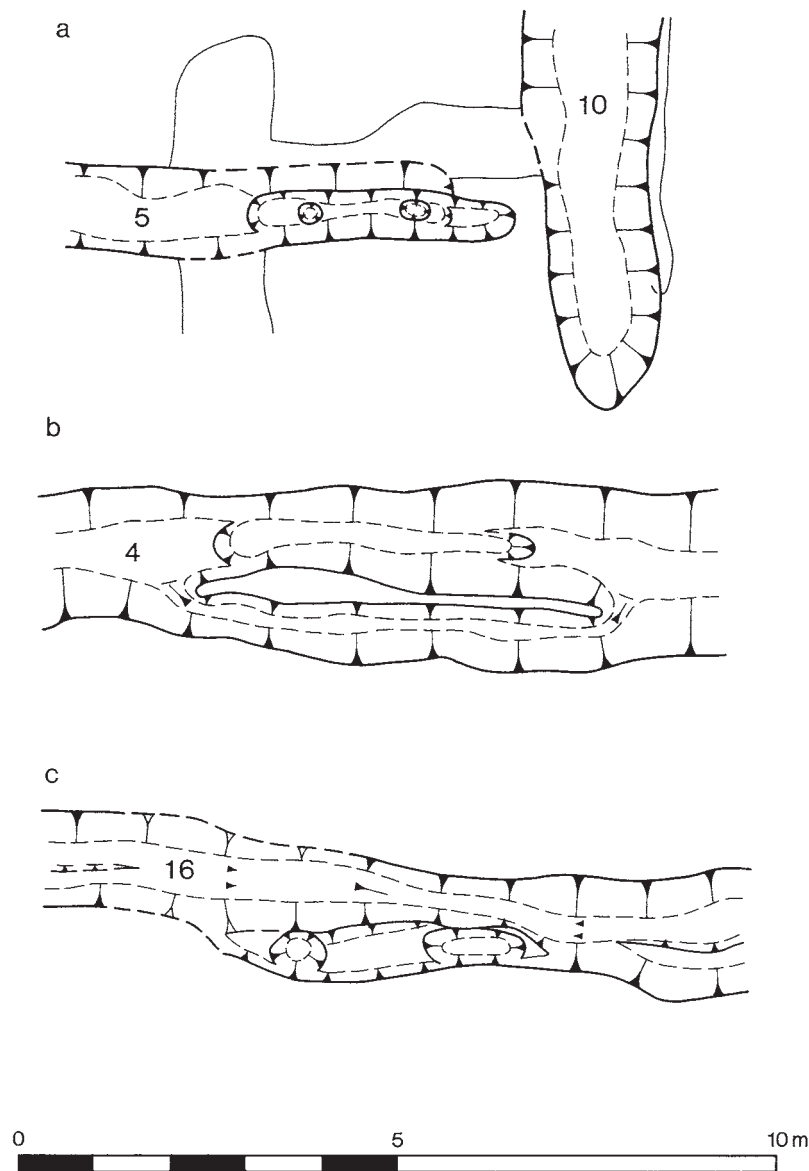


Fig 4.29: Probable bridging points on boundary ditch systems 5, 4 and 16

no clear definition of a basal slot, but for a length of 4.5m the ditch was particularly narrow, suggesting that the recuts converged here. This was flanked by a shallower, flat-bottomed ditch or slot, 3.80m long by 0.20m deep, with postholes set towards either end, 0.35–0.45m deep and 2.00–2.50m apart. A possible fourth example, not illustrated, may have lain at the eastern end of the northern ditch of ditch system 6, defined by a narrow, slot-like length of ditch probably with a post-pit at its eastern end, but this area had been disturbed by later activity.

The basal slots and postholes are interpreted as having held pairs of timber uprights and sill beams supporting simple plank bridges, at least 1.50m and possibly as much as 2.00 to 2.50m wide. It is more difficult to explain the additional provision of shallow ditches or slots adjacent to the ditch systems, unless these held gateways set at the end of a bridge to provide more formal control of the use of such bridging points.

Possible fences

In the latest phases of recutting on ditch systems 2, 3, 4, 13, 15 and 16, there were a number of examples of steep-sided slots, typically more regularly linear than the ditches they replaced. It is suggested that these may have held timber fences, although no direct evidence for this was recovered. The clearest example was provided by the final northern boundary to the eastern enclosures (Fig 4.36, 16). The western end comprised a linear, steep-sided and flat-bottomed slot (1244) and to the east this ran directly into a deeper, broader and curving ditch (1268), suggesting the provision of a boundary with both fenced and ditched lengths. These fenced boundaries appear to have been introduced in the mid to later twelfth century (ph 1, 1150–1225), with the provision of fences marking a growing redundancy of the use of ditched boundaries, and presaging the medieval use of walls for any boundary that did not also act as a drainage system.

The usage and filling of the ditches

The fills of the boundary ditches showed distinct general patterns. To the west they were typically of homogeneous clayey silts, water deposited and presumably derived from flooding both while the mill leats were in use and through the earlier twelfth-century flooding at the around the time of the abandonment of the watermills. These deposits contained few finds, probably resulting from a combination of the silting process and the distance from the main buildings.

Around the buildings of the northern holding and along the frontages onto the central yards the fills were of sandier loams and these did produce considerable quantities of finds. Few came from the rapidly accumulated primary fills, and articulated portions of animal carcasses from the lower fills of ditches, 16, of the eastern enclosure and the northern holding, 4, appear to be isolated occurrences.

Similarly, the surviving secondary fills of the earlier ditches also contained few finds. In contrast, the secondary and final fills of the latest recuts often produced large quantities of pottery, fragmented animal bone, limestone and burnt debris. This suggests that there was little long-term use of the ditches for rubbish disposal, as much of the material had come in only when the ditches were being backfilled at major changes of settlement organisation, presumably in association with the demolition of buildings.

As a result, the pottery assemblages are typically well-mixed and fragmented, with a high proportion of late Saxon types occurring within otherwise twelfth-century groups. The only good primary group came from the final terminal of the ditch system 4, within the northern holding, where there was an exceptionally clearly defined horizon related to a single act of infilling. The light silty fills of the large ditch, 8, flanking the southern side of the late Saxon timber buildings (Fig 4.31, 7290), were sealed by a thin, 50–100mm thick, layer of distinctive grey loam with charcoal producing a sparse pottery scatter but invariably of large sherds.

The ditch system, 18, flanking the eastern side of the road approaching the buildings of the northern holding produced one of the largest pottery assemblages. The fill containing this material may have been dumped in the twelfth century when the first stone buildings were appearing on the northern holding. Further south, the final filling of the same ditch comprised dumped limestone rubble and mortar, perhaps the disposal of debris from building construction.

Evidence for deliberate filling was also provided by the pottery, finds and burnt debris within the ditches along the western frontage onto the central yards (Fig 4.31, 14). Some burnt debris, burnt soil and charcoal, was present within the fills of the earlier cuts and suggests sporadic earlier dumping, presumably derived from use of the contemporary activity area to the north, which probably contained at least one oven. The final fills contained consistently more such debris, along with pottery and animal bone, and this may relate to a clearance of the activity area to the north immediately prior to the appearance of a new building range, S17. This activity was all contemporary with the twelfth-century manor, and is more fully described in chapter five.

The enclosed plots

There is a strong chronological bias in the dating of the features within the enclosed plots. The only major feature that produced a pottery assemblage with a pre twelfth-century date was a transverse internal ditch within plot 1, and even in this instance the adjacent fenced pen was in use in the twelfth century. Similarly, the successive gated entrances to plot 3 and the palimpsest of postholes and pits within the eastern plots, 11, are also dated to the earlier twelfth century.

There is, therefore, virtually no evidence that the

features related to stock control were present through the tenth and eleventh centuries. However, it is suggested that many of these features probably were in use much earlier, and that the dating evidence is probably indicative of the date of disuse. This suggestion is also supported by the known twelfth-century expansion of the domestic enclosure of the medieval manor and the appearance of numerous pits and ovens, all generally containing much burnt debris, showing that these processing activities were supplanting the use of the adjacent enclosures for stock control.

The ditches and plots of the southern holding

Ditch system 1 (LSD1)

This was a primary east-west boundary that formed the central division within the southern holding (Figs 4.28 and 4.30, 140). Only the south-western end lay within the excavated area, but its continuation was confirmed both by partial survival as an earthwork and by geophysical survey. The short excavated length to the west was V-shaped, 0.60m deep, with a narrow basal slot. It was filled with water-deposited silts and clays, and the five sherds of pottery are dated to the earlier twelfth century (ph 0, 1100–1150). After the accumulation of 0.20–0.30m of silts across this western area through the later twelfth century, the ditch was re-established at a higher level (104), but only the very base of this feature survived.

Ditch system 2 (LSD2)

This was an intermediate boundary separating two quarter-acre plots. To the west there were two parallel ditches (Fig 4.30, 81 and 160), and the northern ditch was probably the later cut. They were only 0.10–0.35m deep, but this was a result of the clays into which they were cut being truncated in machine stripping. It is uncertain whether the break in the ditch further to the east was a result of machine removal or indicative of the presence of a real break providing access between the two enclosures. The small quantity of pottery recovered is dated to the first half of the twelfth century (ph 0, 1100–1150).

To the east, a sequence of four ditches formed the southern side of an entrance to the plot to the north. Geophysical survey showed that they turned southward to form a frontage onto the central yard. Although there were insufficient relationships to establish a full sequence, there was probably a steady eastward encroachment onto the central yard, as was demonstrated for ditch systems to the north. The southernmost ditch (1682) turned southward within the excavated area probably as part of the eastern boundary to the original quarter-acre western plots. Some small pottery groups from these ditches comprised only St Neots ware and some Stamford wares and suggest the presence of fills dating to the tenth century (ph LS2, 950–975).

The ditches were 0.30–0.50m deep, but both the

southern and northern ditches (1682 and 1667/1701) deepened to the east, to 0.40–0.80m deep, indicating that the frontage had been recut and deepened on more than one occasion. To the north, a steep-sided slot (1672), up to 0.65m deep, may suggest the addition of a timber fence as a final definition of the frontage.

The fills of the northernmost ditch (1667/1701) contained quantities of burnt soil and charcoal, similar to deposits in ditch systems 13 and 14 to the north. This ditch was largely filled by the middle of the twelfth century (ph 0, 1100–1150), but smaller quantities of later twelfth-century pottery (ph 1, 1150–1225) suggest that the boundary may even have overlapped with the appearance of the first stone building in medieval tenement B.

Two small pits (1746 and 1751), 0.80–1.00m in diameter by 0.35m deep, may indicate the provision of posts flanking the enclosure entrance at some stage.

Plot 1 (LSE1)

This was a quarter-acre plot divided into western and eastern ends by a linear ditch (72), 1.30m wide and 0.35m deep (Fig 4.30). A shallow, L-shaped slot (22/30) containing regularly placed postholes formed a small enclosure or pen adjacent to the ditch, measuring 13.5m by 7.5m, an area of 100sq.m. The slot was 0.40–0.50m wide and 0.15m deep, with postholes in the base spaced between 0.80m and 2.90m apart. While the fills of the ditch contained a good pottery assemblage of later tenth-century date (ph LS2, 950–975), the slot produced a small amount of pottery dated to the earlier twelfth century (ph 0, 1100–1150). Within the enclosure there was a shallow, sub-rectangular pit (73), 0.75 by 0.60m and 0.10m deep, with a post or stakehole at either end, 0.10m deep. The lower fill was of dark grey-brown silty clay heavily flecked with charcoal, and above this a layer of scorched (red-brown) clay and two pieces of burnt limestone appeared to be the *in situ* remnants of a drying oven, and concentrations of charred cereal grain within nearby features and the boundary ditch to the north may have come from here.

A shallow linear hollow (24) up to 3.0m wide but no more than 0.06m deep, ran across the western slot and may have been an eroded pathway leading into the pen. A shallow linear slot to the north (31), 0.6m wide but only 0.03m deep, was aligned with the pen and may have held a further length of fence. To the north there was a shallow oval hollow (165), 5.00m long by 1.50m wide and up to 0.10m deep.

Plot 2 (LSE2)

Access to this quarter-acre plot was from the central yard through a broad, 5.50m wide, opening in the boundary ditch systems, 2 and 13, to the east (Fig 4.28). Initially this had been a simple opening between plain ditch terminals, but with the eastward migration of the eastern boundaries it was furnished with flanking ditches forming a funnelled

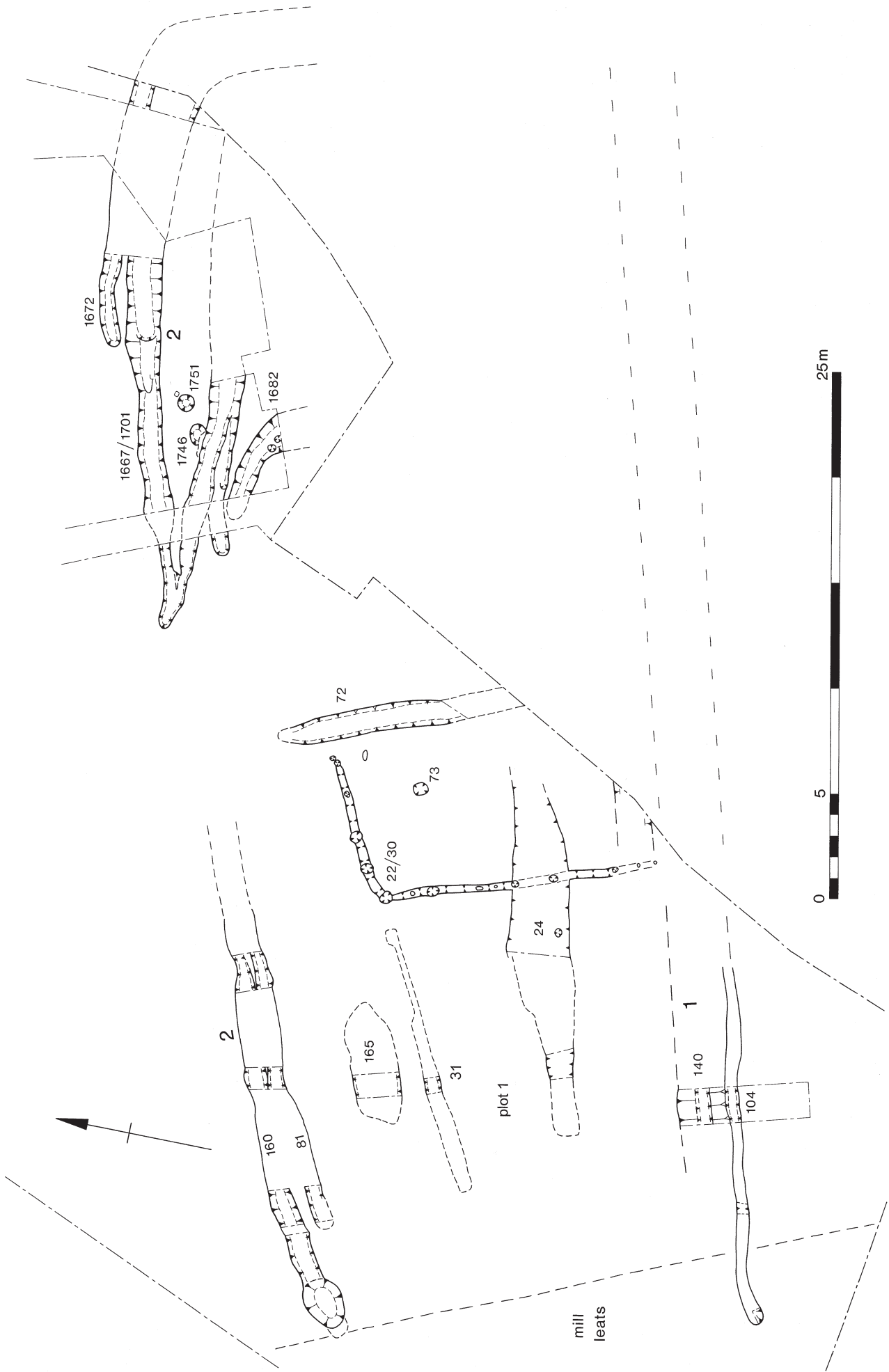


Fig 4.30: The southern holding, plot 1 and ditch systems 1 and 2

entrance passage. The interior of the plot was almost devoid of features, but the heavy machining of this area would have removed any shallow features. To the west an arc of gully (5203), 0.40m wide by 0.05m deep, may have held a fence connected with the control of access to the fording point across the adjacent mill leats (see Fig 6.2).

Plot 12 (LSE12), the southern central yard

The part of the central yard related to the southern holding lay largely beyond the excavated area, but the strip outside the entrance to plot 2 was devoid of any early surfaces or features (Fig 4.28). Geophysical survey indicated that in the south-western corner there was an L-shaped ditch forming a small sub-square enclosure, measuring 12m by 10m, perhaps a small pen or even a timber building. A twelfth-century date would be suggested by the way it appears to abut the most easterly boundary ditch.

The tenorial boundary: ditch system 3 (LSD3)

This was a primary boundary system that is interpreted as the tenorial boundary between the northern and southern holdings (Figs 4.31 and 4.32). In the later medieval period it was replaced by a double-walled boundary and following desertion a new ditched boundary lay between separately owned closes.

The original ditch was perhaps broken only where the original eastern frontage, ditch system 13, bisected it (Fig 4.32). A short length of the original flat-bottomed ditch, up to 0.60m deep, survived to the immediate east of this intersection, between ditch systems 13 and 14. It had been backfilled at an early date with clean gravel and sand, with the small pottery group dated to the later tenth century (ph LS2, 950–975). The second phase to the east had a terminal several metres east of ditch system 13. It was up to 1.00m deep with a V-shaped profile and a distinct basal slot (Fig 4.33). As the frontage moved eastward, to ditch system 14, the ditch terminal also migrated eastward. The ditch was only partially recut, so it then formed a U-shaped ditch half its original depth. The final fills contained quantities of burnt debris similar to the final fills of ditch system 14.

To the west of the frontage the ditch terminated 1.0m short of the transverse boundary. The distinct basal slot suggests that it was probably frequently scoured, and there was a complex history of recutting. The central section showed three surviving cuts shifting progressively northward. The earliest, 0.60m deep with a well defined basal slot, ran to within 10m of the mill leats, where it terminated adjacent to a curving length of gully within the enclosure to the south, which may have controlled access through this opening (see Fig 6.2). Three pits in the base of the later ditch, each 0.60–0.80m in diameter and 0.10–0.15m deep, may have been the truncated bases of post-pits beyond the original terminal, or perhaps a bridged crossing.

A further use of posts followed the abandonment of

both the western boundary ditch, 7, and the second mill leat. A large pit (Fig 6.2, 6977), at least 3.60m long by 2.40m wide and 0.60m deep, contained two sub-square pits, 0.25–0.45m deep, suggesting the provision of a pair of posts set 2.40m apart. The distinctive form of this western end of the boundary system may have been determined by the presence of an adjacent fording point across the mill leats, the posts perhaps marking its location, and reflecting the more intensive usage of the area as the only point of access onto the area west of the mill leats.

By the earlier twelfth century (ph 0, 1100–1150), probably at the abandonment of the mills, the posts had been replaced by a continuous ditch, (5066/1281) typically 0.50m deep, running to the edge of the stream and terminating beside a surfaced ford. A final ditch recut at the western end was 0.30–0.40m deep. In part its profile was steep-sided and slot-like, and to the east the final recut along the northern edge of the system (Fig 4.32, 1155) was consistently a narrow, steep-sided slot, 0.65m wide by 0.50m deep, with a well defined terminal 19m west of ditch system 13. The profile suggests that it may have held a timber fence. The fills of this final recut contained some later twelfth century pottery (ph 1, 1150–1225).

Along part of the western length of this boundary there was an eroded remnant of bank, up to 0.35m high, comprising red-brown sandy clay with a little gravel. Although it had spread across much of the ditch system, it had clearly originally lain on the southern side.

The northern holding: the western ditches and plots

Ditch system 13 (LSD13), the early western frontage

This complex system of ditches formed part of the eastern frontage to plots 2 and 3, and thus formed a frontage to parts of both the northern and southern holdings (Fig 4.32, 13). The plan form shows that while the ditch recutting on the two holdings ran in parallel, the northern and southern halves were quite distinct. On the southern holding, the ditch sequence showed a minimal drift to the east, while to the north there was a substantial movement eastward, with the successive ditches fanning out from a near common origin with the neighbouring system. The central convergence of the ditches made it difficult to correlate the northern and southern sequences, but the presence of several butt-ends in this area, indicated by distinct basal steps, suggests that in many instances there were separate, but contemporary, northern and southern ditches which either closely abutted or even interlinked.

The earliest ditch to the north appeared to have a plain terminal, but it was soon replaced by an inturned ditch (937) forming part of a gated entrance to plot 3, and paralleling the development of ditch system 12 on the opposite side of the entrance. Thereafter, there was a succession of four plain terminals with a steady eastward drift. Two later cuts



Fig 4.31: The northern holding, showing the plots and boundary systems (including the twelfth-century oven and pit groups)

were narrow and steep-sided, up to 0.75m deep, and were either timber-slots or had filled very rapidly. The final recut (935) was also a narrow, steep-sided, slot, up to 0.80m deep, which may have held a fence. It was broadly contemporary with the latest recuts of the southern sequence, where at least the final two of a sequence of six or seven cuts were also narrow and steep-sided, up to 0.80m deep.

The ditch fills were consistently of red-brown sandy loams with pebble inclusions, although the fills of two of slot-like cuts to the south did contain some charcoal and burnt soil.

The ditches produced a large quantity of pottery, but much of this cannot be assigned to specific recuts as these were only defined in the drawn sections and not during excavation. Most of the system produced earlier twelfth century pottery (ph 0, 1100–1150).

Ditch system 14 (LSD14), the later western frontage

The eastward drift of the frontage culminated in the abandonment of the original ditch system and the provision of a completely new eastern frontage formed by two parallel ditches, each of which was recut a number of times (Fig 4.32).

On the western ditch (1662), the inturned entrance to plot 2, to the south, was an original feature, and contained a substantial assemblage of earlier twelfth-century pottery (ph 0, 1100–1150). The later cuts all had plain terminals, and the upper secondary fill of the latest cut contained multiple, interleaved lenses of burnt (reddened) sands with much charcoal and some pieces of burnt limestone. A pit (1674), 1.50m diameter by 0.80m deep, of similar depth to the ditches, lay adjacent to these terminals, and also contained some charcoal and burnt soil.

The easternmost ditch terminated adjacent to ditch system 3, which probably then had a western terminal at about the same point. There was a sequence of at least three cuts and, as with the western ditch, the upper secondary fill of the final cut contained much grey, charcoal flecked loam with burnt (reddened) soil.

At the northern end of both ditches there were pits which also contained burnt debris, these appeared to be related to the oven and pit group (1162/1355) further to the north.

The pottery from the western ditch was largely of earlier twelfth-century date, but one or two groups contained small quantities of later twelfth century date (ph 1, 1150–1225). The eastern ditch produced large quantities of later twelfth-century pottery, suggesting that it was retained after the western ditch was out of use, and may even have replaced the western ditch at around the middle of the twelfth-century.

Ditch system 4 (LSD4)

This was an intermediate boundary, separating two quarter-acre plots, with multiple recutting (Fig 4.32). The earliest

ditch to the west may have been the most northerly (5031). This terminated 7.0m from western ditch system (see Fig 6.2), suggesting that, like boundary system 3 to its south, there was an original opening to the west. The later recuts to the west cut across the abandoned western ditch and appeared to terminate within the fills of the second mill leat.

Any physical link between the earlier ditches to the west and the east was lost where they converged to a single narrow ditch, where a slot-like deepening within the base of the ditch and an adjacent length of slot have been interpreted as the foundations for timber beams supporting a bridge (see Fig 4.29b).

The earliest cut at the eastern end (1352/1432) lay to the south and had the most easterly terminal, which predated the extension of the frontage ditch, 12, to form the inturned plot entrance.

In subsequent recutting the terminal retreated westward. The final recut at the eastern end (1430) was a steep-sided, slot-like cut, 0.55m deep, which contained much limestone, some of which was steeply pitched and may have been displaced packing for a timber fence. It also contained one of the few primary pottery dumps recovered, including several near complete vessels both of earlier twelfth-century date (ph 0, 1100–1150) and also a good group of Lyveden A-ware dated to the later twelfth century (ph 1, 1150–1225).

Plot 3 (LSE 3)

Access to this quarter-acre plot was probably originally through a simple, 9.0m-wide opening in the eastern boundary, but this was soon replaced by a funnelled entrance provided with a post-built double gateway, which presumably formed a pen with gates at either end for stock control, particularly the separating or shedding of animals (Fig 4.32, g1; Fig 4.34).

The gateway, g1, was defined by a regular line of eight postholes to the west, typically 0.30–0.50m diameter by 0.10–0.15m deep, and three to the south, in line with the ditch terminal. On the eastern side there was a more irregular scatter of postholes, and some may have been removed by the later entrance. Along the northern side there was a length of ditch (1115), which had probably removed further postholes. It contained flat-lying slabs of limestone, with a 0.25m deep posthole at the western end. Within the gateway there was a compact layer of orange-red clay with sparse pebble inclusions and occasional burnt patches, measuring 3.60m by 3.40m, probably created by trampling. Above this there was a 30mm thick layer of compact orange-brown sandy loam mottled with patches of either reddened or blackened burning.

With the eastward migration of the boundary, a new gateway was formed further to the east, g2. The western side comprised a slot, 0.60m wide by 0.15m deep, which broadened and deepened at either end. Along the southern side a further length of slot, up to 0.90m wide by 0.20m

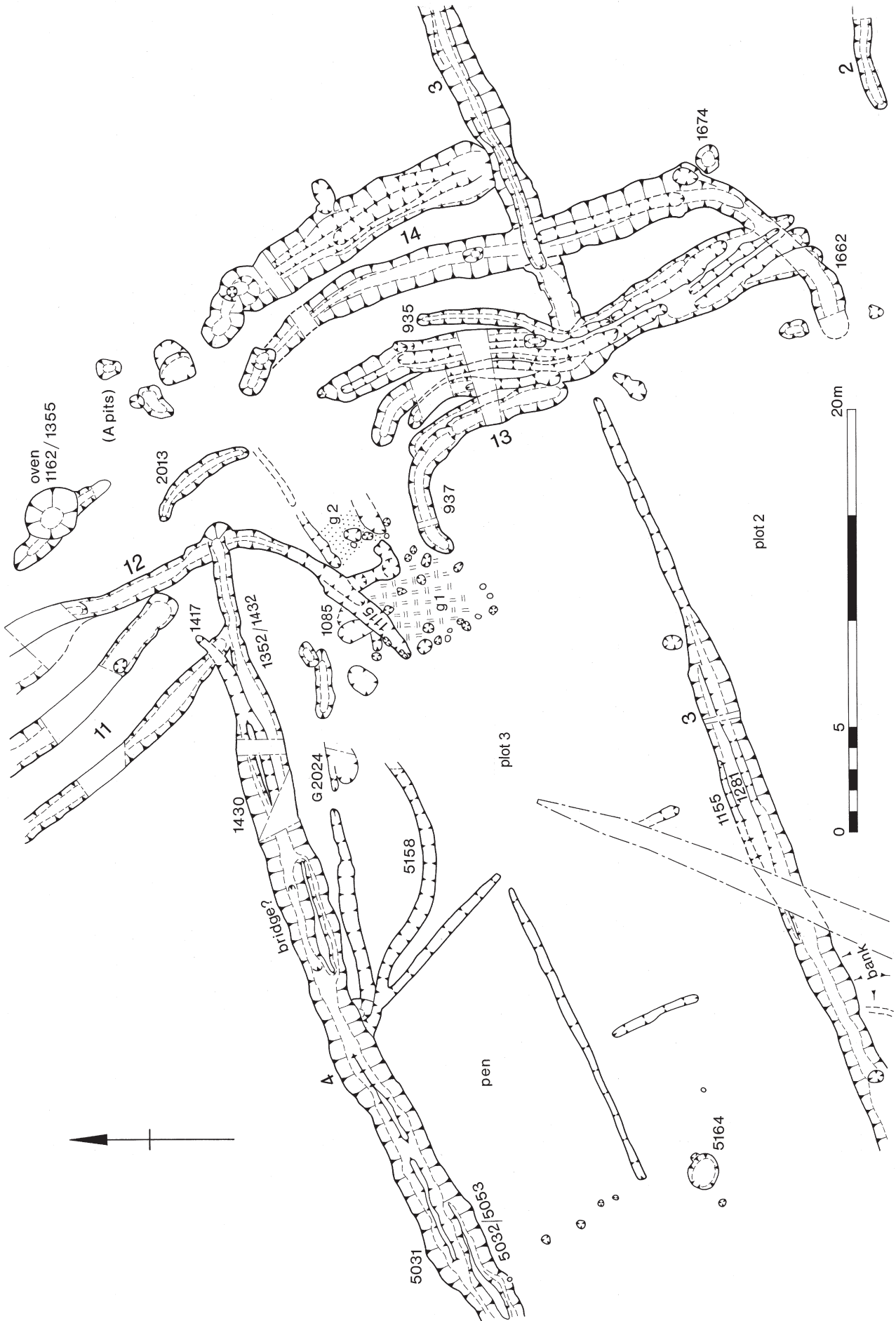


Fig 4.32 : The northern holding, plot 3 with gated entrance (g1 and g2), and boundary ditch systems 3, 4, 11, 12, 13 and 14

deep, ran eastward but was largely removed by later activity. To the north there was a parallel length of slot, 0.50m wide by 0.15m deep. This was also partly removed by later activity, but a faint soil-mark suggested that it was 6.6m long, running to the terminal of a shallow ditch (2013). The new gateway therefore comprised an elongated entrance passage, 3.50m wide, with remnants of a laid surface of gravel and limestone at its western end.

There were several features within the plot (Fig 4.32). A pen, 8.0m wide and 12–15m long, enclosing an area of 108sq.m, was defined by two linear slots, 0.50m wide and 0.10–0.16m deep, and a line of five postholes to the west, 0.27–0.48m diameter and 0.06–0.12m deep. To the south there were two further short lengths of slot. A sub-circular pit (5164), 1.70m diameter by 0.54m deep, had near vertical sides and a flat-bottom. It had a posthole on its eastern edge with a further posthole 0.70m to the west, perhaps suggesting that they supported some structure or device suspended over the pit, but there was no further indication of its function.

To the east of the pen a curving ditch or slot (5158), 0.64m wide by 0.45m deep, had probably held a timber fence, and to its north there was a shallower interrupted linear slot or ditch (G2024). These were probably both concerned with controlling access to a possible bridge crossing the adjacent boundary ditch.

Immediately north of the enclosure entrance there was a cluster of small pits, no more than 0.30m deep. The southernmost pit (1085), 2.30m by 0.90m and 0.25m deep, contained flat-lying pieces of limestone.



Fig 4.33: The primary boundary ditch, 3, separating the northern and southern holdings, looking west



Fig 4.34: The postholes of the double gateway entrance to plot 3, looking east

Ditch system 11 (LSD 11)

Two parallel and slightly curving ditches, 2.0m apart, ran between the domestic enclosure and ditch system 4 (Figs 4.31 and 4.32). They were both shallow, only 0.30–0.35m deep, with no evidence of recutting. They probably belonged with the late tenth-century arrangement and were abandoned before the end of that century.

Ditch system 12 (LSD12)

This ditch formed the frontage to the northern quarter-acre plot (LSE 4), probably replacing ditch system 11 (Figs 4.31 and 4.32). In its original form it comprised a single elongated pit, 7.0–8.0m long by 3.00m wide and 0.20m deep. This was replaced by a ditch, which was later extended southward and curved to the west to meet the northern side of the gateway to plot 3. The small quantity of pottery recovered was of earlier twelfth-century date (ph 0, 1100–1150).

Plot 4 (LSE 4)

While the main access to this plot was generally from the east, for a period in the eleventh century the barn, T34, to the north had its main doors opening into this enclosure. The changes in access involved a number of realignments of the adjacent ditch systems (Fig 4.9).

There were few internal features (Fig 4.31). A line of four irregularly spaced post-pits, 0.40–0.50m deep, formed a partial transverse subdivision, and two postholes to the west, 2.0m apart, may have formed a small two-post structure.

By the middle of the twelfth century, and the introduction of the stone-built manor house, this area had been absorbed into the domestic enclosure of the northern holding, with a new building, S24, occupying the western end.

Ditch system 7 (LSD7), the western boundary

This ditch system ran parallel to the earliest western mill leat, and was cut by the second mill leat, indicating it had been at least partially abandoned by the end of the tenth century (see Fig 6.2). The northern end was retained slightly longer, and cut into pond silts which had probably accumulated during the use of the first watermill, but there was no indication that it was in use into the twelfth century, when the transverse boundaries, 3, 4 and 6, were extended across it.

The original ditch (Fig 6.2, 5082) was a broad, flat-bottomed cut, up to 0.50m deep, which had largely silted before it was recut along its eastern side (5081). The homogeneous fills of clayey silts suggest that it silted rapidly, probably largely as a result of the deposition of clayey silts through overflow from the mill leats.

The northern holding: the northern ditches and plots***Ditch system 8 (LSD8), the defensive ditch***

This substantial, L-shaped ditch partially enclosed the original timber buildings of the northern holding (Figs 4.9 and 4.31). It was both broader and deeper than any of the other boundary ditches.

The southern arm (Fig 4.31, 7290; Fig 4.35) was 3.50m wide with a broad, flat-bottom, 0.60m deep, and a steep-sided slot to the north, 1.10m deep. The same profile was evident along much of the western arm, which was 4.00–5.00m wide. This profile was probably a product of successive cuts, but later recutting had removed the relationship. Originally, the western arm continued northward and opened into the mill leats. The deep slot was filled with loose clean yellow sand and gravel with a few pieces of limestone, while red-brown sands with some gravel had accumulated against the edges of the broader ditch.

The ditch was recut within its former limits as a broad and flat-bottomed ditch, 2.00–2.50m wide by 0.60m deep. The primary fill of mottled silty clays, containing some water snails, suggests that at this stage there was frequently standing water within the ditch, perhaps because the western arm now terminated short of the mill leats. Above the primary silts on the southern arm a distinctive layer, 50–80mm thick, of brown loam mixed with grey charcoal flecked sand and fine, grey ashy material, had been deposited from the inner side of the ditch. It contained scattered clusters of large un-abraded pottery sherds, often from single vessels, dated to the later tenth century (ph LS2, 950–975). The remaining fill comprised up to 0.40m of homogeneous and clean red-brown sand with very frequent pebble inclusions, a dumped deposit probably derived from the levelling of an internal bank.

At the eastern end of the southern arm there was a detached ditch segment (Fig 4.31, 7328), 6.70m long, 2.75m wide by 0.55m deep, with a broad flat-bottom, separated from the main ditch by a low ridge. This had a similar sequence of filling, with the final dumped fill of sand and gravel appearing to be contiguous with the final filling of the main ditch.

The western arm was retained through the eleventh century (Fig 4.9). It was filled with sandy loams with pebble inclusions and some limestone, generally more clayey towards the northern end. The upper secondary fills contained more limestone and towards the northern end there were also deposits of burnt debris, reddened soil, grey loams and much charcoal.

At the northern end, a final recut (Fig 4.9, 4803) extended further northward to open into the latest mill leat, M25. Its fills contained frequent large pieces of limestone. The general fill of the subsidence hollow above the western ditches contained both disordered limestone and mortar broadly contemporary with the construction of the stone-built kitchen/bakehouse, S20, which partially overlay the ditch.



Fig 4.35: The excavated southern arm of the early defensive ditch system (8, 7290) enclosing the timber buildings, looking west, showing the broad, flat-bottomed cut with a steep-sided slot to the north (right)

Once the western arm was largely filled, it was replaced by a shallower ditch system lying to the immediate east, with an opening providing access to building T32. The steep-sided cuts suggest either the provision of a timber fence or rapid filling. The southern end cut the secondary fills of the main ditch, and may have continued across to meet ditch system 6 to the west.

The bulk of the large pottery assemblage from the upper fills of the western arm was of earlier twelfth century date (ph 0, 1100–1150), while the limestone and mortar fills of the subsidence hollow above this produced a large group of later twelfth century pottery (ph 1, 1150–1225).

Ditch system 5 (LSD5)

This boundary replaced the southern arm of the domestic enclosure ditch 8 following its backfilling and the introduction of a new timber building range, T34.

The original linear ditch, 0.45m deep, was broken to the east to provide access to the southward facing doors of the new range (Fig 4.9). The ditch was recut (4617) following the demise of this building. The eastern end, abutting the frontage boundary, 10, contained a narrow basal slot and a pair of shallow postholes, perhaps suggesting the provision of a narrow timber bridge (Fig 4.29a).

The small pottery assemblage is dated to the earlier twelfth century (ph 0, 1100–1150). By the later twelfth century this area had been sealed beneath gravel and limestone surfaces, SY2.

Ditch system 6 (LSD6)

This system comprised two short lengths of recut ditch filling the gap between the western boundary, 7 and domestic enclosure ditch, 8 (Figs 4.9 and 6.2). The southern ditch, 6a was the earliest and comprised two or three lengths of ditch separated by openings. It abutted the corner of the main enclosure ditch, 8.

The later ditch, 6, lay to the north on a slightly different alignment (see Fig 6.2, 4578). The eastern end had been heavily disturbed by a later oven and pit complex, but a narrower, slot-like cut with a post-pit (4900), up to 0.75m deep, at the eastern end may indicate the provision of a bridged crossing.

The earlier ditch produced 12 sherds of St Neots-type ware suggesting that it was filled before the end of the eleventh century (ph LS3/2, 1000–1100). The northern ditch was probably filled well before the middle of the twelfth century (ph 0, 1100–1150), as the overlying oven and pit group were in use at that time.

Plot 5 (LSE5)

This north-western corner of the northern holding lay adjacent to the mill pond (Fig 4.31). The only early feature was a shallow linear ditch filled with clean orange-brown sandy loam, almost identical to the soil through which it is cut, and predating ditch 8. To the east further ditches with similarly clean fills pre-dated the construction of the domestic range and the hall, and it is suggested that they formed an intermediate boundary that was set out but was then abandoned and backfilled to permit the construction of the original buildings and the semi-defensive enclosing ditch, 8.

Plot 6 (LSE6), the domestic plot

This plot contained the timber buildings of the northern holding (Figs 4.31 and 4.9). The open area to the north of the buildings and adjacent to the mill leats was devoid of features.

As noted above with respect to plot 5, lengths of ditch which pre-dated the hall, T29, and domestic ranges, T30 (Fig 4.9, D), had been filled with orange-brown sandy loam containing some clean gravel. They appear to have been part of an intermediate boundary ditch that was set out, but not fully excavated, before it was backfilled to permit the construction of the buildings.

Ditch system 9 (LSD9)

The northern end of this ditch cut the fills of the earliest mill leat, M27, making it broadly contemporary with the second and final mills, M26 and M25. It formed the northernmost part of the intermittent linear boundary flanking the eastern side of the western plots (Figs 4.31 and 4.9)

To the north the ditch cut the western side of a large, shallow pit (Fig 4.9, 6734), up to 0.35m deep. The pit fill

comprised grey clayey loam and gritty sand containing charcoal, mottles of burnt (reddened) sand and grey to red fine ashy material, suggesting that it had been at least partially filled with dumped debris from hearths or ovens. The boundary ditch terminated immediately adjacent to the wall of the timber hall, T29, where it was only 0.15m deep.

The pottery from the ditch is dated to the earlier twelfth-century (ph 0, 1100–1150), and at the northern end the final fill of tenacious clays was contemporary with the final filling of the adjacent mill leat. The boundary was subsequently redefined by a stone wall.

Plot 7 (LSE7)

This area lay to the north of the timber hall, T29, and south of the mill leats (Fig 4.31), where at least the final leat had a bridged crossing providing access to the river. No metalled surfacing or features lay within this area.

Ditch system 10 (LSD10), the western frontage

This boundary lay between the central courtyard of the northern holding and the access road to the east (Figs 4.31 and 4.9). It was introduced following the creation of the courtyard in the later tenth century (ph LS2, 950–975).

The ditch fully blocked access into the courtyard, but the complex sequence of recutting suggests that there had been access points that had been relocated at each refurbishment of the ditch. The earliest ditch only survived to the north, immediately south of the hall, T29. This length was later abandoned, leaving a 6.0m-wide opening between the ditch and the hall, T29. At the new ditch terminal, there was a pair of pits in the base of the later ditch. These may have held deeply-founded posts, perhaps at one stage forming a gated entrance at the south-eastern corner of the courtyard. An intact dog skull, without mandible, lay within the fill of the northern pit, possibly deliberately placed here as a protective deposit. A later shallower recut ran up to the wall of the timber hall, T29. To the south, a shallow slot, up to 0.30m wide by 0.10m deep, partially surviving along the eastern edge of the later ditch may have held a timber fence. At the southernmost end of the ditch the upper fill of the final cut was a mixed deposit of grey loam with charcoal flecks and small pieces of burnt (reddened) clay, similar to the final fills in the ditches to the south.

The pottery assemblage of St Neots-type ware and some Stamford ware suggests that the ditch was largely filled by the end of the eleventh century (ph LS3/2, 1000–1100). However, small pottery groups from both the northernmost end and from the burnt debris at the southern end are dated to the earlier twelfth century (ph 0, 1100–1150), shortly before the construction of the overlying hall, S18.

The access road (LSE 8)

The approach to the hall, T29, between ditch systems 10 and 18, had a metalled surfaced, 80mm thick, of compact

gravel and small pieces of heavily worn limestone, typically between 30–60mm in diameter (Figs 4.31 and 4.9). The underlying soil horizon was generally clean and undisturbed and survived here to its greatest thickness, suggesting that this major point of access must have been surfaced from the earliest phase of occupation. The surface survived for a length of 19.0m and was up to 5.5m wide. To the north a narrow 2.0m wide tongue led directly to the southern door of the timber hall, T29.

To the south, an isolated post-pit, 0.80m in diameter by 0.43m deep, set centrally between the ends of the transverse boundary ditches 18 and 8, marked the formal entrance to the domestic enclosure and was perhaps part of a timber gateway.

Over the road surface there was a layer, up to 50mm thick, of red-brown sand with some pebbles and small pieces of limestone. The clean red-brown sand matrix, similar to the pre-late Saxon soil horizon, suggests that this was a dumped deposit perhaps forming a levelling layer beneath a later road surface.

Plot 13 (LSE13), the northern central yard

The trackway from the east entered the northern part of the central yard at the south-east corner, while the access to the timber building complex was diametrically opposite at the north-west corner (Fig 4.31). While a road surface did survive to the north, the area of plot 13 had been disturbed by later medieval activity.

Ditch system 19 (LSD19)

This boundary separated the plot to the east of the early buildings from the watermill complex (Figs 4.31 and 4.9).

The earliest ditch (Fig 4.9, 6788), 2.00m wide by 0.70m deep, cut the fills of the early mill leat, M27, indicating that the boundary was only introduced following the demise of the original watermill. A pit rich in environmental remains was cut into the fills of the original ditch, indicating the deliberate burying of domestic rubbish in the soft ditch fills. The ditch system was recut, with the introduction of a southward return arm (6590). The new ditch was up to 3.50m wide and up to 0.80m deep, and was recut at least once. A good pottery group indicates that it was filled during the earlier twelfth century (ph 0, 1100–1150).

Plot 9 (LSE9)

Much of the enclosed area to the east of the late Saxon buildings had been disturbed by later medieval activity, and only narrow strips alongside the three boundary ditches were stripped to late Saxon levels (Fig 4.31).

A pair of parallel linear slots (Fig 4.9, 7192 and 7193), set 3.00m apart, lay immediately south-east of the hall. They were up to 2.80m long, 0.40–0.60m wide and 0.25m deep, and there were some nearby postholes. They may

have been the wall-trenches and postholes of a small timber structure. To the north, east of the ancillary mill building, T35, there were several small pits or postholes (G7019).

Ditch system 18 (LSD18), the eastern frontage

This ditch system flanked the approach to the hall and also bounded the southern and western side of the plot to the east of the buildings (Figs 4.31, 4.36 and 4.9).

Initially, a linear ditch system formed part of the southern boundary to the domestic plot, and if there was a contemporary ditch flanking the approach to the hall it had been removed by the later ditches. The original boundary comprised two broad but relatively shallow ditches flanking a central entrance. The western ditch (Fig 4.9, 6486) was 2.90m wide by 0.55m deep, becoming narrower and shallower at either end. The homogeneous ditch fill contained much animal bone and a large pottery assemblage, 218 sherds, of St Neots-type ware of later tenth century date (Ph LS2, 950–975), indicating that the ditch system was redeveloped when the courtyard arrangement of the domestic buildings was introduced.

The eastern ditch (Fig 4.36, 79), was of similar dimensions, and had a shallow recut along the northern side. The fill of the subsidence hollow, dated to earlier twelfth century (ph 0, 1100–1150), contained much burnt debris, charcoal, burnt clay and heat reddened limestone, and similar material occurred beyond the ditch as a surface layer. It was all dumped debris from an adjacent malt oven (393).

Within the 6.40m wide entrance there was a narrow linear slot, 3.80m long, 0.20m wide by 0.08m deep, containing three postholes, 0.10–0.15m deep, which probably held the uprights of a timber gateway. A scatter of other postholes to the west might have held a fence between the gateway and the ditch terminal.

At the end of the tenth century the original system was replaced by an L-shaped ditch, up to 0.75m deep, which also flanked the approach to the hall (Figs 4.31; 4.9, 6544 and 4.36, 149). It was recut at least twice and the final recut ran down the centre of the system. The easternmost end was only partially excavated, but for the final 7.0m the ditch comprised successive, slot-like cuts 0.60–0.85m wide and 0.30m deep, perhaps suggesting that there was a new entrance in the same location as its predecessor. The fill of the later southern cut contained burnt debris similar to that over the earlier ditch to the north-east and this presumably also came from the nearby oven.

The secondary and final fills, particularly near the hall, contained much animal bone and a large pottery assemblage dated to the earlier twelfth century (ph 0, 1100–1150). The subsidence hollow above this, of the same general date, contained much large limestone rubble and mortar, probably discarded construction debris from the building of the new stone hall on the opposite side of the approach road.

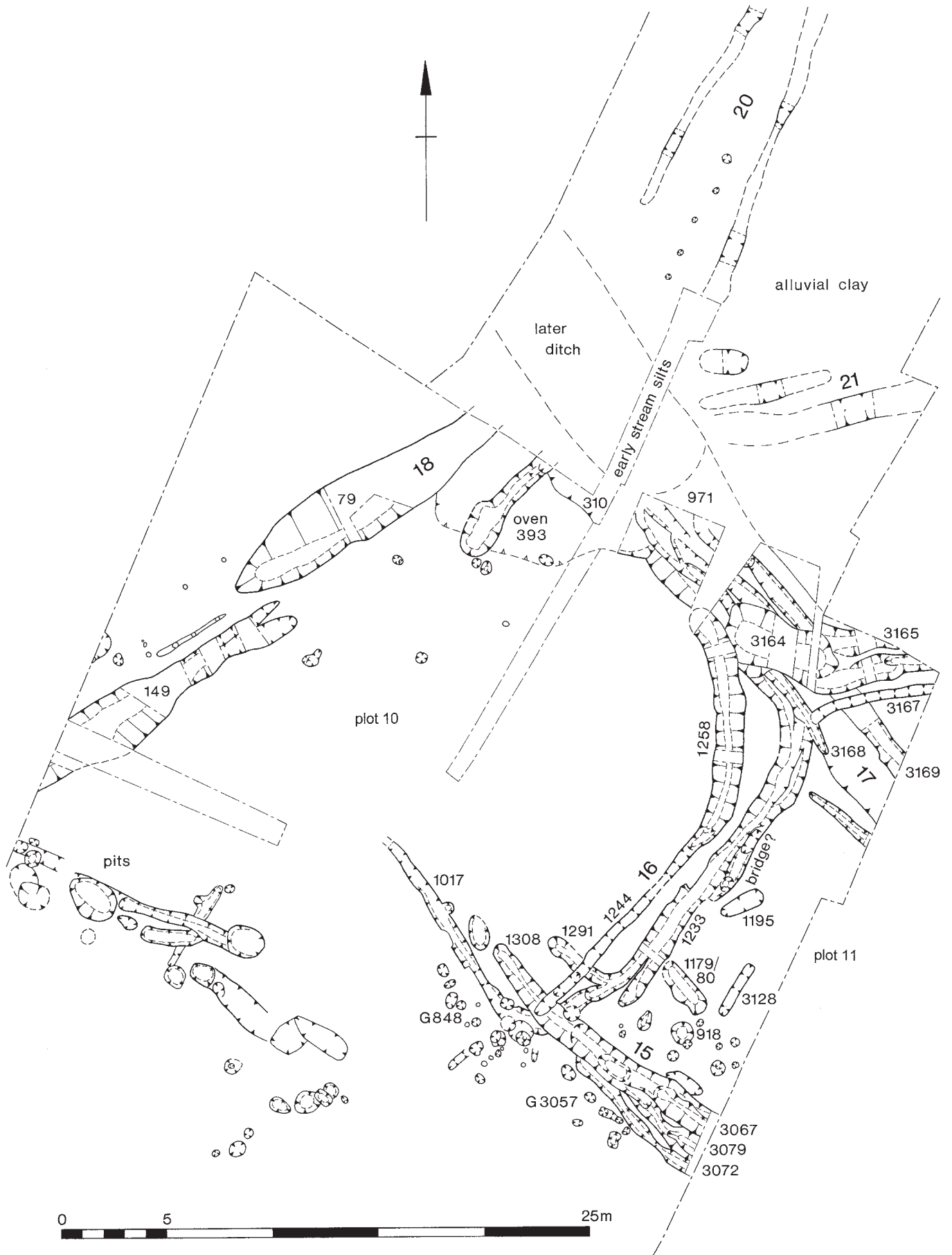


Fig 4.36: The northern holding and the eastern enclosures, plots 10 and 11, and ditch systems 15–18 and 20–21

Plot 10: the central yard (LSE 10)

Initially this area was part of the half-acre open central yard, with the eastern enclosures impinging onto the idealised rectangular plan form (Fig 4.36). There was a sparse scatter of undated small pits or postholes, but there were no major features in this area until it was partly cut off from the yard in the earlier twelfth century, when a linear slot, probably holding a timber fence (1017), was extended northward from the boundary ditches to the south. At this time the malt oven was functioning in the northern corner of the plot.

A linear pit group to the south-west, forming a further encroachment onto the central yard, appeared in the later twelfth century (ph 1), when the area was taken into the extended domestic enclosure of the medieval manor house.

The ditches and plots of the eastern enclosures*The eastern frontage: ditch system 15 (LSD15)*

The earliest ditches (Fig 4.36, 3079 and 3072) were partly removed by a recut (1308) that extended further northward. This length had a distinctive secondary fill containing mottles or blocks of distinct soil types, suggesting that it was deliberately infilled in the earlier twelfth century. Later recuts, terminated further to the south-east.

Alongside the ditch system there was a group of shallow pits or postholes (G3057), which may have formed a short length of fence either flanking the ditch or blocking an opening following the final retreat of the ditch terminal. They may have been contemporary with a further group of postholes to the north (G848). The secondary fills of the latest recut produced a large assemblage of earlier twelfth-century date, but including some later material (ph 1, 1150–1225).

Ditch system 16 (LSD16)

The south-easternmost of the two ditch systems was the earlier (Fig 4.36, 1233). At the mid-point the narrowest length was flanked by a flat-bottomed slot with terminal postholes, possibly indicating the provision of a timber bridge (Fig 4.29c). To the north successive ditches turned westward and ran alongside the northern boundary, 17, cutting the earlier phases of that system. At the southern end of the boundary there was a complex series of ditch terminals, which progressively retreated to the north. The earliest ditch had met the south-eastern end of a linear slot (1017), 0.80m wide by 0.40m deep, with a narrow basal width of 0.30m, forming a partial, probably fenced, boundary to enclosure 10 to the north.

The entire boundary was relocated to the west, and the new system had two distinct components. The northern half was a broader and deeper ditch (1258), 1.40m wide by up to 0.50m deep. The southern half was a narrow, steep-sided and flat-bottomed slot (1244), 0.50–0.70m wide by

0.20–0.35m deep, with the fill containing scattered pieces of limestone. It had probably held a timber fence. At the southern end there was a group of postholes and post-pits (G848), some of which contained limestone packing set vertically against the cut sides, while flat-laid or partially disordered limestone also indicates that some had been carefully backfilled.

The fills of the earlier ditches produced good groups of earlier twelfth-century pottery (ph 0, 1100–1150), with a small amount of later pottery (ph 1, 1150–1225) from the final fills. The small quantity of pottery from the post-pits, G848, is dated to the earlier to later twelfth century (ph 0 or 1).

Ditch system 17 (LSD17)

There was a complex boundary system to the north-east alongside the northern stream channel.

The earliest features were two parallel ditches (Fig 4.36, 3168 and 3169), filled with gritty, sandy silts with a high pebble content. The next phase of ditches were on a different alignment (3165 and 3167) and included a large sub-rectangular pit (3164), 5.50m long by 2.70m wide and 0.60m deep. These features had streaked and mottled fills of clayey and sandy silts with moderate pebble inclusions, and contained a small assemblage of St Neots type ware, suggesting a tenth to eleventh century date (ph LS2–LS3/2).

The early ditches were sealed by a layer, up to 0.50m thick, of mixed silty and sandy clays with some pebbles, deposited during the early twelfth-century episode of flooding that led to the demise of the watermills. A boundary and drainage system was quickly re-established by the digging of a broad shallow ditch (971), up to 3.50m wide by 0.90m deep. The primary fill comprised grey clayey loam mottled with brown to greenish-brown sandy clay, indicating that the area was still flooding at intervals. The secondary fill was a similar grey clayey loam but it contained substantial quantities of burnt (reddened) sand, charcoal flecks and pieces and scattered limestone with some burnt pieces and much animal bone and pottery dated to the early twelfth century (ph 0, 1100–1150). A particular concentration of burnt debris at the northern end, including pieces of limestone with reddened edges and small pieces of fired clay may have come from the malt oven to the north (393). The final fills of the ditch and a broader hollow beyond produced a large assemblage dated to the later twelfth century (ph 1, 1150–1225).

Plot 11 (LSE 11)

Only a 5.0–6.0m wide strip at the north-western end was excavated (Fig 4.36). To the south-west there was a scatter of ten postholes and post-pits. The deeper examples, at 1.00m diameter by 0.60m deep, frequently contained limestone, often steeply pitched, derived from displaced packing stones. They may have formed the southern side

of an enclosure surrounding a small group of pits. A bowl-shaped pit (918), 1.10m diameter by 0.20m deep, had blackened charcoal-flecked sand against the sides and a fill of tenacious yellow-green clay had its surface fire-hardened and blackened, forming the base of a small hearth or oven. An adjacent similar pit (1179) had been largely removed by an elongated pit (1180), 2.60m long, 0.95m wide and 0.30m deep. A second elongated pit (1195) lay 4.0m to the north-east, and to the south-east there was a linear slot (3128). The postholes produced a total of 38 sherds of pottery dated to the earlier twelfth century date (ph 0, 1100–1150), while the pits produced some earlier and later twelfth century groups (ph 0–1).

Ditch systems east of the northern stream

The area to the north-east of the northern stream channel was the lowest lying area within the settlement, and is largely an unknown quantity as only a small area was partially investigated (Fig 4.36). There was no evidence for any tenth and eleventh century use, although this could have been concealed by twelfth-century alluvial clays which covered the entire area and were not excavated. Ditch systems 20 and 21 were cut into the accumulated alluvial clays in the later twelfth century (ph 1).

Ditch system 20 (LSD20)

A pair of roughly parallel ditches, up to 0.80m wide by 0.25m deep and filled with grey clay, produced a small pottery assemblage dated to the later twelfth century (ph 1, 1150–1225). A line of five postholes lay between them. To the north-east (Fig 4.28) three short lengths of ditch or slot may have formed a small, rectangular enclosure or pen, 7.0m wide by at least 9.0m long.

Ditch system 21 (LSD21)

This boundary comprised two parallel ditches, 1.25m wide by 0.30m, and a pit, 0.65m deep (Fig 4.36). They all had clayey fills with some gravel inclusions and produced small pottery groups dating to the later twelfth century (ph 1, 1150–1225). A later continuation of this boundary line to the east was indicated by geophysical survey, which shows a boundary wall.

The western ditch terminals lay at the southern end of a broad boundary/drainage ditch formed along the northern part of the earlier ditch system and stream channel, which survived as a well defined earthwork (Fig 1.6).

Miscellaneous features to the west of the settlement

A number of isolated features were recovered within the quarry area to the west and south-west of the main settlement area, none of which have been well dated.

To the south of the Cotton Brook two postholes and a larger pit or post-pit were seen in the quarry edge section, cut into the soil horizon sealing a mound of Neolithic date and truncated by the ridge and furrow of the medieval field system (Fig 3.1). They may represent some minor structure or activity possibly of early to late Saxon date.

Towards the western end of the prehistoric Long Mound, an area of limestone and ironstone, 9.0m in diameter and up to 0.50m thick, was observed during the removal of the mound by box scrapers (Fig 3.1). There appeared to be a concentration of the larger limestone blocks, up to 0.60m long, around the circumference, perhaps forming a kerb, with adjacent areas exclusively in ironstone, suggesting some care in its formation. A nearby pit, 1.00m in diameter by at least 0.40m deep and containing some limestone within its fills, was probably associated. A few pottery sherds recovered from this area suggest a possible twelfth-century date.

Immediately beyond the stream course along the western side of the settlement the surface of the prehistoric Long Mound had been disturbed, over an area measuring 26m east-west by 20m north-south, by a convoluted complex of sinuous and intersecting features believed to have been animal burrows. They were observed on the surviving surface of the prehistoric mound and continued right through the body of the mound, a depth of 0.50m, into the underlying soil horizon, but rarely penetrated the natural gravel to any depth. The individual 'runs' were typically 0.20–0.30m wide and they occasionally terminated at broader lobes, 1.00–1.25m long by 0.50–0.75m wide, suggesting the presence of chambers. They were filled with sandy loams similar to the pre-late Saxon soil horizon and, although it was not demonstrated in excavation, they were probably in use prior to the accumulation of the alluvial clays which fully sealed this area.

No animal bones were recovered from these features, but bone preservation was generally poor in this area of the site. These runs may indicate the presence of a small rabbit warren located on the slightly higher, drier and softer ground provided by the prehistoric mound, but there was no indication that this was an artificially created warren and rabbit bones are only sparsely represented in the bone assemblage. While it is undated, the warren could not have appeared until the introduction of the rabbit in the later eleventh century and by the mid to later twelfth century the flooding and the consequent accumulation of alluvial clays across this area would have led to its demise.

5 The Medieval Manor (AD 1100–1250)

The transition from the timber halls forming the residence of a minor late Saxon thegn to the stone ranges of a minor medieval manor house, was a period of physical change that took place in the wake of the political changes resulting from the Norman Conquest. However, the rebuilding took place many decades after the conquest and comprised an almost exact replacement of the timber ranges in stone. Whatever the political changes, the economic function of the manor as the centre of a farm estate, including the running of the watermill, appear to have continued unchanged, at least initially.

Change was not far away, however, as over exploitation of the land for arable cultivation may have been responsible for a period of catastrophic flooding and the deposition of alluvial silts that effectively created the medieval floodplain, threatened the very existence of the settlement and brought the use of the watermill to an end. These new circumstances initiated a response in which the processing of arable products, such as producing malt for brewing and perhaps the fulling of cloth became central, cash producing activities and began a physical reorganisation of the settlement as the need for new buildings brought about the creation of a frontage onto the central yard.

The medieval rebuilding (AD 1100–1200)

The early twelfth century saw the appearance of stone buildings on the northern holding, largely as direct replacements for their timber predecessors. The new arrangement, with its two-storey hall, detached kitchen range, dovecote and other ancillary buildings formed a small manor house, and this is consistent with the documentary evidence that in the twelfth century West Cotton was a sub-infeudated manor, the 1/2 hide held by Frumbold de Denford from the Clare/Gloucester fee (Fig 5.1 and Plate 4). The usage of the plots attached to the manor remained much as before although the domestic plot expanded, taking in the formerly separate plot to its south, while through the second half of the century the boundary systems and clusters of pits, often containing dumped debris from hearths and ovens, encroached onto the margins of the central open yards, reducing the extent of this space (Fig 5.2).

The retention of the boundary between the northern and southern holdings suggests that the southern holding also survived as a separate entity. Little can be said about its development, although the usage of the plots continued with the provision of a pen for stock control and a possible drying oven, and it is suggested that the southern holding may have continued to parallel the development of the northern holding as an independent property, and perhaps a second small manor, but held of the Duchy of Lancaster fee.

Through the first half of the twelfth century there was a dramatic change in the topographical setting of the settlement, which is fully described in Chapter 6. A period of catastrophic flooding carried down quantities of silts and deposited these across the valley floor. It has been argued by Mark Robinson that this was most probably a direct consequence of over-exploitation of arable cultivation on the valley sides and, if so, the process had led to disastrous soil erosion within 150 years of the commencement of the open field system.

With the rising ground levels around the settlement, as the alluvial silts accumulated year by year, the watermill system became inoperable and had been abandoned before 1150. An initial attempt to contain any flooding of the settlement by the provision of drainage ditches along the former mill leats failed, and by the middle of the century a flood embankment had been thrown up around the settlement (Fig 5.3). The stream carrying the water that had formerly supplied the mills ran beyond the bank at a significantly higher level than the former mill leats. A further consequence was that the adjacent river channel also silted, and had probably become largely redundant by the end of the twelfth century, although this event cannot be directly dated.

The redevelopment of the northern holding

The introduction of stone buildings on the northern holding was a progressive, rather than a wholesale, replacement of the late Saxon timber buildings, so that occupation would have continued uninterrupted, if inconvenienced, while building works were in progress. The pottery dating is too imprecise to allow the exact sequence of rebuilding to be defined, and the description follows a logical but not necessarily the original sequence.

The construction of a new hall, set across the formerly

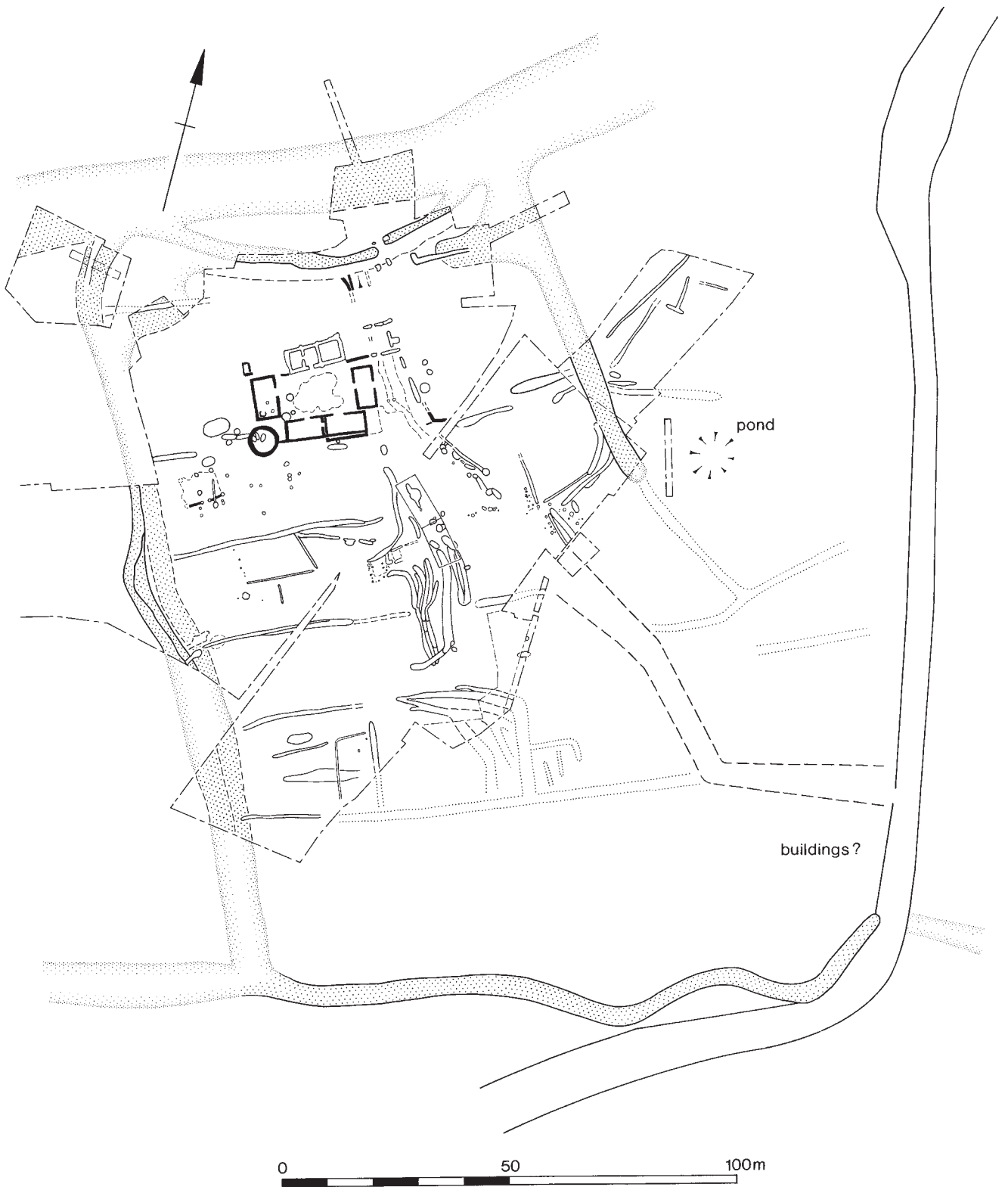


Fig 5.1: The medieval settlement and manor, 1100–1250

open eastern end of the courtyard, may have been the first stage of rebuilding, as it formed the focus of the manor and did not directly replace a preceding timber building (Fig 5.2). The unique presence of scaffolding posts and deeply set, pitched-stone foundations indicate that it stood higher than the other contemporary buildings, so it probably had an upper storey. A remnant of wall to the north may have supported an external stairway. In the hall, the hearth was set against the wall, but the lack of any stone surround indicates that it was probably provided with a smoke hood,

rather than being a full fireplace with a chimney. The road in front of the hall was metalled with gravel and later limestone (Fig 5.4). A pair of postholes cutting the upper metalled surface indicates the provision of a timber gateway in line with the southern end of the hall (Fig 5.3).

A new southern range may have been a closely contemporary construction. The western wall of this building directly overlay the eastern wall of an earlier timber building, suggesting that the timber range may have been retained as an abutting extension. Limestone metalling

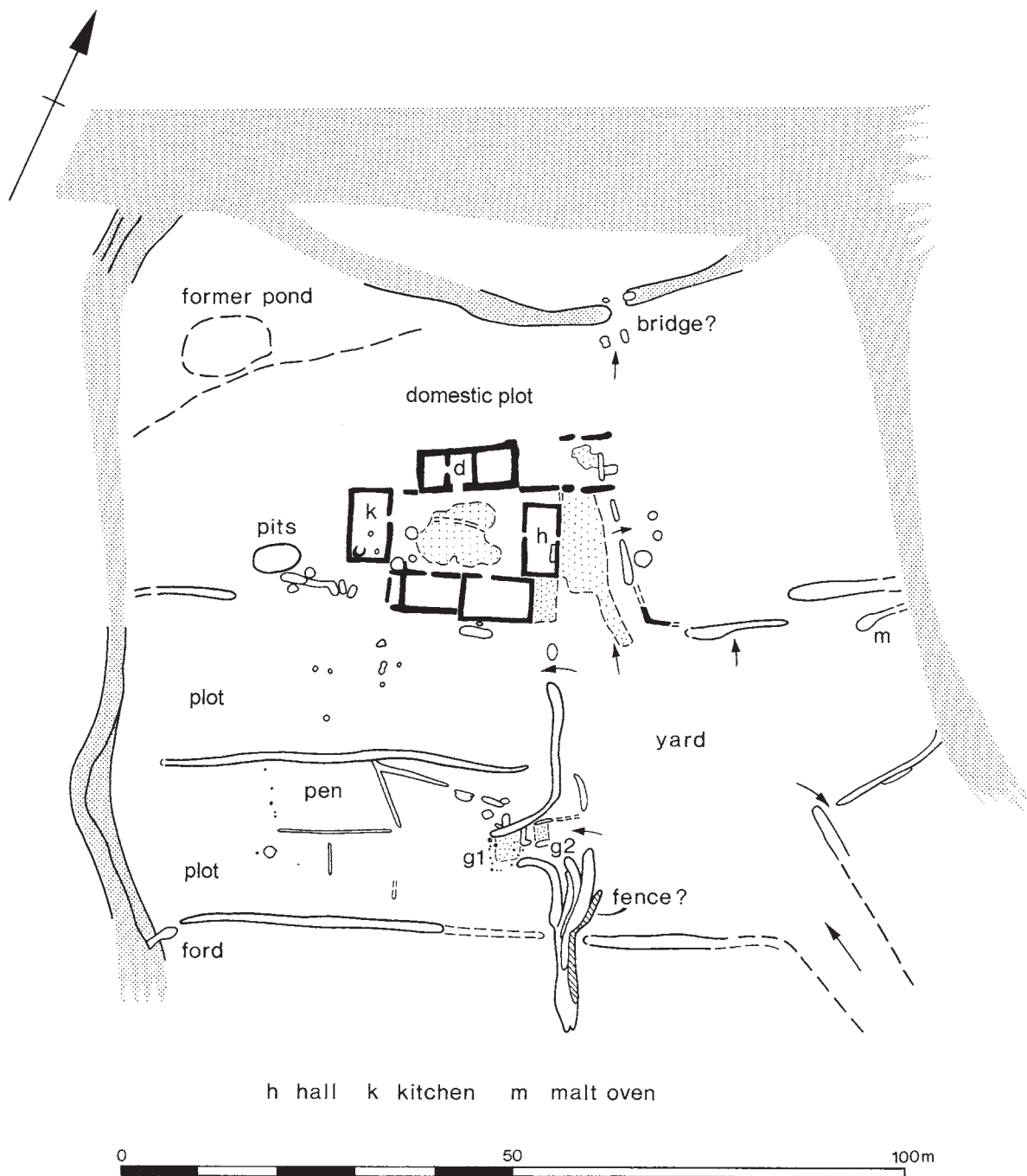


Fig 5.2: The manor house, early twelfth century

between the ends of the southern range and the hall suggests the provision of a small lean-to structure. The plot boundary ditch to the south of the new range was also backfilled, and the removal of this boundary suggests that the formerly separate plot to the south was taken into an enlarged domestic plot.

The detached timber range at the western end of the courtyard was directly replaced by a stone-built kitchen/bakehouse, with the southern bay containing a circular corner oven and successive open hearths.

The Saxon timber hall was probably demolished as soon as the new stone hall was completed, but it was immediately replaced by a new, shorter but substantial timber building of principal-post construction. The provision of a drain and soak away pit suggest that it may have served as a byre or stable, although if it did there must have been a broader doorway, perhaps in the western wall.

The old timber domestic range appears to have been retained, so that the courtyard would have been fully enclosed by a combination of stone and timber buildings.

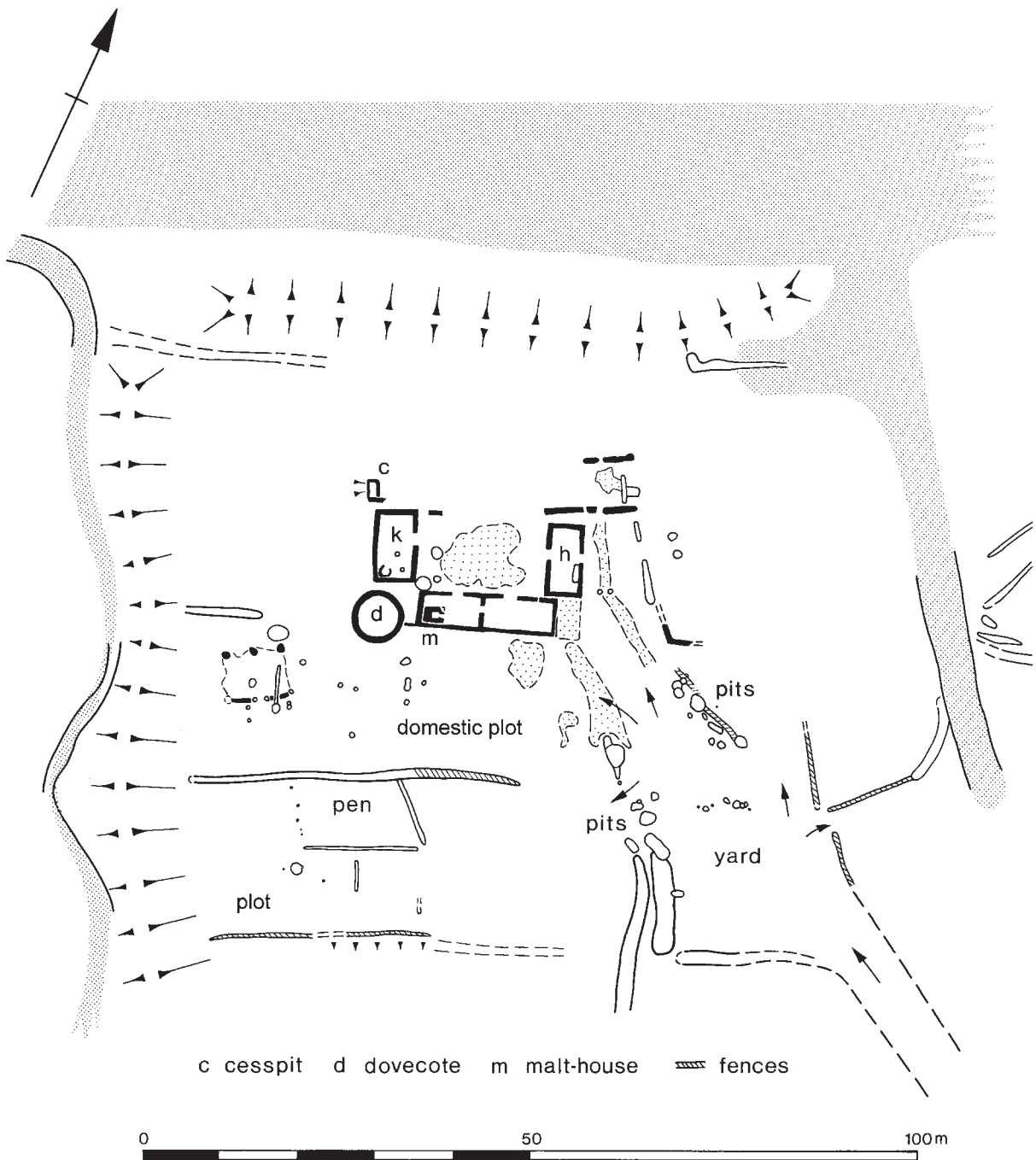


Fig 5.3: The manor house, later twelfth century

To the west of the main buildings a cluster of several pits contained quantities of burnt debris, including fired clay, and at least two pits held *in situ* deposits, indicating their use as external ovens or kilns (Fig 5.2). The carbonised seeds in the fills suggest that they were probably used both as malt ovens and as general drying ovens. At the north-eastern corner of the central yard, well away from the domestic buildings, there was another malt oven, and debris from this was deposited in and over the nearby boundary ditches.

Further redevelopment from the middle of the twelfth century included the demolition of the old timber domestic range. The combined timber and stone southern range was also demolished and replaced by a two-roomed stone range with a malt oven at the western end, the first to be set within a building (Fig 5.3). At least part of the area south of this range was surfaced with gravel and limestone. To the west, between the kitchen and the new malt house, there was a circular dovecote, and a stone-lined cess pit to the north of the kitchen probably appeared at the about the same time. So it is in the later decades of the twelfth century that we see the fully developed stone-built manor house with its buildings set around a courtyard, with the hall dominating the eastern end, and accessible to visitors, while the less savoury aspects of life, the malt house, the dovecote, the kitchen and the cess pit were grouped around

the western end of the courtyard, away from the direct sight of visitors (Fig 5.5).

To the south of the buildings there was a new timber range, of principal-post construction but with the sill beam for the southern wall set on stone footings. The provision of an internal drain indicates that it was used as a byre or stable, either complementing or replacing the similar timber structure built over the site of the late Saxon hall.

At the same time, recut boundary ditches and new pit groups encroached onto the central open yard from both the west and east, making the approach to the hall narrower and appearing more elongated. The group of pits on the western side of the yard contained burnt debris and included one possible oven. They may have replaced the general drying oven function of the earlier pits to the west, but much of the debris might have come from the hall and the new malt house. On the eastern side of the yard there was a group of similar pits, and in one instance joining pottery sherds were recovered from pits on either side of the road. A formal southern end to this enlarged domestic plot may have been provided by a line of pits or post-pits running across the open space (Fig 5.3).

The southern quarter-acre plot to the west was retained through the twelfth century, and was slightly enlarged as the eastern boundary was repeatedly recut to encroach further onto the yard to the east. The initial provision of



Fig 5.4: The manor buildings and the metalled road, looking west

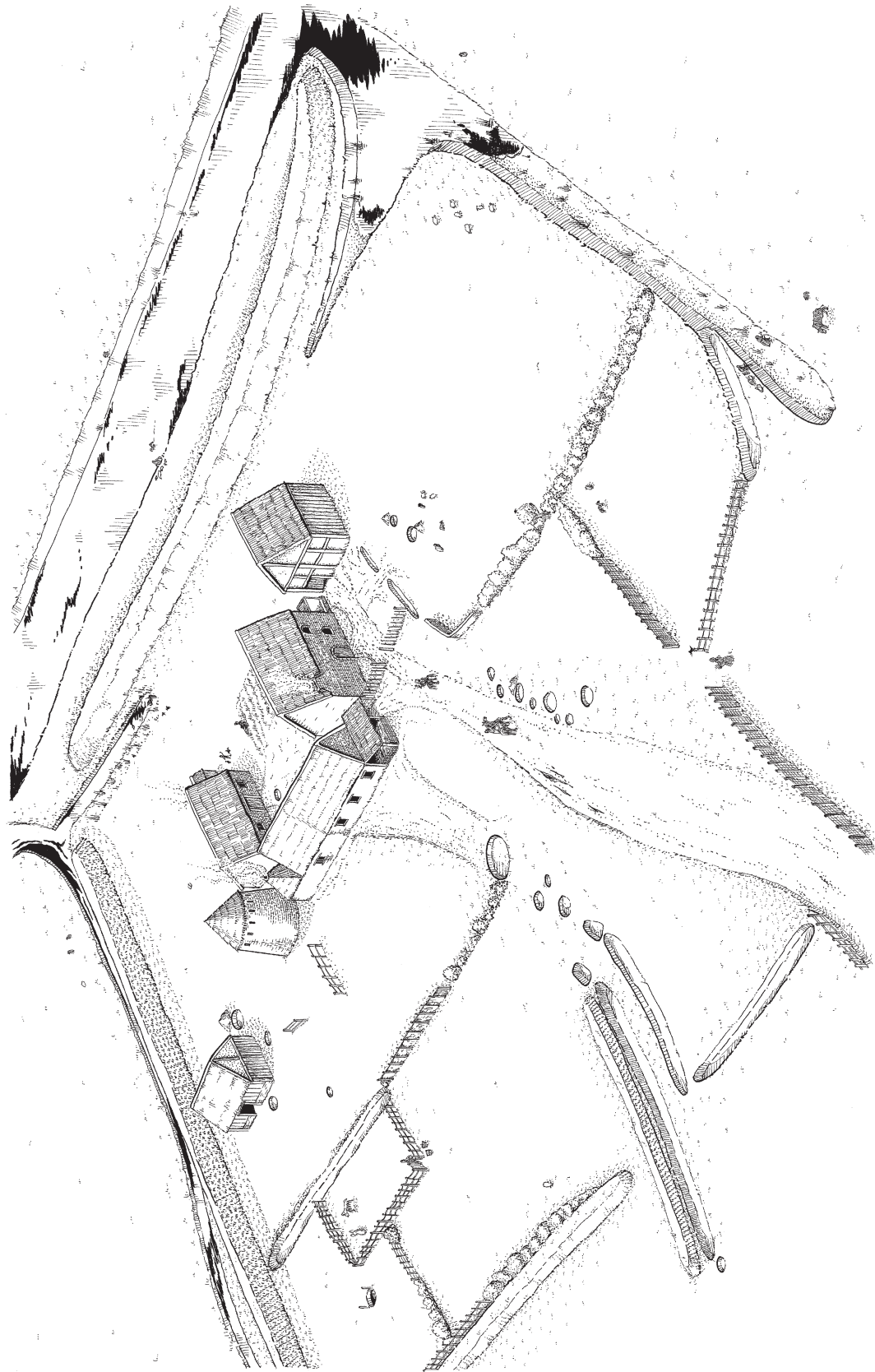


Fig 5.5: The manor house as it may have looked in the later twelfth century (Alex Thompson)

a complex double timber gateway and a second similar arrangement, as well as the internal pens and sub-divisions, indicate that the plot was used to house and manage stock. The later entrances were less complex, perhaps suggesting that such activities were no longer practiced in such close proximity to the manor house.

Although there were changes in organisation, the definition of the plots had still largely been provided by a system of the boundary ditches through the earlier twelfth century. To the north, east of the hall, the substantial late Saxon ditch system was abandoned when the hall was built, with the final ditch fill containing mortar and stone that was probably dumped surplus building material. This ditch was replaced by much shallower ditches and an L-shaped length of wall that marked the approach to the hall.

On the other boundaries many of the latest recuts, and particularly the lengths adjacent to the central yards and the approach to the hall, were steep-sided and slot-like, and may have contained timber fences, although no direct evidence of this was obtained. The boundary between the northern and southern holdings may eventually have been provided with a fence along much of its length. This decline in ditch recutting and the provision of fenced boundaries can be seen as a precursor to the introduction of walled boundaries in the thirteenth century.

The eastern enclosures

As previously, this area may have been either peasant holdings or part of the plot system of the northern manor. There were repeated modifications of the boundary ditches at the northern end, but without any significant encroachment to the west, and many of the later cuts may have held fences. The sequence of ditch recutting has been described in Chapter 4.

The southern holding

Like the northern holding, the recutting of the boundaries at the northern end of the southern holding, showed a progressive encroachment onto the yard to the east. Of the two plots available for excavation, the southern plot contained a substantial pen, formed by an L-shaped post-in-trench structure, and a similarly built sub-division, suggesting that the area was used for stock control. However, a pit within the pen may have been a small drying oven, suggesting an alternative use for at least part of the twelfth century. While there were no stone buildings in this area until the end of the twelfth century, it is suggested that a domestic building complex most probably lay within the unexcavated southern plot, and would be expected to have paralleled the northern plot with timber buildings progressively replaced in stone.

The abandonment of the watermill and the creation of the flood embankment

The abandonment of the watermill was, archaeologically, the most obvious act within a much larger drama that affected the entire settlement during the twelfth century. Given its complex and specialised nature, the evidence relating to the full sequence of the late Saxon and medieval mill system and the subsequent drainage ditches, the flood embankment and the deposition of alluvial silts around the site will be fully described in Chapter 6, and only needs the briefest of summaries here.

It is considered most likely that the latest watermill was still in use when the rebuilding in stone began in the early twelfth century, as there would appear to have been little point in the provision of a new two-storey stone manor house if the threat from flooding and the abandonment of the watermill, and the resultant loss of income from milling, were events that were already in progress.

Immediately following the abandonment of the watermill, the provision of drainage ditches indicates a determination to maintain the manor house once the effort and expenditure of rebuilding in stone was underway. These drainage ditches were inadequate as flooding continued, and the level of the accumulated alluvium would have risen eventually to the ground level within the settlement. The determination to maintain the settlement is vividly illustrated by the provision of over 500 metres of protective floodbank up to six metres wide and approaching one metre high. The bank was formed of the alluvial clays themselves, and so involved no long-distance importation of material, but it obviously required the considerable physical efforts of those dependent on the manor. To the north-east, where there was no bank, a probable former stream channel was partially dug out to form a drainage ditch (Figs 5.3 and 5.5).

Ultimately, the accumulation of alluvial silts beyond the bank raised the ground surface to around 1.0m higher than the ground level within the settlement. Before the end of the century the process was over. The adjacent river channel was redundant or near redundant, and eventually its former course was to be entirely concealed by the general alluvial cover, although exactly when this occurred has not been determined. The digging of new boundaries into the accumulated alluvial silts to the north-east in the later twelfth century suggests that alluvial deposition had ceased or was at least infrequent, with the flood bank apparently providing an adequate protection to the occupied settlement.

The development of the frontage (AD 1200–1250)

During the first half of the thirteenth century the principal buildings of the manor continued in use, but to their south the appearance of new buildings on both the northern and

southern holdings formed a western frontage onto the central yard that significantly changed the appearance of the settlement (Fig 5.6). The economic force behind these developments seems clear. The new buildings included a barn and two specialised processing rooms but no certain domestic rooms. There was therefore an expansion of space and facilities for the storing and processing of the products of arable agriculture. This included barley for malting, although the malt house was also used for drying other

crops, while the processing rooms were perhaps for the fulling of woollen cloth, to close the weave and remove the grease to make it suitable for use or for sale at market. These developments were just the first stage of expansion of these activities, as will be seen when the slightly later development of the plots to the east, further development of the southern holding and the redevelopment of northern manor house are considered. As might be expected, wheat was the predominant cereal in the environmental record.

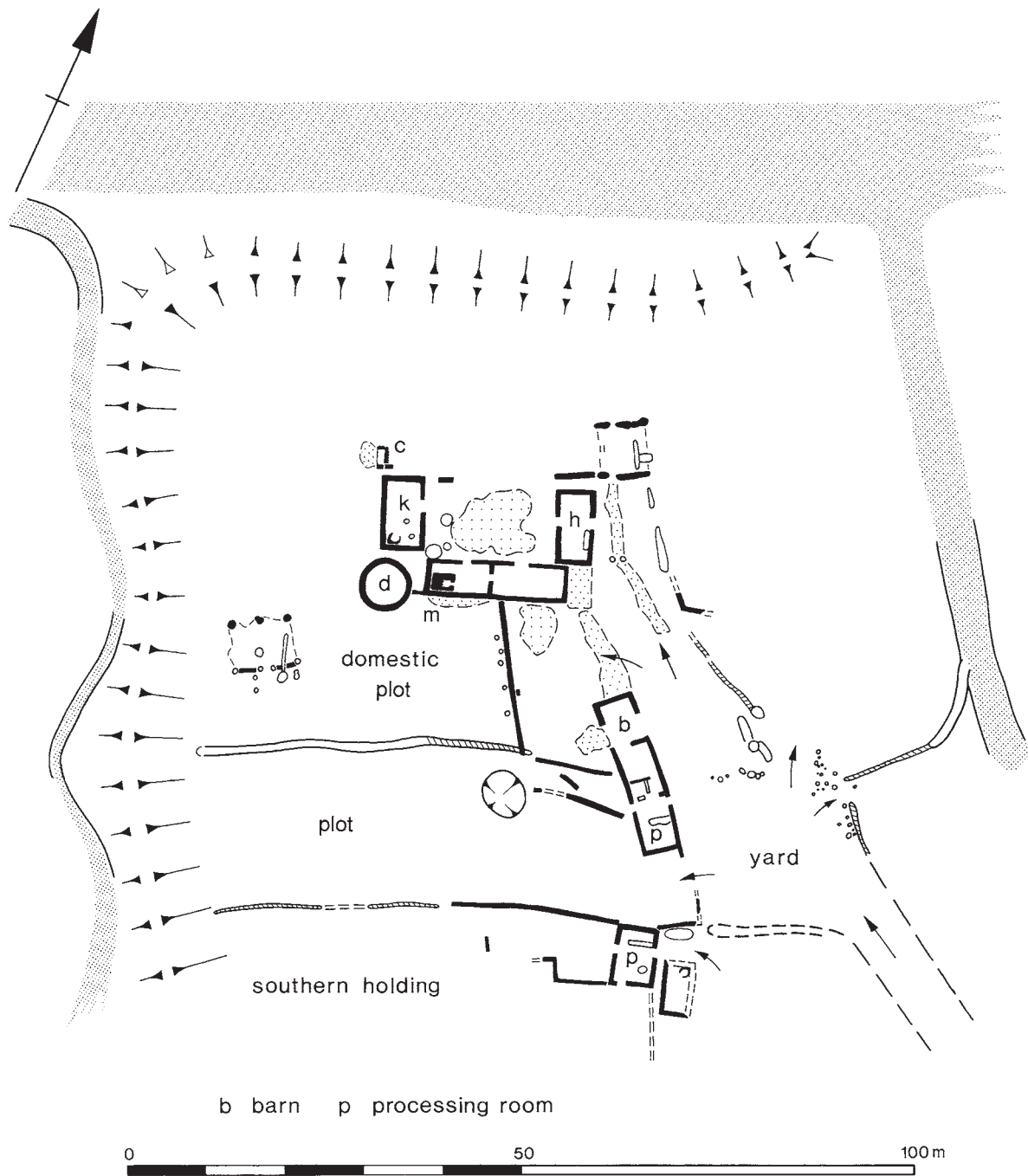


Fig 5.6: The manor house, earlier thirteenth century

A manorial barn

The new range was constructed over an earlier pit group and the backfilled boundary ditches that had previously defined the frontage (Fig 5.6, b). The building was poorly preserved, but comprised two large rooms. There was a barn to the north, 11m long with opposed 3.0m wide doorways. The internal features in the southern room, p, included a stone-lined trough, a hearth and a possible stone-packed, soak-away pit, which indicate that it was used for a specialised processing activity, possibly the fulling of woollen cloth.

Contemporary developments in the plot to the rear of the new frontage are difficult to determine, but the first walled yards and boundaries were probably created at this time.

The boundary ditch separating the southern plot from the domestic area appears to have been filled by the end of the twelfth century, but the new north-south and east-west boundary walls converged on its final eastern terminal, demonstrating continuity of the boundary system, and to the west it was probably still marked by some above ground feature, perhaps a remnant of bank, a hedge or even a fence. A north-south wall defined a yard, at least partially surfaced, between the northern buildings and the new range, while a pair of parallel east-west boundary walls flanked a narrow, metalled approach to the rear of the processing room of the new range (Fig 5.6). As in the later periods, the southern plot was a single open area without any surfacing.

The boundary with the southern holding was also retained. To the east the ditch may have been replaced by a wall, while to the west the final, steep-sided recut may have held a fence flanking a remnant of bank, the only instance where a bank and boundary survived into the thirteenth century. The former eastern continuation of this ditch, partitioning the central yard, may have been infilled at this time, to create a single central yard.

The eastern enclosures

Only the northernmost end was available for excavation, but there was more evidence for the provision of fences supplementing or complementing boundary ditches here than was obtained from any other boundary system. This may have resulted from their provision towards the end of the twelfth century, when the boundaries to the west were being largely removed prior to the development of the buildings forming the new frontage.

The southern holding, tenement B

The appearance of a purpose built processing room with a stone-lined trough, large hearth and a rubble filled soak-away pit, may have occurred at around 1200 AD (Fig 5.6), in parallel with the introduction of the barn and processing room on the northern holding. None of the other buildings were certainly introduced at this time, although a small building to the east may have been a

contemporary bakehouse. Remnants of external walls suggest the provision of a small walled yard to the west of the building.

The material and environmental evidence

Pottery use in the twelfth century was very much a continuation from the previous century. Most of the glazed Stamford ware vessels, including spouted pitchers, came from twelfth-century deposits, as well as all of the large Thetford ware storage jars. This may reflect a growing wealth and a more common use of better quality vessels on the table and the importation of goods in the large storage jars. This is also seen in the recovery of a near complete Oxford ware jug from one of the pits and ovens to the west of the manor house, at a time when glazed jugs are far from common household items.

The St Neots-type ware was effectively directly replaced by the medieval Shelly Coarseware tradition, which comprised a similar range of utilitarian jars for daily domestic use, including the distinctive Top Hat jars used for cooking, but now other vessels forms such as larger bowls, some of which were used for dairying, and plain handled-jugs were becoming more common. Cotswold-type oolitic wares offered more in the way of simple decoration including wavy lines and finger-impressed rims, and appear to have come in from somewhere further away, perhaps Lincolnshire.

By the later twelfth century the products of the local pottery industry based on the villages of Lyveden and Stanion, only some 14km (9 miles) to the north-west of Raunds, were taking over the domestic coarsewares, with a range of jars and bowls, sometimes with simple wavy line decoration and finger-impressed rims, and also including some unglazed jugs and a few larger storage jars strengthened with thumb-impressed, applied strips running down the outside.

The finds assemblage associated with the manor includes a number of items common through the twelfth century and continuing into the thirteenth century, but rare or absent within the later tenements. For instance, all three gilded buckle plates (Fig 11.3), the four finger rings and three of the four earrings are associated with the twelfth century manor, and presumably reflect its greater status and wealth in comparison to the later tenements, both in the range and the quality of these quite basic items of dress and jewellery. In addition, the large quantity of finds from the yards of tenement E, which overlay the site of the manor house, must include residual material from the manor and the full assemblage did contain six of the nine brooches from the site, including the two most ornate examples, and four of the six tweezers.

In fact, while the finds do appear to denote that the twelfth-century manor was more affluent and did have higher social pretensions than the medieval tenements,

such items as gilded buckle plates are only one short step above the basic level and support the idea that West Cotton lay at the bottom of the manorial ladder.

As a further signifier of status, there are two bone gaming pieces (see Fig 11.9), one of which came from the floor of the hall and another from a later but nearby deposit. These have been interpreted as simple stylised chess pieces worked from lengths of sheep bone, and the playing of chess would denote the presence of educated residents. However, these pieces are very simple and appear to be homemade, and do not approach the elaborate and highly-decorated pieces, often in antler and made by craftsmen, found on other manorial sites, such as a highly decorated rook from the moated manor house at Tempsford, Bedfordshire (Maull and Chapman 2005, 78–80, fig 6.3 and plate 15; Chapman 2005). A bone tableman, decorated with ring-and-dot motifs, was recovered from medieval deposits in tenement E, but may be more likely to have been in use in the manor house.

The residents of the manor house also appear to have had riding horses, as a single prick spur and two snaffle bits come from contemporary contexts (Fig 11.29).

The presence of combined spatulae and pointed-end pinbeaters indicates that the two-beam loom was in use in the twelfth century manor house, but the absence of these weaving implements from later deposits might suggest that weaving was not carried out in the medieval tenements. A further item in bone was a near complete musical pipe fashioned on a long slender bone, possibly a deer metatarsal, which may have been a rare example of a reed pipe, the ancestor of the chanter for the Northumbrian pipes and the Scottish bagpipes (see Fig 11.8)

The weeds present in the charred plant assemblages are the most typical of autumn sown crops on lighter calcareous soils, indicating the cultivation of the valley slopes for cereals. However, other weed species indicate that crops from the heavy calcareous claylands were also being processed. A smaller proportion of the weed assemblage is characteristic of soils likely to be found on the gravels of the floodplain. This latter group are typically present in material from the plots of the manor house, which produced some sprouted grain, relatively high numbers of oat and barley, and relatively little rye. In contrast, the ditches flanking the eastern plots produced much rye, hardly any oat, some barley and no sprouted grain. This would suggest that the manor house was receiving some of its crops from the floodplain, and that these crops were probably oats, barley or dredge intended for brewing, whereas the eastern plots, which may have been occupied by peasant houses dependant on the manor, were probably receiving more crops from the valley slopes where rye, rye and bread wheat maslin, and feed or pot barley were grown.

It is of interest, that a similar pattern was seen later in the life of the settlement, when tenement A was also apparently receiving some of its crops from the floodplain, perhaps suggesting that a specific piece of land originally under the control of the manor later ended up under the control of

tenement A. This may have lain on gravels at the margin of the floodplain, and therefore at least largely beyond the area that was subject to alluviation, such as the area of remnant ridge and furrow to the immediate south of West Cotton.

While the arable base of the settlement would have remained largely unchanged, a particular feature of this period was the presence of a number of ovens and associated pits containing dumped debris from the ovens. An earth-cut oven to the east of the manor was evidently a malt oven from the large quantities of charred sprouted barley found in associated features.

However, a demolished oven set in a large pit to the west of the kitchen, and debris from other nearby pits, appear to indicate a broader use for general crop drying. Weed seeds and cereal grain were recovered in roughly equal proportions, but chaff was also common along with large numbers of legume pod fragments, a few seeds of flax and a variety of other material including leaf fragments, thorns and buds, a hazelnut shell, frond fragments of bracken, some possible moss capsules and a large amount of unidentified herbaceous material. The cereal grain component was dominated by free-threshing wheat, but hulled wheat, rye, oat and barley grain were also present, along with hulled wheat, rye and barley chaff.

It can be envisaged that this particular oven was perhaps largely devoted to the general drying of any materials coming in wet from the fields or meadows and requiring drying before going into storage, with this evidently including cereal products, animal fodder and perhaps general herbage and bracken for either strewing across the floors of the manor house or as animal bedding.

The remains showed evidence for the use of a bread wheat and rye mixed together, as a maslin, while rivet wheat and rye maslin was less common. A large quantity of rye chaff from a ditch on the eastern enclosures provided the only evidence for rye being grown as a pure crop, perhaps suggesting that it was associated with dependent peasants rather than the manor house. There was also evidence for oats and barley grown as crops in their own right, and both were perhaps also malted separately. Both two-row and six-row barley were grown although the two-row forms are better suited for brewing, and may have been grown specifically for this purpose.

Oats may also have been grown other than for brewing, perhaps most often as a mixture or dredge, for pottage grain or oatmeal for human consumption, while a sample of charred horse dung indicates that it was also used for animal fodder. Rye straw was also highly valued for thatching and it has been suggested that rivet wheat straw, which has many of the properties of rye straw, might also have been used.

Much of the chaff produced from the winnowing and flailing of the cereals was used as fuel for the drying and malting ovens, rather than going to the animals as fodder, which may suggest that there was enough other winter fodder, probably from nearby hay meadows, together with some permanent pasture. Another reason for the chaff being included in the fuel for the malt ovens may be that malt takes

on the flavour of the fuel used, and wheat straw followed by rye, oats and lastly barley were the preferred fuels.

The animal bone assemblage indicates that sheep were the most common animal, followed by cattle, pigs and horses. Contemporary with the twelfth-century manor house, the kill-off pattern for sheep shows that there was a wide range of ages indicating a mixed economy in which meat, milk and wool were important. However, in comparison to the later medieval period, more animals were killed at a younger age, six months to two years, showing a greater interest in meat production, and many bones bore chopping and cut marks indicative of butchery, showing that they had come from food waste.

The kill-off pattern for the cattle is typical of medieval sites, with most animals kept to maturity and exploited for traction power and milk, with a few animals killed when younger for meat.

The pig bones are dominated by immature and sub-adult animals, with only enough kept to maturity for breeding, as is commonly seen. The aim of pig husbandry was the production of meat and lard, while some young males were probably grown on for sale at market.

A number of horses are also present in the bone assemblage, although when measurable they evidently come from pony-sized animals, no more 14 hands and 2 inches high. Dogs were present in all periods, and were generally of average size, but the only two near complete skulls came from near the late Saxon ranges and the medieval manor, and were both from larger animals of Alsatian size, perhaps suggesting the deliberate burial of the skulls of favourite work or hunting animals.

There was a small number of red deer and roe deer, and the bones are from butchered food refuse, indicating that the restricted privileges of the aristocracy were not always respected. A few pieces of antler, at least some of which were shed, had been utilised for craft manufacturing.

There was a small number of domestic fowl, which were slightly more common in the twelfth century, and while they were presumably exploited for meat, eggs and feathers, they were evidently not among the chief food resources. Goose, probably domestic, and duck were present in similar numbers, and were more common in the twelfth century, when the settlement still stood beside an active river channel as well as having its own small mill pond.

Pigeon/dove was the most common bird, although most of those from the vicinity of the dovecote come from deposits of late thirteenth-century date, probably related to demolition and levelling of the building.

A few bones from birds of prey were also present, with three from red kite and one from a buzzard associated with the manor, while sparrowhawk and kestrel bones came from later medieval deposits. Whether the red kite and the buzzard may have come from birds used for hunting, or were merely local scavengers killed for sport is unknown.

Considering the location of the settlement, fish bones were perhaps surprising scarce, although this may partly reflect a low survival rate. Associated with the twelfth-

century manor there were bones from eel, perhaps coming from an eel trap on the leat of the final watermill, and from a large perch, while the only sea fish were herring, perhaps arriving smoked or salted.

The timber buildings of the medieval manor

The only two timber buildings constructed in the earlier twelfth century possessed individual post-pits, and so were of principal-post construction (Fig 5.7). This transition from pre-Conquest stave-walled construction to post-Conquest principal-post construction has previously been most clearly seen in the sequence of halls and associated buildings at Goltho, Lincolnshire (Beresford 1987).

Building T28

This building overlay the eastern end of the late Saxon timber hall, T29, and appears to have directly replaced it, perhaps utilising timbers from the hall. It was near square in plan, 6.8m long by 7.3m wide, with a floor space nearly 5.75m square giving a floor area of 33sq m (Figs 5.7–5.10).

The northern wall comprised three elongated post-pits, 2.00–2.20m long and 0.65–0.75m deep, cutting at least 0.20m into the natural gravel. Each had a sub-square deepening at the eastern end to hold a principal post, and the western and eastern pits each had a similar deepening at the western end, presumably for a second but slightly smaller post. A narrow slot at the southern edge of the western end of the western pit suggests the provision of both a post and a plank, and differential fills in the western end of the eastern pit also defined two post-pipes, a circular or sub-square post, 350mm in diameter, and an adjacent, rectangular post or plank on the inner edge, 550mm long by up to 30mm thick.

Most of the southern wall comprised a single wall trench. It lay partially over the wall trench of the late Saxon hall, with this perhaps explaining the difference between the two constructions. The wall trench was 4.6m long, and three squared, post-settings were identified within the fills and a fourth, at the disturbed eastern end, may be inferred (Fig 5.9). They were 400–500mm in diameter and each was partially lined with vertically-pitched limestone. The two to the west also had pieces of flat-laid limestone at the base as post-pads. Between the western posts a looser fill appeared to define a shallow central slot, up to 300mm wide by 200mm deep, which may have held a timber sill beam, set at ground level between the principal posts.

The post-pit at the western end of the southern wall was 1.40m long by 1.00m wide and 0.85m deep. The fill of red-brown sand and gravel to the east contrasted with a looser fill containing steeply-pitched slabs of limestone to the west, suggesting that a single post had been set at the western end of the pit. However, the form of the elongated

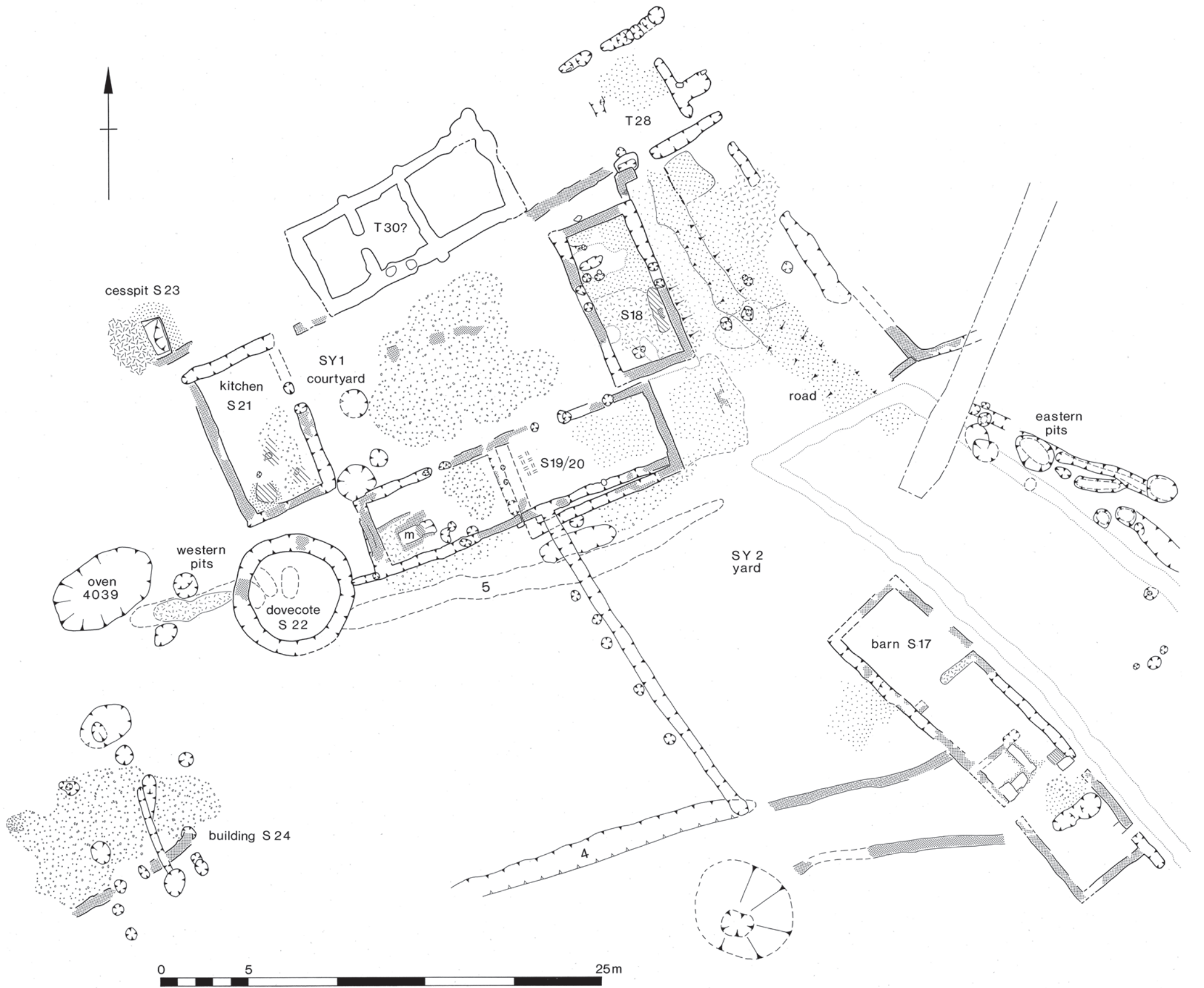


Fig 5.7: The buildings of the twelfth-century manor house

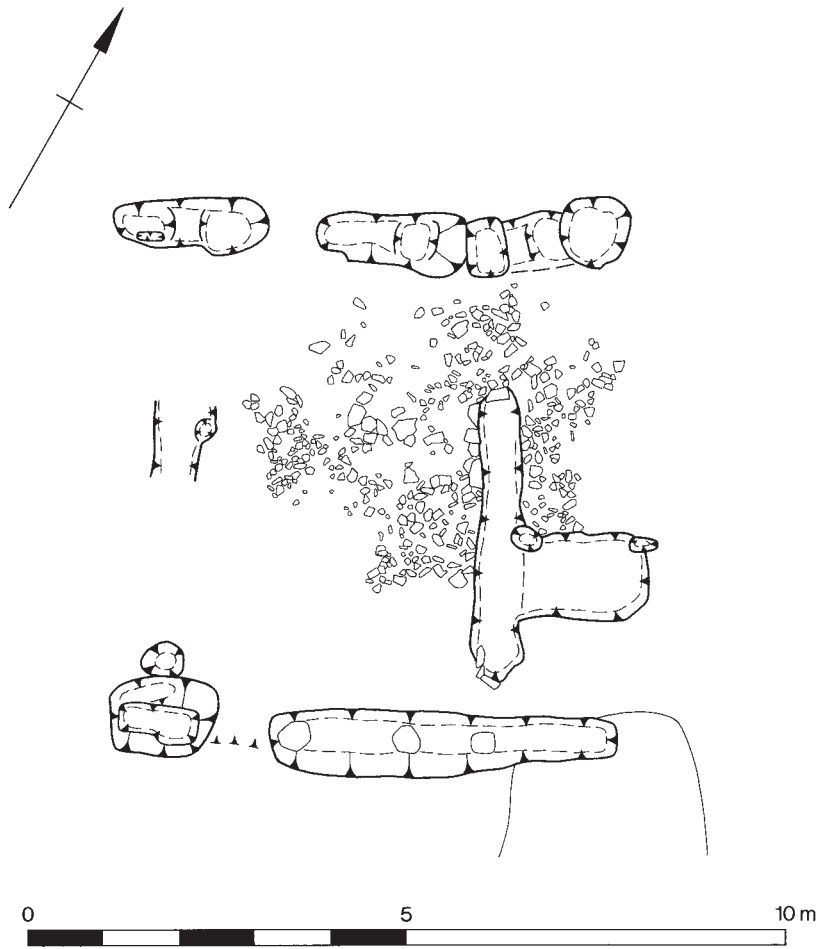


Fig 5.8: The medieval manor, timber building T28

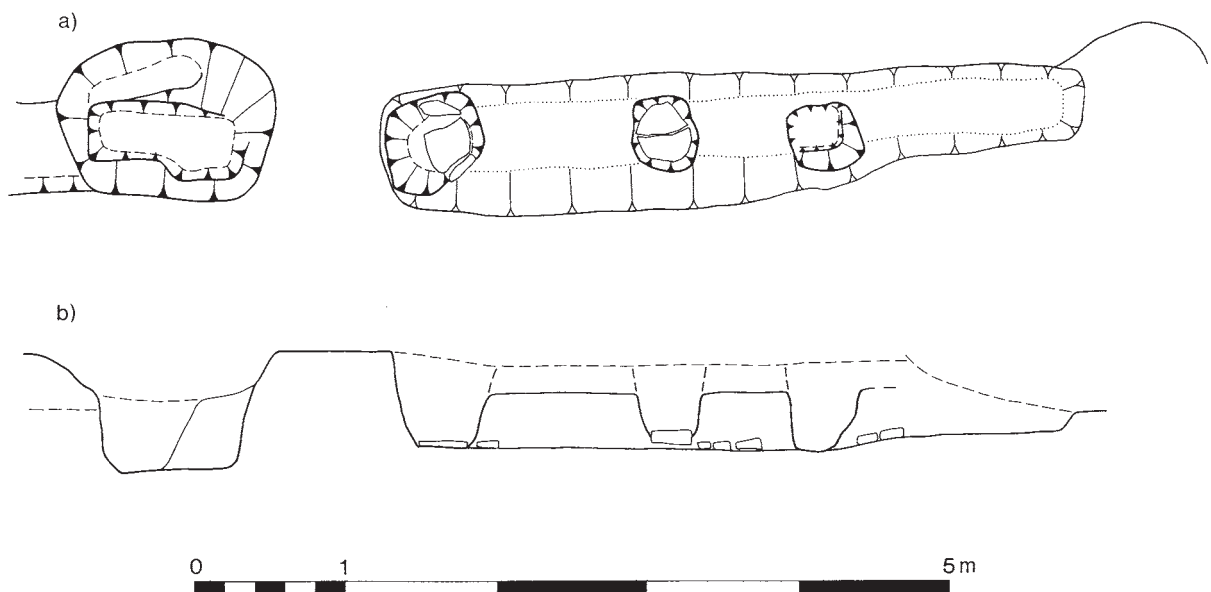


Fig 5.9: Principal post construction, building T28; a) southern wall-trench, b) longitudinal profile of wall-trench

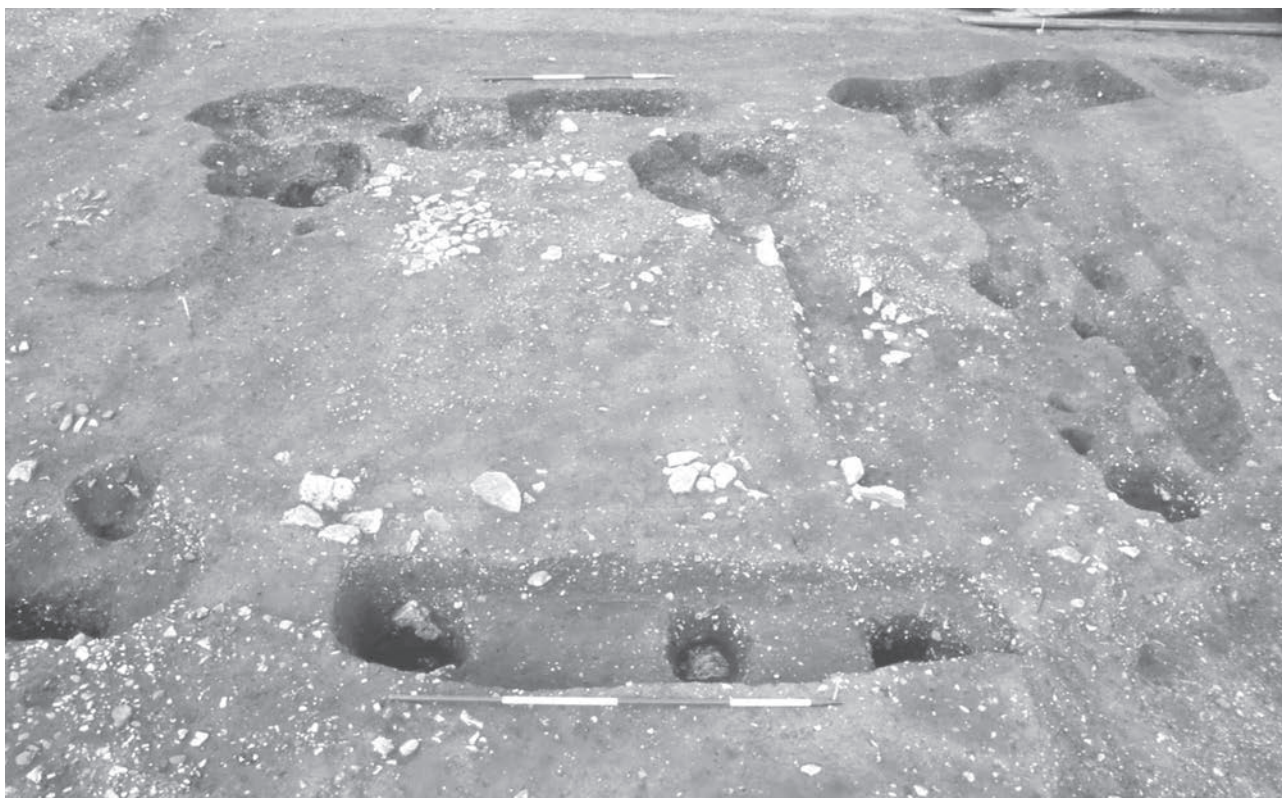


Fig 5.10: Timber building T28, looking north

slot at the base of the cut suggests that originally it may have held two posts.

The form of the northern wall, with its three construction slots, indicates that the basic structure probably comprised three major paired posts, which presumably supported tie beams running north-south, forming a two-bay structure. Within the broader western bay the other posts formed the jambs for doorways in the northern and southern walls, 1.00m and 1.20m wide respectively, which were not quite directly opposed.

The lack of evidence for end walls indicates that these were of a lighter build, probably set in shallow wall-trenches that had been removed by later activity. A short length of shallow trench to the west appears to lie within the probable line of the end wall.

A floor of irregular pieces of flat-laid limestone, often heavily worn, partially survived. In the eastern bay there was a linear slot, 3.95m long, 0.80m wide and 0.10m deep, with a short length of a former stone lining surviving at the northern end of the western side. It was probably a drain that opened into a rectangular pit to the east, 1.70m long by 1.10m wide and 0.20m deep, which was filled with tightly packed pieces of limestone, suggesting that it served as a sump or soak-away. Elongated postholes at either end of the northern side of the pit suggest the presence of either a timber lining or an upstanding timber structure along this side.

The small quantities of pottery from the wall-trenches

and post-pits, none contained more than nine sherds, suggest an earlier twelfth-century construction date (ph 0, 1100–1150). The 58 sherds from the disturbed limestone floor are dated to the later twelfth century (ph 1, 1150–1225).

Building S24

This building was not fully understood during excavation; hence its provisional designation as a stone building (S) on the basis of the stone footings for the southern wall. It lay to the south-west of the main building complex, within an area taken into the enlarged domestic plot (Fig 5.7). The full plan was not recovered, but the building must have been 8.0m long by 7.0m wide; an internal area of 42sq m (Fig 5.11). The post-pit at the east end of the southern wall and the pair of post-pits on the northern wall indicate that it was of principal-post construction. The post-pits were 0.35–0.40m deep, and the two on the northern wall were set 3.70m apart, centre-to-centre. A further two post-pits forming the western wall were not located, probably because they would have been cut into the fills of an earlier boundary ditch.

The southern wall was 0.55–0.60m wide, comprising a single course of large slabs and blocks of flat-laid limestone. It was probably a dwarf wall providing a footing for a timber sill beam. It contained a central doorway

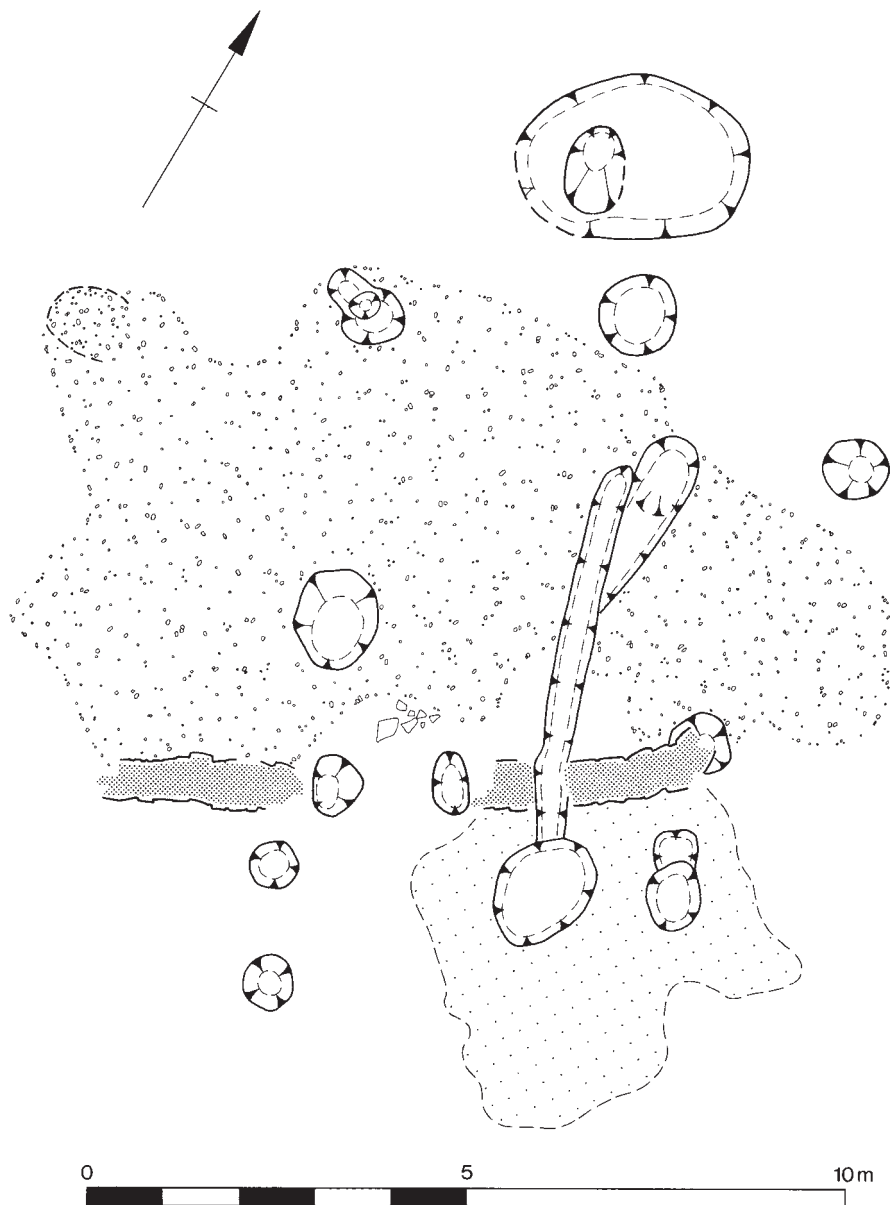


Fig 5.11: The medieval manor, timber building S24

1.30m wide, defined by substantial door jamb post-pits 0.40–0.45m deep (Fig 5.12).

The floor was of gravel with some small pieces of limestone, in a sandy clay matrix. Inside the southern doorway this had been eroded and then patched with larger limestone. Similar gravel surfacing extended beyond the eastern wall, perhaps indicating the presence of a second broader entrance. To the west there was an internal pit, with vertical sides and a flat bottom, 0.65m deep, filled with grey-brown clayey loam with a number of large limestone blocks within the upper 0.4m of the fill. To the east a 0.10m deep, linear drain ran through a gap in the southern wall to

a shallow, 0.22m deep, flat-bottomed pit. As with building T28, the drain suggests that it was used as a byre.

To the south of the building there were a further four small pits, 0.10–0.30m deep. Those to the east were sealed by a roughly square area of metalling comprising disordered pieces of limestone. A further small pit lay to the east of the building while a larger pit, 0.45m deep, to the north was cut into earlier ditch fills. None of the pits contained any distinctive fills or finds to indicate their function or the local presence of any distinctive activity.

The pottery recovered from the various structural features was of later twelfth-century date (ph 1, 1150–1225).



Fig 5.12: Building S24, looking west, showing the western wall and the post-pits holding the timber door surround

The stone buildings of the medieval manor

The twelfth-century stone buildings were not well preserved (Fig 5.7), as they had all been systematically levelled to make way for the thirteenth-century tenements. Only the lowest few courses of walling or the rubble filled, construction/robber trenches survived, along with some floor levels and internal fixtures. The individual buildings are described below, while the general discussion of construction, plan form and usage for the stone buildings appears in Chapter 7, as part of a single discussion of all medieval stone buildings.

The Hall, S18

The hall was 9.55m long by 4.80m wide, with internal dimensions of 8.30 by 3.70m, a ground floor area of 30.7sq m (Fig 5.13). It was the most complex of all the twelfth-century buildings. Uniquely, the mortar-bonded standing walls rested on pitched-stone foundations set in a distinct construction trench, while all of the other medieval stone buildings had no distinct foundation courses. In addition, internal and external lines of stakeholes parallel to the long walls, and sealed beneath floor levels and external surfaces, indicate that scaffolding had been used during its construction. The presence of both the foundations

and the stakeholes are taken as indications that the hall had two storeys.

Scaffold posts

A regular line of five stakeholes, spaced 1.50–1.75m apart, lay 0.85m inside the inner face of the eastern wall, with a line of four stakeholes 0.90–0.95m beyond this wall (Fig 5.13). A much less regular line of stakeholes lay 0.60–1.00m from the western wall. The external areas to the north, west and south had been heavily disturbed by contemporary and later activity, perhaps removing further stakeholes. The stakeholes were typically 0.20–0.40m in diameter and 0.10–0.25m deep, with conical profiles tapering to blunt points, indicating that they were formed by driven stakes. The fills contained mortar and most were tightly packed with small pieces of limestone, suggesting that they were deliberately and carefully backfilled after the stakes had been removed. In two examples, *in situ* pieces of limestone packing defined square stake settings 100mm in diameter. A few examples were more flat-bottomed, suggesting that they may have held posts.

Wall construction

The construction trench for the walls was 0.55–0.65m wide and up to 0.15m deep, with steep sides and a flat

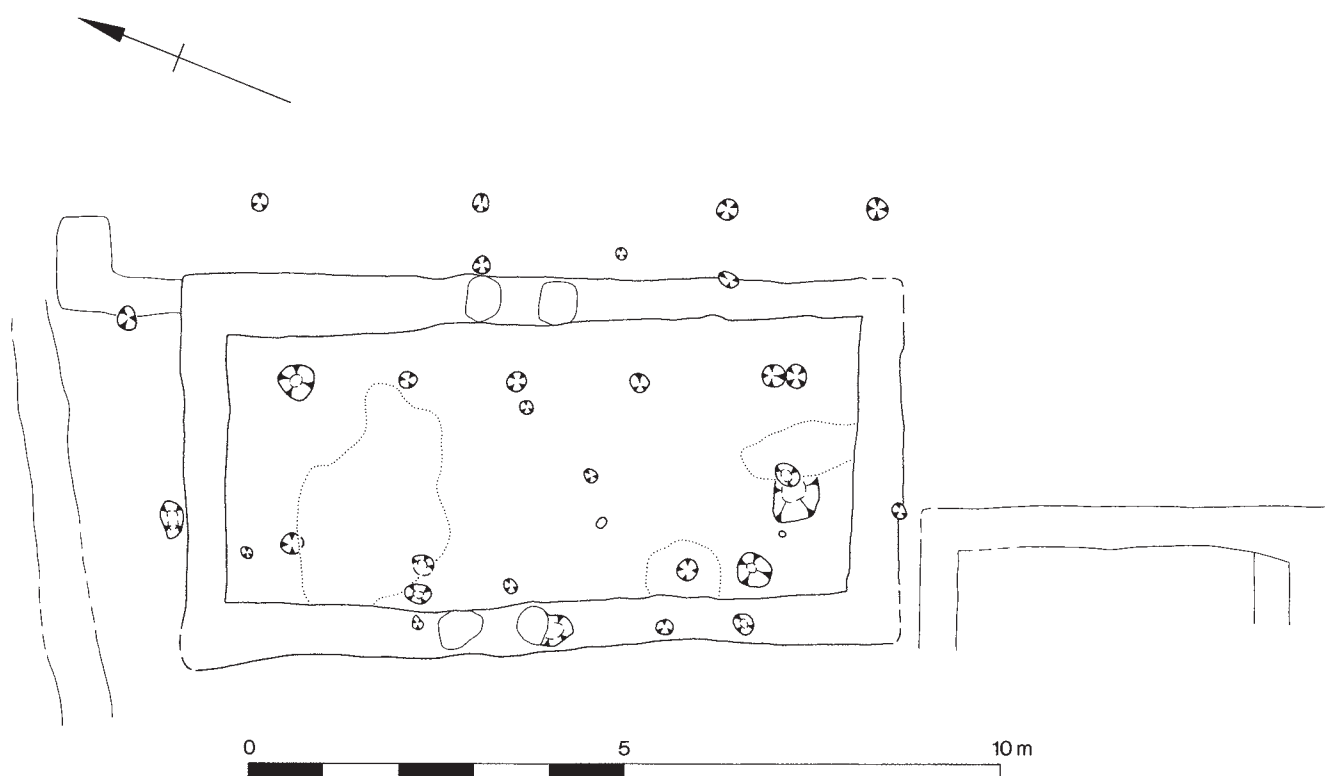


Fig 5.13: The medieval manor; the hall, S18, showing scaffolding postholes

base (Fig 5.14). The foundations comprised inner and outer facings of pitched limestone, set transversely and unmortared, with a central core of smaller limestone rubble either disordered or pitched. A covering layer of mortar formed a flat bed for the standing wall, which had been extensively robbed although at least short lengths survived on all four walls. The best preserved was the southern half of the eastern wall, where both wall faces stood three to five courses high (Fig 5.15). The walls were 0.56–0.60m thick, built in roughly-coursed, flat-laid limestone facings with a core of smaller rubble, all bonded with a yellow sandy mortar. The facing stones were typically only roughly squared, leaving a very uneven wall face, and there were wide joints between the courses.

Opposed doorways lay just north of centre. Originally, they had substantial timber door jamb posts set in deep post-pits (Fig 5.14). Later these were removed and the door surrounds were rebuilt in stone, possibly with less substantial timber jambs (Figs 4.16 and 5.17). The door openings were 0.80–0.85m wide, with square to sub-circular door jamb post-pits 0.25–0.35m deep. The northern post-pits were the deepest and they also contained larger pieces of pitched limestone, probably from displaced packing, perhaps suggesting that both doors had been hung on the northern jambs. Within the doorways the

construction trench was filled with loam mixed with mortar and small pieces of limestone. In the eastern doorway this deposit contained a lead spindle whorl, the only example recovered from the site, and an iron nail. While these may have been random discards, they could be seen as a deliberate protective deposit within the threshold of the main public access to the building, as known from later medieval and post-medieval buildings.

Beyond the eastern doorway a 0.10m deep posthole filled with pitched and flat-lying limestone (a crushed egg shell was found between two of the stones), and set within a shallow linear hollow filled with mortar, may have held a timber screen, but there was no similar feature to the south to indicate that there was a full porch. On the southern side of the doorway a two-course setting of flat-laid pieces of limestone may have formed a low kerb, probably indicating that the approach to the doorway was slightly sunken with respect to the external metalled surface, perhaps as a result of wear and prolonged use.

Floor surfaces

While there were differences in the floor surfaces between the northern and southern ends of the building, as well as a distinct cross-passage, as detailed below, there were



Fig 5.14: The medieval manor; the hall, S18, and the lean-to structure (h=hearth)

certainly no stone partition walls (Fig 5.14). There were also no cut features to indicate the provision on any timber partitions, but these could have been founded on ground laid sills that have left no trace. It is suggested that the differential flooring does imply the probably use of some internal partitions.

Southern chamber

Across the southern chamber a sub-floor comprising large slabs of pitched limestone, 200–400mm long, bedded into a thin spread of loam, mortar and some small pieces of limestone, was probably provided to consolidate the soft fills of an underlying length of ditch. The sub-floor continued further north as a contiguous layer of clean yellow sandy mortar with small pieces of limestone, and ended in line with the northern side of the doorways.

The sub-floor was covered with yellow sandy mortar, from which a bone gaming piece, probably a simple chessman, was recovered. Towards the western doorway, where there was no underlying pitched stone, scattered flat-laid limestone was set into the mortar. A hearth was set against the eastern wall. It comprised a central hearthstone, 620mm long by 40mm thick, set in a rectangular layer of clay, 2.60m long by 0.80m wide. For up to 0.30m around

the hearthstone, the clay had a reddened surface mottled with grey ash and was covered with a spread of fine grey ash. There was no surviving evidence for a kerb or for the presence of a chimney, so it is assumed that no more than a smoke hood had been provided.

A layer of mixed grey sandy loam and yellow sandy mortar overlying the hearth included a linear strip which was hardened and heat reddened on the underside. This material was probably a collapsed length of wall rendering which had been scorched and hardened by the adjacent hearth. It indicates the provision of a mortar or plaster wall rendering adjacent to the hearth, and perhaps within the room as a whole. Along much of the frontage south of the doorway there was an external layer of yellow-brown sandy mortar abutting the lower courses of the wall and extending 0.70–1.00m from the wall, which may have derived from erosion and weathering of external wall rendering.

Other features within the southern half of the room included a deposit of grey silty loam mottled with burnt sand and charcoal flecks, which did not appear to derive from *in situ* burning, and against the western wall there was a short setting of vertically-pitched pieces of limestone set in a shallow slot filled with loam and mortar.

The original hearth and floor was covered by a charcoal-flecked loam and a layer of clean yellow-brown sand.



Fig 5.15: The hall, S18, floors removed, looking east



Fig 5.16 : The hall, S18, showing floors, looking east



Fig 5.17: The medieval manor; the hall, S18; late floors

A remnant of a new floor above this, comprising mixed flat-laid and pitched limestone bedded in sand, probably belonged with the final use of this building (Fig 5.17). There was then an elaborate open hearth, 1.50m long. A kerb, 0.35m deep, of flat-laid limestone blocks with roughly squared facings surrounded a 0.80m long hearth-base. To the south a square setting of small flat-laid limestone was overlain by a layer of heavily burnt clay, and to the north there was a semicircular setting of flat-laid and pitched fragments of a single sandstone hand-querne. The hearth was covered by a layer of grey loam with some reddened soil. A pit, up to 0.25m deep and partially floored and lined with limestone, that abutted the southern wall may have been contemporary with the hearth. The pit fill was a grey sandy loam containing pitched and tumbled limestone, suggesting that it may have served as a small soak-away pit.

Cross-passage

Between the doorways a cross-passage was defined by a 1.00m-wide floor of flat-laid slabs of limestone with some yellow sandy mortar between. Immediately inside the doorways they had worn surfaces, and a roughly semicircular area inside the eastern doorway had been relaid with smaller pieces of flat-laid limestone set in yellow sandy mortar.

Northern chamber

Within the northern chamber there was a further area of floor comprising flat-laid slabs of limestone in a matrix of

yellow sandy mortar, but these were typically larger and more closely set than those between the doorways. To the west a group of postholes surrounding a linear pit may indicate the presence of some form of internal fitting, but this area had been badly disturbed by later activity.

External stairway

To the north of the building a remnant of a roughly built wall, at least 5.40m long and set at an angle to the northern wall of the hall, may have supported a timber stairway giving access to the postulated upper storey (Fig 5.14). No more than two courses of flat-laid limestone survived with a core of smaller rubble in a matrix of stiff clay, with no mortar. This may have been a dwarf wall providing a low footing for a timber stairway. To the east, an L-shaped setting of small pieces of limestone, faced to the west by flat-laid limestone slabs, ran between the two walls. The larger slabs had worn surfaces and were cracked and flaking from exposure to the elements, and may have formed a threshold at the foot of the stairway.

Dating

As the best preserved building, the dating of the hall was crucial to the understanding of the whole manor house complex. A total of 164 sherds from the wall construction and the sub-floor levels indicate a construction date in the first half of the twelfth century (ph 0, 1100–1150), while the 52 sherds from the earlier floor levels included six sherds of Lyveden A ware, suggesting that these floors continued

into the later twelfth century (ph 1, 1150–1225). The later floor level contained 40 Lyveden A sherds, indicating a later twelfth century date. Patchy spreads of burnt debris sealing the levelled eastern wall contained largely twelfth-century pottery but included a few sherds of glazed wares dating to the earlier thirteenth century (ph 2/0, 1225–1250). It is therefore likely that the building was demolished within the second quarter of the thirteenth century (ph 2/0, 1225–1250).

The lean-to

A rectangular area of compact limestone immediately south of the hall, S18, and abutting the eastern end of the southern range, S19, was a hard-standing probably under a lean-to structure set against the end walls of the adjacent buildings (Fig 5.14).

A basal layer of compact stone, comprising flat-lying or gently pitched limestone slabs and small chips of crushed limestone, was set in a matrix of light brown sand. Above this a layer of chips and small pieces of crushed and eroded limestone, 20–150mm diameter, with some larger pieces, formed a compact surface. This extended further to the east, and a number of flat-laid pieces of limestone may have been the badly disturbed remnants of the lowest course of a wall, 0.48m wide, perhaps a dwarf wall for a timber superstructure.

A layer of loam and mortar above this, probably related to demolition and containing the only silver ring recovered from the site, is dated to the earlier thirteenth century (ph 2/0, 1225–1250).

The southern range, S20

The eastern wall of the earlier timber range, T33, directly underlay the western wall of S20, and it is suggested that the timber range was probably retained as a second room (Fig 5.18).

The new stone range was 9.60 long by 5.50m wide, with internal dimensions of 8.20 by 4.50m giving it a floor area of 36.9sq m. The southern and western walls were later levelled, but the eastern and northern walls were at least partially retained when the range was rebuilt, S19.

The eastern wall was 0.50–0.55m wide and survived from one to three courses high (see Fig 5.20). It was built within a shallow construction trench, 0.05–0.10m deep, with the wall founded on a 40–50mm thick bed of mortar. The wall was rubble cored, faced with flat-laid limestone and bonded with a yellow sandy mortar. The surviving remnant of the western wall comprised two more deeply founded courses of flat-laid limestone that appeared to form a partial lining to an adjacent pit, 0.10m deep, which was therefore part of the original construction, although its function is unknown.

There were remnants of a northern wall only to the east and west beyond three post-pits, both containing limestone and mortar, which suggest that there was probably a broad

eastern doorway, 2.0m wide, and a narrower western doorway, 1.5m wide. A shallow construction trench across the eastern doorway contained a remnant of a wall, suggesting that this was probably the original doorway, which was blocked when the building was rebuilt.

To the west a well-defined rectangular setting, 1.40 by 0.90m, of pieces of limestone in a matrix of grey-green loamy clay, edged to the south with vertically pitched pieces of limestone, may have been a threshold abutting the western wall at a further doorway. The surviving limestone floor to the south is dated to the second half of the twelfth century and may be most likely to belong with the rebuilding.

There was little direct dating evidence, but an external layer of mortar abutting the south-eastern corner was dated to the earlier twelfth century (ph 0, 1100–1150), as was further similar material overlying the levelled remnant of the southern wall. However, the pit abutting the western wall contained numerous sherds from a single later twelfth-century vessel (ph 1, 1150–1225), suggesting that the rebuilding occurred during the second half of the twelfth century.

An elongated pit to the south of the building, perhaps used as a sump or soakaway, was probably contemporary with the preceding timber range, T33, but may have been retained as it was only filled in the earlier twelfth century (ph 0, 1100–1150) (Fig 5.7).

The rebuilding of the southern range, S19

The timber building, T33, was levelled and the southern and western walls of the original stone building, S20, were also demolished to allow for the provision of a full range in stone, 18.2m long (Figs 5.19 and 5.20). The details are uncertain, but the construction may have been achieved in two stages as there was a straight joint at the centre of the new southern wall.

The first stage would have comprised the direct replacement of the western timber range, with the new stone walls directly overlying the infilled wall-trenches. The walls had been heavily robbed but a length of the southern wall survived to four courses high, 0.35m. It was founded in a shallow, 0.10m deep, construction trench on a 20–40mm thick bed of mortar with a 0.50m wide, single course foundation of flat-laid limestone. The standing wall, faced with flat-laid limestone and bonded with a sandy mortar, was slightly narrower at 0.45m wide. The western wall had an exceptionally wide foundation course, at 0.60–0.80m, of large limestone slabs, probably due to the presence of a backfilled ditch beneath. The surviving length of standing wall above this was largely in flat-laid limestone, but one course was partly in pitched limestone. In the northern wall, two post-pits, 0.30–0.45m deep, containing displaced limestone packing, held the jambs of a 1.30m wide doorway. The western wall of the original range was probably also demolished at this time, being replaced by a new wall immediately to the west,

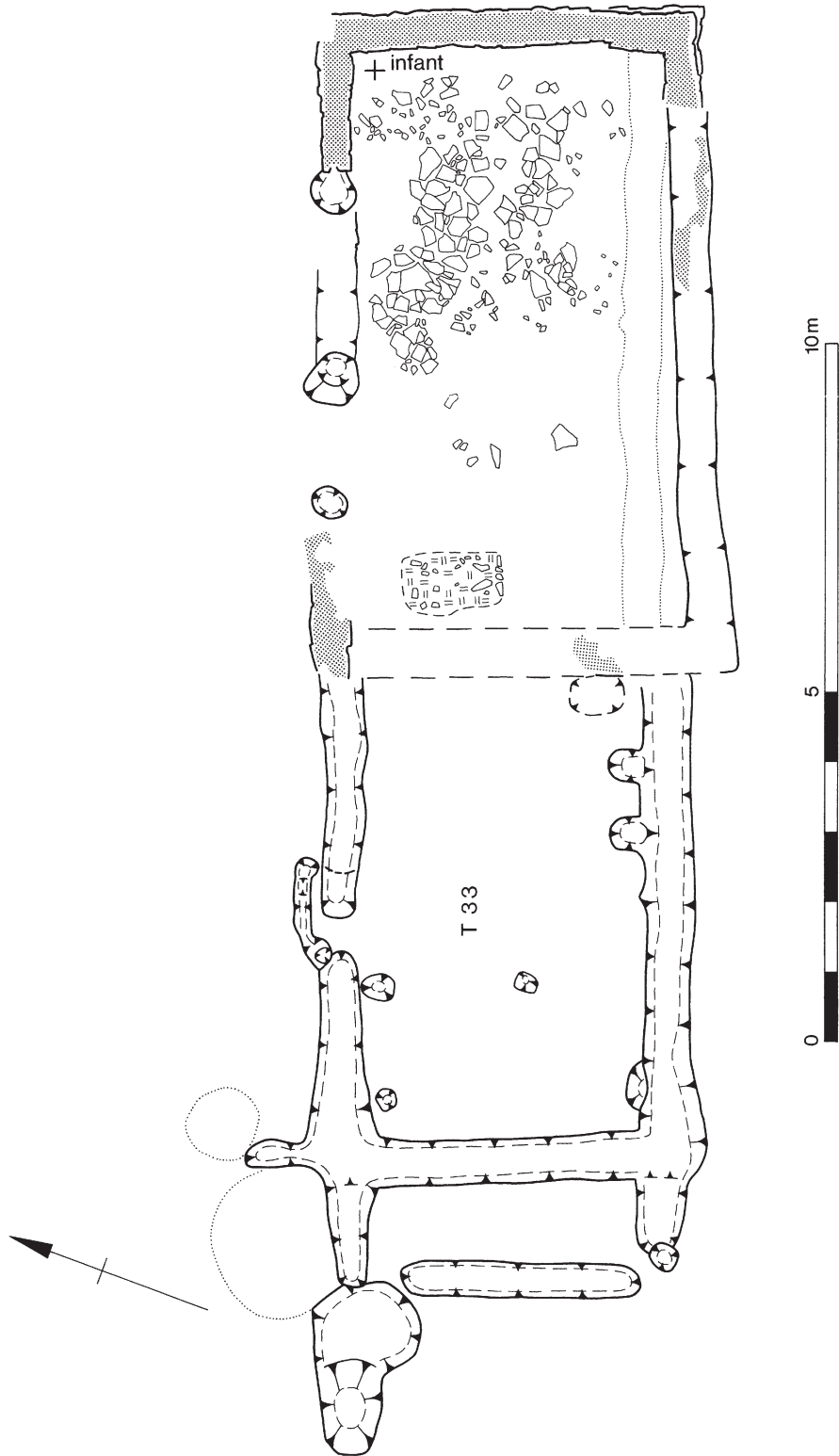


Fig 5.18: The medieval manor; southern range, S20, with retained timber range T33

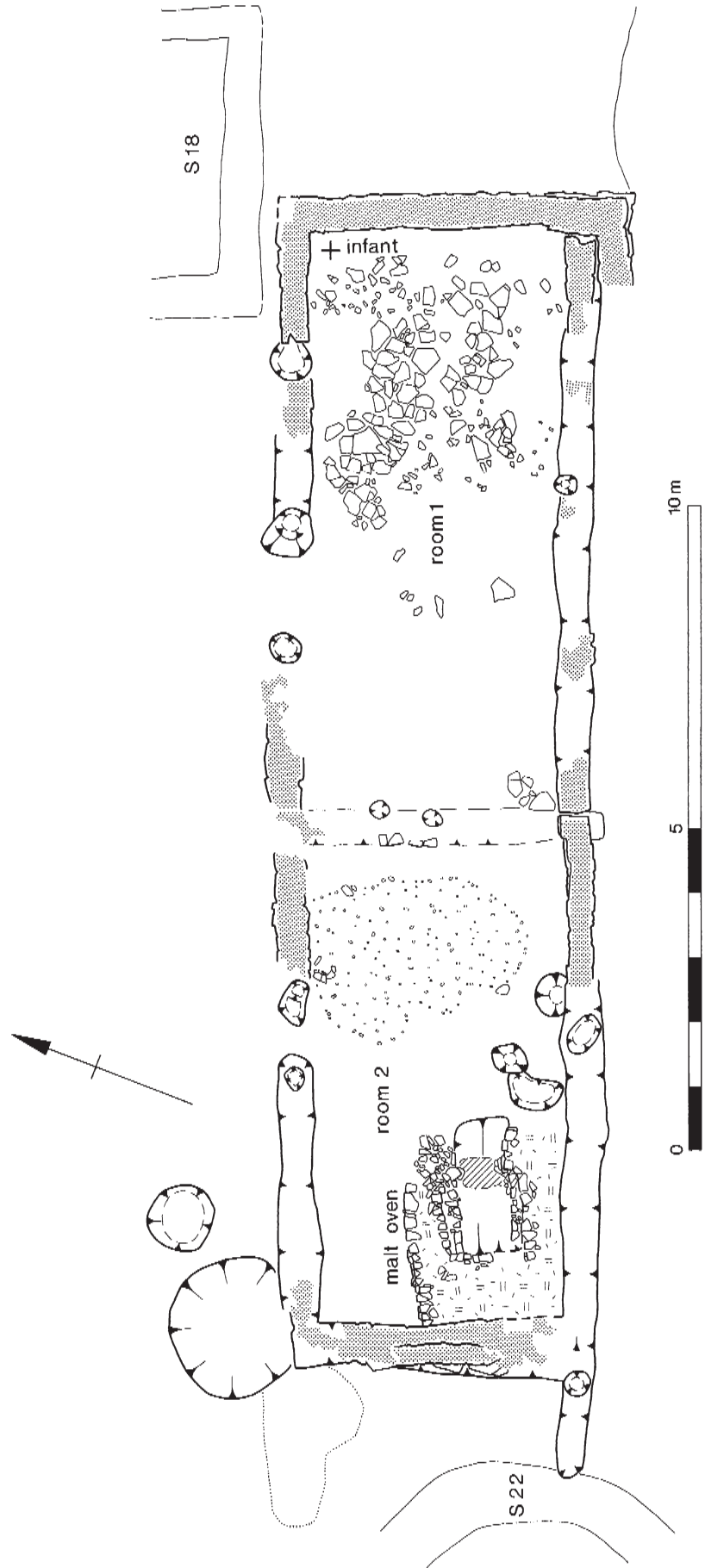


Fig 5.19: The medieval manor; barn and malt house, S19



Fig 5.20: The southern range, S19, room 1, looking west



Fig 5.21: The southern range, S19, room 2, looking north, showing the truncated remains of the malt oven

and contiguous with the new walls of the western room. A pair of post-pits held the jambs of a central doorway. 0.80m wide, and a line of flat-laid limestone formed part of a stone threshold. This wall was probably later removed to provide a single open space.

Subsequently, the southern wall of the original stone building was demolished and replaced by a new wall slightly to the north and in-line with the southern wall of room 2. The northern and eastern walls of building S20 were retained, although the eastern doorway was probably blocked and replaced by a narrower doorway further to the west.

The eastern room, 1, was 9.00m long by 4.00m wide, with a floor area of 36sq m. Across the eastern half there was a floor of large, flat-laid limestone flags, with an infilling of pebbles and smaller pieces of limestone. Within a shallow pit in the north-eastern corner of the room there was an inhumation burial of a neonatal infant (see Chapter 14, burial 4329). There is a direct parallel for the burial of an infant in the corner of a building from the medieval village of Upton, Gloucestershire, which in the 1960s was claimed to be probably “the first human burial recorded from a medieval peasant house” (Hilton and Rahtz 1967; Rahtz 1969, 87–88, fig 6 and Plate III).

The western room, 2, was 7.40m long with a floor area of 29.6sq m. A malt oven occupied just over a quarter of the floor space. The square oven chamber, 1.20m long by 1.10m wide, was set within a shallow pit, 0.20m deep (Fig 5.21). The lining was of small, flat-laid pieces of limestone and between this and the southern and western walls of the room there was a remnant of a mixed mortar and clay infill. To the north, the same filling was retained by a facing of flat-laid limestone. The flue opening was 0.55m wide at its base and widened to 0.63m at five courses high. A rectangular area of scorching indicated the former location of a hearthstone and the immediately adjacent flue lining was also scorched. The base of the chamber was covered with a layer of blackened silt. The side walls of the oven had then been re-lined, narrowing the chamber to 0.80m wide. The oven was later levelled and filled in with mixed mortar, clay, limestone and burnt debris, prior to the building of a completely new malt oven over the top (see Chapter 7, building E16).

Immediately east of the oven there were two shallow pits, 0.15 deep, filled with mixed debris comprising burnt mortar, loam, pieces of limestone and quantities of charcoal. A floor of gravel and small pieces of limestone in a matrix of sandy loam survived across the eastern part of the room, and was covered by mixed deposits of grey-black to orange-brown sandy loam with much charcoal, burnt mortar and pieces of limestone, some of which was burnt.

The small group of pottery from the new walls, as well as the pottery from the floors of both rooms, contained some Lyveden A ware, suggesting that the rebuilding and use occurred within the later twelfth century (ph 1, 1150–1225). The infilling and levelling of the oven chamber, pre-dating the building of a new oven (E16), contained some later

pottery, suggesting a demolition date into the thirteenth century (ph 2/0, 1225–1250).

At the south-west corner of room 2 a short length of robber trench indicates that there was a wall linking this range and the adjacent dovecote (S22). At the north-west corner a large pit abutting the wall and a further smaller pit, both 0.40m deep, were filled with mixed loams, and the larger pit also contained a scatter of limestone fragments.

The kitchen/bakehouse, S21

The hearths and corner oven identify this building as a detached kitchen/bakehouse, which partly overlay a timber building, T32, which may have been an earlier kitchen. The new building was 9.50m long by 5.75m wide, with the internal space measuring 8.25 by 4.35m; a floor area of 35.9sq.m (Fig 5.22).

The western wall stood over a backfilled ditch and, as a consequence, had been provided with a broad, 0.63m wide, foundation course of large flat-laid limestone slabs set in a shallow construction trench. Subsequent subsidence into the ditch accounts for the better preservation of this wall. Up to two courses of surviving standing wall, 0.54m wide with an external offset, were constructed in flat-laid and roughly coursed limestone with a core of small limestone rubble, all bonded with a yellow clayey mortar.

A single doorway, 1.1m wide, immediately north of centre in the eastern wall, was defined by door-jamb post-pits, up to 0.35m deep.

In the south-west corner of the room a shallow, circular pit, 1.80m in diameter by 0.20m deep, filled with burnt clay and limestone was the levelled remnant of a corner oven that was contemporary with the construction of the building, as the inner wall face of the adjacent wall was founded within the oven construction pit. It was later replaced by a new, smaller oven set in the upper fill of the pit. Only a single course of the heavily-burnt oven lining survived, but the chamber was 1.20m in diameter. The 0.70m wide flue opening had been damaged and originally it would have been narrower, perhaps 0.40–0.50m wide. The chamber contained a layer of grey-brown loam with charcoal and pieces of burnt clay, mortar and limestone, but a specific floor level was not located.

In the south-eastern corner of the room a square hearth, 1.10m in diameter, was set into a floor surface of pebbles in yellow sand. A single flat-laid limestone slab, with a heavily burnt and cracked surface, remained *in situ* and some smaller pieces embedded in the larger area of scorched floor suggest the former presence of further stones. Occupation deposits of grey-brown loam with charcoal lay against the eastern wall, in front of the corner oven and more patchily across the entire southern half of the room. They overlay the early floor surface and were partially sealed by a later floor of pebbles in orange-brown sandy loam. A hearth near the centre of the room, comprising a single heavily-burnt and cracked limestone slab at the centre of an oval area of burning, was probably contemporary with this later floor.

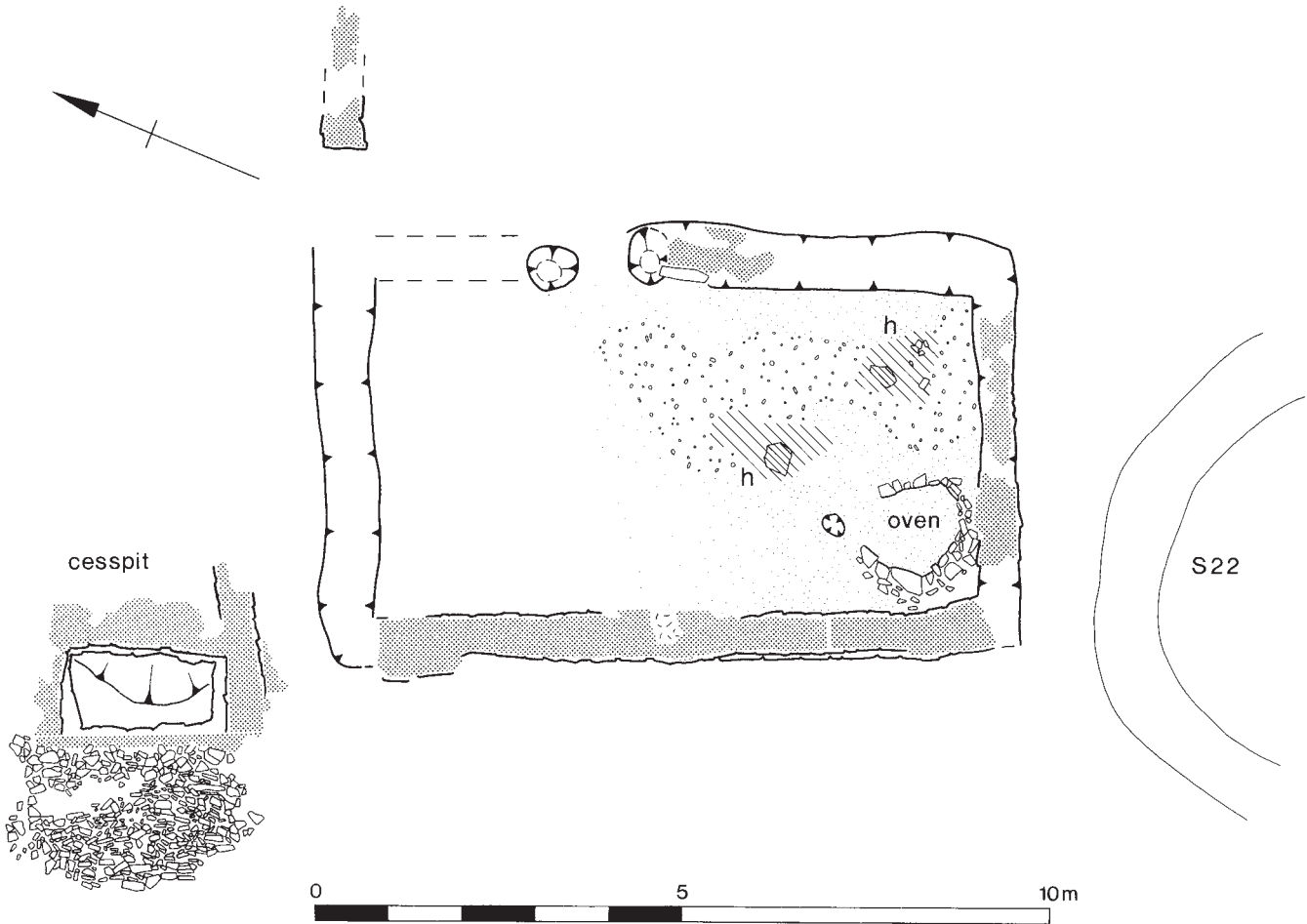


Fig 5.22: The medieval manor; kitchen/bakehouse, S21, and cess pit, S23

The pottery from the disturbed wall footings and the remnant gravel floors suggest a construction date in the first half of the twelfth century (ph 0, 1100–1150). The largest assemblage, 241 sherds, came from the mixed dark loams above the floors. This group was largely of shelly coarsewares, but six sherds of Lyveden A ware, indicate that use of the building continued into the later twelfth century (ph 1, 1150–1125).

The cess pit or garderobe, S23

A well-built, stone-lined cess pit lay immediately north of the kitchen/bakehouse (Figs 5.22 and 5.23). Its construction pit was excavated through the fills of the western boundary ditch, 8, and bottomed on natural gravel. The pit was lined with up to nine courses of flat-laid limestone forming a rectangular chamber with battered faces, 2.20m long by 1.00m wide. To the west it was 0.75m deep while to the east the bottom stepped down to 1.00m deep. On the southern side of the pit an outer wall face at ground level suggests that this side, at least, was flanked by a standing

wall, 0.50m wide, which also continued eastward for at least 1.00m, perhaps to provide a partial screen, although the pit may have been more fully enclosed to provide a roofed structure.

At the base of the pit there was an olive-green discolouration of the natural gravel, which been concreted into a solid mass to a depth of 20mm. Above this there was up to 0.25m of mottled olive green to grey silty clays, indicating the presence of cess deposits. The lower half was mixed and contained some small pieces of limestone, suggesting periodic partial removal of the contents, while the upper half was unmixed, indicating that the final accumulation of deposits had been left *in situ*.

Part of the fill was lifted as a block and excavated in the laboratory. The concentration of mineralised waste decreased towards the bottom of the block. It consisted largely of fragments of coprolite, solid waste which had become mineralised, in which fragments of cereal bran and corn cockle were clearly visible, while detailed analysis showed that wheat and barley were present along with some possible oat and rye fragments.



Fig 5.23: The stone-lined cess pit, S23, looking east (pitched stone ramp removed)

There were also large amounts of herbage, which included some cereal chaff and indeterminate leaf fragments. Fragments of possible *Prunus* sp. (plum etc) skin and pips from an apple or pear (*Pyrus/Malus* sp.) were recorded as well as a large legume, probably a pea (*Pisum sativum*). Arable weeds, familiar from the charred plant assemblages were also present. In addition, large numbers of seeds of elder (*Sambucus nigra*) had not been mineralised, suggesting that they did not enter the deposit with the faecal material. Most of the bone fragments were from fish and Avian egg shell was also common.

Subsequently, much of the lining on the western side of the pit was removed, leaving no more than two courses *in situ*, when a shallow sloping ramp was excavated and surfaced with steeply-pitched pieces of limestone. At this stage the functional depth of the pit may only have been the bottom 0.30m. The ramp presumably provided access into the pit for periodic removal of its contents. A further cess deposit had accumulated and spread across the lower part of the pitched stones before the pit was abandoned. It was backfilled with disordered limestone rubble and mortar, perhaps from a demolished superstructure.

The backfill of the construction pit behind the stone lining produced a large pottery group of 599 sherds dated to the earlier twelfth century (ph 0, 1100–1150), much of which was derived from fills of the subsidence hollow along the underlying ditch. The *in situ* cess deposits contained 31 sherds and the final fill 90 sherds, with the presence of

Lyveden A ware indicating that the pit was in use in the later twelfth century (ph 1, 1150–1225).

The dovecote, S22

This building lay at the south-western corner of the courtyard, with the malt house, S19/2, to its east and the kitchen/bakehouse, S21, to its north (Fig 5.7). It is interpreted as a dovecote on the basis of both its characteristic circular plan and the large assemblage of pigeon bones recovered in the immediate vicinity, largely from overlying demolition levels (Figs 5.24 and 5.25).

It was 6.85m in diameter, with an internal space 5.00m in diameter; a floor area of 19.6sq.m. The wall-trench was 0.16m deep with steep sides and a flat base. It was 1.00m wide suggesting that at foundation level the wall would have been around 0.80m thick, considerably wider than those of the contemporary buildings. On the north-western side a length of wall foundation of flat-laid limestone survived where they had been set to the exceptional depth of 0.50m, replacing the soft fills of an underlying pit. A single course of flat-laid limestone to the north may have formed the threshold of a doorway, 0.85m wide. There was no mortar in the surviving foundations but there was mortar in the fill of the robber trench. No floors had survived across the slightly hollowed interior, which was filled with limestone rubble and mortar, probably a demolition or levelling layer.

There was little direct dating evidence, although a single

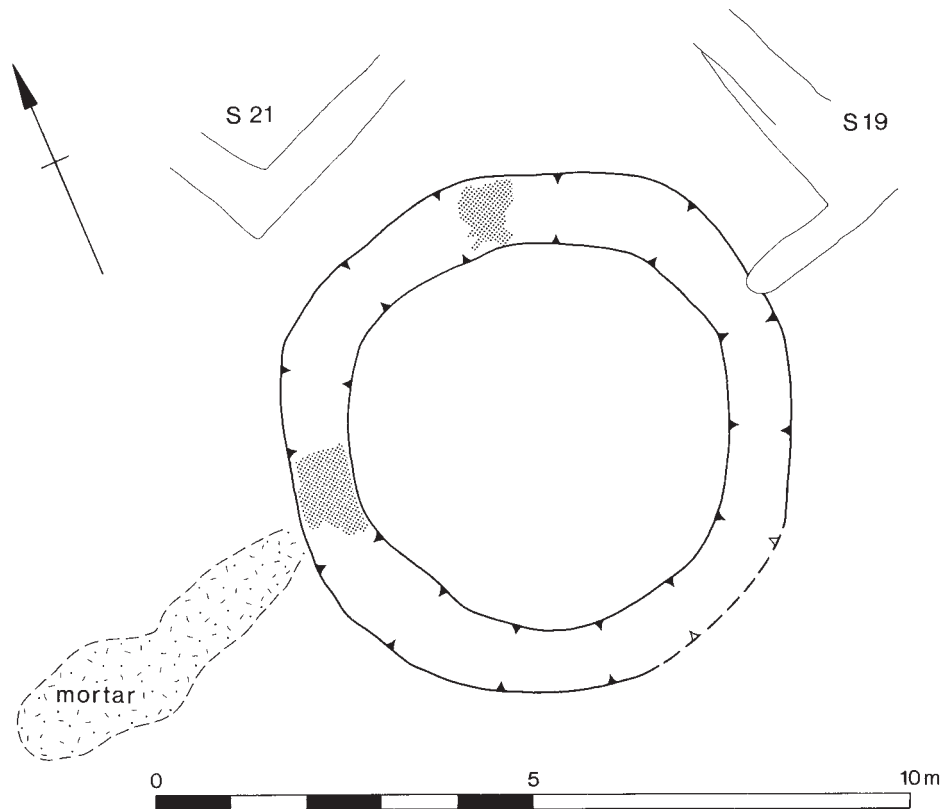


Fig 5.24: The medieval manor; the dovecote, S22

sherd from the *in situ* wall footings suggests a later twelfth-century date (ph 1, 1150–1225) for construction, perhaps contemporary with the rebuilding of the adjacent southern range, S19. The building may have been demolished in the earlier thirteenth century, but the overlying demolition levels contained some later thirteenth century pottery (phase 2/2, 1250–1300), perhaps suggesting that the dovecote was retained into the early use of tenement E.

To the west of the building, a 4.50m length of disordered limestone rubble in a matrix of mortar was broadly contemporary with the dovecote. It served no obvious functional purpose and may merely have been a backfilling to consolidate the ground over underlying soft feature fills.

The barn and processing range, S17

This building, the final addition to the twelfth-century manor house (Fig 5.7), served as a barn with an attached processing room (Fig 5.26). It was 21.00m long by 5.20m wide, probably of a single build, and contained two principal rooms of near equal length, with further partial partitions. It was subsequently largely levelled, leaving many of the constructional details unclear.

The later frontage of tenement A almost directly overlay the eastern wall suggesting that this wall may have been

partially retained, perhaps with new wall lengths keyed into the existing wall to avoid straight joints. To the south the eastern wall of room 2 was slightly offset from the later wall, perhaps indicating that it was levelled and then rebuilt on almost, but not exactly, the same line. The southern wall did appear to have been retained in the later building, with a ragged joint where it met the new western wall. The western and northern walls were in different locations from their successors, as the later building was slightly narrower.

The eastern wall was 0.50–0.56m wide and was founded within a shallow construction trench, 0.6m wide by 0.10m deep. At its southern end the construction/robber trench extended beyond the southern wall for 1.00m, perhaps indicating the presence of a corner buttress. The western wall was best preserved to the south, where one or two courses of flat-laid limestone facing with a rubble core survived. The southern wall was 0.50m wide but in part the foundation courses were broader, at up to 0.57m wide, and were set within a construction trench up to 0.20m deep where it lay over earlier ditch fills.

The central partition wall between rooms 1 and 2 was largely robbed, but it was 0.40m wide. A slight rectangular hollow to the east of the surviving length might indicate its original extent, suggesting that there was a 1.20m doorway to the east to give access between the two main rooms.



Fig 5.25: The dovecote and the kitchen/ bakehouse with circular corner oven, looking north

Room 1

The northern room measured 10.65m by 4.20m, an internal area of 37.8sq m. The broad opposed doorways to the north of centre, each around 3.00m wide, indicate its use as a barn. The large quoins at the southern side of the eastern doorway survived, and a short length of wall slightly offset to the east appeared to be a remnant of a later blocking wall to reduce the width of the doorway. The location and broad width of the western doorway is only indicated by the 2.50m-wide external metallised surface of flat-laid and disordered limestone pieces. However, a 1.0m-wide ridge within the wall trench suggests that this too was later blocked and reduced to a normal width doorway, standing at the northern end of the barn door opening. Another remnant of external surfacing further to the south comprised a cluster of flat-laid limestone slabs overlain by a spread of yellow clay and mortar. This may suggest the

presence of a further, but narrower, doorway giving access to the southern half of the barn end.

Immediately south of the eastern doorway, a shallow hollow, 0.04m deep, filled with mixed sandy loam, yellow clay and mortar, was presumably the footing for a partial partition wall. There were patchy remnants of a sub-floor or levelling layer of mortar-flecked clayey loam which contained much burnt debris derived from an underlying pit group, and above this the floor was of yellow-brown clayey loam flecked with yellow mortar and some small pieces of limestone.

Room 2

The southern room measured 9.00m by 4.20m; an internal area of 37.8sq m. It had opposed doorways to the north of centre and a narrower doorway or opening at the southern

end of the eastern wall (Figs 5.26 and 5.27). The eastern doorway was 1.00m wide, with the quoins partly surviving to the south and an *in situ* pivot stone to the north. The western doorway was 0.95m wide, and was defined by a pair of door-jamb postholes, 0.30m in diameter by 0.10m deep. These were filled with tightly packed pieces of pitched limestone, and a slot for a threshold sill, also filled with pitched pieces of limestone, ran between them.

The opening at the southern end of the eastern wall was only 0.60m wide, with a threshold setting of four flat-laid slabs of limestone. This was either an unusually narrow doorway or was perhaps a low-level opening serving some other purpose, perhaps to allow sacks or other materials to be passed through.

An area of floor survived where it had been overlain by a partition wall within the later building. A scatter of flat-laid limestone slabs was partially overlain by a compact surface of pebbles in a sandy matrix, and above this there was a patchy layer of red to orange burnt loam mixed with fine, pale grey ash and some grey-brown clayey loam.

A small hearth lay immediately inside the eastern door, with an adjacent square base for a respond abutting the wall perhaps to protect the hearth from exposure to draughts. The hearth was 0.70m square with a base of closely packed, gently-pitched pieces of limestone flanked by flat-lying pieces embedded in and partially covered by a clayey loam. The central area of the clay and the tops of the stones were both reddened and blackened, while towards the western side the stones were heavily blackened.

The principal features in the room were the two stone-lined pits occupying the north-west corner (Fig 5.28). The long pit, 1.80m long by 0.50m wide and 0.35m deep, was lined with a mixture of flat-laid limestone slabs and larger, irregular limestone blocks, in up to six rough courses. At the northern end there was a single, steeply-pitched slab of limestone, while at the southern end pitched slabs of limestone had been partially removed when this end was disturbed by the construction of the adjacent rectangular pit. The base was surfaced with flat-laid limestone and much of the base, and the slab at the northern end was discoloured blue-grey by organic chemical staining, and the soil between the stones was stained grey-green. A single flat-laid slab with a blue-grey surface lay at floor level adjacent to the southern end of the pit, and slabs of limestone within the fill and used in the construction of the adjacent pit, may have come from either the upper courses of the lining or an area of adjacent surface. In form and character this pit is identical with a similar feature in contemporary use in the southern holding, tenement B (B5/1) and some of the later tenements. These processing rooms will be discussed in detail in the following chapter, where it is suggested that they were probably used for the fulling of woollen cloth, with the chemicals used producing the grey staining of the limestone.

The smaller, rectangular stone-lined pit, 0.95m long by 0.50m wide and 0.45m deep, was well faced on three sides in up to eight courses of flat-laid limestone, but on the

southern side only a partial lining survived. The flat base was not surfaced. To the west the upper two courses of the lining were contiguous with a square base comprising two courses of flat-laid limestone set in a shallow hollow.

To the south of the doorway there was a large, steep-sided pit, 3.10m long, up to 1.30m wide, and 0.45m deep at either end with a shallower, 0.35m deep, central section. The eastern end of the pit was partially lined with large, overlapping slabs of limestone pitched against the cut sides, while the western end was largely filled with closely-set and steep to near vertically-pitched slabs of limestone in a matrix of grey-green silty clay. It is suggested that the pit was probably originally fully-filled with pitched slabs of limestone, and that it served as an internal soak-away pit. A strip 0.50m wide along the southern side was stained grey-green to yellow or orange, suggesting the use of strong organic solutions and a probable direct connection with the use of the long, stone-lined pit to the north. A small pit in the corner of the room, 0.66m in diameter by 0.60m deep, contained some pitched slabs of limestone, perhaps remnants of an original lining, and its fill included a lens of reddened and blackened loam with charcoal and grey-green silty clay particularly concentrated towards the base of the pit. The fill of this pit produced the largest collection of fish bones, all herring, recovered from the site.

The pits pre-dating the building contained later twelfth century pottery (ph 1), and the presence of Developed Stamford ware suggests that the building was constructed in the early thirteenth century, towards the end of ceramic phase 1 (1200–1225). The remnant floors in room 1 produced later twelfth and early thirteenth century pottery (ph 1 and 2/0). The latest burnt layer within room 2 contained a later thirteenth century pottery group (ph 2/2, 1250–1300), as did the earliest floors of the subsequent building, A1, suggesting that the rebuilding occurred within the second half of the thirteenth century.

The access road, courtyards and pit groups

Three areas of external metalled surfaces contemporary with the twelfth-century manor partially survived (Fig 5.7). To the east of the hall, S18, there was a well-preserved length of the main access road; within the central courtyard, SY1, remnants of metalled surfaces survived; and on the yard, SY2, to the south of the buildings there were remnants of metalled surfaces pre-dating the construction of the barn and processing room, S17, while the walled yards were probably contemporary with this building. There were three major pit groups within the extended domestic plot. These lay to the west and south of the buildings, the latter group pre-dating the barn, S17, and to the east on the opposite side of the access road, with an isolated malt oven further to the east. The fills of these pits typically contained considerable quantities of burnt debris, often including pieces of fired



Fig 5.26: The medieval manor; barn and processing range, S17 (h=hearth, s= stone-lined bin, t= trough)



Fig 5.27: The processing room, S17/2, looking west



Fig 5.28: The processing room, S17/2, stone-lined trough and pit.

clay, and it is likely that each group contained the debris from an associated clay-domed drying oven.

The access road

A 20m length of metalled road was well preserved, overlying an earlier gravel surface contemporary with the later use of the timber buildings. Further south any surface had been removed by later medieval activity. The first phase comprised flat laid limestone, typically 150mm long with heavily worn and smoothed surfaces, and some gravel, including small cobbles up to 100mm long (Fig 5.7).

To the east, the late Saxon boundary ditch, 18, may have been retained for a time but it was later backfilled and replaced by a shallow ditch, no more than 0.30m deep. A 2.20m wide opening provided access to the east, and a localised final fill of crushed limestone in the underlying ditch provided a consolidated surface.

Beyond the southern end of the shallow ditch an L-shaped boundary wall was constructed on a dumped layer of yellow sandy mortar overlain by loam and limestone rubble, which formed the final fill of the underlying ditch. The external corner of the wall was sharply angled while internally it was curved. The arms of the wall were 0.60m and 0.50m wide, standing on a broader foundation course. The corner was abutted by a narrow wall, 0.35–0.45m wide, running westward for 1.80m; a single course survived, in both flat-laid and shallowly pitched limestone, and the surviving western end was probably the original terminal. It would appear to mark the southern end of the approach to the new hall.

At a later date, a timber gateway, only 1.15m wide, may have been added to control access to the hall by forming an enclosed court 10.0m long. The post-pits holding the gate posts were up to 0.80m in diameter by 0.55m deep, and lay at the northern side of an oval construction pit, up to 0.15m deep, which was filled with mixed burnt debris and worn limestone from the earlier metalled surfaces. A double posthole to the north-east and the truncated base of a possible further post-pit further to the east may suggest that the gateway stood in front of a timber fence spanning the width of the approach to the hall.

With the introduction of the gateway a new narrow path was provided. It was 1.50m wide and comprised flat-laid limestone, heavily worn, with small, isolated areas of pitched limestone from subsequent repairs. It ran directly to the doorway of the timber building, T28, which had replaced the old timber hall, T29. The eastern edge of the path was closely linear, and at its northern end there was a 2.40m length of a kerb in vertically-set limestone, with the tops of the stones worn smooth and frost shattered. To the east of the kerb there was a shallow, sub-square hollow filled with charcoal-flecked sandy loam and scattered pieces of limestone, and a pair of shallow pits, no more than 0.08m deep, filled with silty loam, pale grey ash and some reddened sand. These deposits were sealed by a worn limestone surface.

The area between the hall, S18, and the path was surfaced with mixed pale yellow mortar, clean sand and small limestone chips, which appeared to be contiguous with the internal floor surface of the hall, and there was an upper surface of mixed sand and gravel.

Over the upper road surface there was a patchy layer of red-brown sandy loam with a scatter of small limestone pieces. This was sealed by a red-brown loam heavily mottled with grey ashy loam and burnt sand with charcoal flecking. This material may have been demolition debris, and similar deposits overlay the levelled eastern wall of the hall, S18.

To the east of the path the earlier road surface had been heavily disturbed, leaving a layer of disordered limestone, much of it worn, in a light brown sandy loam.

The filling of the shallow ditch along the eastern side of the access road is dated to the first half of the twelfth century, while the layer of ashy loam sealing the road included an assemblage of fairly large and unabraded pottery sherds dated to the later twelfth or early thirteenth centuries (ph 1, 1150–1225). Small amounts of later pottery in an overlying surface immediately pre-dating the construction of the northern wing of tenement E, suggest that the road fell out of use around the first quarter of the thirteenth century (ph 1 into ph 2/0, 1225) at the creation of tenement E.

The central courtyard, SY1

The central courtyard was 16.50m long by 9.50–11.25m wide; an area of 171sq m (Fig 5.7). This area had been heavily disturbed by later use, but early metalled surfacing still patchily survived across the central area. The earliest surface comprised three discrete areas of flat-laid limestone slabs, and the westernmost had vertically pitched limestone along its northern side, possibly forming a kerb. These may have been remnants of a path, perhaps 1.00m wide, running between the hall, S18, and the kitchen/bakehouse, S21. To the north there was a small area of worn limestone.

The early limestone surface was overlain by a layer of gravel pebbles, typically 10–40mm diameter, and some small pieces of limestone in a matrix of orange-brown sandy loam. It survived relatively undisturbed in the centre of the yard and beyond this there was much gravel within later layers, suggesting that it had originally covered the entire courtyard. The gravel abutted and lapped over the margins of the original path. Towards the western end of the courtyard there was a single pit, probably recut, 1.60m diameter and 0.25m deep.

To the north, the timber domestic range, T30, was probably retained into the earlier use of the new building complex, and a short length of stone wall, 0.65m wide, may have closed the gap between the stone-built kitchen range to the west and the retained timber range. At its western end a single large slab of limestone spanned the full width of the wall suggesting that this may have been the wall end, which would have left a narrow gateway, 1.00m wide, adjacent to the kitchen range.

Part of the limestone pathway is dated to the earlier twelfth century (ph 0, 1100–1150), while the pottery groups attributed to the gravel surface range in date from the early twelfth to the fourteenth centuries (ph 0 to ph 3/2), but the material is certainly a result of the extensive later disturbance and contamination of these levels.

The western pit group (LSE5)

This pit group comprised two major features: a large oval pit which contained the remnants of a probable square, clay-walled oven (Fig 5.7, 4039) and a linear gully with terminal pits that was probably another oven (4437). These features were rich in charred plant remains, including cereals, field beans, fodder vetch and flax, indicating their probable use as general crop-drying ovens. Bracken recovered from the larger oven may have been used as fuel.

The large oval pit (4039), 6.10m long by 3.70m wide and 0.45m deep, contained a central, 3.00m square, layer of burnt (orange-red) clay pieces, with unburnt limestone embedded in its upper surface, which was probably the levelled remains of a clay-domed oven chamber. Access to the oven was probably from the more shallowly-sloping western end of the pit, where the primary ashy fills were mixed. At the eastern end multiple stratified layers of alternating blue-black and reddish-black ashy silts were probably the debris from successive firings.

The linear oven (4437) comprised a central gully with a elongated pit to the west on the same alignment, and a pit at the eastern end set at an angle, and lying beneath the wall of the later dovecote (Figs 5.7 and 6.2). The central gully was 3.00m long, up to 1.00m wide and 0.35m deep. At its western end on the cut floor there was a spread of grey-black loam with some small pieces of burnt clay. The western pit was 3.50m long and both wider and deeper than the gully, at 1.50m wide and 0.50m deep. It had a primary fill, 0.10m thick, of grey-brown clay-loam containing moderate charcoal flecking. Above this, a 30mm thick layer of burnt (orange) sandy clay was overlain by a fine, light grey ash with much comminuted charcoal, with scorching of the pit sides. The upper fill was a mixed deposit of burnt debris including pieces of burnt or fired clay, and there was a similar upper fill within the gully to its east. The eastern pit lay at an angle, and was sub-rectangular, 2.0m long by 1.2m wide and 0.45–0.55m deep. Against the sides and base there were remnants of a lining of grey-green sandy clay. The fill comprised several thin lenses of burnt (orange-red) sandy clay between thicker deposits of fine, light grey-brown ash with comminuted charcoal. These were either the *in situ* debris from a succession of firings or a sequence of well-stratified dumps of burnt debris from elsewhere. Immediately adjacent there was a slightly shallower pit, 0.40m deep, with similar fills, but without well defined stratification. A third pit further to the east also had similar fills, perhaps suggesting that all three contained dumped burnt debris from multiple oven firings.

The large oven produced a substantial pottery group,

139 sherds, dated to the earlier twelfth century (ph 0, 1100–1150). The linear oven was sealed by a layer of limestone and mortar with an *in situ* vessel at the western end that is dated to the earlier thirteenth century (ph 2/0, 1225–1250).

The southern yard and pit group, SY2 and APITS

Remnant metallised surfaces of gravel in orange-brown clayey loam with much small limestone abutted the walls of the southern range, S19/20, and sparser gravel inclusions in the loams further to the west and south suggest that this surface had once been more extensive (Fig 5.7). To the south-east an area of early metallised surface was better preserved where it had been sealed by later buildings, S17 and A1. It comprised gravel pebbles in orange-brown clayey loam overlain by scattered flat-laid limestone including some stones with worn surfaces.

At the southern end of the surface there was a pit that had possibly held a clay-domed oven (see Fig 4.29, 1162/1355). The pit was sub-circular, 2.40m in diameter by 0.50m deep, with linear gullies forming flues or stokeholes extending to both the north and south for 2.00m. The gully fills contained some charcoal and burnt soils and a similar primary fill in the pit was overlain by a 70mm thick layer of heavily burnt debris, possibly indicative of *in situ* burning (1355). The upper fill also contained much charcoal and burnt sandy clay including small pieces of burnt or fired clay.

There was a cluster of four pits to the south of the oven which also contained burnt debris (see Fig 4.29, A pits), and a further two large pits, which cut the partially filled northern terminals of the double boundary ditch, 14, contained two or three distinct lenses of burnt soils and blackened loams with charcoal. In addition, the upper fills of both boundary ditches also contained considerable quantities of burnt debris. These concentrations of dumped debris were most probably derived from both the nearby drying oven and from general kitchen waste.

The yard surfaces were disturbed and contaminated, resulting in the presence of small amounts of later pottery, but the bulk of the material indicates that the main period of use was during the later twelfth century (ph 1, 1150–1225). The use of the pit group was contemporary with the similar group on the opposite side of the access road, and both are dated to the later twelfth century (ph 1, 1150–1225).

The eastern pit groups

Some distance to the east of the access road, a drying oven lay adjacent to a boundary ditch (see Figs 5.2 and 4.33, 393). A large deposit of carbonized, sprouted barley grain, which must have been accidentally burnt during a firing, indicates that it was a malt oven. The oven comprised a sub-rectangular chamber, 3.00m long by 2.00m wide and 0.50m deep, with a linear gully, 0.90m wide, probably serving as a stokehole, running eastward for 3.00m. A mass of fired clay from within the chamber had come from a

clay-domed superstructure. The larger pieces were up to 200mm across and 80mm thick, with one face roughly smooth and sometimes blackened while the opposing face was more irregular and often contained one or two semi-circular impressions, typically around either 15mm or 35mm in diameter, of a wattle framework. The fired clay was hardened, and typically an orange-buff to orange-red in colour. The oven was in use in the earlier twelfth century (ph 0, 1100–1150), and is the earliest appearance of malting within the settlement.

For up to 7.0m to the west and east of the oven there was a surface layer of dark grey silty clay with much charcoal and frequent pieces of burnt clay, with further debris in the upper fills of the nearby boundary ditches, 17 and 18. These were probably dumps of burnt debris derived from both the use and the levelling of the oven.

Immediately along the eastern side of the access road there was a group of pits and gullies, with several pits containing burnt debris, typically burnt sands and fine ash (Fig 5.7, eastern pits). The largest pit, 2.50m long by 1.75m wide and 0.58m deep, was filled with interleaved layers of grey sandy loam, flecked with charcoal and burnt (yellow or red) sand, and red-brown sand free of any burnt debris. A remnant of a burnt clay surface at the northern end may suggest the presence of a hearth or oven built at ground level. These pits are broadly dated to the twelfth century (ph 0 and 1, 1100–1225), and are contemporary with the pit group on the opposite side of the access road (Fig 5.3).

To the east, two elongated pits and some smaller pits, did not contain burnt debris and were slightly later in date, the later twelfth century (phase 1). They were also contemporary with a linear gully, 0.90m wide by 0.25m deep, which cut some of the pits containing burnt debris.

This gully may have held a timber boundary fence, perhaps a precursor of the later boundary wall along this side of the central yard. At the eastern end of this complex a number of pits or post-pits extended southward onto the central yard, where they defined the southern end of the

extended domestic plot of the twelfth-century building complex.

The southern walled yards

Walled yards had probably been formed at the introduction of the new barn and processing building, S17 (Fig 5.7). They showed respect for the earlier boundary ditches, showing that the introduction of the walls was just another stage in the development of the plot divisions.

A boundary wall ran south from the southern range, S19, to the old terminal of ditch system 4, blocking off the rear end of the extended domestic plot. It was removed when the manor buildings were levelled for the introduction of the new tenements, and was defined by a robber trench with a little rubble to either side of the trench. The southern boundary to the domestic plot was retained in the introduction of a boundary wall running between the old ditch terminal and the new barn, S17. A second roughly parallel wall, between 3.30m and 5.00m to the south, formed a short access route or a narrow yard, metalled with limestone in mortar, outside the processing room end of the new barn, S17.

To the immediate west of this walled area there was a large pit, 4.50–5.00m in diameter and 0.40m deep. The shallowly-sloping sides led to a central, steep-sided, sub-rectangular pit, 1.80m long by 1.45m wide and 0.30m deep. This may have been a well pit, perhaps supplying water to the trough in the processing room. It was later filled with building debris including pieces of limestone and much crushed limestone, the latter perhaps left over from mortar mixing. The lower fill contained pottery of earlier thirteenth-century date (ph 2/0, 1225–1250) while the upper fills, which included limestone rubble, contained mixed assemblages including pottery of fourteenth-century date (ph 3/2, 1300–1400).

6 The Watermill System (AD 950–1150) and the River Palaeochannels

Given the specialised nature of the evidence, the detailed description of the watermill system, its abandonment and the creation of the flood bank have their own chapter. In addition, the river palaeochannels that were observed and recorded to the west of the hamlet during gravel extraction are also described here (Fig 6.1).

The watermill system appears to have come into use as part of the original establishment of the settlement in the mid-tenth century (see Fig 4.1). The structural elements of the successive mills at West Cotton were only poorly preserved as it went through several refurbishments. One aspect of interest is that the original mill, in the tenth century, was vertical-wheeled while the later phases, in use through the eleventh and into the twelfth centuries, apparently comprised the simpler technology of the horizontal-wheeled mill, with both the wheel and millstone assembly set on a single vertical axle. In addition, much of the associated water supply system was located and partially excavated, providing a broad understanding of the entire system and the work involved in its creation. These elements comprised the 150m of the western leats, which linked the natural water supply with a millpond situated adjacent to the river channel, and the 50m of head race and tail race that served the successive watermills. For each major change in mill construction the entire leat system was renewed, with the preceding leat backfilled while a new leat was cut nearby.

At around the mid-twelfth century a period of catastrophic flooding, which resulted in the deposition of a considerable depth of alluvium across the surrounding landscape, led not only to the disruption of the water supply and the abandonment of the mill system, but also to the creation of a system of flood protection banks, which partly overlay the former mill leats. These flood banks ensured the survival of the settlement despite it then lying up to 1.0m below the level of the newly formed floodplain (see Figs 5.1–5.3). There is a possibility that by the thirteenth century a new watermill had been established on the eastern side of the hamlet, at the edge of the floodplain, but this remains unproven.

Prior to the excavation at West Cotton, only three other watermills of the twelfth century or earlier had been extensively or partially excavated in England. The well preserved timber structure of a mid-ninth century horizontal-wheeled mill at Tamworth, Staffordshire (Rahtz and Meeson 1992) was excavated in 1971 and still stands

as the classic English example of this mill type, and the reconstructed plans and elevations of the mill structure have made many appearances in the archaeological literature (eg Longworth and Cherry 1986, 148–9, fig 77). The successive vertical and horizontal mills at Old Windsor, Berkshire, spanning the eighth to tenth centuries, were excavated in 1953–8 by Brian Hope-Taylor and would have formed a major contribution to the understanding of early mills if more than a short note had been published (Wilson and Hurst 1958, 183–5). The twelfth-century watermill at Castle Donington, Leicestershire (Clay and Salisbury 1990, 276–307), was recognised in a watching brief during gravel extraction. Salvage excavations located a mill dam and the timber breasting within which a vertical wheel would have turned, but no other evidence for the mill itself was obtained. At a slightly later date, late twelfth to early fifteenth centuries, the sequence of four well-preserved watermills at Bordesley Abbey (Astill 1993), providing power for metalworking rather than milling, are now our major source of information on the form and working of medieval vertical-wheeled mills.

Fortunately, other useful evidence is available from both Ireland, where a number of early watermills have been excavated (Lucas 1953, 1–35 and Rynne 1989, 13–15), and Scotland, where a late nineteenth-century study of then recently abandoned horizontal-wheeled watermills in the Shetlands (Goudie 1886) provides a full description of their form and function.

A number of more recent discoveries are adding much to the understanding of early watermills, but it has not been possible to take this into account in relation to the mills at West Cotton.

The documentary evidence

by Paul Courtney

Domesday Book (1, 220c) records two mills held by the Bishop of Coutances (later Clare) in Raunds. One rendered 34s 8d and 100 eels, the second richest mill in the county, while the other produced only 12d. Holt (1988, 118–9) has suggested that some at least of such low value mills are likely to have been horizontal-wheeled mills, being cheap to maintain and build but limited in output. They probably belonged to substantial free tenants, such as

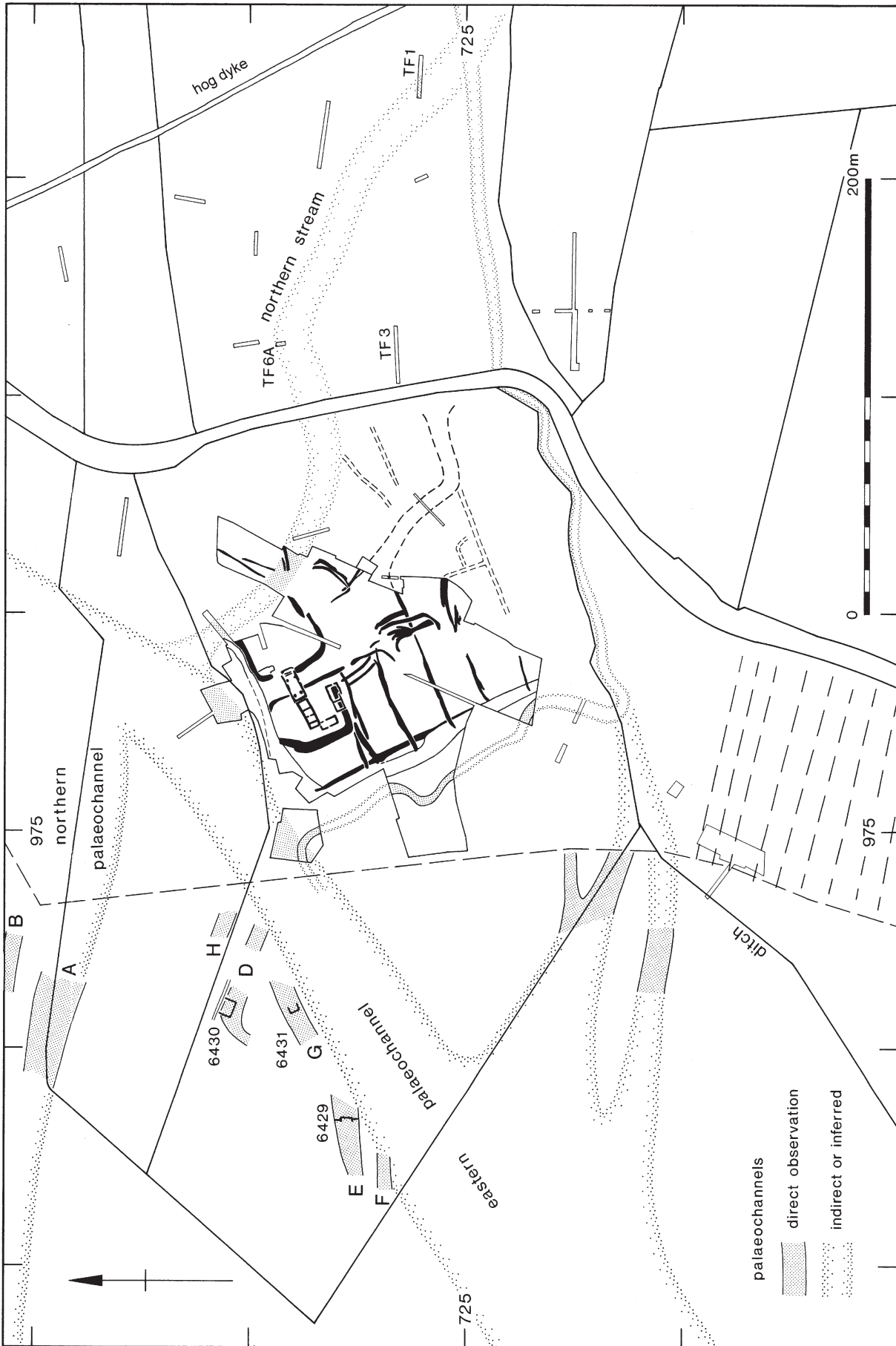


Fig 6.1: West Cotton: the observed river and stream palaeochannels. © Crown copyright. All rights reserved. Northamptonshire County Council: Licence No. 100019331, Published 2009

sokemen, or groups of peasants. It is possible that the 12d mill in Domesday was the horizontal mill excavated at West Cotton.

While there is no archaeological evidence for a later medieval mill at West Cotton, the documentary evidence indicates that Joan Chamberlain had a mill attached to her manor of Wilwencotes in 1413, but both its earlier and subsequent history is unclear (PRO C138/3). It is possible that this was the Chamberlain mill at Malloes Cotton, documented in the 1530s when it was farmed by Thomas Hopkyns (NRO X706: 23–4 Hen VIII), which could have been temporarily attached to Wilwencotes as part of Joan's dowry. However, the possibility of Chamberlain mills in both West and Malloes Cotton cannot be discounted. It is possible that the close in West Cotton sold by Thomas Hopkyns 'miller' of Ringstead in 1545 was attached to a former Wilwencotes mill. The only feasible location for such mill would have been beside the Cotton Brook to the east of the lane, and at the edge of the floodplain, where the buildings of medieval tenement I were investigated by limited trial trenching (see Fig 7.1).

The water supply

The motive power for the West Cotton watermills was provided by the Cotton or Tipp Brook, a minor tributary of the River Nene. It rises 3.5–4.5km to the east of West Cotton as several streams coming off the margins of the boulder clay at around the 75m OD contour (see Fig 1.2). The main tributary stream rises to the north-east of Raunds and flows through Raunds, where it is joined from the east and south-east by further tributary streams. For the final 1.0km of its course to the valley bottom, between the 46m and 38m contours, it flows almost due west down a deeply incised valley. Since the late eighteenth century, the stream has been carried well to the north of West Cotton within a linear channel, the Hogg Dyke (see Fig 1.3). Its previous course took it to the south and west of West Cotton, where it supplied the leats feeding the mill system, with the abandoned course of this stream surviving in earthwork.

Unfortunately, the complex history of the stream system in the immediate vicinity of West Cotton was not fully resolved. In addition to the southern stream channel, there is evidence that there had also been a northern channel. As these channel systems were not fully sectioned, their detailed histories and their inter-relationships remain uncertain, but a possible broad sequence of development has been postulated from the available evidence.

The northern stream

To the east of Cotton Lane geophysical survey and the location of water deposited silts in two trial trenches (Fig 6.1; TF1 and TF6A), suggest that a northern stream channel separated from the southern stream channel at the edge of the floodplain, near the current southern end of the Hogg

Dyke (Figs 1.6 and 6.1). The presence of a northern stream channel pre-dating the late Saxon settlement was defined at two locations within the excavated area. North of an earth-cut malting oven in plot 10, the southern edge of a stream channel, at least 0.80m deep, was located in plan and partially sectioned (Fig 4.31, 310). It was sealed by the pre-late Saxon soil horizon. A machine cut trench, 1.0m deep, to the immediate north of this revealed the presence of water-deposited tenacious grey clays and gravel largely sealed by a general layer of alluvial clayey silts. They were not recorded in detail and the bottom of the deposits was not reached, and the location of the northern edge was not established. However, the demise of an active stream channel and the deposition of the alluvial layer by the middle of the twelfth century (ceramic phase 0, 1100–1150) was demonstrated by the excavated sequence within the adjacent ditch system (Fig 4.31, 17), where alluvial clay sealed early ditch fills of sandy silts with gravel.

To the north-west, the outflow channel of the earliest mill (M27) cut through the clay fills of a possible stream that was at least 5.00m wide by 0.85m deep (see Fig 6.9, 7392). By the late Saxon period the northern stream was therefore either narrower or had shifted slightly to the north of its former location.

There is therefore good, if fragmentary, evidence for a northern stream channel that became redundant within the early life of the settlement and which perhaps was already largely redundant when the settlement was created.

The southern stream

The southern stream channel was observed within the quarry edge to the south-west of the settlement, but it was not examined or recorded in any detail here, although palaeochannels on the same alignment were recorded within the quarry further to the west (Fig 6.1). In addition, the northern and southern margins of a broad eroded area to either side of the stream were observed within the southern part of the main excavation area and within detached trenches to the south, where the stream cut across the probable course of a prehistoric monument, the Long Enclosure (Fig 3.1, LE). The recorded truncation of the prehistoric ditches in these areas shows that the prehistoric ground surface had been eroded over an area up to 100m wide, and the area was subsequently buried beneath up to 4.0m of alluvial clay. These factors alone suggest that the southern stream was probably post-Bronze Age in origin, and therefore not the original stream channel, although the actual date of origin has not been established.

It is suggested that the northern stream channel was probably the active channel contemporary with the Neolithic and Bronze Age monuments, and that at some later date a southern channel developed which eventually became the principal stream channel. Whether the process of change was purely natural channel evolution or involved direct human interference is unknown. A further possibility, given the recovery of a beaver bone of late Bronze Age date (1310–

920 cal BC; 95% confidence; 2900 +/-60; OxA-4740), is that the channel evolution may even have been a result of hydrological changes caused by beaver activity, which may have blocked or at least drastically reduced water flow along the northern channel (Coles 2006, 90–95).

The western mill leats

An artificial leat system, 150m long, carried water from the southern stream channel at the south-western corner of the settlement to a millpond at the north-western corner (see Figs 4.1 and 5.1). The junction of the stream and leat system was not excavated but either there must have been a sluice gate to control water flow into the leat system or with the construction of the western leat the natural stream channel further west became redundant, with the entire water flow feeding into the millpond, and then either overflowing into the river or being fed to the watermills.

The creation of this water supply system would have entailed a major input of labour. The leats were from 2.5–4.0m wide and perhaps approaching 1.0m deep with respect to the contemporary ground surface. However, this particular aspect of the labour input was perhaps only broadly equivalent to the creation of the contemporary boundary ditch system, which entailed the digging of a far greater length of ditch, at least some 500m, although these were admittedly typically much narrower and shallower. Of course, in addition to the western leats there was also the labour input involved in the digging of the pond and the 50m of leat for the head and tail races.

A 49m length of the western leats was examined in 1987, with the sequence determined in plan, in two machine-cut sections and in a small area excavation over limestone-surfaced fords at the end of ditch system 3, the primary boundary between the northern and southern holdings (Fig 6.2).

There was a succession of three broad, flat-bottomed leats (Fig 6.3 a–c), and a final narrower and shallower leat probably post-dated the abandonment of the watermills (Fig 6.4 d). Only the small area excavation produced any dating evidence. The silts between two limestone surfaces of the ford within the third leat produced a small group of pottery dated to the earlier twelfth century (ph 0, 1100–1150) and further groups of this date came from the upper silts of the same leat and from the limestone surfacing of the ford within the fourth leat.

It is not possible to make any firm correlation between the western leats and the mill sequence to the north, and it may be noted that three western leats have been identified as opposed to a sequence of four leats relating to the mill system. However, a simple equation would suggest that the first western leat was contemporary with the original mill (M27) and perhaps the following period of disuse as well, while the second and third western leats may have been contemporary with the two horizontal-wheeled mills (M26 and M25).

The first leat (Phase 1)

The earliest leat was steep-sided with a broad flat bottom, 2.40m wide, and was 0.80m deep with respect to the ground level to its east (Figs 6.3a and 6.5, section a–a', 6941 phase 1). The basal levels of 33.25 and 33.15m OD show a gradual fall towards the millpond. The primary silts, up to 0.25m deep, comprised water-deposited silty sands and fine gravel, and was overlain by mixed and convoluted deposits of light grey silty clay and orange-brown sand or sandy clay with coarse gravel inclusions. The upper fills only partially survived, and comprised alternating bands of red-brown sand with some gravel and gravel in red-brown sand, all inclined downwards to the east. They appear to derive from deliberate backfilling of the leat.

The second leat (Phase 2)

The second leat had a steep-sided, flat-bottomed cut, 4.00m wide with a basal width of 3.40m (Figs 6.2, 6.3b and 6.5, section a–a', 6955 phase 2). It was 0.40–0.60m deep, shallower than the first leat, with bottom levels of 33.64 and 33.35m OD at the two sections, again indicating a fall towards the pond. There was a marked dog-leg in its otherwise linear course. At the junction with the pond a partial longitudinal section was obtained, and here the bottom level was at 33.30m OD and it sloped steadily down into the pond.

The leat contained a primary fill, 0.10m deep, of water deposited sandy or clayey silts with moderate gravel inclusions. This was overlain by up to 0.50m of sandy clays and red-brown sands with variable densities of gravel inclusions and some poorly defined tip-lines, which was probably a result of deliberate backfilling. At the junction with the pond a primary fill of orange-brown sandy clay merged into the blue-grey sandy clay of the permanently waterlogged pond silts.

The third leat (Phase 3)

The third leat was from 4.60m to 5.50m wide, broadening towards the north (Figs 6.2, 6.3c and 6.5, section a–a', 6951 phase 3). Along the eastern side there was a double edge formed by a deposit of red-brown sand or grey sandy clay with some pebbles and small pieces of limestone, from 0.30 to 0.80m deep with a steep to near-vertical inner face. In the sections to the north this was seen to sit on a slightly shallower shelf, and it did not have the characteristics of natural silting. It is most likely that it formed a deliberate backfill, perhaps behind a vertical timber revetment of the leat edge, although no stake or postholes were located. One possibility is that the leat was found to be too wide for the water flow and was made narrower. The western side of the leat was also steep-sided. The basal levels varied between 33.25m and 33.35m OD, but with no consistent fall towards the north.

At the end of ditch system 3, the western side of the leat

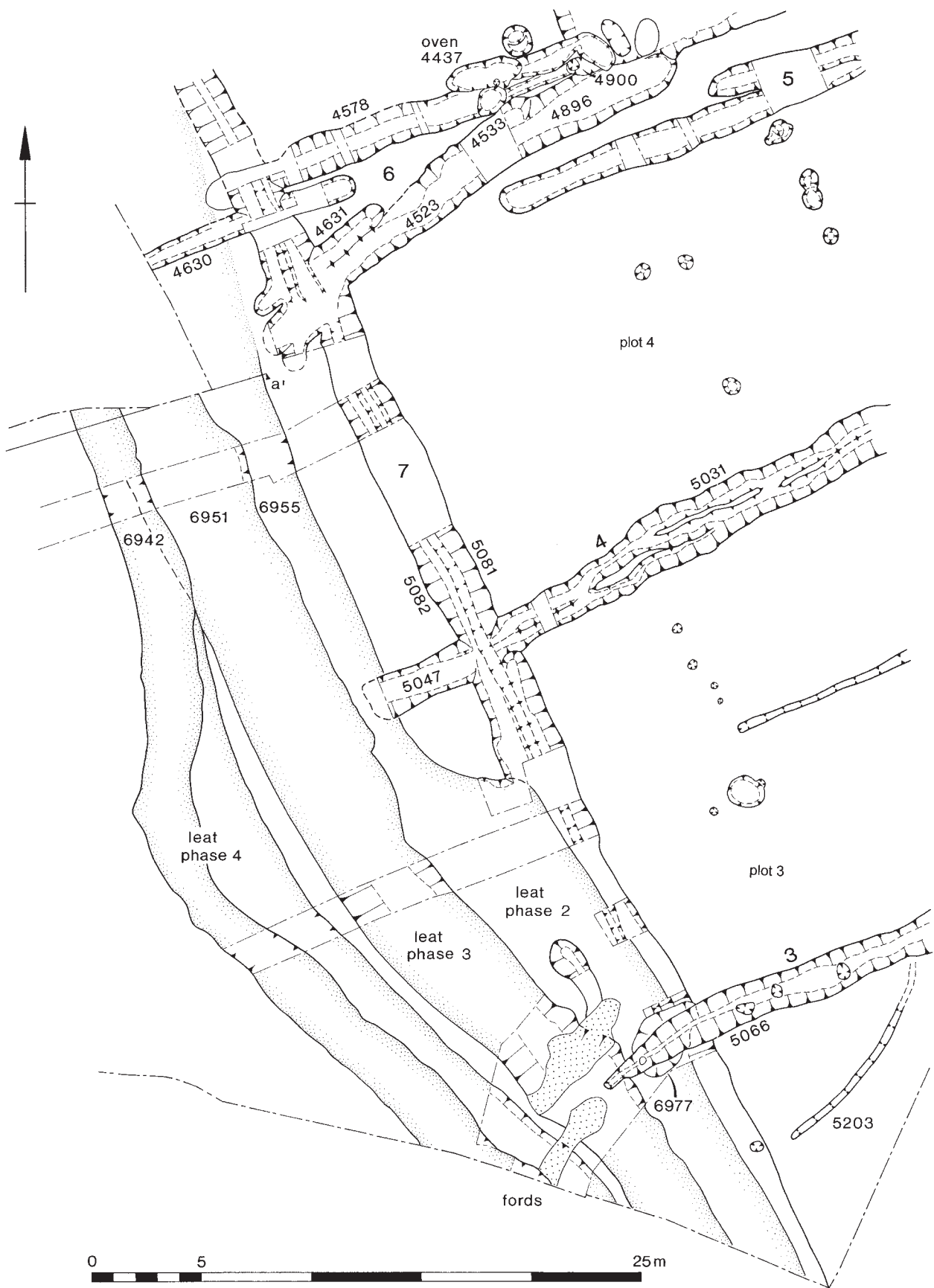


Fig 6.2: The watermill system; the western leats and boundary ditches

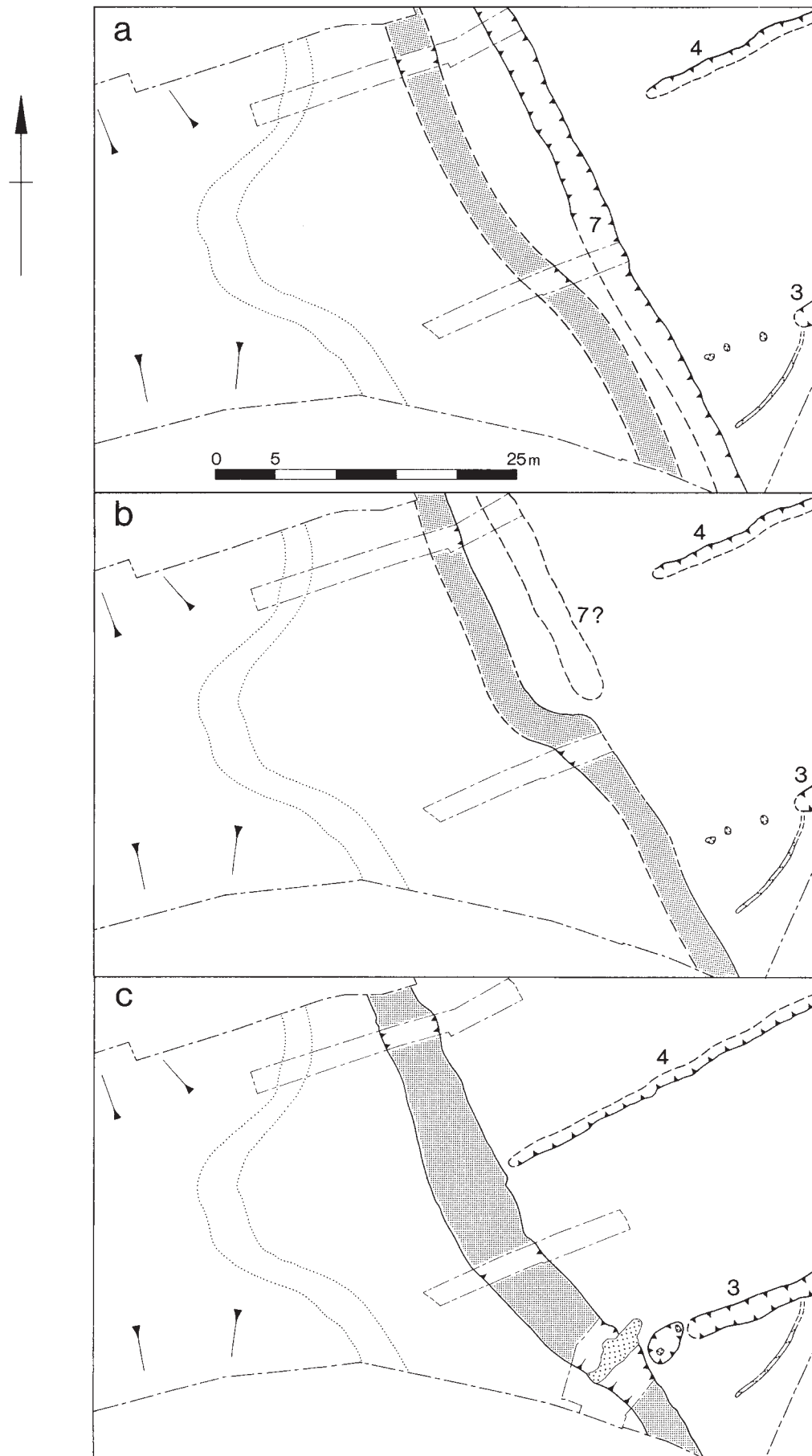


Fig 6.3: The watermill system; the early development of the western leats; a) earliest mill leat and boundary ditch (7), b) second mill leat c) third mill leat, with metal ford

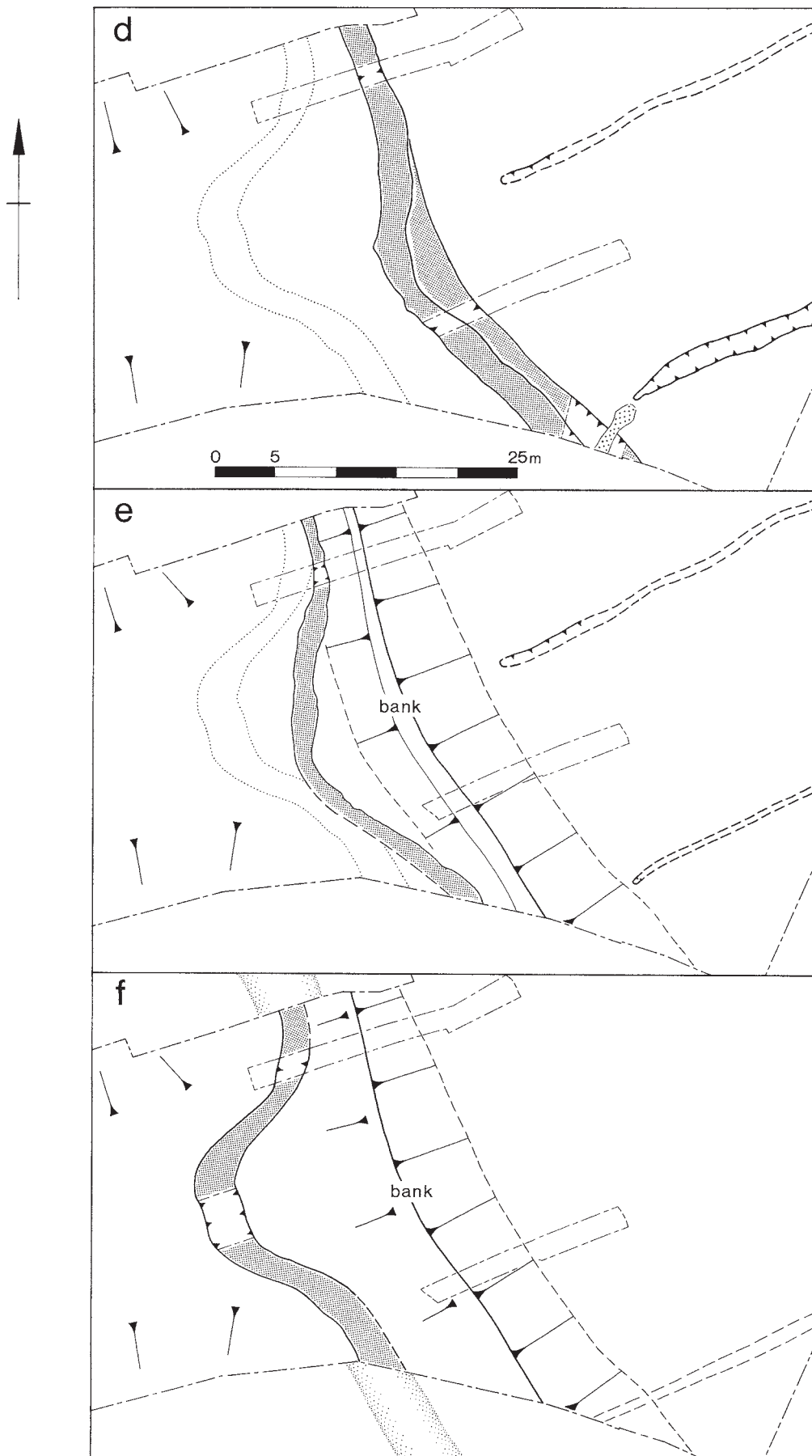


Fig 6.4: The watermill system: the later development of the western leats; d) final leats, with metal ford, e) flood bank and watercourse, f) flood bank and later watercourse

had a shallow slope. Above a primary fill of up to 0.10m of mixed sandy silts with some ironpanned sand and gravel, there was a 2.00m wide metalled surface of limestone set across the width of the leat, apparently forming a surfaced ford (Fig 6.2). The basal layer comprised a scatter of large, flat-lying limestone slabs, up to 500mm long, while the upper surface comprised closely-set, flat-lying slabs of limestone, up to 400mm long, heavily water worn and ironstained (Fig 6.6). Within the leat the surface was near horizontal, and to the east it climbed up the side of the leat within a shallow ramp cut into the leat side. A comparable western end may have been removed by a later leat. Up to 0.10m of sandy silts with fine gravel inclusions overlay the margins of the original surface and were sealed by an upper limestone surface. This was also up to 2.00m wide, and to the east it too climbed up the side of the leat onto the adjacent ground surface (Fig 6.6). Within the leat it had a slightly domed surface of closely set pieces of limestone, up to 300mm long, with an infilling of limestone chips. The surface was water worn and ironstained.

The fourth leat (Phase 4)

The fourth leat was both shallower and narrower than its predecessors, at 2.20m wide with a broad flat bottom, by 0.30m deep, bottom level 33.65–33.80m OD (Figs 6.2, 6.4d and 6.5, section a–a', 6942 phase 4). To the north only a single cut was recognised, but at the fording point there were successive cuts. The earlier phase had a double eastern edge formed by a band of clayey loam set against the leat side. To either side of the limestone surfaced ford this deposit was retained by large slabs of limestone, up to 450mm long, pitched near vertically to form a revetment. The limestone surface of the ford was up to 1.60m wide and comprised closely-set flat-lying slabs of limestone, up to 300m long, all heavily water worn. The surface was partially covered by ironpanned sand and gravel, no more than 30mm thick (Fig 6.6). To the east the surfacing continued up the side of the leat and across the fills of the preceding leat for 2.00m, although here it consisted of disordered slabs and blocks of limestone up to 0.60m long.

It is suggested that the more sinuous course of this leat, and the fact that it was much narrower and shallower than its predecessors, may indicate that it appeared once the problems of flooding and alluviation were already underway, and it might post-date the abandonment of the mill system but pre-date the construction of the flood banks.

The millpond

The southern margin of the millpond lay within the main excavation area and was partially investigated by a combination of machine and hand-excavation (Fig 6.7). The western end lay within a detached, machine-cut trench to the north-west. This area had been investigated before the mill system was located, and the trench had been opened

in the hope of finding a watermill complex. As a result, the complex palimpsest of successive pond, river and stream silts that were revealed in plan were not fully understood at the time, and can now be only partially interpreted retrospectively (Fig 6.8)

The available evidence suggests that the pond was 40–45m long and 20m wide at its western end. It was probably narrower to the east, with a pear-shaped plan. At the western end the flat bottom of the pond was at 32.30m OD. The bottom level lay 1.50m below the ground level to its south, 0.85m below the lowest point of the first western leat and 0.80m below the highest point on the head race of the earliest mill (M27). This indicates that a depth of water in excess of 0.80m would have been required to provide a water flow to the mill, while a depth of at least 1.00m can be suggested as the minimum for the practical functioning of the early mill. With an original surface area of 500 square metres the water capacity of the pond would have been 500 cubic metres, or around 110,000 gallons.

The western end of the pond contained up to 0.50m of blue-grey tenacious clays, and this accumulation would have raised the base of the pond to above the bottom of the head-race for the second mill (M26) and only slightly below the bottom of the final head race (M25). Most of this accumulation must therefore have occurred no earlier than the use of the final mill and much of it probably after the abandonment of the mills, as otherwise the pond would have had no storage capacity to feed the mills.

The northern side of the millpond lay closely adjacent to the contemporary river channel. The machine-cut trench at the north-western end of the pond indicated the presence of a 3.00–3.80m wide ridge of earlier river silts, capped with up to 0.20m of dumped mixed sandy and clayey silts with gravel, separating the pond from the contemporary river channel (Fig 6.7). The ridge was narrower to the north-east, and it is suggested that the excavated part lay at the western end of some form of overflow from the pond into the river, perhaps either a simple weir or a more elaborate timbered sluice, but no evidence was recovered to determine which.

While the western end of the pond was apparently kept open to near its full depth and width throughout the lifetime of the mills, the sequence of silting and recutting at the eastern end indicates that the pond was not kept fully scoured here, so that there was a progressive retreat of both the eastern end and the southern side. Contemporary with the final mill (M25), the effective length of the pond had been reduced to around 20m, half its original length.

The eastern end of the pond was cut into earlier water-deposited silts of Roman date which may have lain along the southern margin of the river channel. The presence of these underlying silts and the disturbance of the early pond silts by the later leats made it difficult to identify the respective phases of activity in plan excavation. In particular, it is not possible to state with certainty the means used for controlling the outflow from the pond into the head races, as no certain sluice gate foundations had survived at the junction of the

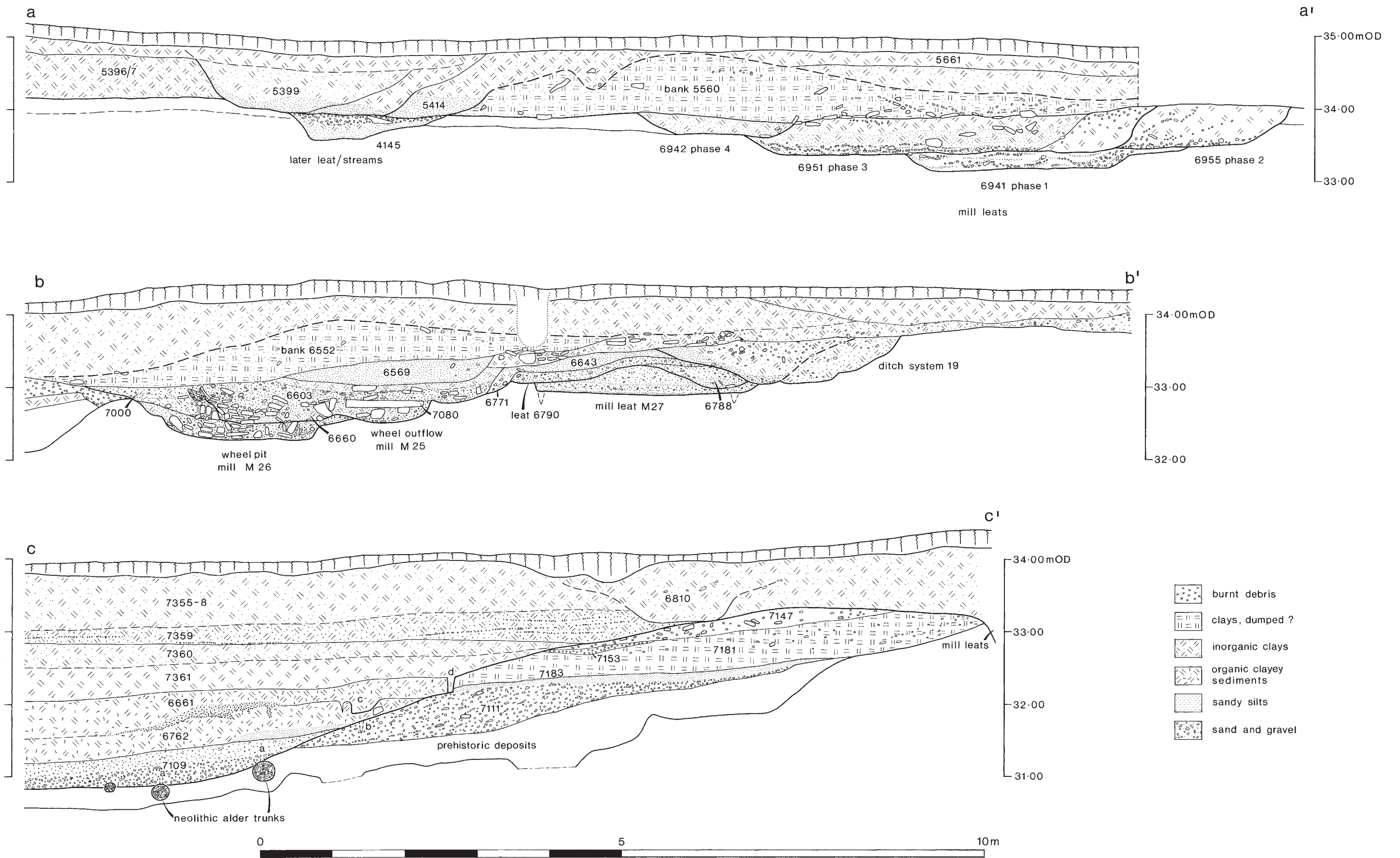


Fig 6.5: The watermill system, sections; a) the western mill leats, the flood bank and late watercourses, b) the watermills and the flood bank, c) the river channel, riverbank and overlying alluvium



Fig 6.6: The limestone metalled fords on the western mill leats, looking south

pond and the successive leats, and there was no surviving evidence for the provision of bypass channels. It seems most likely that there had been controlling sluice gates at the eastern end of the pond, but that the evidence had either been lost or lay beneath one of the several unexcavated baulks (Figs 6.7 and 6.9). Alternatively, water was free to flow from the pond into the head races, with control of the flow only exercised at the eastern end of the head races.

The only dating evidence from the millpond came from pottery within a dumped layer of mixed occupation debris (Fig 6.7, 6905) filling the subsidence hollow over the accumulated pond silts. This group of 23 sherds is dated to the earlier twelfth century (ph 0, 1100–1150).

The watermills (AD 950–1150)

The series of head races, watermills and tails races formed a complex stratigraphic sequence, containing water-deposited silts, dumped backfills and numerous cut features that had held elements of the timber mill structures that had later been removed. In addition, the area had later been buried beneath the dumped clays of a flood protection bank and accumulated alluvial silts, so that the deepest parts of the mill system lay over 2.00m below ground level.

The mill sequence is therefore only interpretable as a

result of excavating it within what became, after a series of extensions, a single open area 35m long (Figs 6.8–6.10). The later mills (M25 and M26) were excavated in 1988. The head race feeding the first mill (M27) was recognised and excavated at the end of the 1988 season. In 1989 the area was extended eastward in two stages to uncover the wheel-pit and tail race of the earliest watermill.

The first watermill (M27)

Although the pottery evidence is scanty, the presence of a St Neots ware, T1(3)-type bowl rim within the wheel-pit revetment suggests a construction date in the second half of the tenth century (ph LS2, 950–975), while a Cotswold Oolitic sherd from the earlier silts of the head race suggest that it was in use until the end of the century (ph LS3/1, 975–1000). The absence of any later pottery suggests that the mill was abandoned and the leats backfilled at the end of the tenth century and this is supported by the eleventh-century dates (ph LS3/2, 1000–1100) for the earliest phase of ditch system 19, which was cut into the mill backfills (Fig 6.9). A displaced hazel stake, presumed to have come from the wheel-pit revetment was submitted for radiocarbon dating but the 8th–9th century date obtained suggests that it was residual from the middle Saxon usage of the adjacent river channel (see Chapter 9, UB-3322).

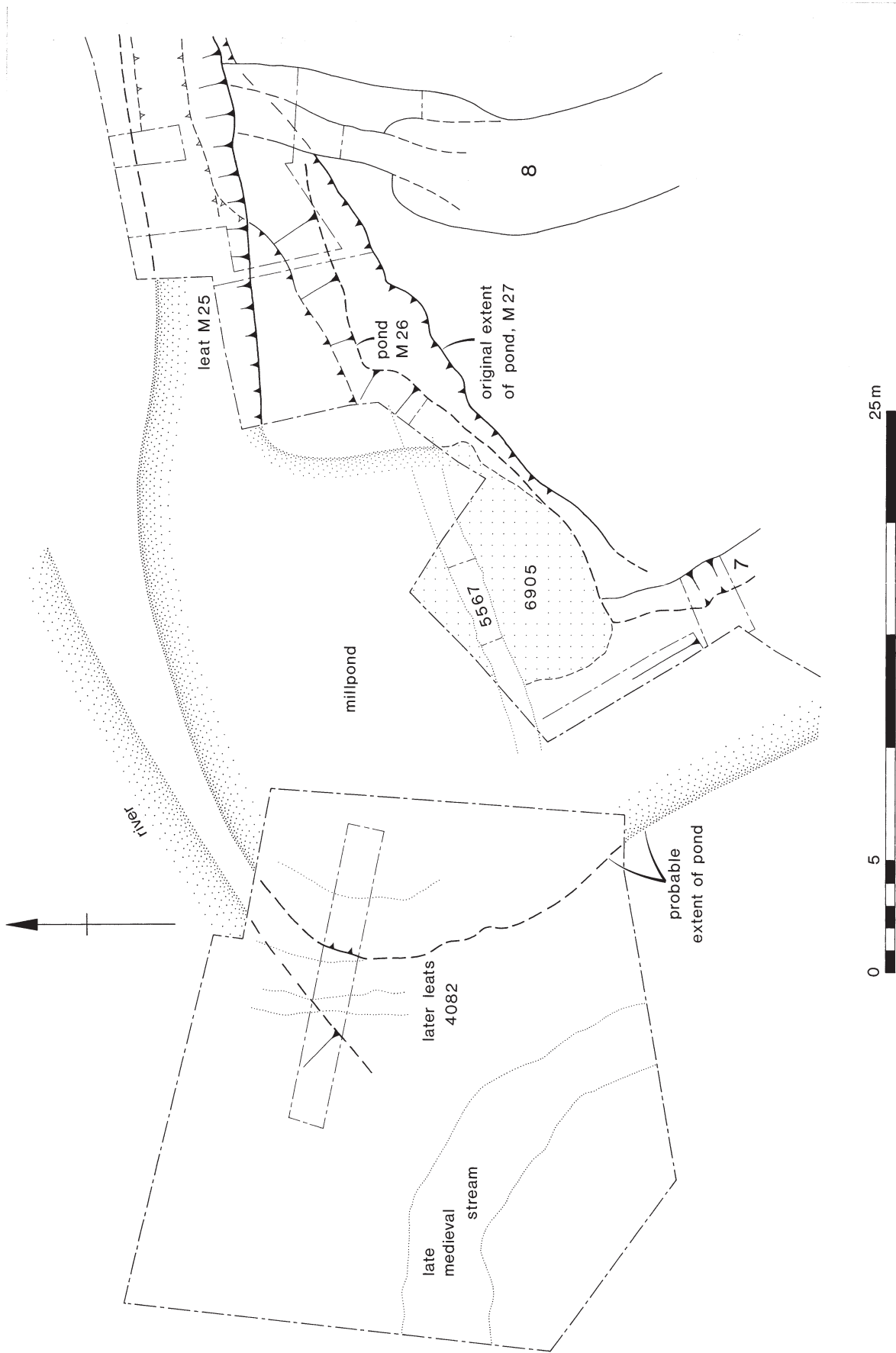


Fig 6.7: The watermill system; the mill pond, general plan



Fig 6.8. The watermill system: the early development of the pond and mills; a) the vertical-wheeled mill, M27, b) the leat system, 6790; probably no functioning mill, c) the second, horizontal-wheeled, mill, M26

The head race

The eastern end of the pond was some 0.20–0.30m deeper than the western end, bottoming at 32.00–32.10m OD, and was 1.90m deep. A shallow hollow, 0.08m deep, filled with limestone fragments, at the base of a 0.30–0.40m high step in the pond floor provided the only evidence for the expected provision of a sluice to control the water flow into the head race, but the feature was too poorly preserved to provide any details of its form (Fig 6.8a).

The head race was a broad flat-bottomed leat, 26.5m long, but for most of its length the northern side had been lost (Figs 6.5, section b–b', mill leat M27; 6.8a and 6.9). At the eastern end it was 2.90m wide at the base, but it was then already tapering towards the dam and sluice (Figs 6.10 and 6.11), so it must have generally been at least 3.10m wide.

The surviving depth of the truncated leat and its fills was typically 0.20–0.40m and never more than 0.60m, although its original depth would have been around 0.85m. The base of the leat was uneven but slightly concave, being up to 0.10m deeper at the centre, presumably as a result of water scouring. The natural gravel on the leat bottom was reddened by ironstaining and hardened by ironpanning, and there was a general fall of 0.30m between the pond and the sluice.

The presence of closely-spaced stakeholes in the base of the leat along the entire southern side and the surviving part of the northern side, indicate the provision of continuous timber revetments between the pond and the sluice (Figs 6.9 and 6.11). The stakes were quite regularly spaced, with an average of 0.44m centre-to-centre, a range of 0.35–0.55m. For the final 8.0m approaching the sluice gate, where the leat was tapering and the speed of the water-flow would have increased, they were slightly more closely-set, averaging 0.37m centre-to-centre, a range of 0.30–0.45m (Fig 6.12).

The stakeholes were typically 150–200mm deep, and 70–80mm in diameter, and tapered to blunt points, indicating that they were the impressions of driven stakes, although no remains of any stakes were recovered. The stakeholes were all filled with light grey silty sand. In many instances the stakeholes were visible as loose silty fills containing small voids within the compact and often partially ironpanned leat fills for up to 0.30m above the base of the leat. Along much of the leat there was also a 100mm thick band of fine silty sand against the near vertical leat side. This silting had probably filled a void left by the decay of the revetment retained by the stakes. No evidence for the nature of the revetment was recovered, but it must have consisted either of planking or wattles and, given the survival of wattles within the wheel-pit, the latter suggestion may be preferred.

The primary fill of the leat comprised up to 0.10m of sandy to clayey silt mixed with some coarse sand and fine gravel. It was sealed by a comparable depth of coarse, gritty sand with pebble inclusions partially consolidated by ironpanning. Above this, there was a repetition of the

same sequence of fine and coarser silting, with the coarser upper fill again partially consolidated by ironpanning. These deposits derive from successive phases of use, which may equate with the two phases of wheel-pit.

The final leat fills comprised a water-deposited silty clay with some pebble inclusions and a few small to medium fragments of limestone, indicating a third period of water deposition. This was sealed by a layer of gravel in a sandy matrix, completely consolidated by ironpanning, which appeared to be a deliberately dumped backfill.

The mill

The mill comprised three structural elements and, by analogy with the well preserved mill, dated to the eighth century, at Morett in Ireland (Lucas 1954, 15–23), where the timber superstructure survived, these have been identified as the dam/sluice, the feeder chute, and the wheel-pit (Figs 6.12–6.14 and Plate 6).

The dam/sluice

At the constricted, 1.90m wide, eastern end of the head race the provision of a timber dam/sluice was indicated by a pair of shallow transverse slots (Figs 6.12, 7226 and 7227; Fig 6.15). The western slot (7226) was 0.26m wide by 0.10m deep, with near vertical sides and a flat bottom. It had sub-square terminal postholes, 0.17m diameter and 0.37–0.40m deep, tapering to blunt points. Within the southern posthole there was a partial void and the decaying base of an oak post, up to 250mm long by 60mm thick, but clearly shrunken and distorted as a result of drying. Above this the hole was sealed by consolidated gravel pierced by a rectangular opening measuring 100mm by 60mm, providing minimum dimensions for the original post. It is assumed that horizontal timbers would have been retained between the two posts to form the western end of the dam/sluice arrangement.

The second slot lay 1.70m the east, and was 2.00m long by 0.74m wide, with the ends slightly recessed into the leat sides (7227). It was 0.10m deep, with an irregular central deepening to 0.18m. Several medium to large fragments of limestone lay on the base of the cut along with part of a millstone. This was thicker than the other stones but rested partially within the central deepening, so that the upper surfaces of the stones were near level. The millstone showed little, if any, signs of use, and may therefore have been broken or faulty, explaining its reuse in the mill structure. A smaller, joining fragment was recovered from the fill of the revetment slot along the northern edge of the tail-race. The stone filling of this second slot is assumed to have been a base for a horizontal timber or sill forming the eastern end of the dam/sluice.

The sunken area between the two slots was 1.60m wide and near level, at 32.89m OD. The natural sand and gravel was not reddened and hardened by ironstaining and panning, indicating that the water was carried above this



Fig 6.9: The watermill system; general plan of the mills and the riverbank



Fig 6.10 : General view of the mill complex, looking east, after excavation of the third mill, M25 (centre, no baulks), with the second leat and mill, M26 (left) and the first leat, M27 (right) with the first mill still to be uncovered (top right)



Fig 6.11: The first watermill, M27, looking west, showing the stakeholes along the edges of the leat, partly marked with modern posts (top left)

within a timber superstructure running between the two slots. A post-pit towards the southern side was oval in plan, 0.80–0.90m in diameter by 0.26m deep (7228). A sharply defined rectangular deepening in the base, 0.46m long by 0.24m wide and 0.04m deep, may have held a rectangular post, measuring 0.40 by 0.20m, perhaps relating to the control of a sluice gate.

The feeder chute

A timber chute would have occupied the space, 4.70m long, between the dam/sluice and the wheel-pit. This area was 1.80–2.20m wide and 0.10–0.15m deep. Beneath it there was a steep-sided cut (Fig 6.13b, 7308), 1.00–1.40m wide and up to 0.35m deep, which terminated beneath the eastern transverse slot. The homogeneous fill of clean gravel and sand, very similar to the underlying natural, indicates that it was deliberately backfilled soon after it was cut and no purpose related to the functioning of the mill can be ascribed to it. It is suggested that it may have provided an access ramp into the wheel-pit during construction, which was

backfilled before the sluice gate was constructed. The gravel in this area showed no signs of reddening and hardening from ironpanning, indicating that the water had been carried above this level in a timber superstructure, the feeder chute. Immediately adjacent to the dam/sluice there were the rounded terminals of two shallow slots (Fig 6.12, 7313 and 7314), 0.25m wide by 0.08m deep, and set 0.50m apart. They ran eastward for at least 0.40m, but further east they had been removed by later activity. They may have held sill beams supporting a timber chute, which would have been at least 0.70m wide.

The wheel-pit

As a result of later activity, the ground level around the feeder chute and the wheel-pit had been lowered by some 0.70–0.90m. As a result, any evidence for the extent and nature of the mill house or of any supports for the wheel itself had been lost. However, there were two successive wheel-pits.

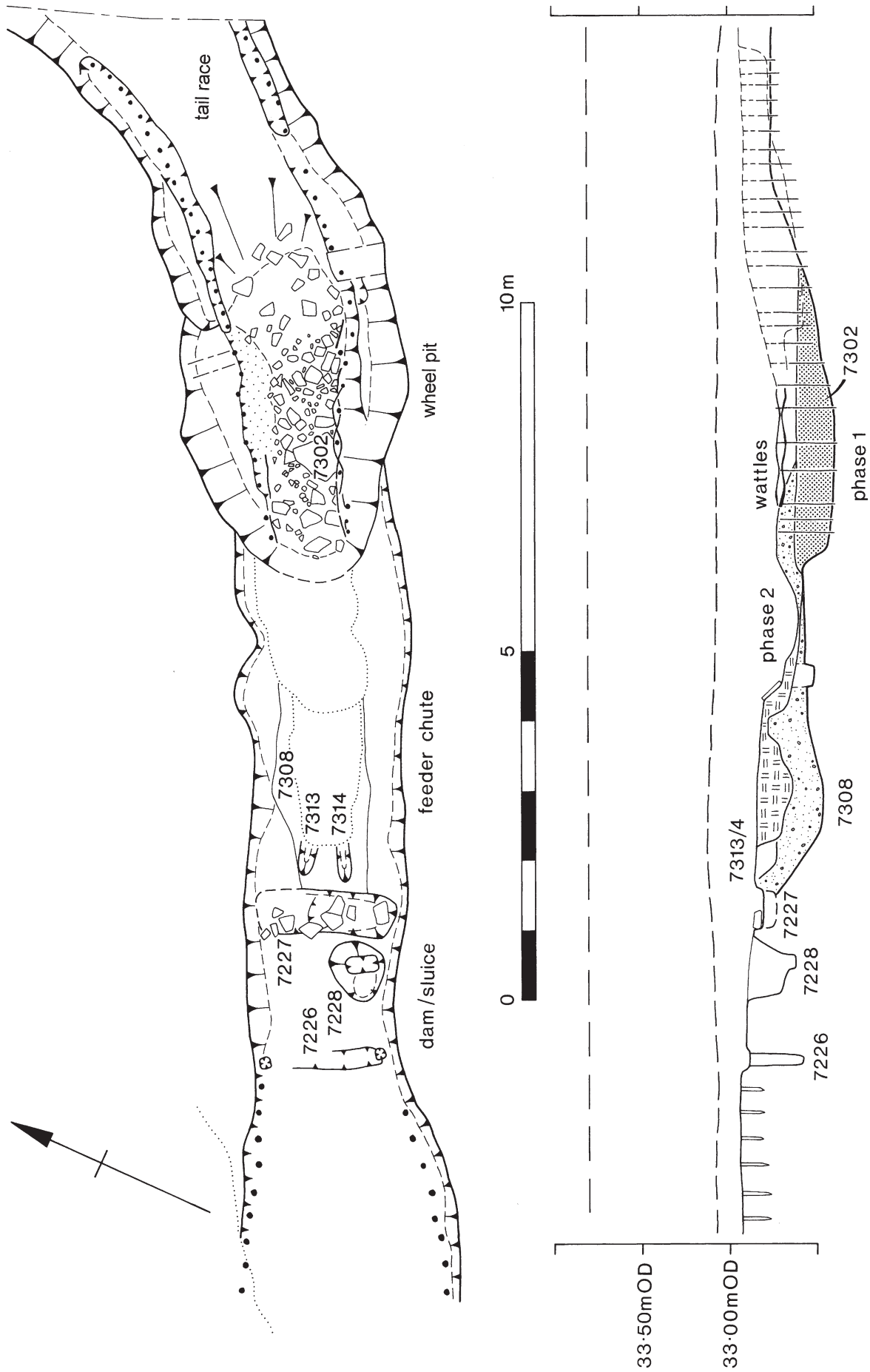


Fig 6.12: The first watermill, M27, with reconstructed longitudinal profile (exaggerated vertical scale)

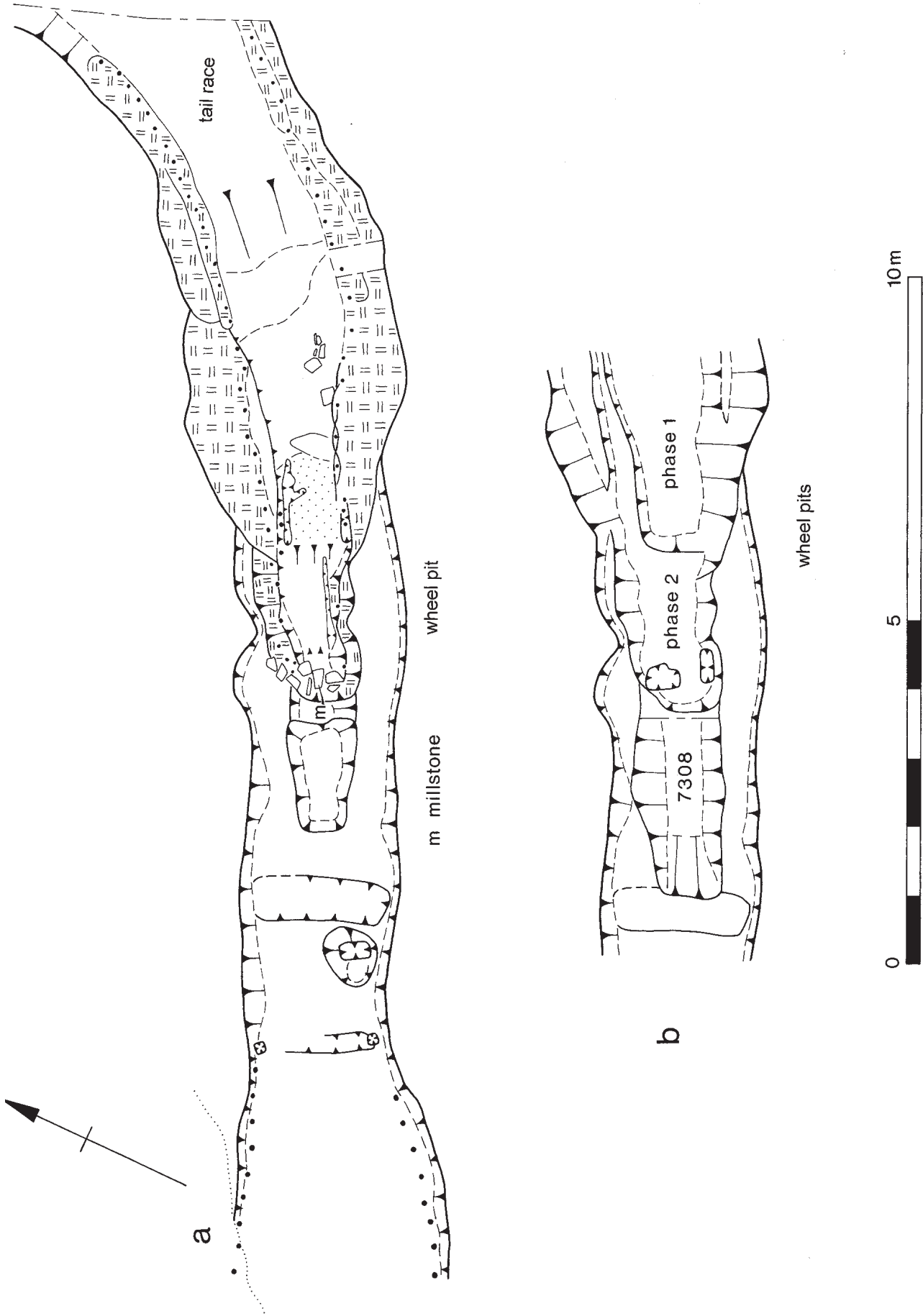


Fig 6.13: The first watermill, M27, a) second phase and b) construction pits

Phase 1

The original pit was up to 3.20m wide, but with shallowly sloping and stepped sides, and survived to a depth of 0.55m, bottom level 32.41m OD, the deepest part of the mill complex (Fig 6.12, section and 6.13b, phase 1). Both sides of the wheel-pit were provided with revetments of closely-spaced stakes and wattles. To the west the revetments were 1.00m apart, but they diverged slightly and then more rapidly to lie 1.80m apart at the junction with the tail race revetments. The former stakes were largely defined by voids within the clay backfill, although in two instances decayed stakes, in oak and *Pomoideae* type (Hawthorn/apple *etc*), survived *in situ* (Fig 6.16). Along the southern side the stakes had been driven 50–100mm into the base of the construction pit, while to the north they were driven to a comparable depth into a lower ledge on the side, which stood 0.15m above the base of the pit. The westernmost stakes were closely set at 0.20–0.25m intervals, but to the east the spacing increased to 0.30–0.45m. The best preserved stake voids were 30–35mm in diameter. Few of the voids were anywhere near vertical, indicating that there had been later displacement and collapse of the revetments.

Decaying remnants of wattles interwoven between the stakes survived along a 2.50m length of the southern revetment (Fig 6.17). They stood to a maximum height of 150mm and comprised withes 15–25mm thick, identified as *Corylus* type (Hazel/alder), perhaps indicating the use of a mixture of available woods rather than the use of a single species obtained from systematic coppicing. The longest continuous withy was 1.25m long, and a few others around 1.00m long were also observed.

The gap between the stake and wattle revetments and the sides of the construction pit was partially backfilled with mixed deposits of grey sandy loam and clay, with frequent inclusions of pebbles and limestone chips. This was sealed by a more compact upper layer of grey sticky clay. In places there appeared to be two phases of backfilling along the northern side, suggesting that this revetment had been refurbished. The upper level contained some fragments of broken millstones.

Limestone metalling (Fig 6.12, 7302) ran along the base of the wheel-pit for 4.70m. It was heavily water-worn, ironstained and concreted by ironpanning. To the west it comprised closely-set, flat-laid slabs and fragments of limestone, typically 150–300mm long and from 10–20mm thick; but including a single large block that measured 650 by 600mm. To the east the surface was patchy. The limestone surface was 1.00–1.20m wide, with an additional strip, 0.40m wide, along the northern side surfaced only with gravel pebbles and small fragments of limestone. It is suggested that this latter area may not have formed part of the base of the pit exposed to water action, and that it may have been sealed by some lost structural element, perhaps a horizontal timber set between the revetment and the surfacing.

The metalling was uneven but roughly level, at 32.60–32.65m OD. The floor of the pit was therefore 0.30m below the base of the chute area. An upper surface of pebbles, cobbles and some smaller fragments of limestone, probably resulting from resurfacing, also contained several water worn fragments of Millstone Grit and lava millstones. All but the very eastern end of the surfacing was sealed by a thin layer, 0.05m thick, of light grey sticky clay mixed with some grey silty loam.

Phase 2

In the second phase the wheel-pit lay 2.00m west of its predecessor, but was less well preserved. It was formed by backfilling the sunken base of the western end of the original wheel-pit with clean gravel and orange sand, and cutting into the eastern end of the feeder chute area (Figs 6.12 and 6.13a). The surviving evidence suggests that the sides were retained by stake-supported revetments, but along the southern side only two stake voids were identified, while to the north there were three well preserved stake voids, 50–60mm in diameter, and a further four less well-preserved examples. At the western end pairs of stakes appeared to have been set within two shallow rectangular pits (Fig 6.13b), 0.05–0.08m deep, rather than being driven into the base of the construction pit. Behind the revetments and against the sides of the construction pit there was a backfill of sand and gravel sealed by firm grey clayey loam.

The spacing of the stakes indicates that the wheel-pit had a maximum width of 0.80m, some 0.20m narrower than its predecessor. At the western end there was a curving setting of stones with the central three inclined at 30–45 degrees. They were largely limestone slabs but the central stone was a fragment of Millstone Grit. The floor of the wheel-pit was not surfaced, and it had a concave longitudinal profile with a shallow linear hollow, 1.40m long, 80mm wide and 60mm deep, along its southern margin. Short lengths of shallow slot also lay along either side of the tail race immediately to the east.

The closely spaced stake voids within the southern slot were in-line with the original southern revetment and suggest that this had been retained and perhaps refurbished at this time. The slot to the north, typically 100mm wide by 60mm deep, which contained two stake voids, was set inside the line of the original wheel-pit revetment.

The grey black loam that filled the hollow of the second phase wheel-pit and also extended eastward into the tail race, contained frequent pieces of semi-decayed wood largely in the form of long thin withies, these were presumably derived from collapsed and decaying wattles. In addition, a small piece of spindle wood showing signs of working was recovered from these fills, and was perhaps a remnant of the mill mechanism, possibly a cog-tooth, indicating the selection and use of a particularly hard wood for elements of the mechanism subject to extreme wear.



Fig 6.14: The first watermill, M27, looking west (upstream), with the leat and dam (top, marked with modern posts and plank), and the wheel-pit fully excavated to show slots containing stakeholes (foreground)



Fig 6.15: The first watermill, M27, showing the tapering head race and the dam/sluiice, looking west (upstream)

The tail race

Roughly in line with the eastern end of the surfaced length of the original wheel-pit, there was a change in the revetment construction (Fig 6.12). The base of the tail race sloped up by nearly 0.20m, to 32.77mOD, and remained near level further to the east, although there was considerable difficulty in accurately defining the base of the tail race due to the merging boundary between undisturbed gravel and the primary fill of clean sands and gravel mixed with grey silty clay. This gave the impression that the natural gravel floor had been churned-up and mixed with water deposited silts, probably a result of the swirling and turbulent water emerging from the wheel-pit. For the first 2.60m the tail race revetments were closely parallel, at 1.8m apart, but beyond this they diverged, and were 2.20m apart at the north-eastern end of the excavated area.

Although the original wheel-pit and tail race revetments appeared to be continuous, with no appreciable change in alignment or the spacing of the stakeholes, the tail race revetments were set within shallow slots, 0.15–0.30m wide by 0.07m deep. The northern slot was 4.60m long, with clearly defined terminals. The slots were filled with mixed grey clay and sandy silt with pebble inclusions, and were capped with homogeneous sticky grey clay free



Fig 6.16: The first watermill, M27, the metalled wheel-pit with modern pegs in stakes voids, looking west (upstream)



Fig 6.17: The first watermill, M27, the preserved stake and wattle revetment

of inclusions. The narrowest length along the northern side also contained a packing of cobbles and limestone, while a single fragment of millstone beside the western terminal joined with a larger portion used in the dam/slucice construction. The stakeholes were typically seen as voids, 30–35mm in diameter, within the slot fill, and they had also been driven 50–100mm into the underlying natural gravel. Along the southern side the stakes were spaced at 0.35–0.40m intervals, while to the north they were typically more closely set, at 0.25–0.30m intervals.

Further to the east the side of the tail race were not supported by revetments. Here the tail race was 3.20m wide and it curved towards the north, presumably to debouch into the contemporary river channel at its junction with the old and redundant northern stream channel.

The vertical-wheeled watermill

The use of an undershot vertical wheel within the earliest mill was indicated by the narrow and shallow channel of the wheel-pit. A simple reconstruction of the basic arrangement of the head race, the dam/slucice, the feeder chute, the wheel-pit and the tail race is based on the evidence provided by one of the few excavated examples of an early vertical-wheeled watermill at Morett, County Laois, Ireland (Lucas 1953), dated by dendrochronology to 770 AD. Here the timber structures of the three main elements were recovered largely intact and the close comparability of general form and dimensions suggests that this mill can be taken as a

model for the West Cotton mill (Fig 6.18). The succession of four mills at Bordesley Abbey also repeats the same basic design (Astill 1993).

At Morett, the dam/slucice comprised converging side beams that held a boarded floor and uprights with vertical boarding set in rebates, although these latter elements had not survived. The side beams were dovetailed into a major transverse timber baulk, and a second timber had originally lain above. These probably held a movable board forming a simple controlling sluice at the end of the dam. The dam/slucice arrangement at West Cotton was shorter but probably of the same general form.

The 4.20m long feeder chute at Morett was hewn from a single timber, with a channel 0.50m wide, which is indicative of the width of the water wheel itself. The chute was only supported by transverse beams at either end, so its presence had left no earth-fast features, and a similar situation pertained in the mill at West Cotton, where the original feeder chute may have been 5.0m long.

At both Morett and West Cotton direct evidence for the precise location of the wheel is lacking. However, at Bordesley Abbey the associated features have been interpreted as indicating that the wheel was centred at the end of the feeder chute, so that the full diameter of the wheel would have spanned the ends of both the feeder chute and the wheel-pit. The diameter of the wheel at West Cotton is unknown, although the minimum width of 1.00m between the wattle revetments indicates that the wheel must have been less than 0.75m wide. At Morett

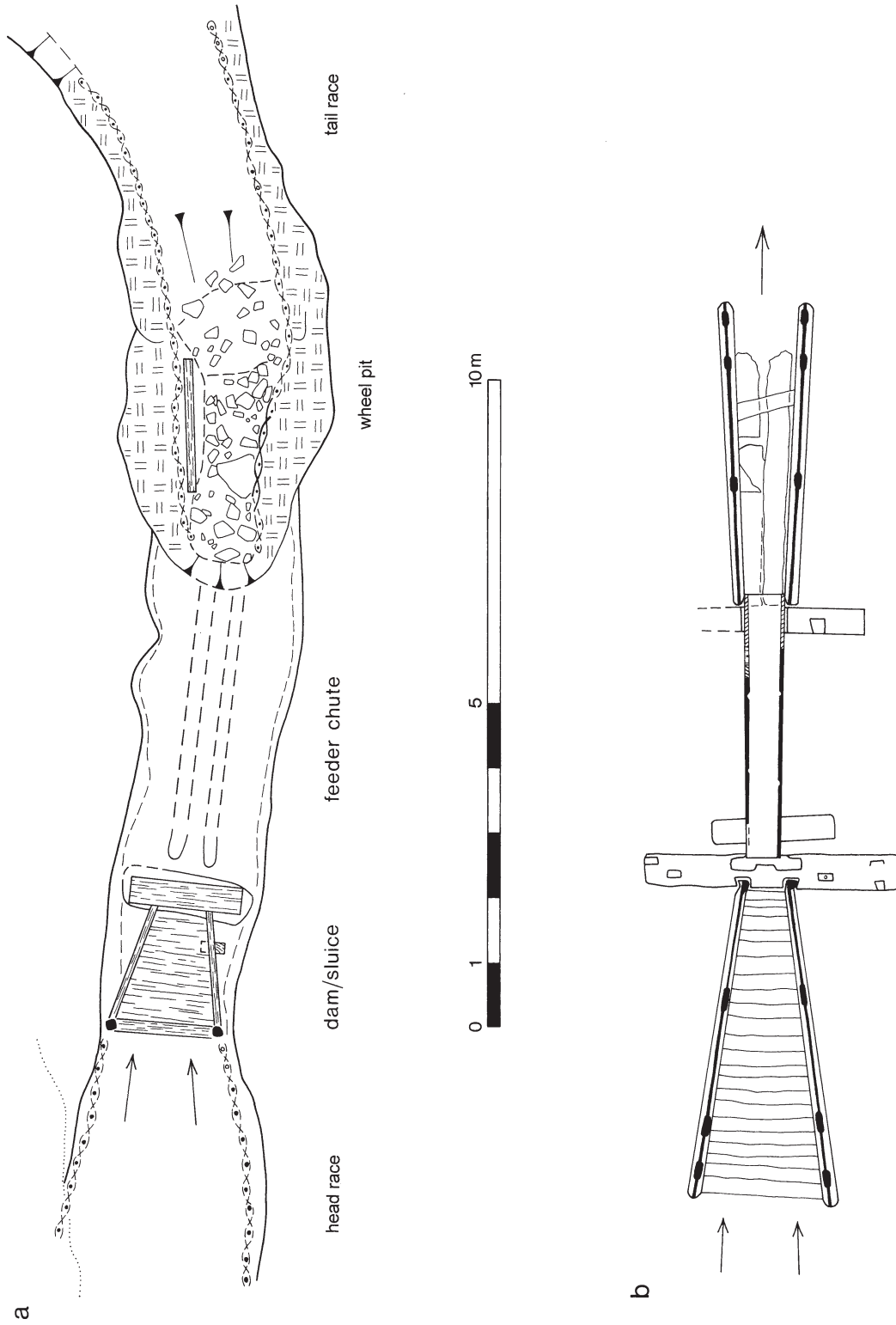


Fig 6.18: The vertical-wheeled watermill; a) West Cotton, reconstructed, b) the late eighth-century mill at Morett, Co.Laois, Ireland

the wheel-pit comprised a pair of slightly divergent side beams with rebates to hold a boarded floor while the side walls, partially surviving, were of boards slotted into rebated uprights.

The West Cotton wheel-pit was apparently of much simpler design, with the sides of wattles woven between closely spaced stakes, while the base of the pit was metalled with limestone and gravel, unless some more elaborate timber structure set within this had been lost. To the east, the progressive widening of the tail race would have reduced the rate and the turbulence of the water flow, so that first the metalling and then the wattle and stake revetment could be dispensed with.

The comparison between the mills at West Cotton, Morett and Bordesley Abbey is striking in the evident close comparability of both general form and scale (Fig 6.18). We therefore have almost the same mill structure reproduced at three sites, two in England and one in Ireland, over a time span of some seven centuries, from the later eighth to the late fifteenth centuries, and used for both corn milling and metalworking. It would seem that this mill form represented the basic design pattern for a small vertical-wheeled, undershot mill; a design that appears to have been widely repeated for several centuries through much of the British Isles and Ireland with only minor variations.

A period of disuse

The high organic content of the dark loam, containing much partially decayed wood, that formed the primary fill of the wheel-pit of the first mill, suggests that it probably formed in waterlogged conditions. This, as well as the semi-collapsed state of the wheel-pit revetments, indicates that the wheel-pit was left open for sometime following the abandonment of the mill and the probable dismantling of the mill building. The subsequent fill within the watermill area and the head race was of redeposited natural gravel and sand, mixed with some grey loam, heavily ironstained and frequently hardened by ironpanning. This was probably a deliberate backfill, perhaps coming directly from the digging of the next phase of leat and boundary ditches.

The second leat lay immediately north of its predecessor, and was broad and flat-bottomed, up to 3.00m wide and 0.20–0.40m deep, although with respect to ground level it would have been up to 0.80m deep (Figs 6.8b and 6.9, leat 6790). Along part of the northern edge of the leat there was a shallow slot, no more than 0.05m deep, which may have held a timber revetment. The mixed fill of sand, gravel and silt was concreted by ironpanning into a solid mass. The new leat was probably contemporary with the formation of a new boundary ditch system, which lay to the immediate south (Figs 6.8b 6788), with both the leat and the ditch system partly overlying and cutting into, the backfilled first watermill (Fig 6.5, section b–b', leat 6790 and ditch system 19).

Along the surviving length of this leat there was no evidence to indicate the former presence of a watermill.

There appears to be insufficient space for such a structure to have lain to the east, and if a mill had lain to the west it would have to have been totally removed by the construction of the final mill (M25). In addition, the base of the leat stood at a higher level than the tail races of both the earlier and the later mills, suggesting that the water was flowing through with little change in level, in contrast to the marked changes in level between the head and tail races of the watermills.

It is therefore suggested that this leat may have been a simple watercourse carrying the outflow from the pond during a period in which there was no functioning watermill. The change in mill technology from the original vertical-wheeled mill to the later horizontal-wheeled mills may therefore be seen to have occurred at a re-establishment of the mill system after a period of abandonment, rather than as a direct rebuilding and replacement of the original mill. The length of the period of disuse cannot be calculated, but may have been years rather than decades, given the limited period of use for the entire system.

The second watermill (M26)

The 53 sherds of pottery recovered from this mill largely comprised undiagnostic St Neots ware sherds, although there is a single sherd of Stamford ware and a single early St Neots ware bowl rim. It is therefore only broadly dated to the eleventh century (ph LS3/2, 1000–1100) but, given the more precise dating available for both the earlier and later mills, a date spanning the first half of the eleventh century can be suggested.

The head race

The end of the pond had apparently retreated westward by at least 5m, with the earlier silts left *in situ* beneath, and with a further accumulation of silts against the southern side, so that the pond edge lay 3.0m further north (Fig 6.7). At the eastern end the pond was 1.40m deep, at 32.40m OD, 0.40m deeper than the shallowest point of the head race. The junction of pond and head race was not defined, but probably lay immediately west of ditch system 8 (Fig 6.7). No evidence was recovered for any sudden change in level or the provision of a timber sluice.

The head race was a broad flat-bottomed leat, 30m long (Figs 6.8c). To the east, where it had suffered less from later disturbance, it was up to 3.00m wide, with a basal width of 1.50–1.80m (Fig 6.19). From the pond the head race initially became shallower, from 1.30–1.00m deep, 32.50–32.79m OD, but then deepened to 1.20m, 32.60m OD, at the sluice. The only evidence for a revetment lay along the final 3.6m of the northern side, where a few stakeholes survived, driven 100–350mm into the base of the leat. The southern side of the head race had been lost, but some isolated stakeholes may have been part of a southern revetment and would indicate a basal width of 1.80m. Two of these stakeholes contained decayed, square-sectioned stakes.

In the base of the leat there was a sub-square pit (Fig

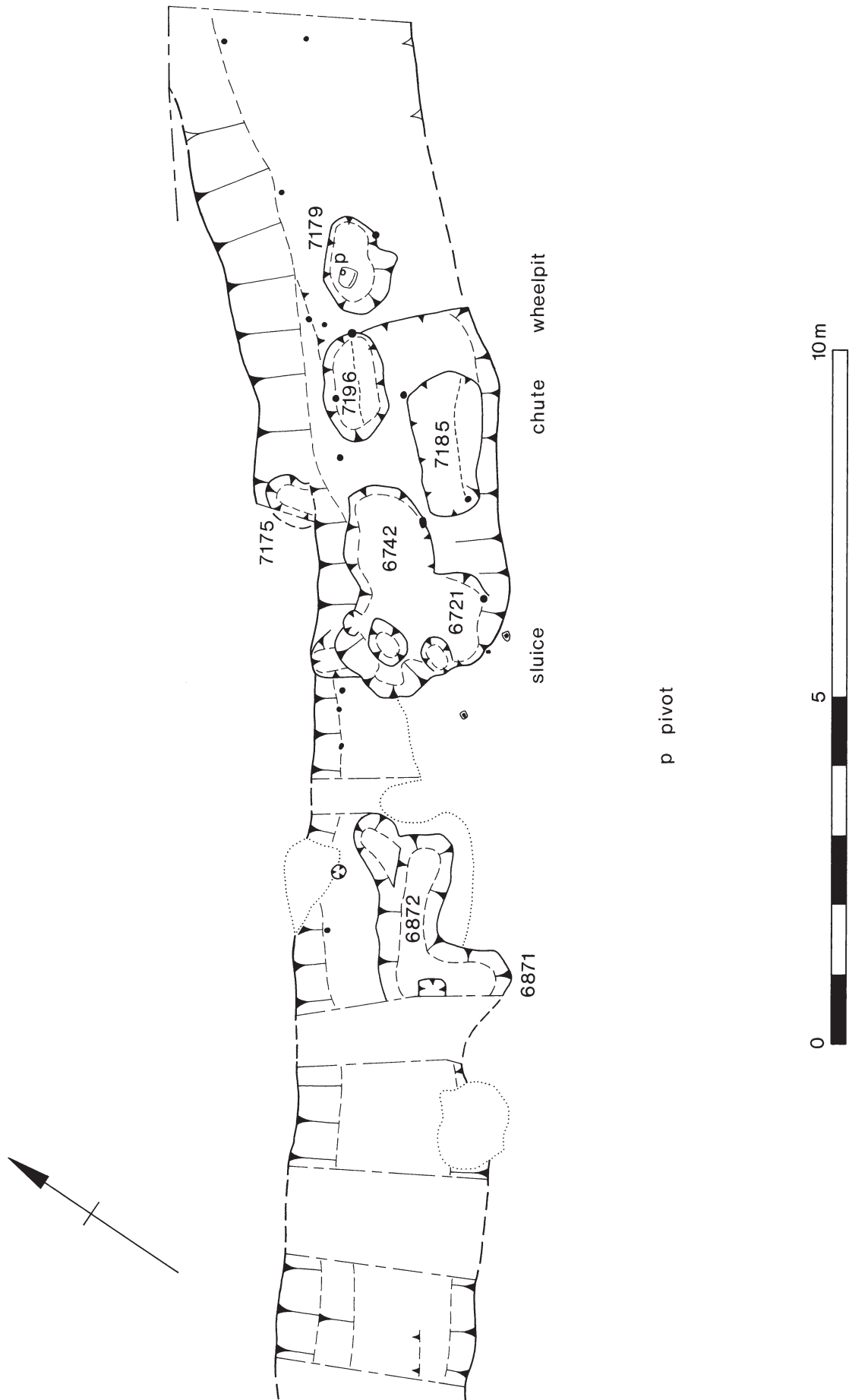


Fig 6.19: The second watermill, M26

6.19, 6871), 1.70m wide and 0.40m deep, and a linear slot (6872), 1.80m long, running along the length of the leat. Both had been filled with mixed sands and gravels prior to the accumulation of any silts within the head-race. It is uncertain whether they were directly associated with the functioning of the mill itself or were truncated earlier features.

The mill

The watermill was very poorly preserved, as it had been extensively disturbed by the construction of the final mill (M25). As a result the features recovered cannot be easily interpreted, but as the general form of the sluice, chute and wheel-pit areas are broadly comparable to the final mill, it too is assumed to have been a horizontal mill (Fig 6.19).

The dam/sluice

At the end of the head race there was a near vertical drop of 0.18m. Two oval hollows at the base, 0.60–0.70m in diameter and 0.10–0.17m deep, were probably the eroded remnants of post-pits supporting a sluice gate. They were both filled with grey clay and gravel and contained some fragments of limestone. A displaced oak stake, 685mm long with a rectangular cross-section of 90 by 35mm (6709, not illustrated), lay with its pointed base partly within the southern post-pit. A sub-rectangular recess to the north, cutting into the side of the leat, may have held the end of a horizontal beam also forming part of the sluice gate.

From the post-pits an elongated hollow (6742), 1.25m wide, ran eastwards for 3.00m, and a shorter hollow to the south (6721) was separated from it by a low ridge. In the northern edge of the leat there was a substantial post-pit (7175), 0.60m in diameter, with near vertical sides and a flat base, filled with clayey loam. A number of limestone fragments may have been displaced packing stones.

The whole of the sluice area was filled with tumbled limestone in a matrix of grey-brown sand and gravel, but this fill probably derived from the demolition of the mill structure.

The chute and wheel-pit

The only surviving evidence in this area comprised two shallow sub-rectangular hollows (7196 and 7185) and a further hollow to the east (7179). Hollow (7196) was 1.60m long, 0.85m wide and 0.20m deep. The northern, outer, half was filled with light grey sandy clay, and there was a near vertical edge between this material and the gravel and sandy clay, containing scattered fragments of limestone, filling the southern half, which may have come in after removal of the horizontal timber beam. The southern hollow (7185), 3.00m long, 1.00m wide and 0.12m deep, had a similar form and fill, with the southern, outer, half filled with grey clayey loam, and a near vertical edge against a fill of limestone in sand and gravel. These two hollows are tentatively identified as having contained

timber beams, set along the length of the leat, which may have supported a timber chute to carry water from the dam/sluice to a wheel-pit.

Along the northern side intermittent stakeholes, from 100–250mm deep and from 50–90mm in diameter, suggest the provision of a revetment.

The only evidence for the wheel-pit location was an oval hollow (7179), 1.40m long, 1.00m wide and 0.20m deep. This contained a square limestone block with a 50mm deep pivot hole on its upper surface (see Fig 11.15, 28). Immediately beyond the pivot stone there was a flat-lying slab of limestone and the remainder of the fill comprised steeply-pitched fragments of limestone tightly packed around the two flat-laid pieces. It is possible that the pivot stone was *in situ* and, if so, it may be postulated that it had held the base of the vertical axle supporting the horizontal mill-wheel. However, it did not appear to be substantial enough for this task, especially as the socket lay at the very edge of the stone block, and it may have been a displaced pivot stone from some subsidiary element of the system. At a more recently excavated and well preserved horizontal-wheeled watermill in stone, at Nendrum, Northern Ireland, the sluice gate had swung on a similar pivot stone (McErlean and Crothers 2007, 94–95)

The tail race

The tail race had been extensively disturbed by later activity. It had a basal width of 2.50m and two *in situ* driven stakes on the northern side, 650mm and 600mm long with square sections of 60mm, may indicate the provision of a revetment.

The abandonment of the mill

The head race had primary silting, 0.10–0.20m deep, of mixed sands, gravel and silty clay. The remainder of the fills all derived from deliberate backfilling with clean sand and gravel, which contained some inclusions of brown sandy silt and pieces of limestone.

The mill area had a more complex sequence of backfilling. It would appear that all the structural elements were removed before the entire area was backfilled with limestone rubble, sand and gravel and some clay to restore the ground level. A lump of charred horse dung, containing straw, oats and wheat came from this rubble dump. To the south of this backfill, a substantial revetment of limestone and clay formed the northern side of the wheel-pit and tail race of the final mill (M25), see below.

The third watermill (M25)

The third mill had a broad wheel-pit containing one of a pair of oak sill beams that would have supported a broad rectangular wheel house (Figs 6.20 and 6.21). This provided a marked contrast to the plan of the original mill, and this new structure is interpreted as a horizontal-wheeled watermill on

the basis of the close comparison in general form to the well known excavated mill at Tamworth, Staffordshire (Rahtz and Meeson 1992) and also to the documented horizontal mills from the Shetlands (Goudie 1886).

Pottery from the clay and limestone around the *in situ* sill beam consisted mainly of T1(2) St Neots ware, along with sherds of Stamford ware and Cotswold Oolitic ware. This indicates a construction date in the eleventh century (ph 3/2, 1000–1100). The clay and stone revetments along the southern side of the wheel-pit and tail race produced a small pottery group indicating that at least a final refurbishment took place into the twelfth century (ph 0, 1100–1150). The fills of the leats and the wheel-pit, the later drainage ditches and the clay flood bank overlying the entire area are also dated to the earlier twelfth century and indicate that these successive changes all occurred within the space of no more than 50 years.

In addition, three radiocarbon dates were obtained from timbers from this mill. An unworked oak trunk within the wheel-pit revetment is dated to the tenth century, and may be regarded as an old timber (cal AD 880–1020; 95% confidence; 1086±29 BP; UB3326). More informative are the dates for an *in situ* post (6691) in the sluice (cal AD 890–1160; 95% confidence, 1014±51 BP; UB3327) and for the *in situ* oak sill beam (cal AD 990–1220; 95% confidence; 941±53; UB3325), which are both centred on the eleventh century.

The combined evidence of the pottery and the radiocarbon dating indicate a construction date for the third watermill at around the middle of eleventh century, with abandonment before the middle of the twelfth century. This would imply that it was this final, horizontal-wheeled mill that was in use at both the time of the Conquest and the Domesday survey. It was, perhaps, the cheaper of the two Raunds mills, worth 12d, as recorded in the Domesday Book.

The head race

The eastern end of the pond had retreated further westward and was not located, suggesting that the pond was then some 20–25m long, only just over half of its original length (Figs 6.7 and 6.20d).

The gently curving head race was 38.0m long (Fig 6.9). Along the western half, which lay west of a high point along the base of the leat, at 33.00m OD, the primary fills of silts and clays were pond-like deposits. To the east of this high point the primary fills were sandy silts with gravel, derived from flowing water deposition. There may have been a sluice set at this high point, but this area lay beneath an unexcavated baulk, and no evidence of a structure here was obtained. Along the entire length of the head race the bottom was ironstained and generally ironpanned, indicating that water flowed over the gravel bottom. At 6.5m from the eastern end the basal width was 2.50m and thereafter it tapered to a width of 1.60m at an abrupt, near vertical step, 100mm high (Figs 6.9 and 6.21). There were a number of features in the base of the head

race. Substantial stakes had been driven in at each side (Fig 6.21, 6874 and 6875). The tapering stakeholes were 280mm deep and 150–200mm in diameter. Part of a decayed post survived in the southern stakehole while the northern hole had apparently held a rectangular-sectioned stake. It is suggested that they may have retained a fish trap.

Two pairs of shallow hollows, from 0.06–0.15m deep, flanked either side of head race at its eastern end (G6696). They lay within a rectangular area, 1.4m long by 1.15m wide, which was slightly sunken and uneven, perhaps as a result of erosion by turbulent water. The pits were all filled with mixed sand, gravel and grey clay and contained some small fragments of limestone. They had probably held posts supporting a revetment protecting the stepped end of the head race.

The mill

THE DAM/SLUICE

The pits (G6696) at the end of the head race may also have supported the western end of a timber dam structure spanning the 1.30m long ridge between the head race and the sluice. Ironstaining of the gravel base of this ridge does suggest the presence of water here, but perhaps as leakage from around and under a timber superstructure rather than from continuous water flow over the gravel, as a timber dam would have been a necessity to contain the water flow prior to it entering a feeder chute.

At the eastern end of the ridge there was a near vertical drop of 0.20–0.30m, with major post-pits at either end that would have held posts retaining the horizontal timbers of a controlling sluice gate. The southern post-pit (Fig 6.21, 6702), 1.10m long by 0.70m wide and 0.40m deep, may have been double, holding a larger post to the south and a smaller post to the north, perhaps 300mm and 100mm diameter respectively. A single fragment of limestone steeply-pitched against the cut side suggests that the other disordered stones within the fill had come from packing disturbed at the removal of the posts. The northern post-pit (6703) was 1.30m long by 1.0m wide and 0.40m deep. Compact gravel and sand against the northern edge may have been *in situ* packing, indicating that it had contained a post at least 300mm in diameter. The shallower eastern lobe of the pit may have held a further post or posts.

In addition, an *in situ*, rectangular-sectioned, oak stake, 510mm long and driven 50mm into the underlying gravel, stood in the north-eastern corner of the northern post-pit (Fig 6.21, 6691). A tapering stakehole, 80mm deep with a rectangular section of 60mm by 45mm, in the corner of the deeper western end of the pit, suggests the former presence of a second similar stake. They may indicate the provision of a timber revetment along the northern side of the wheel-pit. To the east, a shallow hollow and a short length of transverse, steep-sided, flat-bottomed slot (6713), at least 0.70m long by 0.30m wide and 0.12m deep, may also have been associated with the provision of a revetment.

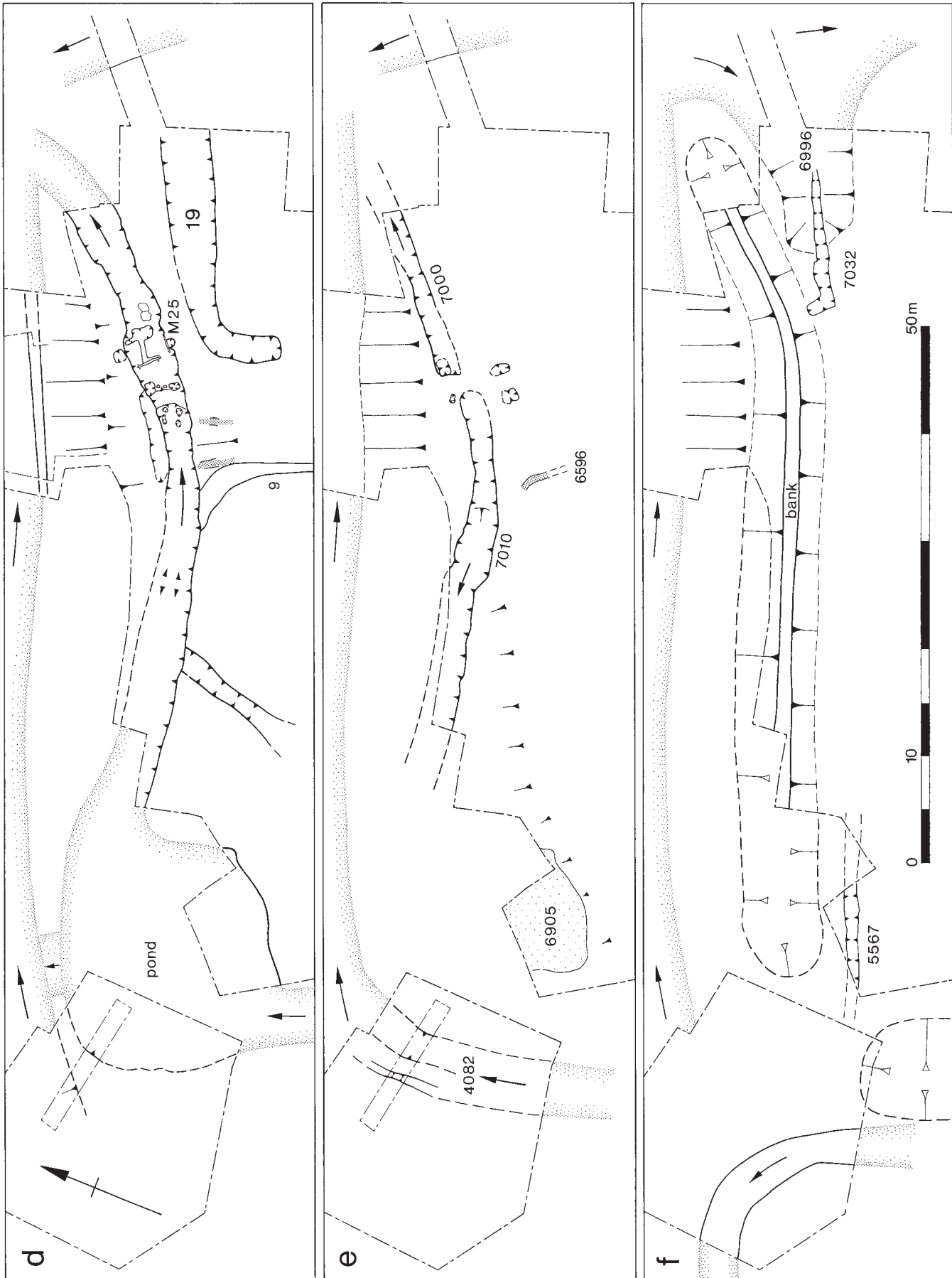


Fig 6.20: The watermill system; later development; d) the third mill, M25, e) drainage ditches on the former mill leats, f) the flood protection bank

The chute

Between the sluice post-pits (6702 and 6703) there were two small postholes, 0.25–0.30m in diameter by 0.15m deep, set 0.6m apart. These may have held smaller uprights supporting a central timber chute feeding the wheel house. The smaller post setting at the northern edge of the southern post-pit (6702) may also have been related, perhaps to support a second chute to feed water to a bypass channel south of the wheel house. (This interpretation is depicted in the reconstruction of the lost timber sub-structure (see Fig 6.25), which draws heavily on the intact timber structure of the mill at Tamworth.)

From the central postholes a shallow channel, up to 1.20m wide and 50–100mm deep, with irregular sides and an uneven base, followed a sinuous course running obliquely towards the southern side of the wheel-pit, and was filled with dirty sand and gravel. It may have been formed by water erosion associated with the flow to the bypass channel, perhaps suggesting that there was a regular, if not constant water flow bypassing the wheel house.

The wheel house and bypass channel

Two transverse slots define the probable location of a rectangular wheel house (Figs 6.22 and 6.23). The western slot (6714) was 2.40m long. It was 0.25m deep with respect to the chute area and up to 0.10m deep with respect to the surface beneath the wheel house. It was filled with grey clay mixed with some gravel, and an oak sill beam survived *in situ*, resting on this clay fill so that its upper surface was near level with the floor of the chute area to the west. The 2.39m long by 270mm diameter sill beam comprised a cleft trunk, which retained its bark, laid with the split face upwards (Figs 6.23, 6.24 and 11.35, 1). It was perforated by rectangular mortice holes, 170mm long by 130mm wide, set 1.33m apart. There were also two drilled perforations of 30–35mm diameter. In the base of the underlying slot there were pairs of stakeholes, set 0.35–0.40m apart and lying towards either end of the sill-beam. Three were circular-sectioned, 100–150mm in diameter, and penetrated 250mm into the gravel, while the fourth had a rectangular section of 90mm by 50mm. A pair of smaller intermediate stakeholes, 60mm in diameter, had been driven 100mm into the gravel. These stakes may have held or clamped the oak sill beam in position.

The eastern slot (6717) was of a similar general form, and was also clay filled. It is presumed to have held a second sill beam, most probably the other half of the same split oak trunk. At the time of excavation the bottom of this feature lay below the water table and further details, such as the stakeholes recovered in the western pit, may have been missed. A displaced and partially decayed length of oak plank (6690, see Fig 6.23 and Fig 11.36, 4) lay within the clay fills.

Running at a slightly oblique angle between the two transverse slots, there was a well defined, flat-bottomed linear slot (6716), at least 2.20m long by 0.40–0.50m



Fig 6.22: The third watermill, M25; showing the leat (top), the dam and sluice (centre) and the wheel-pit (foreground), looking west (upstream)



Fig 6.23: The third watermill, M25, showing the sluice and wheel-pit with *in situ* oak sill beam (centre), looking west

wide and 0.08–0.15m deep. This slot was only observed following the removal of the clay fill, 0.10m thick, that covered this area, but it may have held a removed timber associated with the wheel house structure that had been abutted by these clay fills.

The 1.0m wide gap between the wheel house and the southern side of the wheel-pit probably served as a bypass channel. There were two postholes, 0.55m and 0.30m in diameter and 0.15m and 0.20m deep, to the immediate south of the *in situ* sill beam. These may have supported the eastern end of a bypass chute. The side of the pit here was protected by a large vertical limestone slab (6650), described below. A hollow in front of the slab was filled with pebbles, cobbles and small fragments of limestone with frequent small voids between the stones. Above this there was a rough surface of flat-laid limestone (6705), which was water worn and ironstained. Patchy remnants of disturbed limestone surfacing continued eastward towards the two large slabs of limestone (7080) that lay beyond the eastern end of the wheel house, and at a slightly higher level.

The wheel-pit revetments

Along the southern side of the sluice area there was a broad shelf (Fig 6.21, 6811) filled with mixed sand and silty clay containing several large fragments of water-worn limestone and with a concentration of smaller fragments and cobbles along the northern edge. This appeared to form a consolidation and revetment of the edge. A circular pit (6804) 0.60m in diameter and 0.10m deeper than the base of the shelf, had a similar fill, and may have held a post related to the sluice gate structure.

Along the southern side of the wheel-pit the revetment had been partially lost, but it had probably run for a length of 9.8m from the sluice to the eastern end of the wheel house. To the east there was a 2.00m-wide gap and then a similar revetment (7239) flanked the tail race. It is uncertain whether this was an actual break in the revetment or merely a short collapsed length. The revetment comprised tenacious grey clay containing frequent fragments of limestone, pebbles, small cobbles and a single piece of Millstone Grit, all set on a distinct cut shelf (6771), with its base 0.10m higher than the base of the wheel-pit. There was no surviving evidence that the clay and stone was retained by timberwork, but within the similar tail race revetments there were some stakeholes, perhaps suggesting that evidence for similar supporting stakes within the wheel-pit may have been lost.

To the south of the wheel house the revetment included a large slab of limestone set vertically against the side of the construction pit (Figs 6.21, 6650 and 6.24). It was 1.90m long and up to 0.84m high, but tapered to 0.30–0.40m high at either end, and was 0.10m thick. The sides, right to the apex, were worn smooth. At least one function of this slab would have been to protect the post-pit immediately behind it (6682), while it would also have provided a general protection against erosion at a point where a bypass chute

may have deposited water into the bypass channel. The flat base of the slab stood on up to 120mm of clay and limestone fragments lying within a roughly semi-circular hollow within the base of the bypass channel (6705). A cluster of five stakeholes, up to 100mm deep and 100mm in diameter with either circular or rectangular sections, lay around the western end of the slab. At the eastern end there was a single stakehole, 200mm in diameter and 80mm deep, in front of the slab and a further stakehole was observed within the clay behind the slab as a rectangular-sectioned void, 80mm by 60mm, with a total height of 450mm and penetrating 70mm into the base of the pit. These stakes appear to have held the slab in place.

Along the northern side of the wheel house the former presence of a similar clay and stone revetment was indicated by a layer of clay and limestone fragments slumped against the pit side and overlying the northern end of the *in situ* sill beam. It was probably contiguous with the surviving revetment to its east, and it may have collapsed when the wheel house was dismantled.

The wheel supports

For a length of at least 11m the ground surface to the south of the dam, sluice, chute and wheel-pit, had been raised by the dumping of up to 0.30m of orange-brown sandy silt and fine gravel (Fig 6.21, 6643). The mill house structure would have been founded on this surface but later truncation of the upper levels had removed any indications of its presence.

A sub-square post-pit (6682), with steep to near vertical sides, was cut into this raised surface and abutted the rear face of the large revetment slab. It was up to 0.80m wide and 0.30m deep, but allowing for later truncation of the ground level an original depth of at least 0.45m is indicated. A flat-lying slab of limestone, 0.47m long, just above the base of the pit may have been either a pad-stone or a displaced packing stone.

A further post-pit (6670) lay beyond the northern side of the wheel-pit. It was 2.30m long by 1.10m wide, but had two phases of use. The original feature was a sub-square post-pit, 1.00m diameter by 0.45m deep, later replaced by an elongated post-pit, 2.00m long by 0.35m deep. It is suggested that the post-pits on either side of the wheel house would have held the uprights supporting a 5.00m long cross beam that held the vertical axle holding the wheel and millstone assemblies.

The tail race

A 10m length of the tail race was excavated. It had a basal width of 2.80m immediately beyond the wheel house, and probably maintained much the same width further to the east. Variations in the width as excavated are a result of the partial collapse of the clay and stone revetments before the area was backfilled.

Two flat-laid limestone slabs (Fig 6.21, 7080), each



Fig 6.24: The third watermill, M25, showing the limestone slab revetment and the *in situ* oak sill beam, looking south

around 0.90m square and heavily ironstained, lay to the south. They stood above the level of both the bypass channel to the west and of the outflow from the wheel house to the north, suggesting that the bypass water flow did not run straight through but was directed to the north and back into a common channel with the wheel house outflow. The outflow from the wheel house was initially contained within a narrow channel, 1.50m wide, but to the east this gradually widened until it occupied the full width of the leat.

A 4.00m length of the clay and stone revetment on the northern side of the tail race survived *in situ*. It overlay the wheel-pit of the second mill (M26) which had been backfilled with loose limestone rubble, with frequent voids between the stones. The revetment survived up to 0.35m high with a 0.30–0.40m deep vertical facing of fragments and blocks of limestone, and some millstone fragments, set irregularly within a matrix of sticky grey clay. Behind this the remainder of the earlier wheel-pit was backfilled with grey clayey loam containing a lower density and generally smaller fragments of limestone and some pieces of millstone. A single stake void was observed within the revetment face and penetrating the floor of the construction pit, while remnants of thin lengths of wood, up to 15mm thick, lay horizontally at the base of the face; indicating

that the revetment had been at least partially retained by stakes and wattles. Several fragments of Millstone Grit lay in the uppermost part of the revetment, including the single largest piece recovered from the mills, which was set into the top of the clay and stone facing. In addition, a length of unworked oak trunk or branch (6665), 1.20m long and 0.23m in diameter, was also set into the top of this revetment.

Along the southern side, the revetment (7239) comprised grey silty clay with gravel and some cobbles and small limestone inclusions. It also contained lumps of either sticky clay or ironpanned sand and gravel and there were some irregular voids within the fill. As with the revetment of the wheel-pit, it was set on a ledge bottoming up to 0.50m above the base of the tail race. At the western end six stakeholes were located as partial voids, typically 50–70mm in diameter and 80–150mm deep, spaced 0.3–0.4m apart, perhaps forming a localised reinforcement of the revetment.

The bridging point

Above the watermill, at the eastern end of the head race, there was a ramp flanked by walls on the southern bank and a ledge on the northern bank. These features had no

obvious connection with the functioning of the mill and it is suggested that they relate to the provision of a timber bridge spanning the mill leat and providing access to the river channel beyond (Figs 6.21 and 6.25)

The ramp was 3.10m wide and 4.50m long, with a fall of 0.40m. The northern end lay 0.40m above the base of the head race. A shallow hollow along the edge of the head race (6683), 1.00m wide by 0.10m deep, was filled with sand, gravel and small fragments of limestone. Only a short length and a single course of the eastern wall (6597) survived *in situ*. The western wall (6647) was 3.80m long by 0.65m wide, with up to two courses of flat-laid limestone surviving. It had subsequently collapsed onto the ramp, and the quantity of rubble indicates that it had stood to a greater height.

The ledge (6849) along the northern side of the head race was 8.75m long by 1.00m wide. Its base lay 0.15m above the bottom of the head-race. Along much of the ledge there were stakeholes, typically 60–80mm in diameter and 170mm deep, set 1.0–1.2m apart. Sill beams forming the foundation for a timber bridge may have rested on this ledge and on the southern bank between the two side walls (Fig 6.25).

The horizontal-wheeled watermill

The later two mills at West Cotton have been identified as of the horizontal-wheeled form on the basis of their broad wheel-pits. The earlier example (M26) was very poorly preserved and no detailed interpretation of its structural form can be provided. In the final mill (M25), while only a few timbers survived *in situ*, the palimpsest of post-pits and other cut features define the former positions of further timbers so that it has been possible to provide a general reconstruction of the ground plan that has drawn heavily upon the excavated and reconstructed form of the mill at Tamworth, Staffordshire (Rahtz and Meeson 1992, figs 95–7), with which it appears to be closely comparable in general form and overall size (Fig 6.25).

Given the survival of the single oak sill beam with mortice holes at either end, which was set within one of a pair of parallel construction slots, it is clear that the West Cotton mill had contained a rectangular timber wheel house. While no direct evidence survived to indicate the provision of a timbered floor, the level and apparently undisturbed gravel bottom between the sill beam slots, which contrasts with the convoluted surfaces within the chute area to the west and in the bypass channel to the south, does indicate that the wheel house had been floored. The function of the slot running across this area is unclear, unless it held a timber providing additional support for a floor, perhaps directly beneath the water wheel. On the reconstruction, the wheel has therefore been placed above this longitudinal slot and between the post-pits set beyond either edge of the wheel-pit, which are believed to have held the uprights supporting the cross-beam carrying the vertical axle that held the wheel and millstone assemblies.

While such uprights could have carried the load, the lack of any lateral support seems surprising given the forces created by the functioning system. It is therefore likely that both the uprights and the cross beam were also tied into the structure of the mill house, which could then have provided the necessary lateral support. As no evidence for further earth-fast timbers was recovered, we must assume that the rest of the mill house was founded on ground laid sleeper beams spanning the wheel-pit, which have left no trace of their presence.

The millstones

The full report on the assemblage of millstones is within the finds report, and here only a brief summary is provided. The quantity of material recovered leaves no doubt that the primary functions of the successive mills was the grinding of grain into flour. There is a total of some 277 fragments, weighing 337kg, from sandstone millstones, the majority of which came from the structure and fills of the first and third watermills. In addition, there are some 55 recorded finds of lava, weighing 31.6kg, which has come from millstones in use only with the first watermill.

Stones in Millstone Grit from the Northern Midlands, most probably Derbyshire, form the largest group, although there are pieces from a millstone in finer-grained sandstone that was in use in the first watermill. By determining joining pieces and matching geologies it is suggested that for the Millstone Grit a minimum of seven separate upper stones and five lower stones had been in use through the lifetime of the first and third mills (Figs 6.26–6.28). The fragments of lava stone, which had been imported from the Eifel region of Germany, comes from a minimum of a further two sets of stones. The lava stones may have been of comparable diameters to the sandstone millstones, but as the circumferences of the lava stones often comprise flattened facets, the overall diameters may have been over estimated.

From the better preserved fragments it is seen that the millstones were typically 950–1000mm in diameter, and had been around 120mm thick when new, when a full set would have weighed 300–350kg (Fig 6.26). The used stones had typically been worn down to around half of their original thickness, and in one exceptional case an upper stone had two worn surfaces, indicating that it had been inverted and reshaped for reuse, and was used until it was only 32mm thick (Fig 6.26). In one case the distinctive shape of the surviving part of an upper stone suggested that it may have been recut to provide stone for a much smaller diameter rotary quern (Fig 6.27). The upper stones appear to have worn more rapidly than the lower stones, with this perhaps accounting for the greater number of upper stones identified.

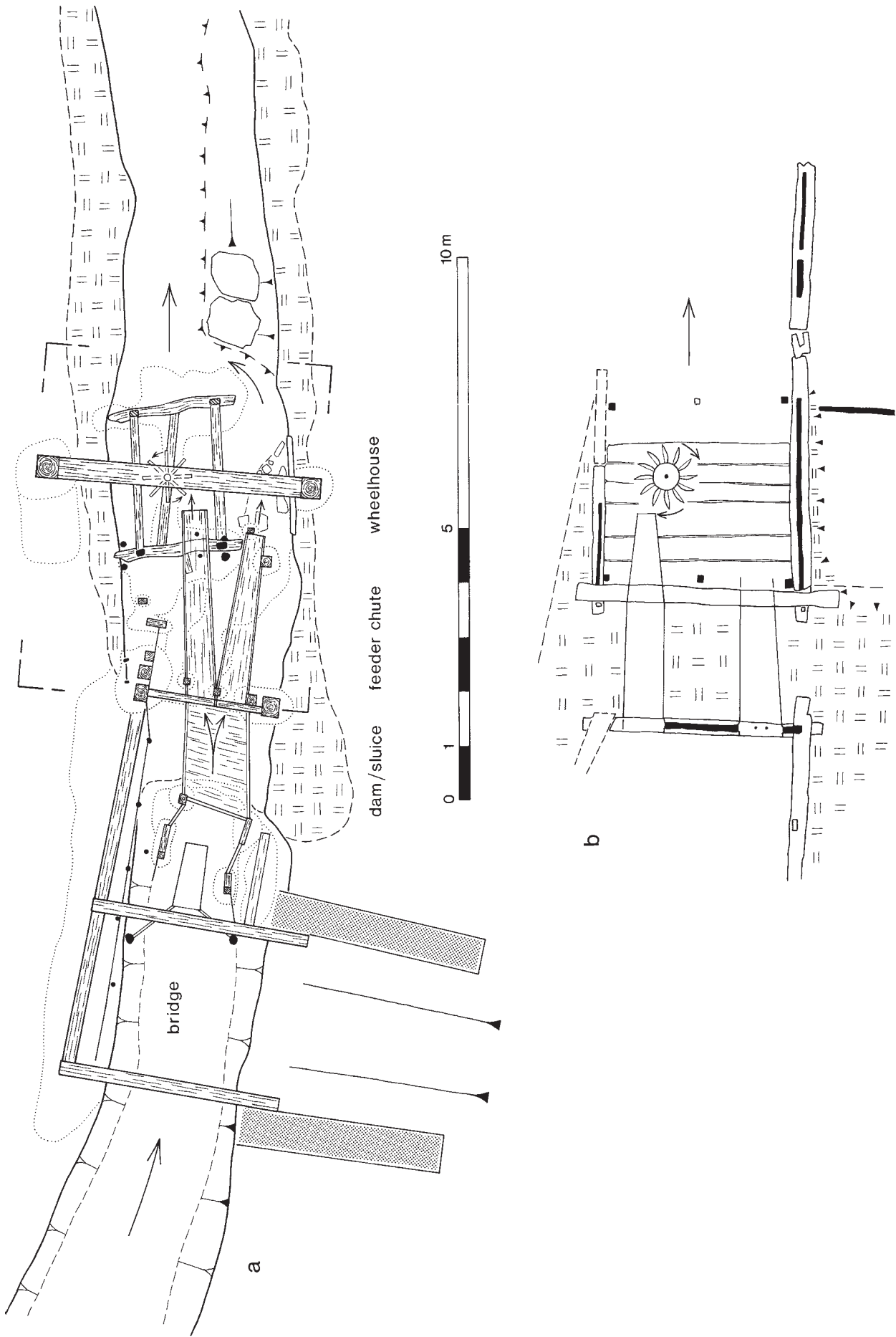


Fig 6.25: The horizontal-wheeled watermill; a) West Cotton, reconstructed, b) the ninth-century mill at Tamworth, Staffordshire

The abandonment of the mill system (AD 1150)

The abandonment of the mill system at West Cotton was a direct consequence of the disruption to the water supply caused by a catastrophic and abrupt episode of flooding and the subsequent deposition of alluvium, which remodelled the topography of the local landscape. Around the mill system itself, it is possible to describe a sequence of events that chronicle the onset of this episode.

The watermill area

Following the disuse of the final watermill (M25) the nature of the fills along the head race, wheel-pit and tail race provide evidence for a complex sequence of events occurring within a short period of time, some of this was

evidenced in plan (Fig 6.20 e–f) but the overall sequence was largely derived from the section evidence (Fig 6.5b). The pottery from the entire sequence up to formation of the overlying flood bank falls within the first half of the twelfth century (ph 0, 1100–1150).

To the east of the final watermill, and above the area that had been occupied by the first mill (M27) and leat 6790 (Fig 6.9), there were very mixed layers of water deposited silts, denser pebble concentrations concreted by ironpanning, as well as dumped deposits of limestone, charcoal, burnt sands and fragments of fired clay derived from oven/hearth debris, and considerable quantities of fragmented animal bone and pottery, which included much Stamford ware, dated to the earlier twelfth century (ph 0, 1100–1150). This is all marks a period, shortly following abandonment of the final mill, in which either the leat systems were overflowing across the surrounding areas, or flood water was coming



Fig 6.26: Upper millstone, with fragment of rectangular socket (left)

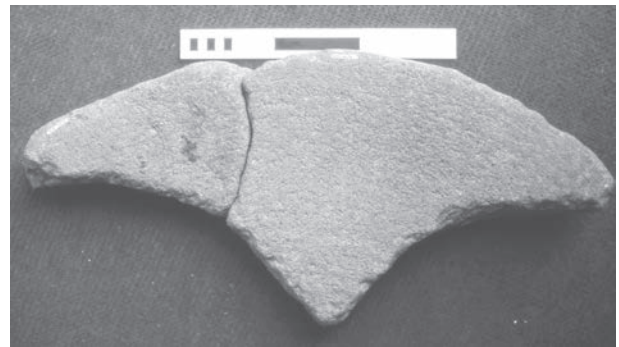


Fig 6.27: Upper millstone after recutting, possibly to provide stones for a small rotary quern

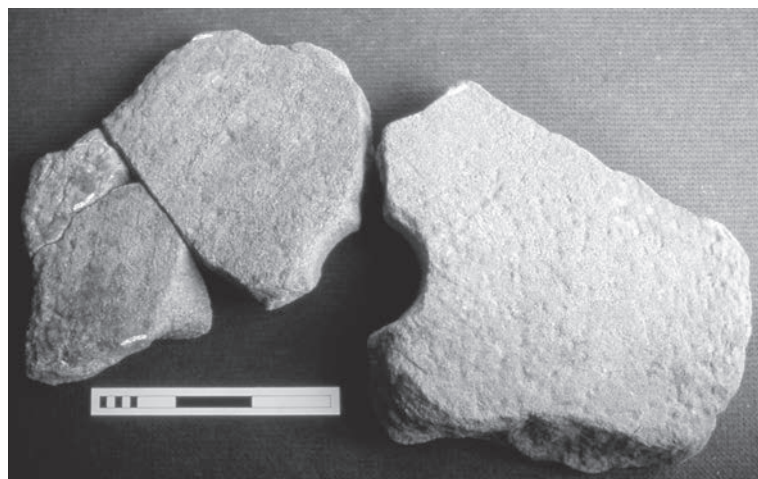


Fig 6.28: Lower stone in Millstone Grit

in from outside, with this particular area also being used as a convenient dump for occupation debris.

The primary fills of the wheel-pit of the final mill (Fig 6.5; section b–b', 6660) were of mixed sandy silts and clays, gravel, water worn fragments of limestone and frequent pieces of broken millstones. Some of this may have accumulated during the use of the mill, but much of limestone and millstone fragments must have been dumped following the demolition of the mill, perhaps to raise the wheel-pit and tail races to the same level as the head race. This allowed a smooth flow of water through the area, and this resulted in the deposition of sands and gravels (6603) heavily ironstained and partially ironpanned. A slowing of the rate of water flow is suggested by the later deposition of clayey-loam with some gravel.

Subsequently, the sluice and wheel-pit area was infilled with tumbled dumps of limestone rubble, including slabs of building stone up to 600mm long. This created a raised area some 10m long that would have stopped the flow of water through the system. However, water was still present to either side of the raised area. To the east there was an accumulation of generally coarser silts, including mixed sandy clays, sand with fine gravel and coarse yellow-brown sand (Fig 6.4, section b–b', 6569). To the west, sandy clays accumulated within the head race to a depth of up to 0.35m, and also over the ramp of the possible bridge approach and within the northern end of the adjacent ditch system (Fig 6.20d, 9). Following the filling of the boundary ditch, it was redefined by the introduction of a boundary wall (Fig 6.20e, 6596), 0.55m wide and surviving up to 0.30m high in three courses of flat-laid limestone bonded with yellow sandy mortar. A length of 3.00m of wall survived, which curved abruptly to the west as it approached the head race.

Once the head race had fully silted a new channel was cut along its northern side (Fig 6.20e, 7010). This was up to 3.50m wide and deepened towards the west, carrying water away from the raised area over the former mill. For part of its length the bottom was roughly surfaced with limestone and cobbles, heavily water worn and ironstained. To the east the evidence was less clear, but there may have been a similar channel along the northern side of the wheel-pit and tail race (7000). This also deepened away from the raised area and may have carried water eastward.

Two post-pits on the southern side of the former mill area (Figs 6.20e and 5.19, 6602 and 6610), were probably contemporary with this phase and may indicate the provision of supports for a new bridge. The pits were 1.50–2.00m long by 1.00–1.20m wide and 0.30–0.45m deep, with shallower shelves at the southern ends. To the north, a pair of smaller postholes (6820) and the elongated recut at the western end of post-pit (6670) may have formed an opposing pair of post settings. These four features would suggest the provision of a bridge some 3.00m wide by 5.00m long set slightly obliquely to the underlying, but by then largely backfilled, sluice and wheel-pit.

The pond and the western leats

The tenacious clays forming the primary deposits at the western end of the pond had probably accumulated after the abandonment of the final mill (M25). Above this there was a further 0.40m of light grey-brown sandy clays, and a final fill of light brown sandy clays with moderate pebble inclusions filled the pond almost to a level with the contemporary ground surface. The high level to which these silts had accumulated indicates they must have largely post-dated the demise of the entire western leat system, being contemporary with the higher level streams, described below, that had replaced them. They are therefore most likely to derive from flood inundation at a period when there was no longer any controlled outflow from the pond into the river (Fig 6.20e).

A final fill of dark grey clayey loam (Figs 6.7 and 6.20, 6905), was up to 0.40m thick and contained much occupation debris; pottery, animal bone, charcoal scatters, mottles of reddened (burnt) sand and burnt pieces of limestone, and was contemporary with the similar deposits to the east over the former watermills.

The identification of watermill systems

The previously excavated early watermills in England were recognised when substantial portions of the timber structures had survived. In this they differ markedly from the mills at West Cotton, where the timber structures had been almost totally removed.

It would seem likely that the situation encountered at West Cotton cannot be unique and may well be representative of many abandoned mill sites of pre- or immediate post-Conquest date. It is therefore of interest to consider what understanding of mill form and usage would have been achieved at two classic English mill excavations, Tamworth (Rahtz and Meeson 1992) and Bordesley Abbey (Astill 1993), if the timber structures had been largely lost. If the West Cotton mills had been encountered in, say, a watching brief or limited trial trenching, their very presence may not have been recognisable. In this context, it may be of use to future researchers to summarize the processes of thinking, investigation and chance that led to the discovery and excavation of the watermills at West Cotton.

The possible presence of a watermill at West Cotton had not been considered prior to the excavation. Retrospectively, this seems a curious oversight given the location of the settlement in the river valley beside a tributary stream. However, the expected peasant status excluded the possibility of a medieval manorial mill being sited here. In addition, the extensive leat and pond system and the watermills themselves had been totally concealed by a twelfth-century flood protection bank, so that the earthworks gave no indication of the presence of a mill system beneath. While the process of concealment may be

unique to this site, there is clearly the potential for broadly comparable processes, such as stream migration and the deposition of alluvium, to have resulted in the concealment of mill systems at other similar settlements.

The first problem at West Cotton was, therefore, the recognition of the potential presence of a watermill system. The post-medieval stream channel with its sharply angled turns at the southern and northern ends (Fig 6.1), could have been seen as potentially indicative of an artificial origin, but this possibility was not recognised in advance of excavation. Indeed, the pre-excavation earthwork survey covered only the evident core of the settlement as defined by the building platforms, and ended at the inner edge of the flood protection bank. The stream course beyond was partially surveyed following the commencement of excavations, but was only fully surveyed once its significance to the understanding of settlement development had been recognised. Given broadly comparable circumstances at other deserted settlements, it might be possible to postulate the probable former presence of a mill system from anomalies in the courses of later stream channels, but to postulate the probable location of the mill itself presents a further difficulty which might not be resolvable purely from earthwork evidence.

At West Cotton the western stream course and the leats pre-dating it were partially uncovered at the southernmost end of the site in the first season of excavation, 1985, but this area had a low priority and no systematic attempt was made to understand the nature and development of the watercourses partly revealed in plan and section. The potential significance of the western stream system was finally recognised during the third season of excavation, 1987. However, this area was only examined in order to establish the extent of a prehistoric monument, the Long Mound (Fig 3.1), and without this additional impetus the western streams may not have been examined in such detail. Once the presence of the long sequence of watercourses was revealed, its potential use for generating water-power was appreciated, with Dr Mark Robinson instrumental in reaching this conclusion. As a result, a detached trench to the north-west of the main excavation area was opened to investigate the possibility that a medieval mill had lain at the northern end of the western stream channel system. The absence of a mill here was a disappointment, but retrospectively it can be seen that whilst the general reasoning was correct the detailed hypothesis was flawed, as the visible western stream post-dated both the abandonment of the mill system and the creation of the flood banks.

The location of the watermill system on the northern side of the settlement in the fourth season of excavation, 1988, was a result of chance. A broad trench was opened to link a previous detached trench across the river palaeochannel to the main excavation area, in order to provide a continuous stratigraphic link and to examine two large timbers within the palaeochannel which were then thought to represent either a watermill or a river edge revetment or landing stage. The northern leat system and watermill was located

within this new area, however, it was totally unrelated to the timbers which had originally raised this possibility, as these were later shown to be of prehistoric date.

It was also a matter of chance that this trench encountered the wheel-pit area of the final mill (M25), the most readily explicable part of the entire system and producing such a quantity of millstone fragments that the presence of a watermill could not be doubted. If this trench had lain further to the west and encountered the mill leats near their junctions with the millpond, the resulting complex palimpsest of channels would have defied comprehension. The exposure of an area further east would have provided a slightly less complex but still largely incomprehensible sequence, and both of these areas produced no more than a sparse scatter of millstone fragments.

It must also be noted that initially only the presence of the final mill was recognised. The two earlier mills were largely filled with clean sands and gravels, often consolidated by iron panning, and barely distinguishable from the natural gravel. It was only following the full excavation of the final leat and mill that the presence of odd bands of silt within the consolidated gravel in the sides of the latest leat and wheel-pit suggested that these deposits were not natural. Given a greater time pressure, perhaps in combination with a strict excavation brief and limited funding, it would have been easy to dismiss these hints and deem the excavation complete, thereby missing two earlier phases of mill structure.

From this account of the process of discovery at West Cotton there can be no doubt that there may be no easy answers when facing the questions; did this settlement contain a watermill and if so, where? The excavation of the mills at West Cotton was achieved by a mixture of logical deduction, intuition and good fortune, but all generated by a positive and ambitious attitude in seeking to explicate aspects of the archaeology physically peripheral to the evident core of the settlement. The problems would only be compounded for mill systems detached from a settlement, as at Castle Donington, where it was noted that, "One of the major challenges now facing archaeologists is in the detection and recording of archaeological remains buried beneath deep alluvial deposits" (Clay and Salisbury 1990, 276).

Mill systems are extensive and given any significant duration of use, with multiple recutting of leats and the relocation of the mills themselves, they will not be easily understood. In particular, limited trial trenching might not be sufficient to determine the difference between a leat system and natural stream channels and, unless extremely fortunate, would be unlikely to determine the actual location of the mill. It may therefore be concluded that a similar broadly-based approach to the consideration of the morphology of the local tributary streams and their relationship to the main river channel, and to any adjacent settlement, would be a necessary prelude to selective trial trenching to explore the earlier history of the system. Beyond analysis and good judgement, it is still likely that a generous slice of luck would also be required.

New watercourses and the creation of the flood banks (AD 1150)

The southern flood bank and stream channel

The earthwork and contour surveys show that there were flood banks along the northern side of Cotton Brook from the eastern edge of the floodplain to the Cotton Lane. The bank continued along the southern side of the settlement to the junction with the western mill leats (see Figs 1.3 and 1.6). This southern bank was not excavated, so its date of origin is unknown, but there can be little doubt that it originated in the mid-twelfth century at the same time as the western and northern flood banks. The Cotton Brook meandered along the top of this flood bank, presumably raised above earlier streams channels. The stream course is preserved in earthwork, having lost its water flow at the end of the eighteenth century, when the Hogg Dyke was constructed.

A related feature may be a deep, clay-filled ditch beyond the south-western corner of the hamlet and running along the western margin of the field system to the south of the settlement (Fig 6.1 ditch, and see Figs 1.3 and 1.6). This may have been an attempt to reduce flooding across the fields. It was evidently no more than a partial or temporary success, as the ditch was filled with clay and alluvial clays had also accumulated over the ridge and furrow within the western half of the field system to a depth of up to 1.0m. The alluvium became gradual thinner to the east and the earthworks of the former ridge and furrow field system became more prominent to the east. This area is subsequently recorded as the “Short leys” indicating its later use as pasture.

The western flood bank and stream channels

Following the demise of the mill system a flood bank was raised over the western mill leats (Fig 6.2). The water flow was then carried by a sequence of raised stream channels running along the western side of the bank. The bank was recorded in a single section (Fig 6.5, section a–a’, 5560). It was 6.5m wide and up to 0.75m high with gently sloping sides, and comprised orange-brown sandy clay with some gravel pebbles. It certainly contained water-deposited silts, which presumably had been dug from nearby alluvial deposits. There were occasional pieces and slabs of limestone, mainly towards the outer edges and perhaps deriving from later refurbishment. On the eastern side, above the former mill leats, there was a tail of more mixed silts some 3m long. While no dating evidence was obtained for the bank itself, the presence of only earlier twelfth-century pottery (ph 0, 1100–1150) in the deposits beneath it suggests that it was constructed at around the middle of the twelfth century.

A series of watercourses lay beyond the flood bank and these must originate, like the leat system that they replaced, in an artificial channel (Fig 6.4, e). However, it is likely that

subsequent development, with a westward migration into the more sinuous channel owed much to natural evolution (Fig 6.4, f). The steady rise in the successive bottom levels probably reflects the steadily rising ground surface created by the progressively accumulating alluvium to the west (Fig 6.5, 4145, 5414 and 5399).

It has been suggested that the new stream course may have been constrained between the recognised clay bank and an outer bank. If so, it was not possible in section to distinguish an outer bank comprising dumped alluvial silts from the general accumulation of alluvial silts beyond this. These silts were up to 0.70m thick and were seen in section for a length of 35m, although only part of this length is depicted (Fig 6.5, section a–a’, 5396/7). If there was originally an outer bank, the later stream migration and its sinuous course indicate that it was soon effectively absorbed into the general accumulation of alluvium. Further alluvium also accumulated across the inner slopes of the main flood bank and onto the margins of the settlement area, partly filling some of the boundary ditches. So, whilst the flood bank was an evident success in enabling the settlement to survive, despite the ground levels eventually lying up to 1.0m below the level of the adjacent floodplain, there were inevitably repeated incidents of over-bank flooding.

The earliest of the new watercourses (Fig 6.5, section a–a’, 4145) was up to 3.25m wide and 0.60m deep, bottom level 33.67mOD deepening to 33.55mOD to the north. Above a 200mm thick primary silt of mixed gritty silts, sand and silty clay there was a general fill of yellow sandy silts and clay sealed by a possible dumped layer of gravel containing some limestone. The bottom level of the next watercourse (5414) lay 0.30m higher, at 33.85mOD. The primary silty clay fill, with inclusions of fine grit, was overlain by yellow-brown sandy clay virtually indistinguishable from the adjacent flood bank.

In the detached trench at the western end of the former millpond successive linear channels that cut into a layer of alluvial clays sealing the pond deposits (Fig 6.20e, 4082), may have been the continuation of the new western channels. If so, they indicate that the water flow was then directly into the river channel to the north, running over the silted millpond. By this time it is likely that the river course itself was on its way to redundancy, but it was still capable of carrying at least the flow of the Cotton Brook, although whether there was still any flow along the river system is uncertain.

The third western stream course (Fig 6.4f) is the one that survived both as an earthwork feature and on the enclosure map of 1798 (Figs 1.6 and 1.4). A double edge on the western side, as seen in section, suggests that it was scoured out at least once (Fig 6.5, section a–a’, 5399). It was 3.0m wide and up to 0.80m deep. A primary fill of yellow-brown silty clay with fine gravel was overlain by a fairly homogeneous fill of yellow-brown sandy clay with fine gravel inclusions, indicating a prolonged period of silt accumulation whilst there was continuous or near continuous water flow.

Unlike its predecessors, at the north-west corner of the site the stream turned abruptly onto a south-westerly course to flow the wrong way along the silted course of the former river channel (Fig 6.20f). It was, therefore, this third western stream course that evidently post-dated the cessation of all water flow along the former river channel. Its sinuous course further to the west, carrying it to the river channel on the west edge of the floodplain is shown on the enclosure map of 1798 (Fig 1.4). While there is no direct dating evidence, it is suggested that the sequence of events was so rapid, that it is likely that the river channel had probably become redundant by around the end of the twelfth century.

The northern flood bank

Flooding along the northern side of the settlement, over the former mill system, was prevented by a combination of drainage ditches and a flood bank.

To the west there was a linear ditch, up to 1.40m wide by 0.50m deep, which was filled with clay. It was cut through both the pond silts and the overlying layer of occupation debris (Fig 6.20f, 5567). It probably terminated to the east within the former limits of the pond, while to the west it may have run beyond a northern terminal of the western flood bank to join the stream channel. To the east, south of the former mill system and over ditch system 19, there was a similar linear ditch that ran eastward into a sunken area (6996) containing pond-like deposits of grey to blue-grey tenacious clays (Fig 6.20f, 7032). It too was filled with yellow tenacious clay. The relationship of these drainage ditches to the flood banks was not established, they may have appeared either shortly before it or as accompanying features to provide drainage through breaks in the flood banks.

The northern flood bank lay over the former watermill system (Figs 6.20f and 6.5, section b–b', 6552). The bottom levels were of greyish-brown sandy clay mixed with orange brown sand, and contained much pottery, animal bone and some millstone fragments, probably as redeposited alluvial silts mixed with occupation debris. The similar clayey silts above this formed a bank up to 5.0m wide by 0.70m high. It is likely that it terminated shortly to the north-east of the excavated area, adjacent to the former northern stream channel.

The northern flood ditches

There does not appear to have been a bank along the north-eastern side of the settlement, but along the course of the old northern stream channel a new drainage ditch was established, also lying partly over the silted boundary ditch system 17 (see Fig 4.31, later ditch). This too was evidently successful, as alluvial clays accumulated only across the area to the north-east of this. By the middle of the thirteenth century (ph 2/0–2/2) the southern terminal had retreated to the north (Fig 7.1), and was filled with tenacious clays containing quantities of limestone rubble

and associated pottery dated to the later thirteenth century (ph 2/2, 1250–1300). This ditch was maintained through to the desertion of the settlement, and survived as one of the most prominent earthwork features (Fig 1.6).

The late Saxon to medieval river channels

The modern course of the River Nene adjacent to West Cotton lies along the western margin of the river valley, at its closest 400m west of the settlement (see Figs 1.2 and 1.3). This had become the only river channel sometime prior to the late eighteenth century; as a map of 1779 and the enclosure map of 1798 (Fig 1.4) both show the river much as it is today. It can be suggested that it was perhaps the only channel by the end of the twelfth century. However, as a result of survey, observation and some limited excavation it has been possible to establish the general location of the two major palaeochannel systems of former river courses that were contemporary with the late Saxon settlement of West Cotton (Figs 1.2 and 6.1). One channel ran along the eastern side of the valley and directly past West Cotton, the eastern palaeochannel. The other lay to the north, the northern palaeochannel. This ran west to east, linking the western channel with the eastern palaeochannel.

These palaeochannels were exposed during successive stages of the machine removal of the overburden within the quarry. To the immediate west and north of West Cotton much of the information was obtained during 1987 by the West Cotton team, while to the south the palaeochannels were recorded during survey work conducted by Steve Parry, and by the Central Excavation Unit teams during the excavation of the Stanwick Roman settlement and the investigation of the prehistoric landscape. In addition, a contour survey of the depth of the overburden across the valley floor, produced by the Central Excavation Unit utilising the borehole information obtained by ARC, also defined the locations of the main palaeochannels. Sampling of the palaeochannel deposits for both macro- and microbiological remains was conducted by Mark Robinson and Tony Brown, who also recorded partial sections of the palaeochannel systems at several locations (Parry 2006, 23–29).

The eastern palaeochannel

This palaeochannel ran along the eastern side of the valley for 1.5km. To the south it branched from the modern eastern channel of the Nene to the west of the Stanwick Roman settlement, and ran around the northern side of West Cotton before turning back towards the north to a confluence with the Scalley Brook, to the south of Mallows Cotton. Its continuation northward is marked by the modern course of Scalley Brook and the post-medieval Hogg Dyke, which rejoin the river between Mallows Cotton and Mill Cotton (Fig 1.2).

In 1986 the location of this palaeochannel at West Cotton was determined in a series of boreholes. In 1987 a 32m long trial trench was cut by machine across the southern part of the channel system for the specific purpose of providing a section for environmental sampling within a recorded stratigraphic sequence (Fig 6.5, section c–c'; located on Fig 6.9). In 1988 the northern limit of the main excavation area was extended northward to provide a stratigraphic link between the dry-land excavation and this palaeochannel, and the area was further enlarged in 1989 to permit the investigation of the late Neolithic levels within the palaeochannel, which demonstrated the longevity of this channel system (Harding and Healy 2007, 113–115). The middle Saxon and the late Saxon to medieval river edges almost directly overlay the prehistoric river edge, illustrating the stability of the channel. While the general sequence of silting was obtained in a single major section, the complex sequence at the river edge was only fully resolved with the additional evidence obtained from several partial sections, and these have been combined with the major section to form a single composite section across both the river and watermill sequences (Fig 6.5, sections b–b' and c–c').

The river edge revetments and bank

The middle Saxon utilisation of the river has previously been described, and the deposits above this are all presumed to broadly date to the tenth to twelfth centuries, when the channel was 17m wide.

The river edge was artificially raised by the deposition of up to 0.50m of tenacious clays (Fig 6.5, section c–c', 7181) sealed by mixed gravels (7147). To the north the clays terminated at a near vertical edge and this and other evidence has suggested the possible presence of successive timber revetments along the river edge (Fig 6.9). A lower revetment was defined by a single *in situ* stake (7111), 60mm diameter by 350mm long and sharpened to a point, and driven into the underlying gravels (Fig 6.5, section c–c', b projected onto section). Two sections also show a rectangular cut, 0.40m wide by 0.20m deep, filled with grey-brown clay (c), and a narrow, vertically-edged cut, 0.30m deep by 0.14m wide, with a loose fill of mixed grey and brown clay (not illustrated). There was also a slight step, up to 0.10m high, in the exposed surface of the gravel layer (7111), and a single block of limestone lay on the gravel in line with this step. Taken together, these features suggest that there was a linear revetment formed of stakes and horizontal planks set on the riverbank against a slight step cut into the gravel layer.

An upper revetment was defined by a single *in situ* stake, up to 80mm in diameter by 200mm long, while two sections show a near vertical northern edge to the clay layer (7181), and in one instance this was flanked by a narrow, vertically-sided cut (Fig 6.5, section c–c', d), 200mm high by 90mm wide, filled with dark grey clay. This upper revetment was abutted on the river side by clayey river silts (6661) which largely sealed the lower revetment, suggesting that

the upper revetment had replaced the lower revetment as water levels rose within the adjacent channel.

The final layers at the river edge were dumped deposits broadly contemporary with the use of the watermills. Above and partly within a shallow linear hollow, up to 0.15m deep, there was a deposit of grey loam containing much charcoal and charred seeds, including sprouted barley from a malt oven, as well as some pieces of fired clay and some small pieces of heat reddened limestone (7153). Above this there was up to 0.30m of gravel in a mixed matrix of yellow-brown to grey-brown sands and silts with some mottles of grey clay and some charcoal flecking (7147). This layer merged with the upper fill of the northernmost mill leat (M26), indicating that it was contemporary with the construction of the latest mill leat (M25). The dumping of gravel here may have been to raise the ground level adjacent to the mills to prevent over-bank flooding into the leats.

The silting of the river channel

The river silts broadly contemporary with the possible lower river edge revetment (Fig 6.5, section c–c', b and c), and also the watermills, comprised a layer of grey to near black peaty silts, up to 0.75m thick (6762). Immediately in front of the lower revetment the upper surface of this layer was convoluted and there was a deposit of coarse light grey-brown sand containing numerous shells of water molluscs. This deposit was up to 0.20m thick and had presumably been deposited at the river edge. The layer above this (6661) was of grey to blue-grey tenacious clay mottled with brown clay and containing some silt and peaty clay. It was up to 0.70m thick and abutted the upper revetment, d. The accumulation of peaty clays would suggest that at this stage the water flow in the channel was fairly slow, and perhaps that it was at least seasonally cut-off from the main channel or channels so that there was no longer a continuously flowing river, although it must still have been permanently under water or at least waterlogged.

Above the peaty layer blue-grey tenacious clay had accumulated (7361), sealing the upper revetment. These clays also interleaved with lenses of gravel probably derived from erosion of the adjacent gravel bank. The high level to which these silts had accumulated would suggest that they must have been deposited following the abandonment of the final mill. By this stage a near horizontal surface was established and the former river channel had become no more than a slightly sunken area, likely to have contained only seasonal flood water. A layer of sticky mottled brown clay with some sand and frequent small pebbles accumulated (7360).

The upper part of the sequence relates to alluvial deposition following the demise of the river channel. A layer of mottled orange-brown to light grey-brown sandy clay with inclusions of fine grit, up to 5mm, showed some banding, particularly towards the river edge where there were multiple near horizontal trails of fine gravel with numerous mollusc

shells (7359). The upper surface of this layer was near level with the highest point of the gravel bank beside the watermills, suggesting that it accumulated following the construction of the flood bank over the former mills.

The final deposits (7355–8) comprised up to 1.0m of fairly homogeneous light brown tenacious clays with few inclusions. These were part of the widespread cover of alluvial clays seen to extend across the entire area to the south-west of the settlement. In a single section (not illustrated), it was possible to identify stratification within the alluvium. Successive, homogeneous clay layers 0.30–0.35m thick, were each overlain by thinner, 0.10–0.14m thick, and sandier layers containing water mollusc shells. This may indicate the presence of two successive accumulations of alluvial clays each followed by a period of relative stability. While the lower level can be assumed to have accumulated against the flood bank during the later twelfth century, no date can be provided for the accumulation of the upper level. The lower part of the accumulation would have built up against the flood bank (6552), while the upper part ran across the bank and into the interior, presumably as a result of regular seasonal over-bank flooding.

The latest feature recorded in section was a substantial ditch (6810), up to 3.00m wide by 0.90m deep, cut into the alluvial clays. This lay partly beneath the modern hedge line, and both respected a field boundary shown on the enclosure map of 1798 (Fig 1.3). This ditch may therefore have provided the original definition of the field boundary, while also serving as a flood protection to the West Cotton closes.

The fish weirs

To the immediate west of West Cotton the eastern palaeochannel was not exposed as this area was excluded from stripping and extraction because of the known presence of the palaeochannel. The areas to either side were quarried, leaving the palaeochannel standing as an unexcavated ridge. Along the northern margin of the palaeochannel four or five separate minor channels, each no more than 13m wide, were observed to run either closely parallel or at oblique angles to the main channel (Fig 6.1). The relationship and dates of these channels is unknown, but as the main channel was redundant by the end of the twelfth century they must have been functioning no later than this date.

On three of these channels there were man-made structures of limestone and timber stakes, seen following the machine removal of the overburden. They were recorded by measured sketches at the arbitrary levels revealed, but it was not possible to conduct any further examination of either their form or of the channels on which they lay. It would seem most likely that these structures were fish weirs, although it was not possible to identify the characteristic V-shaped arrangement of stakes supporting wattle screens to corral the fish into a central basket or trap (Steane and Foreman 1988, 170–172). It would appear

that the channels on which they lay could not have been of any great depth, perhaps 0.5–1.0m deep, and they were clearly separate from the main palaeochannel system. One possibility is that they represent minor meander channels within a complex braided river system.

The best preserved structure (Fig 6.1, 6429) lay across channel E, which was 13.0m wide and largely filled with grey-black clayey silts. It comprised a C-shaped structure of stakes, horizontal planking and withes, and was backed by limestone, which in part comprised at least two courses of flat-laid and some pitched stones, to a depth of at least 0.30m. At either end there were arms of limestone rubble returning to the west. The structure was 5.5m long by 0.75m wide, with the return arms 2.5m long. The main vertical stakes were up to 1.00m long by 100mm in diameter and had been driven up to 400mm into underlying tenacious clay silts, and smaller stakes were interspersed between them. Running northwards from the structure there was a line of at least four stakes, which probably supported a timber revetment extending to the northern edge of the channel. A short line of four closely-spaced stakes running south from the southern arm suggests that a similar revetment ran to the southern edge of the channel. Within the grey-black clayey silts abutting the western, upstream side of the structure there were further stakes as well as a dense scatter of fresh-water mussel shells.

A second and probably similar structure (6431) lay to the east, across what may have been part of the same channel G. This had been badly disturbed and it was only possible to record that a limestone platform lay within a silted river channel.

A third and better preserved structure (6430) lay across a separate channel to the north, channel D, which was 11m wide and filled with grey-black clayey silts and orange sandy silts. The structure was set at a sharply angled turn in the channel and comprised a roughly rectangular platform, 7.0m long by 6.0m wide and at least 0.30m thick, of closely packed limestone rubble, including blocks of limestone up to 400mm long. Two *in situ* vertical stakes, 50mm in diameter by at least 0.30m long, lay within the platform and the presence of much displaced wood within the disturbed limestone rubble suggests that there were originally other timbers associated with it, probably including further stakes. From the eastern end of the platform to the southern bank there was a 4.0m long line of numerous closely-spaced stakes, some only 100mm apart. To the north-east of the limestone platform, and presumably on the northern-eastern stream bank, there was a linear spread of disturbed limestone rubble, 13m long by 1.0m wide. Beyond its north-western end there was a less disturbed area of limestone which appeared to be faced with at least three courses of limestone blocks, suggesting that there may have been an adjacent wall or revetment running along the northern bank of the channel for at least 19m.

Short lengths of two further channels were observed to the north, H, and south, F, of those containing the possible fish weirs.

The northern palaeochannel

A second palaeochannel lay to the north of West Cotton. It ran near west to east for a distance of 400m (see Figs 1.2 and 1.3), linking the present western channel with the eastern palaeochannel to the north of West Cotton. To the west the overburden above the channel was not removed but the quarrying of the adjacent areas defined its location. To the east, where it was exposed, three separate parallel channels were observed. The southernmost channel (Fig 6.1, A) was 25m wide and the central channel (B) was 9m wide. At the level exposed both were filled with grey-black clayey silts containing unworked wood ranging from small twigs up to small trunks or branches 250mm in diameter. The northernmost channel (C) was 20m wide; and was also filled with grey-black clayey silts, but these were seen to lie beneath a layer of tenacious blue-grey clay itself sealed by light brown tenacious clay.

There is no direct dating evidence for this northern palaeochannel. However, aerial photographs show that at least part of its course was more prone to flooding than the adjacent areas of the valley floor, including the palaeochannel directly adjacent to West Cotton. This would suggest that the northern palaeochannel had been active at a later date than the channel adjacent to West Cotton. It is possible that while the eastern palaeochannel up to West Cotton had silted up by the end of the twelfth century, its continuation further to the north, and running past Mallows Cotton, may have been sustained by this west-east channel, as well as by the Scalley Brook to the immediate south of Mallows Cotton. The date of the demise of this northern channel has not been established, but it must have occurred well before the late eighteenth century, as maps of this date do not show it.

7 The Medieval Manor and Hamlet (AD 1250–1450)

In the thirteenth century the buildings within the excavated part of the settlement were converted from a small manor house, to the north, and part of a possible second manor, to the south, to an arrangement that eventually comprised four substantial peasant tenements (Fig 7.1, A, B, C and E) and a single cottage, D. These building groups were set around a central yard, with further similar tenements to the east flanking both sides of Cotton Lane, although these have not been excavated, tenements F–I.

The simplistic interpretation would have been to view this as comprising the desertion and abandonment of the manor house and the division of the plots into a series of smaller properties, or crofts, with each containing its domestic and agricultural buildings, the toft. While this was the ultimate conclusion of the process, marking the abandonment of direct farming of the manorial demesne in favour of the collection of rents and dues from tenant farmers, some of the new buildings, particularly the barn, detached kitchen range and malt house on tenement C/D, appear to have been of manorial status.

This indicates that there was an intermediate phase that involved both the relocation of the manor house onto the eastern plots adjacent to the Cotton Lane, and thus the maintenance of direct farming of the manorial demesne into the later thirteenth century, and the contemporary provision of new tenements on the former site of the manor. The abandonment of direct farming of the manorial demesne was therefore a staged transition that took over 50 years to complete.

The context for the relocation of the manor house most probably lay in the twelfth-century abandonment of the watermill and the silting of the adjacent river channel, together with the agricultural reorientation that had been initiated with the introduction of the barn and processing room on the original manorial plot. With the loss of the mill there was no incentive to retain the manor house adjacent to the river, which was also silting, and the relocation provided the opportunity for both a further expansion of the processing activities and their physical separation from the domestic buildings of the manor, which could not have been achieved within the confines of the old manorial enclosure. The opportunity to introduce a more modern arrangement was taken, and the relocation would also have provided more convenient access to Cotton Lane and to the fields that now formed the principal economic base for the settlement.

The relocation of the manor (AD 1250–1300)

A new tenement on the manorial plot: tenement E

Slightly before AD 1250, most of the former manorial buildings on the northern holding were levelled and new buildings were constructed (Fig 7.2, tenement E). The hall of the manor was levelled and new domestic ranges were built around a new open courtyard at the northern end of the central yard. These included an attached kitchen range and adjacent processing room, and a detached building to the east with a broad doorway may have been a stable or byre. Some of the former manorial ranges were initially retained. The range containing the malt oven was levelled but a new oven was built over the remains. This was now either free-standing or under a new cover building that left few traces, and was set in one corner of a new walled yard, which occupied the area of the former courtyard. The dovecote may also have been retained and, to the south, the barn and processing room was probably also still in use. One possibility is that while new domestic ranges were provided for an incoming tenant, the agricultural ranges may have still been used directly by the manor, perhaps through an interim period whilst comparable and improved facilities to the east were still under construction, tenement C/D.

The new manor: tenement C/D and tenement F

By the mid-thirteenth century a substantial new complex of service and agricultural buildings, including a barn, detached kitchen/bakehouse and a malt house, had been constructed at the northern end of the eastern enclosures (Figs 7.2, tenement C/D and 7.3). The substantial barn, which fronted onto the eastern side of the central yard, was not fully excavated, but if the broad, opposed doorways were central it would have been 20–22m long. Geophysical survey also indicated that there was perhaps a further building beyond the south-eastern end of the barn (Fig 7.2). Abutting the northern end of the barn there was a large kitchen/bakehouse containing a circular oven, open hearths and a possible small processing trough. To the rear of the barn there was a walled yard, initially surfaced with gravel and later with limestone metalling, and beyond this stood a malt house, the most complex of the four excavated.

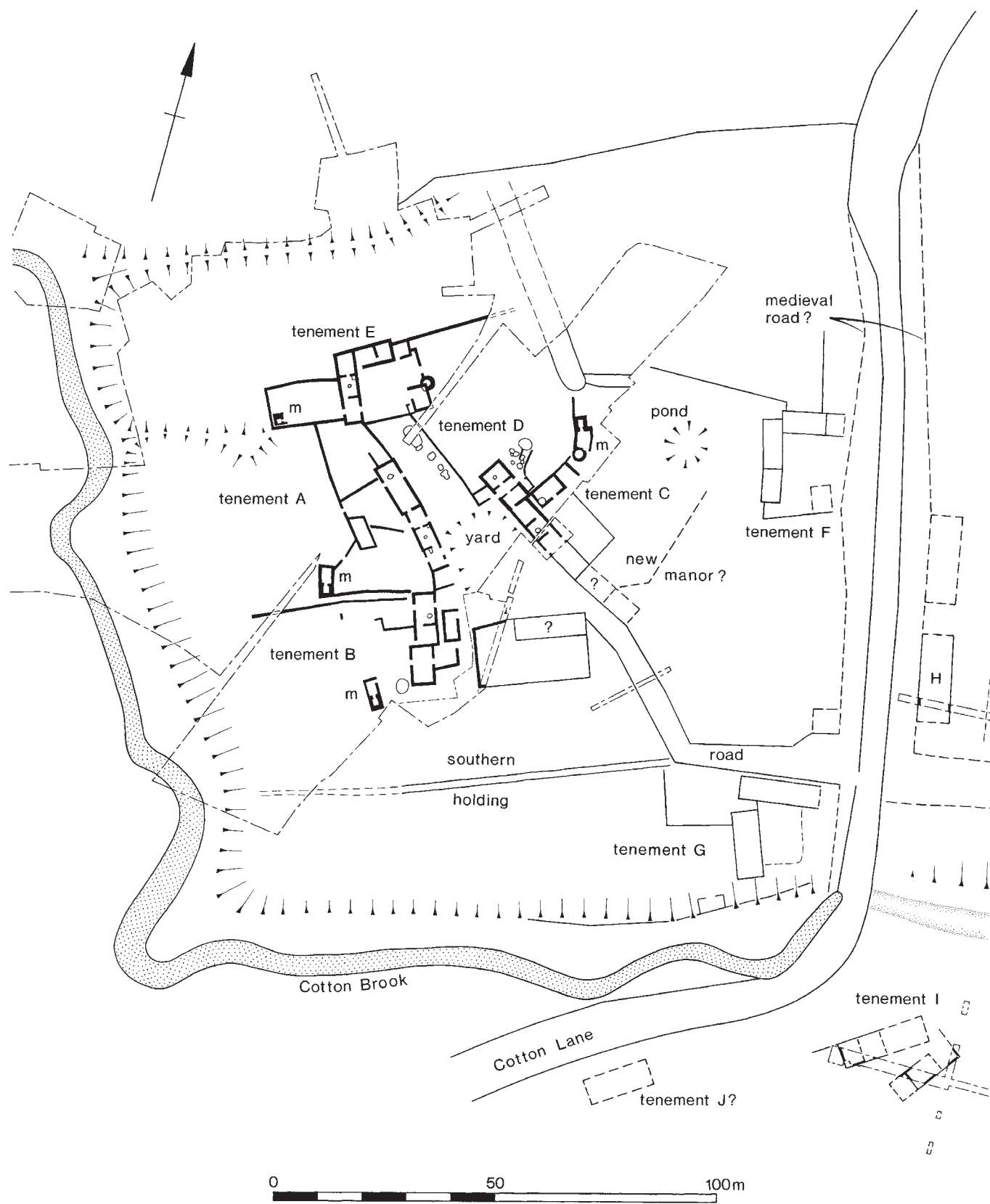


Fig 7.1: The medieval manor and hamlet, 1250–1450

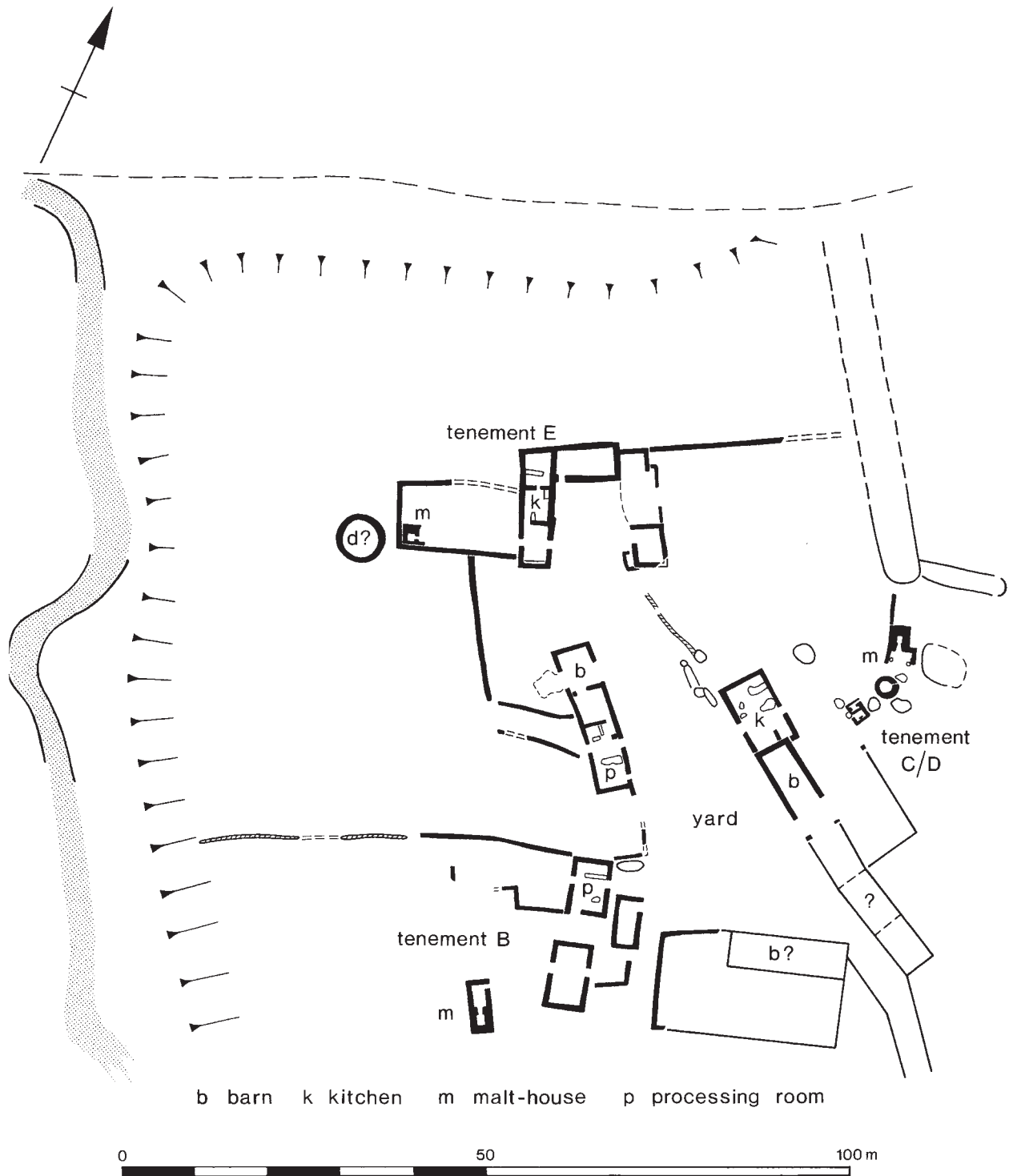


Fig 7.2: The manorial agricultural ranges and peasant tenement, mid thirteenth century

Originally it comprised a free-standing oven and a circular structure, perhaps holding a vat for steeping the barley prior to malting. An adjacent H-shaped stone-lined pit was also associated, and burnt debris from the firing of the oven was dumped into nearby pits.

Subsequently, the malt house was partially rebuilt to

provide a fully enclosed room (Fig 7.4). The kitchen range was also partially rebuilt, and when a narrow partition wall was inserted the oven went out of use. It may have been replaced by a nearby new and separate bakehouse (Figs 7.4 and 7.5). In addition, a new room with an external door may have been added to the frontage at this time,



Fig 7.3: The medieval tenements in 1985, looking west, showing tenement C/D (foreground), tenement A (top right), tenement B, unexcavated (top left), the silt-filled yard (centre) and the ditches of the Bronze Age round barrow (right)

along with the provision of a boundary wall that ran to tenement E to the north.

It is suggested that the contemporary domestic buildings, the new manor house, lay further to the east adjacent to Cotton Lane (Fig 7.1, tenement F). These buildings survive as well-preserved earthworks, with many walls evident as parch marks in dry summers, and they have also been subject to geophysical survey. A central courtyard may originally have opened directly onto Cotton Lane, and it was flanked to the west by a range with two or more rooms and to north by a second range of similar length. Along the southern side there was a boundary wall and possibly a further, detached building to the east.

Geophysical survey indicates that there was a boundary wall along the northern side of the new manorial enclosure, and to its south a rectangular area of metalling flanked the northern side of a pond or large well pit, which survives as an earthwork and still retains water in the winter months. There may have been a north-south boundary wall, but this sub-division might only have been introduced when the manor was subsequently converted to peasant tenements. There is an absence of stone scatters in the south-eastern part of the area, south of tenement F, although at some date a small building may have stood near the junction of the internal road with the Cotton Lane (Fig 7.1).

Together, the two building complexes, C/D and F, would have formed a substantial farm that is interpreted as the new manor house, relocated from the northern holding onto the eastern enclosures, and with the domestic and agricultural ranges now physically divorced by being set on opposite sides of the new manorial enclosure.

Further new buildings: tenement A

Slightly after AD 1250, the old manorial barn and processing room was extensively rebuilt to form the main domestic range of a new tenement occupying the southern part of the old manorial enclosure (Fig 7.4, tenement A). While this tenement formed a linear frontage, the accommodation provided was closely similar in terms of room space to that of tenement E, to its immediate north, and included an attached kitchen with similar internal fittings.

This new tenement was provided with a malt house, set in the yard to the rear, but rather than supplementing the production of tenement E, it may have replaced it, as by this time both the dovecote and the malt house had been demolished. A new boundary bank separating the two tenements ran over the levelled dovecote. Once both were established, the northern tenement possessed a processing room containing a trough, perhaps used for fulling cloth,

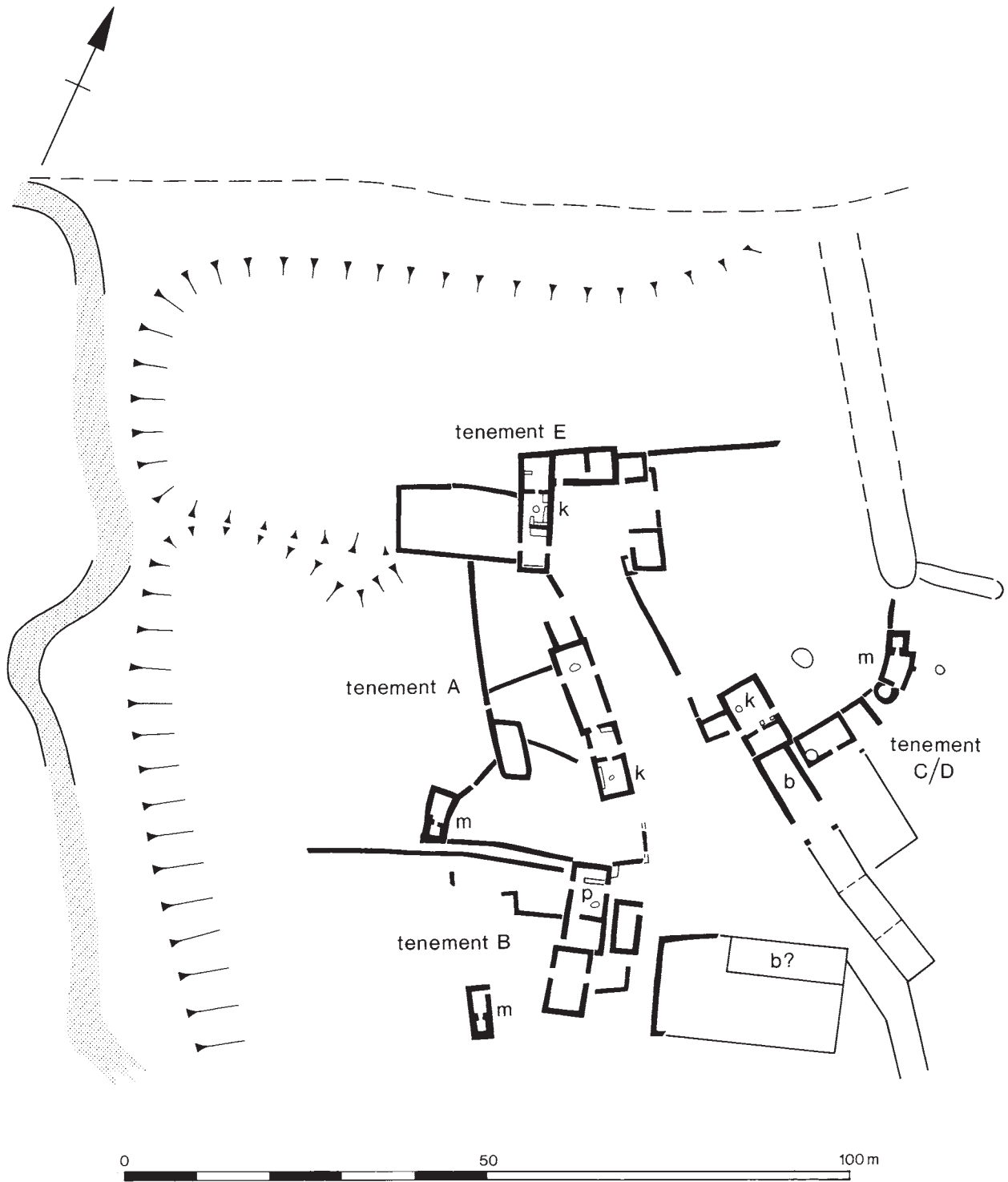


Fig 7.4: The manorial agricultural ranges and peasant tenements, late thirteenth century

while the southern tenement had a malt house. So each carried out one supplementary processing activity, perhaps directly contributing to the productive capacity of the new manor house, where perhaps both processes were carried out.

The southern holding: tenements B and G

Despite the replacement of the manor house with two tenements, the boundary between the former northern holding and the southern holding was both retained and re-emphasised. Initially, a single wall may have supplemented a remnant bank and perhaps a partial timber fence (Fig 7.2), but with the full development there was a double-walled boundary, perhaps with each wall provided and maintained by the separate property holders (Fig 7.4).

Further buildings appeared on the northern part of the southern holding to supplement the existing processing room (Figs 7.2, tenement B). An open room was attached to the processing room and a malt house was built in the yard behind. The small bakehouse at the frontage may have been either retained from the earlier development or was constructed at this time, although it was subsequently rebuilt, removing the oven (Fig 7.4). To the north of the bakehouse and in front of the processing room there was a small yard with successive metallated surfaces of neatly pitched limestone and a similar walled yard probably lay to the rear.

These facilities partly paralleled the development of the agricultural ranges on the opposite side of the central yard, and at the eastern limit of excavation there was a boundary wall indicating the presence of further related structures to the east. Without excavation, the nature of these buildings cannot be established but, taking the geophysical survey evidence into account, it appears to have comprised a building set within a walled yard and directly facing the barn and walled yard on the manorial enclosure to the north-east. It is therefore suggested that this building was perhaps also barn, with the two barns facing each other.

As with the new manor house, the related domestic ranges may have lain to the east forming a frontage onto Cotton Lane. This building complex is known from both poorly defined earthworks and geophysical survey (Fig 7.1, tenement G). Western and northern ranges flanked a metallated courtyard to the east, while a walled yard lay to the west.

To the south, a wall along the top of the bank flanking the Cotton Brook was abutted by a small building, but these features could be later medieval or even post-desertion in date.

As in previous periods, it is therefore suggested that there were still two manors at West Cotton, with closely comparable arrangements and facilities. The farm buildings were set on either side of the central yard, while the domestic ranges occupied the prime locations, fronting onto the Cotton Lane.

Other tenements: H and I

It may have been with the establishment of two major domestic ranges fronting onto the Cotton Lane that a further tenement or tenements appeared on the eastern side of the lane (Fig 7.1, tenement H). These buildings were located by geophysical survey and were investigated with a single trial trench.

A further two ranges of buildings lay to the south-east, and to the south of the Cotton Brook (Fig 7.1, tenement I). These buildings were in use in the fourteenth century, but only the demolition levels were investigated in limited trial trenching, so an earlier origin is possible.

The environmental evidence suggests that the agricultural activities still included the preparation of grain for milling, and the only possible location for a new mill would have been to the east, beyond the area where alluvial silts had been accumulating, and therefore in the vicinity of tenement I. It is suggested, therefore, that tenement I may have been a later medieval watermill complex, and there is documentary evidence for a watermill attached to the Chamberlain holding of West Cotton in the early fifteenth century. The only physical evidence to support this suggestion is part of a well-worn millstone from tenement H, to the north. It is, of course, also possible that grain was being prepared for milling elsewhere, perhaps at Mallows Cotton, where both documentary and archaeological evidence indicate the presence of a medieval watermill.

The medieval organisation and status of West Cotton

By the mid to late thirteenth century the whole focus of the settlement had shifted dramatically from a clustering of holdings around the central yard, to domestic ranges set alongside Cotton Lane while their agricultural complexes and two subordinate tenements occupied the central area (Fig 7.5 and Plate 7).

The presence of two major holdings and the tenements might be reflected in the documentary evidence as, by the later thirteenth century, it is recorded that men of both Ralf Normanville and Henry de Albotesk were in West Cotton. The earliest documented date of AD 1274–5 for this dual holding, might suggest that the relocation of the manor and the comparable development of the southern holding, had coincided with the acquisition of West Cotton by Henry de Albotesk and Ralf Normanville around the middle of the thirteenth century. The identity of the respective holdings cannot be established with certainty, however, the earlier decline of the southern holding might suggest that this was held by the Normanville family, as by the early fourteenth century this is recorded as the lesser of the two, 1/40 of a knight's fee in comparison to 1/16 of a knight's fee for the other, then held by the Chamberlain family. In the later fourteenth century the Chamberlain family were in possession of both.

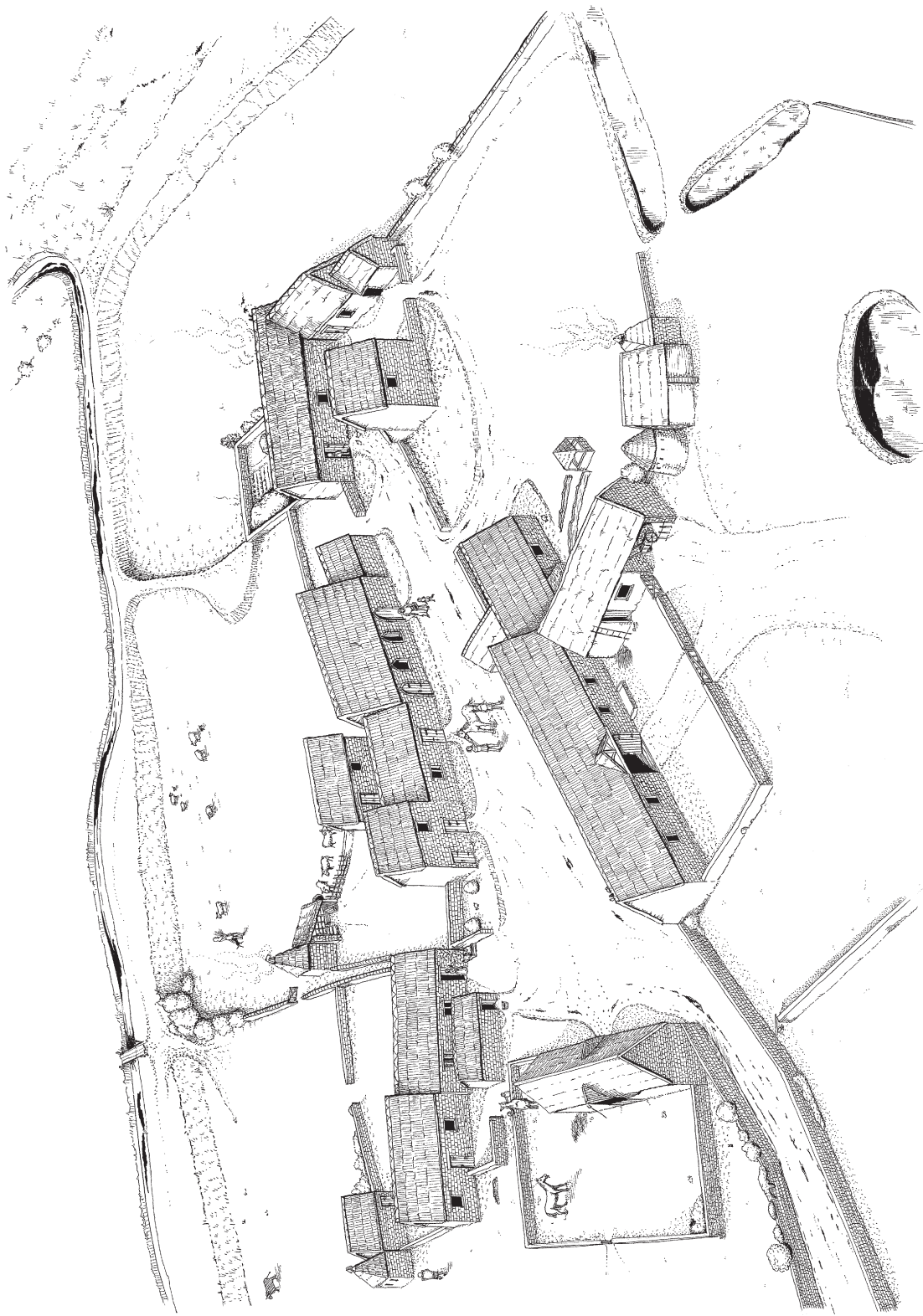


Fig 7.5: The manorial ranges and peasant tenements as they may have looked in the late thirteenth century (Alex Thompson)

From manor to hamlet (AD 1300–1350)

The relocated manorial buildings of the northern holding, with their emphasis on the storage and processing of arable agricultural products, and the probable comparable development of the southern holding, had represented a considerable investment in establishing substantial, well-organised and well-equipped farms. However, this was to be a short-lived phase of activity.

By the beginning of the fourteenth century most of the buildings, on both the manorial enclosure and the southern holding, which had been related to specific agricultural activities, had been either abandoned or reused for other purposes. In particular, both the barn and the kitchen of the manorial complex were converted to domestic buildings (Fig 7.6), to form a tenement, C, comparable to those already existing to the north and west, and an adjacent cottage, D. This in itself implies that direct farming of the manorial demesne had ceased, and it may be that there was a full abandonment of the manor at this time, with the domestic range adjacent to Cotton Lane perhaps also converted to a tenement.

Whether it was the desertion of the manor that caused the redundancy of the agricultural buildings or an agricultural decline that led to the desertion of the manor, cannot be established from the archaeological evidence. It is perhaps most likely that the two went together, reflecting the national decline in arable agriculture and the shift towards pastoral farming.

The southern holding underwent a similar decline, indicated by the disuse of the processing room at the beginning of the fourteenth century. The further short-term use of these buildings into the early fourteenth century may have been as ancillary buildings to a tenement, perhaps with its domestic buildings formed by conversion of the possible barn within the walled yard.

It is of interest that on both holdings the agricultural decline did not lead to total desertion of the buildings but to their conversion to tenements, tenanted crofts. It is therefore possible that through the first half of the fourteenth century, with the settlement now forming a hamlet of several crofts, its population may have reached its highest ever level. For a time there may have been seven tenements within the main settlement area. Tenements A and E were certainly still in use, the manorial complex may have been broken into two tenements, C and F, and a smaller cottage, D, and the southern holding probably contained two tenements, B and G. A further one or two tenements, H, lay to the east of the Cotton Lane. To the south a further building group, I, possibly a watermill, was also functioning at this time and may only have been introduced in the mid-fourteenth century. The fully excavated tenements exhibit a diversity of forms. To the north, tenement E had a croft of around one acre. To the south of this, tenement A had a very similar building arrangement but a smaller croft, at under 3/4 of an acre. To the east, the smallest tenement, D, possessed only a cottage on a croft of less than 1/2 an acre.

It has already been suggested that the lesser value of the fourteenth-century Normanville holding may identify it as the southern holding, which was at least partially deserted before 1350. Before the end of the century the Chamberlain family was in possession of both holdings, and this may reflect the continuous occupation of the tenements on the Chamberlain holding while the partial, and perhaps by then total, desertion of the Normanville holding had perhaps rendered it of so little value to the Normanville family in generating an income that it was not worth retaining.

While the Clare/Gloucester fee dominated West Cotton, with little doubt that the holdings occupied the main settlement area, we are left with the question of the location of the Duchy holdings, which comprised a meadow, recorded in the fourteenth century, and a cottage, recorded in the fifteenth century. Orders in the Duchy court rolls for the scouring of ditches at Cotton Bridge and references to the cottage with an acre of willows by the Cotton (Tipping) Brook, may provide sufficient clues when combined with the enclosure map of 1798 (see Fig 1.3). From this it can be seen that the ancient enclosure comprised two separate blocks; the Gloucester fee enclosure west of Cotton Lane and north of the Cotton Brook, and a further enclosure east of the lane and south of the brook. It is therefore possible that it is the enclosure to the south-east that formed the Duchy holding, and the Duchy cottage might have been a building to the south of the brook, where stone walls were observed in a pipe trench dug in 1967 (Fig 7.1, tenement J).

It may also be noted that of the various names applied to the settlement within the later medieval documents, the Duchy records generally refer to West or Little Cotes while the Gloucester fee documents use Wilwencotes. If the holdings of the respective fees were located as described above, and the differing names were specifically applied to the two distinct entities, then this would imply that what was actually excavated was the Gloucester fee holding of Wilwencotes and not the Duchy fee of West or Little Cotton.

The conversion of the manorial buildings

The tenement C/D malt house was abandoned and probably demolished around the end of the thirteenth century, while the barn and the kitchen were converted into separate domestic ranges (Fig 7.6, tenements C and D).

Tenement C

The broad barn doors were partially blocked to form narrow doorways, and two partition walls were inserted to form a series of smaller rooms. The internal arrangement was closely comparable to that of tenements E and A, with a clay-floored hall to the north, a kitchen, k, with a central hearth and no external doors, while the central room, with its opposed doorways, was at least partially floored with limestone slabs. The separate bakehouse was also retained, although the oven was removed. As noted earlier, a possible

boundary wall running from the eastern end of the frontage to the pond to the north may have been introduced at this stage to separate the croft of tenement C from a further separate tenement occupying the former domestic buildings to the east, tenement F.

Tenement D

The former kitchen was divided into three small rooms by the addition of a second partition wall. The northern chamber served as a kitchen, k, there was a central cross-passage and the southern chamber probably had a flagged floor. A small, sunken chamber with a flagged floor and an external door, probably used for storage, was added to the rear. A walled passage provided access to a well, which may have been retained from the previous phase. The room abutting the front of the building was probably retained, along with the boundary running to tenement E to the north.

This building could be appropriately described as a cottage, as there is a striking contrast with the extensive ranges of tenements E, A and C. The small croft extended to the buildings of tenement E and it was probably with the appearance of the cottage that access from tenement E onto this area was blocked.

The northern tenements

Tenement E

This was retained with only minor alterations. The kitchen was frequently refurbished, and there was a succession of central hearths. In the chamber south of the kitchen at least the western external door was blocked, and the room was furnished with a full limestone floor, suggesting that it was used as a storeroom. The processing trough in the northern room was rebuilt twice, each time becoming shorter, with this indicating a progressive decline in the quantity of material being processed. This may mark a decline from commercial and domestic use to purely domestic usage. The hall was subdivided into two small rooms and the abutting, open-sided chamber was turned into a closed room. The detached building, formerly a stable or byre, was also partially rebuilt. The doorway was partially blocked and a massive circular foundation was set around one corner. An external area of burning suggests that it functioned as an oven with an internal step providing access to a raised oven chamber, similar to post-medieval bread/baking ovens.

Tenement A

There were similar modifications to this tenement. The kitchen was reorganised when a southern door was inserted to provide access to a new chamber abutting the southern wall. The provision of a stair-base within this extension indicates that it was of two storeys. The later blocking of its external doors suggest that it later functioned as a flag-floored storeroom with access only from the kitchen.

It may be noted how the later development of the kitchens in tenements A and E ran closely parallel. Both had access to an adjacent chamber in which the external doors had been blocked when they were provided with floors flagged with limestone slabs. This indicates a need for increased storage space, presumably for domestic foodstuffs, within the individual tenements, perhaps a need that followed the loss of the barn or barns of the two manorial holdings.

The conversion of the southern holding

The excavated buildings of the agricultural complex, tenement B, had fallen out of use as specialised buildings by the end of the thirteenth century. The bakehouse had been replaced by a new building, while the malt house was demolished and the trough in the processing room was filled in. The final use of these buildings was therefore merely as ancillary buildings, and they appear to have fallen out of use before 1350. A curving boundary wall then blocked access from the central yard and the levelled rubble over the former buildings may have been utilised as an external yard.

The medieval hamlet: decline and desertion (AD 1350–1450)

Tenement B had a short lifetime, as it was deserted before 1350 (Fig 7.6). In contrast, the desertion of the tenements of the northern holding probably began no earlier than the mid-fourteenth century. Tenement E was the first to go, possibly as early as 1350, but the dating evidence is far too imprecise to confirm any direct association with the Black Death, which reached this area by the end of April 1349. There was some reuse of the buildings in the later fourteenth century. A central doorway was opened in the main range, giving access into the former kitchen, and the partition wall separating the kitchen from the northern room may have been demolished. The building was perhaps then utilised as an outbuilding by the adjacent tenement, A. The provision of a continuous boundary wall, physically separating the tenement courtyard from the central yard, may either have coincided with this late reuse or even post-dated the desertion and demolition of all the tenement buildings.

By the early fifteenth century water-deposited clayey silts had begun to accumulate within the central yard, the access road and also within the Cotton Lane itself. The cause of this flooding is uncertain, but it may have resulted from the abandonment of control of the tributary stream, perhaps following desertion of the postulated medieval watermill. It is likely that domestic occupation of tenements A, C and D ceased at about this time, but at least some rooms in all three tenements were provided with thick clay and rubble or pitched-stone floors and raised doorway thresholds. In the cottage of tenement D,

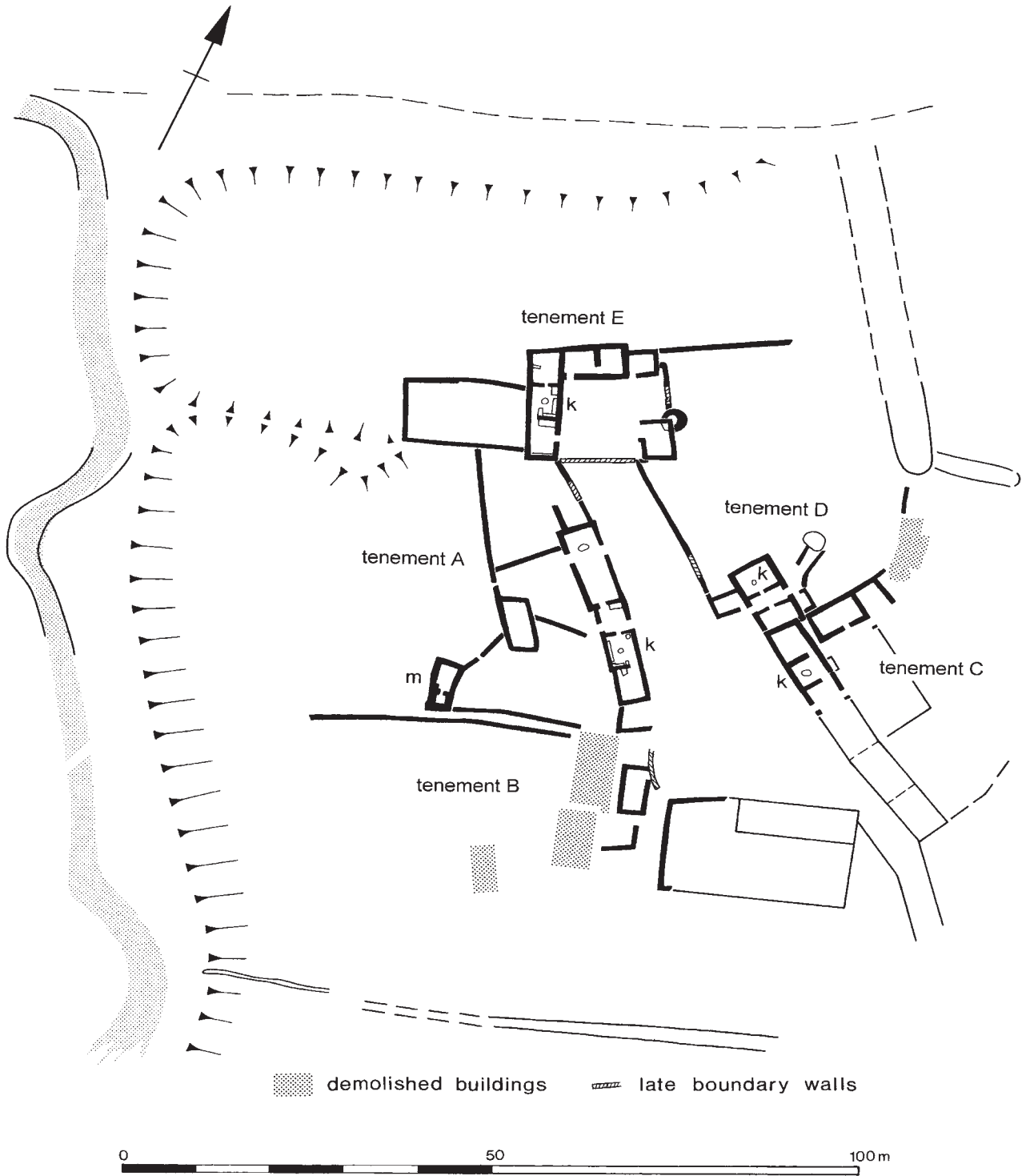


Fig 7.6: The peasant tenements of the medieval hamlet, fourteenth century

the southern wall to the central and eastern rooms may have been totally removed and the pitched-stone floor in the eastern chamber had been carefully laid, suggesting a specific use, perhaps as a byre or cart shed. These new floors were probably inserted to raise them above any threat of flooding, and the absence of any associated features, such as hearths, suggests that they were then only being used as outbuildings, perhaps by the tenements adjacent to the lane, which may have been the last to go.

The cutting of a ditch around much of the central yard indicates that an attempt was made to drain and maintain it (Fig 7.7, PM2). This ditch ran along the frontage of tenement A (Plate 9), suggesting that these buildings had totally fallen out of use, while its absence in front of tenement C and the very eastern end of tenement D, suggests that these buildings, perhaps specifically those with raised floors, were still in use when this drainage ditch was excavated.

Tenements A, C and D all had been deserted by around 1450. The desertion date of the tenements adjacent to Cotton Lane is unknown, and these may have been in use later, but the general absence of later fifteenth-century pottery on the site would still suggest a general date of desertion at around the middle of the fifteenth century.

The levelling of the deserted buildings appears to have occurred fairly soon after desertion, probably through the later fourteenth to early fifteenth centuries. In some instances walls were totally robbed, but those fronting onto the central yard were generally retained to a sufficient height to complement the drainage ditch in preventing flooding from inundating the former crofts, although some intermittent flooding is indicated by accumulations of silty clays in hollows over the demolition rubble.

It is possible that stone from the first tenements to be deserted may have been partly utilised within the settlement, perhaps for further building or rebuilding alongside the Cotton Lane. This may explain why tenement E had been more extensively robbed than tenement A. Conversely, the well-preserved earthworks of tenement F and G, adjacent to the lane and perhaps the last to be occupied, suggests that these were not extensively robbed. Perhaps the effort of carting the stone up the hill to Raunds for reuse was not considered worthwhile as more immediate sources were available.

By the later fifteenth century the documentary evidence indicates that only a single cottage survived, held by the Duchy and tentatively equated with tenement J, lying well to the south of the main settlement. It was deserted by or before the late sixteenth century, bringing to an end 600 hundred years of continuous occupation.

The material and environmental evidence

At the beginning of this period the coarseware pottery was dominated by the range of jars and bowls produced

by the local pottery industries based on the villages of Lyveden and Stanion, in the north of the county, and also from Potterspury, towards the south of the county. The first half of the thirteenth century also saw the first appearance of quantities of glazed jugs, as the production of glazed vessels for widespread use started to become common in the local industries. Many of these were from Lyveden and Stanion, which produced coil-built, wheel-finished, thick-walled jugs, not of the best quality, boldly decorated with vertical or diagonal white slip stripes, or applied strips of white firing clay commonly accompanied by stamped pads, which contrasted with the green body. Glazed jugs of better quality from the Potterspury industry were also common although sometimes it is uncertain whether these are genuine Potterspury vessels or similar finer, wheel-thrown jugs being produced in imitation at Lyveden and Stanion. Brill/Boarstall ware jugs, from the villages near the Buckinghamshire border east of Oxford, were also relatively common.

A handful of vessels also came in from slightly further away; including a couple of Oxford ware jugs and a tripod pitcher, two London ware drinking jugs, and a couple of Nuneaton ware jugs. The superior status of tenement C/D, as the suggested agricultural and kitchen ranges of the relocated manor house, may be reflected in the presence of these rarer vessels; with a Nuneaton ware jug coming from a primary deposit in a pit behind the kitchen/bakehouse, D12, while the Oxford ware tripod pitcher was from the adjacent tenement C.

It may be noted that the relatively lowly status of the site is reflected in the pottery assemblage, as it is dominated by local and then regional products, and clearly there were few wares being imported from further away and no exotic imports from the continent. However, the range of medieval glazed wares is basically the same as those from the site of Furnells manor in Raunds, which again emphasises how little difference there was between the outlying hamlet and the manorial centre in Raunds.

The range of other finds also illustrates aspects of the domestic life of the medieval tenements. There were many small items, particularly copper alloy buckles, buckle plates, strap ends and other small decorative fittings, all of basic simple forms. There was a large range of whittle tang knives, with the tang set in a socketed handle, while the presence of only twelve scale tang knives, where side scales of bone or antler are riveted to a flat tang, reflects the late introduction of these knives. It is notable that none came from tenement B, which was deserted soon after AD 1300.

Specific tool groups were rare, although the presence of spindle whorls and bone pins denoted that spinning was still a daily activity, although the absence of pinbeaters indicates that the two-beam loom was no longer in use. There is a notable scarcity of agricultural or woodworking tools in iron; which is restricted to parts of two pairs of shears, two sickles, a weed hook, a spoon bit, some wedges and a small draw knife only suitable for use on

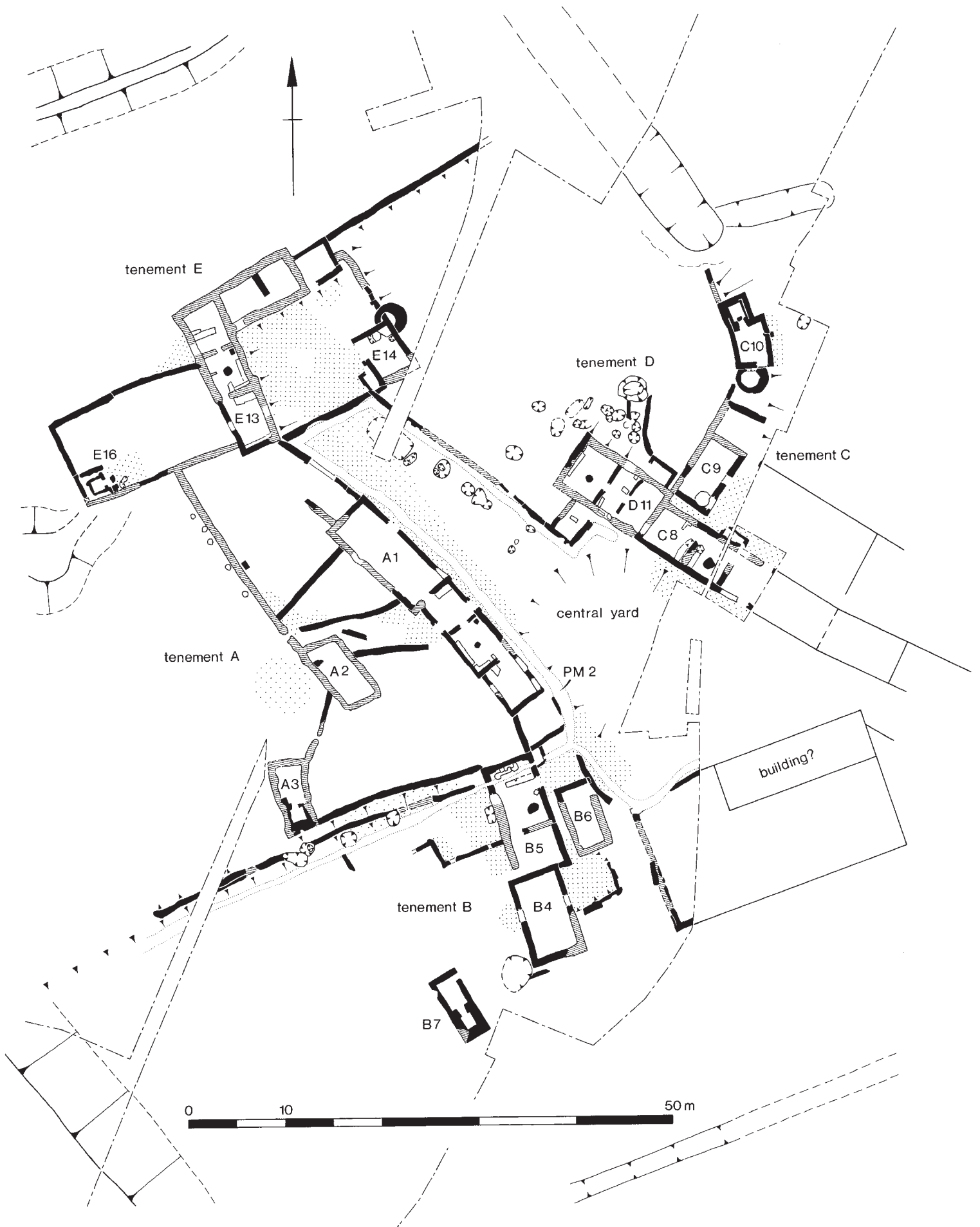


Fig 7.7: The excavated medieval tenements and buildings

small domestic items. Ironwork relating to the buildings is also surprisingly sparse, but there is a range of sizes of staples, and eight L-shaped hinge pivots to hold window shutters or doors and gates.

In fact, it can be argued that, despite the recovery of around 1000 nails, iron in general is under-represented in the finds assemblage, suggesting that much of it, including the humble nail, had been recycled as scrap to the local blacksmith. This under-representation is well illustrated by the desertion of the domestic range of tenement C. This building appears to have been left derelict but with some fittings, either a door or chest or perhaps a number of such items, left stacked in one of the rooms. They were left long enough for the wood to decay, leaving behind a collection of nails, iron sheet and staples and parts of three lock mechanisms including a barrel padlock and sliding bolts from two mounted locks. Similarly, when the manorial kitchen/bakehouse, D12/D11, underwent a major rebuild a dense scatter of nails, presumably debris from demolition/construction, was sealed beneath the new floor.

The most common single item in iron, after nails, was the horseshoe, with 78 recovered. Only 10 came from twelfth-century contexts, and the remainder are of thirteenth to fifteenth century date. A considerable proportion might have been deposited during use of the closes following desertion of the tenements. However, the riding of horses during the lifetime of the hamlet is indicated by a small collection of spurs and bridle bits. Some of these were associated with the twelfth-century manor, while a number of others come from tenement E, and could either be residual from the underlying manor or add corroboration to the interpretation of the free-standing building with a broad doorway as a possible byre or stable.

Other items of interest relate to more leisurely activities. There are two simple musical pipes worked on lengths of sheep tibia, and perforated pig metapodials were spun on cord as buzz-bones. Other items include three nine-men's morris boards, all crudely scratched on irregular fragments of limestone. All of these were recovered from either the manorial kitchen/bakehouse range or its later use as a peasant cottage, D11/D12. This building also produced the only figurative carving from the site (Plate 13), set at one end of a small stone-lined pit with the floor of the pit including a scratched nine-men's morris board (see Fig 7.27).

Soil samples taken from the medieval tenements generally produced few charred plant remains, with the exception of samples from some of the malt-house ovens. Tenement A produced more material than the others and, like the twelfth-century manor house, the charred remains were dominated by weeds, and wheat was generally still the dominant cereal. It is also of interest that tenement A was apparently receiving some of its crops from the floodplain, as had the manor house in the twelfth century, perhaps suggesting that a specific piece of land originally under the control of the manor had come under the control of tenement A, with the area of remnant ridge and furrow to the immediate south of

West Cotton a possible candidate, although it might have lain further away.

Chaff remains were relatively scarce, but both types of free-threshing wheat, and hulled wheat chaff were present. Rye chaff was in the richer samples, though rye grain was only present in the tenement B, C and E malt houses. Sprouted grain and sprouts came from three of the four malt houses; with sprouted oat and barley grain from tenement B, and sprouted barley from tenements A and E. No sprouted grain came from the tenement C malt house, although wheat was present, perhaps suggesting that this malt house was also, if not primarily, used for grain drying.

Another striking feature of the samples from the malt houses is the number of cabbage and mustard seeds (*Brassica* spp.) recovered. Large legumes were also present, with peas from the tenement A malt house, and single peas from tenement C and B, which may have been deliberately used in brewing. There were lentils from the tenement B malt house and a single possible lentil from the tenement E malt house, although these may have grown as contaminants of the cereal crops.

The weed assemblages from the samples are somewhat different to the previous period. Species typical of winter and spring sown cereals are again present but leguminous weed seeds form a much larger proportion of the assemblages.

In the animal bone assemblage, as previously, sheep was the most common animal, followed by cattle, pigs and horses. In this later period, as also noted with regard to the medieval manor, while the range of ages in the kill-off pattern for sheep indicates a mixed economy exploiting the meat, milk and wool, there was an increase in slightly older animals, of 3–4 years, indicating a greater interest in wool production. This suggests that the animals were now providing two or more fleeces before being slaughtered, although at this age they would also have provided the best mutton, so there does not appear to have been a shift to specialised wool production.

The cattle show a slightly younger kill-off pattern than previously, which may suggest a small increase in beef production, but otherwise most animals were still kept to maturity for traction power and milk production. Many of the cattle bones bore butchery marks, and cut marks on the phalanges and metapodials indicate that animals were skinned for their hides, and a single chopped horn core may relate to horn working. All slaughter and butchery probably took place on site for both sheep and cattle.

The exploitation of young pigs, with few older animals, for a quick return of meat and lard was unchanged.

The horse bones are of interest, as they show an unusually high incidence of cut marks indicative of skinning. In addition, there are also chop marks that come from the butchering of the carcasses for meat in the same fashion as for the cattle and sheep. It may be that this horse meat was being fed to the many dogs around the site, but at least one horse bone had been smashed apparently to extract the marrow and, in the context of the wet seasons,

poor harvests and animal diseases that were such a common feature of the early fourteenth century, the use of surplus horses for human consumption cannot be ignored.

As just mentioned, dogs were common throughout the life of the settlement both directly in the bone record and indirectly from the widespread evidence for dog gnawing of other bones. Cut marks show that dogs were skinned, and the pelts may have been used for producing gloves. Cats were also quite common, although many of the bones were from young cats, perhaps suggesting that they were largely exploited for their pelts, although a secondary use of keeping vermin under control was no doubt also useful.

As previously, fish were scarce but there was eel and carp from freshwater, and herring and ling from the sea.

The buildings of the later medieval manor and tenements: C, D and F

Tenement C/D contained the agricultural ranges of the later manor (Fig 7.7 and Plate 10). These buildings were constructed within the former eastern enclosures in the decades prior to the mid-thirteenth century (ph 2/0, 1225–1250). Initially, there was a barn, a multi-purpose kitchen range and a malt house with various ancillary features (Fig 7.8: C8, D12 and C10). At around the middle of the thirteenth century the kitchen range was rebuilt (Fig 7.9, D11) and the circular baking oven was probably relocated to a new building, C9. The malt house was also redeveloped and the barn was retained. At this stage, if not earlier, a walled yard was attached to the rear of the barn.

At the end of the thirteenth century (ph 2/2, 1250–1300) the buildings were converted into two peasant tenements, C and D. Both the barn, C8, and the kitchen range, D11, were partitioned into smaller rooms to form two separate domestic dwellings, tenements C and D (Fig 7.9). The malt house complex fell out of use and was probably demolished.

The new tenements were in use through the fourteenth century (ph 3/2, 1300–1400) but may have been abandoned at the around the end of the century. The insertion of raised floors in a few rooms of both tenements in the early fifteenth century (ph 4, 1400–1450), probably relates to the reuse of these rooms as agricultural outbuildings, with the raised floors a response to the onset of flooding within the central yard.

The barn and later domestic range, C8

This building was only partly excavated but the opposed broad doorways identify it as a barn. If the doors were central, they would indicate a total length of 20–22m (Figs 7.10–7.12). The building was 5.00m wide, and the internal width of 3.80m suggests that the internal area would have been of the order of 80sq m, probably making it the largest single building in the history of the settlement.

The southern wall was well-preserved, surviving five to

seven courses high, 0.40m. It was 0.60m wide with broader foundations, 0.65–0.70m wide, and an internal offset at the western end. The central doorway was 3.00m wide. At the western end of the wall the neatly faced northward return formed the southern side of a doorway opening, giving access into the adjacent kitchen range. The central door jamb recess had projecting pad stones at its base.

The northern wall had been extensively robbed, but the partly surviving surrounds indicated that the doorway was 4.10m wide. The western door surround had an external thickening suggesting the provision of a strengthening buttress.

A remnant of an early floor comprising large, flat-laid limestone slabs, cracked, fragmented and with worn surfaces, survived between the opposed doorways and suggests the provision of a threshing floor. A neonatal infant (3065) had been buried within a shallow pit beside to the northern wall, to the west of the doorway.

The barn was converted to a domestic range by the partial blocking of the barn doors and the provision of partition walls to form a series of smaller rooms. The blocking wall of the southern door was 0.55m wide and was founded on a course of large flat-laid limestone slabs. At the eastern end there was a new doorway, with a door jamb recess in the eastern surround. The blocking wall of the northern door had been robbed, but a new threshold comprising a double layer of flat-laid limestone, was 1.20m wide. A kerb of pitched limestone ran northward and flanked a better laid surface of pitched limestone that formed a path leading to the new door.

The westernmost partition wall was 0.55m wide, and within the internal doorway at the northern end a shallow slot and a pair of postholes, each up to 0.30m in diameter by 0.18m deep, would have held the door-jamb post and a sill beam. The other partition wall between was 0.60m wide.

The western room, 1, was 4.50m long by 3.90m wide; an area of 17.5sq m. A floor of clean yellow clay was up to 70mm thick against the walls, but had been eroded within the centre of the room and through the doorway leading to room 2. A shallow, linear robber trench adjacent to the partition wall, and a similar feature in room 2, probably held the foundations for stone-built benches.

In the angle of an L-shaped stone setting against the northern wall, there was an irregular clay and loam-filled hollow sealed by a flat-laid slab of limestone. This was similar to the corner bins seen in other buildings (eg D11/1 and A1/2). A later pit to the east was steep-sided, 0.53m in diameter by 0.30m deep, with a loose fill of limestone pieces and brown sandy loam.

In the surface of the clay floor and within the overlying layer of brown sandy clay, there was an exceptional quantity of domestic artefacts and a primary pottery assemblage, from which some nine vessels could be partially reconstructed. A particular concentration around the doorway between rooms 1 and 2 included parts of three lock mechanisms, iron sheet and numerous nails

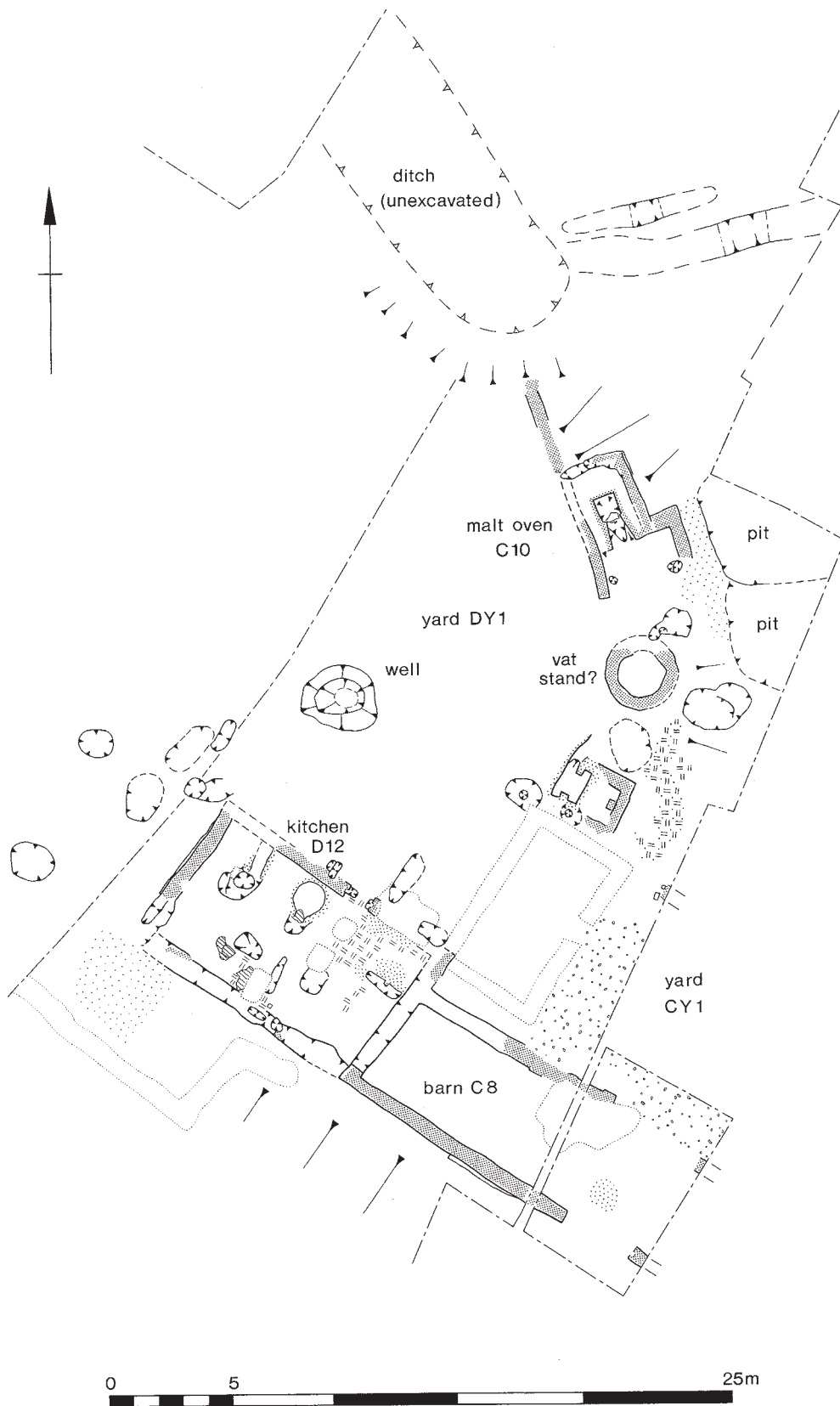


Fig 7.8: The agricultural ranges, tenement C/D

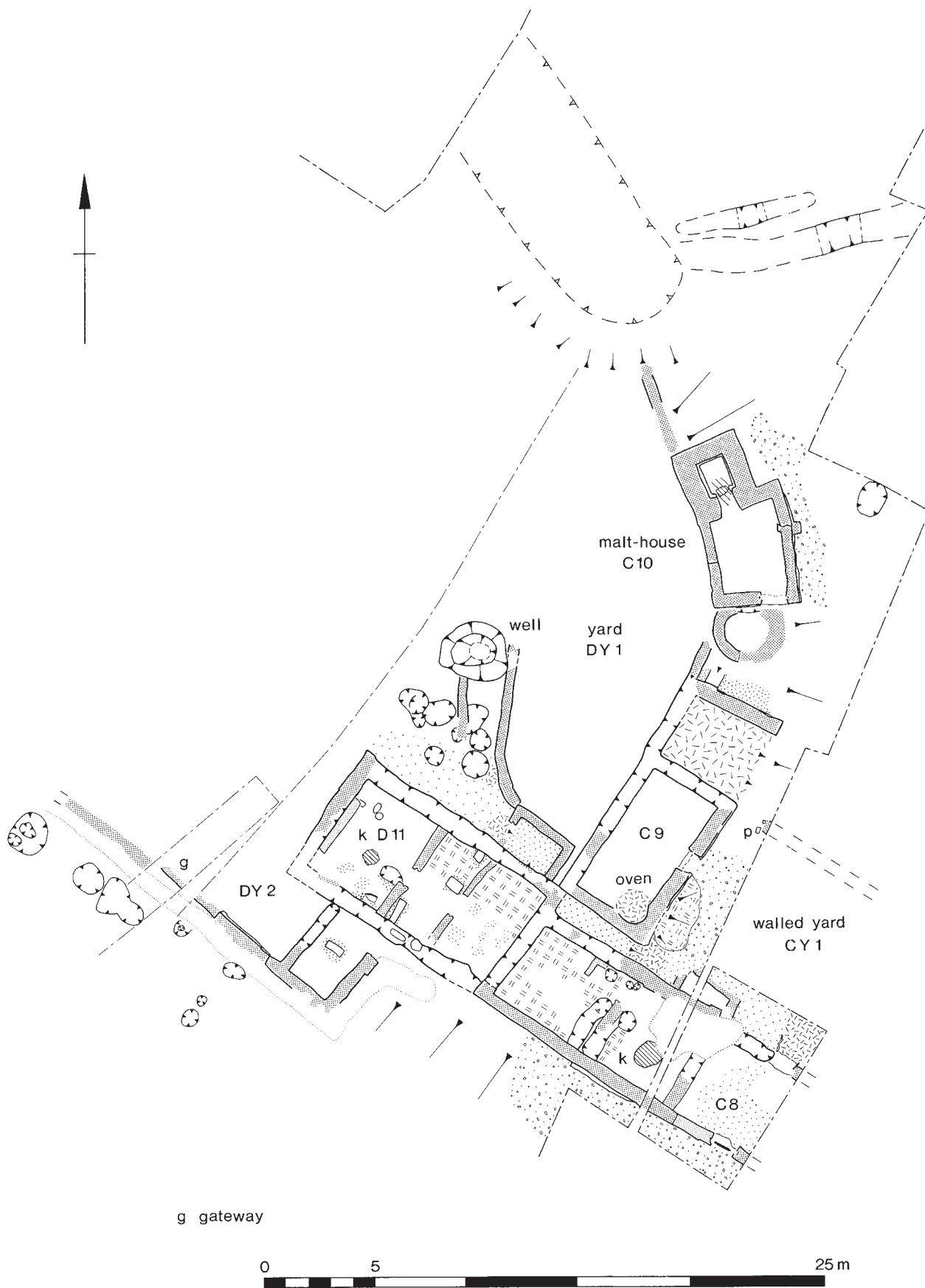


Fig 7.9: The agricultural ranges and their conversion to peasant tenements, C and D

and staples. These fittings probably came from a door or chest, or perhaps more than one such item, apparently left to decay *in situ*. These deposits suggest that there was a period of temporary abandonment in which quantities of domestic items were left in rooms 1 and 2. This material was then sealed beneath the raised floors inserted when the building was brought back into use.

Room 2 was a kitchen, 3.60m long by 3.90m wide, with an internal area of 14.0sq m. To the south there were intermittent patches of a yellow clay floor beneath an earth floor. There may have been a stone bench against the partition wall to the west but, if so, it had been totally robbed. The open hearth, lying just south of centre, was 1.00m in diameter and comprised a heavily burnt hearth stone flanked on its eastern side by an arc of pitched limestone and pot sherds. Further fragments of burnt limestone above this were probably from an overlying hearth base that had been disturbed.

Room 3 provided a cross-passage, at least 3.9m long. The floor comprised light brown sandy clay with frequent pieces of limestone.

An external, stone-lined pit against the northern wall, was 2.20m long by 0.85m wide and 0.20m deep, with a partial floor of large limestone slabs (Fig 7.10, s).

In the final use of the building there were raised floors and thresholds. In the cross-passage, room 3, the earlier floor was covered by a 0.15m thick layer of disordered limestone rubble in a matrix of yellow-brown clay, with an area between the doorways comprising closely-set, pitched limestone slabs. In the northern doorway a massive slab of limestone, 0.90m long and 0.15m thick, with a worn surface, formed a new threshold. At the southern threshold a large slab of ironstone, 0.82m long, was set vertically across the width of the doorway, suggesting that there would have been a step down to the external surface, and an abutting internal threshold of flat-laid limestone sat on the new floor level. The partition wall between rooms 2 and 3 was retained but the western partition wall was levelled to create a single room spanning former rooms 1 and 2. There was a similar raised floor of disordered limestone rubble in a matrix of yellow-brown clay, with areas of tightly packed, pitched limestone.



Fig 7.10: Medieval tenement C; the barn and peasant house, C8 (h=hearth, s=stone-lined pit)

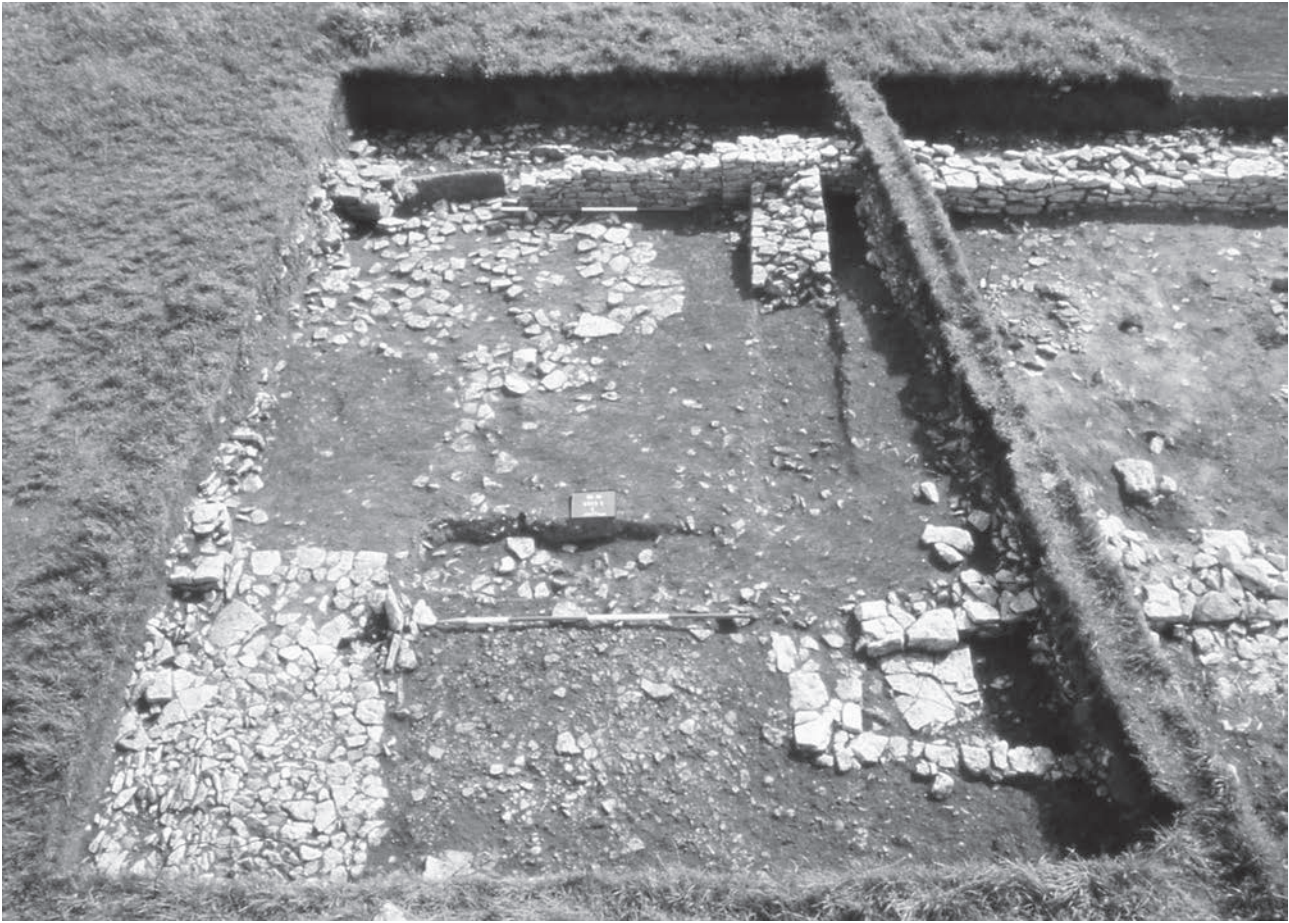


Fig 7.11: Building C8, showing blocked barn doors, looking south



Fig 7.12: Building C8, looking north, showing rooms 1 (left) and 2

At some later date a large irregular pit, up to 3.80m long by 2.70m wide, had cut through the floors of rooms 2 and 3.

The walled yard, CY1

The walled yard to the rear, north, of the barn was 8.0m wide by around 16m long (Fig 7.9). Only the very end of the northern boundary wall lay within the excavated area, although further east it was partially visible as a low earthwork and was also located by resistivity survey. Two ironstone pivot stones, probably *in situ*, lay beside the wall terminal, and indicate the provision of a timber gate set within this opening, which was 1.5m wide. The pivot stones have larger sockets, up to 120mm diameter, than those recovered from building doorways.

To the west, in front of building C9, the yard surfaces had been heavily disturbed by later activity, but in front of the blocked barn door there was a well-preserved early surface of gravel pebbles, typically 20–40mm in diameter, with moderate small pieces of limestone.

At the conversion to a domestic range the yard was neatly resurfaced with flat-laid small pieces of limestone incorporating some small areas of pitched limestone, possibly later repairs. In front of the new narrow doorway there was an even more carefully laid area of pitched

limestone edged by kerbs of vertically-pitched limestone. In front of building C9 the metalling had been largely lost, but its former presence was indicated by the patchy survival of flat-laid limestone in a matrix of yellow sandy clay. This was best preserved beneath a dump of clayey mortar, 0.30m high, which had been heaped against the wall of the bakehouse, C9.

The bakehouse, C9

This single-roomed building was 7.60m long by 4.60m wide, and the internal dimensions of 6.40m by 3.20m gave a floor area of 20.5sq m (Fig 7.13). The southern wall was 0.60m wide and stood up to eight courses high, 0.60m. The internal face was of well-squared stones, while externally they were less well-squared. There were remnants of yellow-brown sandy loam bonding within the core. Only the bottom one or two courses of the eastern wall survived, at 0.65m wide and set on a 0.70–0.75m wide foundation course of large limestone blocks with an external offset of 0.05–0.10m.

The doorway at the southern end of the eastern wall was 1.20m wide with door jamb recesses, 0.15m square, overlying postholes up to 0.30m deep. It was blocked when a corner oven was inserted (Figs 7.14 and 7.15). The doorway just north of centre was 1.00m wide, and may

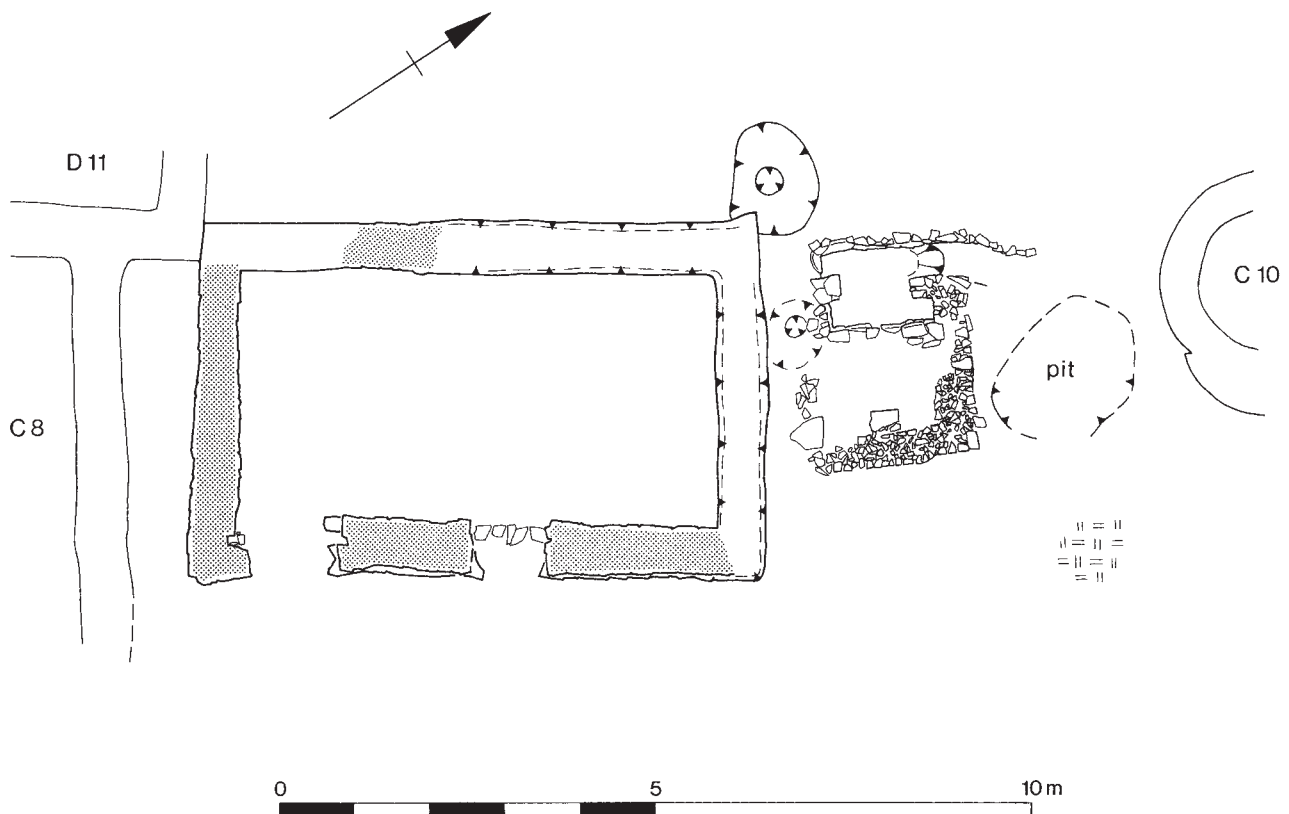


Fig 7.13: Medieval tenement C; building C9, early phase and H-shaped pit

have been inserted when the other doorway was blocked. Flat-laid limestone slabs set in a shallow hollow at the inner side of the doorway formed either a threshold or a step.

The corner oven was recessed into the standing walls, which had been refaced to follow the curve of the oven when the doorway was blocked (Fig 7.14). The oven base was 1.40m in diameter and comprised closely-set, flat-laid and pitched limestone sealed by a 20–30mm thick layer of yellow sandy clay, which was partially heat reddened (see Fig 7.79). A mixed layer of yellow-brown sand, bright yellow clay and some pieces of limestone that had accumulated over this foundation to a depth of 0.15m was probably debris from the levelling of a clay and limestone superstructure.

In the north-east corner of the room there was a steep-sided, flat-bottomed pit, 1.10m long by 0.40m wide and 0.15m deep, filled with grey sandy silt which contained some charcoal flecking and pieces of limestone. Around its southern end a tight cluster of small limestone pieces were set into the earthen floor, which comprised brown loam with some small pieces of limestone and some pebbles. An area immediately inside the central doorway was eroded into a broad shallow hollow, up to 1.80m in diameter, filled with a greyer loam and a higher density of limestone pieces.

The bakehouse was retained as part of the peasant tenement although the oven was levelled and covered by a new earth floor. An open-sided cart or shelter shed, 3.50m

long by 4.00m wide, was added at this time (Fig 7.14, room 2). The new wall survived up to six courses high, 0.32m, and was 0.65m wide.

In the cart or shelter shed, there was a disturbed remnant of a probable original earth floor. This lay beneath a raised floor, 0.35m thick, which comprised a mixture of a single and a double layer of large, closely-set, vertically-pitched slabs of limestone, generally aligned across the width of the room and partly set in yellow sand (Fig 7.16). The raised floor inclined downward to the east to meet a mixed deposit of loam with much scattered limestone and gravel, which was probably derived from the trampling and churning of earlier laid surfaces.

A short length of blocking wall, 0.50m wide with two rough courses surviving, was inserted between the end of the cart or shelter shed, room 2, and the malt house, C10. A shallow, 0.15m deep, stone-lined pit lay beside the blocking wall (Fig 7.14, s). This area was later sealed by a layer of yellow-brown sandy loam that abutted the new walls and spread patchily over the levelled circular structure of the malt house.

To the south, the narrow space, 0.80–1.05m wide, between the bakehouse, C9, and the barn, C8, contained a succession of limestone surfaces, perhaps suggesting that it was utilised for storage. The surfaces stood above the yard level and there was a sloping surface of pitched

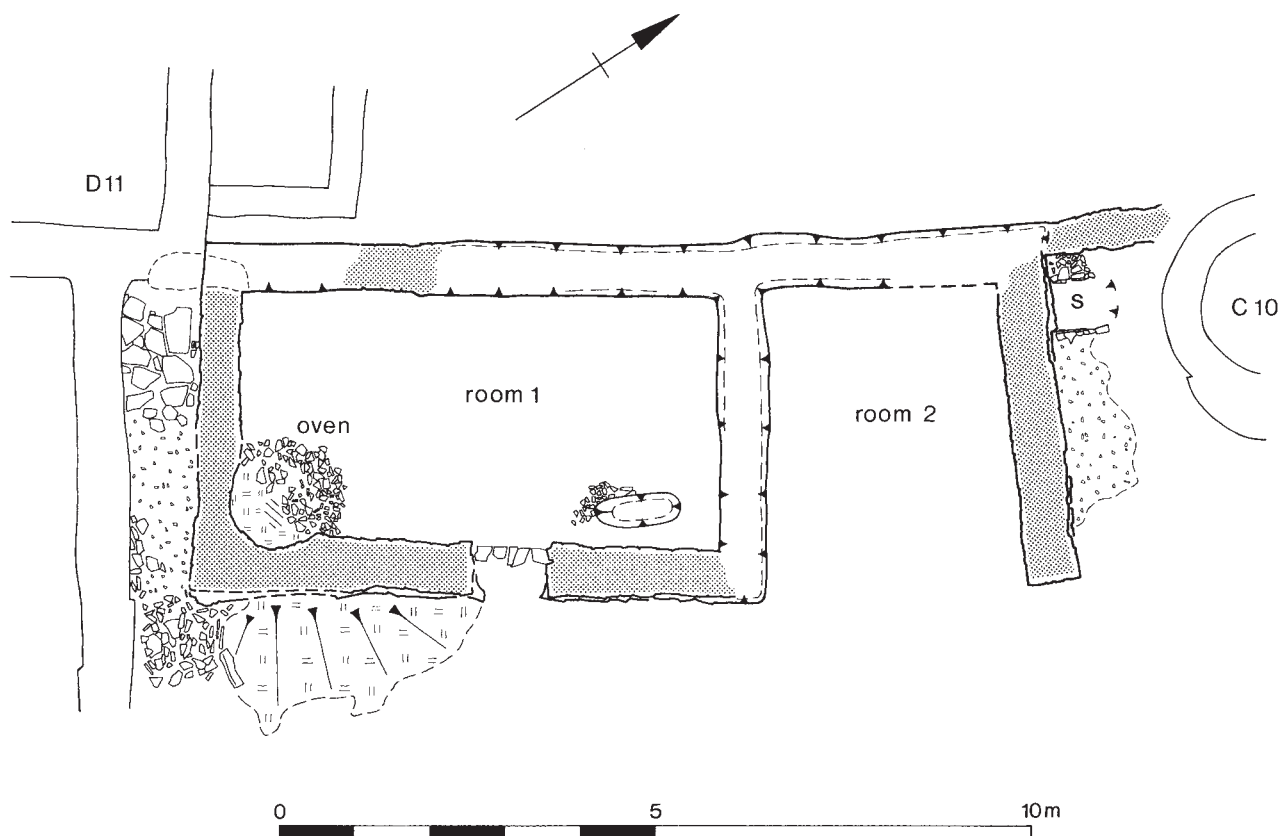


Fig 7.14: Medieval tenement C; building C9, with inserted oven (s=stone-lined bin)



Fig 7.15: Building C9, looking north-west, showing corner oven (left) and part of structure beneath room 2 (right)



Fig 7.16 : Building C9, room 2, showing late pitched-stone floor in section

limestone at the opening onto the yard (Fig 7.14). It would have been protected from the elements by the overhanging roofs of both adjacent buildings.

The malt house, C10

This was the best preserved and most elaborate of the excavated malt houses, with the walls standing 0.50m high. Specific constructional details are described below, and this

is one of the specialised building types also covered in the general discussion of medieval buildings.

In its original form this was a free-standing oven, with the outer wall of the chamber continued southward for 1.50m to form an open-ended protective shed, although postholes adjacent to the walls may indicate that there was a timber end wall (Fig 7.17). To the south, a free-standing circular structure probably contained a vat for steeping the barley prior to malting.

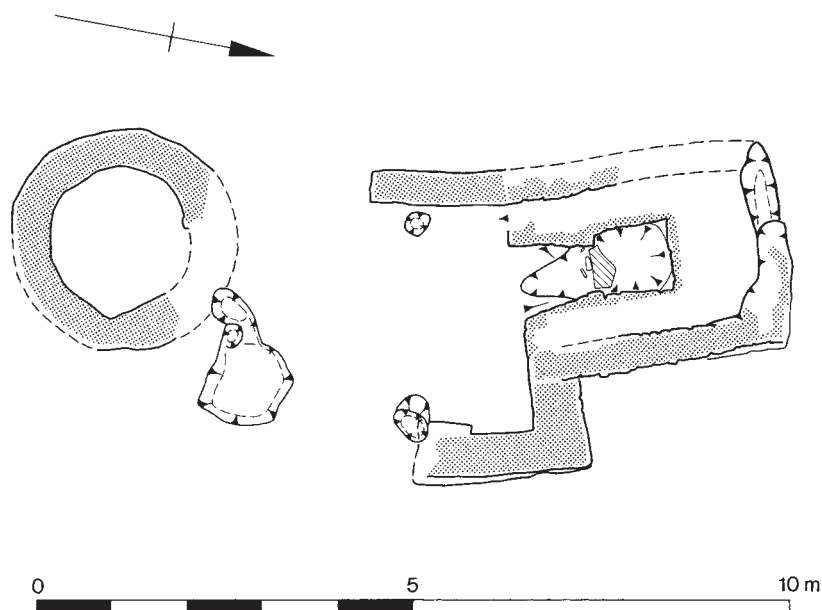


Fig 7.17: Medieval tenement C; the malt house C10, original form

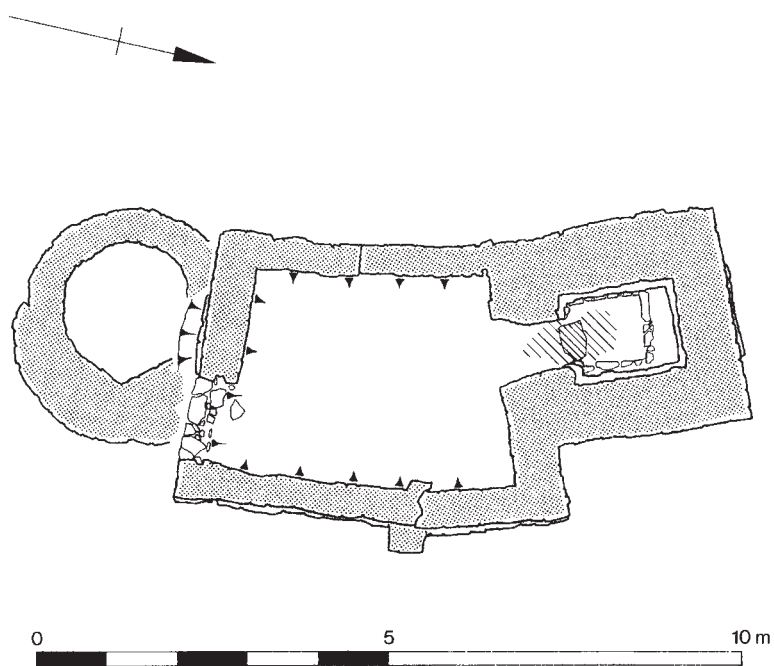


Fig 7.18: Medieval tenement C; the malt house C10, later form

Subsequently, the oven was rebuilt and enlarged, and the flanking walls were extended southward to form a fully enclosed room (Fig 7.18, and see Figs 7.74 and 7.75 and Plate 11). The circular vat stand was retained and would then have abutted the south wall of the malt house.

The oven chamber

The bottom course survived of the original near-square

sunken chamber, 0.95m long by 0.80–0.90m wide and set in 0.20m deep construction pit (Figs 7.17 and 7.19). The chamber floor was yellow-brown sandy clay covered by a thin spread of blackened silt. A blackened slab of limestone was set in the opening of the flue, and the bottom one or two courses of the adjacent walls were reddened. The tapering flue was 1.10m long and from 0.60–1.00m wide.

The outer wall of the oven was built from ground level. To the west and north it was 0.50m wide, and an extra

course of foundations were provided to the north where it overlay ditch fills. To the east an L-shaped length of wall abutted the oven build, and was slightly broader, at 0.55m wide with a 0.65m wide foundation course of large limestone slabs and blocks.

The enlarged oven chamber was 1.45m long by 1.10m wide (Fig 7.18). A lining of flat-laid limestone stood 0.50m high, and was battered so that at the upper level the chamber measured 1.65m by 1.30m. The flue was retained from the original oven and there was a ragged joint between this and the new lining. The oven walls were 0.85–0.95m thick in total, with the space between the chamber lining and the outer walls filled with limestone rubble in a soil matrix.

The original chamber was filled with closely-set, pitched limestone covered with yellow clay. An area of intense burning, 0.52m wide by 0.35m long, and some *in situ* burnt limestone showed the former presence of a stone fire base in the flue opening. This was covered by a new surface of yellow sandy clay and a new fire base comprising a single slab of limestone set immediately inside the chamber, rather than at the flue opening. This was overlain by a spread of grey-brown to dark grey charcoal flecked loam derived from the final firings.

The enclosed room

The new lengths of wall abutted the ends of the existing stubb walls (Fig 7.18). The western wall was 0.45m wide and it was founded 0.10m higher than the original wall, indicating that the external ground level had risen since the construction of the original building. To the south the wall was thicker, at 0.60m wide, and at the eastern end there was a corner doorway, 1.10m wide, with shallow door jamb recesses. A raised threshold setting of limestone slabs formed a stepped entrance.

The new eastern wall was 0.55m wide. The original wall terminal had been partially demolished, presumably to enable the new wall to be keyed into it. There was an internal wall thickening, and additional support was provided by a well-built, free-standing buttress.

The room was 3.20–4.10m long and 2.80–3.00m wide, an area of 10.4sq m. The earth floor was sunken, lying 0.10–0.20m below the base of the walls. Intermittent deposits of yellow-brown sandy clay against the walls may have been either a remnant of a clay floor or decayed wall rendering that had accumulated against the walls during a period of abandonment prior to demolition.

The circular chamber

The detached circular structure was 2.90m in diameter and the enclosing wall was typically 0.50m wide, leaving an internal space 1.90m in diameter (Fig 7.17 and see Fig 7.74). It is assumed that a doorway lay to the north within the demolished length. A floor of closely-set, pitched limestone was covered with yellow clay, and an upper floor of pitched stone, partially survived (Fig 7.20). At

some stage the eastern side had been rebuilt, with the wall thickened at foundation level.

An adjacent sub-square pit, 1.15m long by 1.05m wide and 0.25m deep, was largely filled with heavily charcoal-flecked, blackened loam (Fig 7.17).

With the creation of the fully enclosed room, the northern side of the circular chamber was removed, with the ragged wall ends abutted by the new wall (Fig 7.18). If the vat stand was still in use, it must have been accessed from an opening on the eastern side, as otherwise the thickened wall here would have blocked the adjacent doorway.

To the east of the malt house there were remnants of several contemporary surfaces, some pre-dating the full enclosing of the room. The uppermost comprised mixed yellow sandy clay, grey-brown clayey loam and small pieces of limestone, along with many small, abraded pottery sherds. This was overlain by a single width, linear setting of near vertically pitched limestone, which directly abutted the wall of the malt house.

At demolition, the walls were levelled to a consistent height as a single operation, and there was no subsequent wall robbing.

The H-shaped stone-lined pit

This lay to the south of the vat stand and is assumed to be related to the use of the malt house (Figs 7.8, 7.21 and 7.22). The stone-lined pit was 1.40m long by 1.05m wide and 0.50m deep, with 0.30m square buttresses forming the H-shape of two linked chambers each 0.40m wide. It was constructed in a combination of flat-laid and vertically-pitched slabs of limestone. The base was not surfaced and the lining showed no signs of burning or other discolouration. The northern end of the western chamber was unlined but steeply sloped, and a shallow channel, partly lined with limestone, extended 1.50m to the north. A pair of post-pits, up to 0.50m deep, lay to the south, and may have held posts 300mm in diameter. A shallow, U-shaped footing to the east, largely in small pieces of limestone, enclosed an area 1.50m long by 1.30m wide.

The specific function of this feature is unknown, although the primary fill of loose and soft grey-brown sandy silt suggests that the stone-lined pit served as a sump. The two buttresses may have held a mechanical device or container positioned above the sump. The post-pits and the U-shaped footing presumably held associated parts.

Pits east of the malt house

There was an extensive sunken area to the east of the malt house. This lay over former boundary ditches, and the upper fills may have been partially dug-out at this time (Fig 7.8). The fills of these hollows contained quantities of charcoal and small pieces of burnt clay and stone, suggesting that debris from the malt oven was dumped here. A partly stone-lined oval pit, 1.60m by 1.20m and 0.50m deep, was cut into these fills (Fig 7.9). It was filled with loosely



Fig 7.19: Malt house C10, the oven chamber partially dismantled to show method of construction



Fig 7.20: Malt house C10, showing pitched stone floor within circular chamber

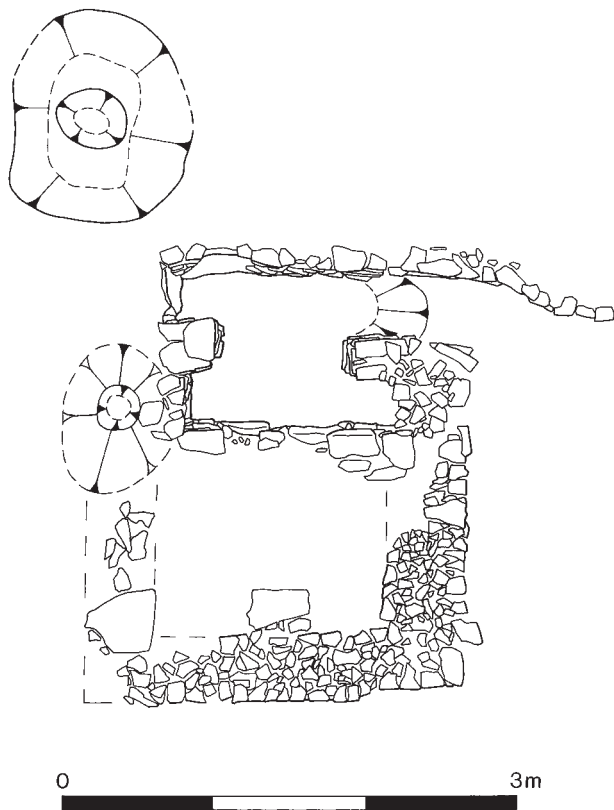


Fig 7.21: Medieval tenement C; the H-shaped, stone-lined pit and associated footings



Fig 7.22: The H-shaped, stone-lined pit, looking north-east

packed limestone rubble that was stained yellow-brown, indicating that it was used as a soak-away.

The kitchen, D12

This building was 11.00m long by 6.20m wide, with internal dimensions of 9.65m by 5.50m providing a room space of 53.1sq m (Figs 7.23 and 7.24). It was constructed on a slightly raised area over a partially surviving Bronze Age round barrow mound, and abutted the western end of the barn, C8.

The foundations of the western wall were well preserved as a result of being partly founded within a narrow construction cut into the sloping surface of the barrow mound. The wall above this was 0.65m wide. Part of the northern wall survived to either side of a doorway, which was 1.00m wide. The door jamb recesses in the wall surrounds were 0.15m square, and to the east a square posthole at the base of the recess contained a limestone pad stone, indicating that it was probably this jamb that carried the door. There was a slot beneath the other recess, but no pad stone. The presence of an opposed doorway in the robbed southern wall was defined by a similar but less well-preserved door jamb posthole and slot. An

adjacent pivot stone appears to have had no functional purpose in this location, but it may have been displaced in a refurbishment of the doorway. In addition there was a doorway in the south-east corner providing access to the barn, C8.

To the west of the southern doorway a shallow slot that ran part way across the room may have held a timber partition wall. A similar feature to the north had been largely removed when the circular oven was constructed. There would have been a central access between the partition and the oven, linking the chambers to either side.

In the eastern chamber the floors had been largely lost, but in the south-eastern corner a floor of flat-laid limestone slabs was contiguous with the stone-lining of an elongated pit or trough, 1.60m long by 0.35m wide and 0.30m deep (Fig 7.23, t). The lining comprised two rough courses of limestone blocks with a partial central division. There was no distinctive discolouration of the pit lining, but the form was similar to the processing troughs seen in other tenements. The trough was later taken out of use and was sealed by a new limestone floor over which a yellow clay floor only partly survived. There were also isolated patches of similar clay across the southern half of the room. Immediately beneath the clay floor in the

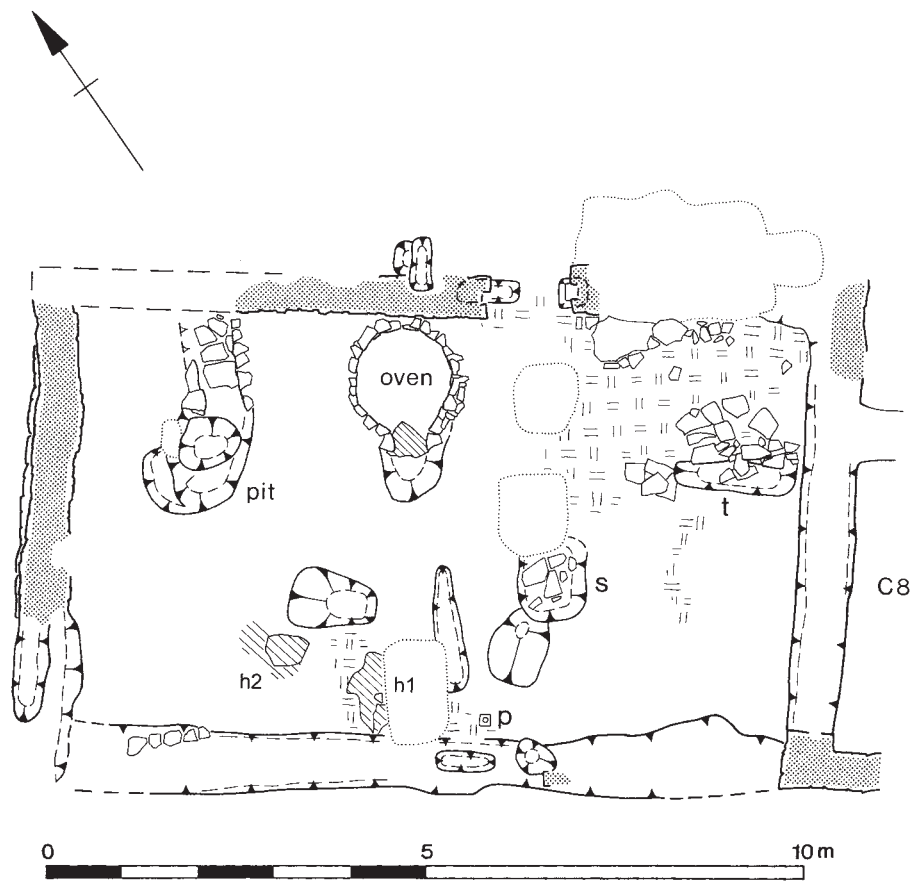


Fig 7.23: Medieval tenement D; kitchen range, D12 (h=hearth, s=stone-lined bin, t=trough, p=pivot stone)



Fig 7.24: The kitchen range D12, looking north

south-east corner there was a dense scatter of iron nails, and further nails were recovered from the disturbed floor to the south, suggesting that they were deposited during this refurbishment. The only other feature in the eastern chamber was a sub-square pit, 0.90m diameter by 0.15m deep, partly floored with limestone slabs (Fig 7.23, s).

The western chamber had an earth floor. A hearth against the southern wall, h1, comprised a clay base, 1.30m long by at least 0.60m wide, set in a shallow hollow, and a single piece of burnt limestone was a remnant of a larger hearth stone. A small open hearth lay nearby, h2.

In the north-western corner of the room there was a rectangular stone-lined pit, 1.30m long by 0.45m wide and 0.15m deep. A small area of one floor slab was lightly scorched, but otherwise there was no burning or other discolouration, but iron-staining of the underlying natural gravel suggests that water had been percolating through the base of the pit. To the south it may have opened directly into a complex bowl-shaped pit, 0.30m deep.

The circular oven was the best preserved from the site, and there is further discussion of these features in the section on detached kitchens (see Fig 7.77). The construction pit was 0.25m deep. A floor of neatly pitched limestone was covered by a layer of yellow sand, and the oven lining were built on this foundation in courses of small flat-laid limestone. The oven chamber was 1.26m in diameter and a large slab of heavily burnt limestone lay within the flue, which was 0.46m wide and opened into a small stokehole. Much of the stone lining was reddened and blackened, as was the sandy floor.

The rebuilding of the kitchen, D11

The kitchen was at least largely rebuilt (Fig 7.25 and 7.26). The northern wall was new and lay inside the levelled wall of the earlier building, while the western wall was probably rebuilt over the foundations of its predecessor, but with a slight shift to the east of 0.15m. The southern wall was either retained or rebuilt on the same line. The kitchen was then 10.8m long by 6.20m wide. A new room, 4, was added to the front of the building. The circular oven was removed at this time, and was perhaps replaced by the oven in a new separate bakehouse to the north-east, C9.

On the southern wall an external threshold of worn limestone suggests that there was still a central doorway, and there may have been an opposed doorway to the north.

The narrow, eastern partition wall, which was only 300–400mm thick, was probably built at this time. This may have been a dwarf wall supporting a timber partition, to form two rooms of unequal lengths. There was a central doorway, 1.10m wide, with a narrow door jamb recess in the surround to the south.

The smaller room to the east, 3, was 2.70m long, with an internal area of 11.6sq m. The disturbed floor of brown sandy clay was scattered with flat-laid slabs of limestone, including a large square slab with a heavily cracked surface set against the partition wall. It had probably been more

extensively, if not fully, surfaced with limestone slabs, suggesting its use as a storage chamber; there were no internal fittings.

The western room, 1, which was 6.30m long by 4.80m wide with an internal area of 30.2sq m, still functioned as a kitchen. Against the western face of the partition wall there were two stone-lined pits. The larger pit, 0.85m long by 0.55m wide, which lay adjacent to the doorway, was partially floored with two flat-laid slabs of limestone overlain by the lining of three courses of flat-laid limestone, s1. No lining survived around the western and southern sides of the pit, but a lining may have been removed. The eastern floor slab had a nine-men's morris board crudely scratched on its upper surface, executed before the stone was inserted into the pit. The eastern end of the pit was more crudely lined with three vertically pitched pieces of limestone, and the central stone, which stood on a smaller stone, carried a high relief carving of a figure with a stylised, shield-shaped face, and wearing a long robe or surcoat with the hands held together in front as if in prayer (Fig 7.27 and Plate 13). As a result of the juxtaposition of the figure and the nine-men's morris board, the figure was immediately christened 'Norman Morris' by the digging team.

This is the only figurative piece of worked stone from the site and it is an unusual, if not a unique item of exceptional interest but uncertain interpretation. It may be viewed most simply as a foundation deposit associated with the rebuilding of the manorial kitchen, D11, but the presence of both the carved figure and the nine-men's morris board at its feet could imply religious or mystical associations. The fill of the pit contained a small pottery assemblage dated to the earlier thirteenth century (ph2/0) while the overlying floor is dated to the later thirteenth century (ph2/2), suggesting that the figure itself is no later in date than AD 1250.

The pit containing the figure was subsequently backfilled and overlain by a later floor, but even following this the very top of the carved stone may still have stood above floor level, with the face perhaps at least partially visible.

To the north there was a smaller stone-lined pit, s2, 0.40m square by 0.23m deep, floored with flat-laid limestone and lined on three sides with two courses of limestone. On the northern side a single pitched limestone may have leant against the adjacent wall.

To the west of the southern doorway a well built stone-lined pit, s3, abutting the southern wall was 1.05m long by 0.35m wide and 0.45m deep, with a lining of six or seven courses of limestone and a floor of flat-laid limestone (see Fig 7.86). To the west there was an open hearth comprising a burnt hearth-stone set on and surrounded by a layer of burnt clay, h1.

Between the stone-lined pit and the hearth there was a less regular pit that may have been either introduced at this time or was a reuse of a pit within the earlier building. The primary silts, from a previous use, were overlain by some limestone rubble in clayey loam and above this the pit was lined along its northern side with steeply pitched slabs of

limestone while there was a flat-laid slab of ironstone at floor level to the south. The fill of loose limestone rubble, frequently steeply pitched and in a matrix of grey-brown sandy loam, suggest that it may have functioned as a soak-away.

The stone bench abutting the western wall was 0.38m wide and survived one or two courses high, 0.10m. A posthole at its northern end was 0.25m deep, and vertically pitched pieces of limestone suggest that it had held a squared post of at least 100mm diameter.

The single-room extension, room 4, was 3.25m wide by 4.40m long, with internal dimensions of 2.15m by 3.85m; a floor area of 8.3sq m. The walls were 0.55m thick, and thickened to 0.66m adjacent to the doorway.

The doorway opening was 0.85m wide, with a shallow door-jamb recess to the south and an *in situ* pivot stone to the north, p. A small scratched, nine-men's morris board had been incorporated into the build. The new room was earth-floored and contained a central stone-lined pit, 0.85m long by 0.35m wide, which had replaced an earlier similar feature (Fig 7.25, s).

At the south-western corner of the new room, the wall extended 0.60m to the west. Beyond this the boundary wall was more crudely built, and ran from the end of the room 4 to the detached building range of tenement E, E14, to the west. The wall was 0.55m wide and survived up to three courses high, 0.30m. A change in the build suggests that there was a gateway, 3.5m wide, to the west of the

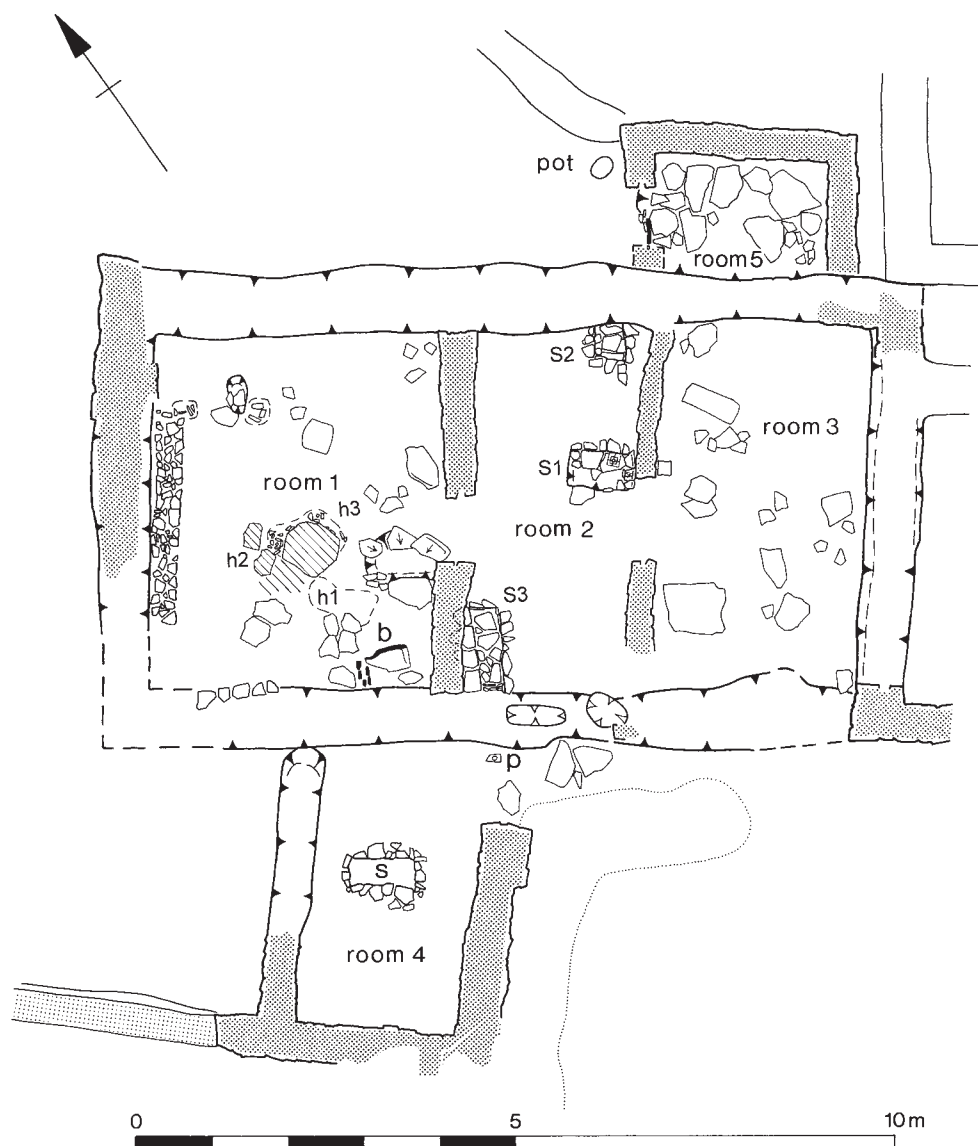


Fig 7.25: Medieval tenement D; the rebuilt kitchen and peasant cottage, D11 (h=hearth, s=stone-lined bin, b=raised bin, p=pivot stone)



Fig 7.26: The peasant cottage, D11, looking north

kitchen range (Fig 7.9, g). A single course of stone within this gateway was probably a later blocking wall. This was only faced on the southern side, indicating that the ground level within the plot to the north was higher than the surface of the central yard. At tenement E the boundary wall abutted, but also partially overlay the levelled wall of a small, stone-floored chamber attached to building E14.

The peasant cottage, D11

With the conversion of the manorial ranges, C/D, to two tenements the former kitchen was retained, but with further modifications (Figs 7.25 and 7.26). A second partition wall was introduced to provide three rooms, and a sunken, stone-floored storage chamber was added at the rear. The doorway giving access to the barn must have been blocked, as this was then a separate tenement, but this area had been totally robbed.

The new partition wall was 0.50m wide with a central doorway, 0.85m wide. The door surrounds contained narrow door-jamb recesses.

The shortened western chamber, 1, which was 3.75m long with an internal area of 16.1sq m, served as a kitchen. There were two successive open hearths. Of the earlier, fragments of a hearth stone and some adjacent pitched stone survived,

h2. The second hearth lay slightly to the east and comprised a single, large slab of limestone, 0.70m in diameter, with its surface reddened, blackened and heavily cracked, h3. It was flanked to the north by a narrow band of pitched pieces of limestone. Both hearths were partially surrounded by patchy areas of reddened and blackened loam, suggesting that there was an earth floor immediately around them.

In the southern corner of the room a large, upstanding slab of limestone suggests the presence of a corner bin, 0.90m long by 0.40m wide, b. A remnant of limestone surfacing survived against the southern wall adjacent to the bin. The stone bench abutting the western wall may have been either retained or levelled.

The new central chamber was only 2.15m long, an internal area of 9.2sq m, and probably formed a cross-passage between opposed doorways. The well-built stone-lined pit adjacent to the southern doorway was retained, while the two stone-lined pits against the eastern partition wall were both filled and sealed beneath a new floor of sandy clay and small pieces of limestone.

The eastern chamber, which was 2.70m long, an internal area of 11.6sq m, contained no internal fittings.

The small, sunken chamber, room 5, abutting the rear of the building had internal dimensions of 2.30m by 1.50m, an area of 3.45sq m (Fig 7.28). The wall was 0.40–0.45m



Fig 7.27: *The carved stone figure, in situ in a stone-lined pit in building D11*

thick with a slightly battered inner face, and the door surrounds contained narrow door jamb recesses. An external surface of pitched limestone sloped down towards a low step, 0.10m high, partly edged with vertically-pitched limestone. The sunken floor of the chamber comprised large limestone slabs.

The final use of the building probably post-dated its abandonment as a dwelling and marked its reuse as an outbuilding. The eastern end of the southern wall was totally demolished, along with the end of the eastern partition wall, to leave at least room 3 open-ended. Within room 3 a new raised floor comprised a double interlocking layer of vertically-pitched limestone, 0.35m thick, set in a matrix of sandy clay. This may suggest that it then served as an open-ended cart or shelter shed. To the south this surface sloped down to meet an external surface of scattered limestone that ran across the former wall line.

Within room 2, the final floor was a 0.15m thick layer of brown sandy clay with some scattered limestone. Within room 1, which was still fully enclosed, there was a similar floor but to the south it incorporated large limestone slabs, covering the final hearth and probably derived from disturbance of the earlier floors in this area. There was an eroded hollow within the centre of the room and through the doorway into room 2. Within room 4 a layer

of disordered and pitched limestone rubble in a sandy clay matrix may have been either a similar raised floor or merely demolition rubble.

Pit groups and a well

Three pit groups were contemporary with the kitchen range, D12/D11. Two pits lay to the immediate north-east (Fig 7.8), and both had been disturbed by the construction of the sunken chamber. The smaller eastern pit, 1.30m long by 0.75m wide and 0.45m deep, contained a compact mass of limestone rubble that included one of the few later medieval primary pottery groups, which comprised numerous large sherds from a small number of vessels, particularly glazed jugs, dated to the later thirteenth century (ph 2/2, 1250–1300).

A group of shallow pits, up to 0.30m deep, to the west of the kitchen were broadly contemporary with the rebuilding, D12 (ph 2/2, 1250–1300) (Fig 7.8). To the north of the building there was a tight cluster of eight small pits (Fig 7.9). The westernmost and largest, at 0.50m deep, contained only later thirteenth-century pottery (ph 2/2) indicating that it was contemporary with the rebuilt kitchen range, but some were open into the fourteenth century (ph 3/2). Once these pits had fallen out of use,



Fig 7.28: The sunken, stone-floored chamber at the rear of building D11

a pair of parallel walls, 1.5m apart, flanked the approach to a probable well (Fig 7.9). The eastern wall of this pair abutted the corner of the new sunken chamber and both walls contained a much higher proportion of ironstone, at up to 40%, than was encountered in the other tenements buildings or boundary walls.

The well shaft was up to 3.00m in diameter by 1.63m deep. The upper sides were moderately steep, at 45 degrees or more, and from a depth of 0.70–0.80m it was steep to near vertically-sided, with a basal diameter of 1.00m. It cut through the compact natural of mixed sands and gravel and bottomed in loose calcareous gravels at the modern water table. The bottom 0.60m of the pit was filled with sandy silts and much disordered limestone rubble. Large slabs of limestone, up to 0.40m long, and one ironstone block, 0.70m long, were pitched against the more shallowly-sloping north-western side. The stone content of the fill was not building stone, and it is possible that it was the debris from the robbing of an original stone lining. The shallower slope, with its cut step, may have provided an access ramp for the robbing.

The secondary fill of the shaft contained a small pottery assemblage dated to the earlier thirteenth century (ph 2/0), while the small, mixed assemblage from the final fill spanned the thirteenth century (ph 2/0 and 2/2) and contained three sherds dated to the fourteenth century (ph 3/2).

To the north of the parallel walls there was a general,

homogeneous soil horizon of brown sandy loam with scattered small pieces of limestone. The underlying subsoil and prehistoric barrow mound had been disturbed and truncated, suggesting that the area was in use as a garden/horticultural plot through the thirteenth and fourteenth centuries. The ground was similarly disturbed to the north-west adjacent to tenement E.

The manorial domestic range: tenement F

This tenement lay adjacent to Cotton Lane, and the evidence for its general form and its buildings is provided by earthwork and resistivity surveys (Fig 7.29).

The building along the western side of the courtyard probably formed the main domestic range (F39). It has a total length of at least 18.5m, and perhaps as much as 25.0m. Changes in the alignment of the long walls suggest that it may have comprised two abutting structures of separate build. The northern room is 10.5m long by 4.5m wide. A wall extending a further 2.4m to the north may be a boundary wall or part of a small northern chamber. The southern room was 7.5m long by 4.5m wide. At the southern end there may have been an additional square room, 3.5m long.

The building flanking the northern side of the courtyard was probably 11–12m long (F40). A poorly defined cross-wall indicates that there are at least two rooms.

The courtyard is up to 18m long by 14m wide, and is deeply sunken with respect to the building earthworks. A low linear ridge, 4m wide at the crest, probably with stone metalling, runs across the courtyard and was perhaps an access road. The southern side of the courtyard is bounded by a wall, although a raised platform and stone concentration at the eastern end could represent a further building, perhaps as much as 10m long and partly concealed by a later boundary bank. The boundary bank along the eastern side of the courtyard continues beyond the tenement in both directions and is most probably associated with post-desertion embanking along the Cotton Lane.

This was the only tenement for which clearly defined building outlines were visible in earthwork, and in the exceptionally dry summer of 1990 several walls appeared

as sharply-edged, linear parch-marks, 0.30–0.70m wide. Probing established that the walls lay immediately below the modern turf, with some stones showing through at ground level, and the upper courses were only abutted by topsoil. In the excavated tenements the lengths of standing wall were always abutted by demolition rubble, and the lack of such rubble here accounts for the exceptional clarity of the earthworks and the sharply defined parch marks. It also suggests that most of the walls probably still stand to an appreciable height, indicating minimal robbing and even better preservation than in the excavated tenements.

There is no direct evidence for the date of origin of these buildings. However, the southern end overlies the probable former course of the northern stream, which had become redundant by the end of the twelfth century. This indicates

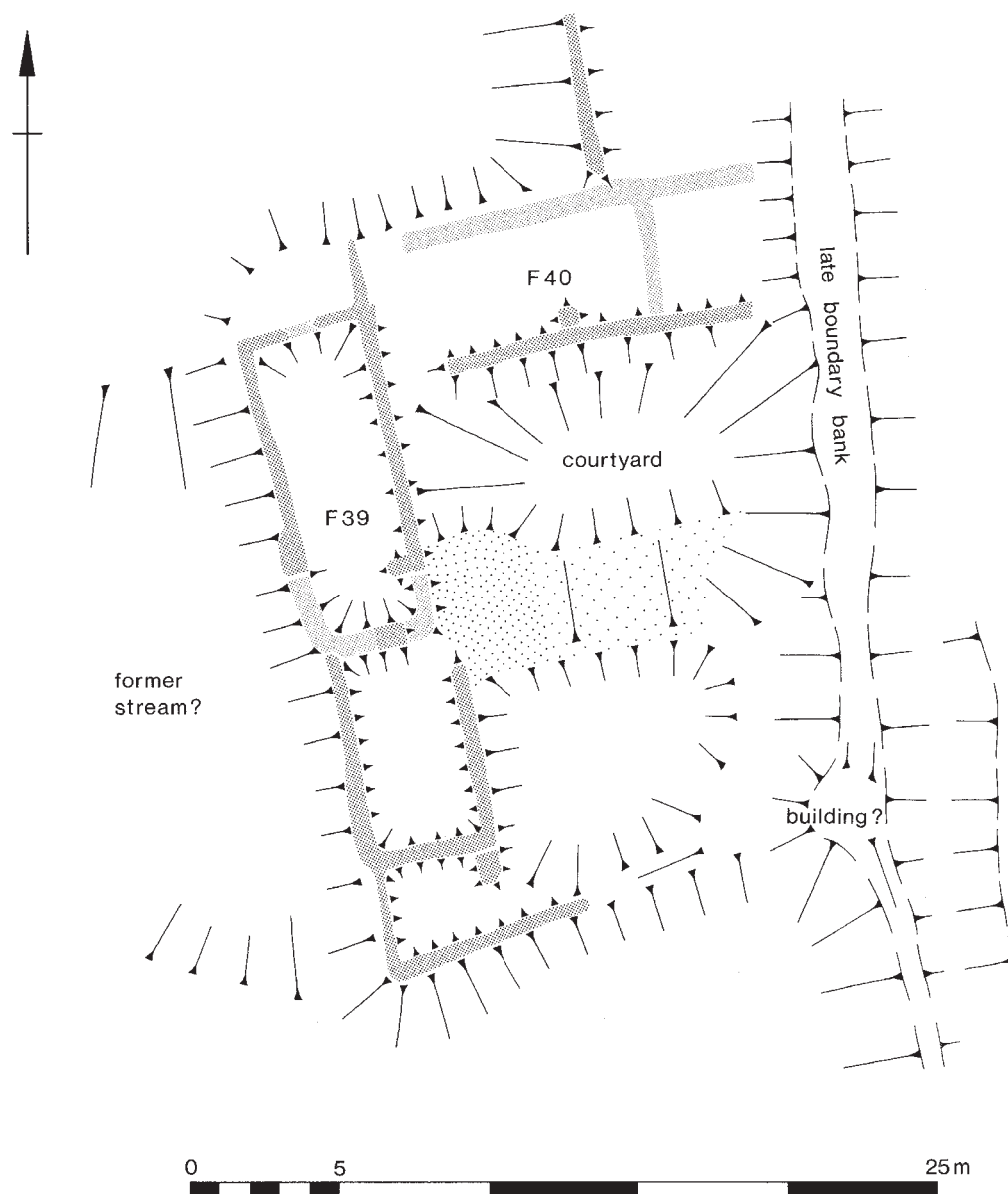


Fig 7.29: Medieval tenement F; the earthwork and parch-mark survey

that tenement F was a new development between the later twelfth and mid-thirteenth centuries, at least broadly contemporary with the appearance of tenement C/D.

The apparent lack of wall robbing is taken as an indication that this was one of the last tenements to be deserted, and that it was left as a derelict ruin. One possibility is that it was still occupied when the buildings of tenements C and D were in their final phase of partial use as outbuildings with raised floors, perhaps serving the occupants of tenement F. It is therefore suggested that this tenement probably remained in use well into the fifteenth century.

The buildings of the southern holding: tenements B and G

Two separate building groups occupied the area defined as the southern holding, with the northern buildings, tenement B, perhaps providing the agricultural and service facilities to a domestic complex, tenement G (Fig 7.1). This interpretation would imply that the southern holding had formed a second small manor, with a similar arrangement to that proposed for the manorial complex of tenements C/D and F; but again, the partial excavation of only one of the two building groups leaves the validity of the overall interpretation uncertain (Figs 7.30–7.31 and Plate 8).

The origin of tenement B apparently lay in the provision of a purpose-built processing room, B5/1, in the early thirteenth century (ph 1, 1200–1225), probably contemporary with the addition of a processing room and barn as the final phase of development of the original northern manor. The open, hall-like building, B4, was introduced slightly later as part of a second stage of development, with the tenement fully formed by the mid-thirteenth century (ph 2/0, 1225–1250), contemporary with the relocation of the northern manor onto the eastern plots. In its fully developed form tenement B was in use through much of the second half of thirteenth century (ph 2/2, 1250–1300), but by the end of the century the specialised functions had all been removed and buildings were either demolished or reused. Final abandonment of all buildings occurred early in the fourteenth century (ph 3/2, 1300–1400), perhaps well before 1350.

Building B4

This single-roomed building was 9.4m long by 5.5m wide, with internal dimensions of 7.95m by 4.35m, an internal area of 34.6sq.m (Fig 7.32 and 7.33).

The walls were more deeply founded than in any other contemporary building, perhaps as a response to constructional problems posed by the uneven existing ground surface. Two or three foundation courses were set within a construction trench 0.15–0.20m deep and, unlike all the other excavated buildings, the foundations were carried through under the doorways. There were considerable variations in the widths of the foundations

and the standing walls from 0.50m wide on 0.55–0.60m wide foundations on the northern end wall to the 0.80m wide southern end wall.

Opposed doorways were set immediately north of centre. They were 1.20m wide externally and slightly splayed, broadening to 1.32m wide. Shallow door jamb recesses, 70mm wide by 50mm deep, were set towards the outer wall faces and each had a pad stone at the base of the left hand jamb, as viewed from outside, probably indicating the side on which the doors were hung.

The room had either an earthen or a sandy clay floor, slightly hollowed within the centre of the room. There were no internal fixtures or fittings. It is suggested that it originally functioned as a store or workroom related to the agricultural and service functions of the adjacent buildings and as a domestic hall when the buildings may have been converted to a single tenement.

Directly abutting the walls around much of the interior there was a distinctive layer of clean, bright yellow, sandy clay. This may have been a remnant of a clay floor preserved only against the walls, or it might represent an accumulation of former wall rendering eroded during a period of dereliction prior to demolition. This interpretation may be supported by the presence of similar material abutting the external wall faces and similar deposits in the room to the north, B5, room 2.

The processing room, B5

Originally there was a single room, 1, and the second room was a later addition that linked this building to the southern range, B4 (Fig 7.32). The two-roomed building was 12.4m long. This is one of the specialised processing facilities that are subject to a general discussion at the end of this chapter (see Figs 7.87–7.89).

Room 1 was 6.55m long by 4.25m wide internally, a floor area of 27.8sq.m. The eastern long wall was 0.60m wide, with the lower two courses broadening to 0.70m. At its northern end, adjacent to the stone-lined trough, the inner face was built down into the end of the construction pit for the trough, indicating that the trough had been installed as part of the building construction and not merely as an internal fitting. Similarly, the foundations for a stone footing against the southern wall extended beneath the robber trench as another pre-determined internal fitting.

The ends of the northern end wall were contiguous with the long walls but oblique ragged joints indicate that the central section of this wall had been rebuilt, and was slightly narrower, at 0.50m wide (Fig 7.34). The rebuilding may have been necessitated by subsidence into an underlying ditch.

There were opposed doorways immediately south of the stone-lined trough, and a doorway at the western end of the largely robbed southern wall. The eastern doorway was 1.15m wide, with door jamb recesses set towards the inner wall face and including a pad stone at the base of the northern recess and a probable slot for a sill beam.

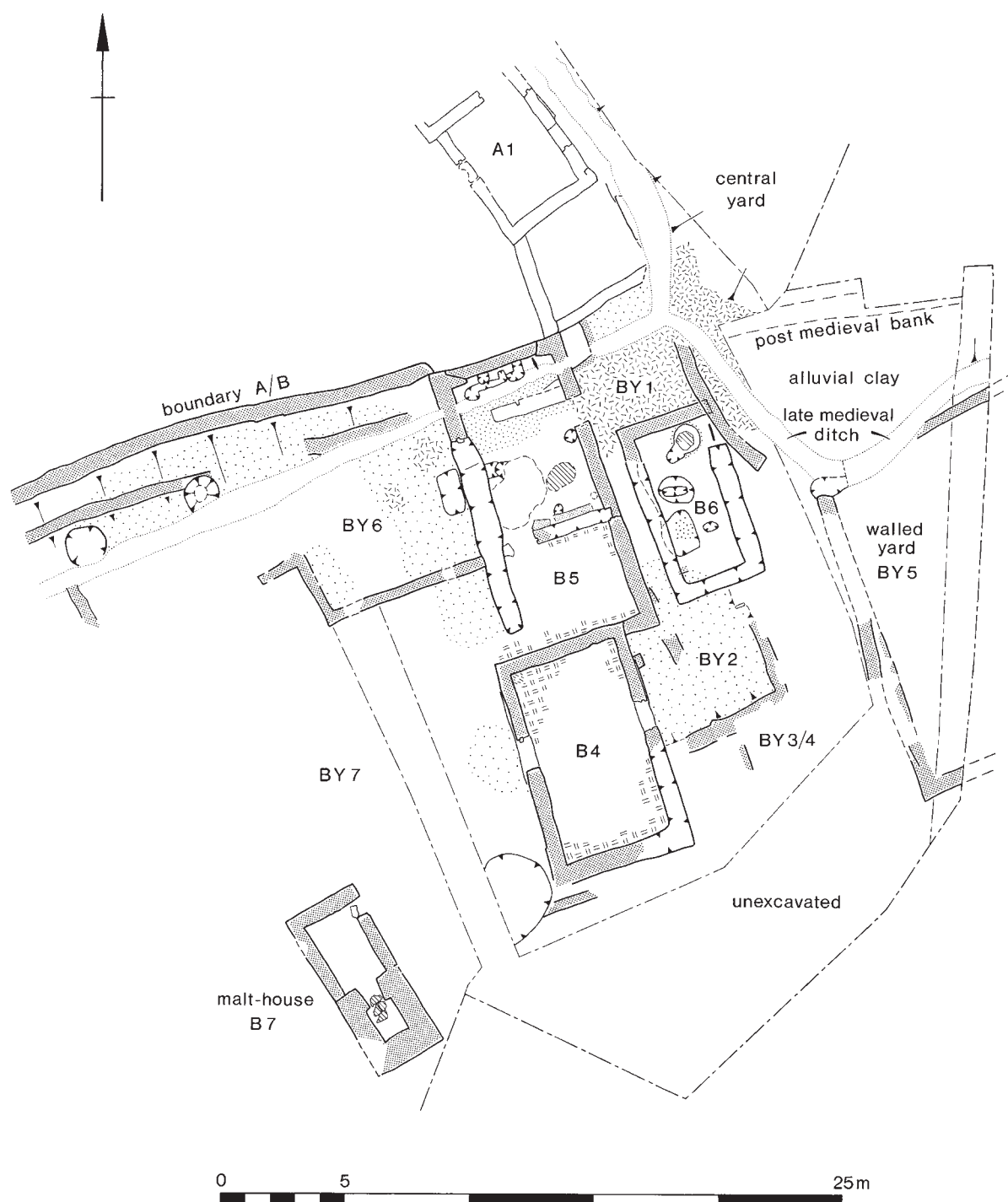


Fig 7.30: Medieval tenement B

The western doorway was similar. The southern doorway was 1.10m wide, with a door jamb recess to the east and a pivot stone to the west, probably slightly displaced. To the north the doorway opening was flanked by a rectangular respond.

The internal arrangements comprised the stone-lined processing trough, a stone-foundation against the southern

wall, an open hearth and a large pit probably serving as an internal soak-away. The stone-lined processing trough was 3.0m long by 0.30m deep, with a basal width of 0.60m (see Fig 7.87 and 7.89). It was floored with limestone slabs, and included the lower stone of a rotary quern. A partial transverse division was formed by a block of ironstone projecting a third of the way across the trough. The southern



Fig 7.31: Medieval tenement B, looking north

side and the western end of the northern side were vertically faced with flat-laid limestone while the remainder had a stepped facing, which had partially collapsed. The floor and the facings of the pit were all discoloured by a thin grey encrustation.

To the south and west there was a surface of worn limestone slabs. Between the trough and the northern wall there was a complex setting of postholes and slots, which probably derived from at least two successive arrangements that comprised end posts, successively 2.0 and 1.5m apart, with shallow linear slots running between them. These arrangements indicate the provision of some form of timber framing set against the wall, presumably to support whatever was being processed within the adjacent trough.

The stone foundation against the southern wall was at least 1.7m long and comprised three mortar-bonded courses within in a construction pit, 0.20m deep and 0.60m wide, with half of its width beneath the adjacent robber trench (see Fig 7.87). At the western end there was a small posthole and a patch of clay and pitched stones, unexcavated, suggest that a further posthole lay against the eastern wall. The deeply set foundations suggest that this base had to carry a substantial load, while the small postholes may have supported an associated timber frame.

There was a large open hearth east of centre. A flat-laid, but unburnt, slab of limestone and an adjacent setting of cobbles, were probably a remnant of an early hearth. The later hearth measured 1.30m by 0.95m, and comprised a mortar bed for a flat-laid hearth stone, with pitched pottery sherds to the west flanked by a rough kerb of small, flat-laid limestone (see Fig 7.87). The heavily burnt and fragmented remnants of two successive hearth stones survived, surrounded by a spread of burnt debris, grey ash and blackened and reddened loams with much comminuted charcoal.

West of the hearth there was a large pit, 2.6m long by 2.4m wide and up to 0.50m deep, partially filled with loose limestone rubble (Fig 7.32 and see Fig 7.87). At the northern end this rubble was exposed at floor level and contained some near vertically pitched stones. Over the rest of the pit the rubble was covered by an upper fill of mixed sands sealed beneath a floor of mixed clayey to sandy loam. The pit would appear to have functioned as an internal soak-away.

A posthole inside the eastern doorway and a broad but short slot inside the western doorway may have held short wooden screens.

When the trough was taken out of use it was backfilled

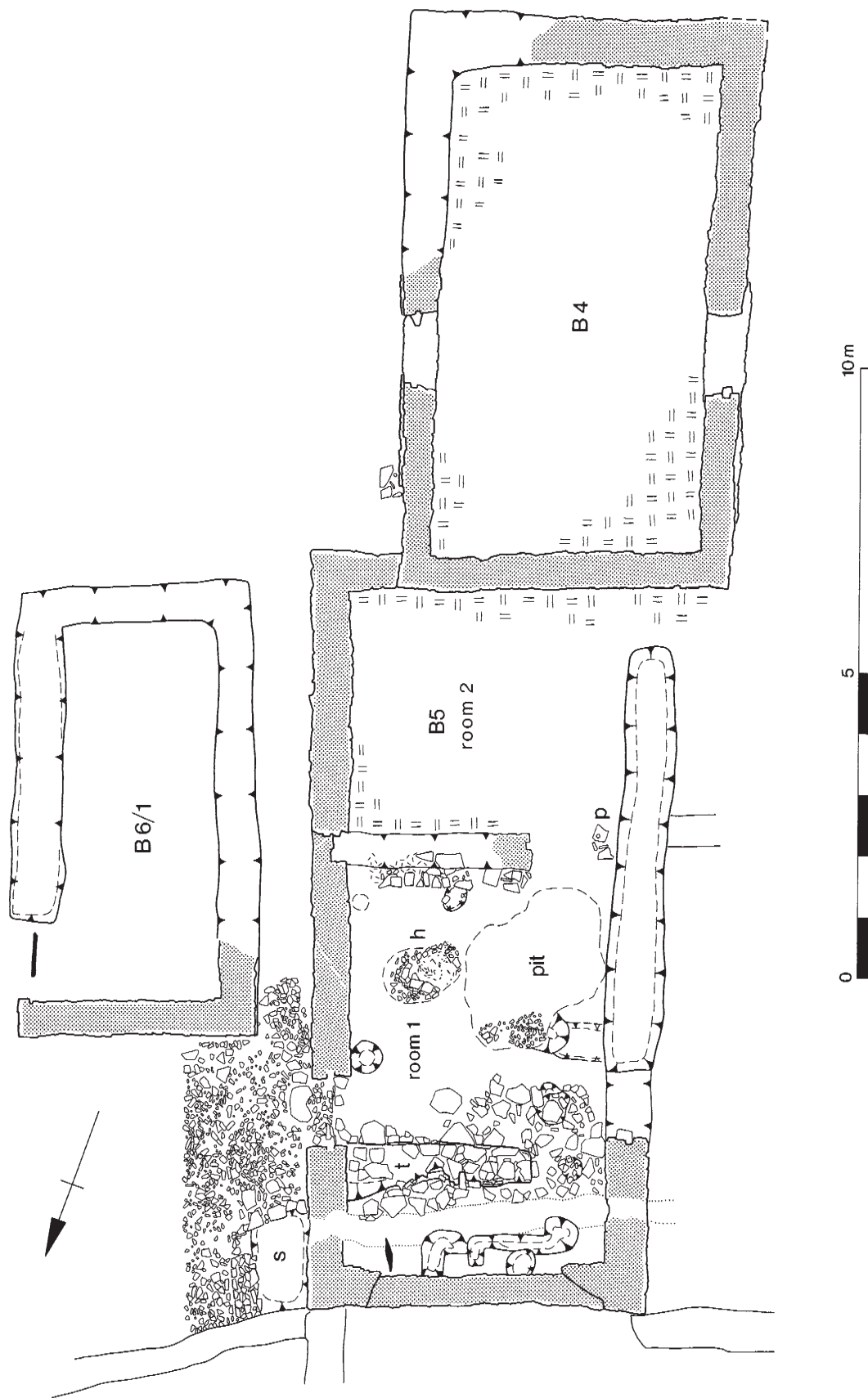


Fig 7.32: Medieval tenement B; the processing room B5 and buildings B4 and B6/1 (h=hearth, t=trough)



Fig 7.33: Building B4, looking east



Fig 7.34: Building B5, the processing room, showing the angled joint between the rebuilt (bottom) and original lengths of the northern wall

with limestone rubble, containing much charcoal, and the area was floored over with disordered limestone containing some patches of smaller, pitched limestone. The stone foundation against the southern wall was also levelled and partially removed. The final hearth stood above the latest floor surface and was probably still in use. In the north-east corner an upstanding slab of limestone may have formed one side of a corner bin, perhaps 0.70m square and at least 0.20m deep. The retained hearth and the corner bin suggest that the room was then functioning as a domestic kitchen.

Room 2 was 4.0m long by 4.6m wide, an internal area of 18.4sq.m, and was formed by infilling between the two existing buildings. The eastern wall was 0.65m wide, broader than the eastern wall of room 1, and was founded at a slightly higher level. There was access into room 1 and an external doorway at the southern end of the western wall, which had been totally robbed. Directly abutting three of the walls there was a patchy layer of yellow sandy clay. As in building B4, this may have been either a remnant floor or decayed wall rendering that accumulated during a period of dereliction.

The bakehouse, B6/2, and its rebuilding, B6/1

The original building, B6/2, was around 5.7m long by 3.0m wide internally, but as it had been totally levelled it was only defined by the extent of the internal features and floor surfaces (Fig 7.35). A slight scarp to the west indicates that the floor level was partly sunken below the base of the walls.

In the south-west corner there was a broad, shallow hollow, up to 0.15m deep, floored with two large flagstones. In the centre of the room there was a steep-sided pit, 0.5m deep, with a rectangular slot, 1.0m long by 0.15m deep, in its base. This may have held a timber base-plate supporting a timber superstructure that needed to be well founded. To the north, shallow postholes and some intervening stones are of uncertain function and may either have been remnants of an internal fitting abutting the northern wall or a door jamb and sill beam setting within the wall, although doors were not often set in end walls. In the north-east corner there was a circular oven with a slightly sunken chamber, 1.10m in diameter, but only the bottom course of the facing and a large, burnt floor slab survived (see Fig 7.78).

A layer of pitched limestone ran the entire length of the room alongside the western wall. It contained a high proportion of edge-reddened stone probably derived from the demolition of the oven superstructure, and may have been a levelling layer prior to the rebuilding, which took place in the later thirteenth century (ph 2/2, 1250–1300).

The new building, B6/1, was 7.30m long by 3.90m wide, with internal dimensions of 6.15m by 2.60m, an internal area of 16.0sq.m (Fig 7.32). The surviving northern wall, which stood up to eight courses, 0.46m, high, was 0.62m wide, and there was a broad doorway, 1.4m wide, in the north-east corner. A straight joint in the facing 0.45m from the eastern end of the wall indicates that the wall end was rebuilt at some stage; it contained a door jamb recess 80mm

wide by 70mm deep. There were no internal features and the floor was a light brown sandy loam with some small pieces of limestone.

In its final use, dated to the fourteenth century (ph 3/2, 1300–1400), the building was given a raised floor of compact limestone rubble, which abutted a vertical limestone slab standing 0.10m high within the doorway. Externally the threshold slab was abutted by rubble metalling.

Five knives or knife fragments came from the late floors of this building, with a further five from the surrounding yards; the only concentration of knives from the settlement. There was also a possible concentration of schist hones in the same contexts. This suggests that the final use of the building may have been in a food processing or some manufacturing process involving the use of sharp knives. One possibility is that it was used as a slaughter house or for the butchering of carcasses, but perhaps only following the abandonment of the adjacent buildings.

The malt house, B7

This building was 7.30m long by up to 3.15m wide (Figs 7.36 and 7.37), with nearly half of this length taken up by the oven itself, which was 3.50m long by 2.90m wide. The rectangular oven chamber, 1.40m long by 1.10m wide, had slightly battered internal facings, built down into a 0.20m deep construction pit. The oven walls were 0.90–1.00m thick, with a core of mixed loam and limestone rubble. The

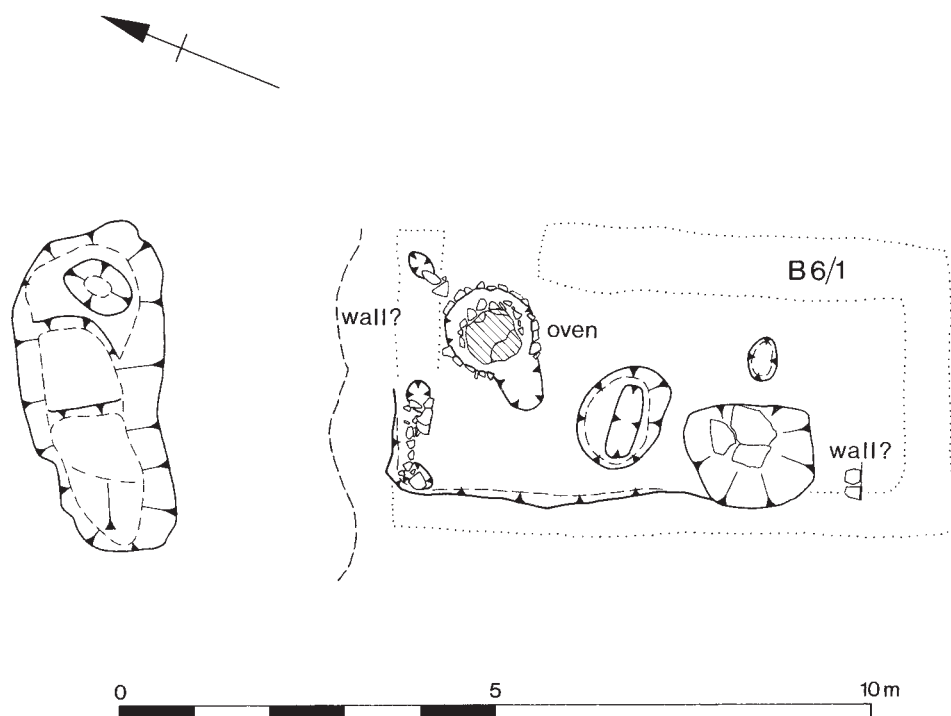


Fig 7.35: Medieval tenement B; the bakehouse, B6/2, and the sand-filled pit

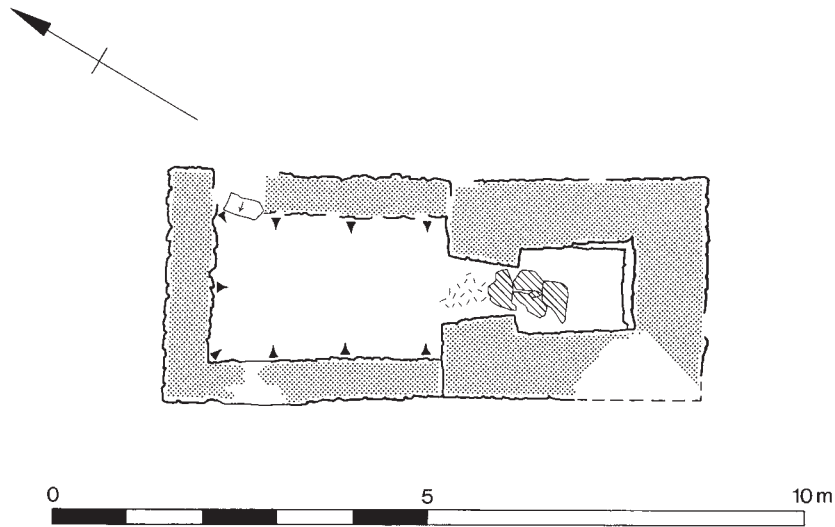


Fig 7.36 : Medieval tenement B; the malt house, B7



Fig 7.37: The malt house, B7, looking north

flue was 0.96m long and narrowed towards the chamber from 0.90m to 0.63m wide, and the wall faces leant slightly inwards, indicating the former presence of a flue arch. Two successive fire bases survived within the flue opening. The earliest comprised a layer of mortar extending along

the flue and into the chamber, with an area of intense scorching immediately inside the chamber indicating the former position of a hearth stone. Above a thin layer of mixed burnt debris, a second fire base comprised three large limestone slabs, with the central slab the most heavily burnt and cracked. The entire chamber and flue area contained a spread of burnt debris.

The oven chamber could have been a free-standing structure prior to the addition of the room, but no evidence was recovered for any post-pits suggesting the presence of an abutting timber shed. The abutting room was 3.10m long by 1.90m wide, a floor area of 5.9sq.m, with walls from 0.50–0.66m wide. The earth floor was sunken and lay below the base of the walls by up to 0.05m. Within the narrow, 0.60m wide, doorway at the north-east corner, there was a partially displaced threshold slab.

At its demolition the entire building was consistently levelled so that one or two courses of the walls of the attached room survived standing level with the compact limestone rubble, and both wall tops and rubble had a weathered surface indicating that it had been left exposed to the elements for sometime.

The boundaries and yards

The northern tenement boundary, A/B

The northern wall of the paired boundary walls was the earlier construction. It abutted a tenement B building, B5, to the east and the tenement A malt house, A3, to the west (Figs 7.7 and 7.26). The southern wall overlay early metalling within yard BY6, and was a later addition, forming a double-walled boundary. It also continued further to the west.

Both walls were constructed on a sloping surface and directly overlay an earlier boundary ditch. The southern wall was 0.55–0.60m wide, and to the west of the tenement A

malt house it sat on a low bank, up to 0.35m high. A length of at least 4.0m towards the west had been thickened by the addition of a 0.40m wide facing along the southern side, to give a total width of 0.95m.

There was no evidence to indicate that the narrow gap, 1.0–1.4m wide, between the two walls was utilised as a passageway. The space was largely filled with disordered limestone rubble that may have accumulated over an external period from progressive collapse of the walls as maintenance was neglected. Pottery of fourteenth to fifteenth century date (ph 3/2 and 4) suggests that much of this rubble accumulated after the desertion of the tenement B buildings. At this time four large pits were cut through both the rubble and the southern wall, and were filled with soil and stone rubble (Figs 7.7 and 7.26).

The yards

Isolated remnants of an early north-south boundary wall probably abutted the south-east corner of the original processing room, B5, and ran south across what was later yard BY2 (Fig 7.26). This wall certainly pre-dated the southern room of range B5 and perhaps also pre-dated building B4. A further remnant of early wall lay to the south of building B4. These early walls may have formed a walled yard to the south of the original processing room and with the malt house at the south-western corner.

With the full development of the buildings three small walled yards were introduced. To the north of the bakehouse, B6 there was a semi-enclosed yard, BY1, with multiple successive surfaces of neatly pitched limestone at the frontage of the processing room, B5 (see Fig 7.72).

To the north there was a 0.50–0.60m wide boundary wall with tenement A that abutted the corner of the processing room, B5. In the earlier use of the yard there was a large pit closely adjacent to the boundary wall (Fig 7.35). The pit was 4.20m long by 2.00m wide and up to 0.50m deep, with steep-sides, a rounded base and a shallower shelf at the eastern end. The bulk of the fill comprised a single, clean and homogeneous deposit of yellow to orange-yellow sand, with sparse small pieces of limestone, and contained pottery dating to the first half of the thirteenth century (ph 2/0). Over this there were successive layers of disordered limestone. It is suggested that the pit was utilised as a soak-away for surplus water from the adjacent processing room. To the south of the pit there was patchy metalling of gravel with some mortar, and above this there was a pitched limestone surface contemporary with the original ancillary building to the south B6/2.

To the east, the surfacing extended several metres beyond the frontage and sloped steadily downward to the lower level of the central yard. A second surface of pitched limestone covered much the same area, but was contemporary with the second building, B6/1. Immediately in front of the doorway of the processing room, B5/1, this surface included an area of larger, flat-laid limestone with worn surfaces (see Fig 7.72).

A third surface was of flat-laid limestone, and there was again an area of larger limestone with worn surfaces at the processing room doorway. To the north-west, in the corner between building B5 and the boundary wall with tenement A, there was a stone-lined pit, 1.50m long by 0.80m wide and 0.30m deep. This was later rebuilt, when it was floored with two large limestone slabs (see Fig 7.73). These surfaces and the pit overlay the large, sand-filled pit, which had evidently become redundant.

Subsequently, a layer of light brown clayey loam with scattered small pieces of limestone accumulated across the entire area. A final metalling of limestone rubble was laid on top of this layer, and was probably contemporary with the final use of building B6/1, when it was provided with a raised floor and an upstanding threshold slab.

Subsequent activity post-dated the abandonment of the buildings. A curving wall ran across the final rubble surface, in front of the doorway of building B6, and terminated to the south (Fig 7.30). This wall and the retained northern wall of building B6 formed the northern limits to a late rubble hard-standing, see below.

There was a small walled yard, BY2, in front of building B4. The boundary walls, which stood slightly above the sunken yard, had been largely levelled, but there was a 0.80m wide entrance adjacent to building B6/1.

The earliest surface, of limestone rubble in clean yellow sand, lay below the threshold of building B4, suggesting that there was either a stepped entrance or that the surface pre-dated the building. Above this there was a levelling layer, contemporary with the demolition of the bakehouse, B6/2, and rough metalling of small pieces of limestone in a clayey loam.

Following the demolition of building B6/1 in the early fourteenth century (ph 3/2), the entire area was surfaced with compact limestone rubble. To the west it abutted the frontage of buildings B4 and B5; to the north it abutted the retained northern wall of building B6/1 and the new curving wall to the east. To the south it may have abutted another new wall overlying the levelled walled yard, BY5, but only a short remnant survived running at a slight angle to the levelled yard wall.

A walled yard to the west of the processing room, BY6, had originally been surfaced with flat-laid and pitched limestone (Fig 7.30). Immediately outside the doorway to the processing room small patches of pitched stone indicate that a more extensive surface, probably similar to the metalling in the yard to the east, had been largely lost. Following the introduction of the southern tenement boundary wall, A/B, which overlay this early surface, there were no new surfaces and the earlier metalling was heavily disturbed by later activity. Immediately south of the processing room doorway there was a shallow rectangular pit, 1.70m long by 1.00m wide and at least 0.15m deep.

The dark loams across the eastern part of the open yard, BY3/4, to the south of the buildings, contained considerable quantities of occupation debris, including pottery of thirteenth century date (ph 2/0–2/2), animal

bone and a wide range of other domestic finds, suggesting the presence of a midden heap immediately south of the walled yard BY2. In addition, a neonatal infant (1648) had been buried in this area, probably in a pit cut through the accumulated soils.

To the west of room B5/2 there was an area of flat-laid limestone, some of which had worn surfaces, and immediately outside the western doorway to building B4 there was a semi-circular area, 3.0m long by 2.0m wide, where successive layers of limestone rubble filled a shallow, eroded hollow. A steep-sided, flat-bottomed pit, 3.50m in diameter by 0.35m deep, beyond the south-west corner of building B4, was filled with yellow-brown sand and much limestone rubble.

Across the remainder of the croft, BY7, the contemporary soil horizons were largely removed by machine excavation. There was a general layer of mixed clayey loams overlying the alluvial silts and clays which had accumulated over much of the area in the earlier twelfth century. Above this, and sealed by the modern topsoil, there was a further accumulation of clean, alluvial clays that post-dated the abandonment of the tenement, probably accumulating in the later fourteenth or fifteenth centuries at the same time as similar deposits were accumulating within the central yards.

The walled yard, BY5

To the east of the excavated buildings there was a large walled yard, BY5, measuring 25m east-west by 12.0m north-south. Only the western end lay within the excavated area (Fig 7.30), but geophysical survey has defined the extent of the yard and the probable presence of a building range, perhaps 10–15m long by 5–6m wide, on the frontage (Fig 7.7).

The limited dating evidence suggests that the construction of the northern yard wall, which was 0.5m wide, occurred no earlier than the late twelfth or early thirteenth century, as it overlay layers dated to ph 1 (1150–1225). Demolition rubble adjacent to the walls is dated to the late thirteenth century (ph 2/2, 1250–1300) and this suggests that the yard boundary wall was levelled at the same time as the abandonment of the tenement B buildings to its west.

The domestic range: tenement G

The general location of these buildings, which were not excavated, was evident in earthwork, where the sunken central yard was clearly defined (Fig 1.4). Further details come from a resistivity survey, which indicates that building ranges flanked the western and northern sides of a yard in an arrangement closely comparable to tenements E and F (Fig 7.1), with the northern range fronting onto the eastern end of the access road. The lack of more detailed definition in the geophysical survey was at least partially a result of the dumping of brick and other building debris within and around the central sunken courtyard. Below

ground the state of preservation may well be broadly similar to tenement F, with only minimal robbing of the walls.

The western range was 15–17m long and 5–6m wide, with at least one major transverse wall. The northern range was at least 17m long by 5m wide, but the eastern end lay beyond the limit of the resistivity survey. The northern wall may have been concealed by a bank belonging to the late medieval to post-medieval ditches and banks enclosing the road and the central yard. There are indications of two internal divisions, suggesting that the building contained at least three rooms. To the west of the buildings there was a rectangular walled yard, 15m long by 11m wide.

The central courtyard was 20m long by 10m wide, and at least the southern half was probably metalled. There would probably have been direct access to the Cotton Lane but, as with tenement F, there was a late medieval to post-medieval bank along the frontage.

The peasant tenements: E and A

Following the demolition of the medieval manor in the earlier thirteenth century (within ph 2/0, c1225–1250) its enclosures were occupied by two tenements, E and A (Figs 7.1 and 7.7). Tenement E may have appeared towards the middle of the thirteenth century, with the manorial barn and processing range, S17, and perhaps the dovecote, S22, retained, while the malt oven, E16, was rebuilt as a free-standing oven within a walled yard. The malt oven and dovecote were probably demolished into the second half of the century (ph 2/2, 1250–1300) when the barn and processing range was remodelled and partially rebuilt to form the main range of a second tenement, A, which had a very similar arrangement of rooms. Both were occupied through the fourteenth century (ph 3/2, 1300–1400). Before the end of the century tenement E had been abandoned, while Tenement A was occupied into the fifteenth century, with a final reuse of some rooms prior to its abandonment and demolition.

Tenement E

Tenement E comprised an L-shaped range set around two sides of a central yard, with a further walled yard to the west (Fig 7.38). Its excavation provided a vivid illustration of the state of the buildings following demolition, with upstanding walls and fairly stone-free robber trenches set within a sea of scattered rubble from the levelled walls (Fig 7.39). The building plans only fully emerged once the rubble, which had concealed and protected the original floor levels, had been removed (Fig 7.40 and Plate 12).

The domestic range, E13

The total length of the L-shaped range was 29m, and the floor area of the five rooms, 86.3sq.m, was closely similar to the main range of tenement A (see Fig 7.67).

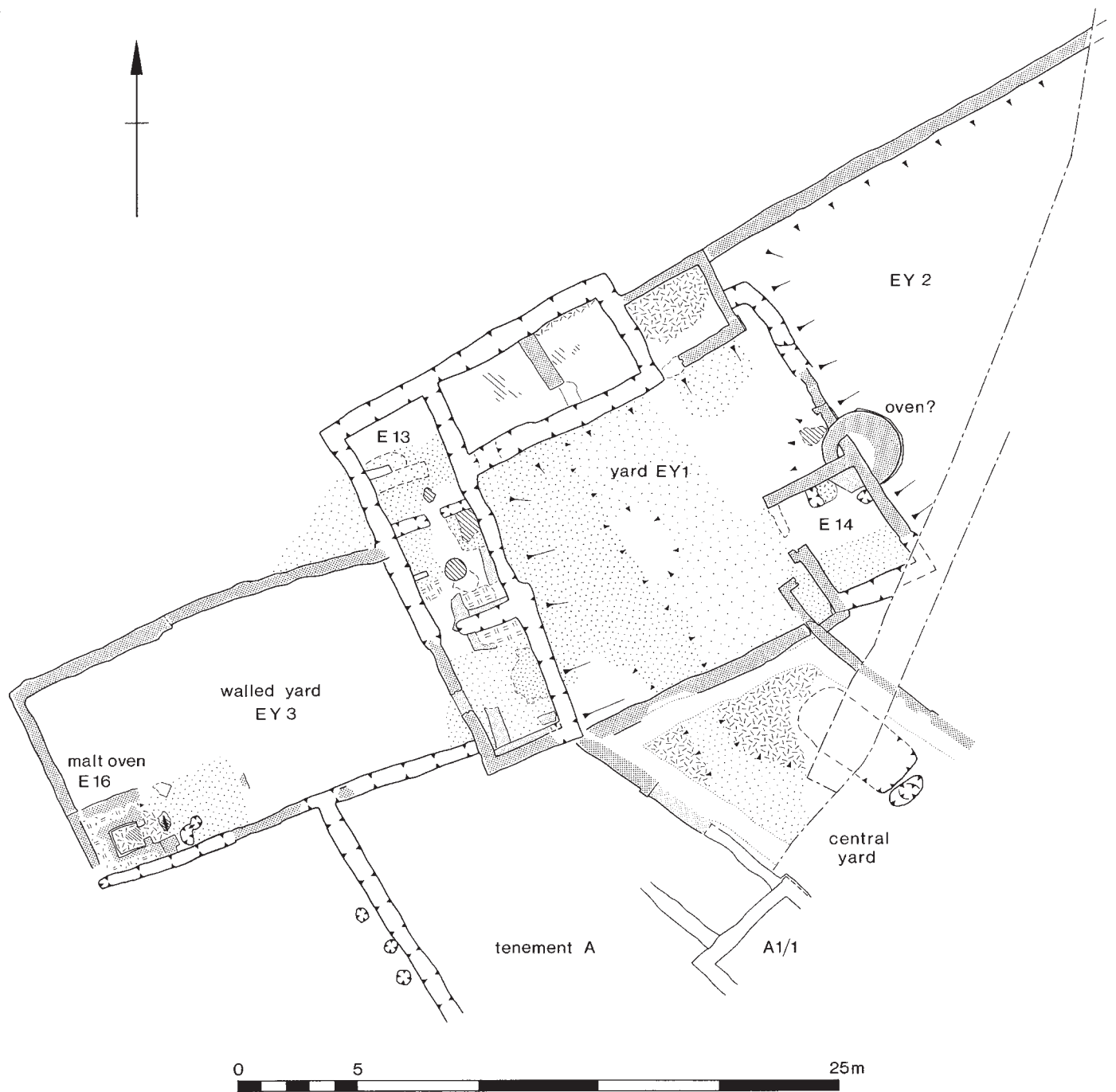


Fig 7.38: Medieval tenement E



Fig 7.39: Medieval tenement E; the demolition rubble, looking south-east



Fig 7.40: Medieval tenement E; the buildings, looking south-east

The western wing

This wing was 16.60m long by 4.90m wide (Figs 7.41 and 7.42). The long walls of rooms 2 and 3 directly overlay the levelled walls of the medieval hall, S18, although the end walls were slightly offset from their predecessors. Rooms 2 and 3 were of a single build, and the southern wall of room 2 was founded at the same depth as the long walls, suggesting that room 1, which was slightly narrower at 4.50m wide, was a separate abutting build.

The southern and western walls of room 1, which stood from six to eleven courses high, 0.40–0.70m, was 0.65m wide at its base and was slightly battered, tapering to 0.55m wide at the highest surviving level. The surviving doorway was well preserved as a result of the later insertion of a blocking wall. The opening was 0.98m wide at the door jamb recesses, which were set slightly towards the inner face, and the wall ends were slightly angled so that the opening widened both internally and externally to around 1.05m (see Fig 7.69).

Room 1 was 5.35m long by 3.25m wide, an area of 17.4sq.m. A levelling layer of sandy loam and small pieces of limestone largely sealed the pre-building surfaces,

although in the south-west corner a length of the levelled wall of an earlier building, S19/20, still stood above both this layer and the earliest floor. Against the southern wall there was a narrow, 0.30m wide, stone bench standing up to 0.45m high, six or seven courses, coincident with the levelled top of the adjacent end wall. There was a single-course setting of flat-laid limestone in the south-east corner of the room.

The earliest floor was of light brown sandy loam, which to the east abutted a setting of large, squared limestone slabs patchily worn smooth, probably through the use of an adjacent doorway (Fig 7.43). A broad bench against the northern wall could have been introduced at this time or later.

The second floor was of yellow sandy clay, with the frequent presence of finely crushed limestone suggesting that it contained some mortar. It abutted the blocking wall of the western doorway. The bench against the northern wall, 2.25m long by 0.80m wide, comprised a platform of sandy loam and small pieces of limestone overlain by clean, yellow clayey loam, with the western end retained by a low stone revetment.

The third floor surface comprised limestone slabs,

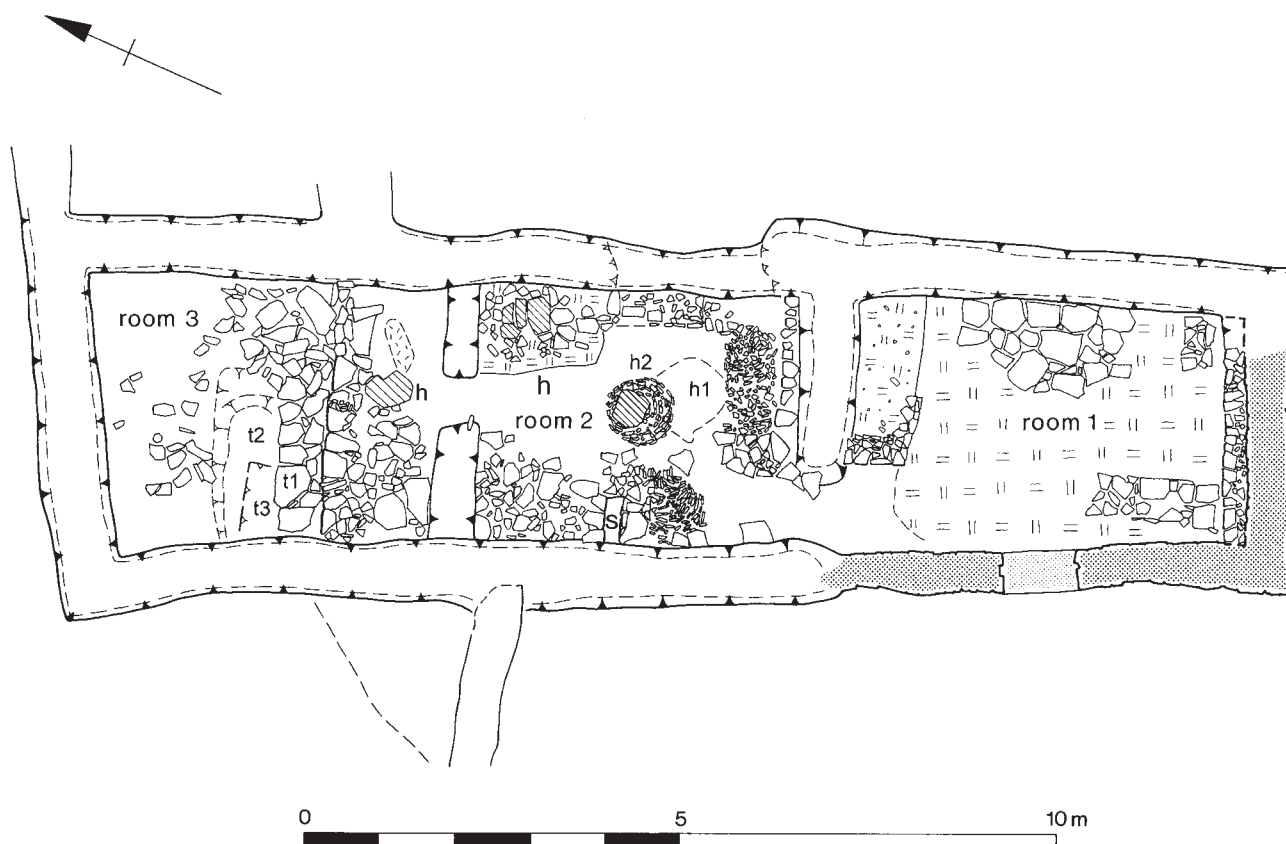


Fig 7.41: Medieval tenement E; the domestic range, E13, west wing (h=hearth, s=stone-lined bin, t=trough)



Fig 7.42: Medieval tenement E; domestic range, E13, west wing, looking south

from 0.1–0.6m in diameter. These were largely unworn and had therefore probably been covered by a lost upper surface of clay or earth. The two benches were retained, and within the northern doorway an eroded hollow had been patched with mixed deposits of loam, yellow clay and some limestone.

Room 2 was 4.20m long by 3.40m wide, an area of 14.28sq.m. It contained an extremely complex arrangement of features related to its use as a kitchen and, like all the later medieval kitchens, there was no external door to this room. Most of the internal fittings had been replaced at least once, and there was a sequence of four central hearths. This kitchen is discussed and illustrated further in the general account of the medieval kitchens (see Figs 7.83 and 7.84).

There was a narrow, 0.30m wide, stone bench against the southern wall. A similar bench was later built against the eastern wall, and broader foundations of pitched stone overlain with yellow clay against the southern bench may have been the base of a much broader bench, similar to the one in the room to the south.

In the north-east corner a rectangular hearth or oven base was replaced by an almost identical structure, comprising a rectangular clay base, 1.50m long by 1.10m wide, with flat-laid pieces of limestone surrounding a single, but fragmented hearth stone. Only this and the immediately adjacent stones, an oval area up to 1.30m long by 0.95m wide, had been burnt.

The original, circular open hearth lay towards the southern end of the room, h1, but with the introduction of the broader bench it was relocated further to the north,



Fig 7.43: The domestic range, E13, showing the partial stone floor in room 1

h2. The new hearth was 0.75m in diameter, comprising an arc of pitched limestone with a scorched area to the north where the hearth stone had lain. This was almost directly replaced by an almost identical hearth and, finally, by a further hearth which survived intact and was the best preserved example on the site (see Fig 7.86). It was sub-circular in plan, 0.90m in diameter, and comprised a near square, burnt and blackened limestone slab, measuring 0.46 by 0.40m, surrounded by a crescent of pitched limestone, incorporating pitched pottery sherds, carefully laid in a series of concentric rings. The hearth was surrounded by an homogeneous layer of brown to grey-brown sandy loam containing much comminuted charcoal.

Against the western wall there were two layers of flat-laid limestone slabs, with the upper surface worn. Bordering the southern margin of this surface was a stone-lined pit, s, similar to the example in building D11 (see Fig 7.86). It measured 0.65m long by 0.15m wide and 0.35m deep, but was built within a much larger construction pit. It was floored with a single large slab of limestone, covering much of the base of the construction pit, and was lined with three to four courses of flat-laid limestone. The apparently unnecessarily large size of the construction pit may suggest that either a solid, stone base was required as part of its functioning or that it may have replaced an earlier stone-lined pit of square plan. To the south of the stone-lined pit there was a well-laid quadrant of pitched limestone.

Room 3 was 4.50m long by 3.40m wide, an area of 15.30sq.m (Fig 7.41). The floors in the northern end of the room had been disturbed, but the remainder was well preserved. Three successive stone-lined troughs indicate that it was devoted to the same processing activity as seen in other tenements, and this room is discussed and illustrated further in the general discussion of these rooms.

The original trough, t1, was 2.30m long by 0.60m wide and 0.23m deep, and abutted the western wall. It was floored with large limestone slabs which were smoothed, rounded and discoloured and encrusted to a light blue-grey colour (see Fig 7.90). The lining on the southern side had an untidy bottom course of flat-laid and pitched limestone and an upper course of flat-laid limestone that was discoloured in a similar fashion to the floor. The lining on the northern side and the eastern end had been removed in the construction of a later trough. To the south the trough was flanked by a surface of flat-laid limestone slabs, which included an *in situ* heavily burnt hearth stone.

The original trough was infilled with clay and limestone and a new trough was built immediately to the north. This too had been partially robbed, but it was 0.65m wide by 0.30m deep and probably around 1.80m long, t2. The floor comprised scattered pieces of flat-laid limestone with their surfaces discoloured grey, but these may only have been remnants of a once more extensive surface. The southern side of the trough had a vertical lining of up to three courses of flat-laid limestone, and the facing was also stained grey. The northern and eastern sides, which had been largely

robbed, may have been stepped or inclined, rather than vertically faced.

The eastern end of the second trough was filled in with limestone and clay, including much discoloured limestone, and a shorter stone-lined pit, t3, 1.0m long, 0.40m wide and 0.25m deep, was built at the western end. The southern wall of the preceding trough was retained and new, vertically-faced walls, three courses high, were built to the north and east and it was floored with flat-laid limestone slabs. The facings of the new walls were not discoloured, except for the occasional stone that was probably reused, and the floor stones were discoloured red to purple, rather than the typical blue-grey of the earlier troughs. It would seem, therefore, that this final structure may have had a different function from the earlier troughs.

The later reuse of the western wing

A 2.0m length of the robber trench of the eastern wall of the kitchen, room 2, had a distinctive fill of brown loam and limestone that was partially overlaid by a late external yard surface. This suggests that a broad doorway had been opened in the eastern wall, and the room was given a new floor of brown loam and limestone. The partition wall between rooms 2 and 3 was probably removed and the robber trench was filled in and concealed by a final floor of small limestone pieces in clay.

The northern wing

The northern wing comprised two rooms of separate builds. The main room, 4, was 7.80m long with an average width of 3.70m, an area of 28.86sq.m (Fig 7.44).

Beneath room 4, earlier road and yard surfaces were sealed by a levelling layer of brown loam and small limestone pieces. The robbing of the walls had removed any direct evidence for doorways, but there was a slightly shallower section of robber trench at the western end of the southern wall. Against the southern wall there was a small stone-lined pit, 0.80m long, 0.30m wide and up to 0.30m deep. The fill of the pit was sealed by a well defined rectangle of pale yellow sandy clay, measuring 1.90 by 1.15m. A small central area was scorched red, as was a larger area to the south-west, above the stone-lined pit, suggesting that it may have formed the base for a brazier stand.

The room was subsequently split into two separate chambers by the insertion of a partition wall (Fig 7.46). At 0.70m wide, it was broader than most structural walls, and it is presumed that the standing partition was narrower than this. The internal doorway was 1.05m wide, with a single course of flat-laid limestone forming an offset threshold. The western chamber was 4.0m long by 3.5m wide, an area of 14.0sq.m, and had a floor of light yellow-brown sandy clay with a sparse scatter of small pieces of limestone. Just east of centre an irregular area reddened by light scorching may indicate a brazier location.

The floor within this chamber was around 0.10m higher than the floor within the eastern chamber, which was 3.00m long by 3.80m wide, an area of 11.40sq.m. Against the northern wall there was a linear setting of pitched limestone, 0.25–0.30m wide, possibly the foundation for a narrow bench. Against the partition wall there was a sub-square area of yellow sandy clay and the floor immediately to the east of this was patchily reddened by scorching.

Room 5, which abutted room 4, was 3.50m long by 3.00m wide, an area of 10.50sq.m. Originally it formed an open-sided cart or shelter shed with a sunken but well-laid floor of closely-set, pitched limestone (Fig 7.44 and 7.45). The northern and eastern walls were of a single build and 0.40–0.45m wide. To convert it to a closed room, a broader southern wall, 0.60m wide, was added. There was a straight joint in the external wall face, but internally the wall had been partly refaced to conceal the join (Fig 7.46). At the western end there was a doorway, 1.0m wide, with a central door jamb recess in the wall end. There were two phases of threshold stones, each edged with vertically pitched limestone standing above the floor level by up to 100mm, indicating that there was a step down into the room, where the later floor was of clayey loam with some pieces of limestone.

Building E14

This building was 5.80m long by 4.50m wide, with the room measuring 4.60m by 3.40m, an area of 15.64sq.m (Fig 7.47 and 7.48). The northern wall and western walls were 0.60–0.65m wide and stood up to six or seven courses high, 0.40–0.50m. The northern wall has been used as the exemplar for wall construction in the medieval period (see Fig 7.68).

The broad doorway, 2.10m wide, suggests provision of access for animals or goods, and the building probably served as a byre or stable, perhaps with storage for fodder and bedding in the roof space above.

A rectangular pit abutting the northern wall was 1.30m long by 0.85m wide and 0.40m deep with a shallower shelf to the west. The deeper part was filled with loose disordered limestone suggesting that it was a rubble-filled soak-away providing drainage. A small sub-square pit against the eastern wall was clay-lined. South of the doorway there was a well-laid floor of closely-set, small pieces of flat laid limestone. A single larger slab of limestone immediately inside the door was probably the sole survivor of an original kerb of larger stones, largely removed when the later floor was inserted. The stones were not worn and were probably a sub-floor for the overlying surface of brown clayey loam.

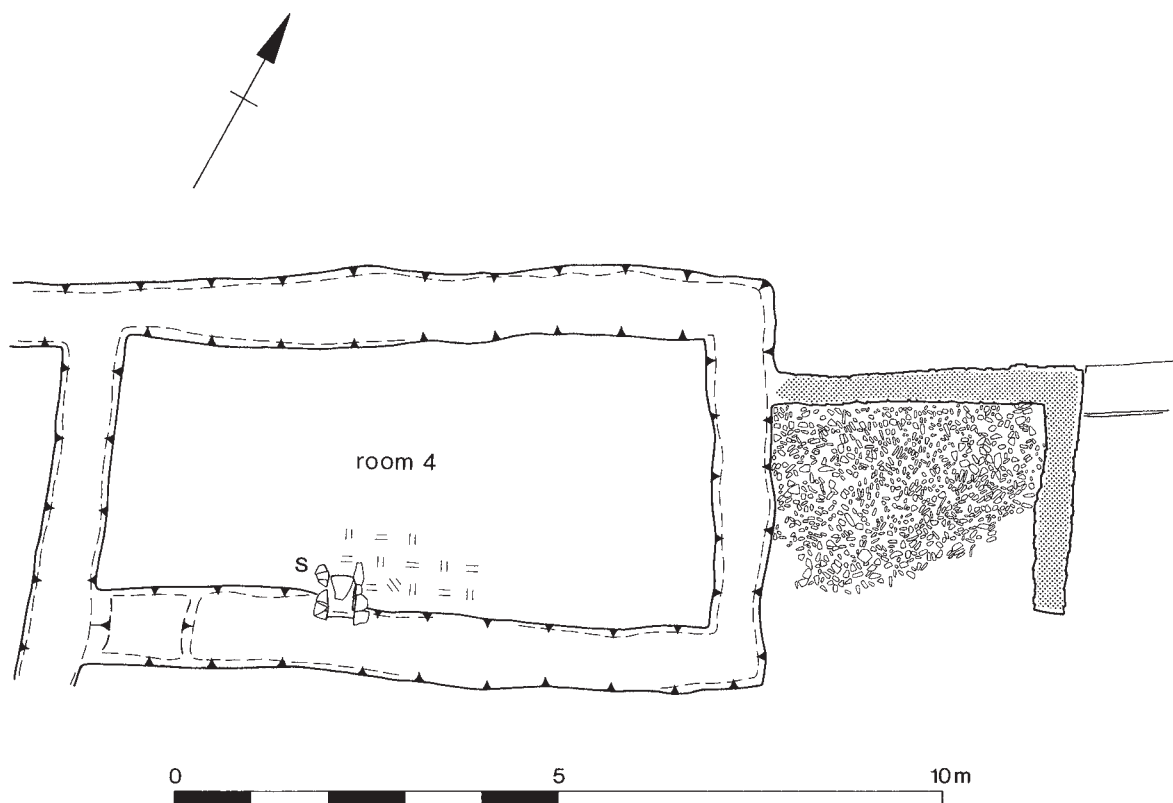


Fig 7.44: Medieval tenement E; the domestic range, E13, north wing original form



Fig 7.45: The domestic range, E13, showing the early pitched-stone floor in the room 5

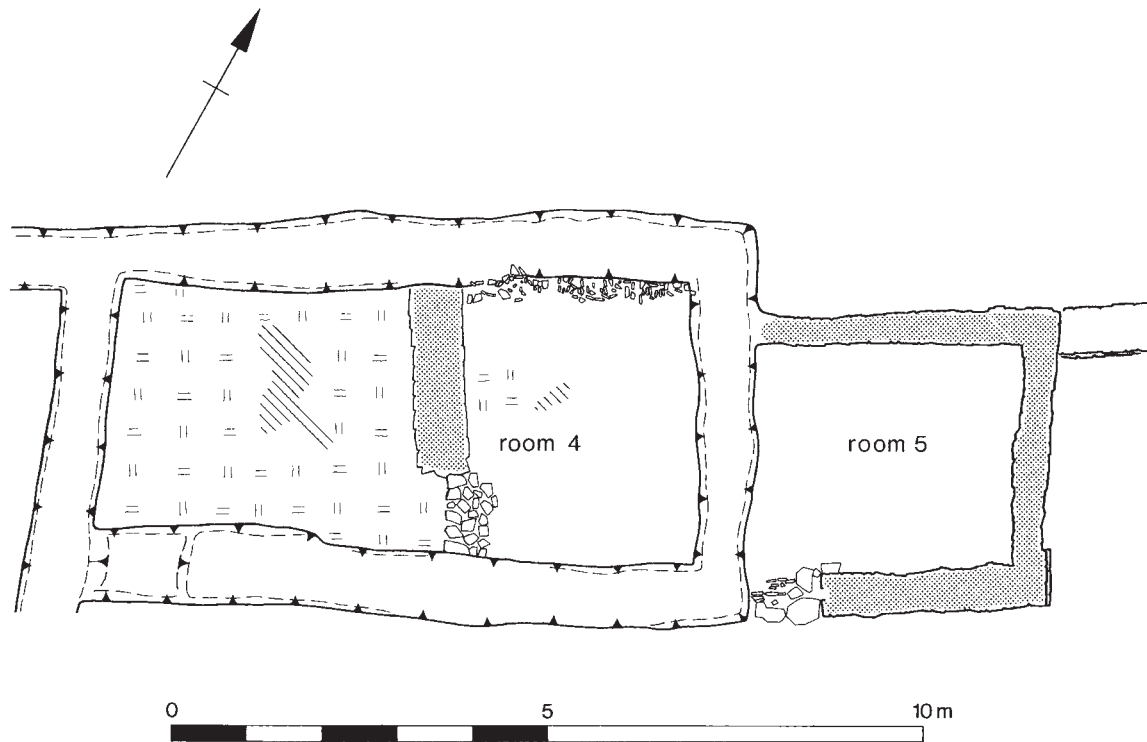


Fig 7.46: Medieval tenement E; the domestic range, E13, north wing, later form

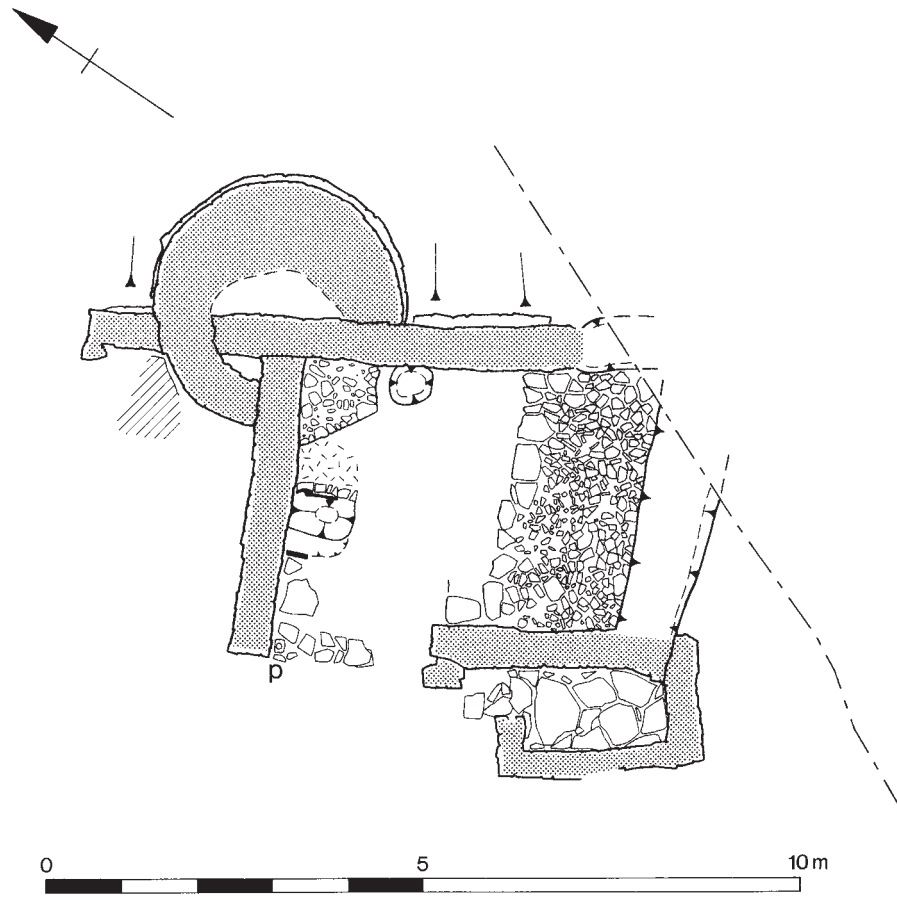


Fig 7.47: Medieval tenement E; building E14



Fig 7.48: Building E14, looking north, showing the broad doorway and the partial stone floor



Fig 7.49: Building E14, showing stone-floored external chamber

The second floor was identical, but did not extend quite as far to the north; and had a kerb of larger, roughly squared, slabs. This surface was partly worn and the central area had been lost.

A small, stone-flagged chamber abutted the western wall (Fig 7.49). It had a floor of several very large slabs of limestone carefully fitted to form a near continuous surface. This was laid prior to the construction of the standing wall, which was 0.40m thick and stood on the laid stone surface. The doorway was 0.60m wide with a central recess in the door surround.

The eastern wall was subsequently completely rebuilt, when it then continued to the north to form a yard boundary wall. It was flanked and partly overlain by a massive circular foundation wrapped around the north-eastern corner of the building (Fig 7.50). To the east the wall stood up to eight courses high, 0.50m, and was up to 1.25m thick, with a battered face and a core of limestone rubble that merged into a central fill of loam and rubble. To the west it was as little as 0.65m wide.

The wall probably enclosed a chamber 2.0m in diameter. Any internal surfaces, which would have stood well above the floor in the adjacent room, had been lost, but the structure was most probably a raised baking oven. An adjacent layer of yellow clay which had been partly hardened by burning to a blue-grey colour may indicate that it was fired externally. Directly above this burning there was dump of mixed burnt debris, comprising small pieces of limestone, typically heavily reddened on both faces, as well as small pieces of burnt and fired clay, all



Fig 7.50: Building E14, base of probable circular raised oven, looking west

probably from the demolished superstructure. Access to a raised oven chamber was perhaps via a stepped stone platform within the corner of the room.

Probably at the same time as the addition of the oven, the doorway was restructured. A pivot stone was set at the northern side of the opening (see Fig 7.71), while to the south the external quoins were removed and a door jamb recess was formed on the inner side of a newly constructed buttress, founded on a single large block of ironstone. Within the doorway a stone threshold formed a step down to a lower floor level.

The malt oven, E16

A malt oven had previously stood here within the southern range of the manor, S19/2, and the new oven was constructed over its levelled remains, probably as a free-standing structure (Figs 7.51 and 7.52). The small quantities of associated pottery suggest that it was in use for a short period at around AD 1250 (ph 2/0, 1225–1250), with its demolition occurring at about the same time as the formation of tenement A.

The earlier oven was sealed by a layer of neatly pitched limestone that formed both the floor of the new oven and a base upon which the new walls were constructed. The elongated chamber was 1.05m wide by 2.0m long, as defined by the location of the burnt limestone slab of the original hearth base. This slab remained *in situ* when the original flue was demolished and new responds were inserted to form a shortened oven chamber, 1.15m long, with an area of burning just inside the flue opening.

To the south and west the outer walls of the oven were provided by retained lengths of the earlier building walls, while to the north there was a new facing retaining a core of loam with some mortar and limestone. Beyond the end of the southern side of flue there were two shallow pits containing mixed burnt debris.

To the east of the oven there was a roughly 4.0m-square area of clay, mortar, limestone and burnt debris that defines a working surface or floor and suggests the possible presence of some form of cover structure (Fig 7.38).

The yards of Tenement E

There were two fully or semi-enclosed yards attached to the tenement; a metalled yard, EY1, at the northernmost end of the central yard and surrounded by the main buildings, and a walled yard, EY3, to the west of the buildings (Fig 7.38). At least in the earlier use of the tenement there was also access onto an enclosed plot to the east, EY2.

The central yard (EY1)

Within the area enclosed by the buildings a sequence of metalled yard surfaces was well preserved (Fig 7.38). The earliest comprised irregular pieces of flat-laid limestone, including slabs 0.30–0.40m in diameter, with gravel pebble infilling, was probably a levelling layer over the earlier

roads. To the east, the ground level stood at a higher level where it lay beyond the earlier eastern ditched boundary alongside the roads. To accommodate this disparity the shallow ditch was filled with limestone rubble and there was a thicker layer of stone to smooth out the gradient.

Above the levelling layer a metalled yard of smaller flat-laid limestone, frequently with worn surfaces, was particularly well preserved adjacent to the domestic range, E13, and was more patchy to the east. The final extensive resurfacing was of even smaller pieces of limestone, generally no larger than 100mm, but subsequent repairs were indicated by distinctive patched areas, up to 1.0m diameter, which in one instance contained a high proportion of ironstone. Another was largely of pebbles, and a number of small areas comprised pitched limestone. This upper surface was contemporary with the final, non-domestic use of building E13, when a broad doorway was opened into the former kitchen.

In the south-western corner of the yard a dump of loam and limestone against the wall of building E13 contained mainly large pottery sherds and other finds, suggesting that it may have been a remnant of a midden heap. Either there was never any surfacing directly beneath it or the periodic removal of the heap had also removed former metalling from beneath it.

Across the eastern end of the yard there were no surviving metalled surfaces of any great extent, although immediately outside the open-ended cart or shelter shed, E13 room 5, a layer of clayey loam contained frequent small pieces of limestone some of which were worn and had come from disturbed metalling.

There was a boundary wall at the eastern end of the yard, between E13 room 5 and the byre/stable, E14. The southern end was a continuation of the rebuilt eastern wall of building E14, and the northern end was represented by a robber trench. A broad gateway, 3.0m wide, had been subsequently blocked with a wall that was well faced only on the eastern side, indicating that the open yard to the east, EY2, was at a lower level than the central yard, EY1.

The midden deposit in the south-west corner of the yard pre-dated the construction of the boundary wall that ran between the southern ends of buildings E13 and E14, to form a closed courtyard, now separated from the central yard. The wall was 0.80m wide and survived up to six courses, 0.30m high. Following the construction of this boundary wall the courtyard was never remetalled with limestone, and the latest layers across the southern half of the yard comprised deposits of sandy to clayey loams interspersed with patchy areas of worn limestone that were possibly redeposited from the earlier surfacing. A hollowed area in the centre of the yard was similarly filled with clayey loam containing numerous pieces of worn limestone.

The construction of the boundary wall apparently removed all direct access to the courtyard and the buildings of tenement E, while the absence of any late metalled surfaces in yard EY1 also indicates a contemporary change in usage. This suggests that the boundary wall probably

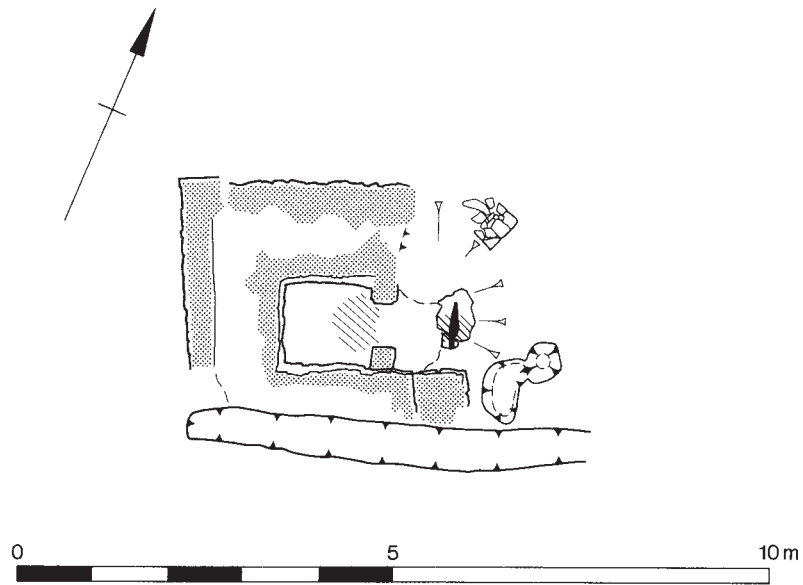


Fig 7.51: Medieval tenement E; the malt oven, E16



Fig 7.52: The malt oven, E16, looking east

appeared at the desertion of the tenement to cut off the abandoned buildings from the rest of the settlement, parts of which were still occupied.

The walled yard (EY3)

The walled courtyard occupied both the courtyard of the preceding building phase, SY1, and also extended over the levelled southern building range, S19 (Fig 7.38). Initially, a malt house, E16, stood in the south-western corner but this was levelled early in the use of the tenement.

The southern courtyard wall was the retained southern wall of the earlier building range, S19, while the western wall and the western end of the northern wall was a new construction, up to 0.70m wide. The narrower eastern half of the northern wall was of a separate build, more roughly built and on a slightly different alignment, perhaps suggesting that it formed a later closing of access from the north.

In the south-eastern corner of the yard a small area of closely-set, flat-laid limestone with worn surfaces was probably originally more extensive, and may have formed an area of metalling outside the western doorway of the domestic range, E13. Across much of the yard there was a build-up of sandy or clayey loam with few stone inclusions but containing much pottery and other finds, a proportion of which was residual from the earlier periods of occupation, the manor house.

An area of surfacing comprising a compact layer of small pieces of flat-laid limestone with worn surfaces lay in the external angle of the northern boundary wall and the domestic range E13. A substantial pottery scatter on this surface was of fourteenth century date (ph 3/2).

The eastern yard (EY2)

The area to the east of the buildings was slightly sunken with respect to the central yard. It was bounded to the north by a well-built linear wall, 0.65m wide and surviving five courses, 0.30m high, which abutted the end room of the domestic range, E13 room 5 (Fig 7.38). To the south the yard was open to the buildings of tenement D/C, leaving some uncertainty as to which tenement it belonged with, although in its latest use access from tenement E was apparently blocked.

Away from the boundary walls the area was covered by an homogeneous layer of brown, slightly clayey loam with a sparse scatter of small pieces of limestone, showing little differentiation down to the truncated and disturbed subsoil, which suggests that the area may have been used as an horticultural or garden plot.

Tenement A

Tenement A comprised a long frontage onto the central yard, with walled yards and two ancillary buildings to the rear (Figs 7.53). To the east it shared a double-walled boundary with tenement B.

The domestic range, A1

This range was developed by extensive rebuilding of the manorial barn and processing room, S17 (Fig 7.54 and 7.57). Some standing walls may have been retained while others were rebuilt on or adjacent to their predecessors. The domestic hall, A1/1, the narrower cross-passage, A1/2, and the kitchen, A1/3, were of a single build, while the storeroom to the south, A1/4, was an abutting addition that contained a stair-base, indicating that it had an upper storey. There was also an open-ended shelter or cart-shed to the north, A1/5. Together, they gave the range a total length of 31.0m and a total ground floor room area of 103sq m, closely similar to the main range of tenement E.

The cart or shelter shed

The open-ended cart or shelter shed attached to the northern end of the range was 3.70m long by 3.00m wide (Fig 7.54, room 5). Its construction was probably contemporary with the provision of a gateway opening onto the northern end of the central yard (Figs 7.53 and 7.38). The eastern wall was built in two abutting lengths, which may suggest that originally there was a 2.0m wide doorway at the southern end of the wall that was subsequently blocked. The interior was surfaced with clay and flat-laid limestone, and a remnant of a later floor of clay and pitched stones survived against the western wall.

The hall

The open hall, room 1, was by far the largest room, measuring 11.25m by 4.10m, an area of 46.1sq m. This space reflected the size of the barn that had preceded it (Figs 7.54 and 7.55). There were opposed doorways a third of the way along the walls, forming a three-bay room. The eastern doorway was 1.15m wide, with a large and heavily worn threshold slab of limestone edged across the doorway opening with vertically pitched limestone. The robbing of the quoins of the doorway opening, in an otherwise well-preserved length of wall, may indicate that an elaborate surround had been removed, perhaps for reuse elsewhere. Two limestone fleur-de-lys found within rubble in front of room 2 to the south might have come from a decorative finial surmounting such an elaborate door surround (See Fig 11.16).

There was a doorway, also 1.15m wide, at the southern end of the eastern wall, which had been subsequently blocked. In addition, there was a doorway at the western end of the southern wall to provide access to the cross-passage to the south. Both surrounds were partially removed, but there was an *in situ* pivot stone and a threshold of flat-laid limestone. The subsequent blocking of this doorway was indicated by the presence of an upstanding internal fitting in the room to the south.

The hall floor was of yellow clay mixed with some mortar, and it had probably been relaid in a similar fashion at least once. There were no internal fittings and no

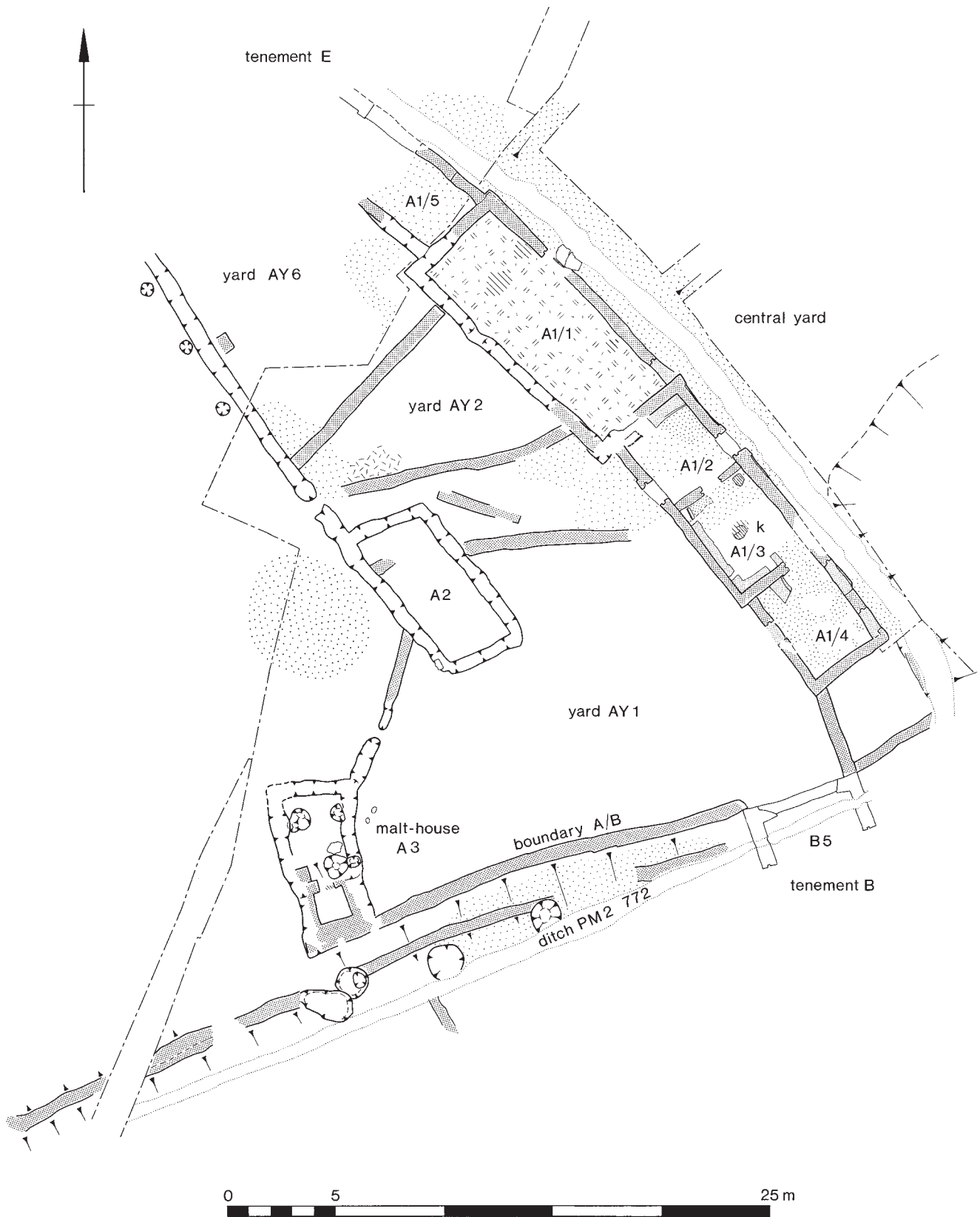


Fig 7.53: Medieval tenement A



Fig 7.54: Medieval tenement A; the domestic range, A1 rooms 1 and 5



Fig 7.55: The domestic range, A1 room 1, looking south-east

evidence for the former presence of a stone-built hearth, but an area of scorched and blackened floor to the north of the opposed doorways might denote the location of a brazier. Two smaller areas of similarly scorched floor adjacent to the eastern wall may denote further brazier locations. Later, a floor of clay and limestone pieces, including areas of pitched stone, was laid across the northern end of the room, extending to the southern side of the opposed doorways (Fig 7.54, dashed line and Fig 7.56). This suggests that there was a functional division of the room even though there was no evidence for any physical partitioning. This later partial floor might have been contemporary with the late provision of raised floors in the rooms to the south.

The eastern end of the wall between the hall and the cross-passage, room 2, projected beyond the line of the frontage by up to 0.2m to form a shallow pilaster buttress. The wall was contiguous with the eastern wall of the rooms to the south, which suggests that, despite the greater width of the hall, this and the cross-passage and the kitchen were probably of a single build.

The cross-passage

The cross-passage, room 2, was 4.00m long by 3.45m wide, an area of 13.8sq m (Figs 7.57 and 7.58). The opposed doorways at the southern end of the room, which were 1.10m wide, were flanked externally by narrow, pilaster



Fig 7.56: *Building A1, room 1, showing late floor of clay over pitched stones*

buttresses, which makes them more elaborate than the typical tenement doorway. In both doorway openings there were square door jamb recesses, and each had a threshold of laid stones.

The earliest floor was of small slabs and pieces of limestone, and there were probably no internal fittings at this time. It was resurfaced at least once in a similar fashion, when a stone-built bench, 0.46m wide by 1.75m long, with an offset bottom course that was heavily worn, was set against the northern wall to the east of the doorway to the hall. In front of this bench the floor was of large, worn flagstones. In the north-west corner, a slab of limestone standing up to 400mm high, and the probable stumps of further such slabs, suggest the provision of a box or bin structure (b), inserted following the blocking of the adjacent doorway.

Rooms 2 and 3 were separated by an internal partition wall, 0.4m wide, which abutted the main walls. The length west of the central doorway was later refaced on the northern side, broadening it to 0.6m wide. The doorway was 0.9m wide, and the door jamb recesses had underlying postholes. There was a single course threshold of flat-laid pieces of limestone.

The kitchen

The kitchen, room 3, was 4.50m long by 3.60m wide, an area of 16.2sq m (Figs 7.57 and 7.58). This is discussed below as one of two exemplars of medieval kitchens (see Figs 7.80–7.82). There were no external doorways and initially the only access was via the central doorway to room 2. The room to the south was a later addition, and a corner doorway was opened in the southern wall of the kitchen to provide access between them, which had necessitated a rearrangement of the internal fittings.

Throughout there was a central open hearth, but in the earlier arrangement there was also was a hearth or oven in the south-east corner (Fig 7.59). This was disturbed, but remnants of burnt clay, a limestone hearth base and part of a kerb of pitched limestone survived. In the north-east corner there was a stone-lined pit, s, although the stone lining along the southern side had been totally removed. It was 1.0m long and may have been 0.3m wide when both sides of the lining were intact, making it comparable to the small stone-lined pits recovered in other buildings. The northern end of the room had a floor of limestone slabs while the remainder was earth floored. Along most of the western wall a single course of stonework, 0.36m wide, was probably the levelled base of a stone bench.

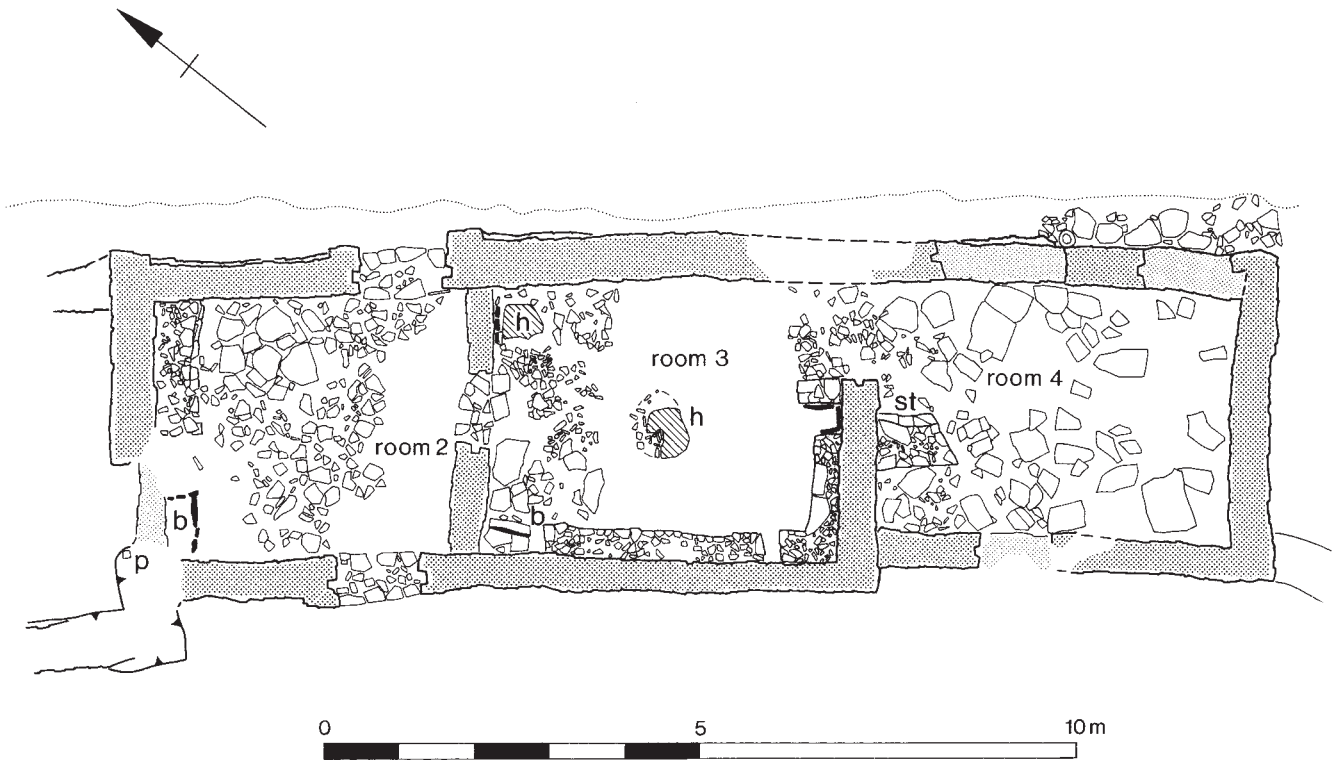


Fig 7.57: Medieval tenement A; the domestic range, A1 rooms 2–4 (h=hearth, b=bin, p=pivot stone)



Fig 7.58: The domestic range A1, showing the cross passage, room 2 (right) and the kitchen, room 3

Following the insertion of the southern doorway, many of the same fittings were present but they had been relocated (Figs 7.57 and 7.80). The corner hearth or oven was now in the north-east corner, replacing the stone-lined pit. The main hearth stone, 0.50m square and heavily burnt and cracked, was set on a layer of clay adjacent to the partition wall with vertically pitched stones set against the wall. To the west and south there was a surrounding surface of mixed flat-laid and pitched pieces of limestone, set into the clay base, and the surfaces of the stones to the immediate west of the hearth stone were lightly burnt.

The lost stone-lined pit may have been replaced by an upstanding stone-lined box or bin in the north-west corner, b, formed by an upright slab, 0.60m long and standing up to 0.40m above floor level. It was set between the end of the stone bench and the partition wall. Adjacent to the box or bin there was a well-laid surface of three large flagstones within a general surface of smaller limestone across the northern end of the room.

A new L-shaped bench, 0.37m wide with a rubble core faced with up to seven courses of flat-laid limestone, was built against the southern wall (see Fig 7.82). The surviving surface was at a height of 0.4m above floor level, and was probably the originally surface, which included two large slabs of limestone, each 0.40–0.44m long. Adjacent to the doorway there was a stone-built respond and vertical slabs within the space between the respond and the bench supported a remnant of an overlying slab that had carried the bench surface over this small alcove (Fig 7.82). As before, the remainder of the room was earth-floored with a concentration of burnt debris around the central hearth.

The original central hearth, not depicted, comprised a base of yellow clay beneath a single large slab of limestone, 0.90m long, which was burnt, blackened and fragmented. The later central hearth comprised a sub-rectangular hearthstone, 0.66 by 0.48m, heavily burnt and cracked, flanked to the north and east by a 0.2m wide setting of small pieces of pitched limestone interspersed with pitched pottery sherds (Fig 7.81). Part of the slab appeared to have been lost while the hearth was in use, and this area was patched with further pitched limestone.

The southern chamber

The abutting southern chamber, room 4, was 4.75m long by 3.30m wide, an area of 15.7sq m (Figs 7.57 and 7.60). There were two doorways in the eastern wall, and the northern doorway had a wider than average opening of 1.65m. There was a further doorway in the western wall.

The original use of this room is uncertain. The wide doorway could suggest that it served as a stable, perhaps in a similar fashion to building E14 in tenement E, but if so, this use might be expected to pre-date the opening of the doorway into the adjacent kitchen. Subsequently, all three doorways were blocked, although not necessarily simultaneously, and it is likely to have been the blocking of at least the broader doorway that coincided with the opening

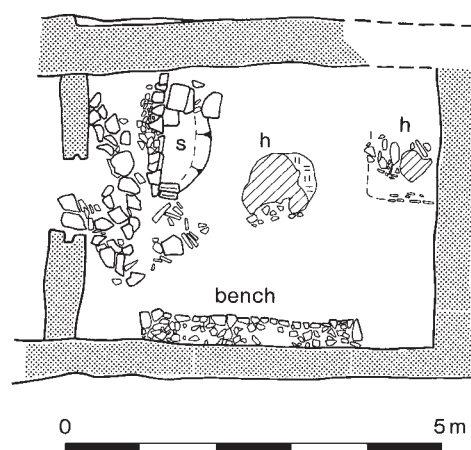


Fig 7.59: *Medieval tenement A; the kitchen, A1 room 3, early arrangement (h=hearth, s=stone bench)*

of the internal doorway to the kitchen. The original wall was levelled down to floor level, leaving the lower wall courses *in situ* beneath the new earth floors. The ragged wall end was refaced to form the door surround, which included a square door jamb recess. The fully enclosed room was probably used for storage, and at this time it was floored with large flagstones, although many had later been lifted and disordered.

Against the northern wall there was a stone-built stair-base of trapezoidal plan, 1.1m long and standing 0.45m high (Fig 7.57, st and Fig 61). The lower step on the eastern side had worn edges and surfaces, and there was a rise of 0.20m, although the surface of the second tread was unworn. The outer end of the western side was not faced, leaving the core of loam and rubble exposed, suggesting that it had been built against a timber support, possibly a newel post supporting a timber stairway set in a slightly hollowed area between the stair-base and the western wall. The presence of the stairway indicates that there was either a full upper storey or at least frequent usage of the loft space.

There was a late reuse of at least some of the rooms, which was most clearly seen in the kitchen. The southern bench was left standing but the remainder of the internal features were sealed beneath a layer of clay and limestone that included areas of pitched stones. A 2.0m length of the eastern wall may have been removed at this time to provide a broad opening into both this room and the adjacent store to the south. It was probably during this late use as an agricultural range that the flagged floor was so badly disturbed. The cross-passage to the north of the kitchen was also given a raised floor of clay and disordered limestone. The presence of small amounts of fifteenth-century pottery (ph 4, 1400–1450) within the final floor surface of the hall and within the demolition rubble suggests that the building was only demolished in the early fifteenth century.



Fig 7.60: The domestic range, A1, showing the kitchen, room 3 (right) and the storeroom, room 4



Fig 7.61: Building A1, showing the stone stair-base in room 4, looking south-west

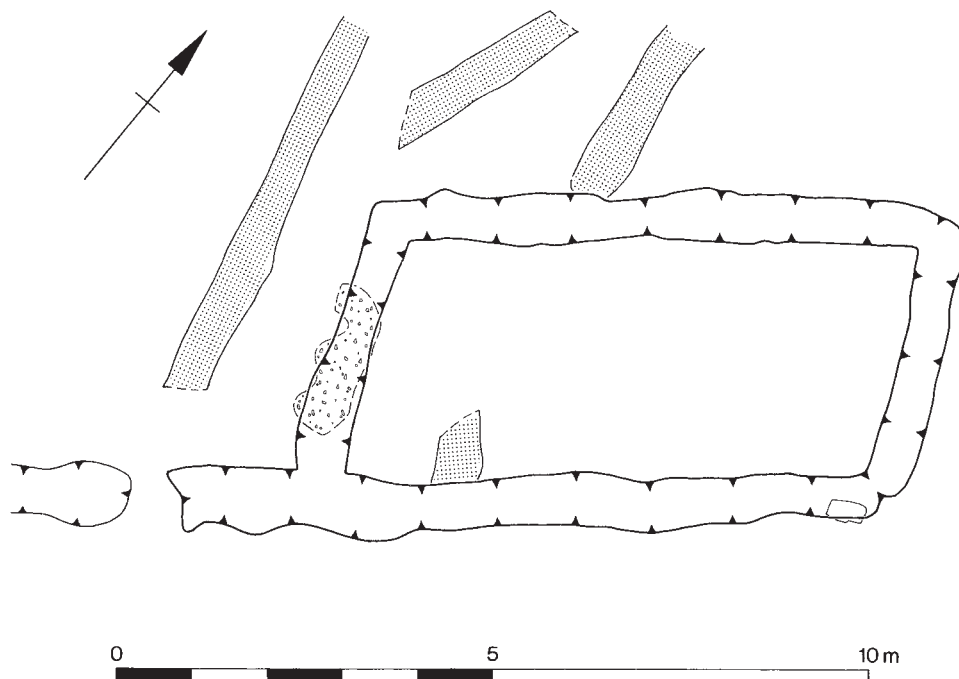


Fig 7.62: Medieval tenement A; building A2

Building A2

This building had been more thoroughly robbed than any other excavated medieval building. It was defined by the robber trenches and a spread of demolition rubble, and was 8.0m long by 4.2m wide although the plan formed a parallelogram, with the end walls at an obviously oblique angle to the long walls (Fig 7.62). The internal dimensions of 6.9m by 3.10m provided an area of 21.4sq m. Along the western wall a single course of stonework may have been a remnant of either a deeper foundation course or an earlier surface preserved beneath the later wall. The room had an earthen floor and there was no evidence for any major internal fittings.

The malt house, A3

Only the inner lining of the oven chamber, within a 0.35m deep construction pit, survived (Figs 7.63 and 7.64). The chamber was near square, 1.4m long by 1.5m wide, with slightly battered walls. A surface of irregular limestone, set within a shallow hollow, formed a hearth base at the inner end of the flue.

Originally, the oven was probably free-standing and abutted by a timber-built room or lean-to shed, some 3.0m long, founded on a pair of corner posts to the north and perhaps with further posts adjacent to the flue opening.

The walls of the later stone-built room had been totally robbed apart from a short length abutting the western side of the oven chamber. The shallow robber trenches indicate that the internal dimensions were 3.8m by 2.4m, an area of

9.1sq m, giving the building an overall length of 7.8m.

Two complete pottery vessels had been buried upright just beyond the western wall, one of Lyveden A coarseware and the other of Lyveden D glazed ware, indicating activity around the building in the later fourteenth century.

Tenement A boundaries and yards

The boundaries

The boundary walls between tenements A and B (Fig 7.53, boundary A/B) followed a former boundary ditch and a bank, which was partly retained within the new boundary. In its original form it had been defined by only the northern wall, which was 0.70m wide. For most of its length this wall was built across a sloping ground surface largely resulting from the presence of an underlying prehistoric mound. To the east it abutted the end of the processing room of tenement B, B5/1. To the west it probably abutted the malt house, A3, but this area had been robbed. The southern wall has been described as part of tenement B.

The boundary between tenements A and E was provided by the walled yard of tenement E to the north (Figs 7.6 and 7.7). To the west this line was continued by a low clay bank that would have abutted the main flood bank along the western side of the settlement. At its narrowest, the bank was 3.50m wide by 0.30m high, but to the west, as it approached the flood bank, it was broader and higher, 5.50m wide by 0.50m high. It was also broader and higher to the east, up to 11.50m wide by 0.50m high, and formed a sub-circular platform beyond

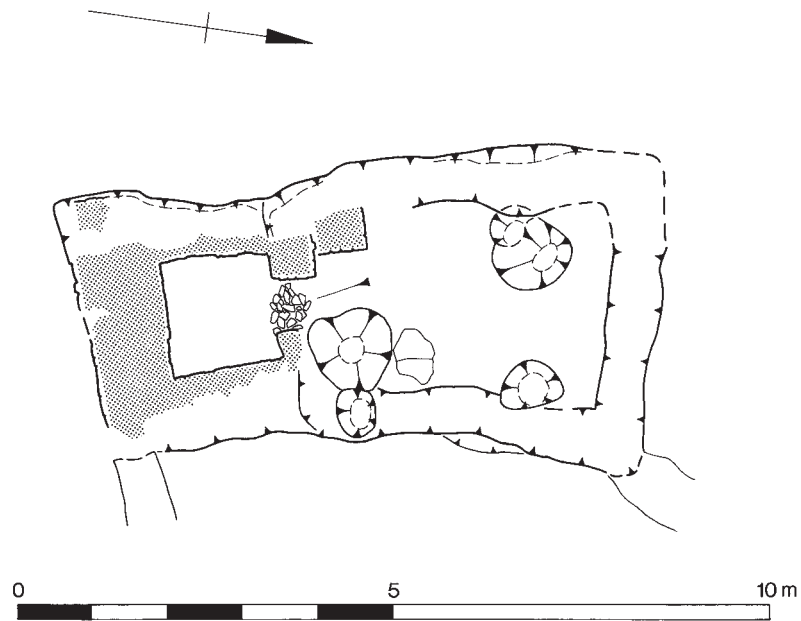


Fig 7.63: Medieval tenement A; the malt house, A3



Fig 7.64: The malt oven, A3, looking south

the corner of the walled courtyard, partly overlying the levelled malt house, E16.

The yards

Three walled yards lay to the rear of the frontage, probably at least partially respecting yards that had been introduced with the earlier barn and processing range.

The southernmost yard, AY1, was covered with homogeneous brown sandy to clayey loams, containing only a sparse stone scatter. It was bounded to the west by the ancillary building, A2, and the malt house, A3. A length of boundary wall, largely robbed, ran between these buildings and included an opening giving access into the croft to the west. The chamber at the southern end of the domestic range, A1/4, had been a later addition, so initially this yard opened directly onto the central yard. Subsequently, the opening was blocked both by room 4 and by a boundary wall running between room 4 and the northern end of tenement B.

The central yard, AY2, had originally comprised a narrow, limestone-surfaced access way, which was flanked by parallel boundary walls standing only 3.0m apart. In this form it was probably contemporary with the barn and processing room, S17, and it certainly pre-dated the introduction of the ancillary building, A2, which lay above the original western end of the yard southern wall. With the appearance of this building, perhaps at the formation of tenement A or shortly after, the northern wall was levelled and replaced by a new boundary wall further to the north and set at a right angle to the hall, to form a larger yard. This wall was 0.60m wide and was well built, and had not been disturbed in the same fashion as the two walls to its south. It was probably retained until the very end of the use of the tenement.

Although only small areas of well-laid limestone surfacing survived, the general dense scatter of limestone across the entire yard indicates that it was originally extensively metalled in this fashion.

The northern yard, AY6, ran up to the buildings and walled yard of tenement E. To the west there was a linear boundary wall, totally robbed, which had probably been introduced at the appearance of the barn and processing room, S17. Along the western side of this wall there were five small pits or post-pits, 0.50–0.60m in diameter by 0.20–0.30m deep, four of which lay at regular intervals of 3.1–3.2m, perhaps suggesting the provision of substantial fence at some stage.

To the north-east access to the central yard was provided by a gateway in a boundary wall running between tenements E and A (see Fig 7.38). The wall was at least 0.45m wide, but the outer face had largely collapsed into a later ditch. The southern end of the northern length ended at a broader buttress, with a central recess overlying a substantial post-pit, 0.40m deep and largely filled with vertically-pitched packing stones. A similar post-pit lay beneath the terminal of the southern part. These indicate the provision of substantial timber gate posts flanking an entrance, 2.80m wide. Subsequently, this gateway was blocked with a crudely constructed blocking wall in very rough courses of mixed limestone and ironstone.

The croft

The open croft beyond the walled yards contained no pits or other cut features. An earlier large shallow pit, which

lay immediately west of the ancillary building, A2, was finally fully filled with limestone rubble during this period, probably to consolidate the surface over earlier softer fills. The entire area was covered by amorphous mixed loams suggesting that it was perhaps utilised as either paddocks or for horticultural activities.

Access in and around the settlement

The central yard

Trial sections across the central yard had shown that it was filled with up to 0.5m of water-deposited clays, which had been laid down at around the time of desertion in the later fourteenth and fifteenth centuries. As a result, the limits for full excavation of the medieval levels were set around the margins of the central yard, so that only narrow strips immediately adjacent to the tenements were fully investigated. In 1986, following excavation of the stone buildings of tenements A, B and C/D, the central yard was fully stripped by machine down to the natural gravel as part of the investigation of the underlying prehistoric monuments (Fig 7.7).

The medieval yard overlay the open yards that had been established at the formation of the settlement in the late Saxon period. However, by the time the medieval tenements were established, encroachment of the boundary system and the final phase of building associated with the twelfth-century manor, had reduced the extent of the central yard and its original form was lost.

There were two distinct areas to the yard: a broad southern end between tenements B and C, with the access road entering at the eastern end, and a narrower continuation between tenements A and D running up to tenement E (Fig 7.7). The southern area was up to 25m long by 17–22m wide, and was slightly sunken in comparison both to the adjacent tenements and to the northern end of the yard. Metalled surfaces survived along the margins of the southern area and generally comprised rough spreads of flat-laid limestone rubble, although the well-laid, pitched stone yard of tenement B to the west extended onto the central yard and sloped gently down from the tenement frontage, which was some 0.20m higher. The absence of any metalled surfacing across the sunken central part of the southern area may have resulted from intensive usage creating a hollowed area, a hollow-way effect. However, the clays directly sealed the natural gravel, when it might be expected that there would at least have been an intervening deposit containing disturbed limestone from former metalling. It is therefore suggested that this southern end of the yard had been partly dug-out at a later date, perhaps with this material contributing to the late embankments around the margins of the yard.

The northern end of the yard was 9.5–12.0m wide. Although originally it ran right up to tenement E, there was always a clear distinction between the tenement E courtyard, with its flat-laid limestone metalling, and the

northern end of the central yard, where there was well-laid, pitched-limestone metalling. Further south there was flat-laid limestone along the frontage of tenement A. The survival of a pitched stone surface at the northern end of the yard was probably partly due to the later introduction of the wall cutting off access to the deserted tenement E, so that later usage of the central yard did not then extend far enough north to result in its removal.

Several pits alongside the boundary wall between tenements E and D were in use in the fourteenth century. They were typically 1.00–1.80m in diameter and from 0.10–0.40m deep, and were filled with clay and frequent pieces of limestone. At the northern end of the group there was a larger, sub-rectangular, flat-bottomed pit, 5.20m long by 2.30m wide and 0.20m deep. An elongated pit at the southern end of the large pit contained a central post-pit packed with disordered limestone, but the specific use of the pit and adjacent standing post is unknown. There was no metalling across the area occupied by the pits, but scattered disordered stone suggests that metalling may have been disturbed and removed whilst the pits were in use.

It is suggested that at the establishment of the medieval tenements, and probably continuing from the twelfth-century manor, much of the central yard was metalled with laid limestone, which in some areas comprised neatly pitched surfaces. Most of this was then lost at around the end of the life of the settlement. Much of the damage was perhaps a result of the final phase of occupation, when some of the buildings fronting onto the yard were given raised floors and were apparently used as sheds and byres. Animal trampling across the central yards would have disturbed and churned these surfaces, especially if the raised floors do indicate that at least periodic flooding of the yard was already occurring. This model also accounts for the survival of metalling at the frontage of tenement B, which had been the first to be abandoned, and in association with tenement E, probably the second to be abandoned, and thus avoiding animal trampling in the final phase of activity.

The Cotton Lane

Adjacent to West Cotton and running south for 1.25km, the former medieval road between Higham Ferrers and Thrapston survives as an unsurfaced track to the immediate east of the new road (see Fig 1.3). It is typically 10m wide between the flanking field hedges, although immediately south of West Cotton it is now much overgrown and the effective width is often less than 5m. The track adjacent to West Cotton had still been some 5m at the time of excavation, but by 2008 a new wooden fence along the field to the east of the lane had reduced the former track to little more than a wide footpath.

Adjacent to West Cotton the modern track is approximately level with the general ground surface. However, the former presence of a hollow way was demonstrated by a trial trench across tenement H (Fig 7.1). The eastern side of the lane was located 4.0m beyond the present track, with limestone

rubble abutting the building frontage and sloping down to the west. This indicated the presence of a hollow way at least 1.10m below modern ground level and 0.40m below the floor level of the adjacent building, H. On the western side of the lane a low bank is visible in earthwork inside the modern hedge line (see Fig 1.6) and while perhaps late medieval in origin, it may define the former western limit of the road. This would suggest that adjacent to West Cotton the road had widened to around twice its normal width, from 10m to 20m.

The accumulation of at least 0.75m of water deposited, tenacious clays within the hollow way repeats the pattern seen within the central yard to the west, with this process perhaps beginning in the late fourteenth century but probably largely occurring through the fifteenth century (ph 4–5, 1400–1500).

The filling of both the central yard and the Cotton Lane with water-deposited clays was clearly a result of extensive flooding of the lower lying road system and this must have been caused by frequent over-bank flooding of the Cotton Brook. This may merely have been a result of a lack of general stream management through the period of progressive desertion, but if tenement I was a medieval watermill, then a lack of maintenance of the mill leats following desertion may have provided a specific context for this flooding.

To the north of West Cotton, where the Cotton Lane begins to climb uphill and runs past the Mallows Cotton settlement, the lane largely survives as an evident hollow way. It is remembered by local residents as having been in use as a footpath until the 1940s or 50s, but had since fallen out of use and was badly overgrown. A section cut across the hollow way between West Cotton and Mallows Cotton (Parry 2006, 183–184, fig 6.18) exposed limestone surfacing at the base of the hollow way, which was 1.0m deep. The surface was sealed by clays overlain by a later gravel and limestone surfacing, but no dating evidence was obtained.

The course of the Cotton Lane between Mallows Cotton and Mill Cotton has not survived, but it is depicted on the first edition of the one-inch Ordnance Survey (Sheet 53, Bedford and Northampton, first published in 1835).

Tenements east of Cotton Lane: H, I and J

Evidence for the former presence of stone-built tenements to the east of the Cotton Lane is derived from a variety of sources, but particularly from the survey and trial trenching conducted by the Raunds Area Survey team under the direction of Steve Parry (Parry 2006, 172–177, fig 6.13).

Tenement H

In 1990 a series of trial trenches were cut in the field to the east of West Cotton as part of the second stage of the

Raunds Area Survey. These were mainly located to test for the presence of subsoil features related to early Saxon pottery scatters, but a single trial trench immediately east of the lane, 27m long by 1.30m wide, located part of a medieval building in a area that had previously produced a surface scatter of limestone and medieval pottery (Fig 7.1, H).

The western wall of the building was 0.60m wide, and was abutted by a 0.40m wide internal stone facing, perhaps a bench. The former eastern wall was denoted by a ridge of limestone rubble, indicating an internal width of 6.50m. The floor levels were largely concealed by rubble, which was not removed, but an area of burnt clay and limestone, and including pitched stones, 1.0m in diameter, indicated the presence of a hearth or oven to the east. To the rear of the building and at a slightly lower level, a compact layer of small, worn pieces of limestone formed a metallated yard, 8.0m wide.

A fragment of an upper millstone, 800mm in diameter by up to 95mm thick, in a type of sandstone not present within the assemblage of millstones from the main excavations, was built into the bench abutting the western wall. It provides some support for the suggestion that tenement I, to the south, may have been a medieval watermill, see below.

Pottery recovered from the hearth indicates that the building was in use in the later thirteenth century (ph 2/2, 1250–1300), while sherds of late medieval reduced ware and oxidised ware suggest that the building may have been in use into the early fifteenth century (ph 4, 1400–1450) and was perhaps only demolished in the second half of the century (ph 5, 1450–1500), although the later date may relate to the deposition of clays over the levelled building remains.

The full extent of the medieval frontage along the eastern side of the lane remains uncertain. Resistivity and magnetometer surveys along a 180m length of the frontage did not reveal clearly defined wall lines, possibly because of the effect of the overlying alluvial clays, but did suggest the possible presence of a total length of 50m of building, perhaps as two separate tenements each around 20m long.

Tenement I

In 1988 an area east of Cotton Lane and south of the Cotton Brook had also been trial trenched by the survey team under the direction of Steve Parry. Previously unknown medieval buildings were located beneath a layer of water-deposited clays (Fig 7.1 tenement I). Only the uppermost levels were exposed, revealing the tops of walls, demolition rubble and some probable areas of internal floors and external metallating (Fig 7.65). Trenches beyond the buildings indicate that they sat on alluvial clays, presumably filling earlier channels of the Cotton Brook and probably associated with the twelfth-century alluviation seen to the west.

While no direct evidence was obtained to define the function of this building complex, its location over earlier

alluvial silts and directly beside the Cotton Brook opens the possibility that it could have been a later medieval watermill, and the fragment of millstone from tenement H adds some support to this suggestion. The buildings lay at the western end of a close, measuring about three acres, Cotton Close, as recorded on the enclosure map of 1798 (Fig 1.4).

Building I44

The trial trench ran obliquely across the western end of a major medieval building (Fig 7.65). The walls were 0.70–0.75m wide and constructed in flat-laid limestone with some ironstone. They were significantly broader than the typical building walls located within the central area of the settlement. The building was perhaps 6.0m wide, with an internal width of 4.50m.

A partition wall, 0.45–0.50m wide, abutted the southern wall to form a room 3.30m long. There was a stone bench, b, 0.45m wide, against the western end wall, and a trapezoidal stone foundation, s, against the southern wall may have been a stair-base. There was a corner doorway to the next room, which may have been at least partially floored with pitched limestone, and which had a external doorway in the southern wall.

The full extent of the building was not established. The two rooms give a minimum length of 9.0m and it may have been up to 20m long, containing four or five rooms. The stair-base and the unusually thick walls suggest that it was of two storeys.

The yard

Between the two buildings there was a yard which had been at least partially metallated with flat-laid slabs of limestone, some of which had worn surfaces (Fig 7.65).

Building I45

The walls to the east, which were 0.60m wide, probably belonged to a second building, with an internal width of 4.0m (Fig 7.65). The northern end wall was located, and a robber trench of a possible internal partition wall indicates that there was a further room to the south. The building may have been around 17.5m long with three or four rooms.

The outer face of the eastern wall was abutted by limestone rubble, including pitched stones, and it was suggested by the excavator that this may have been deliberately banked against the wall.

Immediately following the levelling of these buildings a layer of yellow-brown clay was deposited across the entire area, directly overlying the demolition rubble. It was as little as 0.05m thick over the standing walls and up to 0.50m thick within the yard.

Pottery from the alluvial clay, the demolition rubble and from the yard surfaces is dated to the fourteenth century (ph 3/2, 1300–1400) and there were no residual ceramics of earlier date. It would appear therefore that the construction,

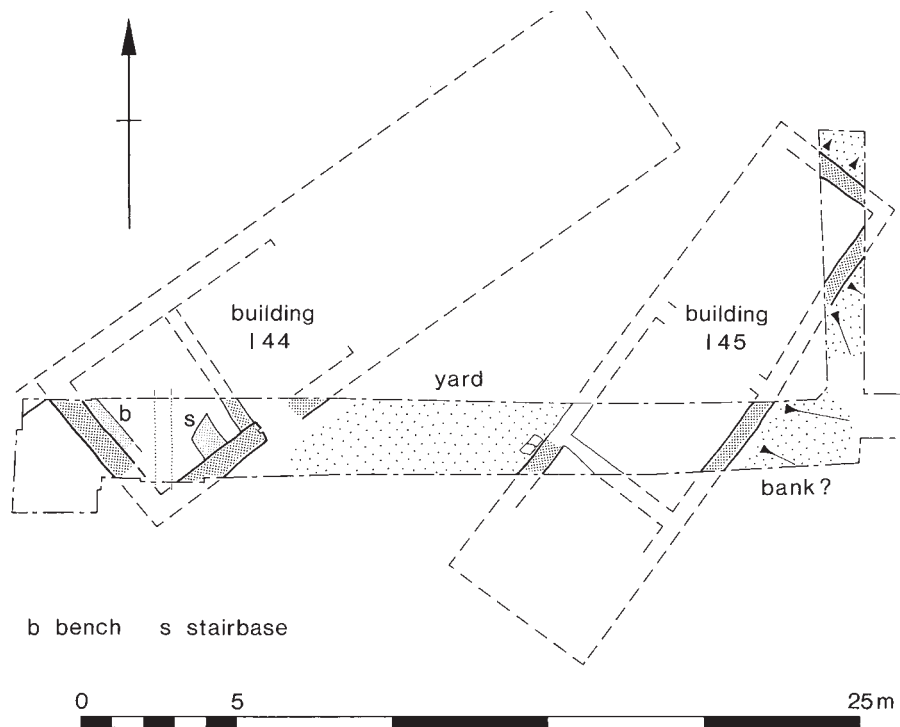


Fig 7.65: Medieval tenement I; trial trenches

use and demolition of these buildings all occurred in the fourteenth century.

Tenement J

The only evidence for the existence of a further tenement to the east of Cotton Lane comes from the observation of a pipe trench in 1967 by A E Rowlings, when a limestone wall footing and pottery sherds of the twelfth to early fourteenth-century date were recovered (Brown 1967, 28). This provided the first identification of the location of West Cotton, and a later reference to this same observation records that the pipe trench had cut through “a building with foundations 3ft deep” (Hall and Hutchings 1972, 15). The recorded grid reference is consistent with the known location of the pipe trench and it places this building both to the east of Cotton Lane and south of the Cotton Brook (see Figs 1.3 and 7.1). No surface scatters of limestone or medieval pottery have been recorded in this area, but this may result from the concealment of the building beneath a layer of alluvial clay, in a similar fashion to that demonstrated with tenement I.

The southern field system

The only extant area of the contemporary ridge and furrow field system in the vicinity of West Cotton lay to the west of Cotton Lane and south of the main settlement area and

the former course of the Cotton Brook (see Figs 1.3–1.6). It was surveyed by David Hall in 1973 and appears on several aerial photographs (see Fig 1.5). In earthwork, a length of 50–60m survived, gradually fading out to the west as it was obscured by an increasing depth of alluvium.

In the investigation of the southernmost prehistoric monument, ridge and furrow preserved beneath the later alluvium was exposed and sectioned near the western edge of the field (Fig 1.6). The furrows were generally quite regularly spaced at 9–11m, although to the north the spacing was narrower at only 7m. They were formed within a 0.60m thick soil horizon of homogenous sandy loam almost free of stone inclusions, and where they crossed the prehistoric monument the furrows bottomed on or slightly into the underlying mound (see Heading and Healy 2007, 70, fig 3.20). The western side of the field was bounded by a ditch, 3–4m wide and up to 1.0m deep, seen in section in a machine cut trial trench, cutting through the western edge of the prehistoric mound and slightly into the underlying natural gravels (see Harding and Healy 2007, 68, fig 68). The inner edge of the ditch stood 0.40m higher than the outer edge and the greater depth of soil at this point probably indicates the presence of a head or butt at the end of the strips. The ditch was filled with light brown tenacious clays indistinguishable from the overlying alluvial clays covering the entire area. Over the ridge and furrow system the alluvium was as little as 0.35m thick over the tops of the ridges, but it was up to 1.0m deep over the furrows.

Despite the partial investigation of this field system it is not possible to provide any date for its origin. Similarly, the date of the alluvial cover has not been directly established. However, by analogy with the evidence from elsewhere on the site it can be suggested that the earliest possible date for the alluvium is AD1150, so the ridge and furrow system had been fully formed by the mid twelfth century at the latest. The western ditch may have been introduced as an original field boundary, as given the low-lying location seasonal flooding may always have been a problem, but it could have been introduced in the twelfth century specifically to protect the field system from flooding after the commencement of the period of catastrophic alluviation.

The earthworks indicate the presence of a later linear ditch at this same location and running south-westwards from the angle of the southern stream channel. No ditch was recorded in section within the upper alluvial clays, but if largely filled with these clays it would have been barely discernible. The coincidence of location does indicate that a ditch was either maintained during the period of alluvial deposition or was re-established once it had ceased.

The prominent linear and curvilinear ditches appearing in earthwork show a respect for the alignment of the ridge and furrow, but these clearly post-date the alluvium and are probably post-medieval drainage ditches carrying the outflow from a spring on the eastern side of the Cotton Lane and lying directly opposite the end of the northernmost ditch (Fig 1.4). At least part of this drainage system has remained in use for this purpose until the present day, although now carried by a field drain lying towards the southern end of the field. From the 1739 records of the field names the identification of this field as Short leys (Hall *et al* 1988, fig 6 and table 1) suggests that it had reverted to pasture, with this perhaps occurring as a direct result of the twelfth-century flood inundation.

The medieval stone buildings

The exceptional state of preservation of the buildings constructed between the mid-thirteenth and earlier fourteenth centuries, and the excavation of an extensive sample of the available tenements, has provided a vivid illustration of the argument that the size, quality and complexity of late medieval peasant buildings has frequently been underestimated (Dyer 1986). The general characteristics of these buildings are considered below, along with the less well-preserved stone buildings of the twelfth-century manor, and this is followed by an overview of the specialised buildings that contained a range of distinctive internal fittings.

Building dimensions

Despite the wide variety of local construction traditions, it has been recognised that among the common characteristics of later medieval peasant buildings is the frequent presence

of two or three-bay houses or barns at around 30ft and 45ft (9.2m and 13.8m) long and 15ft (4.6m) wide (Dyer 1986).

These general conclusions are supported by the evidence from West Cotton. The two-bay arrangement is particularly well seen in the buildings of the twelfth-century manor (Fig 7.66). The hall, S18, the southern range, S20 (not illustrated) and the kitchen range, S21, at 9.5–9.6m long and 4.8m, 5.5m and 5.75m wide respectively, all possessed central or slightly off-centre doors indicating the presence of two bays. The later two-roomed southern range, S19, at 18.2m long by 5.0m wide, comprised a pair of two-bay structures, and the hall with opposed doorways in tenement B, B4, probably dated to the earlier thirteenth century, was a two-bay structure 9.5m long by 5.5m wide.

The barn and processing room, S17, added to the manor in the later twelfth century was comparable in width, at 5.2m, but had an overall length of 21m. The processing room conformed to a two-bay length, at 9.5m long, while the barn, at 11.5m long was appreciably longer. The only other building of probable later twelfth-century date, the processing room of tenement B, B5, was 7.8m long by 5.5m wide.

The majority of the twelfth-century buildings therefore showed regularity in length but a slightly broader range of widths, indicating that they were typically set out to a standard two-bay plan and to a standard length of around 9.5m (31ft). The exceptions, the barn, S17, and the processing room in tenement B, B5, were both specialised buildings, and the latter was certainly purpose built for its specific function. In addition, the thirteenth-century kitchen/bakehouse range of the later manor, tenement C/D, D11, at 11.0m long by 7.0m wide, was longer than a standard two-bay structure and, like the earlier bakehouse, S21, was unusually wide. It would therefore appear that it was the buildings with specialised functions which departed from the standard dimensions of the basic medieval two-bay structure.

In the thirteenth to fourteenth-century tenements there was consistency of room organisation, as was very clearly evidenced by the two purpose-built tenements, A and E, which comprised almost identical sets of rooms (Fig 7.67). A square kitchen with no external access was flanked on one side by a cross-passage chamber, while an open hall stood at the end of the range, abutted by an open-ended cart or shelter shed. The room on the other side of the kitchen, which in the case of tenement A was a later addition, had their external doors blocked and were then furnished with limestone-flagged floors, indicating use for food and crop storage. The same pattern of room arrangement was also seen in tenement C at the conversion of the barn to a peasant tenement, with the excavated rooms again comprising a cross-passage, a kitchen, a store room and a domestic hall, together with an open-ended cart or shelter shed.

Behind the consistency of form in these tenements there was a wider range of building and bay lengths within which it is difficult to isolate examples of Dyers' standard lengths.

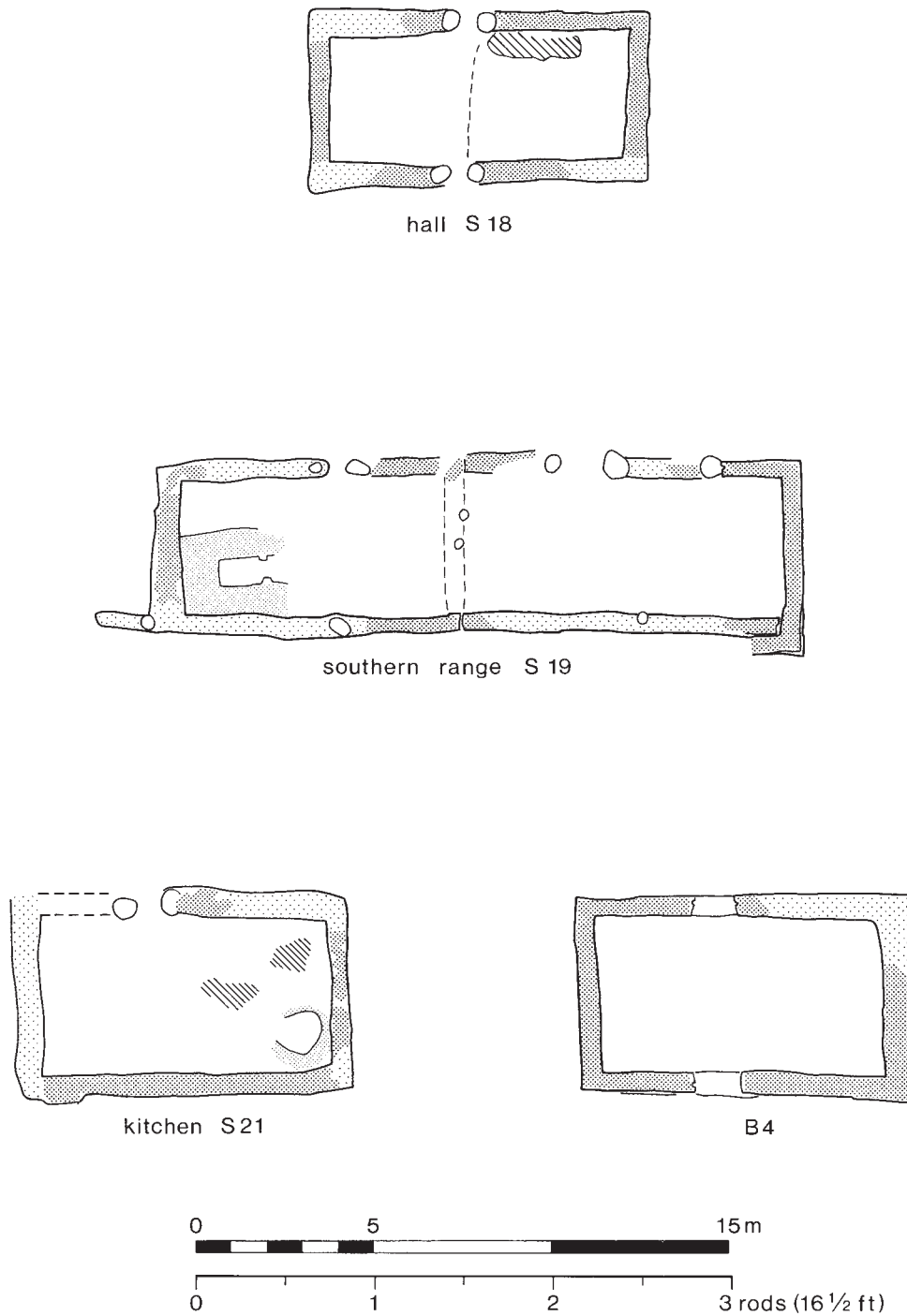
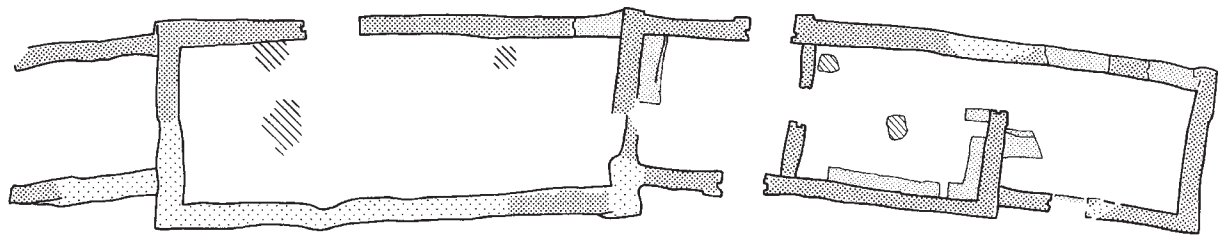


Fig 7.66: The twelfth-century manorial buildings, comparative plans

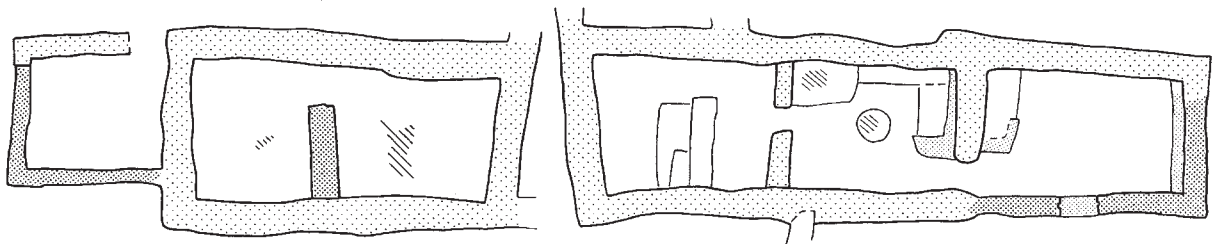
This may suggest that the building dimensions were determined on a more *ad hoc* basis, but the complex way in which these tenements had replaced earlier buildings, often largely but not precisely overlying earlier wall footings, may itself have provided a complicating factor that tended to result in departures from standard lengths.

The 12.5m long hall of tenement A had opposed doorways well to the north of centre, indicating a basic

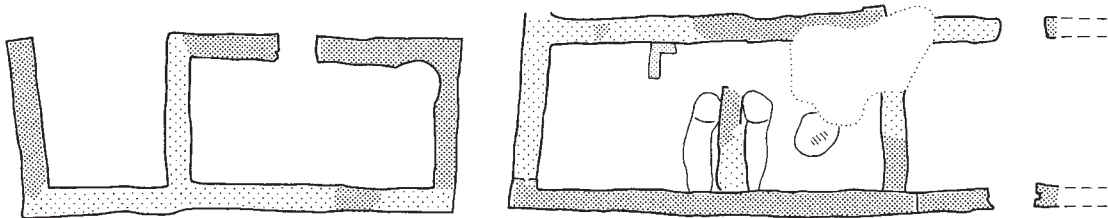
three-bay structure of a fairly regular form, but this was largely formed over, and may have retained some of the walls of the earlier barn, S17, which may explain its exceptional length in comparison to the other contemporary tenements. The central rooms of this range formed a regular two-bay structure 9.6m long, but this was an almost direct rebuilding over the earlier standard two-bay processing room, S17.



tenement A



tenement E



tenement C

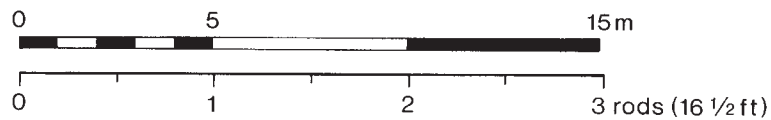


Fig 7.67: The peasant tenements, comparative plans

The main range of tenement E was a new build, and possessed three rooms, although two of these did overlie the levelled hall of the manor, S18. At 16.6m long it exceeded the typical length of a three-bay structure. In contrast, the adjacent domestic hall was 8.5m long and so somewhat

short for a two-bay room. The cottage, D11, of tenement D had three rooms but two were particularly short, so the building may be considered as a simple variation on the standard two-bay theme, although at 10.2m long by 6.2m wide it was both longer and wider than average.

However, these dimensions were largely determined by the underlying kitchen/bakehouse, D12, one of the specialised buildings that appear to depart from the norm.

While we cannot provide a simple analysis for the later buildings in terms of regular bay lengths, tenements A and E do vividly illustrate the size, quality and complexity of the peasant tenement in the later thirteenth and fourteenth centuries. In its final form, the four main rooms of the tenement A range, together with the open-ended shed to the north, presented a continuous facade 31m (101ft) long. This may, however, be placed in perspective by contrasting it with the agricultural buildings of the contemporary manor, tenement C/D, which had a continuous facade perhaps 44m (144ft) long, over half of which comprised an impressive barn.

It may be noted that each of the four tenements also contained a small detached range both narrower and shorter than Dyer's typical two-bay structure. These buildings were from 6.0m to 8.0m (19ft 8in–26ft 3in) long and 3.9m to 4.5m (12ft 9in–14ft 9in) wide, and in at least three instances they originally had corner doorways indicating that they were single rooms (Fig 7.7; A2, B6, C9 and E14). They were all evidently ancillary structures, detached from the main ranges, and perhaps serving a range of specific or general functions. Two were used as small bakehouses for part of their usage and another was a small stable or byre. The rooms attached to the malt ovens were also of similar dimensions (Fig 7.7; A3, B7 and C10).

The evidence therefore shows a diversity of approaches. There was evidently a considerable regularity in size and form in the typical two-bay structures of the twelfth-century manor, but greater diversity in size within certain specialised buildings such as barns, detached kitchen/bakehouses and processing rooms. In the tenements of the thirteenth and fourteenth centuries there was considerable consistency of form and arrangement, indicative of buildings of some quality and complexity, but with a diversity of building lengths, although this was partly derived from the way in which earlier buildings had been remodelled or rebuilt.

Building stone

The main building stone was limestone, the Blisworth Limestone of the Great Oolite Series which outcrops locally in the vicinity of both Raunds and Stanwick. Medieval stone pits and quarries have been excavated immediately to the north of the parish church in Raunds (Audouy and Chapman 2008; 127 and fig 5.74; 136 and fig 5.84) and the one-inch Ordnance Survey map of 1835 shows lime kilns 1.5km to the east of West Cotton, at the junction of Meadow Lane and London Road in Raunds, and also in Stanwick, a similar distance to the south. While the limestone used at West Cotton may have been obtained from such local quarries, an alternative source would have been the Roman settlements to the south and north, at Stanwick and Mallows Cotton (see Fig 1.2), which both lay within 700m of West Cotton with direct access along Cotton Lane. Many of the

residual finds of Roman date recovered at West Cotton may have been brought to the site on carts loaded with building stone robbed from these settlements. In particular, it is notable that more Roman than medieval coins were recovered, along with small quantities of Roman pottery and tile. The robbing of stone from the nearby Roman ruins, in which there may still have been many partially standing walls easily accessible, would have removed the need for quarrying and would have provided conveniently-sized stone for either direct use or reworking, with the transport distance to a minimum.

A small quantity of ironstone was used in the buildings, particularly the later building phases of the thirteenth and fourteenth centuries, where it typically appeared as large squared blocks in the quoins at the wall corners and within door surrounds. This Northampton Sand Ironstone, a ferruginous sandstone from the Inferior Oolite Series, is also available locally, outcropping on the valley slope immediately above West Cotton and within less than 1km. Ironstone quarries of Roman date were located within the nearby Mallows Cotton settlement, and the Roman buildings at both Mallows Cotton and Stanwick may again have provided a further or alternative source of ironstone.

Construction techniques

Superficially, there was little difference between the buildings of the twelfth-century manor and those of the peasant tenements dating to thirteenth and fourteenth centuries. All the standing walls comprised courses of flat-laid, rough hewn limestone set on shallow foundations of the same build but usually slightly broader than the standing wall. There was, however, one major distinction between them; the twelfth-century buildings all possessed mortared walls which were, on average, slightly narrower than those of the later buildings, which were merely bonded or packed with sandy clay.

Foundation courses

The foundations of the stone-built manorial hall, S18, which was probably of two storeys, were unique in comprising single or double courses of pitched stone set within a well-defined construction trench, 150mm deep. The pitched stone was sealed by a layer of mortar, which provided a level base for the standing wall.

The foundations of the other buildings comprised one and sometimes two courses, 100–150mm thick, of flat-laid limestone, and were 50–100mm wider than the standing walls, at 600–750mm wide, with external offsets. They tended to contain limestone slabs longer, wider and often thicker than the facing stones of the standing walls. These frequently met at the centre so that there was no more than a minimal core of smaller stones.

The lack of well-defined construction trenches made it difficult to determine the relationship of the foundations

to the contemporary ground surface. In many of the twelfth-century buildings there were distinct but shallow construction trenches, 100mm deep, but construction trenches could not be identified in the later buildings. These may have been lost in the removal and relaying of both internal and external surfaces, as well as through subsidence of the wall foundations into underlying softer soils. However, it is possible that the technique used was to level the entire area of a building so that following construction the floor levels, and perhaps the adjacent external surfaces, were built up from the same level as the base of the wall foundations, so that the walls were ground laid.

In the earlier buildings it was recognised that additional support needed to be provided for walls running over softer ground, generally the fills of underlying ditches. The western wall of the southern range of the manor, S19, ran across a major boundary ditch and was provided with an exceptionally wide foundation course of particularly large limestone slabs, while the lowest wall courses were partially of pitched stone. The dovecote wall, S22, ran across a pit with exceptionally soft fills and these had been partially dug out and an additional depth of rubble foundations was inserted. The southern wall of the later thirteenth-century barn and processing complex, S17, did not possess a foundation course distinct from the standing wall, but the central length of the wall had been carried down into the upper ditch fills beneath. The earlier thirteenth-century kitchen/bakehouse, D12, of new manor, tenement C/D, was built over the remnant of a prehistoric barrow mound with its northern wall across sloping ground. Here, an additional depth of foundations for the external wall face was set within a narrow construction trench, presumably to prevent slippage down the slope.

The nature of the underlying ground appears to have been ignored in the later thirteenth to fourteenth-century tenement buildings, even though many walls ran along or across recently filled in ditches. There were no clear instances in the later buildings of the provision of broader or deeper foundations over such potential weak spots, while there were a number of examples of structural problems resulting from such situations. The central length of the northern wall of the processing room in tenement B, B5/1, which lay directly over an earlier ditch, was narrower than the remainder, with angled joints at the junctions with the original wall. It appears that subsidence had necessitated the complete levelling and rebuilding of this length of wall. Conversely, the southern end of the western wall of the domestic range in tenement E, E13/1, crossed the levelled remnant of an earlier wall and had subsided on either side, resulting in cracking at the corner, with the southern end wall leaning outward.

Standing walls

The standing walls were constructed in flat-laid courses of rough hewn limestone. The coursing was generally

quite regular (Fig 7.68 a), indicating a fairly careful preparation and choice of stones of similar thickness for individual courses, although there were intermittent thicker blocks spanning two, or exceptionally three, courses, and sometimes two thinner slabs within a course. The typical facing stones were 150–300mm long by 50–100mm thick. In some instances the stones of the inner wall face were evidently either smaller or better squared than those of the outer wall face. The quoins at the external and, to a lesser extent, the internal corners and in the door surrounds were typically of larger stones, either of the same thickness, to maintain the courses, or spanning two courses (Fig 7.66 b). In the later buildings, the use of ironstone blocks for at least some of the quoins was common and these were typically two to three courses thick. The largest ironstone quoins occurred either in the foundation courses or at the base of the standing walls.

The facing stones generally took up some 2/3 of the total wall thickness (Fig 7.66c). The wall cores contained smaller limestone rubble but much of this was still flat-laid with interspersed smaller rubble, indicating that the wall cores had been carefully built-up along with the facings. Except for occasional instances within the foundations, there were no through stones.

The later medieval boundary walls were clearly more roughly built, without broader foundation courses and with smaller facing stones. The facings were also shallower, no more than half the wall width, and the cores comprised mainly disordered rubble, so that the wall faces were not tied together particularly well.

The mortared walls of the twelfth-century buildings were typically 450–600mm thick, although the walls of the possible two-storey hall were slightly wider, at 550–600mm. The walls of the later buildings were slightly broader, on average 550–650mm thick. The northern wall of the tenement A hall, A1/1, was exceptional wide at 700–750mm. On some of the best preserved walls battering was evident. The western wall of the west range of tenement E, E13/1, had a basal width of 650mm while at its maximum surviving height of 700mm (11 courses) it had narrowed to 550mm. To the east of Cotton Lane a building located in trial trenching, tenement I, was exceptional in having walls 700–750mm. Both the wall width and a probable stone stair-base within one of the rooms may indicate that this was a building with two storeys, and its interpretation as possibly a later medieval watermill may provide an explanation for the presence of both an upper storey and the exceptional wide walls.

The walls of the twelfth-century buildings were bonded with mortar; a pale yellow sandy lime mortar with small inclusions of friable limestone. The later buildings did not have mortared walls, but within the best preserved walls there was yellow-brown sandy clay both within the core and between the facing stones, indicating that they had been packed with clay, presumably used during construction as thick slurry.

The change from mortared to clay-packed walls may

partly reflect the difference in status between the twelfth-century manor and the later peasant tenements. However, the barn and processing room, S17, added to the manor at around the end of the twelfth century and the early to mid thirteenth-century buildings of tenement C/D, the new manor, had clay-packed walls similar to the peasant tenements.

The best preserved lengths of wall stood up to 900mm high. This, together with the substantial quantities of demolition rubble, clearly indicates that these were not merely dwarf walls. They would have stood to eaves height, perhaps typically some 1.8–2.1m (6–7 feet). Stone stair-bases in tenements A, A1/4, and I, I44, have been taken as indicators of the presence of some upper storeys, or at least a more formal use of the roof space. Both of these instances are quite late additions implying that this may only have occurred in the fourteenth century, with the exception of the two-storey hall in the twelfth-century manor.

Internal partition walls were typically 400mm wide and of the same general build as the external walls, although they only abutted the external walls. An exceptionally narrow partition wall in tenement D, D11, was only 300mm wide and, as found, was leaning considerably. It may have been a dwarf wall supporting a timber partition. A partition wall in the domestic hall of tenement E, E13/4, was 700mm wide, with shallow facings and a rubble core. It may have

formed a foundation for a narrower partition wall, perhaps incorporating some piece of room furniture.

No direct evidence for external or internal wall rendering had survived, and none of the buildings had plastered walls. However, a strip of heat hardened yellow sandy mortar that appeared to have collapsed onto the hearth in the manor hall, S18, may have been uniquely preserved by being burnt on the fire. It is also possible that an external layer of yellow-brown sandy mortar abutting the lower wall courses along the front of the same building, may have been derived from the weathering of an external rendering. In a similar fashion, the walls of a number of the later buildings were directly abutted either internally or externally with clean yellow-brown sandy clay, similar to the packing used to bond the walls themselves. This too may have been derived from decayed wall rendering. Its survival in only a limited number of instances might suggest that only a few buildings had been rendered in this way, but alternatively it may only have accumulated around buildings left standing derelict for a period following their abandonment.

Doorways

In the twelfth-century manor buildings large, sub-square post-pits, typically 0.50m in diameter by 0.30m deep,

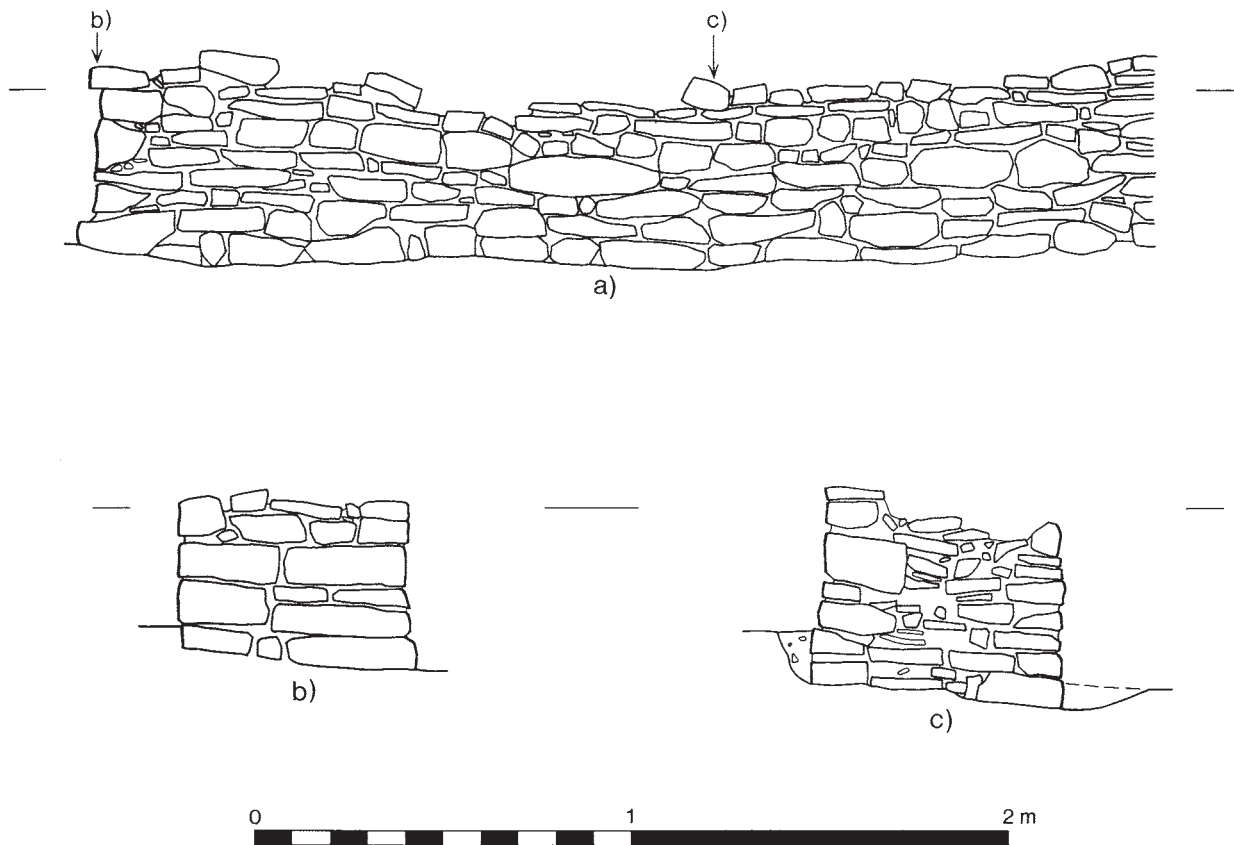


Fig 7.68: *The medieval stone buildings; building E14 north wall, elevations; a) inner face, b) wall end, c) section*

would have held square or rectangular door jamb posts, perhaps up to some 300–400mm thick, indicating the provision of substantial timber door surrounds.

In the thirteenth century, the use of such massive door posts ceased and thereafter doorways were provided with stone-built surrounds that typically possessed shallow, square recesses for slender door jamb posts, around 100mm square (Fig 7.69). This change was most clearly evident within the manorial hall, S18, where the original door-jamb posts were removed and the stone surrounds were extended over the backfilled post-pits. In some doorways there were either shallow postholes or pad stones at the base of the recesses, and in a few instances linear slots ran between the door jamb recesses, indicating the provision of timber sills. The sills were of comparable width to the door jamb posts, and were set within one or two courses of flat-laid threshold stones. Some of these slots had been carefully filled with small pieces pitched limestone, suggesting the later removal of the timber sills. Pad stones were only ever present beneath one of the recesses, indicating that they were provided to support the door jamb on which the door was hung. In nearly all instances the doors were hung on the left hand side, as viewed from outside, as in buildings through to the present day.

The intact door blocking in building E13 room 1, also illustrates shows the depth of accumulation of both the floor levels and the external surfaces during the lifetime of these

buildings, with the base of the blocking wall raised some 200mm above the original floor level (Fig 7.70).

In addition, five pivot stones were found *in situ* within doorway openings, while a further nine displaced examples were recovered (Fig 7.71). None came from a doorway provided with door jamb recesses, indicating that they were not used in the main domestic accommodation. Two were on internal doorways where there was an abutting room of separate build, B5/1–2 and A1/1–2, two were on doorways of smaller ancillary buildings, D11/4 and E14, and the fifth was from the processing room of the late twelfth-century barn, S17, the earliest example. The conical pivot sockets indicate that the doors were equipped with metal studs (see Fig 11.15).

Floors and room function

There were three basic forms of floor surface: clay, stone and earthen, and some rooms had composite floors associated with different functional areas.

The twelfth-century hall, S18, possessed the most complex floor surface. A partial sub-floor of pitched limestone was probably provided to consolidate the fills of an underlying ditch. Above this there was a floor of yellow sandy mortar. Between the central doorways and within the northern chamber the floor was of flat-laid slabs of limestone in a matrix of yellow sandy mortar.



Fig 7.69: Door jamb recesses, building E13, room 2



Fig 7.70: Building E13, room 2, showing the blocked doorway and the change in level resulting from the accumulation of floor and external surfaces



Fig 7.71: Door pivot stone, in situ within building E14

At least one major domestic room in each of the ranges of the thirteenth and fourteenth centuries had a clay floor, and in tenement A, A1/1, the clay had been mixed with mortar. These rooms all contained few internal features indicating that they functioned as domestic halls. In tenements A, A1/1, and E, E13/4, areas of scorched clay suggest the possible locations of braziers providing heating.

In the main range of tenement E, a clay-floored room had an area of large limestone slabs adjacent to the doorway, E13/1. In the southern range of the twelfth-century manor, S20 and later S19 room 1, the eastern end of the room was surfaced with flat laid limestone and may have served as a storage room. In tenements A and E, rooms adjacent to the kitchens were re-floored with large flat-laid limestone slabs when the external doors were blocked in the fourteenth century, indicating that they were converted for use for food and crop storage, E13/1 and A1/4.

On a smaller scale, there were stone-floored external chambers in tenements E and D, which may have served as small storage rooms, with the tenement D example being slightly sunken, D11/5 (see Figs 7.28 and 7.49).

Some rooms fully or partially floored with smaller slabs of limestone in tenements A and D were cross-passage chambers, A1/2, which probably provided the main access to these ranges and certainly to the adjacent kitchens. The processing rooms in the twelfth-century manor and tenements B and E were also floored with large limestone, but usually only immediately adjacent to the processing trough, S17/2, B5/1 and E13/3. The kitchens were largely earth-floored but with some small areas of stone paving, including some pitched stone.

The only rooms provided with more robust floors of pitched stone were the open-ended cart or shelter sheds in tenements E, C and D, confirming their use for agricultural rather than domestic functions, E13/5, C9/2 and D11/3.

The detached ancillary buildings and the malt houses in tenements A, B and C were earth-floored.

A single piece of a ceramic floor tile was recovered from tenement C, and this may indicate that late in the life of the hamlet there was at least one room with a tiled floor, perhaps in the postulated fifteenth-century use of the unexcavated tenements adjacent to Cotton Lane.

Roofs

Only negative evidence is available for the nature of the roofing materials. The total absence of any stone or ceramic roof tile indicates that all the buildings were roofed with organic materials, most probably straw or reed thatch. The use of wooden shingles cannot be excluded, although in this instance it might be expected that more nails would have recovered.

External surfaces

The twelfth-century metalling of the central access road comprised a compact surface of small well-laid pieces of

limestone, much worn through use and with some patched areas that included pitched stones.

In the thirteenth to fourteenth-century tenements many of the walled yards and much of the central yard comprised mixed deposits of disordered limestone in a clay or earth matrix. In some instances small areas of metalling survived beneath, indicating that more extensive areas had been largely lost, perhaps as a result of animal trampling during the late reuse of some former domestic buildings for agricultural purposes.

There were more extensive areas of intact metalling within tenements B, where a succession of flat and pitched-stone surfaces lay in front of the processing room (Fig 7.72). They may have been protected from later damage by soil accumulation following the early abandonment of this tenement. In one corner of this yard there was also a stone-lined external pit (Fig 7.73). There was a similar external stone-lined pit abutting the barn in tenement C.

An area of similar metalling survived at the northern end of the central yard, south of the boundary wall cutting of the courtyard of tenement E. In both instances there was little wear on the stones, indicating that they had formed a consolidated sub-base for overlying clay or earth surfaces.

Specialised buildings: malt houses, kitchens and processing rooms

Among the numerous buildings excavated at West Cotton there were three types that served such specific purposes that they required tailor-made internal fixtures and fittings, and in some instances these were evidently built into the fabric of the rooms in which they stood. This indicates that the rooms were pre-designed to serve these functions and they had not merely utilised an existing building shell. The buildings in question are the malt houses, the detached and internal kitchens and the processing rooms. In all instances a number of examples were excavated and from the particular details of each, as already described, a generalised account of their forms and functions can be provided.

The malt houses

The basic process of malting involves steeping barley grain in water, and then spreading the grain out on a surface or floor until it germinates and sprouts. It is then dried in a low temperature oven to kill the sprouting. The end produce of the drying is the malt, as used in brewing ale.

A linear earth-cut oven was operating at Furnells manor, Raunds as early as the sixth of early seventh centuries, although it is not certain whether this example was used for malting or just general crop drying (Audouy and Chapman 2009, 66, fig 5.6).

They were malting at West Cotton by the earlier twelfth century. In the northern holding there was an earth-cut



Fig 7.72: Tenement B, metalled yard, BY1, looking west



Fig 7.73: Yard BY1 with external stone-lined pit abutting the wall of the processing room, B5

oven with a sunken sub-rectangular chamber and a linear flue, and the debris indicated that its superstructure had been of fired clay over a wattle frame (see Fig 4.31). Carbonized, sprouted barley grain came from the oven and also from earlier twelfth-century deposits around the nearby watermills.

Stone-built malt ovens and detached malt houses are relatively common, and numerous medieval and post-medieval examples have been excavated on both rural and urban sites throughout Britain. Further examples within the Raunds area are known at Mill Cotton deserted medieval settlement (Parry 2006, 188–190, fig 6.21) and at Furnells manor and Burystead in Raunds (Audouy and Chapman 2009; 98–100, figs 5.38, 5.39; 105–106, figs 5.45 and 5.46 and 131–133, figs 5.79 and 5.80). A medieval manorial malt house and barn complex has also been excavated at nearby Irthlingborough (Chapman *et al* 2003, 81–86, plates 1–3 and figs 6 and 7).

A malt oven dated to the late eighth to early ninth centuries from the middle Saxon estate centre at nearby Higham Ferrers is a rare or even unique example of an early stone-built oven, as the middle to late Saxon examples from Raunds, Furnells and West Cotton were earth-cut ovens. The Higham Ferrers oven is also anomalous in that the lining of the entire chamber and the elongated stone-lined flue had been heavily burnt. This would suggest that it was either used for some other purpose, requiring much higher firing temperatures, or that it had been the victim of an accidental conflagration (Hardy *et al* 2007, 48–54 and 135–140).

The circular structure at the western end of the tenement C/D malt house is a rare instance of the survival of a structure related to other stages of the malting process (Figs 7.74–7.75). It is interpreted as having held a large wooden vat in which the barley grain would have been steeped in water to promote sprouting. A similar circular wall footing was attached to the end of the late medieval kitchen/bakehouse range at Furnells manor Raunds, and may have served the same purpose (Audouy and Chapman 2009, 105–106, figs 5.45 and 5.46). A malt oven related to the earlier, western manor house at Furnells lay close to a rectangular, stone-lined pit, which may also have been used for steeping the grain.

There is no specific evidence to indicate where the barley was laid out to sprout, but presumably it could have been spread across the floors of the rooms attached to the malt ovens, where a small fire may have helped to keep the room temperature up to promote more rapid sprouting. In examples of malt houses set at the end of barn-like buildings, there would have been plenty of space for spreading the grain to sprout, but the floor areas of the majority of the malt houses would appear to be too small, and presumably either other rooms were utilised or the grain was laid out within the walled yards.

It is the ovens themselves that provide most of the evidence. By the mid to later twelfth century the northern manor included a stone-built malting oven. In this instance the oven was constructed within a standing building, the

southern range, S19, with the earth core behind the stone-faced chamber set against the existing standing walls (Fig 5.18). This is not the most common form of malt oven, which are more usually free-standing structures. A malt oven abutting the walls at one end of a barn-like building as part of a complex of manorial status has been excavated more recently at Irthlingborough, only a few kilometres to the south of Raunds (Chapman *et al* 2003, 82–86), while there is a further example at Brackley, although in this instance the status of the building is unknown (Atkins *et al* 1998–9).

It is the three malt houses that were constructed around the middle of the thirteenth century, attached to tenements A, B and C (Fig 7.7), that provide the model for the most commonly recorded form of malt house. In each example there was a free-standing oven that had a slightly sunken chamber with the stone-lining slightly inclined, battered, so that the dimensions increased up to the extent of the surviving walls. The rectangular chambers were typically 1.20–1.45m long by 1.10–1.40m wide. Behind the chamber lining there was an earth core and an outer stone facing, to make a well-insulated structure with walls around 1.0m thick (see Fig 7.20). While the ovens were free-standing, there was typically an attached stone-built room, as in tenement B (Fig 7.76). As the walls of the attached room and the outer facing of the oven chamber were ground laid, while the oven chamber was sunken, in excavated examples on truncated sites only the lining of the chamber itself might survive, giving little clue as to the full extent of the oven and the attached structure. In the tenement A malt house there were possible post-pits beyond the free-standing oven (Fig 7.63), suggesting that there was an abutting timber shed or shelter prior to the construction of the stone-built room.

The malt house attached to the agricultural ranges of the later medieval manor, tenement C/D, was the most elaborate of those excavated, and the only one where there were additional ancillary structures presumably related to other aspects of the malting process (Figs 7.74 and 7.75). It was also atypical as its structure was of an intermediate form. The oven chamber was built abutting a full-standing wall, in a similar fashion to the manorial ovens already mentioned, but these only projected a little way out from the oven as stub walls supporting a short open-ended shed, with postholes suggesting the provision of an end-wall in timber (Fig 7.17). Subsequently, the stone walls were extended to form a fully enclosed room, giving it a similar appearance to the other contemporary malt houses (Fig 7.18).

The exceptional thickness of the oven walls provided both heat insulation and support for the superstructure. Large slabs of limestone, surviving up to 500mm long, filled the chamber of the tenement C/D oven, and may have collapsed from a raised oven floor on which the sprouting barley was spread for drying.

The hearth stones were typically set at the inner end of the sloping flues, and partly within the rectangular chambers (Figs 7.74 and 7.76). While the hearth stones were burnt and blackened and the adjacent stones on the flue were

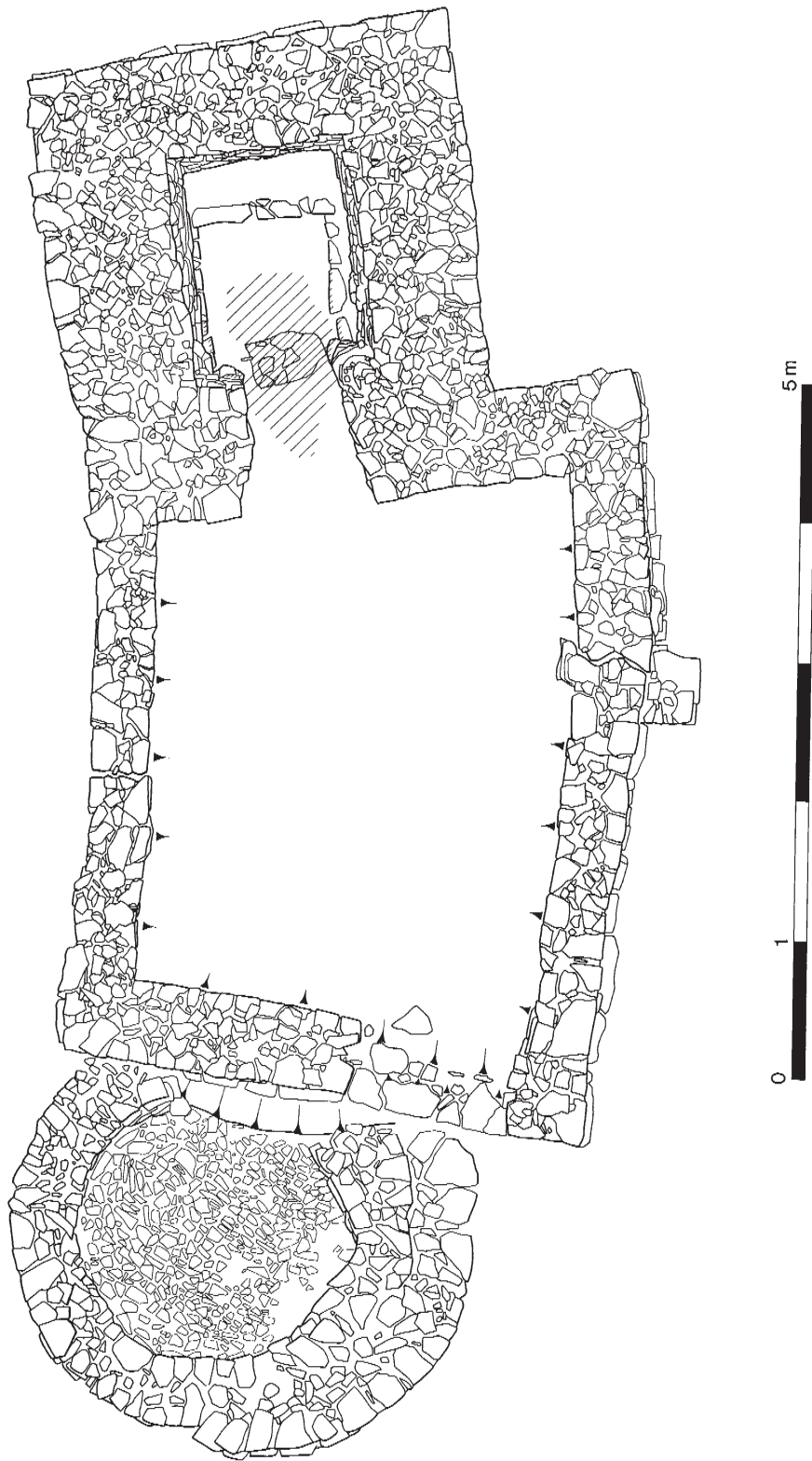


Fig 7.74: The malt house, tenement C/D

reddened, the low temperature maintained in these ovens was indicated by the absence of any general scorching of the floor of the chamber or on the chamber walls.

Deposits of burnt soils within a number of the ovens contained charred seeds, evidently from firings that had been overcooked (see Chapter 12, The charred plant remains by Gill Campbell, from which the following overview is abstracted). The charred seed evidence does confirm the use of these ovens for drying barley to kill the sprouted grain and thus to form the malt for brewing. However, a range of other carbonised seeds and material was also present. The abundance of chaff in the early earth-cut malt oven indicates that they had been using threshing waste as fuel, although this was less evident in the later ovens. In addition to cereal and pulse threshing waste, bracken, and possibly rough grassland vegetation lining hedges was also used as a fuel for drying grain.

The burning of chaff is thought to be associated with sites that can provide for their animals by other means, so the chaff is not needed as fodder, or sites associated with a particular product such as malt. The proximity of West Cotton to hay meadow would suggest that there would have been ample supply of winter fodder, and it is likely that there would have been some permanent pasture.

The choice of fuel for malting is particularly important as the malt takes on the flavour of the fuel used. Wheat straw was often regarded as the best fuel, followed by rye, oat, and lastly barley. Both types of wheat, and maslins of both together, along with rye, would be the most likely

types of chaff to be used as fuel, which may explain the abundance of both types of wheat chaff, and rye with bread wheat chaff in assemblages from West Cotton.

In some instances barley was being malted on its own, with good evidence from the early earth-cut oven and from the tenement malt houses, E16 in particular. In the tenement B malt house there was both sprouted barley and oat grain, suggesting that these two cereals were grown together as a mixture, known as a dredge or drage, which was then used for malting. Two-row barley was particularly favoured for brewing, but in some instances hulled six-row barley was also used.

The malt houses attached to both the twelfth- and the thirteenth-century manors were also used for drying wheat prior to grinding, and in the tenement C/D malt house much wheat was recovered but no sprouting barley, perhaps suggesting that the broader use as a drying oven for grain was as important as its use as a malting oven.

The scale of the operation at West Cotton is taken as indicating that sufficient malt was being produced both for local consumption and to provide a surplus to go to market as a cash crop, as indicated by the documentary evidence for malt being traded from the market at nearby Higham Ferrers to as far away as London.

Detached kitchens and bakehouses

The twelfth-century buildings of the medieval manor included a detached kitchen/bakehouse range (Fig 5.19,



Fig 7.75: The malt house, tenement C/D, looking west

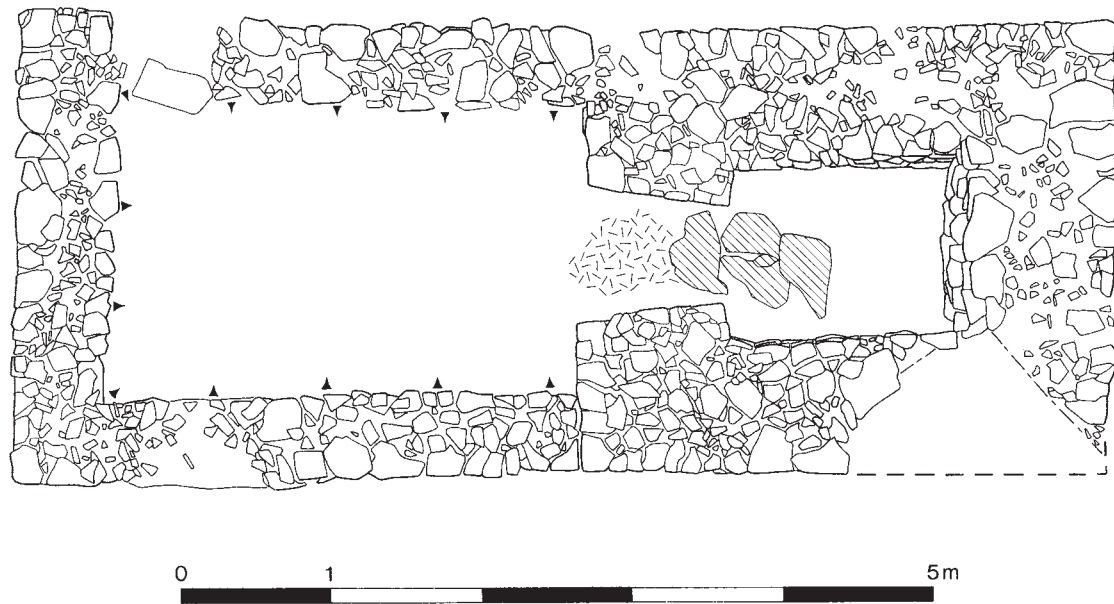


Fig 7.76: The malt house, tenement B

S21), which stood at the opposite end of the courtyard from the manor, surrounded by other activities that would also have produced strong smells, namely a malt house, a dovecote and a cess pit (Fig 5.7). With the relocation of the manor to the east in the early thirteenth century, a larger and more elaborate kitchen/bakehouse was provided in tenement C/D (Fig 7.23, D12) and, as earlier, this was kept well away from the domestic apartments, and abutted a barn with a malt house lying nearby. Later in the century this building was remodelled and became just a kitchen range, with a new and separate bakehouse provided nearby (Fig 7.14, C9). There was a similar detached bakehouse in tenement B (Fig 7.35, B6/2).

In three instances the circular baking ovens were located in the corners of rooms with the flue at 45 degrees to the walls, S21, B6/2 and C9, while in the fourth example it was set near centrally and at a right angle to the wall, D12. This was also the best preserved oven. It was built within a 0.25m deep construction pit, with a metallised surface of pitched stone covered by a layer of sand (Fig 7.77). The chamber lining, in flat-laid limestone, was built over this surface; and it had an internal diameter of 1.26m, with a 0.4m wide flue opening into a short stoke hole.

The others possessed chambers of 1.1 and 1.2m diameter (Fig 7.78), while in building C9 the chamber lining had later been fully removed but had been built up over a 1.40m diameter surface of flat-laid and pitched stones covered with sandy clay (Fig 7.79). This example had been a later addition to the room and was recessed into the wall, with the facing rebuilt. The other examples merely abutted the adjacent walls. No stone floor survived within the oven in building S21, and in building B6/2 much of the chamber

was occupied by a single hearth stone. In all the ovens the facing stones around the entire circumference of the chamber had been reddened and blackened by heating.

The superstructures had all been fully removed above floor level, but in building D12 the chamber was largely filled with pieces of limestone each with a reddened edge, and scorched, but not fired, sandy clay, indicating that the superstructure largely comprised limestone bonded with clay. Given the sunken chambers, these ovens evidently had a lower fire box which would have heated the floor of a second raised chamber into which the bread was placed for baking.

In buildings S21 and D12 there were open hearths in addition to the ovens, indicating that they also served as general kitchens, even though few internal fittings had survived. The hearths comprised flat-laid hearth stones surrounded by scorched and blackened floor surfaces. In building C9 a number of other features may have been contemporary with the oven; a shallow pit floored with limestone slabs lay beside a deep pit with a rectangular slot in its base; this pit may have held a sill beam supporting a vertical timber for some item of equipment requiring a solid foundation, some form of press perhaps. The largest kitchen/bakehouse, D12, also contained a stone-lined pit apparently opening at one end into a pit with stepped sides.

All of the excavated small circular baking ovens had gone out of use by the early fourteenth century. It is possible, however, that the detached range in tenement E, E14, was converted to a bakehouse in the fourteenth century (Figs 7.47 and 7.49). This was of a different form with a larger more substantial circular stone structure,



Fig 7.77: A circular baking oven with pitched-stone floor; detached kitchen range D12



Fig 7.78: Small circular baking oven, detached bakehouse, B6



Fig 7.79: Stone base for circular corner oven, detached bakehouse, C9

wrapped around the corner of the building. It contained no internal burning at the level it survived to. This indicates that rather than the separate fire box and oven chamber of the manorial ovens, this would have had a single raised chamber. A fire would have been lit and once the oven was raised to temperature, the ashes would have been swept out and the bread inserted for baking. A plinth provided access from inside the building, while an external area of heavily burnt clay may suggest that it was fired and raked out from outside. In this form and function, the structure would have been closely similar to post-medieval baking ovens, which sometimes still survive in standing buildings.

The detached kitchens and bakehouses of probable manorial status, were out of use by the fourteenth century. The new style bakehouse in tenement E perhaps served for the whole hamlet, while the individual tenements now included a kitchen within the main domestic building range.

The tenement kitchens

In the later medieval tenements the kitchens were a single room within the main range. The kitchens in tenements A and E possessed the same set of features and had closely similar internal arrangements, and may provide a model for kitchens at this time (Figs 7.80–7.86).

In both instances there was no external doorway: a central doorway at one end and a corner doorway at the other provided access to the adjacent rooms. The kitchen in tenement C also appeared to be similar, although it had two corner doorways and was less well preserved, so some internal fittings may have been lost (See Fig 7.10, C8/2).

The tenement A and E kitchens were provided with stone benches, one set against a long wall and the other along the adjoining end wall containing the corner doorway. In tenement E only the basal levels survived, but in tenement A the bench against the end wall was 0.37m wide and stood to a height of 0.4m (Figs 7.81 and 7.82). The large top slabs indicate that this was probably the original surface, so it seems likely that the others had all once stood to a similar height. They could therefore have served as seating, but it is perhaps more likely that they acted as shelves for storage, perhaps with timber superstructures above them for further storage of food or utensils, in fact forming the base for a medieval “cup-board”. In front of the end bench in tenement E there was a surface of pitched limestone covered with clay, which may have served as a foundation to a new item of timber furniture perhaps replacing the narrow bench with a broader structure serving the same function. Similar high and narrow, and broad and low benches were also found in some rooms that had not served as kitchens.

The tenement E kitchen contained a stone-lined pit with adjacent areas of flat-laid and pitched stone surfacing (Fig 7.83, s and Fig 7.84). It had been constructed at one end of a square construction pit and the filling of the remainder with limestone might suggest the provision of an adjacent solid foundation, perhaps to carry some item of machinery functioning in conjunction with the pit. Alternatively, it may simply have served as a below ground cool box, perhaps covered with a movable wooden or stone slab (and was commonly referred to as the wine cooler during excavation, for which it would have served perfectly). There was a closely similar feature in building D11 (Fig 7.85). The

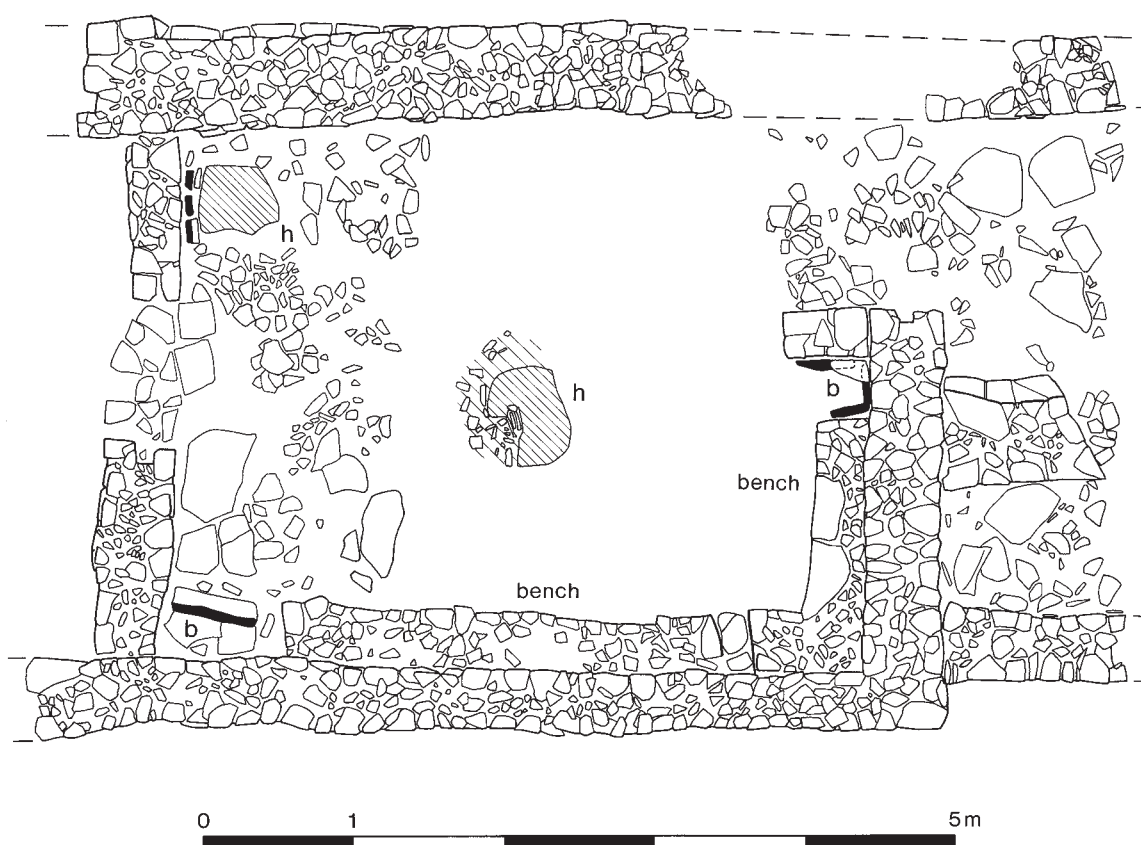


Fig 7.80: The kitchen, tenement A, room 3 (h=hearth, b=raised bin)

first phase of the tenement A kitchen probably included a similar stone-lined pit, much disturbed by later activity, while in its second phase a slab of limestone standing 0.4m high suggests the provision of an above ground bin in the corner of the room, with an adjacent area surfaced with large slabs of limestone (Fig 7.80, b). This bin may have served a similar storage function, although above-ground storage would not have had the same cool box effect. Both kitchens were partially surfaced with limestone, with this occupying the corner of the room adjacent to the stone-lined pits or bins.

The focal point of these kitchens was the central hearth, with the surrounding earth-floors rich in comminuted charcoal from the decades of use. The central hearths were 0.8–1.2m in diameter, comprising a large, flat-laid slab of limestone flanked by a crescent of small pitched stones, usually set within a clay base and often incorporating quantities of pitched pottery sherds (Chapman and Hurman 1991). The flat-laid slabs had clearly been the hearth stones as they were blackened, cracked and often quite friable, while the reddening and no more than slight blackening of the projecting edges of the pitched stones indicated that these had been subjected to less intense heating (Fig 7.86). This arrangement suggests the provision of both

direct and indirect heating; with metal vessels suspended over the fire itself and metal or ceramic vessels set beside the fire on the pitched stone area with hot ashes heaped around them to provide a slow cooker effect. In all of the kitchens, the hearths had been relaid a number of times, with their predecessor still at least partially intact beneath, so that the hearth area became slightly raised with respect to the rest of the floor surface.

The tenement A and E kitchens also possessed either corner hearths or, perhaps, small semi-enclosed corner ovens. They were of rectangular plan, measuring 1.5 by 1.0m, and comprised a single flat hearth stone, intensely burnt, set adjacent to the wall and surrounded by an area of smaller flat-laid stones, less heavily burnt. In tenement A, small slabs of limestone had been pitched against the adjacent wall, presumably to protect it from burning, but no other evidence for any enclosing superstructure was recovered (Fig 7.80, h, and Fig 7.83, h, both top left). How the use of these corner hearths/ovens supplemented or complemented the central hearths is uncertain, but their use in a different fashion, perhaps for roasting, as in a dutch oven, seems likely. This would imply that when in use they were partially enclosed perhaps by a portable metal screen.



Fig 7.81: The kitchen, tenement A, looking west, showing central hearth, corner hearth/oven (bottom right), raised bin (top right), and stone bench (left)



Fig 7.82: The stone bench, tenement A kitchen, room 3

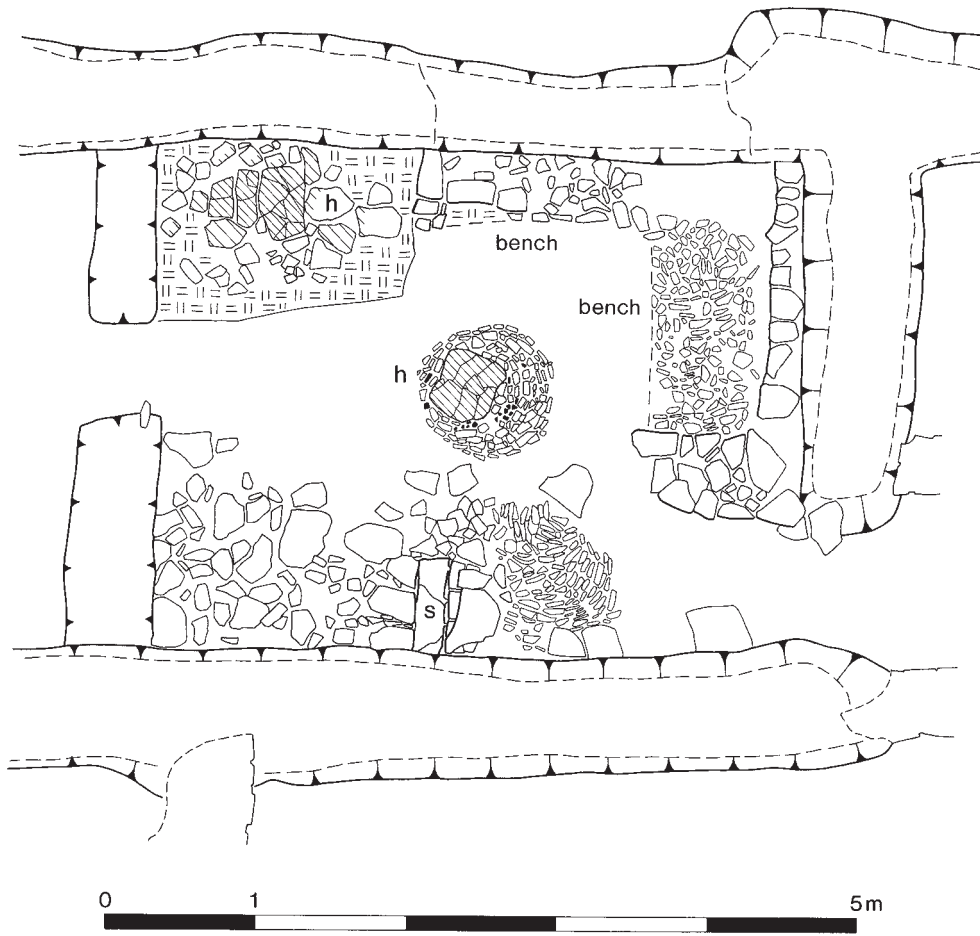


Fig 7.83: The kitchen, tenement E, room 2 (h=hearth, s= stone-lined bin)



Fig 7.84: The kitchen tenement E, looking east



Fig 7.85: A stone-lined bin, building D11

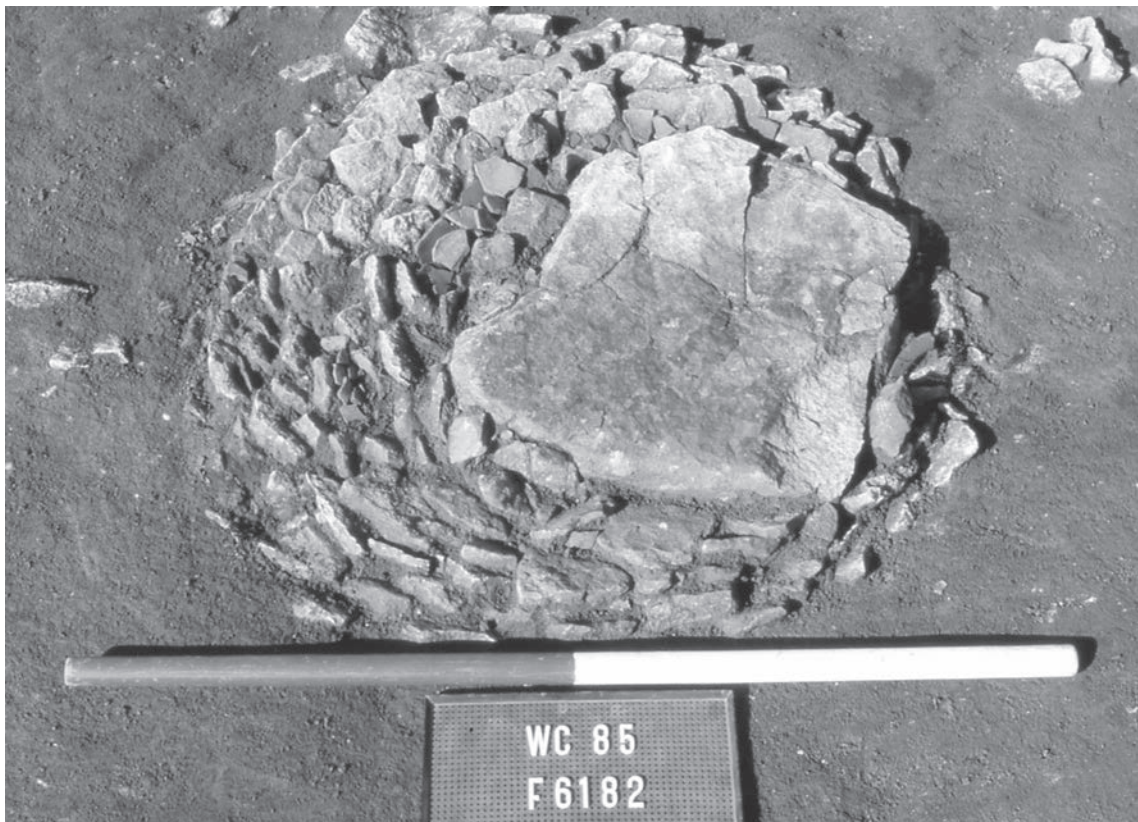


Fig 7.86: A typical central hearth, tenement E, kitchen

The processing rooms

These rooms were defined by the presence of elongated stone-lined pits, which were stained and encrusted grey or blue-grey by the action of powerful organic chemicals. The earliest examples are dated to the end of the twelfth century. One was attached to the manorial barn (see Figs 5.23–5.25, S17/2) and there was another in tenement B (Figs 7.87 and 7.88, B5/1). In the thirteenth century a room in tenement E was also devoted to the use of a processing trough, which went through three phases of rebuilding, getting shorter each time (see Fig 7.41). A shorter processing trough was in use in the kitchen/bakehouse range of the relocated manor house, building D12 (see Fig 7.23. t).

The processing rooms in buildings S17 and B5 also included a hearth and a stone-filled soak-away pit set beneath the floor of the room, with these features presumably related to other stages of the same processing activity (Fig 7.87).

The troughs were typically 1.8–3.0m long by 0.50–0.60m wide and 0.30m deep. They were fully stone-lined, and two possessed partial transverse divisions. They were all flanked by areas of limestone flooring, often with well worn-surfaces which were similarly stained and encrusted (Figs 7.89 and 7.90). In tenement B an irregular group of postholes and slots between the trough and the adjacent wall suggest that there was an adjacent timber structure, perhaps racking of some form (Fig 7.87).

The processing room in tenement B also contained a mortared stone footing. This was more deeply-founded than the adjacent wall, and extended partly under the wall, showing that the footings had been put in place before the walls were built. A pair of postholes at either end of this footing may have supported some timber structure related to it. At the end of the processing trough the inner face of the building wall was carried down into the construction pit to form the end of the trough. So, like the footing at

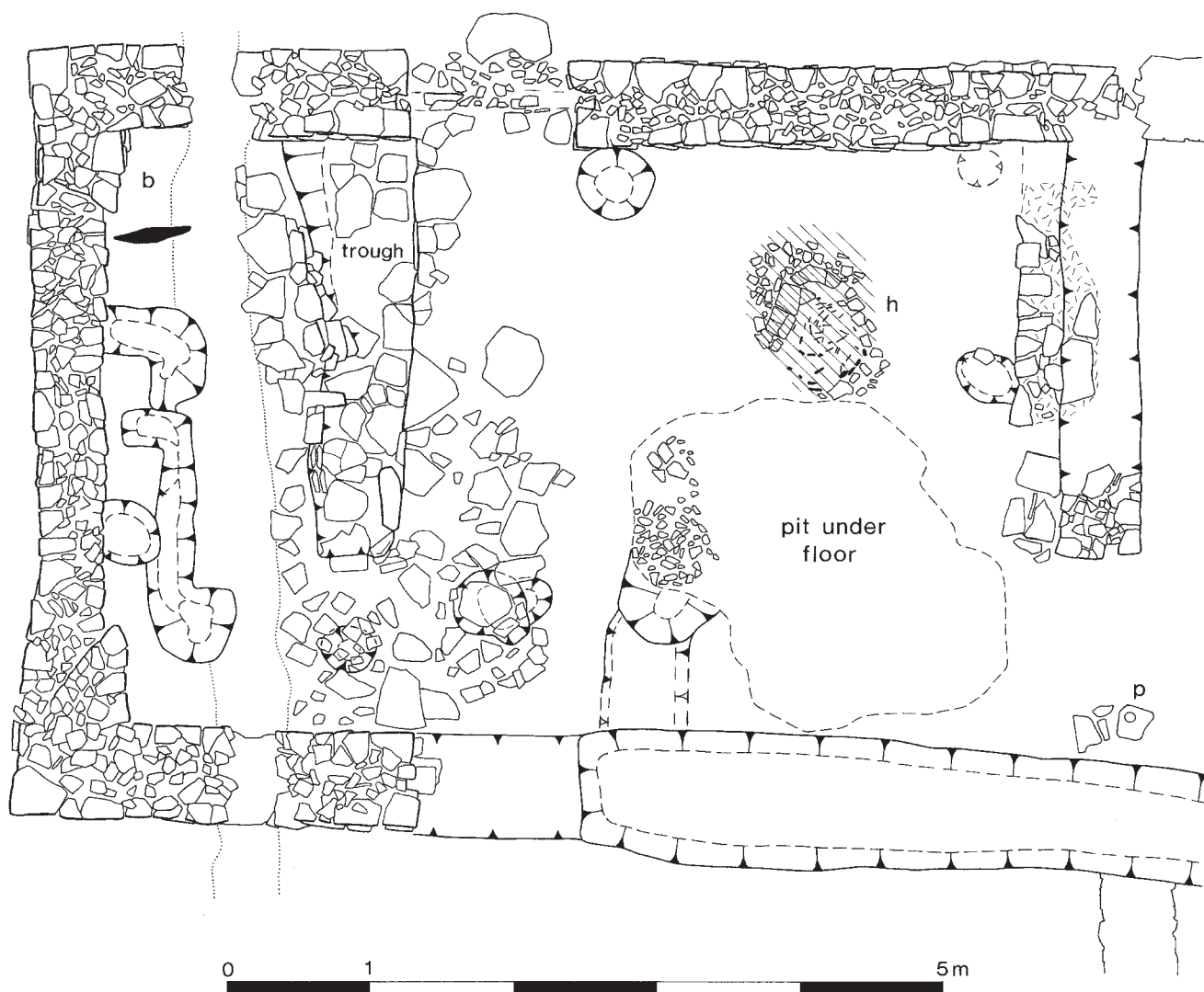


Fig 7.87: The processing room tenement B (h=hearth, b=raised bin)



Fig 7.88: The processing room tenement B, looking north

the other end of the room, the arrangement of the trough was also set out before the walls were built, showing that this was a purpose-built structure.

There seem to be few excavated parallels for these stone-lined troughs, although there was a similar feature with the same grey discolouration of the limestone lining, within the early use of the service wing of the later medieval manor at Furnells, Raunds (Audouy and Chapman 2009, 102 and Fig 5.41). With the lack of parallels, the specific function of these processing rooms remains uncertain. However, if it is accepted that the discolouration and encrustation derives from organic chemical staining, there are two main possibilities both relating to the processing of cloth.

The most likely option is that the troughs were used for the fulling of newly woven woollen cloth. The fulling process fulfilled the two requirements necessary to finish the cloth: *scouring*, the cleansing of the cloth to remove the natural oils and greases by soaking and pounding in a strong liquor of water and a cleaning agent such as fuller's earth, stale urine or soapwort; while the pounding of the cloth matted the fibres together to close and tighten the weave.

Fulling mills had been introduced on monastic sites by the later twelfth century to mechanise the process, but the use of human power to “walk” the cloth by trampling it underfoot would still have been the standard process beyond the monastic establishments, and in the late fourteenth century William Langland in his *Vision concerning Piers the Plowman* states (translated to modern English) that



Fig 7.89: The stone-lined processing trough, tenement B

“cloth that comes from the weaving is not comely to wear until it is full under foot or in fulling stokes”.

The use of stale urine, forming an ammonia-based liquor, might well account for the staining and encrustation of the pit lining, and fulling is therefore the preferred option for the use of these troughs. The postholes and slots adjacent to the trough in tenement B may have supported a wooden rack on which the cloth, or part of a length of cloth, could be hung during the processing, while the stone-filled soak-away pits would have collected the surplus liquids.

The second option is the bleaching of linen yarn or cloth. This involves three basic processes (Baines 1985, 29–30): *bucking*, boiling the cloth in lye (alkalised water: wood ash, fern and seaweed ash and lime have all been extensively used); *grassing or crofting* on the *bleach green*, laying the cloth out on the fields to expose it to the oxidising effect of air and sun (the cloth had to be kept damp so that the lye could take effect without damaging the cloth, this could take from two to fourteen days); *souring*, soaking the cloth in a weak solution of acid as a neutraliser (buttermilk, sour milk and water fermented with bran or rye meal have been used), followed by complete rinsing.

It has been established that the water-retting of flax (submerging under water to decompose the woody matter and cellular tissue so that the fibres could be easily separated) was being carried out within the adjacent river channel in the eighth century. In addition, the spindle whorls and heckle teeth recovered in the excavations

could be indicative of either flax or wool spinning, while a single glass linen smoother from tenement E indicates that the final finishing of linen cloth (pounding or *beetling* to close the surface by making it smooth and glossy) was carried out on the site.

As with the malt houses, the processing rooms would have been central to the evolving cash economy in producing a surplus of goods that could have gone for sale to the traders in the market at nearby Higham Ferrers.

Additional note

Following the preparation of this summary a probable parallel for these troughs has been recognised in a medieval house at the deserted medieval village of Upton, Gloucestershire, excavated in the 1960s, and dated to the mid to late thirteenth century. Building AD–AF comprised: an upper room; a kitchen, with central hearth and corner oven; and a lower room, with a cross passage to the north and two, probably successive, troughs with floor slabs and uprights to the south (Rahtz 1969, 86–98 and fig 6). As at West Cotton, much of the area between the cross-passage and the troughs was paved. No interpretation was offered in the published account, but in an article in *Current Archaeology* (Hilton and Rahtz 1967), this room was interpreted as “a ‘working area’, with troughs where some domestic industrial activity such as fulling or tanning was carried on”.



Fig 7.90: The early stone-lined processing trough, tenement E, looking south, partially removed by later troughs

8 West Cotton, Raunds: a study of medieval settlement dynamics

For many people today the English village is seen as “a tangible symbol of an ideal rural life: simple, safe, stable and cohesive” (Lewis *et al* 2001, 5). The excavation of around a half of the outlying deserted medieval hamlet of West Cotton, along with the complementary evidence from the similarly extensive excavations of parts of the manorial centre in Raunds (Audouy and Chapman 2009), has provided a mass of high-quality information that reveals some of the reality behind the myths; and the results should be of use to researchers for many decades to come.

The term ‘settlement dynamics’ has been chosen to embody both the analysis of the processes of change through the lifetime of the settlement and also to emphasise that we are truly talking about a dynamic settlement: a place that was far from simple, safe or stable, although the survival of the settlement through five centuries of change does speak of an underlying social structure that was cohesive.

The overall story is, therefore, one of dynamic change in response to changing social and economic factors, but within a pattern of continuity that can be embodied in the survival of a field gateway that lay at the end of the access road off the Cotton Lane, as established 1000 years earlier, but which is now buried and almost lost within the hedge following disuse in the mid-twentieth century (as depicted in the frontispiece). It is such compelling evidence of continuity that leads many to believe that they are viewing a static rural landscape rather than a landscape of constant adaptation to changing circumstances.

The planned late Saxon settlement

There was no substantial domestic settlement at West Cotton in the ninth century, and the mid-tenth century date for its creation strongly suggests that it appeared in the decades following the reconquest of eastern England by the Saxon kings and the subsequent establishment of order within the Danelaw.

The work of the Raunds survey team has shown that the Anglo-Saxon settlement pattern was of dispersed farmsteads that were either abandoned at the creation of the new nucleated settlements (Parry 2006) or were absorbed into the new larger settlements. People were therefore brought in from their farmsteads and their fields in an episode of overt social engineering.

West Cotton was clearly a planned settlement comprising regular rectangular plots, nominally one-acre in extent and sub-divided into smaller functional areas of half- or a quarter-acre; although to the east regularity had to give way to the topographical limitations imposed by an old stream channel.

Work in Raunds has shown the appearance of similarly regular plots at about the same time (Audouy and Chapman 2009, 53–54, fig 4.1), so it can be argued that this was not a piecemeal process of change but probably a single episode of imposed and widespread reorganisation of settlement. West Cotton was a new foundation on a block of land beside the river that had seen some previous small-scale Anglo-Saxon settlement in the sixth century, and the use of the river for flax retting in the eighth century. It provides a contrast to Furnells manor in Raunds, where a similar plot system was imposed on an existing substantial farm of mid-ninth century origin, the so-called Anglo-Scandinavian farm, which contained several post-built halls standing next to a ditched enclosure, which contained a further hall (Audouy and Chapman 2009, 28–34, fig 3.5). At this point in the discussion it may be worth noting that the revised dating for Furnells presented in the final report (Audouy and Chapman 2009, 24–25, table 3.1), does indicate that it was only in the mid-ninth century that continuous occupation began, and not in the 6th century as was suggested in interim publications, which have been subsequently cited by others (eg Lewis *et al* 2001, 87).

An echo of the style seen at Furnells in the ninth century, with the provision of substantial ditches to provide both a practical and a psychological sense of defensibility, was evident in the original formation at West Cotton, where the principal buildings were partially enclosed by both a timber palisade and a substantial ditch. The success of the new political and social order may be reflected at West Cotton in the abandonment of this arrangement by the end of the tenth century in favour of a more open courtyard setting, a form that was to be retained in the twelfth-century manor house.

It has not been possible to provide an accurate date for the establishment of the open field system at Raunds, but it does seem most likely that it was formed, or at least formalised, as part of the same process of reorganisation, with the fields extending across the former farmsteads of those who had been brought into the new nucleated settlements.

There can be little doubt that such an all-encompassing reorganisation could only have been imposed from outside at the highest level as a response to the evident need to establish peace, or at least stability, within an area potentially liable to outbreaks of civil disobedience if not outright revolt. The political organisation behind the practical end results seen in Raunds at the lower levels of settlement hierarchy has been summarised by Lewis *et al* (2001, 47) in their overview of medieval settlement in Central England:

“the kings of Wessex instituted in the east Midlands a hierarchy of administrative structures which provided them with an effective system of government, capable of imposing law and order, and of raising military service and taxation. In many respects it was this system that provided the framework for government for the rest of the middle ages”.

The ultimate success of this reorganisation is demonstrated by the period of extended peace that followed, which was disrupted but not overturned by the Danish incursions at the end of the tenth century that led to the installation of Danish Kings in the earlier eleventh century (Swein 1013–14 and Cnut 1016–35). Its success must have derived from the fact that the system was sufficiently equitable to enable most individuals to maintain if not improve their standard of living, with the regularity of the planning of the settlements and the systematic organisation of the field system providing a ready measure of the fairness of the land allocation. There was, therefore, a common vested interest in its maintenance at all levels of local society.

One particular aspect of the early organisation of West Cotton that needs some further comment is the presence of so-called empty plots. It has been argued that “the presence of unoccupied tofts ... suggests that the settlement was planned to allow for anticipated growth” (Lewis 2001, 82)”. This statement originates in the assumption that the status of West Cotton was static, so that its final form as a peasant hamlet reflected an origin as a peasant settlement comprising a row of ditched plots each of which was a potential toft awaiting occupation.

The excavated late Saxon building group was of a higher status, and in fulfilling its role at the centre of a mixed regime of arable and pastoral farming it utilised the surrounding ditched plots as functional areas of the farm. The presence of a double-gated enclosure at the entrance to a plot south of the main residence, although of a slightly later date, demonstrates a use for stock control, with this shedding enclosure utilised for the separation of animals. The other plots opening onto the central yard, which can perhaps be most appropriately pictured as a farmyard, were probably also used as paddocks for stock, perhaps including the oxen for the plough team and maybe a horse or two, while other areas around the buildings may have had a horticultural use.

Seen in this light, these plots were far from unoccupied, but were never intended as potential tofts. The fact that each could have served as a peasant toft only underlines the difference in status, and therefore land holding, between

the Anglo-Saxon peasant and the residents of the main building complex at West Cotton.

The status of the late Saxon occupants of West Cotton

The question of the likely status of the late Saxon occupants of West Cotton, and the nature of their tenure, has already been considered in relation to the documentary evidence. As concluded by Courtney, it is most likely that in the excavated late Saxon building complex we are looking at the residence of someone of relatively high status in local terms, probably either a minor thegn or a sokeman or freeman; and he has drawn attention to the likely overlap in economic status between these individuals. The suggested presence of two similar high-status holdings at West Cotton is considered as perhaps more appropriate to the presence of sokemen or freemen, although another possibility is that at least the excavated building complex, with its associated watermill, may have been the residence of a minor thegn, with the southern holding perhaps occupied by a sokeman or freeman, while the dependent peasants occupied the smaller plot to the east between the roads and an old stream channel.

The arrangement of the late Saxon buildings, with a hall at the end of an access road while the domestic range and other buildings were set around a central courtyard, closely paralleled the arrangement at Furnells, Raunds, a documented post-Conquest manor. A more substantial manor at Goltho, Lincolnshire had the same arrangement (Beresford 1987, fig 26), but on a slightly larger scale, and by the twelfth century it had been replaced by a motte and bailey castle. The well-documented manor at Faccombe Netherton, Hampshire (Fairbrother 1990) evidently possessed a similar hall with attached domestic range, showing that this form was not unique to midland counties. In all of these instances the factor that denoted the manorial status of Furnells, Goltho and Faccombe Netherton was the presence of an adjacent church, to reflect the parochial responsibilities attached to the manor, which were obviously absent from the social level immediately below even though economically there may have been no significant distinction.

The similarity in the general courtyard form of the building arrangement at West Cotton compared to those at Furnells, Goltho and Faccombe Netherton, and other examples, can be extended more specifically to the actual hall and domestic apartments. In all instances these comprised two adjoining ranges with an open hall and adjacent apartments, although the higher status sites were generally on a slightly larger scale, with broader and longer halls and perhaps a longer domestic range containing an additional chamber or two. A further discussion of these long ranges is contained in the report on the sites in north Raunds (Audouy and Chapman 2009, 53–55, fig 4.2), where it is suggested that the overall dimensions of the West Cotton and Furnells long ranges are so similar that they could have been off-the-peg designs, perhaps constructed

by the same builder and maybe even utilising timbers prepared off-site to standard dimensions.

The difference in status only becomes physically evident a little later. At Furnells manor some of the ditches of the original plot system were realigned in the mid tenth century to make space for a new plot to hold a small church and churchyard. Later still, the hall at Furnells was rebuilt as a much wider aisled hall, presumably to add more physical substance to its seigneurial status, while the rebuilding of the hall at West Cotton added no appreciable additional ground floor space, and was perhaps related more towards the additional comfort of the residents.

The Norman Conquest and sub-infeudation

It has been argued by Courtney in this volume, that in the twelfth century all three of the Cottons were sub-infeudated, and he has identified West Cotton as the half-a-hide held of the Clare/Gloucester fee by Frumbold de Denford, in addition to his lands in Knuston. This was clearly not his main residence and we must envisage the West Cotton manor house as a manorial holding in which the demesne was directly farmed by a resident bailiff.

The suggested continued presence of a second major holding has support from documentary evidence, which tells us that men of both Ralf Normanville and Henry de Albotesk (later the Chamberlain family), both of the Clare/Gloucester fee, held land in West Cotton by the later thirteenth century, and perhaps this had a much earlier origin. It is possible that the southern holding was occupied by a freeman, as it may have been before the Norman Conquest, but the presence of a wealthy tenant of Frumbold is perhaps the more likely explanation.

As in the late Saxon period, the paucity of the documentary evidence leaves us unable to clearly define more than the broadest view of the status of the residents, while the archaeological evidence shows a complex pattern of multiple tenure in which the physical form of a prosperous holding may be little different from a documented manorial holding.

Although the post-conquest period may have seen a tenurial change at West Cotton, the twelfth-century rebuilding entailed the almost direct replacement of the timber buildings with new stone buildings offering much the same scale and range of accommodation as previously. There is therefore no reason to suppose that there was any immediate change in the economic functioning of the settlement. However, the provision of a dovecote clearly does reflect the manorial status of the holding at this time, together with a detached kitchen and bakehouse and a stone-lined cess pit, an uncommon luxury on a rural settlement. The manor house itself also showed some limited architectural pretensions, and was the only excavated building provided with distinct foundations of pitched stone, and the only building where timber scaffolding was systematically used in its construction. An external staircase provided access

to the upper chamber, and a hearth in the hall below was probably provided with a smoke hood.

Although the new buildings offered little additional space, there was a change in the organisation of the plot pertaining to the manor house, as this was enlarged by absorbing an adjacent plot to the south, so that the new buildings stood towards the centre of the enlarged plot. Part of this space was taken up by a new ancillary building, while areas to the west of the kitchen and dovecote and at the frontage onto the central yard were taken up with agricultural processing facilities, largely comprising ovens used for the general drying of grain and animal fodder for winter storage, although much of this activity occurred later in the twelfth century.

A new barn on the southern side of the courtyard would have provided storage, while at its western end there was an oven specifically for the production of malted grain, for brewing, the surplus from which may have provided a cash crop at market.

By the mid-twelfth century, shortly following the establishment of the new manor house, change arrived unasked for and unwanted when a catastrophic episode of flooding and consequent alluviation threatened the very survival of the settlement. Changes to the hydrology resulted in the abandonment of the manorial watermill, and to combat the flooding a series of drainage ditches were excavated around the margins of the settlement. When these proved to be ineffective, it became necessary to create several-hundred metres of flood bank to protect the settlement. With continuing flooding the deposited alluvial clays rose to the top of the flood embankment, and thereafter the ground level within the settlement was actually around one metre lower than the surrounding floodplain. Deposits of clays within the settlement show that over-bank flooding was not unknown.

Without the flooding, it would seem likely that the mill would have been retained, and perhaps even enlarged, to continue as a major part of the economic function of the manor. Its loss was perhaps compensated for by an expansion of other agriculturally-based industries. This was partly indicated by the external drying ovens within the manorial enclosure and by the provision of a specific malt house within a new and longer barn on the southern side of the courtyard.

However, the major expansion of these activities lay at the beginning of the thirteenth century with the addition of an entirely new range fronting onto the central yard, which contained a new barn and an adjacent chamber with a stone-lined trough and other features probably used for the fulling of woollen cloth. This involved soaking the newly woven cloth in an ammonia rich solution, probably made from stale urine, to remove the natural grease while also pounding it to close the weave, with both processes preparing the cloth for dyeing. This new activity may have run in parallel with a gradual increase in the age-of-death of the sheep from the site to three or four years, showing that an extra fleece or two was being taken from them before they were slaughtered for the mutton.

With both the expansion of the manorial enclosure and the introduction of the new barn and processing room at the frontage, the former open plots that had been used for stock control had largely been lost to new walled yard areas, utilised in relation to the activities taking place in the buildings. This is not to say that such routine pastoral activities as the infield penning and separation of stock were no longer taking place, just that they were no longer taking place so close to the principal residence of the manor house. In the next period of development we will see the continuation of this process as the domestic industries represented by the barn, processing room and malt house were themselves moved to a distance beyond the principal residence.

The surplus from the new activities of malting and the fulling of woollen cloth could have gone to market as part of an enlarged cash economy replacing the loss of the fees from the mill. Of course, even if the mill had continued in use, these other activities may well still have seen a similar level of expansion, as on the separate southern holding a purpose-built processing room, with a similar fulling trough, appeared as a new development on the frontage at about the same time, and therefore closely paralleled the expansion of the manor house to the north.

The decline of manorial demesne farming

The appearance of the new manorial barn and of new processing rooms on both the manor and the southern holding, marking an increased need for both crop storage and crop processing facilities, was the first stage in the expansion of arable-based industry. The second stage took place around the mid-thirteenth century within a major reorganisation of the northern holding and the eastern enclosures that marked the beginning of the end for direct farming of the manorial demesne.

There may have been both social and economic factors behind this change. With the demise of the mill and the silting of the adjacent river channel, the focal point of the manor had gone and, perhaps in order to reinstate itself in a position of primacy within the larger settlement, the manor house was relocated onto the eastern enclosures adjacent to the Cotton Lane, where it could dominate and control access to and from the settlement. A further factor may have been that within the physical constraints of the northern holding it would not have been possible to provide a better-appointed manor house. In the new manor the domestic ranges stood beside the Cotton Lane, well away from the functional ranges that fronted onto the central yard, and included a barn, a kitchen/bakehouse and a malt house.

It is possible that this move onto the Cotton Lane was associated with the establishment of a new watermill also lying adjacent to the lane and to the east of its crossing of the Cotton Brook, which later documentary records refer to as a bridged crossing, although the presence of a watermill at this date has not been proven.

The old domestic enclosure was then subdivided into two peasant tenements that would have been occupied by rent-paying tenants. Once fully developed, one of these tenements contained a processing room and the other a malt house, presumably directly complementing the production from the manor house itself. Although they have been described as peasant tenements, the new buildings were well-appointed and are well above a basic peasant cottage. The farmers who occupied them were clearly men of some substance, and one at least had a detached building that was either a byre or even a stable, while each tenement also had an open-ended shed that must also have served as either a cart or shelter shed.

At the same time, further development of the southern holding appeared to parallel the new manor house. There may have been the same separation of activities with a principal house fronting onto the lane, while a malt house and perhaps a barn were added to the processing room, and faced the manorial barn on the opposite sides of the access road. The new buildings on both plots overlay the former ditched boundaries between the plots and the central yard. This encroachment obviously narrowed the width of these yards to that of a street running between the tenements, although a broader area was left between the two barns, perhaps for ease of turning carts bringing goods into the barns for storage.

Given the presence of the new manorial barn and the malt house, there was evidently still direct manorial farming of at least some of the demesne land, but with tenants occupying new well-appointed tenements and evidently duplicating some of the functions it would seem that the process of transfer of the demesne to rent-paying tenants was well underway.

The desertion of the manor

At around 1300, no more than 50 years after the new manor house and tenements had been built, change was underway again. The new manor house was abandoned and both the kitchen and the barn were converted into peasant tenements. The broad barn doors were blocked to make normal-width doors and a series of partition walls were inserted. The end result was a range similar to the two northern tenements on the old manor site. The kitchen range was also subdivided with partition walls, but this formed a much smaller residence, that can perhaps truly be seen as a peasant cottage with few pretensions. The manorial malt house was abandoned and levelled.

The similar agricultural complex of the southern holding was also deserted at this same time, with the processing room, the malt house and perhaps another barn being abandoned, but in this instance without reuse of the buildings, perhaps indicating that the limit of land for rent by tenant farmers had been reached.

With the abandonment and conversion of these buildings it would appear that direct farming of the manorial demesne ceased, with the lands being farmed only by

the tenants of what had finally become a peasant hamlet, most probably containing no higher-status residents. The possible watermill may have been the one manorial right that was retained, as clearly this function could not have been easily relocated elsewhere.

No specific reasons for the desertion of the manor are suggested by the archaeological evidence, and we must turn to the recognised general economic processes in action in later medieval England. Arable exploitation is believed to have reached its peak by the end of the thirteenth century, with virtually all possible land taken into cultivation, and by the later fourteenth century the land under plough was being reduced (Postan 1972, Chapter 2.4). Soil exhaustion, particularly on marginal land, would have led to decreasing yields, and this would only have been exacerbated by the climatic extremes occurring from the later thirteenth century onward, generally a colder and wetter period, but interspersed with occasional prolonged droughts (Beresford 1975, 50–2). These factors led to loss of crops and animals and in these more difficult times the abandonment of direct farming of the manorial demesne and the collection of rents from tenants was a sounder means for maintaining a reliable income from the land, while the tenants often found cash rents preferable to labour dues and tithes.

Concurrently, a rise in sheep farming for wool is well evidenced across the country. The bone evidence from West Cotton reflects this in showing an increasing proportion of sheep and with an increase in the age of death, indicative of both more sheep and the obtaining of more fleeces per animal before they were slaughtered for meat. The sudden decline in arable crop processing at West Cotton, as indicated by the abandonment of at least two malt houses, could be taken as an indication of a decline in arable exploitation, although it is possible that the processing of grain for malt was tied to the manorial holding and was relocated elsewhere. It may also be noted that while the manorial barn was converted to a residence, rooms within at least two of the tenements, both adjacent to kitchens, had their external doors blocked and were furnished with flagged floors, indicating a conversion to storage rooms for produce, perhaps to replace some of the storage capacity lost with the demise of the barn or barns.

The transition from manor to hamlet: some speculations

by Paul Courtney

By the mid-thirteenth century the manor house at West Cotton had been demolished and replaced by two peasant tenements. It may have been replaced by a new manor further to the east but, if so, this too had been replaced by peasant tenements by the end of the century. The abandonment of the manor house is unlikely to have reflected its closeness to the more important de Denford and Normanville estate in Knuston, 2km to the south. The continuing use of a residence would have been necessary for a steward or farmer (leasee), even though the post-

Conquest period may have seen the decline of West Cotton as a main residence of its lord.

The succession of the Normanville family, who may also have had a manor house in Raunds, could have played a role in its decline or abandonment, but the date of this event is uncertain. They had certainly replaced the de Denfords at Knuston by 1232. One explanation may be suggested by the archaeological evidence for the location of peasant tenements within the manorial enclosure. These may reflect the end of direct farming of the demesne and its subsequent splitting up between new peasant tenants.

The abandonment of the manor house certainly indicates a major and permanent tenurial change. Manorial buildings were normally maintained when demesnes were farmed to multiple peasant leasees later in the middle ages. The small extent of the West Cotton demesne may have made it awkward and not especially profitable to run. The purchase of the demesne by peasant tenants may therefore have been an attractive proposition for the lord. A similar phenomenon may have occurred on the newly acquired Waldeshof family fee in Ringstead and Stanwick in the early thirteenth century. The customary tenants had their work services commuted and tenures changed to free socage, either indicating a total reliance on hired labour or more likely the end of demesne farming (Kerr 1925, 83, fn.10).

The peasant hamlet and its desertion

The conversion of the manorial buildings to peasant tenements indicates that there was probably an increase in the population of West Cotton at this time, suggesting continued importance for arable farming. The possible retention of a watermill into the fourteenth century, together with documented mills at both Mallows Cotton and Mill Cotton, is indicative of the continued primary role of arable farming, but the increase in wool production does suggest that more land was now under pasture.

The peasant hamlet, as formed at around 1300 at the desertion of the manor, may have survived relatively unchanged for a period of some 50–75 years through the difficult decades up to and beyond the mid-fourteenth century, but subsequently there was a progressive process of desertion, tenement by tenement.

The northernmost tenement was probably abandoned between 1350 and 1375, when a wall was built across the end of the access road. Some of its buildings were left standing with new doorways broken through the walls to enable use as agricultural outbuildings, probably for the adjacent tenement. The other tenements around the access road were probably in use until slightly after 1400. Some of these buildings were also reused as outbuildings, with the provision of raised floors suggesting that maintenance of the Cotton Brook was being neglected, with water often filling the hollow way of the Cotton Lane and running into the centre of the settlement, with animals trampling the former metalled yards while these were also progressively buried by an accumulation of alluvial clays.

The reuse of some of these central buildings may suggest that one or more of the tenements fronting onto the lane were still in use, and these were most probably the last to be deserted, with this occurring at around 1450. The evidence therefore indicates a progressive desertion of the hamlet over the course of approximately a century from 1350 to 1450.

It is from this time, 1413, that we have a detailed account of the Chamberlain holding in West Cotton. In terms of buildings, land and rent (excluding the total of 3.5 virgates in the open field) it lists; a messuage, three acres of land and a watermill; two other messuages; and one cottage, two tofts, nine acres of land and 3s 5d of rent. Trying to equate these to the known tenements is fraught with uncertainty, but the attempt must be made.

We may identify the watermill as the buildings to the east of lane and adjacent to the brook, tenement I, while the messuage and three acres of land could all have belonged with the mill. The converted manorial kitchen, tenement D, might have been the cottage, but another possibility is that the two other messuages and the cottage were perhaps all tenements fronting onto the lane, F, G and H. The two tofts might take in the abandoned tenements, C/D and A/E, set around the central yard.

The sixteenth-century reference to the Duchy holding in West Cotton comprising a cottage with three acres of pasture and an acre of willows, cannot apply to any of the excavated buildings at the centre of the settlement and must relate to one of the tenements beside the Cotton Lane, and it has been tentatively suggested that this may have lain to the south of the main settlement area, tenement J.

The desertion of West Cotton must be seen within the national trend towards the desertion of minor settlements resulting from a complex combination of causal factors. One major factor was the social and economic reorganisation that followed in the wake of the Black Death. This is known to have arrived in the Raunds area in May 1349 (Groome 1983) but the desertion of only a single tenement occurred at around this time, indicating that it cannot be cited as the primary direct cause of desertion.

Given the marginal location and the small size of West Cotton, it could not be regarded as a prime settlement, especially when the depredations of the Black Death had left better land untenanted. The drastic reduction in the population had also led to a contraction of arable cultivation, although this ran in parallel with a contraction from land that had been rendered even more marginal as a result of the deterioration in the climate in the early decades of the fourteenth century. The evident local flooding is a further possible direct cause although, as already noted, it may have been a product of the abandonment of water management associated with the early stages of desertion, perhaps specifically the abandonment of a watermill beside the Cotton Lane.

The end result was probably a progressive relocation to more potentially profitable tenancies elsewhere, especially given the inducements offered by landlords to attract new tenants to such properties following the loss of tenants

caused directly by the Black Death. By at least the end of the fifteenth century the tenants of the Chamberlain's Gloucester fee holding had all departed and the buildings were levelled. The land was rented out as pasture closes and was eventually sold to a new generation of farmers acquiring land piecemeal as the old manorial system contracted.

The disappearance of the horizontal mill in England

The use of the excavated watermills at West Cotton spanned the mid-tenth to mid-twelfth centuries, with a vertical-wheeled mill replaced by successive horizontal-wheeled mills. Of the two Raunds mills mentioned in the Domesday Book, the horizontal mill at West Cotton may be the mill valued at 12d, among the lowest level of mill valuations nationally (Holt 1988, 11–16), and provides an extreme contrast with the other mill which was valued at 34s 8d and 100 eels, the second richest mill in the county.

In Huntingdonshire, all the low-valued mills were on the minor watercourses, while those of intermediate to higher value were on the rivers Ouse and Nene (*ibid*, 11–13). This model would appear to be applicable at Raunds, where the low-value mill at West Cotton was adjacent to the River Nene but fed by a tributary stream, while we may surmise that the high-value mill probably lay directly on the river, perhaps at Mill Cotton, where a mill on the river was still in use until the late nineteenth century (Parry 2006).

However, mill valuations were certainly not purely dependent on the nature of the water supply, and the possibility that a low-valuation may at least sometimes denote a horizontal-wheeled mill has been explored by Holt (1988, 117–122) in considering the chronology of the decline and eventual abandonment of the horizontal mill. From the demonstrated sequence at West Cotton and the possible valuation of this mill at 12d, we may now suggest that low-value mills are most likely to represent small mills situated on minor watercourses, either away from or closely adjacent to major rivers, and which could either be of horizontal form or small vertical mills of similar power-producing capacity.

The date of demise for the horizontal mill in England is poorly defined. West Cotton demonstrates that they were still in operation beyond the time of Domesday Book and into at least the mid-twelfth century, and Holt argues that they must largely have disappeared by the thirteenth century, which would suggest a rapid decline in the use of the horizontal mill through the twelfth century.

The technological implications of the sequence at West Cotton, where a vertical mill was replaced by a horizontal mill, are also worthy of comment. It is clearly generally true that the higher costs involved in the provision and maintenance of the more complex machinery required for a vertical mill was offset by the increased potential for the generation of power. However, at West Cotton there was no evident social or technological reason for the apparently regressive change from a vertical to a horizontal mill, and

it may merely have been economic pragmatism, with the lower costs in maintaining a horizontal mill making it the more attractive proposition.

The horizontal mill was cheap to build, maintain and operate, and so could be equally as well worked as, for instance, a co-operative venture by groups of peasant families (as indicated in some Domesday Book references), as under direct manorial control. The decline in their use, as indicated by Holt (*Holt 1988*, 117–22), must therefore be viewed within the social context and not purely from a technological viewpoint. Holt's analysis indicates that their decline was linked with lords acquiring exclusive rights of milling in the post-Conquest period, with this perhaps having been largely achieved coincident with the disappearance of horizontal mill by the end of the twelfth century. Thereafter, the vertical mill in its many forms reigned supreme with the exception of areas where seigneurial control was never achieved; as denoted by the survival of horizontal mills in the Shetlands into the nineteenth century, where they were operated as family or co-operative enterprises (Goudie 1886).

The result of seigneurial control of milling was to remove another element of potential peasant independence, with the consequent and additional benefit for the lords that, apart from illegal hand milling, the peasants had no choice but to have their grain milled at the manorial mill whilst paying for the "privilege". In this context, we can see that the simple but effective technology of the horizontal mill was forced out of existence within most of England not as a result of its direct replacement by a superior technology but through the worst practices of the feudal system, the removal of self determination from the hands of the peasants and its replacement with dependence on, and subservience to, the lord.

We may take this argument even further. A decline in the horizontal mill was inevitable, given the tendency for milling to become more centralised at a smaller number of larger manorial mills, and clearly the horizontal mill could never compete with, say, a large vertical mill run directly on a major river. However, the total disappearance of the horizontal mill was not necessarily a logical and necessary outcome, either technologically or economically, of the change to manorial control. At West Cotton we have argued that the change from a vertical to a horizontal mill could have been merely a pragmatic change to a cheaper and simpler mill but with a near equal productive capacity. So, there seems no reason why the continued use of horizontal mills, which were cheap to build and maintain, could not have had a useful, if minor, role within manorial-controlled milling throughout the medieval period, at least within smaller manors. Indeed, by reducing the overheads it would surely have increased the profitability of small manorial mills.

We may therefore postulate an additional reason for the complete disappearance of this technology. The continued use of a mechanism clearly capable of being successfully managed at lower levels of society would have been a constant reminder of the iniquity of the new system of

manorial control. The removal of the simpler technology would therefore have assisted in defining milling as something evidently beyond the control of the peasants. This is to suggest an Orwellian process; if the technology no longer existed how could there be a concept of any alternative to manorial control! It may be going too far to suggest that the technology of the horizontal mill was consciously forced out of existence as part of the process of establishing manorial control of milling; their natural decline through the progressive establishment of fewer and larger mills may have achieved this on its own. However, whether consciously achieved or not, the end result was still the same; the horizontal mill ceased to exist and its technology was lost in England, and there was thereafter no alternative to vertical mills which, by definition, were beyond the economic means of the peasants.

The disappearance of the horizontal mill therefore provides a vivid illustration of how technology can be controlled for the benefit of the few and to the clear disadvantage of the many; with the replacement of cheap and simple technologies by complex and expensive technologies providing a very effective means of market control. It can be concluded that without the post-Conquest establishment of manorial milling rights, it is more than likely that the horizontal mill would have remained a common sight within at least smaller villages and hamlets throughout England in the medieval period, as it did within marginal areas throughout Europe until recent times.

West Cotton: a future for its past

The title of this section is a paraphrase of the adopted motto of the Northamptonshire Archaeology Unit as it existed in the 1980s and early 1990s through the fieldwork phase of the Raunds Area Project – Northamptonshire Archaeology Unit: Making a Future for our Past.

In those days, the unit was under Alan Hannan as County Archaeologist and he headed both the field team and the team running the Sites and Monuments Record (SMR) and the associated activities related to the enhancement of that record, together with an education officer and assistant and an information officer. The funding for most of the fieldwork through the 1980s came from the Manpower Services Commission, with additional support from English Heritage, the County Council and often help-in-kind, such as the provision of heavy plant, from developers.

Since then, times have changed dramatically. The County Archaeologist gave way to a County Archaeological Officer in the 1990s, and into the 2000s the post was further reduced to the status of a section head under a broader umbrella of the Built and Natural Environment Team, and the education and information officer posts were removed one by one.

In 2006 further County Council cuts saw the disappearance of an archaeology section as a separate entity, with the SMR absorbed into the County Record Office. At

the same time the curatorial role of providing advice to local authorities on archaeological issues relating to planning applications was downgraded and then removed altogether, undermining the basis of commercial contract archaeology in Northamptonshire.

Concurrently, in the early 1990s the field team had to adapt to survival in the world of developer-funded archaeology, with contract tendering and the resultant changes which have led most former County-based units into carrying out much of their work out of county, with developers often preferring an external organisation free of any taint of closed-shop practices with the partnering curatorial section.

This has seen a huge increase in the quantity of archaeological work being carried out, and has resulted in many important discoveries on sites that might have been let go in the days of more limited resources. It is certainly known to the author that while we were excavating West Cotton there were other sites of potential that passed with no more than token investigation, which should not happen today. However, developer funding has different demands and restrictions, and many present large-scale area excavations are carried out under severe time and financial schedules that can produce inadequate levels of sampling, while other sites of great potential will be preserved beneath modern developments that will render them inaccessible for many decades to come.

It may be worth pointing out that in the present situation West Cotton would most probably not have been excavated. Following geophysical survey and some trial trenching, it would have been argued that as the length of the new road from West Cotton northward required an embankment, the site could and should be preserved under that embankment. Of course, the initial evaluation would not have produced an understanding of the watermills and the adjacent river channel, and these areas may have lain beyond any scheduled or preserved area. As a consequence, they might have been lost to gravel extraction without adequate excavation, although a watching brief might have produced enough evidence to show that there had been a watermill there as, if nothing else, fragments of millstones should have been recognised as the silts were machined away.

However, West Cotton was excavated and we may finally consider the future for its past beyond the production of the present report.

For West Cotton and for all other aspects of the Raunds Area Project, an immediate problem is the lack of a permanent county archaeological store, let alone an archive suitable for researchers to access those archives. At the moment it is not possible to comment any further on how this may change in the future, and how a physical archive of the finds and the primary site record may be preserved and made accessible. All that is likely to be available for the foreseeable future is the report itself.

A further consideration that needs to be briefly mentioned is that half of the settlement of West Cotton still survives. A triangular area between the new road and Cotton Lane

includes the remaining parts of two partially excavated medieval tenements and two complete medieval tenements, as well as late Saxon timber buildings and further prehistoric monuments. This area is a Scheduled Ancient Monument and survives in good condition under pasture and represents a significant archaeological resource, not the least in that it has the potential to examine the extrapolated conclusions presented in this report concerning the nature and status of the unexcavated buildings. It may be worth mentioning that the planning grid was extended onto the unexcavated area and metal pegs have been driven into the ground so that any future fieldwork could be directly related to the original site grid.

The tenements east of the Cotton Lane lie beneath a field that has been subject to annual ploughing in its use for horticulture, but trial trenching has shown that the medieval buildings and cut features of prehistoric date further east, lay below the reach of the recent ploughing regime. By 2008 this area had been taken out of cultivation and is currently also under grass as paddocks for houses. The buildings adjacent to the old stream channel, the possible later medieval watermill, lie on land belonging to the Anglian Water, which has long been left as a neglected and overgrown wasteland.

With the publication of this volume, the results of the prehistoric and the Saxon and medieval aspects of the Raunds Area Project have now been made available, leaving only the Iron Age and Roman aspects, centred on the settlement and villas at Stanwick and Redlands Farm, still to come. Given the breadth of the study and the significance of the results for all periods, it would still be highly desirable to make these results available in a popular form to a wider audience, although whether this will be achieved is uncertain.

Conclusion

by Paul Courtney

The excavation at West Cotton, and indeed the Raunds Area Project as a whole, indicates the importance of understanding the process of settlement creation in explaining the varied character and success or failure of settlements over later centuries.

West Cotton has a lack of manorial records and the available documentation is highly biased to its feudal overlords, saying little about its medieval peasant inhabitants. In addition, there is a chronological bias to the period after its decline as a settlement. Such problems, though, are typical of minor subsidiary settlements and make nonsense of Sawyer's much quoted and infamous statement that archaeology is 'an expensive way of telling us what we know already' (cited by Rahtz 1983, 15).

Put another way, the archaeology of West Cotton has produced information of great interest to medieval historians, and for most of which the documentary evidence gives no inkling or adequate explanation.

9 Radiocarbon dates

Six wood samples and one charcoal sample of suspected Anglo-Saxon to medieval date were submitted for dating to The Queen's University of Belfast (UB), while organic material from environmental sampling was submitted to the Radiocarbon Accelerator Unit, Oxford University (OxA).

Radiocarbon dating was undertaken in order to obtain absolute dates for specific aspects of the site where stratigraphic sequences and pottery assemblages were either not available or were insufficient to provide the required definition.

In addition, a beaver bone recovered from river silts of mid to late Saxon date was submitted to Oxford, but this proved to be a residual bone of late Bronze Age date. The results of these determinations are summarised below.

The radiocarbon determinations have been calibrated using CALIB v2.1 (Stuiver and Reimer 1986) which uses datasets published by Pearson and Stuiver (1986); Stuiver and Pearson (1986) and Pearson *et al* (1986).

The date ranges have been calculated according to the maximum intercept method (Stuiver and Reimer 1986), with calibrated date ranges cited at two-sigma (95% confidence) and rounded to 10 years.

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Table 9.1: The radiocarbon determinations

Laboratory Reference Number	Context/ Structure	Sample	Radiocarbon age (BP)	Calibrated range (95% confidence)
OxA-4740	7109, river silts	Bone (beaver)	2900 ±60	1310–920 Cal BC
UB-3418	Early Saxon SFB, Str 36	Charcoal	1548 ±33	Cal AD 420–600
OxA-4079	River silts	Hazel (<i>Corylus</i>)	1295 ±70	Cal AD 620–890
UB-3328	Riverside <i>in situ</i> post 6778	Flax seeds & capsules Wood	1297 ±49	Cal AD 630–860
UB-3323	Riverside <i>in situ</i> post 7120	Oak (<i>Quercus</i>) Outer rings only Wood	1264 ±52	Cal AD 660–890
UB-3322	M27, 1st mill Displaced stake	Wood	1258 ±36	Cal AD 660–880
UB-3326	M25, 3rd mill trunk 6665. in revetment	Hazel (<i>Corylus</i>) Wood	1086 ±29	Cal AD 880–1020
UB-3327	M25, 3rd mill <i>in situ</i> post 6691	Oak (<i>Quercus</i>) (outer 30 rings) Wood	1014 ±51	Cal AD 890–1160
UB-3325	M25, 3rd mill Head sill 6444	Oak (<i>Quercus</i>) Wood	941 ±53	Cal AD 990–1220

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10 The Saxon and medieval pottery

by Paul Blinkhorn

Introduction

The excavation of the settlement at West Cotton has produced the largest Anglo-Saxon and medieval ceramic assemblage from a rural context in Northamptonshire. A total of 107643 sherds of pottery (823.5kg) were recovered, of which 2787 were from topsoil contexts. The vast majority were late Saxon or medieval in date, although 262 sherds were of early/middle Saxon origin, 71 prehistoric (excluding the material from the ritual complex), 197 Romano-British, and 77 post-medieval. All the pre-Saxon ceramic appears to be residual, with the exception of a Romano-British Ecton ware jar from deposits associated with the palaeochannel system.

Until the 1980s, most of the rural excavations in the county had been on a small scale, with a number of the resulting pottery reports (where they occurred) inadequate by modern standards. In many cases, this was less the fault of the authors than a demonstration of how ceramic studies have advanced in the last 20 years.

The ceramic from West Cotton is important in many respects. In some ways, this report can be seen to be a 'year zero' operation; providing the first opportunity for a decade for the many disparate strands of Northamptonshire's medieval ceramics to be pulled together and their validity examined. Whilst some questions have been answered, more importantly, the agenda has (hopefully) been set for the future of pottery studies in the county. Ultimately, the pottery from West Cotton and the other Raunds sites, along with that of the 1980s Northampton Development Corporation type-series, formed the basis of the Northamptonshire County Type-Series, and, where possible, these codes have been retrospectively added to the late Saxon and later pottery in this report. It should be noted that the report was originally completed in 1994 and has been revised in January 2006.

The West Cotton pottery, due to force of circumstance, is forced to virtually stand alone in the medieval archaeology of the Raunds area. It was originally hoped that the data from the peasant tenements would provide a counterpoint to sites of different function and status in the immediate vicinity, but due to the shortcomings of some of the previous work only limited *comparanda* on a broad scale have been possible.

It can be fairly said that this report demonstrates an

over-emphasis on chronology, but this is an unavoidable facet of the discipline. The vast majority of the dating evidence for the settlement comes from ceramic, and without dating there could be no understanding of the settlement dynamics. In addition, it was necessary to test the relevance of the existing dating of the late Saxon and medieval pottery from Northampton for a small rural settlement, which could not be said with certainty to have the same ceramic chronology as a large town some twenty miles away. West Cotton has enabled some secure absolute dates to be applied, to the medieval pottery in particular, and enabled the construction of solid foundations for future chronological refinements.

The primary objectives of the report can be summarized as follows:

- The thorough testing and, where possible, refinement of the Relative Seriated Dating System (RSP), initially established for dating the ceramic from the Langham Road and Burystead excavations in Raunds.
- Application of absolute dates to the RSP, using associated datable artefacts or scientific methods.
- Identification of vessel/fabric status with relation to the spatial distribution and organic residues.
- Definition of the ceramic catchment area and the sources of pottery.
- Residue Analysis. Investigation of the functional considerations of vessel/fabric type from the preserved organic lipids present due to post-firing usage of the pot.
- Examination of the cross-joins, with discussion of the depositional taphonomics.
- RSP dating of the major features from the site.
- Identification of the areas of the ceramic of the county which are in need of further research and development.

The organic residue analysis carried out by Stephanie Charters and Dr. Richard Evershed at the University of Liverpool, Department of Biochemistry (now at the University of Bristol, Department of Chemistry) is an exciting new breakthrough in ceramic analysis. They have used a variety of well-known analytical techniques which have never been attempted on this scale and in this context before. The project, although ongoing, has already managed to answer some long-standing questions concerning the

function of medieval pottery, and confirmed theories which have required fact to support them.

Thanks are due to many people, without whom this report would not have reached completion, with honourable mentions to Tony Baker, Andy Chapman and Tora Hylton who were the core of an excellent post-excavation team, BMW for constructing crash-resistant motorcycles (without which, someone else would have been writing this report), Brian Dix for his patience and support, and Varian Denham, whose invaluable guidance steered the ship away from the rocks on several occasions.

Analytical methodology

The initial stage of the analysis of the Saxon and medieval pottery assemblages was to collate a level III or research archive, with the various features of the ceramic converted to a digital form and recorded using DBase III+ software and a 10Mb Apricot Xen microcomputer. The material was sorted by context and grid square and separated into individual fabric types, with each individual group of featureless bodysherds recorded in a single field by number and weight. Feature sherds, such as rims, bases, handles, spouts, lugs and feet were entered individually, unless they were obviously from the same vessel. Decorated sherds were treated in a similar fashion. Rim and base diameters were recorded where appropriate. Separate fields were used for incised, applied and stamp decoration, to enhance the efficiency of analysis. Similarly, glaze colour, slip colour and the slip pattern were recorded. Finally, where possible, a general period date was given to each context group, and an RSP date (see below) designated where possible. The resultant database ran to over 21,000 records.

Very little re-organization of the database was required after its completion; extra fields giving the location of each context were added from the main stratigraphic archive, so that analysis of individual structure or yard groups could be carried out with relative ease by constructing subsidiary databases. This allowed the various analyses of those groups to be carried out more quickly and efficiently. Similarly, subsidiary databases were also constructed, consisting of single fabric and/or vessel types, as well as others of context assemblages of the same phase date, so that analyses of all types from cataloguing to the diameter/volume correlations were greatly simplified.

The Relative Seriated Phase Dating System (RSP) for the Raunds area was first used during the analysis of the late Saxon and medieval pottery from the Langham Road and Burystead sites in north Raunds (Blinkhorn 2009) in an attempt to establish some form of chronology for the major ceramic assemblages, which compensated for the fact that there was very little absolute dating evidence. It was based on the suggested dating of the pottery types which are common to both Northampton (Denham 1985) and Raunds. The system was originally quite broad in chronological terms, due to the fact that it was not known

if the lifespan of the major fabrics at Northampton was the same as those for Raunds. The system appeared to be satisfactory, but could not be thoroughly tested due to the low level of relative stratigraphy at the north Raunds sites. West Cotton, however, has provided an opportunity to both confirm and enhance some areas of the RSP.

The Phase dates ascribed to the pottery assemblages is based on the occurrence of major wares, which provide a stratigraphic *terminus post-quem* for the groups. Whilst this can sometimes provide dates which are too early, such groups can usually be eliminated by cross reference to stratigraphically related assemblages. Evidence from West Cotton has allowed the refinement of the suggested absolute dating of some of the Ceramic Phases (Ph), and it is envisaged that these will be focused further as new evidence comes to light.

It is a well-worn cliché that pottery is the commonest artefact type found in medieval excavations but, all too often, little use is made of the material in a site-interpretative fashion. This has been attempted with the West Cotton pottery, at the expense of detailed fabric analysis, but it is felt that in this case, the latter is of questionable value in relation to the amount of time such an undertaking would consume. The sheer logistics of the detailed microscopic analysis of over 100,000 sherds of (mainly coarseware) pottery appeared an expensive luxury when the amount of useful data that this would generate was considered, especially due to the fact that a large number of localized manufacturing sources are involved, most of which are unknown, unexcavated or not published to modern standards. It is hoped that funding will become available in the future to allow research of this type.

The early/middle Saxon pottery

The problems relating to the analysis of pottery of this type from the Raunds area have been dealt with at length elsewhere (Blinkhorn 2009), and the same general comments apply in the case of the material from West Cotton. A total of 262 sherds were recovered. The majority consists of small, undecorated bodysherds, although a few larger rims and a full profile of a small jar came from material in the fills of the two sunken-featured building, Structures 36 and 37 (Fig 10.1, 6–11). The majority of the pottery was concentrated in and around the two excavated structures, and the rest formed a thin scatter of redeposited material in the later features in the central area of the site.

A single stamped sherd was noted (1), as were four sherds with incised decoration (2–5). Despite being present at the nearby north Raunds sites, no Ipswich or Maxey-type wares were found at West Cotton, suggesting that the assemblage is purely early Saxon in date, although this cannot be stated with complete confidence, as the factors relating to the occurrence, chronology and use of the rare Middle Saxon wares are far from understood.

Fabric types

The fabric types are basically the same as those for north Raunds, minor variations notwithstanding, and thus the same general groupings and codings are used:

- F1: Organic tempered
- F2: 'Sand' tempered. Sparse to dense rounded and sub-rounded grains of white limestone and white, pink and grey quartzite up to 1mm and in varying proportions
- F3: Fine crushed quartzite. Moderate to heavy temper of very angular and sub-angular grains of clear quartzite up to 1mm
- F4: Crushed Oolitic limestone. Moderate temper of ovoid white ooliths up to 3mm, sub in larger cemented clusters up to 5mm
- F5: Coarse crushed quartzite/sandstone. As F3, with some pieces up to 5mm, consisting of fragments or whole 'clusters' of sub-angular crystals
- F6: Black quartzite. As F5, but with dark grey-black, iron-rich quartzite
- F7: Crushed Shelly limestone. Angular lumps of limestone and fossil shell up to 3mm
- F8: Sparse Shelly limestone. As F7, but with very sparse and finer temper
- F9: Coarse crushed sandstone. As F5 but with inclusions consisting of cemented grains of rounded quartzite
- F10: Granite tempered. Angular lumps of granite up to 3mm.

Table 10.1: Number of sherds of early/middle Saxon pottery by fabric type

Fabric	No. of sherds	%
F1	1	0.4
F2	38	14.5
F3	65	24.8
F4	3	1.1
F5	37	14.1
F6	11	4.2
F7	20	7.6
F8	23	8.8
F9	0	0
F10	64	24.4

The fabric types were amalgamated into fabric classes based on the physical treatment of the temper: Sand temper, where the inclusions are added in their original form ('Sandy'); Crushed mineral temper, where the inclusions appear to have been produced by the potters' physically crushing rocks ('Gritty'); and Organic temper:

Sandy fabrics (F2 & F6)	18.7%
Gritty fabrics	80.9%
Organic tempered (F1)	0.4%

The possible significance of the temper preparation is discussed later.

Illustrated early Saxon pottery (Fig 10.1)

- 1 Stamped sherd. Fabric 3. Fragment of cross-hatched 'wurm' stamp and two parallel incised lines which would suggest pendant triangles. Surface slightly and evenly abraded. (Context) 4540, (structural group) LSD6
- 2 Incised sherd. F8. Fragment from neck angle of closed vessel, two incised horizontal cordons, smooth exterior surface. 4833, F31
- 3 Incised sherd. F2. Fragment from the neck angle of a closed vessel. Three incised horizontal cordons, light exterior burnish. 4719, (not applicable) N/A
- 4 Incised sherd. F3. Fragment from the neck angle of a closed vessel. Three incised horizontal cordons, light exterior burnish. 4952, 36
- 5 Incised sherd. F7. Internal surface shows suggestion of edge of boss.
- 6 Full profile from a small shouldered jar. F10. Lightly burnished outer surface. 5000, 37
- 7 Rim sherd. F2. Lightly burnished outer surface. 4492, 36
- 8 Rim sherd. F3. 5166, 37
- 9 Rim sherd. F8. 4956, 36
- 10 Rim sherd. F2. 5000, 37
- 11 Rim sherd, F10. 5000, 37

The late Saxon and medieval pottery

As noted above, the Northamptonshire County-Type Series (CTS) grew from the fabric types defined in this and the north Raunds reports, and the codes have been retrospectively inserted into this report. The range of late Saxon and medieval pottery from West Cotton is typical of the Raunds area. The major late Saxon ware is St Neots type, with Cotswolds-type Oolitic wares and Stamford ware making up the rest of the assemblage. Thetford-type ware, despite being present in some twelfth-century features, was not found in any of the late Saxon contexts.

The vast majority of the pottery from medieval contexts is shell-tempered coarsewares from various local sources, with Lyveden/Stanion glazed wares, Potterspurty wares and Brill/Boarstal types making up the bulk of the glazed material. Sand-tempered coarsewares and a few individual glazed vessels from other sources make up the rest of the assemblage, along with Reduced and Oxidized wares in the later part of the medieval period.

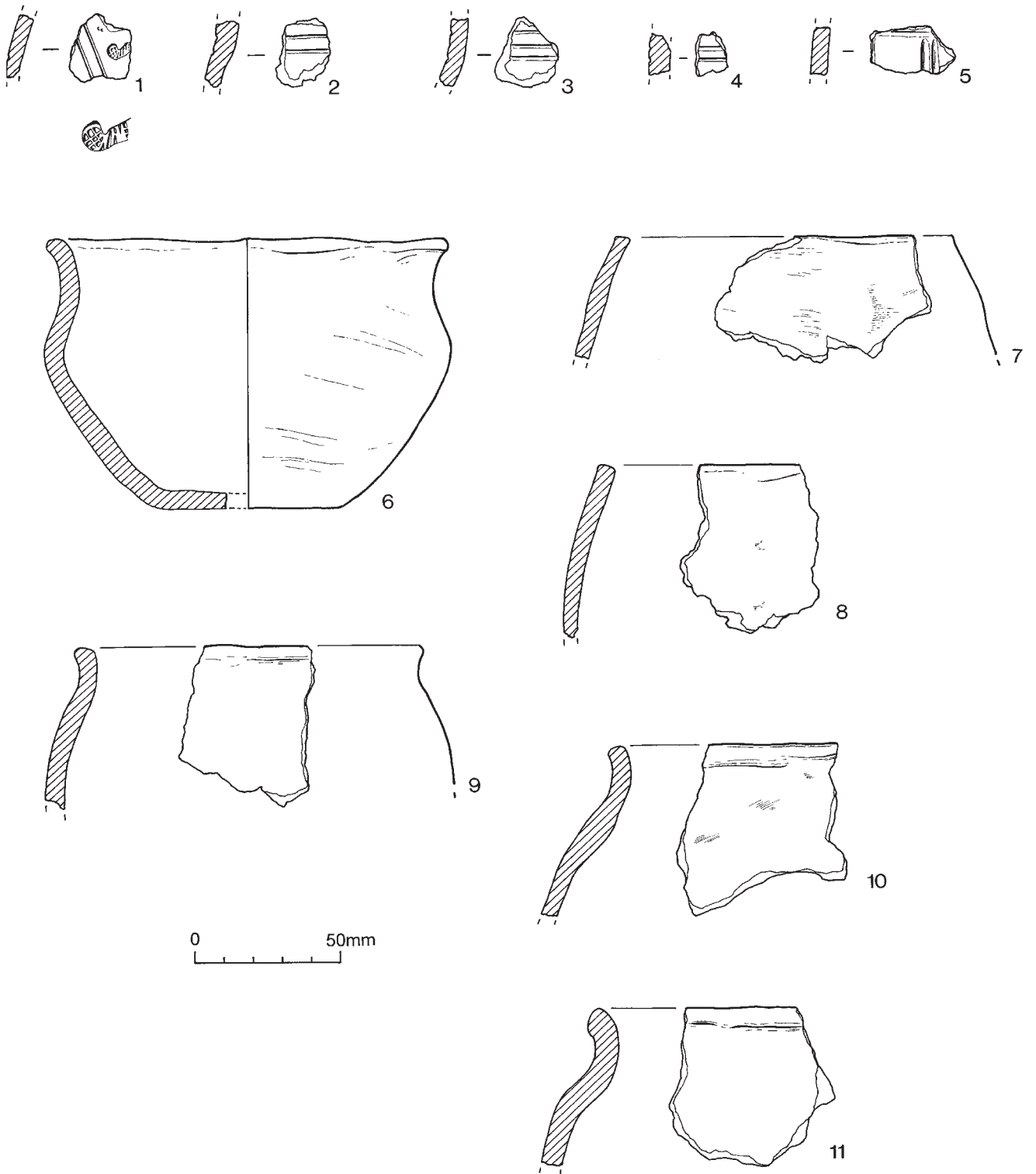


Figure 10.1: Early/middle Saxon pottery (1–11)

St Neots-type ware

Northampton Development Corporation (NDC) fabric T1 + subdivisions

County-Type Series (CTS) codes F100, F101, F103 and F200

(Fig 10.2)

The 1092 sherds of St Neots-type ware occurred in late Saxon contexts, with a further 7239 in later deposits, 2783 of which were in twelfth-century contexts (Ceramic phases Ph0 and Ph1). The assemblage consisted of the T1(1) and T1(3) types, as well as the Saxo-Norman T1(2) wares. The site stratigraphy confirmed that the ware displayed the same development as at Northampton, with the former types having been in use before the latter.

Vessel forms

The predominant vessel form was the jar, with 253 rim sherds present (Fig 10.2, 1–4), with the next commonest being the T1(3) bowl, with 210 examples (Fig 10.2, 6–10). Three fragments of spouted/socketed bowls were found (9), along with two pitcher rims and 59 ‘Top Hat’ (THP) vessel rim sherds. No decoration was found apart from a single rouletted T1(2) jar (5) and a few vessels with thumb impressions on rims or the external carination of bowls (10).

Very few full profiles of vessels were found, with only THPs, T1(3) bowls and T1(2) jars being reconstructed. This indicates that the late Saxon assemblage was of a scattered and fragmentary nature. Cross joins were not attempted due to the visual similarity of the material.

Other than the analysis of the THP and jar rims, see below, little can be added to the detailed analysis of St Neots ware as published by Denham (1985).

Rim forms

Analysis of the St Neots-type ware from north Raunds suggested that there may have been typological development in the rim form of the jars, but the evidence from West Cotton would suggest that the pattern is general rather than specific. Basically, the late Saxon vessels have profiles which tend to be simple and everted, with lid-seated and rolled examples, whereas the later vessels tended to be more developed, with upright collars and triangular, hammerhead and round beads being the norm. The simpler forms are also found in medieval contexts, but it is unclear if these are residual or contemporary.

Socketed bowls

Only three examples were found. It has been suggested in the past that the sockets were not spouts, but were for the insertion of wooden handles to allow the vessels to be used as frying pans. It is worthy of note, therefore, that Residue Analysis of the West Cotton examples has

shown all three vessels to be saturated with fats (Charters *et al* 1995). This cannot be seen as proof, however, as the vessels could have been used for rendering fat or clarifying butter, with the socket used as a spout for pouring off part of the liquid.

Top Hat Vessels (THP)

These vessels were manufactured in both St Neots type and medieval Shelly Coarseware fabrics. Like the jars, the THP rim profiles have fairly simple forms in the early part of their lifespan, and then develop during the twelfth century. The simple type 11 and 12 rim forms continue (eg Fig 10.15, 93 and 97), with the more developed forms such as types 36 and 37 (Fig 10.15, 92 and 96) not appearing before Ph0 (AD 1100–1150). It is difficult to ascertain exactly when the vessel type ceases production, as they occur in later medieval contexts throughout the lifespan of the site, but they seem to have fallen from use before the mid-thirteenth century (Phase 2/0).

It was stated in the north Raunds report that these vessels appeared to be confined to the Raunds area, but since then several examples have been noted from Milton Keynes (B Hurman pers comm) and Bedford (Baker *et al* 1979, 188, fig 109) which are in St Neots--type or Shelly Coarseware fabrics and from late Saxon and twelfth-century contexts. There is also a vessel in a St Neots--type fabric from Thetford (Rogerson and Dallas 1984, 165, fig 184). It would appear, therefore, that the vessels were a traditional part of the St Neots and Shelly Coarseware potters repertoire of the south-east Midlands area, although at the time of writing by far the largest number of finds occur in the Raunds area.

Illustrations of St Neots-type ware (Fig 10.2)

JARS

- 1 T1(2) type fabric. Grey with light grey-brown surfaces, lower body and exterior of base smoke-blackened. Interior of base pad is burnt. Moderately heavy temper of crushed shelly limestone up to 4mm, with the occasional piece of ironstone up to 2mm. Late type?
(Context) 36, (Structural group) LSD2, (RSP Date) Ph0
- 2 Fabric as (1), pink-brown surfaces. Outer lower body is blackened in patches. Many laminar fractures, suggesting vessel was coiled on a wheel.
4496, T33, Ph0
- 3 Fabric as (1), pink-brown inner surface, blackened exterior.
3066, LSD15, Ph0
- 4 Fabric as (1), but with black surfaces. Base pad is slightly scorched internally and externally.
2000/2006, LSE3, Ph1
- 5 Grey fabric with pale brown surfaces, and blackening below the exterior carination. Rim sherd from a small T1(2) jar.
1009, DY1, Ph3/2

BOWLS

- 6 Fabric as (1), scorched orange base pad.
1716, LSD3, Ph1

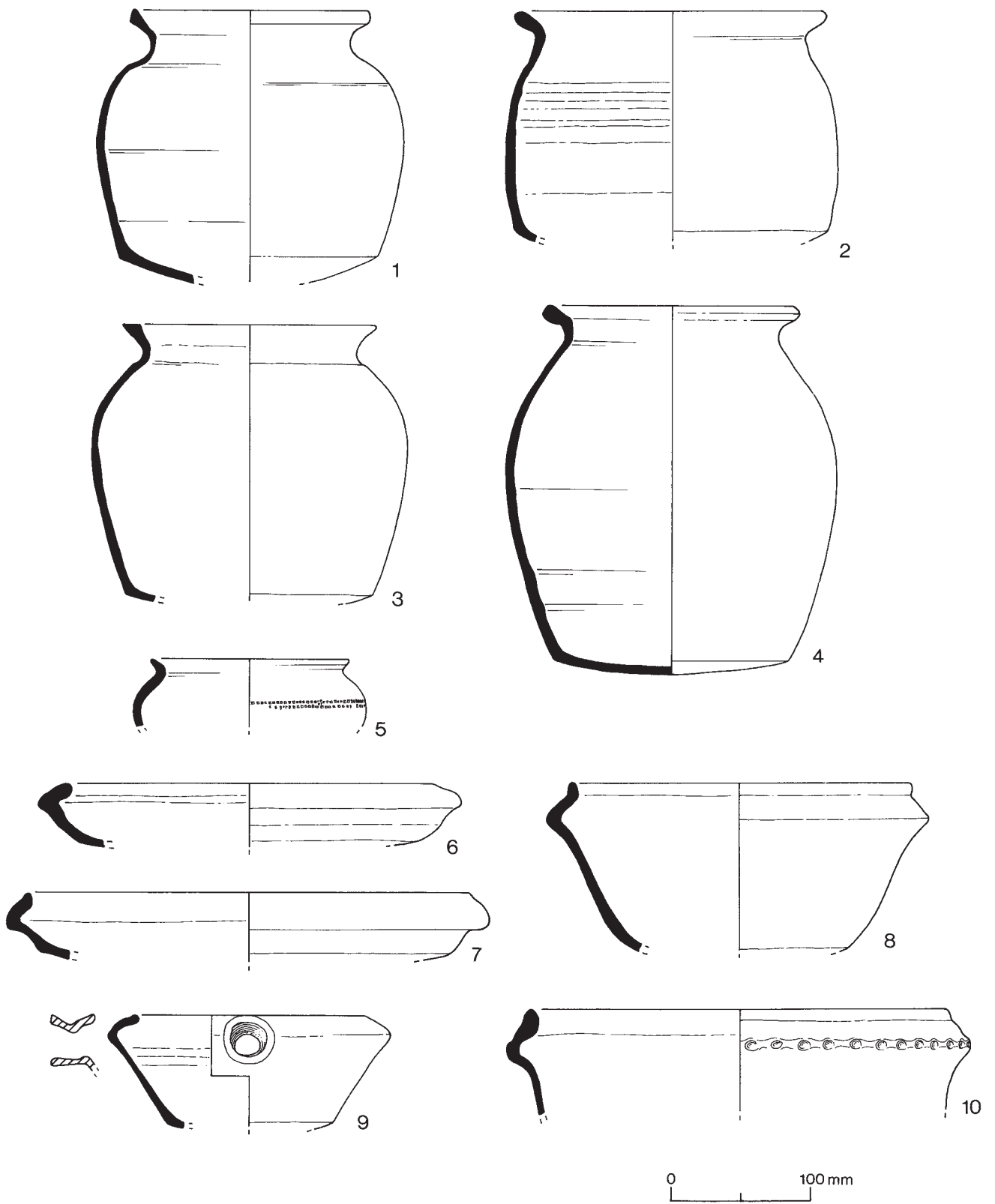


Figure 10.2: Medieval pottery, St. Neots ware (1–10)

- 7 Fabric as (1).
1646, BY7, Ph1
- 8 Sparser temper than (1), with larger average inclusion size. Totally blackened outer surface.
7279, M27, PhLS2?
- 9 Fabric as (1). Outer body is completely blackened except for the top of the rim and the upper half of the spout. Patches of blackening on the inner surface of the vessel.
6485, LSD18, Ph0
- 10 Fabric as (1). Light smoking below the carination.
4575, T34, Ph0

Thetford-type ware

NDC fabric W3, CTS fabric F102
(Fig 10.3)

The 302 sherds of Thetford-type ware recovered were from handled storage jars, with the exception of two rim sherds from small jars. The former vessel type is less common in the earlier part of the late Saxon period in East Anglia, but

in Ipswich it carried on into the twelfth century when other vessel forms are scarce (Blinkhorn in press), although this may be due to the fact that storage vessels generally have a longer life than small jars and bowls.

The vessels all appear to be products of the kilns in Thetford itself, and the vast majority are in the Medium fabric (Rogerson and Dallas 1984, 118). Micro- and macroscopic examination of the sherds suggests that the majority of them originated from no more than half-a-dozen different vessels. The stylistic similarity of the few rims and handles and the consistency of the thumbed strips would also bear this out.

Finds of the material were mainly concentrated in the area of the timber buildings and the backfill of the mill leats around the watermills. It is tempting to see this as evidence for the vessels being used for storage in the final mill, but it is equally possible that the sherds were part of dumps of domestic refuse from elsewhere, although there were no cross joins to sherds found around the buildings.

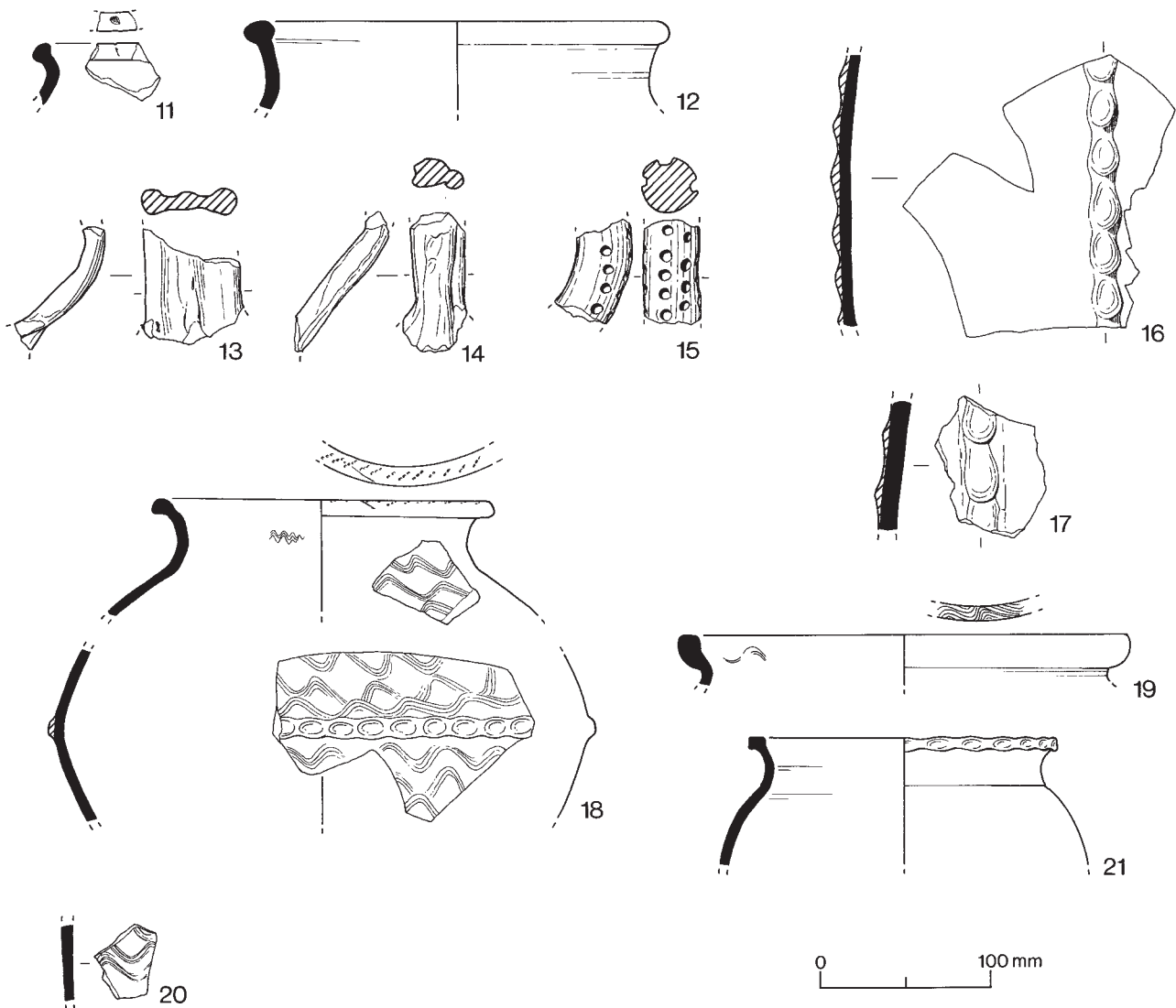


Figure 10.3: Medieval pottery, Thetford-type ware (12-21)

Cross Joins

Two cross joins are particularly worthy of comment. Two joining rim sherds from a storage jar were found in yard SY1, within the twelfth-century manor complex, and the other some 30m to the north in the middle of the yard EY2 of medieval tenement E (Fig 10.3, 12). The other cross join was of two storage jar bodysherds from timber building T33 and from cleaning levels some 40m to the south, near ditch system 4 (LSD4).

All the other cross joins were from the same or adjacent 5m grid squares, and so from no more than 10m apart, although often from different contexts.

Illustrations of Thetford-type ware (Fig 10.3)

- 11 Fine fabric, Hard, pale grey fine. Rim sherd from a jar. Context 1646, structural group BY7
- 12 Grey fabric with brick-red outer margins and dark blue-grey surfaces. Inner surface partially flaked away. Rim sherd from a storage jar. 4163, SY1; 6433, EY2
- 13 Dark grey fabric. Strap handle from a storage jar. 6264, EY4
- 14 Fine fabric, pale grey with darker grey surfaces. Strap handle from a storage jar. 1716, LSD3
- 15 Very dark grey fabric. Large rod handle with punched decoration probably from a storage jar. No published parallels known. 4220, EY3
- 16 Dark grey fabric with slightly browner surfaces. Inner surface badly flaked away. Five joining bodysherds from a storage jar. 4326/4393, S19
- 17 Very dark grey fabric. Inner surface badly flaked away. Bodysherd from a storage jar. 6894, T35
- 18 Fine fabric, dark grey with light brown surfaces. Two joining bodysherds, and non-joining neck sherd and rim probably from a storage jar. No published parallels known. 1546, B5/2; 1620, BY2; 1680, LSD2
- 19 Light brown fabric with dark grey, flaking inner surface. Rim sherd probably from a storage jar similar to (18). 32 non-joining bodysherds found. 4228, EY5
- 20 Bodysherd from (19). 4163, SY1
- 21 Fine fabric, dark grey with brown inner surface. Rim sherd from small jar. 6552, MILLS

Stamford ware

NDC fabric X1(1), CTS fabric F205 (Fig 10.4)

A total of 1653 sherds were recovered, 1077 of which were glazed. Only 104 sherds occurred in late Saxon contexts.

Rim-form analysis of the assemblage has shown that a limited number of vessel types were present. The majority

of rim sherds are from jugs/spouted pitchers, 43 in total, the rest being jars, 25, or flange-rim bowls, 18. A single pedestal-based cresset lamp was also found. It is possible that some of the rims classified as jars are from pitchers, but it is difficult to ascertain the vessel type when handles or spouts are not present.

Apart from a few vessels with horizontal incised cordons, no decoration was found on any sherds other than glazing, with the material being very fragmentary. No full profile reconstructions were possible.

Cross Joins

The ware was scattered across the site, but with the main concentrations occurring in the ditch systems and the mill leats. Few cross joins were possible, other than from the same or adjacent 5m grid squares. Two appear to be of significance, however. The base of a large unglazed vessel (Fig 10.4, 22), had sherds in a mill leat, a pit some 60m to the south-west, and the fill of the construction pit of the medieval garderobe, S23, 50m from the leat and 10m from the pit.

Another vessel (Fig 10.4, 24) had three sherds from yard DY1 and one from yard AY1/2, around 30m away. The latter sherd has been burnt, which has removed the sooting from the outer surface which the other three sherds possess.

Illustrations of Stamford ware (Fig 10.4)

- 22 Fabric B (Kilmurry 1980). Base of large vessel. Blackened exterior base, smoked exterior body surface. Unglazed. 4921, S23; 4873, LSE5; 7076/7077, LSD19
- 23 Fabric B. Rim (Group 4 form) and spout from pitcher, patchy green glaze. 1257, LSD16; 3099, LSD17
- 24 Fabric A. Body from globular vessel. Unglazed. 783, AY1/2; 829, DY1
- 25 Fabric A. Rim (Group 4) and spout from pitcher. Surfaces are somewhat abraded, patchy olive-green glaze. 6550, LSD18; 6654, T28
- 26 Fabric A. Rim (Group 2) and handle scar from a pitcher, glossy, olive green and yellow variegated glaze. 6588, LSD19
- 27 Fabric A. Rim (Group 4) and spout terminal from a pitcher, patchy, thin yellow glaze with minute green speckles. 1393, LSD12
- 28 Fabric A. Rim (Group 2) probably from a jar, glossy yellow-green glaze. 992, A1/4
- 29 Fabric B. Rim (Group 12) from a bowl, unglazed. 759, AY2
- 30 Fabric A. Rim (Group 3) probably from a jar, glossy yellow glaze. 1528, EY3
- 31 Fabric A. Rim (Group 12) from a bowl, unglazed. 6433, EY2

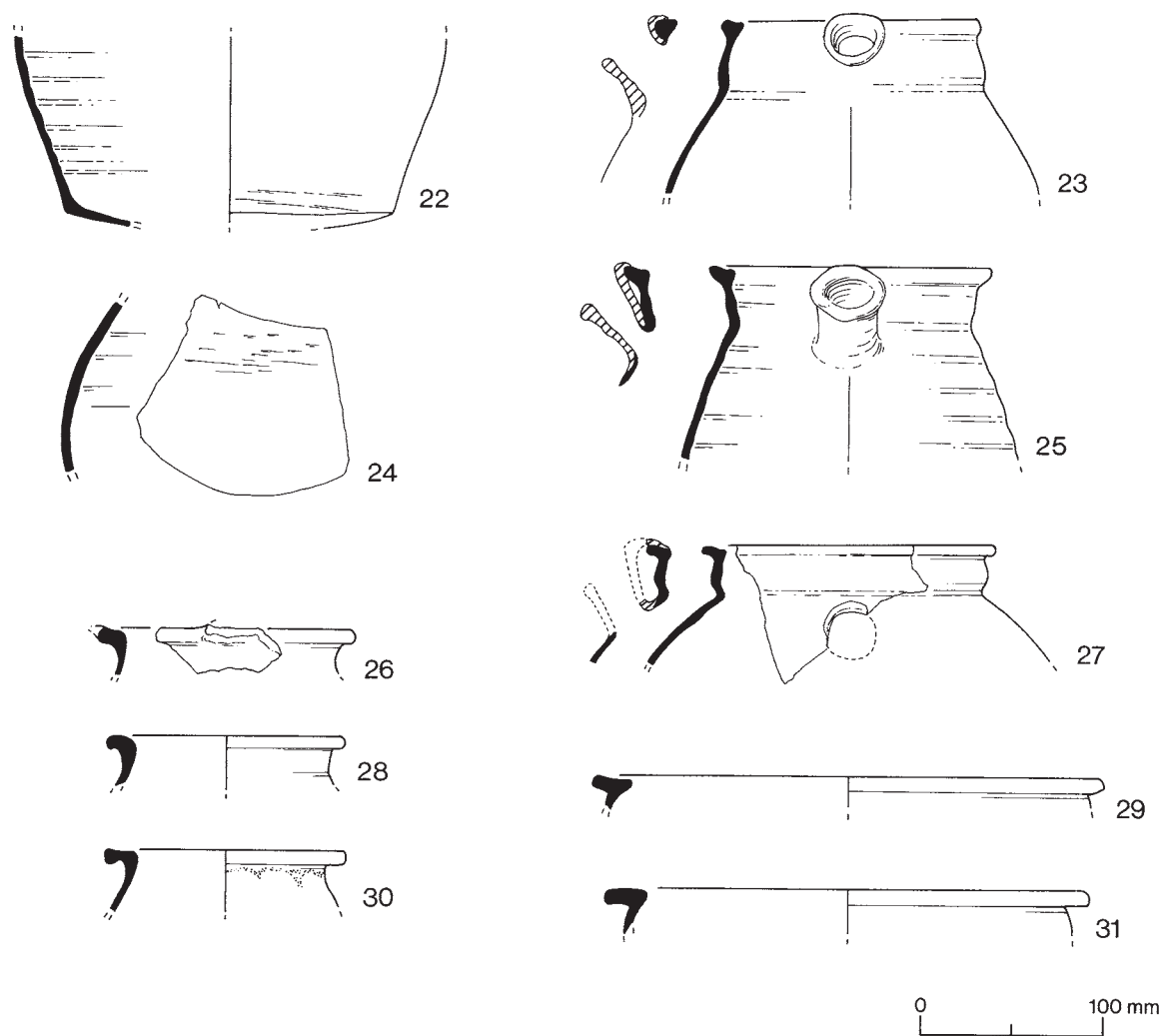


Figure 10.4: Medieval pottery, Stamford ware (22–31)

Cotswolds-type oolitic wares

(NDC fabrics T11, V5 and V8)
(Figs 10.5 and 10.6)

A total of 3008 sherds were recovered. The original classification was based on the Northampton (NDC) type series, with two fabric classes, V5 and T11, occurring at West Cotton, although the latter are by far the most common. The basic dating framework of late tenth century to AD1300 appears to hold good, but there are definite differences in terms of fabric as well as form between the pre- and post-Conquest material.

It seems highly likely that the earlier ware is from the Cotswolds region (see Mellor 1994 for *comparanda*), but the later is not. The earlier type occurred in association with T1(2) St Neots wares at a small excavation at Helmdon in south Northamptonshire (Blinkhorn 1994c), close to the Oxfordshire border. They were absent from the

pottery assemblage at Castle Lane, Brackley (Blinkhorn in archive), which was founded sometime in the later part of the twelfth century, and just five sherds were present at the Elms, Brackley, which began around the beginning of the twelfth century (Blinkhorn 1999). It would appear therefore that the ware had a use-span covering the period 975–1150, with the material in later contexts at West Cotton probably being residual. The later ware was absent from the Brackley assemblage, which would suggest that it is not of Cotswolds origin, as it occurs in quantity at West Cotton and Raunds, despite the sites being much further from the Cotswolds than Brackley or Helmdon. Cotswolds wares also occur in quantity in Oxfordshire as late as the thirteenth century (Mellor 1994), so their almost complete absence at sites in south-west Northamptonshire after the middle of the twelfth century further suggests that those Oolitic wares in the north of the country are from a different

source, most likely somewhere in south Lincolnshire or north-eastern Northamptonshire, as this is the nearest area with suitable geology, as is demonstrated by the fabrics of the later medieval wares of the Lyveden and Stanion industries. Oolitic wares have recently been noted in medieval contexts in as yet unpublished excavations in Peterborough, adding further weight to the argument that this area is the source for the medieval Oolitic wares.

Late Saxon Cotswold-type oolitic wares

CTS fabric F207

The ware first appears at West Cotton during phase LS3 (AD 975–1000) and is a defining parameter of the phase. The vessel types appear to be purely limited to jars, with everted, triangular or undeveloped hammerhead rimforms. The distinctive dark brown, grey or black fabric has a dense temper of fine white ooliths.

A total of 55 sherds were found in late Saxon contexts, four of which were rim sherds, all of which were from jars. The distinctive triangular rimforms and black fabric of the pre-Conquest examples appear to be no different to those from Northampton (Denham 1985) or the Cotswolds wares known from Oxford (Mellor 1994).

The rimforms showed typological variation from the examples found in later contexts, which were simple and everted. No full profiles were reconstructed.

Illustrations of late Saxon Cotswold-type oolitic ware (Fig 10.5)

- 32 Dark blue-grey fabric. Heavy white (limescale) encrustation on the inner lower body and base. Rim and base from a squat jar.
148, LSD18
- 33 Dark brown fabric. Rim from a squat jar.
331, LSD18
- 34 Dark reddish-brown fabric. Rim from a squat jar.
1256, LSD17

Saxo-Norman Cotswold-type oolitic wares

CTS fabric F209

These wares, although similarly oolith tempered, have distinctive differences to distinguish them from the late Saxon types. The inclusions are pale grey rather than white in colour, and tend to be of a larger average size, with some reaching 2mm in length. There are often pieces of angular grey limestone up to 2mm.

The vessels tend to be oxidized to an orange colour, although the core is usually blue-grey, as is the inner surface of the vessel in some cases. Completely oxidized examples are known. They vary considerably in hardness, and often have a harsh, 'pimply' surface with protruding inclusions, similar to vessels from Peterborough, whereas the earlier wares tend to have a smooth, 'wet-hand' finished surface. The ware first appears during Ceramic Phase 0 (AD 1100–1150).

Vessel types

The only vessels which occur at West Cotton are jars, bowls and jugs, with jars being the most common. Reconstruction of full profiles of bowls and jars were possible, with the forms being fairly consistent. The six reconstructed jars can be loosely grouped into two form categories; the first is the classic early medieval, squat, baggy 'cooking pot' form (Fig 10.6, 48–51), with the second being a more refined globular or shouldered type. Both types appear to have been made on a turntable with the upper bodies and rims showing turning marks where the vessels were finished on a tournet. Both types were in use at the same time, the illustrated examples largely coming from Phase 0 and Phase 1 contexts. All bases are sagging.

The rims on all the reconstructed vessels are everted with triangular beads, but other forms are found, such as squared, everted types with lid seats, and simple everted and thickened varieties. Some of the triangular and hammerhead forms have a thumbed internal bead (eg Fig 10.5, 43).

The bowls are very simple 'platter' forms, and are fairly shallow, usually with simple upright or hammerhead rimforms.

It was not possible to reconstruct any jugs, but the various fragments suggest that they were high necked, with pulled lips, thumb-grooved strap handles and globular bodies, often decorated with rouletting, although plain examples are also known.

Decoration

There is a large portion of a storage jar with thumb-impressed applied strip decoration (Fig 10.5, 47). Incised decoration was limited to wavy lines and rouletting. The former were cut into the external body surface (43), and/or the inside of the rim (Fig 10.6, 49), and could be single, individual multiple or combed. One rim sherd was comb-stabbed on the top of the bead.

The rouletting was either rectangular- or triangular-notched, and usually limited to jugs, although one jar rim was found with rectangular notched decoration.

Thumbed impressed applied strips were very rare, occurring on only three separate vessels, two of which were single sherds.

Cross Joins

Only one significant cross join was made. The sherds (Fig 10.5, 45) occurred in three different contexts; a rubble layer within tenement E, and pits to either side of the twelfth-century road. The pits lay 12.5m apart while the residual sherd lay 30–40m to the west.

Illustrations of Saxo-Norman Cotswold-type oolitic wares (Figs 10.5 and 10.6)

- 35 Orange fabric, grey core.
4155, EY3

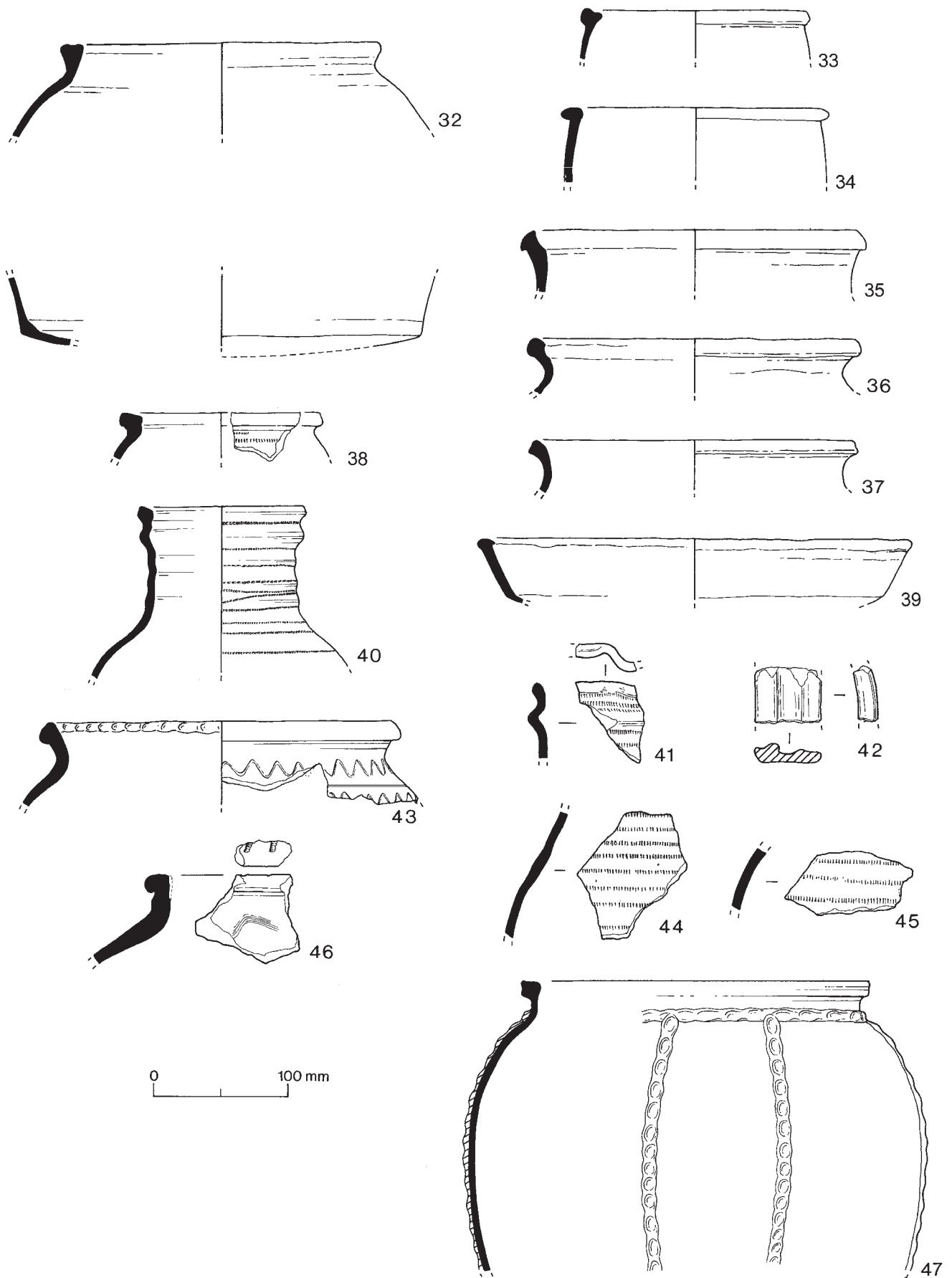


Figure 10.5: Medieval pottery, Cotswolds-type oolitic wares (32–47)

- | | |
|--|---|
| <p>36 Fabric as (35).
2007, LSD14</p> <p>37 Fabric as (35).
1349, LSD4</p> <p>38 Orange-brown fabric, grey core.
4312, SY2</p> <p>39 Fabric as (35).
249, A2; 783, AY1/2</p> <p>40 Grey fabric, orange outer surface, dark grey inner surface.
6397, E13/4</p> <p>41 Grey fabric, orange inner surface, pale grey-brown outer surface.
4163, SY1</p> | <p>42 Grey fabric, orange-brown outer surface.
4598, LSD12</p> <p>43 Grey fabric with orange patches on the outer surface.
2095, LSD20</p> <p>44 Grey fabric, orange outer surface.
684, PM2</p> <p>45 Grey fabric.
1342, APITS; 3045, LSE10; 4156, EY5.</p> <p>46 Fabric as (35)
2007, LSD14</p> <p>47 Uniform soft orange fabric. Unstratified.</p> <p>48 Soft grey fabric with orange surfaces, becoming progressively more blackened towards the base, internally and externally.</p> |
|--|---|

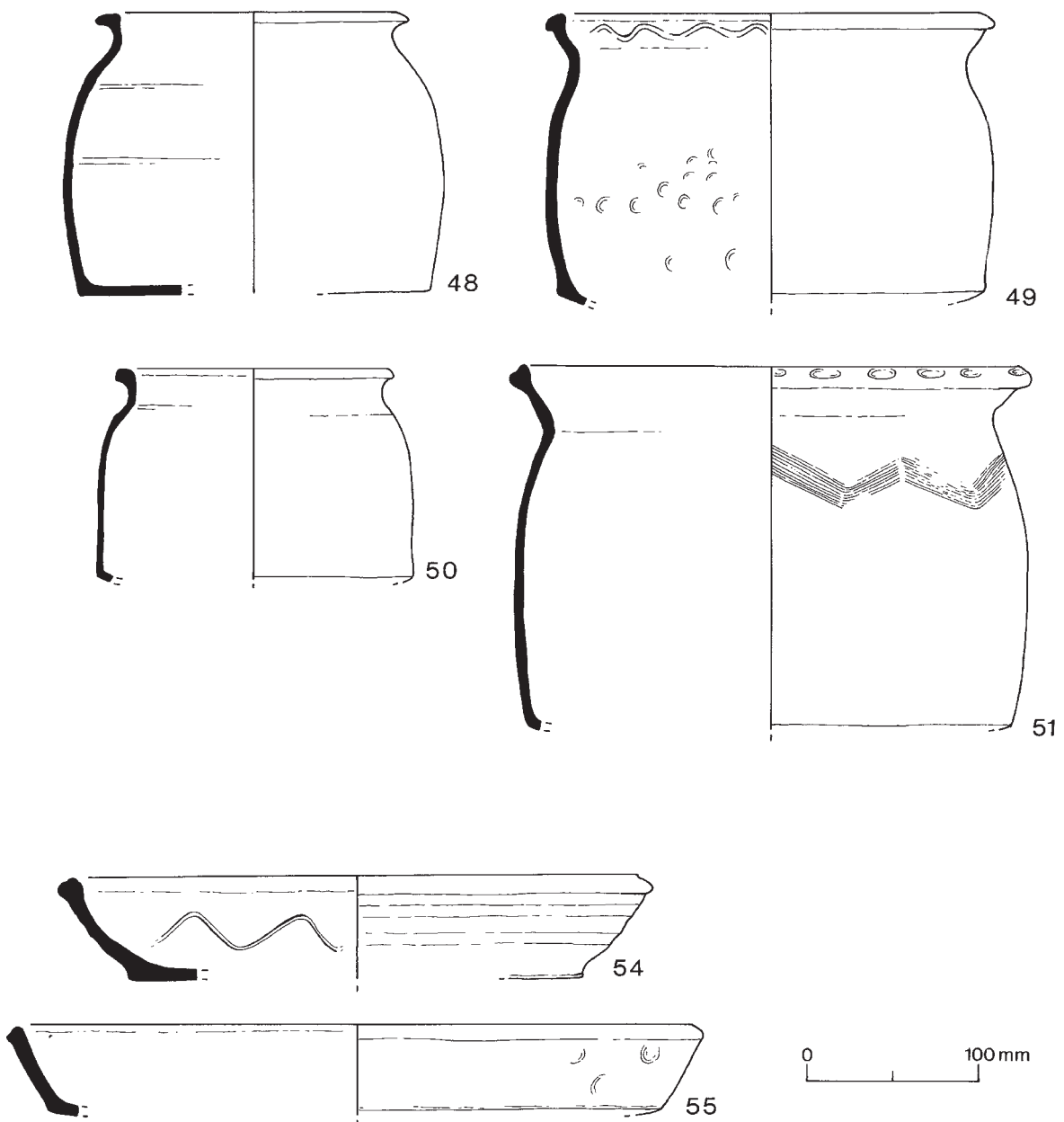


Figure 10.6: Medieval pottery, Cotswolds-type oolitic wares (48–51 and 54–55)

Moderate temper of pale grey oolites up to 2mm, with a rare burnt organic material up to 1mm. Numerous specks of extremely fine mica.

1349, LSD4, Ph1

- 49 Moderately hard dark grey fabric with light brown surfaces. Outer surface becomes progressively more blackened from the shoulder to the base, with patches of sooting. Incised wavy line on the inside of the rim.

4350, S23, Ph0

- 50 Slightly corky, friable fabric as (48), progressively more blackened towards the base.

2000, LSE3, Ph1

- 51 Fabric as (48), with variegated orange brown and grey outer surface.

4313/4347/4921, S21/S23; 4370 LSD8; 4325, S23; Ph1

- 52 & 53 Not illustrated

BOWLS

- 54 Grey fabric with variegated reddish- and dark brown surfaces.

1349, LSD4

- 55 As (54).

1341, SY2

Shelly Coarseware (SHC)

NDC fabrics T1/2, T2, T6; CTS fabric F330 (Figs 10.7–10.18)

Shelly-limestone tempered coarsewares are the commonest medieval pottery types at West Cotton, but also the most difficult to categorize. The manufacturing tradition is widespread throughout the south-east midlands, with several production centres known, with it seeming likely that more await discovery. The tradition can be divided into two broad types; the shelly coarsewares (SHC), and the Lyveden/Stanton A Coarsewares (LA). The LA wares have the same basic geology but are visually distinctive, and the vessels are usually thicker-walled, with far more variation of inclusion size within individual vessels, and the limestone is usually ill-sorted. The rim forms of such vessels are also very different to those of the SHC tradition.

The SHC wares can be seen to be a continuation of the St Neots-type ware tradition, the fabrics being generally moderately to heavily tempered with quite finely crushed and well-sorted shelly limestones, with the vessels usually thin-walled with throwing rings on the inner surface of the upper body. The colour of the wares can vary enormously: red, brown, buff, orange and blue-grey wares are all common. It is extremely difficult to differentiate between the wares by fabric analysis, but analysis of the jar rimforms suggests that it is possible to provenance some wares by their profiles, see below. The range of vessel types which occur at West Cotton is very limited, with only jars, bowls, pitchers and Top Hat vessels (THPs) occurring. A single sherd may have been from a curfew (Fig 10.8, 70), but none are known from Raunds in SHC fabric. There are no examples of pedestal lamps, a vessel type which occurs at Northampton, but conversely, only four possible THP

rim sherds were found there. This would indicate that the two places were receiving a large proportion of their SHC from non-mutual sources, and that the perceived model of many localized production sources for the ware is probably an accurate one.

Decoration

Incised decoration is extremely rare, occurring on less than fifty of the 48969 sherds, with the main techniques being rouletting or incised wavy lines (Fig 10.8). Most of them were single small bodysherds, with no indication of vessel type.

Applied strips were also rare occurrences, and seem to be functional attributes of large storage vessels and Top Hat jars. A handful of sherds were pierced post firing, although whether this related to the function of the complete vessel or the recycling of sherds as spindle whorls is uncertain.

Production centres

Several production sites for wares of this type are known in the area. A kiln found at Yardley Hastings, Northamptonshire, produced pottery which is typical of the tradition. The fabrics are described as 'soft to hard, smooth to rough texture, 2–8mm thick. Rare to common angular and sub-angular shell from 4mm to less than 1mm. Rare limestone, sub-angular quartz grains, red and/or black iron ore. Surfaces light red, reddish yellow, or grey with grey, light brown or red core' (Groves 1980, 5), which would appear to cover all possible SHC fabrics, illustrating the difficulty in provenancing sherds of this type.

The rim forms are overwhelmingly of the simple everted and triangular types, with hammerhead and squared types being very rare.

Survey and excavation at the village of Olney Hyde, Buckinghamshire (Mynard 1984) revealed at least fourteen possible kiln sites where two different shelly limestone coarsewares were being produced. The three groups of A ware are readily identifiable as part of the SHC tradition. The jar rim forms are all types commonly found on SHC vessels in the Raunds area, with the usual type being everted with a rounded bead, although sub-groups do occur. It is worthy of note that, whilst the assemblages from Olney all had simple everted rim forms as the commonest type, there are variations in the proportions of the types through time.

Group 1 at Olney had only 3.7% of type 1 rims (everted), favouring mainly lidseated type 1a (12.3%) and rounded 1b (13.5%), with hammerheaded type 1c forms making up only 1.2% of the total. Group 2, however, had type 1 rims making up 38% of the total, with no type 1c examples whatsoever. Group 3 also had a large number of type 1 forms (39.1%), but only 4.3% type 1b and 26% type 1c. This group did not contain any of the variants of triangular type 2 or squared type 3 forms, despite the fact that the various forms in each of the types represented around 15% of the rims from groups 1 and 2.

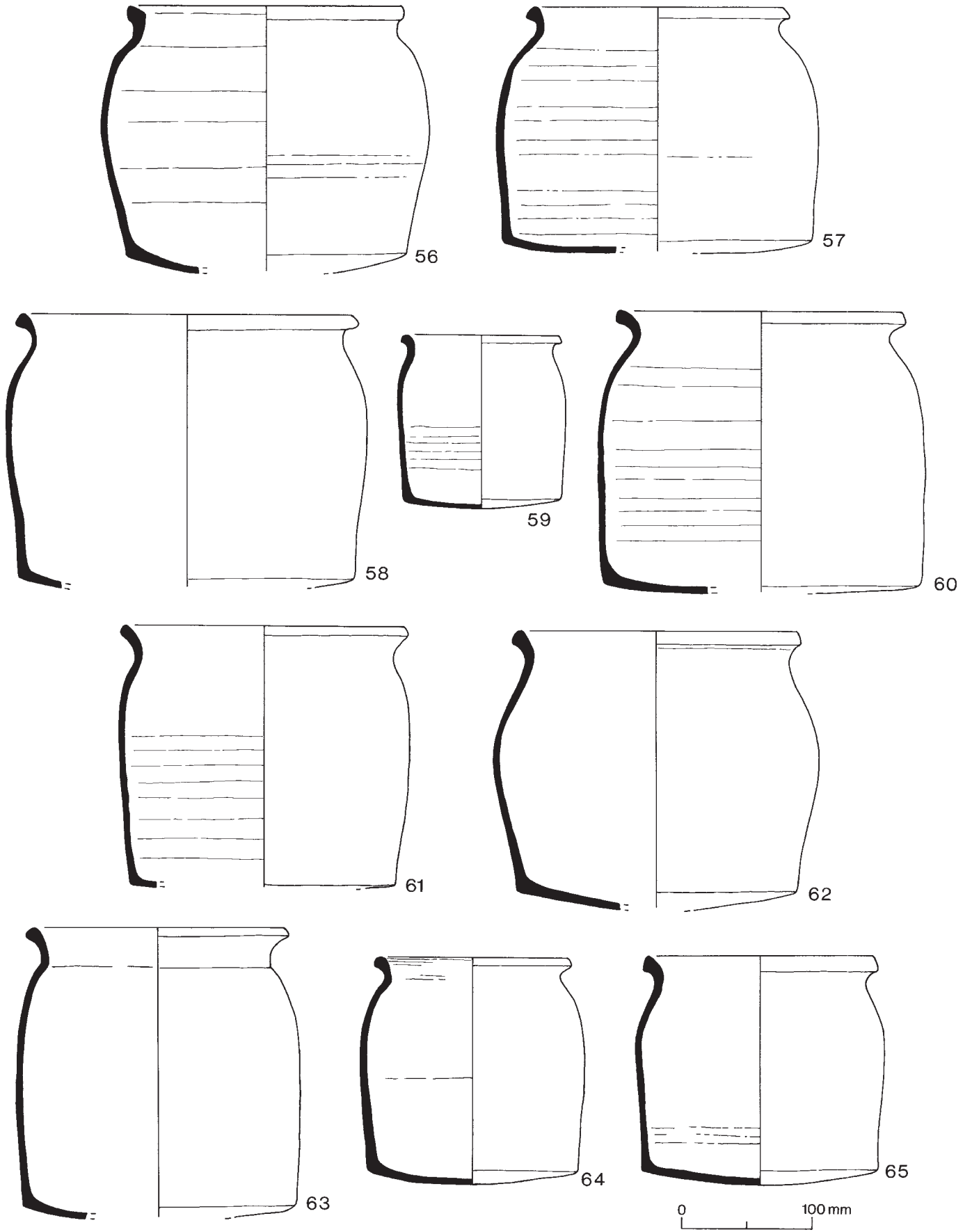


Figure 10.7: Medieval pottery, Shelly coarseware jars (56–65)

It seems likely that the variations represent each individual potter's favoured choice of rim forms rather than typological development, as groups 2 and 3 are said to be contemporary (Mynard 1984, 65–70).

Several SHC kilns are known at the village of Harrold in Bedfordshire, but only one has been excavated, at 8 Brook Lane (Hall 1972). The rim forms are quite distinctive, usually having thick, heavy profiles. They tend to be everted, triangular or hammerhead types, with squared types not occurring. Informal field survey by the author and Anna Slowikowski, of Albion Archaeology, has noted at least twelve other probable kilns in the fields around the village.

The given date of the thirteenth century appears a little insubstantial, with evidence from West Cotton suggesting that a twelfth-century date may be more appropriate (see below). It is a fact that the excavated kiln cut an earlier feature containing pottery which was identified as being the same as the material from the kiln itself, so it seems likely that there were several phases of production of the ware.

Vessel Usage

The shelly vessels represent an almost constant proportion of the jar population through time. Despite the apparent functional and aesthetic superiority of the later wheel-thrown wares such as Potterspur, it is only with the introduction of Raunds-type Reduced ware (RRW) in Phase 3/2 that the proportion of shelly ware jars falls noticeably. If the RRW jars and bowls are added to the shelly ware totals for Phase 3/2, the resultant figures are 86.4% and 80.7%, which is consistent with the figures for the earlier Phases.

Table 10.2: Percentage of major vessel types in Shelly Coarseware fabrics

Vessel/ Phase	Jars	Bowls	Jugs
Ph0	85.7%	97.7	55.6
Ph1	85.0	76.0	63.0
Ph2/0	89.8	76.2	39.2
Ph2/2	87.9	72.1	33.3
Ph3/2	80.3	64.7	32.5

This data would indicate that the consumption of coarseware remained fairly constant throughout the medieval period at West Cotton and, by implication, the domestic practices involving ceramic vessels remained largely unchanged. This mirrors the fact that metal kitchen equipment remained virtually unchanged throughout the medieval period (Moorhouse 1987, v).

The exception to this is the jugs. The introduction of glazed examples in Ph2/0 caused the proportion of shell-tempered jugs to be almost halved. It is possible that these vessels may have had a different status to the unglazed vessels, but the distribution of the glazed jugs around the

settlement suggest that this is not the case, and functional considerations appear more likely.

It would appear therefore that these figures support the notion of medieval pottery as having a mainly functional role. The introduction of supposedly superior glazed wares has little effect on the domestic assemblage, apart from the jugs, presumably because they were a more efficient container of liquid than the porous shelly coarseware. The fact that the kiln sites such as Lyveden and Stanion produced few glazed jars, despite glazed jugs being made in quantity, would indicate that such treatment was regarded as unnecessary, despite the supposed functional improvement that this would bring to the vessels. Similarly, most of the Potterspur jars were unglazed, despite glazing being common on the pitchers. There is some evidence to suggest that internal glaze does not form an impermeable membrane; ethnographic evidence has shown that vessels with an internal glaze still absorb the flavours of food which is cooked in them, and so are often used for the preparation of only one food type (Fel and Hofer 1988). This would suggest that there were other reasons for glazing pots, such as using green glaze in an attempt to imitate the colour and finish of bronze ewers, although the symbolic value of colour cannot be discounted either.

Table 10.3: Total number of Shelly Coarseware vessels by rim sherd count

Vessel /Phase	Jars	Bowls	Jugs	Total
Ph0	76.9%	21.8%	1.3%	390
Ph1	84.0	13.3	2.6	714
Ph2/0	81.0	15.1	3.9	510
Ph2/2	75.9	20.4	3.6	632
Ph3/2	74.5	21.7	3.8	761

Shelly ware jugs, which decrease sharply as a proportion of the all-fabric assemblage during Ph2/0, increase as a proportion of the shelly ware collection, with shelly bowls showing a similar pattern. As the level of shelly jars remains at a fairly constant level in the all-fabric assemblage, this indicates a general decline in the use of the ceramic jar, rather than increased usage of the other main vessel forms. This may be due to the changes in cooking practices during the medieval period, which saw a gradual increase in the use of metal cooking vessels from the thirteenth century onwards (Moorhouse 1987, 22), and may also be the explanation for the sudden decline in the use of THPs at that time (see below).

Illustrations of Shelly Coarseware jars (Fig 10.7)

- 56 Grey fabric with pale orange-pink surfaces. Moderately heavy temper of well sorted crushed angular shelly limestone up to 2mm, with shell platelets up to 4mm. Occasional grain of quartz and some burnt organic material up to 2mm. Lower body is heavily smoke blackened, and interior of the base pad is burnt.
1349, LSD4, Ph1

- 57 Light grey fabric with orange surfaces, inclusions as (56). Outer lower body and base heavily smoke-blackened. 1349, LSD4, Ph1
- 58 Fabric as (56) with buff surfaces. Outer lower body is heavily sooted. 4332/4348, S23, Ph1
- 59 Fabric as (56), orange surfaces. Blackened exterior base pad. Inclusions are leached out on the inner surface of the base pad and the lower 5cm of the inner body surface. 4759, T30, Ph0?
- 60 Fabric as (56), outer surface is extensively blackened, with a scorched red outer base pad. 6552, MILLS, Ph0
- 61 Fabric as (56). Outer body surface is blackened, becoming more concentrated towards the base, which is itself scorched reddish-orange. 6534, LSE8, Ph0?
- 62 Fabric as (56). Outer body is slightly darker towards the base, with the outer base pad itself heavily smoke-blackened. 6291, EY2, Ph2/2
- 63 Fabric as (56). Extensively blackened lower body and scorched red base pad. 4410, S21, Ph0
- 64 Fabric as (56), although with larger average inclusion size. Lower body and base pad are smoke-blackened (Plate 10.1). 1349, LSD4, Ph1
- 65 Fabric as (56). Smoke-blackened lower body, scorched orange-red exterior base pad with black area in the centre of the interior. 1349, LSD4, Ph1
- 68 Three non-joining sherds. Buff fabric with grey core. 6174, E13/5; 6453, LSE8, Ph1.
- 69 Orange fabric with a buff core. 6282, EY1.
- 70 Grey fabric with pink-brown surfaces. Thickness and curvature suggests that the sherd may be from a curfew. 1552, B4.
- 71 Grey fabric with orange surfaces. 1047, LSD16.
- 72 Brown fabric with lighter core. 449, AY1.
- 73 Orange fabric with grey core. 1528, BY3.

The evidence from the yards would suggest that ceramic bowls can be linked to grain processing. The two primary ceramic groups of Ph1 date also add support to this. A dump of coarseware near the eleventh-century kitchen, S21, contained very few bowl sherds, but a fairly large proportion of THPs, whereas a dump in ditch system 4 to the rear of the barn and processing building, S17, contained no THPs, but a large number of bowls.

It is difficult to see any stage of the baking process which would require the specific use of such vessels, other than perhaps for dough proving, as baking ‘tins’ or for measurement of capacity. A few manuscript illustrations of sixteenth-century bakeries (eg Moorhouse 1987) do not give any indication of pottery bowls as bread moulds, usually showing small loaves being baked without any sort of container and there is an illustration of large, flat, round loaves being baked on a stone without the use of a container (Moorhouse 1987, 30).

There are documentary references to a type of measuring device known as a Cantel, which is described as a shallow vessel specifically for the use of measuring oats, malt or meal (Zupko 1968, 30). A sixteenth-century illustration from the York Baker’s Company Ordinances shows meal being measured in such a vessel (Brears 1987). It is possible

Illustrations of decorated Shelly Coarseware sherds (Fig 10.8)

- 66 Grey fabric with orange inner surface and blackened outer surface. 6973, LEATS, Ph0.
- 67 Buff fabric with black patch on inner surface. 4292, AY2, Ph3/2.

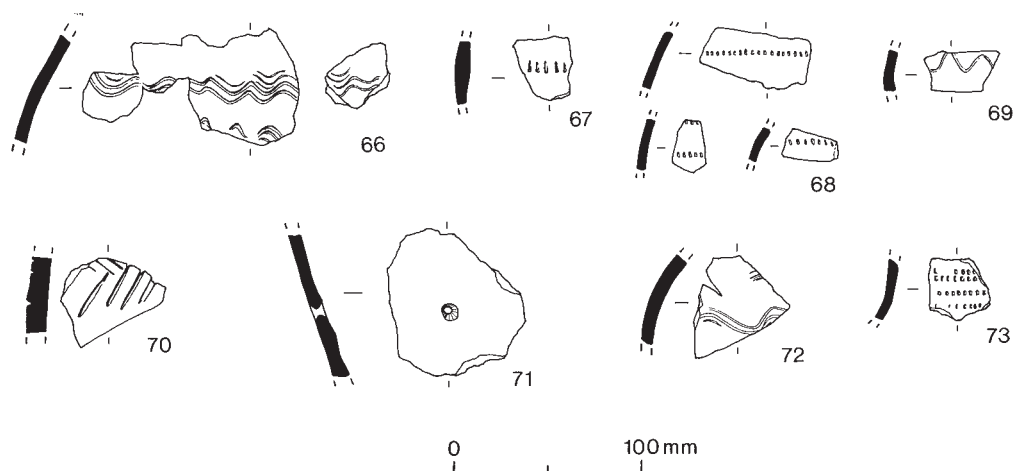


Figure 10.8: Medieval pottery, Shelly coarseware, decorated sherds (66–73)

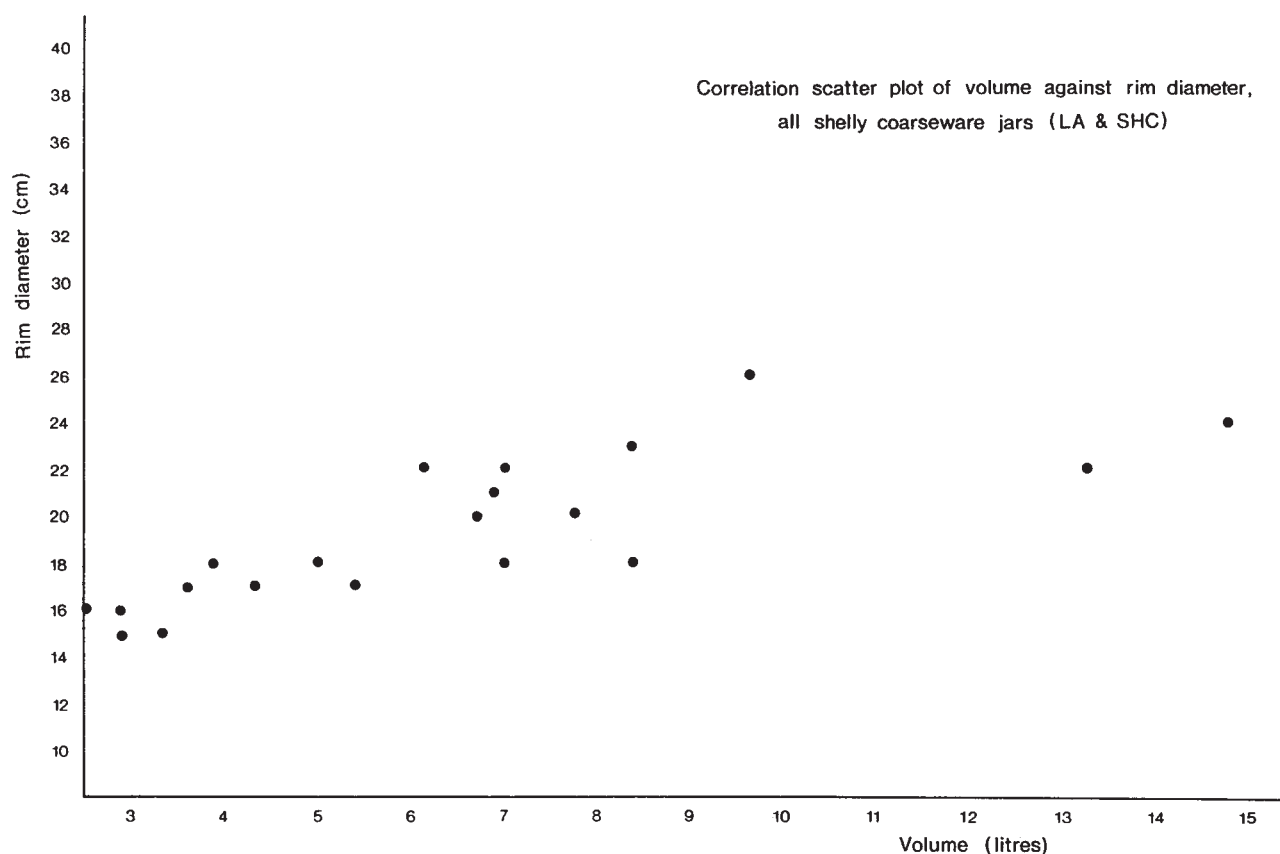


Figure 10.9: Medieval pottery, plot of volume against rim diameter for Shelly coarseware and Lyveden A ware jars

that the pottery bowls were used in such a manner, but evidence is required for a consistency of volume of the vessels to support this, whilst at the same time bearing in mind that medieval weights and measures were liable to a large degree of variation (Zupko 1968, ix), and at times appear to have almost been subjective.

To examine this possibility, measurement was made of the volume of the reconstructed coarseware jars and bowls. The volume was calculated by dividing the vessel horizontally into 10mm slices and measuring the diameter of the top and bottom of the resulting *frustra*. The volume of each was then calculated, to give the volume of the whole vessel, rounded to the nearest 0.1 litre.

The plots of the volume against rim diameter for jars and bowls (Figs 10.9 and 10.10) indicates that there is a simple correlation between the rim diameter and volume, and this can be confirmed statistically, with minor variations from perfect correlation deriving from slight differences in body forms.

The rim diameters of all the coarseware jars and bowls were examined (Figs 10.11 and 10.12). The jars show a unimodal distribution, showing that there was a standard range of vessel sizes. This would indicate that they were used for a variety of non-specific functions, with no need for a tightly-controlled size range.

The bowls, however, demonstrate very different traits. There is a trimodal distribution with peaks at diameters of 220–260mm, 320–360mm and 400–460mm, which equates with volumes of 2.0 litres, 3.5–4.0 litres and 6.0–8.0 litres.

The standard medieval dry measure, the bushel, was of approximately 35.2 litres, while a smaller unit of 2 quarts, known as the Pottle, measured 1.9 litres. It would appear therefore that the majority of the bowls cluster around capacities of 1, 2 and 4 pottles (1.9, 3.8 and 7.6 litres). This would suggest that the volume of the bowls was known to the makers and users, and that either the potters manufactured the vessels in these three volume units, or that vessels of these specific capacities were favoured by the people of West Cotton. This would imply that their correlation with bakehouses and kitchens was due to their usefulness as Cantels, although there is no doubt they probably had other less specific functions. Most of the vessels are scorched on the base pad, but the lack of organic lipid residues (R Evershed pers comm) in the shelly bowls would suggest that this may have been caused during firing rather than by use for cooking.

The bowls show no significant typological development, and are remarkably consistent in terms of form through the medieval period, with the exception of the large pancheon-

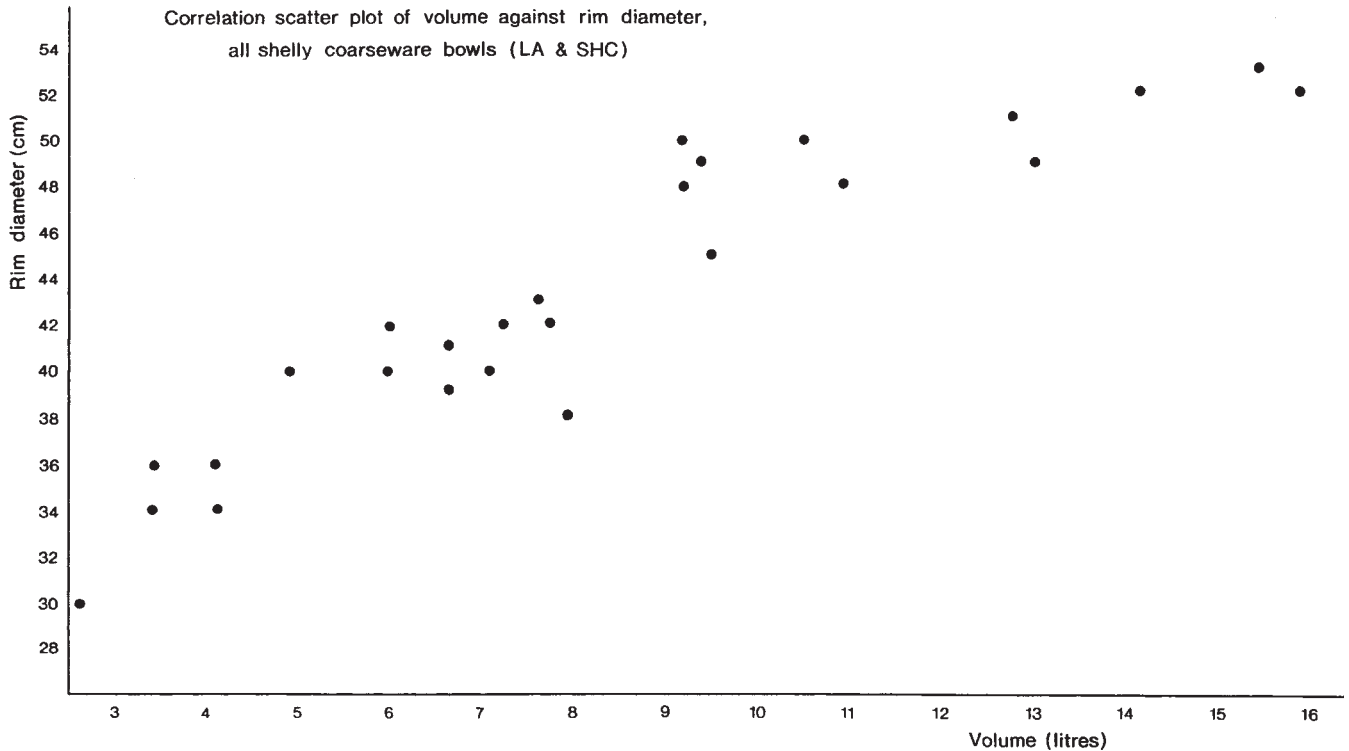


Figure 10.10: Medieval pottery, plot of volume against rim diameter for Shelly coarseware and Lyveden A ware bowls

type vessel with the fingertipping on the interior of the rim and the base angle, the only example of decoration on any of the medieval shelly bowls (Fig 10.13, 82).

Illustrations of Shelly Coarseware bowls (Figs 10.13 and 10.14)

- 74 Brown fabric as (56). Exterior of base is heavily scorched to an orange red, no sooting.
1250/1257, LSD16, Ph2/2?
- 75 Fabric as (56). Outer surface is slightly blackened and the exterior of the base pad is scorched red (Plate 2).
1341, AY6; 1349, LSD4, Ph1
- 76 Fabric as (56). Patches of soot on the upper outer rim. Slightly scorched base.
1349, LSD Ph1
- 77 Fabric as (56). Base pad and entire interior surface are scorched orange.
3099, LSD17, Ph1
- 78 Fabric as (56), although darker.
3066, LSD15, Ph0
- 79 Fabric as (56). Exterior base pad scorched orange. A few traces of sooting on the rim.
1661, LSD14, Ph0
- 80 Fabric as (56). Blackened exterior.
1546, B5/2, Ph2/2
- 81 Fabric as (56), orange inner surface. Traces of sooting on rim.
5017, LSD4, Ph0
- 82 Fabric as (56). Very friable, with the outer surface disintegrating in place. No scorching.
6577/6593, M25, Ph0
- 83 Fabric as (56). Rim top is reddened.
6477, S18, Ph0
- 84 Fabric as (56). Sooting around upper rim exterior.
6604, M25, Ph0
- 85 Fabric as (56). Base is scorched red in the centre and there are a few patches of soot on the outer rim.
1349, LSD4, Ph1
- 86 As (56). Base is scorched red.
904, LSD13, Ph0
- 87 As (56). Light grey-brown fabric.
1274, AY1/2, Ph1
- 88 As (56). Brown fabric with blackened outer surface.
1075, LSD14, Ph2/0
- 89 As (88).
1567, BY1
- 90 As (88).
1636, B4
- 91 As (88).
U/S

Top Hat Jars

Whilst no clear typological pattern emerges, the occurrence of Top Hat rim forms by phase would suggest that production of THP vessels had virtually ceased by Ph2/0, when they represent less than 5% of the shelly coarseware jar assemblage, as opposed to nearly 21% during Ph0 (Table 10.4). Their use appears to have become redundant at a time which saw considerable change in the manufacture of medieval ceramics, with the introduction of glazed wares on a large scale and the full industrialization of pottery

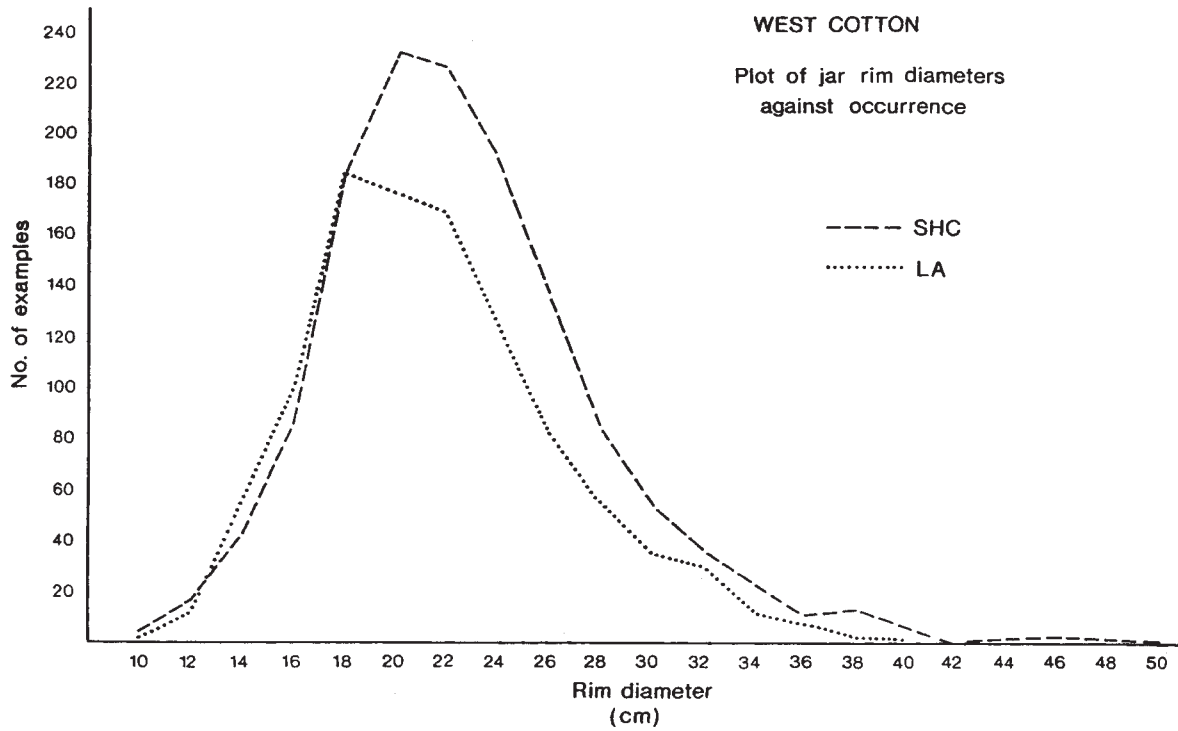


Figure 10.11: Medieval pottery, plot of rim diameters against occurrence for Shelly coarseware and Lyveden A ware jars

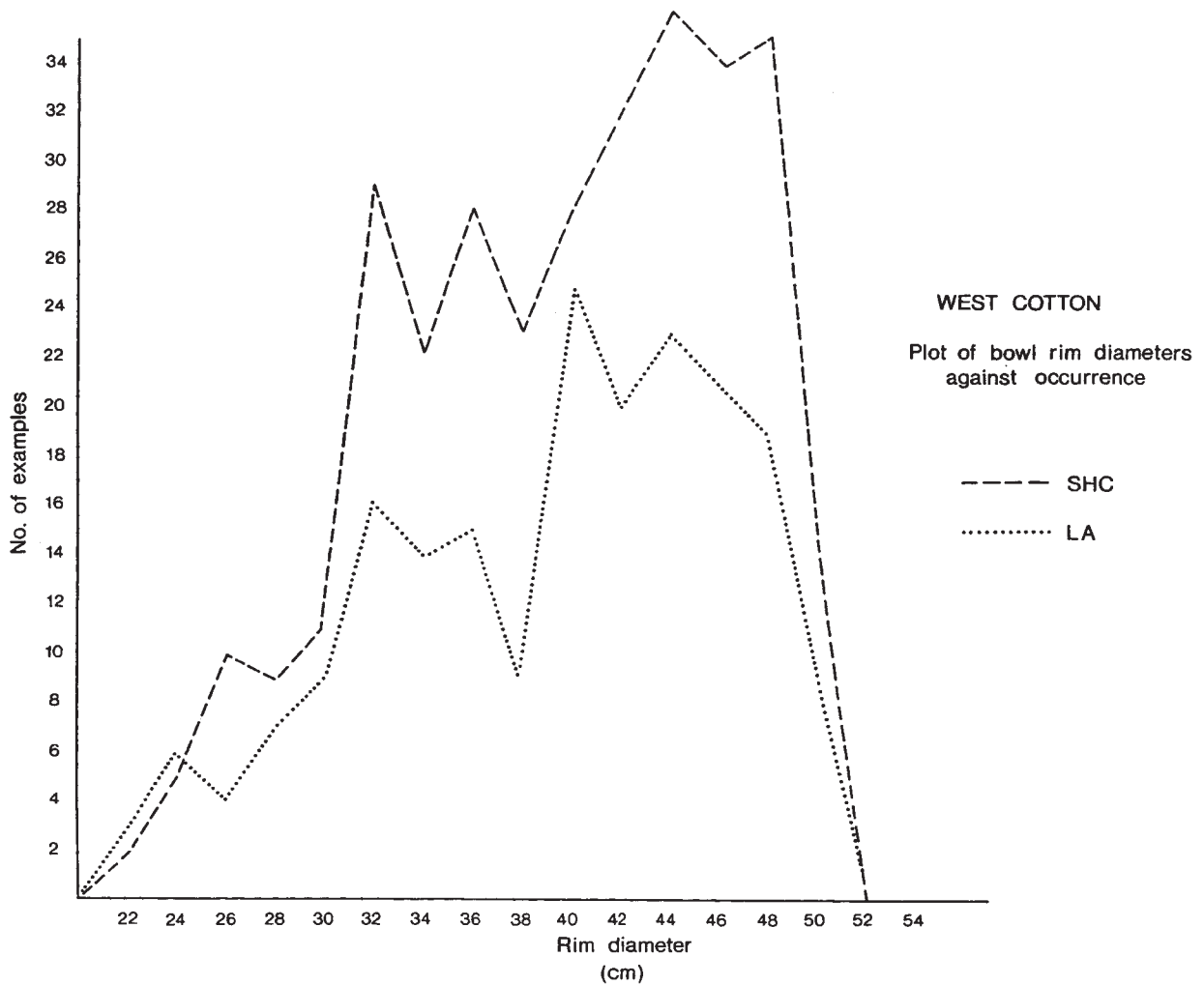


Figure 10.12: Medieval pottery, plot of rim diameters against occurrence for Shelly coarseware and Lyveden A ware bowls

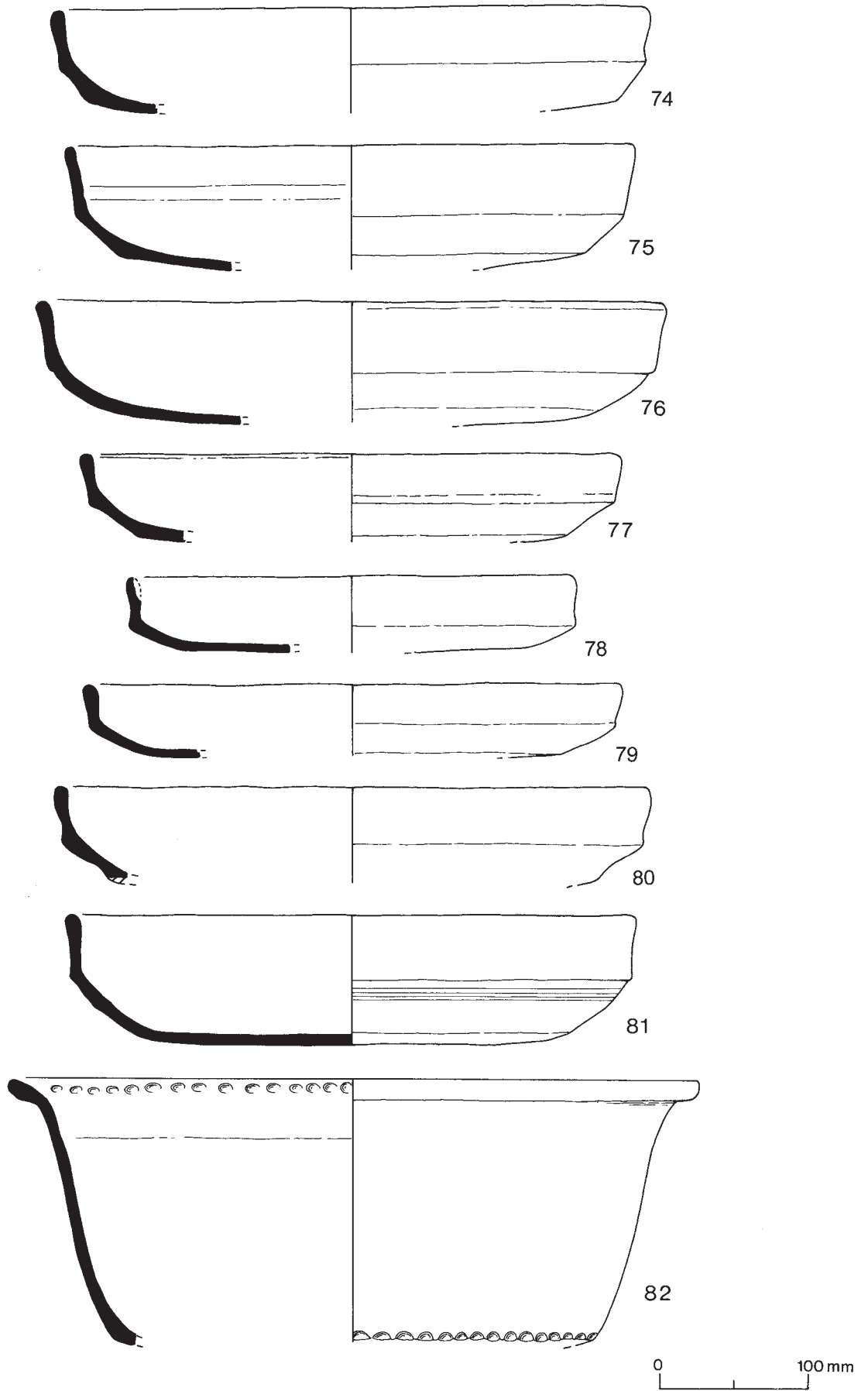


Figure 10.13: Medieval pottery, Shelly coarseware bowls (74–82)

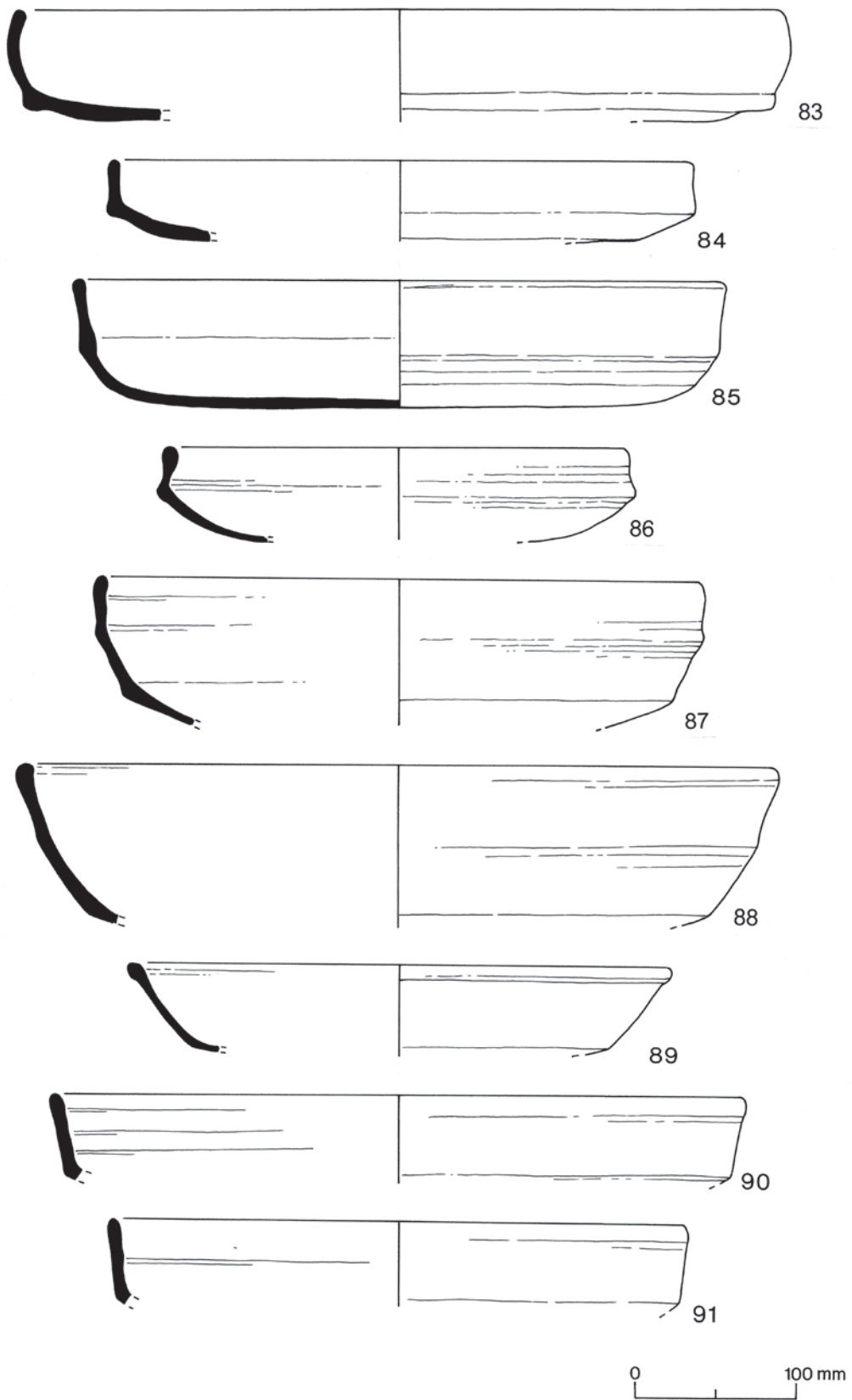


Figure 10.14: Medieval pottery, Shelly coarseware bowls (83–91)

production in the south-east midlands, such as at Lyveden, Stanion and Brill/Boarstall.

Table 10.4: Occurrence of Top Hat rimforms

Ceramic Phase	Total No.	% of all SHC rims
Ph0	49	20.9
Ph1	30	12.8
Ph2/0	14	4.7
Ph2/2	17	4.7
Ph3/2	10	2.4
Ph4	19	12.6

The apparent increase of THP in the proportion of the shelly jar assemblage in Ph4 is a further illustration of the large scale redeposition of pottery due to the disturbance of the ground from demolition and robbing of the buildings at desertion.

Like the bowls, the THP rim diameters show trimodal clustering, suggesting three main different sizes of vessel (Table 10.5).

Table 10.5: Top Hat jars: Rim Diameters versus number of examples

Diameter (mm)	No. of examples
120	0
140	5
160	9
180	11
200	24
220	15
240	22
260	13
280	11
300	5
320	3
340	9
360	6
380	1
400	1
420	0

Statistically, the correlation between rim diameter and volume is strong so that an estimation of the volume can be made from rim diameter (Table 10.6).

The three peaks in the rim diameters at 200mm, 240mm and 340mm, suggest corresponding volumes of approximately 4, 7 and 20 litres, with vessels of rim diameters of 280mm or more having volumes of 10 litres or more.

Table 10.6: Top Hat jars: Rim diameter versus volume

Rim diameter (mm)	Volume (litres)
160	1.8
250	7.7
260	8.5
280	10.5
300	16.9
320	16.1
330	18.8

The form of the vessels, the smoking and burning on the exterior and the fact that many of them yield organic lipid residues (R Evershed pers comm) does suggest that they may have been specialist cooking vessels. The fact that they occur in quantity in possible association with the kitchen, S21, but not within an assemblage possibly associated with the barn and processing building, S17, adds credence to this.

The volumes of the THP appear extremely large compared to modern cooking vessels. However, ethnographic studies indicate that such large cooking pots are not unusual in peasant societies. The people of the village of Atany in Hungary in the 1950s were still using traditional pottery cooking vessels of the same fabric, form and manufacture as the pottery of the medieval period, and cooking similar foods in traditional solid fuel ovens. A study of the ceramics (Fel and Hofer 1988) gave consideration to the volume of the cooking vessels used for differing cooking actions in the kitchen. Each pot in the household was used only for the heating of one specific foodstuff, with the vessel volume depending on the function of the pot in the kitchen and the size of the family. The largest pots were generally used for the heating of water, milk (for cheese manufacture) or the soups and stews which formed the major part of the diet.

The pottery from five different households at Atany was considered, ranging from that of a lone widow to a fairly wealthy peasant farmer with a wife and five children. The overall assemblage shows remarkably similar traits to the THP from West Cotton. The assemblage of Hungarian vessels had volumes ranging from 0.5 litres to 30 litres and, like the West Cotton THP, demonstrated a trimodal volume distribution, in this case around 3 litres, 6 litres and 20 litres, compared with the estimated 4 litres, 7 litres and 20 litres for the West Cotton THP.

Generally speaking, at Atany, the larger the population of the household, the larger the average volume of their cooking pot assemblage, with the family of seven having two large pots of 20 litres each for the preparation of the various stews. This would suggest that the volume of the larger West Cotton THP does not seem excessive for a cooking vessel.

At Atany, the ratio of vessels of under 10 litre capacity to those of greater was 2.7:1 (125 vessels) whereas at West Cotton the ratio for THP is 2.5:1 (135 rims).

*Illustrations of Shelly Coarseware; Top Hat jars
(Fig 10.15)*

- 92 Fabric as (56), but more finely crushed and sparser inclusions. Pale brown surfaces, with the exterior burnt and sooted. 1469, A/B, Ph0
- 93 Fabric as (56), with reddish brown surfaces. Most of the outer body is blackened with patches of sooting. Base pad is scorched orange. 4447, LSD8, Ph0

- 94 Fabric as (56). Patches of blackening on the outer surfaces, inclusions leached out on the lower half of the inner body and the base pad. 5046, LSD3, Ph1
- 95 Fabric and colour as (92). Heavily sooted base pad. 1075, LSD14, Ph1
- 96 Fabric as (56). Outer lower body is blackened and smoked, becoming darker towards the base. Outside of rim is heavily blackened and sooted. 6540, LSD18, Ph0

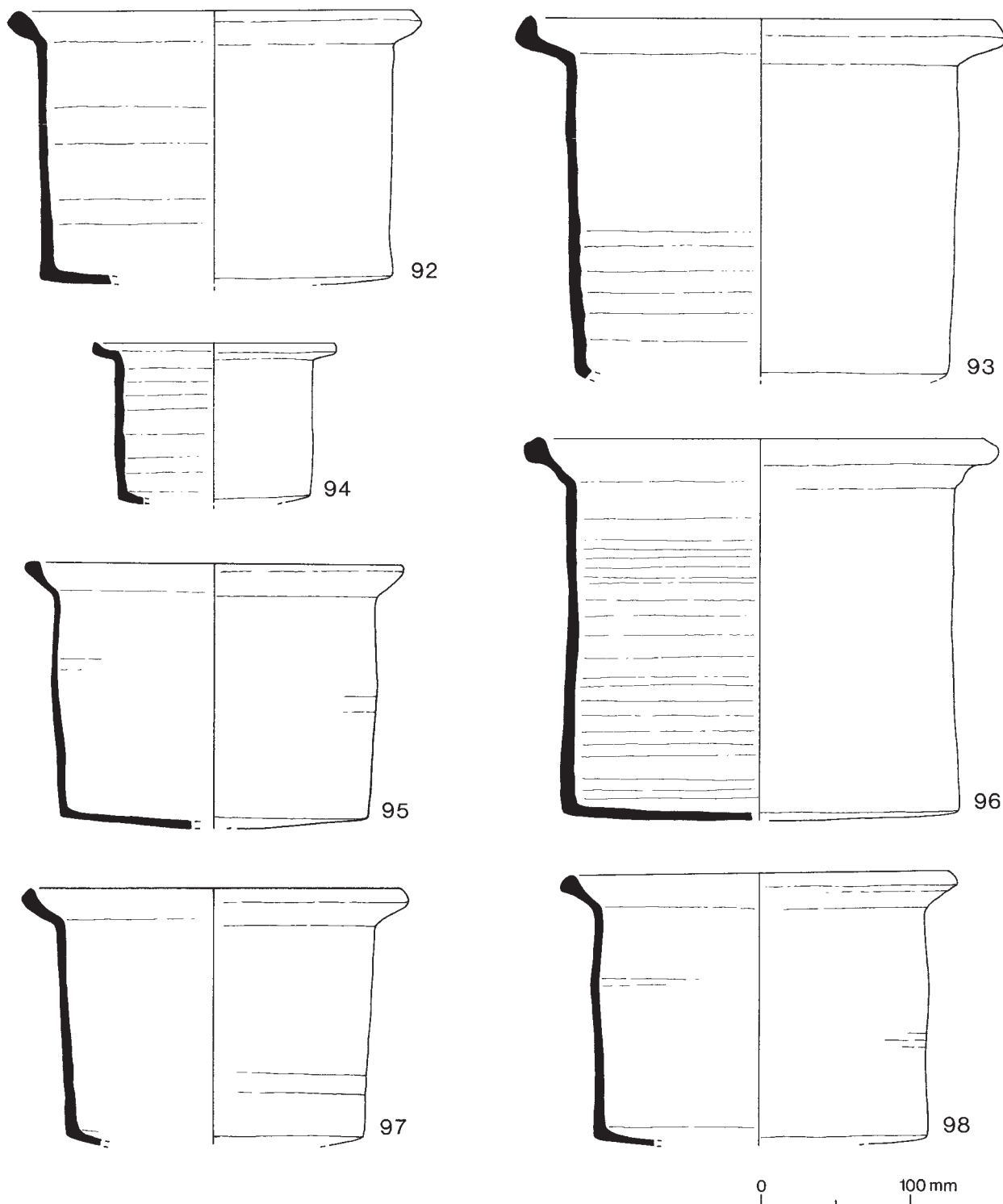


Figure 10.15: Medieval pottery, Shelly coarseware Top Hat Jars (92-98)

- 97 Fabric as (56). Orange surfaces, smoke-blackened lower body and outer rim.
4306, S21; 4312, SY2; 4921, S23, Ph1
- 98 Fabric as (56). Yellow-brown with a grey core. Smoke-blackened lower body and base.
4332/4348, S23, Ph1

Pitchers

SHC pitchers are the rarest of the major vessel forms in this fabric, with a maximum of 69 vessels represented by rims, 22 of which have handles attached. A maximum of 146 vessels are represented by handles alone (includes unPhased examples), but as some of the vessels appear to be multi-handled *pegaux* types, this cannot be used as a reliable measure of vessel occurrence. All handles appear to have been luted to the outside of the vessel body.

The handles do show some typological traits (Table 10.7). All the Phase 0 vessels have plain, undecorated strap handles, and whilst this type remains the commonest form throughout the medieval period, it gradually declines as a proportion of the assemblage until Phase 3/2. Phase 1 sees the introduction of stabbing and thumbing as decorative techniques. Phase 2/2 sees the introduction of combing and multiple decorative techniques on straps, with Phase 3/2 vessels having a full range of different techniques, including applied strips, often used in combination.

The various coarseware kiln sites have examples of most of the different handle types present. Yardley Hastings had examples of thumbed, stabbed and plain straps (Groves 1980, figs 2.42, 3.54–6 and 4.73), as did Olney Hyde (Mynard 1984, figs 6.17–22 and 7.34–36). The handles from the Harrold kiln were predominately stabbed or plain thumb-grooved straps (Hall 1972, figs 10–12 and 26–7), although a single rod handle is also illustrated (*ibid*, fig 23).

Decoration other than on the handle is extremely rare, as with the other vessel types in this fabric, with rouletting being the only technique occurring at West Cotton (Fig 10.18, 114–117).

Illustrations of Shelly Coarseware Pitchers and handles (Fig 10.16)

- 99 Fabric as (56).
6291, EY2, Ph2/0
- 100 Fabric as (56).
6552, MILLS, Ph0
- 101 Pink-brown fabric with a grey core.
4155, EY3
- 102 Fabric as (101).
549, BY6
- 103 Fabric as (101).
1105, CPITS
- 104 Fabric as (101).
512, AY4; 6472, EY1
- 105 Pale brown surfaces with a grey core.
4311, SY2
- 106 As (105).
1567, BY1
- 107 As (105).
6905, PDL
- 108 Purple-brown surfaces, grey core. Smoke blackening below the shoulder carination and on the rim bead.
739, CPITS
- 109 As (105).
1525, BY4
- 110 As (105).
6453, LSE8

The lack of reconstructed pitchers makes discussion of vessel forms rather difficult, but there are a few points worthy of comment.

It would appear from the illustrated examples that there are two basic jug forms, the ‘classic’ medieval high-necked, narrow-mouthed, globular baluster jug and another with a wider mouth and short neck, which is more reminiscent of a jar form, with a handle attached (eg Fig 10.16, 108). It also may be significant that this particular vessel is smoke-blackened, indicating that it had been heated on a fire, whereas none of the baluster jugs have any signs of being used in this manner. The implication, therefore, is that these wider-mouthed, handled vessels were less function-

Table 10.7: Occurrence of Shelly Coarseware jug handles by percentage per Phase

Type	Ph0	Ph1	Ph2/0	Ph2/2	Ph3/0
3: stabbed single grooved strap	0%	4.3%	23.1%	33.6%	29.6%
4: plain rod	0	4.3	3.8	0.	0
6: plain single grooved strap	100.0	77.2	61.6	45.0	49.6
9: strap, thumb-ed edges	0	8.6	7.7	8.6	8.2
14: double grooved strap	0	0	0	0	5.5
15: triple grooved strap	0	4.6	3.8	0	0
20: type 9 with stabbing	0	0	0	4.3	0
21: type 6 with combed edges	0	0	0	4.3	0
24: type 3 with applied strip	0	0	0	0	2.7
27: type 6 with applied strip	0	0	0	0	2.7
28: type 6, slashed and stabbed	0	0	0	0	2.7
29: stabbed rod	0	0	0	4.2	0
Total	12	23	26	23	37

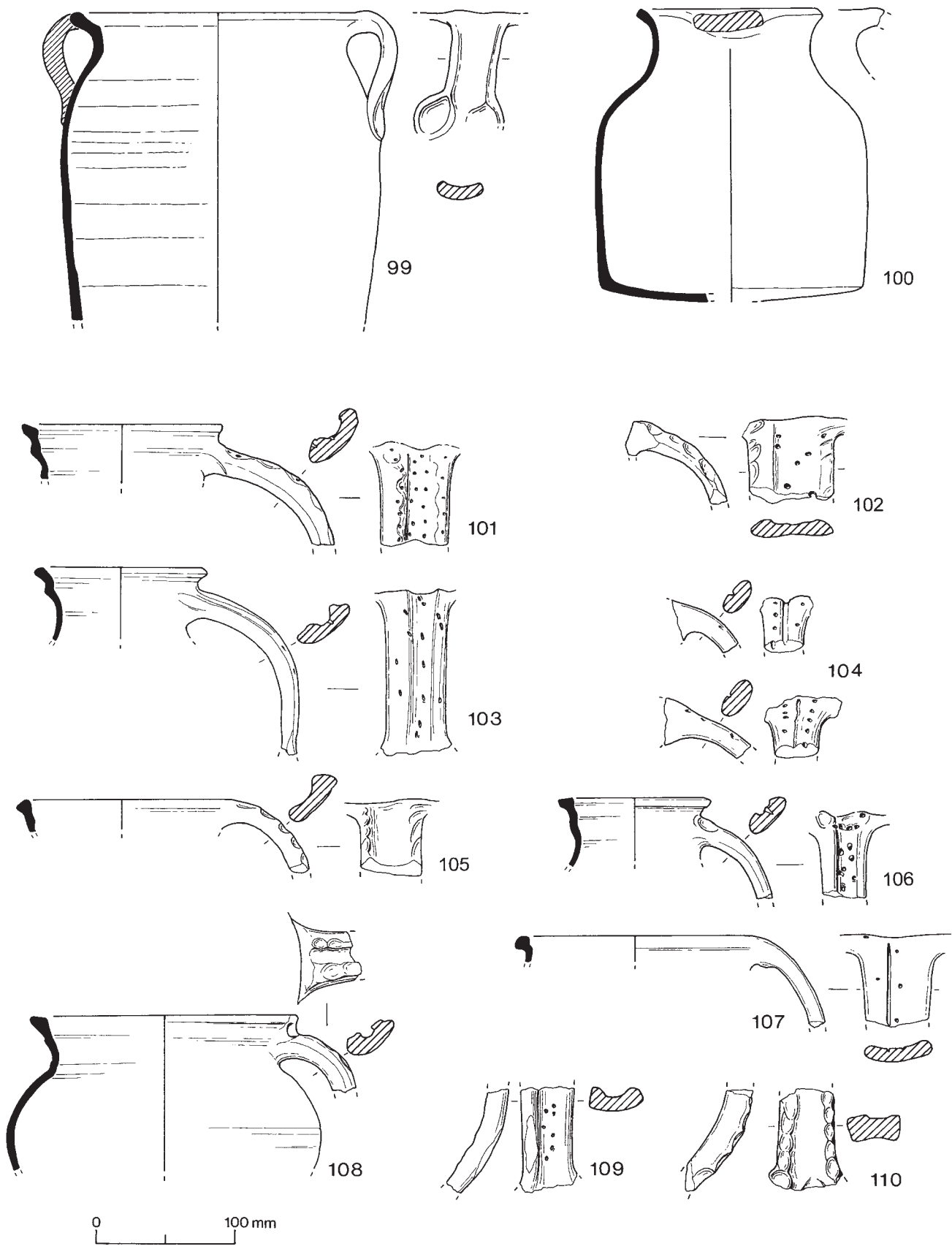


Figure 10.16: Medieval pottery, Shelly coarseware pitchers and handles (99–110)

specific than the balusters, although it is possible that they may represent an earlier form. Squat, wide-mouthed handled vessels occur in most ceramic-using areas of Britain during the early medieval period (see McCarthy and Brooks 1988, 159–207), whereas they are extremely rare after the twelfth century (*ibid*, 208–368). It should be noted the narrow-mouthed globular jugs often occur at the same time. Despite the fact that the SHC jug population at West Cotton is quite small, statistical testing of the rim diameters can be used to test this theory (Table 10.8).

Table 10.8: Mean diameter of Shelly Coarseware jug rims by Phase

Ceramic Phase	Number of examples	Mean rim Diameter (mm)	Standard Deviation (mm)
Ph0	5	152	2.2
Ph1	11	153	8.5
Ph2/0	11	129	4.2
Ph 2/2	13	129	1.6
Ph3/2	10	138	1.9
Ph4	7	128	2.4

The figures for Ph0 show a fairly large mean diameter, with the standard deviation indicating that the rim diameters cluster fairly tightly around that size, with a range of 120–180mm. During Ph1, the mean remains largely unchanged but the standard deviation is much larger, reflecting the broader spread of sizes, a range of 100–240mm. During Ph2/0, the mean diameter drops, with a smaller standard deviation, and although the range is still large (80–240mm), most vessels have a diameter of 120–140mm. By Ph2/2, the standard deviation is very small and the range is reduced to 100–160mm, showing that the rim diameters are tightly controlled and clustering around the smaller mean, as is the case for the later Phases.

This indicates that the wide-mouthed squat jugs are probably an early form (Ph0 – ?early Ph2/0), although testing of a larger population would be of value.

Wide-mouthed pitchers do not occur at any of the coarseware kiln sites discussed above, stressing once again that there are other, probably localized, production centres which await discovery.

The SHC jugs had only two types of pouring mechanism. There were twelve examples of a pulled lip (Fig 10.17, 112) and six had a short tubular spout (Fig 10.17, 111 and 113). The tubular spouts, with one exception, occurred in Ph0 or Ph1 contexts, whilst all the lipped vessels were found in features of Ph2/0 or later, suggesting that this is a valid typological trait, with the spouted vessels representing the final stages of the Saxo-Norman pitcher tradition and the lipped vessels belonging to the later medieval jug tradition. It is noteworthy that the vessels with the tubular spouts all appear to be of the wide-mouthed type discussed above, and that several have smoke-blackening on the outer body.

Illustrations of Shelly Coarseware spouts and lips (Fig 10.17)

- 111 Orange fabric with a grey core. Patches of sooting on the spout and rim bead.
905, LSE3, Ph0
- 112 Orange fabric with a brown-grey core.
1209, BY6
- 113 As (112).
6905, PDL

Illustrations of Shelly Coarseware decorated sherds (Fig 10.18)

- 114 Grey fabric with a buff outer surface and orange inner surface.
4303, S19/1, Ph1
- 115 Orange fabric with buff inner surface. As (66).
6174, E13/5
- 116 Fabric as (99).
343/475, D11
- 117 Three joining sherds. Fabric as (115).
564, C8, Ph1; 1313, LSD15, Ph0

Sandy Coarsewares (SAC)

NDC fabrics W22 (CTS fabric F350) and W49 (CTS fabrics F303 and F304)
(Fig 10.19)

The various SAC fabrics occurring at West Cotton represent a maximum 3.3% of the medieval assemblage during Ph0, falling to around 1% for the rest of the medieval period.

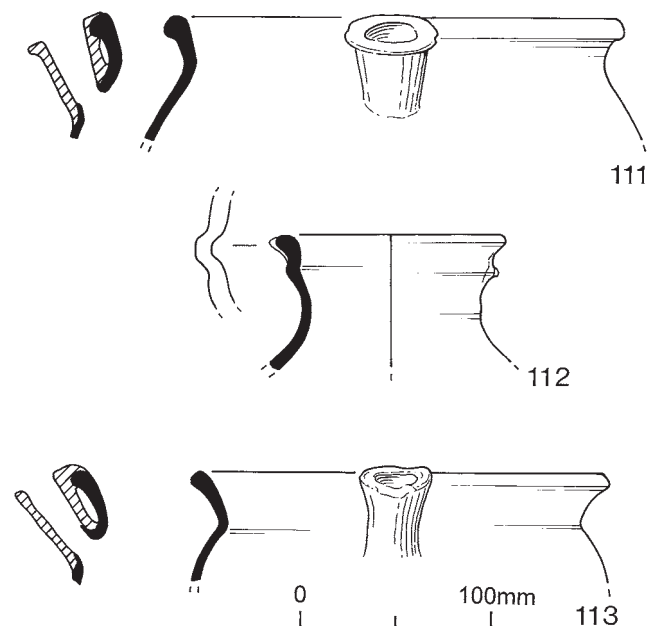


Figure 10.17: Medieval pottery, Shelly coarseware spouted and lipped vessels (111–113)

The sherds all appear to be examples of the local Sandy Coarseware tradition. Both fabrics occur in medieval contexts of all phases, and CTS fabrics F303 and F304 are wheel-thrown.

The large majority of the rims are from jars, although five bowl rims, fragment of two strap handles and two possible decorated pitchers were also present. Several rim

sherds have a characteristic single incised line below the neck carination.

Most of the base sherds were heavily burnt and sooted, and internal limescaling was not uncommon. This may indicate that the vessels were primarily used for the heating of water, the sandy fabric being less porous and possibly having better refractory qualities than the shelly wares.

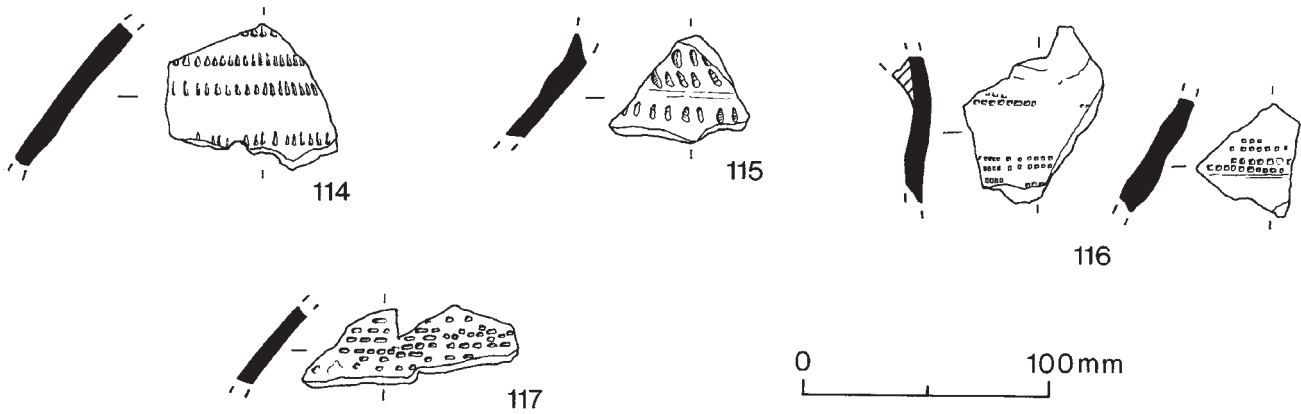


Figure 10.18: Medieval pottery, Shelly coarseware, decorated sherds (114-117)

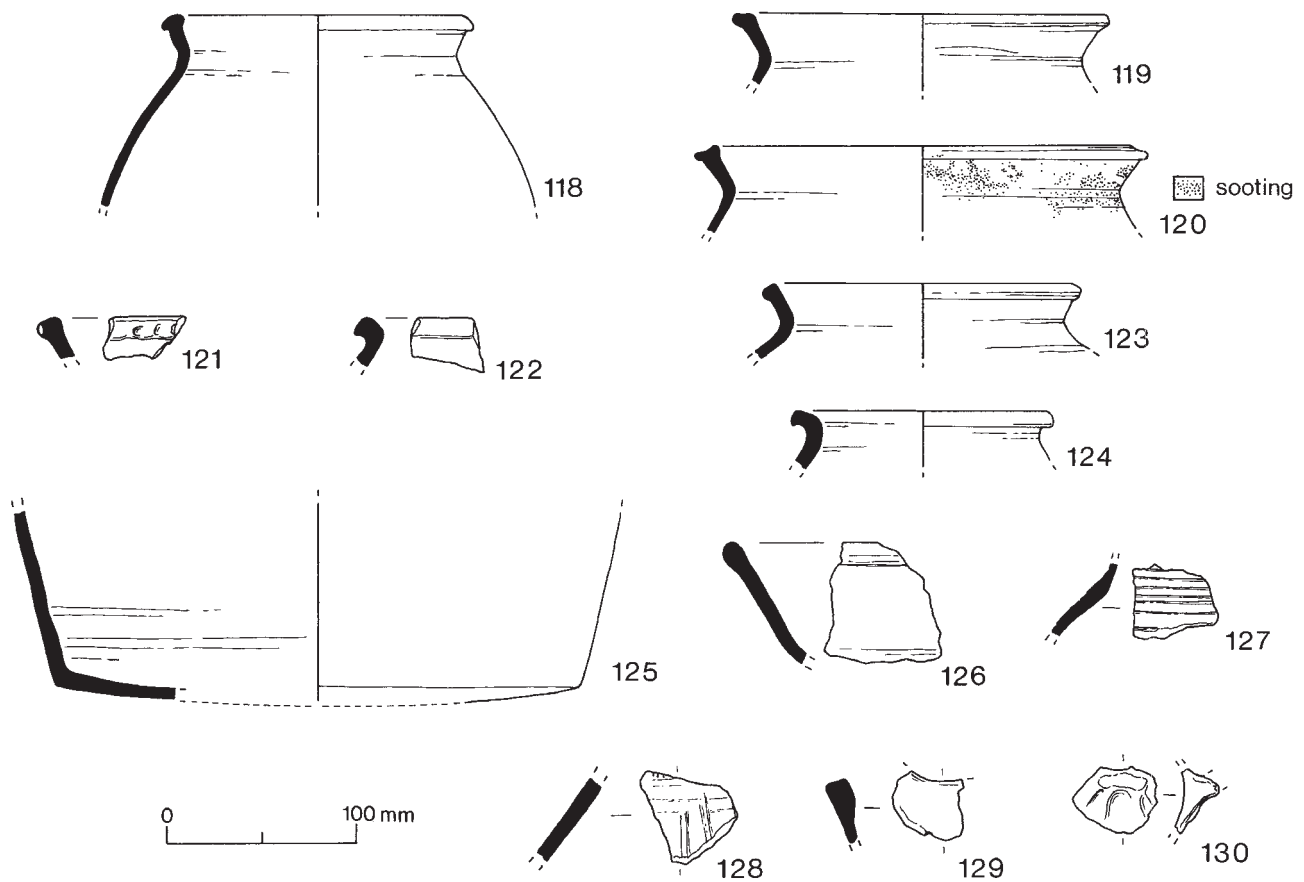


Figure 10.19: Medieval pottery, Sandy coarseware (118-130)

Illustrations of Sandy Coarsewares (Fig 10.19)

- 118 NDC fabric W22. Grey fabric with orange surfaces. Lower external body is sooted.
4449, LSD8; 4884, LSE5
- 119 W22. Grey fabric with orange surfaces. Patches of sooting on both surfaces.
U/S
- 120 W22. Grey fabric with browner surfaces. Outer surface is encrusted with a heavy deposit of soot.
3089, DPITS
- 121 W22. Grey fabric with orange surfaces.
4163, SY1
- 122 W49. Grey fabric with orange surfaces.
13, AY1
- 123 W22. Grey fabric with orange surfaces. Grey patches on outer surface.
3025, U/S
- 124 W49. Light grey fabric with orange-brown surfaces. Outer rim bead is sooted.
1528, BY3
- 125 W22. Grey fabric with browner surfaces. Exterior base pad is burnt black and the interior limescaled.
4216/4252, EY5
- 126 W22. Grey fabric with brown surfaces.
4228, EY5
- 127 W49. As (126). Pitcher?
1645, B4
- 128 W22. As (126). Pitcher?
1644, BY4
- 129 W22. As (126). Strap handle fragment.
6378, EY1
- 130 W22. As (126). Terminal of strap handle.
244, AY1

Lyveden/Stanion wares

CTS fabrics F319, F320, F322, F325
(Figs 10.20–10.27)

The medieval settlements at Lyveden and Stanion in north-eastern Northamptonshire were major centres of pottery production throughout the later medieval period. The wares have a mainly localized distribution in the East Midlands and East Anglia. The wares occur at King's Lynn, which was the major point of export of Grimston Ware to Norway, and a few sherds have been found in the Norwegian towns of Bergen and Trondheim (Reed 1990, 32) in association with Grimston wares, which were exported in quantity there throughout the medieval period (Leah 1994).

The Lyveden and Stanion kilns

At Stanion, two kilns have been excavated, and there have been finds of at least seven waster dumps since 1933, but the evidence is sketchy due to Stanion still being a living village. This has resulted in most of the excavations being carried out in small trenches during building work. None have been fully published. The most recent excavation of waster dumps, in 2002, produced 600kg of pottery that will be a valuable addition to the understanding of the typology

and chronology of this important industry (Blinkhorn 2008). This report also provides an overview of previous work in Stanion, including a description of a kiln excavated in 1990 (Chapman *et al* 2008).

The settlement at Lyveden was deserted at some point in the fifteenth century, and a programme of excavations carried out between 1965 and 1973 discovered a series of pottery and tile kilns, as well as a potter's toft and associated outbuildings (Steane 1967, Bryant and Steane 1969, Bryant and Steane 1971).

Unfortunately, the resulting reports are sadly lacking in detail from a ceramic point of view (see McCarthy 1976) and the vast majority of the pottery was reburied in a large machine-dug pit on the site (B Dix pers comm), so it is highly unlikely that a useful reinterpretation of the ceramic data will be possible.

The two centres produced wares which are very similar in terms of form, fabric and decoration, with any possibility of differentiating between the products of the two centres being impossible at this time. The main products of the industry found at West Cotton consisted of coil-built, wheel-finished, coarseware jars and bowls, tempered with shelly limestone, unglazed and largely undecorated (Lyveden/Stanion A ware, CTS fabric F319), and coil-built, wheel-finished glazed jugs (Lyveden/Stanion B ware, CTS fabric F320) in oolitic limestone tempered fabric, usually with various forms of slip decoration. Dating is very uncertain, but the coarseware production probably started at some time around the middle of the twelfth century, with the first glazed wares appearing during the early part of the thirteenth century. The industry also produced wheel-thrown vessels from about AD1400 (Lyveden/Stanion D ware, CTS fabric F322), but these are extremely rare finds at West Cotton, as the settlement was in severe decline by this time.

For the sake of brevity, the products of both the Lyveden and the Stanion potteries are referred to in this report as Lyveden ware.

Lyveden A ware

NDC fabric T2(2), CTS fabric F319
(Figs 10.20–10.24)

A wide range of fabrics and apparent conservatism of form makes identification of typological parameters very difficult, but there is some evidence from the boundary ditch systems to suggest that it may be possible to identify early Lyveden Coarseware types. Two fabrics, both with a very heavy temper of fairly large pieces of shelly limestone (up to 5mm), and fired to a deep reddish-purple or bluish-grey colour, tend to occur in the stratigraphically earliest of the Ph1 contexts in some of these features, with LSD2, LSD13 and LSD14 all demonstrating this pattern. The few rims occurring in these features all tend to be simple everted thumb-frilled types, eg (Fig 10.20, 139), although plain types do occur in other Ph1 contexts. The tabulation of the stratified rimforms by Phase (Table 10.9) indicates that plain rims do not become the norm until Ph2/0 and

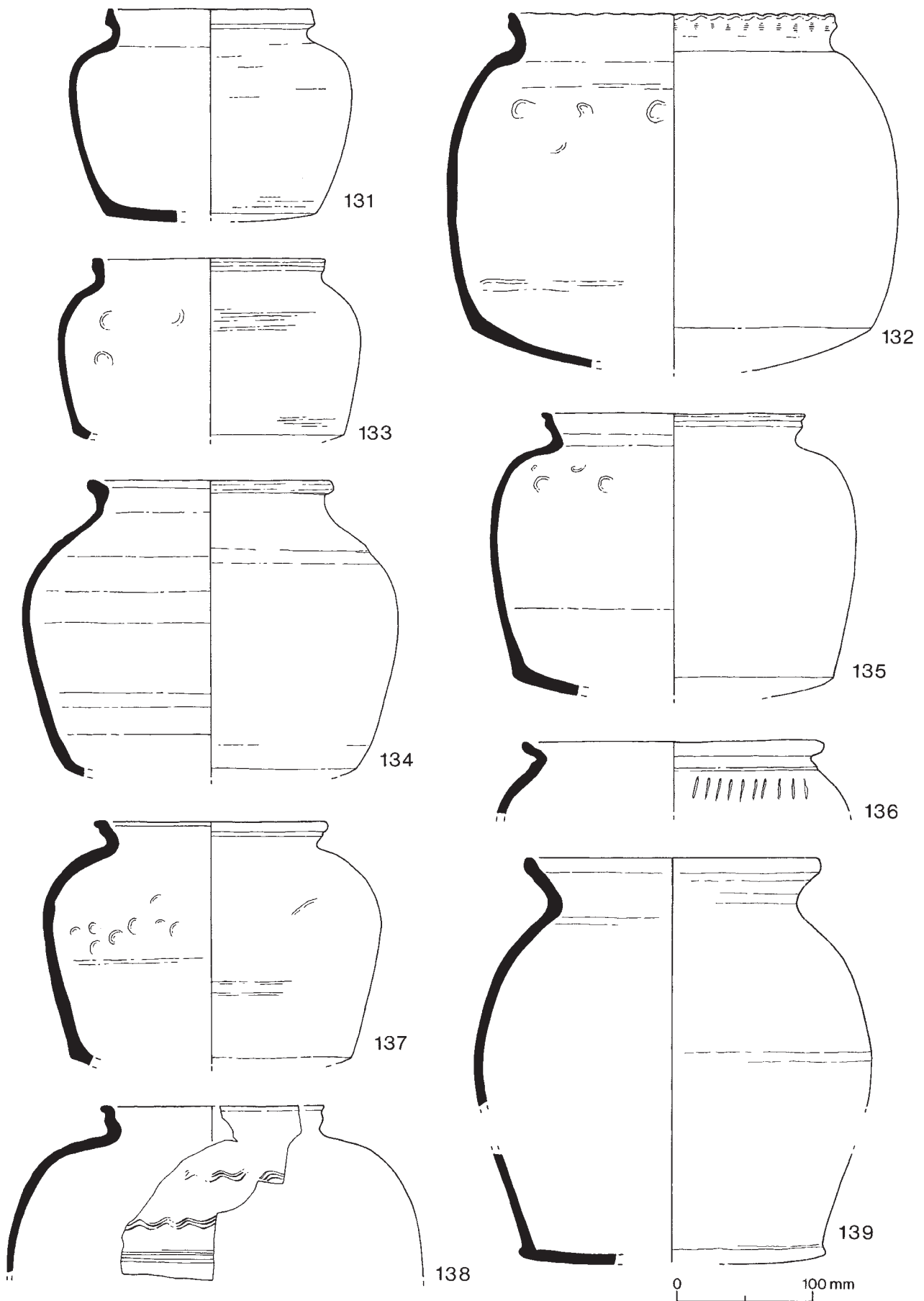


Figure 10.20: Medieval pottery, Lyveden A ware jars (131–139)

later. Whilst colour cannot usually be seen to be a reliable indicator of fabric type, the evidence from Northampton has shown, in the case of the T1(2) St Neots ware (Denham 1985), that it can be a valid typological parameter.

There is also some evidence to suggest development of form, but as only nine vessels of this type were reconstructed to full profiles, caution must be exercised. Two vessels from Ph1 contexts have forms typical of early jar types, being slightly ‘baggy’ and lacking well-developed shoulders (Fig 10.20, 132 and 139). A vessel of this form in the purple fabric with a thumbed rim occurred in a Ph1 context in LSD8. All the vessels from later contexts have a more developed appearance, with quite sharply defined shoulders and tapered lower bodies. It is also worthy of note that none of these later vessels have thumb-frilled rims or the blue or purple fabrics, having finer, less shelly fabrics.

The potential therefore exists for a split of Ph1 into two Phases based on the presence of the later, finer fabrics, but more evidence will be required before this can be advanced with complete confidence. This observation yet again stresses the urgent need for a thorough research programme for the Lyveden industries.

A total of 17 different rimforms occurred on vessels of this type, with a tabulation of their occurrence against time showing a strong conservatism (Table 10.9).

Thumb-frilled rims are not uncommon, with three basic variants: thumbing on the outer bead of the rim, thumbing on the inner bead and thumbing on both beads. A tabulation of their occurrence over time supports the suggestion that thumb-frilled rims are products of the earlier part of the industry (Table 10.10).

Jars

These vessels, apart from SHC jars, are the commonest vessel type at West Cotton. Rim sherds from over 1000 different vessels were noted, although some were too small to enable the rim diameter to be measured, which is the cause of some of the apparent anomalies in the sherd totals in the different statistical analyses. As already noted, there is a correlation between the rim diameter and the volume of these vessels, which has a unimodal distribution with a range of 100–520mm, a mean of 218mm and a standard deviation of 52mm (Figs 10.9 and 10.11).

Table 10.9: Occurrence of Lyveden A Jar Rim Forms by Phase

Rim form	Ph1	Ph2/0	Ph2/2	Ph3/2	Ph4
26 dt	7.9%	0.9	1.7	1.5	0
32 to	26.3	19.7	15.6	22.8	6.5
40 to	0	0.9	1.1	1.0	0
54	2.6	1.7	2.8	0	0
55	0	0.9	2.8	2.5	0
56	2.6	6.0	7.2	3.6	2.2
75 ti	7.9	0	0.6	1.5	0
76 ti	0	0	3.3	2.5	15.2
78	23.7	54.7	61.1	54.8	52.2
80	0	0	0	0	4.3
85 dt	2.6	0.9	0.6	0.5	0
87 ti	18.4	12.8	3.9	8.1	10.9
89 ti	2.6	0.9	1.1	0.5	0
90 dt	0	0	0	0	6.5
258 to	0	0	1.1	0.	0
274 dt	5.3	0.9	0	0	0
281	0	0	0	0.5	2.2
Total	38	117	180	197	46

dt = thumbed on inner and outer of rim bead

to = thumbed on outer of rim bead only

ti = thumbed on inner of rim bead only

Table 10.10: Proportion of Lyveden A ware jar rims by thumbing technique by Phase

Rim form	Ph1	Ph2/0	Ph2/2	Ph3/2	Ph4
Plain	28.9%	63.2	71.1	61.4	65.1
External bead	26.3	20.5	17.8	23.9	7.0
Internal bead	28.9	13.7	8.9	12.7	27.9
Both beads	15.8	2.6	2.2	2.0	0
Total number	38	117	180	197	43

Table 10.11: Lyveden A Jars: Number of rims by diameter

Diameter (mm)	No. of examples
100	3
120	13
140	57
160	99
180	184
200	178
220	169
240	129
260	85
280	57
300	35
320	31
340	11
360	9
380	3
400	3
420	1
440	1
460	1
480	2
500	1
520	1

This indicates that the range of vessels sizes used at West Cotton is what one would expect of a form with many different non-specific functions.

Illustrations of Lyveden A ware jars (Fig 10.20)

- 131 Grey fabric with orange surfaces, heavily blackened base pad, rising about 20mm up from the base carination. Moderate temper of coarsely crushed and ill-sorted shelly limestone up to 4mm. Rare lumps of red ironstone up to 2mm and traces of burnt organic material. Coil join visible on the interior of the upper shoulder.
346, C10, Ph2/2
- 132 Fabric as (131). Lower body and base pad extensively smoke blackened. Many of the inclusions on the inner surface have been leached out, except for the rim and upper shoulder, suggesting that this was caused by material contained in the vessel during its use rather than after deposition. Thumb impressions are visible on the inner shoulder.
689, A3, Ph1
- 133 Fabric as (131). Body from the shoulder and the base pad are extensively smoke blackened.
696, A1/1, Ph2/0
- 134 Fabric as (131), pale orange-pink surfaces. The lower outer body is very heavily smoke-blackened and burnt, with many of the inclusions burnt out.
1030, D12, Ph2/0
- 135 Fabric as (131). Lower body and base are quite evenly blackened.
1567, BY1, Ph2/2
- 136 Decorated rim sherd. Fabric as (131), higher than normal ironstone content.
4292, AY6, Ph2/2
- 137 Fabric as (131). Lower outer body is heavily sooted.
1200, A/B, Ph2/0
- 138 Fabric as (131), but much harder, with brown-grey surfaces.
- Almost all the inclusions on the inner surface have been leached out.
6401/6353/6354, E13/2, Ph3/2
- 139 [NI] Fabric as (131), but slightly 'corky', with many inclusions leached out. Pale brown inner surface, outer surface is brick red, becoming progressively darker until changes to purplish black at the base.
783, AY1/2; 1341, AY6; 1349, LSD4

Decoration

Incised decoration is extremely rare on these vessels, with less than 100 examples occurring, mainly on single sherds. The techniques consist of incised wavy lines, slashing, rouletting, horizontal cordons and comb stabbing. A single sherd with wavy lines is noted at Lyveden site C (Steane 1967, 21). No mention is made of decorated jar sherds at Lyveden site D (Webster 1975), but an unusual, highly decorated bowl and two curfews did occur.

There are decorated sherds in medieval contexts of all Phases at West Cotton, and the absence of cross joins illustrates the scattered and fragmentary nature of the medieval assemblage.

Illustrations of decorated Lyveden A ware (Fig 10.21)

- 140 Hard blue-grey fabric with a paler core. Moderate temper of angular shelly limestone up to 5mm, with sparse sub-angular red ironstone up to 2mm. Some spalling of the surface where the larger inclusions occur.
472, D11/5, Ph2/2
- 141 Soft fabric with orange surfaces, otherwise as (140).
881, CPITS, Ph3/2
- 142 Fabric as (140), but finer inclusions and no spalling.
760, DY2, Ph2/0; 3043, DFRONT, Ph3/2
- 143 Fairly soft buff fabric with a grey core. Inclusions mainly quite fine (less than 1mm), but with a few larger ones up to 3mm.
6472, EY1, Ph2/2
- 144 Patchy red and dark purple fabric with heavy temper of shelly limestone up to 5mm. Sparse red ironstone up to 2mm. Early Fabric?
2049, LSD14, Ph1
- 145 Hard, brown fabric with fairly rough surfaces. Otherwise as (140) without the spalling.
449, AY1, Ph4
- 146 Soft, buff, slightly sandy fabric with sparse shelly limestone up to 3mm.
449, AY1, Ph4
- 147 Soft orange fabric. Moderately heavy temper of fine to medium limestone up to 3mm.
656, C10, Ph2/2
- 148 Fabric as (147).
668, CPITS, Ph3/2

Bowls

Like the SHC vessels, the Lyveden A coarseware bowls appear to demonstrate a consistency of form throughout the medieval period, generally having tapered bodies, with

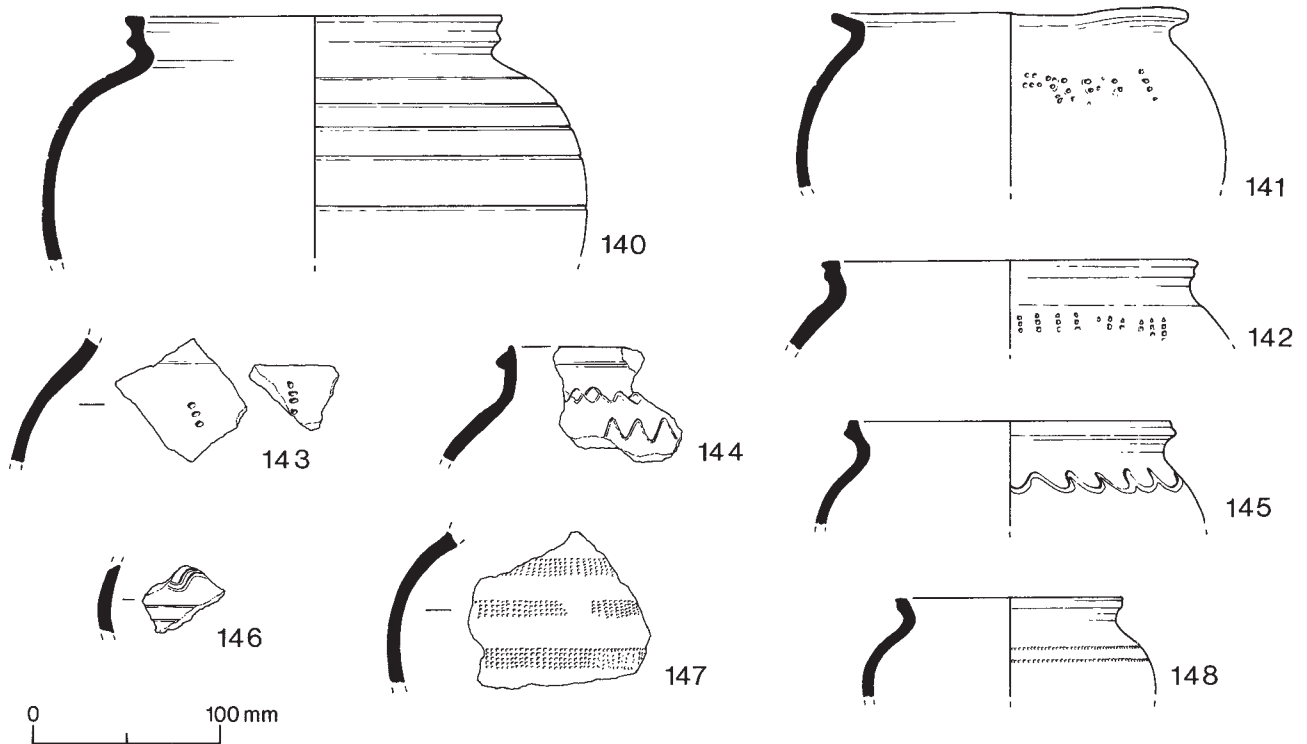


Figure 10.21: Medieval pottery, Lyveden A ware jars (140–148)

slightly sagging bases. The rim diameters also demonstrate a trimodal distribution, suggesting that they too had certain sizes which were favoured by the consumers at West Cotton (Fig 10.12).

They have a limited range of rimforms, which are similar to those of the jars, except the thumbed examples usually have the impressions below the upper rim bead. The figures for rimform occurrence are fairly inconclusive (Table 10.12). Forms without thumbing become more common through time, but both groups occur throughout the medieval period. There are no examples of decoration apart from thumbing, although some vessels are pierced, eg (Fig 10.23, 161 and 162). This was usually carried out post-firing.

Table 10.12: Lyveden A ware bowls: Rimform type occurrence by Phase

Form	Ph1	Ph2/0	Ph2/2	Ph3/2	Ph4
78	26.9%	29.4	57.1	53.5	0
86	0	0	0	4.7	53.3
211 t	46.2	58.8	33.3	41.9	53.3
241 t	26.9	11.8	7.1	0	26.7
243	0	0	2.4	2.3	20.0
total	26	17	42	43	15

t = thumbed

Illustrations of Lyveden A ware bowls (Figs 10.22 and 10.23)

- 149 Fabric as (140), but with greyish-brown surfaces. Patches of soot on the outer surface.
549, BY6, Ph2/0
- 150 Fabric as (140), but with purplish-brown surfaces. Rows of fingertip impressions on the inner surface appear to be the result of the manufacturing technique rather than an attempt at decoration.
390, PMED
- 151 Fabric as (150). Lower outer body is quite heavily abraded.
619, A1/1, Ph3/2
- 152 Fabric as (149). Heavily blackened and sooted outer surface.
684, PM2
- 153 Fabric as (149). Centre of base pad is burnt black on both sides.
471/472, D11/5, Ph2/2
- 154 Fabric as (149). Outer surface blackened.
308, CY1, Ph2/2
- 155 Fabric as (149). Outer surface is extensively blackened and sooted
1621, BY6, Ph2/2
- 156 Fabric as (149). Rare large fragments of ironstone up to 5mm.
4248, EY3, Ph2/2
- 157 Fabric as (149).
6297, E13/2, Ph3/2
- 158 Fabric as (149), with lighter patches on the outer surface.
6258, AY6, Ph 3/2; 6262, EY3, Ph2/2

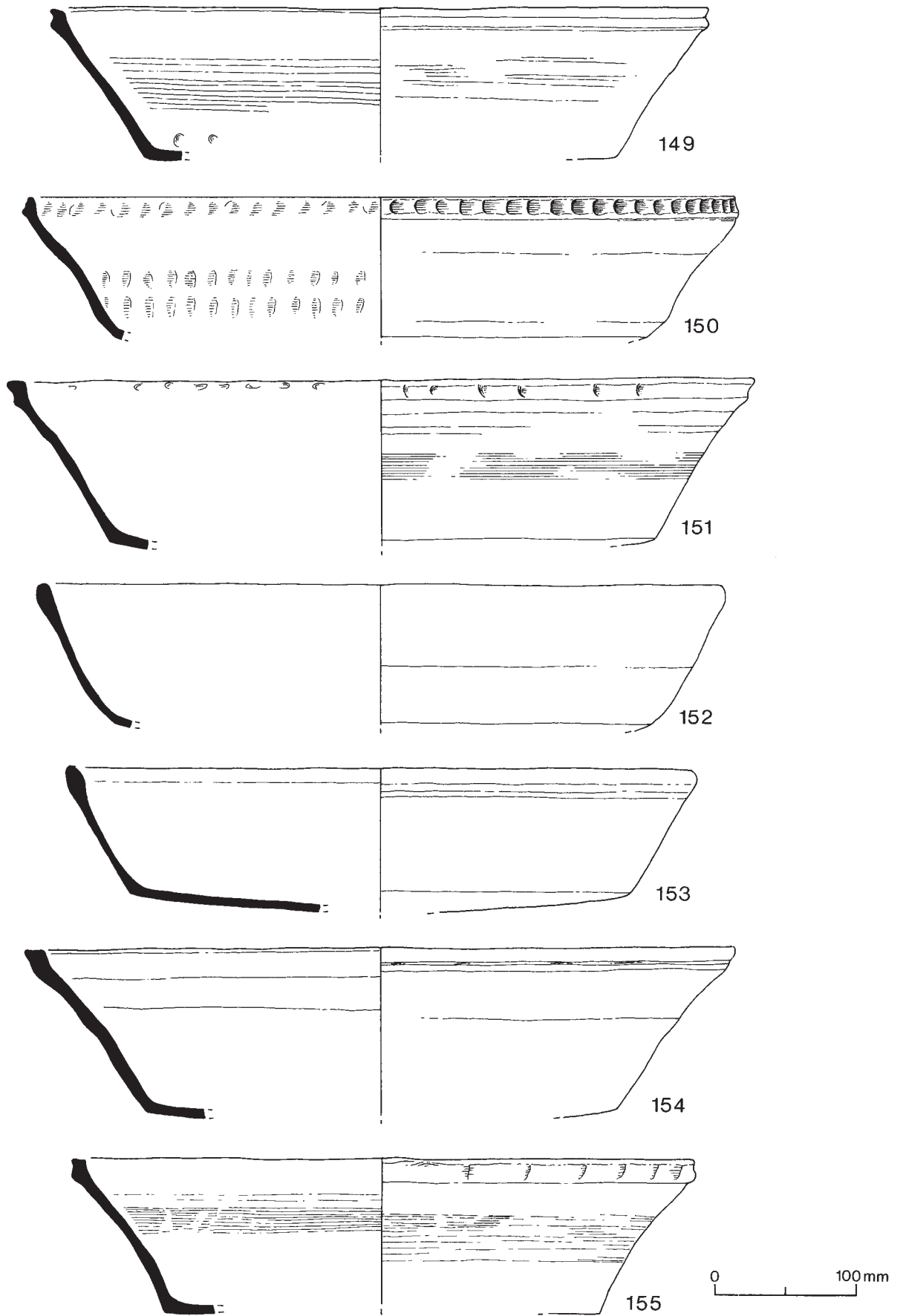


Figure 10.22: Medieval pottery, Lyveden A ware bowls (149–155)

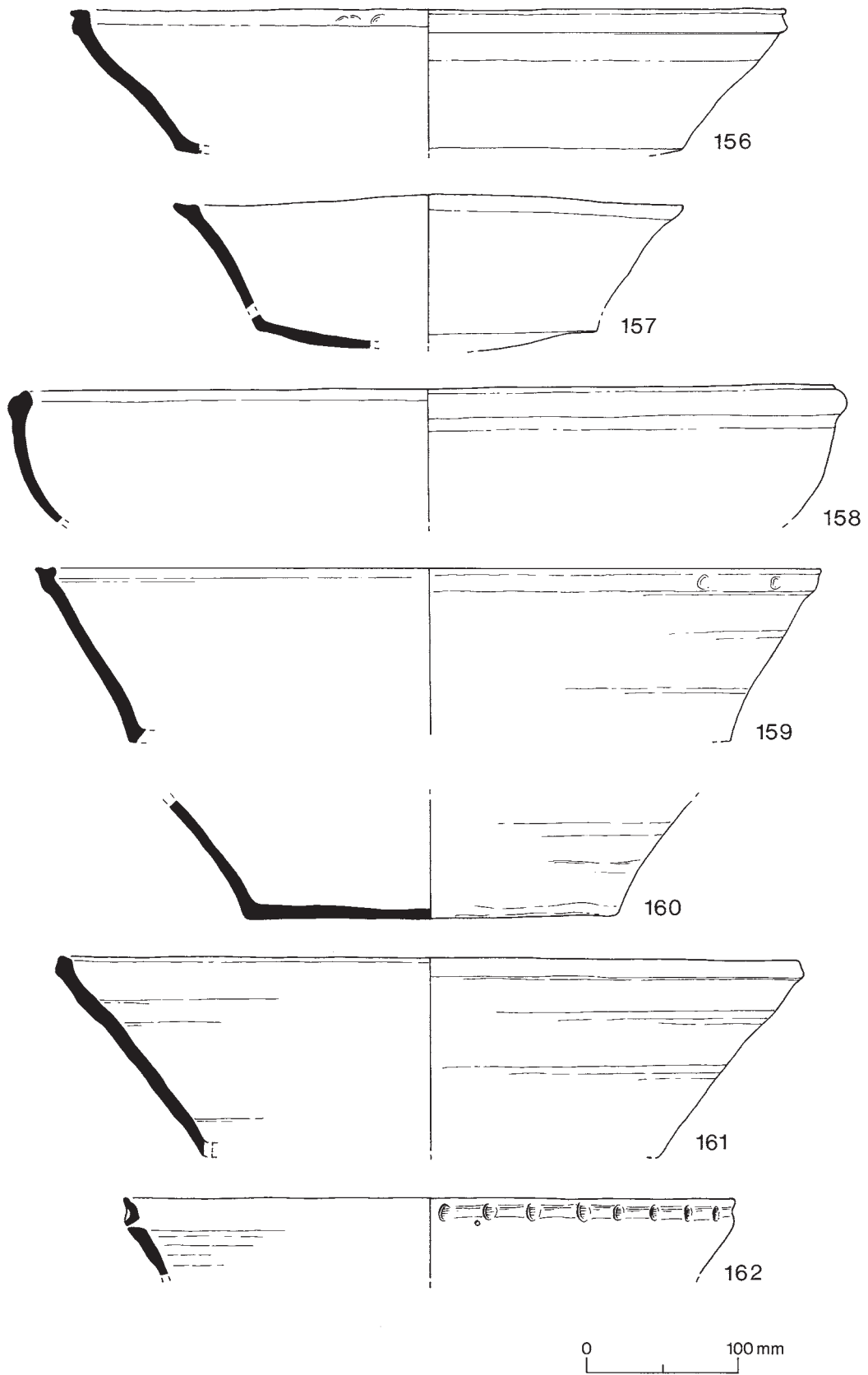


Figure 10.23: Medieval pottery, Lyveden A ware bowls (156–162)

- 159 Fabric as (149), without the ironstone. Dark grey-brown outer surface, red-brown inner surface.
1152, BY6, Ph2/2
- 160 Fabric as (149). Soft, brick red with a grey core. Surface flaking away in places.
914, C8/2, Ph3/2
- 161 Orange red outer surfaces with a grey core. Single hole pierced pre-firing at the base angle.
1567, BY1, Ph2/2
- 162 Brown fabric with grey core. Outer body is smoke-blackened below the carination.
1525, BY4, Ph2/2

Jugs

Despite the occurrence at West Cotton of unglazed coarseware jugs in what appears to be Lyveden A fabric, none of the published Lyveden or Stanion kilns note the presence of such vessels. Whether this is due to the inadequacy of the reports in the case of Lyveden or the lack of publication in the case of Stanion is unclear, but it is possible that the vessels were made elsewhere. It has already been noted that there is great similarity on a macroscopic level between Lyveden coarseware and that from kilns at Harrold and Olney, with form differences often the only way of differentiating between the wares. The evidence from the publications from the latter kilns is also inconclusive, as there are similarities of form, but they are not of sufficient strength to enable differentiation of source of manufacture. Once again, this problem will only be resolved when a full programme of analysis and publication of the backlog of unpublished medieval kilns in Northamptonshire has been undertaken.

Decoration of these vessels is extremely rare, with the illustrated vessels (Fig 10.24, 164 and 165), being the only examples.

There are differences of form when compared to the SHC jugs. The wide-mouthed SHC form does not occur, and spouted vessels are unknown. A plot of the rim diameters demonstrates a unimodal distribution, with a mean of 130mm (range 80–180mm) and a standard deviation of 2.2 (n = 47), indicating a high level of standardization.

The rim forms all tend to be upright with a slight external bead, and the handles are usually strap forms.

Illustrations of Lyveden A ware jugs (Fig 10.24)

- 163 Red-brown fabric with a grey core. Outer surface of the lower body is extremely damaged.
- 164 Light brown fabric with a grey core.
339, DY1; 349, D11/2; 474, D11/5, Ph 3/2.
- 165 Grey fabric with browner surfaces.
4229, EY3, Ph 3/2?

Storage vessels

These vessels are basically large jar forms, but with applied strips of body clay, usually with a single row of thumbing, running down the outside of the pot. It was not possible

to reconstruct any of these to a full profile, but some of the more complete vessels show that the rim diameters are considerably larger than on those without applied strips (Fig 10.24, 166 and 168).

Such vessels are relatively rare, with only 14 rims occurring at West Cotton, although they occurred in medieval contexts of all dates from Ph1 onwards. The rim diameters range from 240–500mm, with a mean of 313mm and a standard deviation of 74mm, compared with a mean of 218mm and a standard deviation of 52mm for jars without the applied strips. There were no vessels like the lug handled storage jar found at Lyveden site D (Webster 1975, 64, fig 1.02). That vessel, a bowl and two curfews with applied strips were the only such vessel at that site. Applied strips are found on some of the vessels from kiln D1 at Lyveden (Adams 1969), but few are illustrated and there is no indication given of the number involved. Six examples were found at kiln C at Lyveden (Steane 1967, 23, fig 6 a-f), one of which does bear a strong resemblance to a sherd from West Cotton (Fig 10.24, 167), dated to Ph3/2.

Sherds of such vessels have a reasonably even distribution in and around the tenement buildings and yards, indicating that they probably did not have any particularly functional-specific usage favouring industrial processes or the domestic context.

Illustrations of Lyveden A ware storage vessels (Fig 10.24)

- 166 Fairly hard, pale orange-brown fabric with a grey core. Fairly sparse limestone inclusions up to 3mm, very scarce sub-angular ironstone up to 2mm. Most of the limestone protruding from the surface is leached out.
549, BY6, Ph2/0.
- 167 Fabric as (166). Soft orange-brown fabric with a grey core.
516, AY2, Ph3/2.
- 168 Fabric as (166), although the inclusions are larger and more densely concentrated. Fairly soft, orange fabric with a browner core. Crudely wiped outer surface.
1002, D11/5, Ph2/0.

Shell tempered coarsewares: typological summary

- Ph0: Plain strap handles only on pitchers
- Ph0 to end Ph1: Short tubular spouts only on pitchers. Lifespan of wide-mouthed pitcher forms.
- Ph1: Earliest Lyveden A fabrics, deep reddish-purple or blue-grey in colour, usually with thumb-frilled rimforms. Baggy, unshouldered body forms. First decorated handles on shelly pitchers/jugs.
- Ph2/0: Pulled lips on jugs. End of THP production. Lyveden A jars tend toward shouldered forms, thumbed rims become less common.

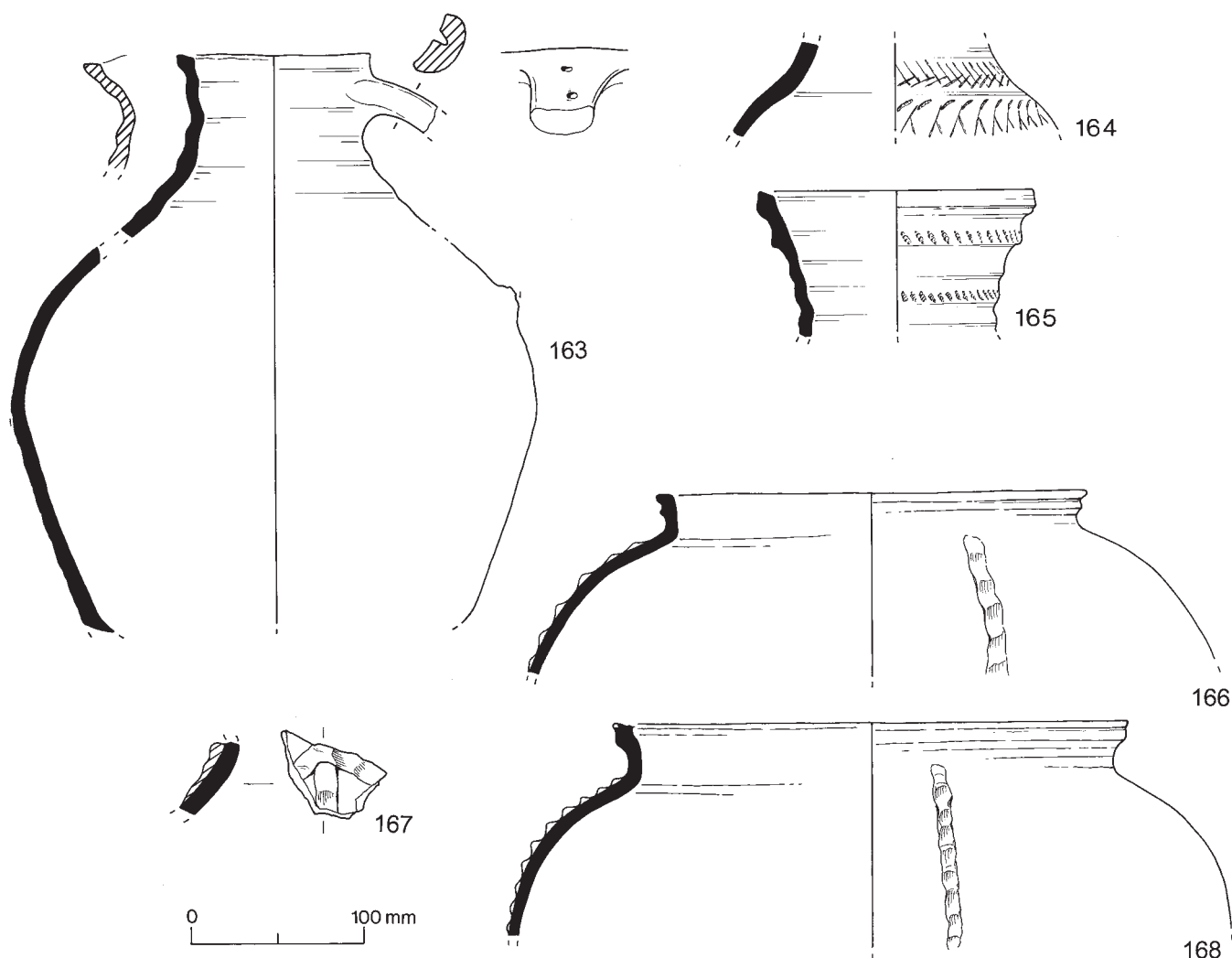


Figure 10.24: Medieval pottery, Lyveden A ware jugs (163–165) and storage vessels (166–168)

Lyveden B glazed ware

CTS fabric F320

This generic term encapsulates the coil-built, wheel-finished glazed jugs in oolitic limestone tempered fabric. Dating is very uncertain, but the first glazed wares probably appeared during the first half of the thirteenth century. In addition, two glazed jars and two unglazed bowls in the same fabric were recovered.

Jugs

Decoration

Most jugs of this type are decorated, usually with vertical or diagonal white slip stripes, or applied strips of white firing clay or body clay. They are commonly accompanied by stamped pads (Plate 3). Other, rarer forms of decoration do occur, see below.

Evidence of manufacture of vessels decorated in this

manner are rare at the kiln sites. A large fragment of a jug with near-vertical slip stripes and stamped pads was found west of the workshop at site D (Bryant and Steane 1969, 26, fig 9), but the pottery associated directly with the kiln is all unglazed coarseware, making it highly unlikely that vessels of this type were manufactured there.

It is reported that vessels of this type were one of the main products of the Lyveden kilns (Steane and Bryant 1975, 63), but as no specific examples are illustrated or discussed it is difficult to draw any firm conclusions. However, a number of dated vessels from sites away from the manufacturing centre are known (Steane and Bryant 1975, 90), suggesting that vessels with this form of decoration were in use from the early thirteenth century to the fourteenth century.

The stamp motifs are almost all cross-hatched round grid types (Fig 10.26, 175), with the exception of two different examples of stylised 'cartwheels', (Fig 10.26, 177 and 179), and a single vessel with a ring-and-dot motif

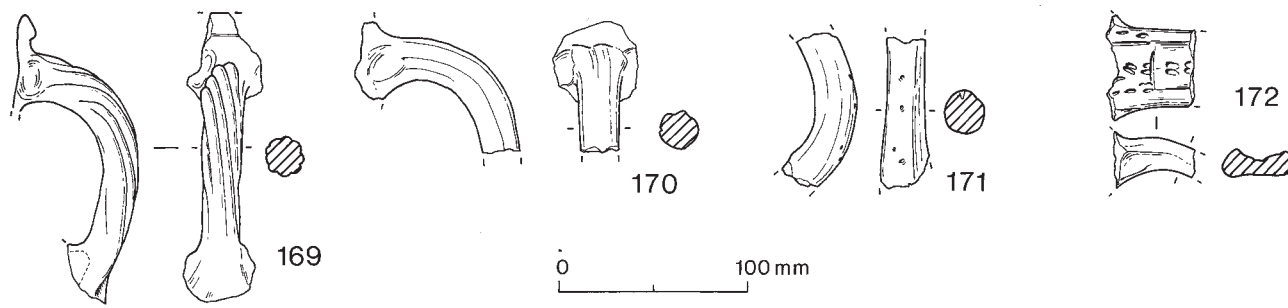


Figure 10.25: Medieval pottery, Lyveden B glazed ware handles (169–172)

(184). Incised decoration is extremely rare, and is limited to three vessels, (181 – 183).

A fragment of a facemask occurred at site C at Lyveden (Steane 1967, 18, fig 3.g), and an unprovenanced, imported, anthropomorphic vessel was discovered at site J (Steane and Bryant, 1975, 87, fig 34.8.01), although this jug did not have a facemask. Three rim sherds from two different vessels with this unusual form of decoration were found at West Cotton in contexts of Ph2/0 date, (Fig 10.26, 173 and 174), indicating that vessels of this type date to the early part of Lyveden/Stanion production. Three very similarly decorated rim sherds occurred at Isham, Northamptonshire (Fox 1976, fig 30, 258–60). Several vessels with similar decoration have been noted from excavations at the Gordon's Lodge Field School, Hanslope, and others more recently in Northampton, suggesting that such vessels are probably not of exceptional status.

Slip decoration is also found on other rare vessels such as aquamaniles and glazed jars. Two Lyveden/Stanion aquamaniles are known, one from Furnells, Raunds (Pearson 1983 and Pearson 2009, fig 6.8) and the other from Twywell, Northamptonshire (Nenk and Walker 1991). Aquamaniles are absent from the West Cotton assemblage, suggesting that in rural contexts they are largely associated with higher status sites, being basically an item belonging to the formal table, rather than having a mundane usage.

Handles

Twisted Rods (Fig 10.25, 169)

Twelve handles of this type were found; one was unstratified, the rest came from all phases from Ph2/0 to Ph4, but with only a single example from the earliest of these phases. A fragment of a handle of this type was found at a kiln in Stanion (Bellamy 1983, 157, fig 3.26), although it was stabbed as well as twisted.

Ridged Rods (Fig 10.25, 170)

Thirty-two examples occurred; five were unstratified, twelve from Ph3/2, and one from Ph4.

A further 14 came from contexts of similar late medieval

date, but within small assemblages that had earlier ceramic phase dates. There are no published examples of handles of this type from any of the Lyveden/Stanion kilns.

Stabbed Rods (Fig 10.25, 171)

Eighteen handles of this type were found; one was unstratified, four were from Ph2/2 contexts and the rest from Ph3/2. The earlier examples are in good condition, indicating that the RSP date is valid. Handles of this type were found at a kiln in Stanion (Bellamy 1983, 157 figs 3.24 and 3.25), and in association with Lyveden kiln C (Steane 1967, fig 1a)

Stamped Straps (Fig 10.25, 172)

A single example from tenement A represents the only strap handle positively identified as B ware from the site. The context dates to Ph2/0, but as other apparently contiguous groups date to Ph3/2, this early date must be regarded with caution.

Spouts

All the jug rim sherds from West Cotton which had remnants of the pouring mechanism possessed simple pulled lips.

Illustrations of Lyveden B ware glazed jugs (Fig 10.26)

- 173 Two rim sherds from the same vessel. Grey fabric with orange-brown surfaces, green glaze, white slip.
- 174 Rim sherd from vessel similar to (173). Brown surfaces. This sherd lacks the knife cut 'mouth' on the facemask.
- 175 Jug with vertical slip trails and stamped pads. Orange fabric with grey core, green glaze with white slip appearing yellow under the glaze.
1627, BY1, Ph2/0
- 176 Shoulder and lower rim from a jug. Grey fabric with more orange inner surface. Patchy green glaze, with arches in white slip which appears orange through the glaze.
4155, EY3, Ph2/2; 4247, E16, Ph2/0?; 6197, EY3, Ph3/2; and 6203, PM2, Ph3/2

- 177 Sherd from the lower body of a jug. Grey fabric with orange brown inner surface. Vertical applied strips in the body clay, poor quality dark green glaze. 696, A1/1, Ph2/0
- 178 Sherds from the lower body of a jug. Uniform grey fabric with orange staining on the inner surface. Patchy green glaze, slip stripes appear dark greenish-yellow through the glaze.
- 179 Grey fabric with orange surfaces. Dark green glaze, with the slip appearing pale olive green through the glaze. 375, C9, Ph3/2
- 180 Sherd from the neck of a jug. Grey fabric with a bright orange inner surface. Pale olive green glaze, slip appears yellow through the glaze. 5098, LEATS, unstratified
- 181 Body and base from a jug. Grey fabric with dark yellow-brown surfaces. Dark olive green glaze. 402, AY1, Ph3/2; 1508, BY1, Ph2/2
- 182 Body sherd from jug. Grey fabric with pale orange-brown inner surface. Decoration is incised across a vertical stripe of white slip. Patchy olive-green glaze. 714, CY1, Ph3/2
- 183 Body sherd from jug. Grey fabric with orange-brown surfaces. Decoration is incised into a light blue-grey firing, oolith-free slip strip. Olive-green glaze. 249, A2, Ph2/2
- 184 Fragment from the shoulder of a highly decorated jug, the applied strips and stamped pellets are in the body clay. Grey fabric with yellow-brown inner surface. 684, PM2; 1557, BY1; both Ph2/2

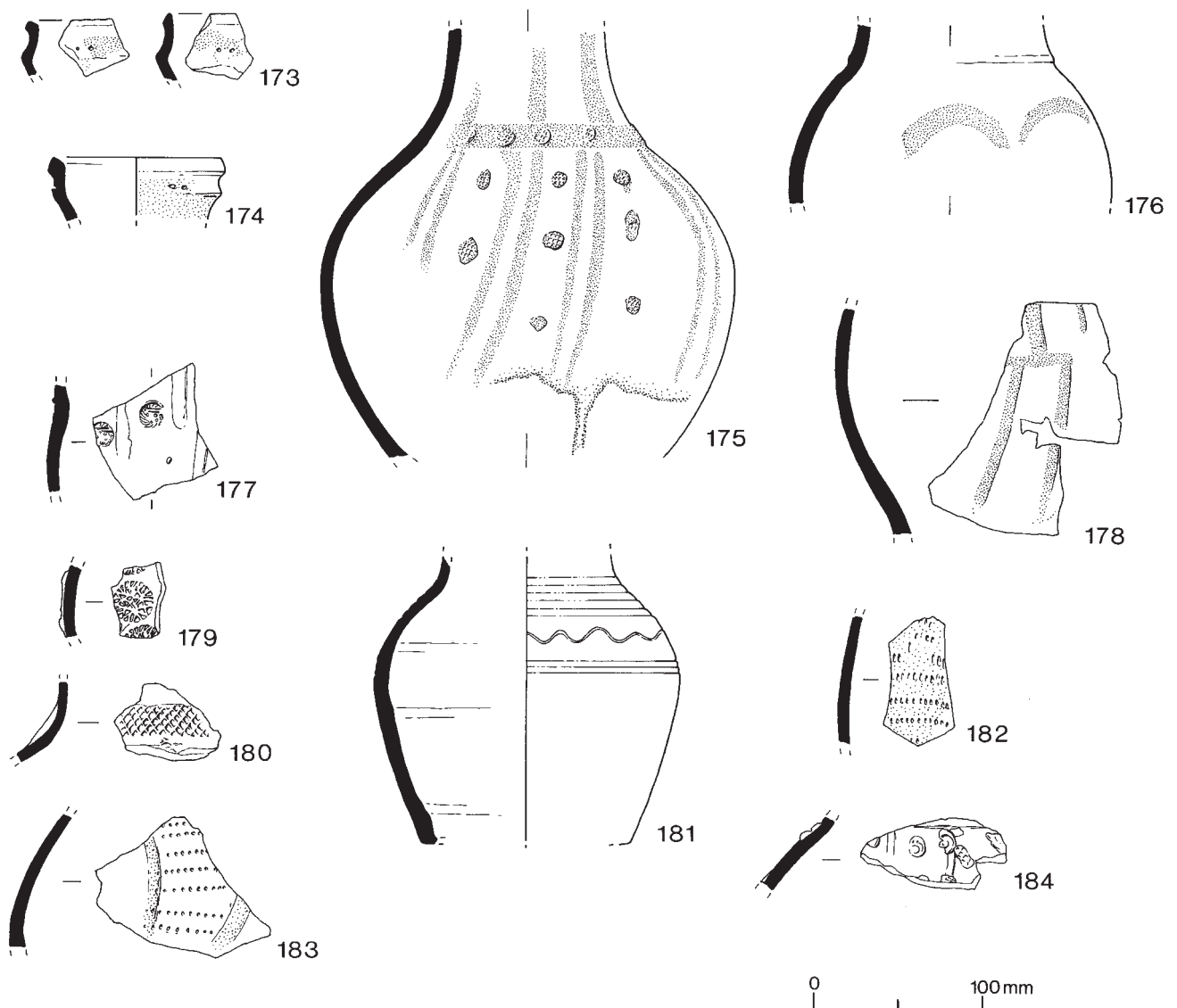


Figure 10.26: Medieval pottery, Lyveden B glazed ware jugs (173–184)

Jars

Two glazed jars in this fabric were found at West Cotton, and vessels of this type generally are very rare. None are known from the kiln sites, although glazed jars in the wheel thrown D fabric do occur at both centres.

the rim circumference oval rather than round (Plate 4).

649, DY1, Ph3/2

186 Rim and body fragments, patchy green and orange glaze both internal and external. Slip appears yellow through the glaze (Plate 3).

1542/1554/1557, BY1, Ph2/2

*Illustrations of Lyveden B ware glazed ware jars
(Fig 10.27)*

185 Blue-grey fabric with orange surfaces. Moderately heavy temper of white ooliths *c*1mm, with occasional lumps of red ironstone up to 7mm. Thin green glaze on the lower interior body and base pad. Slightly unevenly made, with

Bowls

Three bowl rims in type B fabrics were found at the site. They are unglazed, and other than the fact they are in the oolitic fabric and are somewhat harder, are unremarkable when compared to the vessels of the same type in the shelly A fabric.

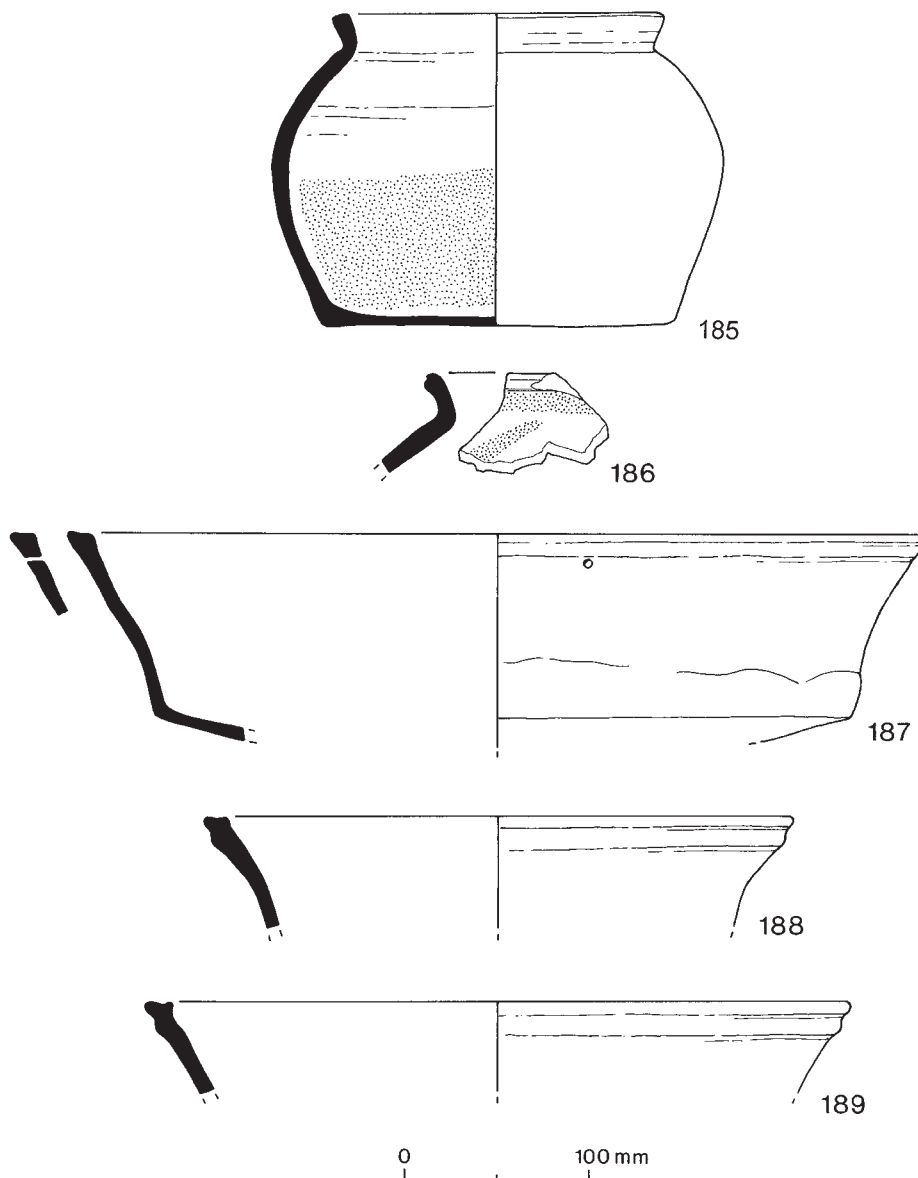


Figure 10.27: Medieval pottery, Lyveden B glazed ware jars (185–186) and bowls (187–189)

Illustrations of Lyveden B ware bowls (Fig 10.27)

- 187 Light brown fabric with darker surfaces and a grey core. Moderate temper of white ooliths and sparse irregular lumps of red ironstone up to 3mm. Small hole drilled post-firing just below the rim.
6291, EY2, Ph2/2
- 188 Grey fabric with orange brown surfaces.
6182, E13/2, Ph3/2
- 189 Grey fabric with pale orange brown surfaces.
6538, EY4, Ph3/2

Cross joins

Despite the fact that it was not possible to reconstruct any full profiles of Lyveden ware jugs, a relatively large number of cross joins were achieved. A total of 75 individual vessel fragments had joins between different contexts. Most were from the same or adjacent grid squares, but some were from relatively long distances, the most extreme being between a context in the tenement C/D malthouse, C10, and a context in tenement E, a total distance of 55m (Fig 10.29, C, no.1). Another vessel had four joins ranging across tenements E, A, and B, over a total distance of 65m (Fig 10.28, A, no. 3).

The relatively high number of cross-fits is possibly due to the fact that the distinctive slip-decorated glazed wares are more conducive to the process of cross-fitting than coarsewares. The explanation for the process of sherd distribution within a single yard would appear to be that the household refuse was being deposited in midden heaps in the yard areas, although the mechanics involved in scattering sherds of the same vessels across 65m of the site and into different tenements are not clear. Some of the more significant cross joins have been illustrated (Figs 10.28 and 10.29).

Possible Lyveden/Stanion wares

Two glazed jugs possessed some of the attributes of Lyveden/Stanion ware, but could not be provenanced with certainty. Both were atypical in terms of glaze and form, but the fabrics, leaching notwithstanding, were very similar, being typical other than the colour, which was white. The vessel with a burnt base pad possessed a more typical colouration around the scorched area, being reddish-brown with a grey core (Fig 10.30, 190). In the balance, it would appear that these vessels originated in the Lyveden/Stanion region, but, once again, further research is vital to eliminate doubts.

[*Editor's note:* Similar vessels have been recovered from waster pits at Stanion (Chapman *et al* 2008, 248–249, fig 230).]

Illustrations of possible Lyveden/Stanion wares (Fig 10.30)

- 190 White fabric with slightly pinker surfaces. Many ovoid voids, probably from leached out ooliths. Rare sub-rounded white

quartzite up to 1mm, occasional sub-rounded red-ironstone up to 5mm. Base is scorched, with the fabric grey with orange surfaces in this area. Mottled green glaze, with many partially dissolved copper filings present. This, along with the thumb-frilled base is extremely unusual. A vessel similar to this was found during excavations at Isham, Northants (Fox 1976, fig 26.222).

- 191 White fabric with pink surfaces, otherwise as (190). Pale yellowish green glaze.

Lyveden D ware

CTS fabric F322

Several of the kilns at Lyveden and Stanion were known to be producing wheel-thrown, glazed undecorated jugs of this type (eg G Cadman pers comm, unpublished kiln at Stanion excavated in 1990, see Chapman *et al* 2008).

Most of the West Cotton material consists of small sherds from individual vessels, with little worthy of illustration. A total of 239 sherds of the ware occurred, demonstrating the low level of activity (in ceramic terms) in the settlement by Ph4. The illustrated vessel is the most complete from the site and was found in yard AY1, providing further evidence that occupation continued in this part of the hamlet after the majority of the settlement had been abandoned (Fig 10.30, 192).

Illustration of Lyveden D glazed ware (Fig 10.30, 192)

- 192 Upper part of jug. Hard, grey fabric with brown surfaces, uneven and patchy covering of dark green glaze which fades out towards the waist of the vessel. A few spots occur on the inner surface. Few visible inclusions except for sparse white ooliths up to 2mm, with some spalling where the inclusion are near the surface of the vessel. Very rare sub-angular grey quartzite up to 2mm.

Brill/Boarstall wares

NDC fabric W14; CTS fabric F324
(Fig 10.31)

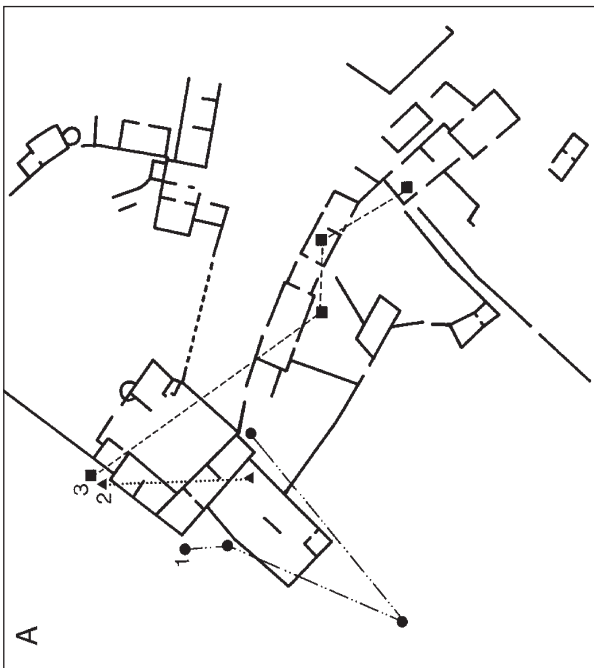
There were over 900 sherds of Brill/Boarstall ware, from the villages near the Buckinghamshire border, east of Oxford. Like the Lyveden/Stanion wares it was not possible to reconstruct the complete profile of a single vessel.

All the sherds appear to be from highly decorated jugs of thirteenth to fourteenth-century type, usually with various forms of applied decoration, as well as some stamping and rouletting. Three jug forms occurred in Northampton, namely, baluster, biconical and 'three stage' (McCarthy 1979, 161). All these forms were found at West Cotton.

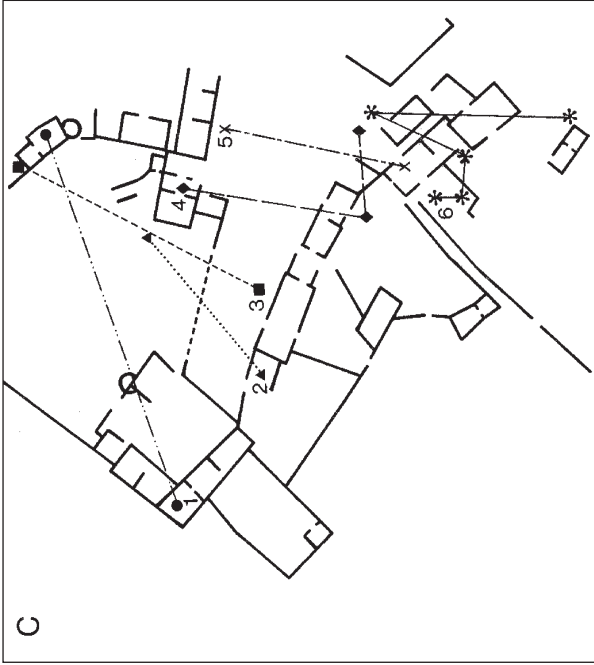
Illustrations of Brill/Boarstall ware (Fig 10.31)

- 193 Buff fabric with a variegated orange/blue grey core. Heavy temper of subrounded, iron-rich, quartzite *c* 0.5mm. Decorated with short vertical strokes of iron slip and thin

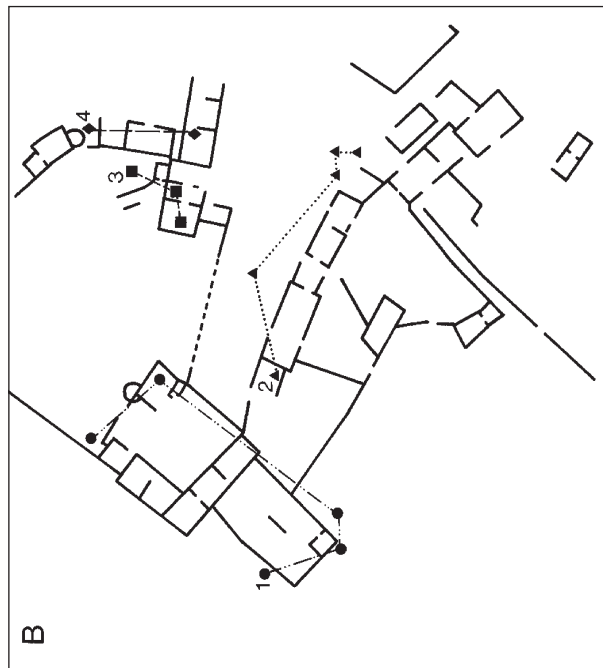
1. Ph. 3/2; Ph. 3/2;
Ph. 3/2; Ph. 3/2
2. Ph. 2/0; Ph. 3/2;
Ph. 3/2; U/S; Ph.
3/2
3. Ph 2/0; Ph. 2/0



1. Ph. 2/0; Ph. 2/2
2. Ph. 2/2; U/S
3. Ph. 3/2; Ph. 2/0
4. Ph. 3/2; Ph. 2/2;
Ph. 2/0
5. Ph 2/2; Ph. 4
6. U/S; Ph 2/0;
Ph. 2/2; Ph 2/0;
P/MeD; Ph 2/2;



1. Ph. 2/2; Ph. 2/0;
Ph. 2/2; Ph. 2/0;
Ph. 2/0
2. Ph. 3/2; Ph. 2/0;
Ph. 2/0; Ph. 2/0;
Ph. 2/0
3. Ph 3/2; Ph. 3/2;
Ph. 2/2
4. Ph 2/0; Ph. 2/2



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3. Ph. 2/0; Ph. 2/0
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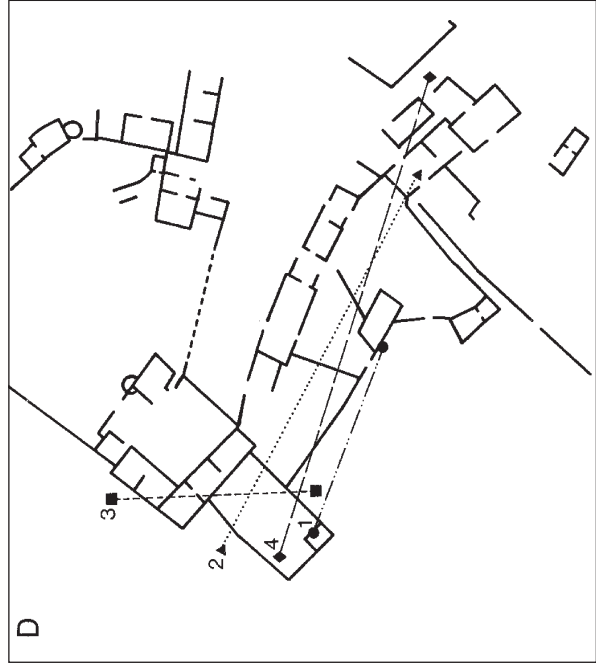


Figure 10.28: Medieval pottery, examples of widely scattered but joining sherds of Lyveden wares

Figure 10.29: Medieval pottery, examples of widely scattered but joining sherds of Lyveden wares

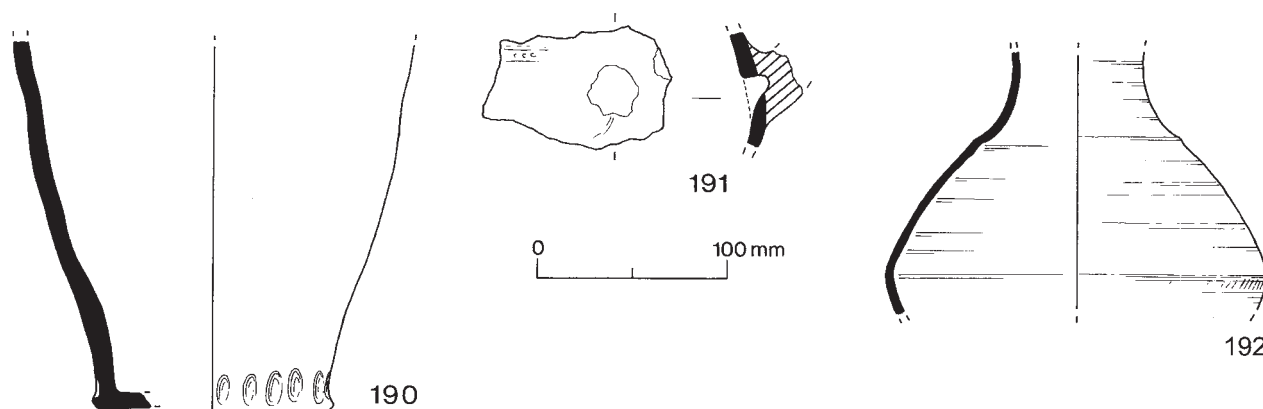


Figure 10.30: Medieval pottery, Possible Lyveden wares (190–191) and Lyveden D glazed ware (192)

- green glaze with many undissolved copper filings. Inner surface is heavily limescaled.
799/860, B7; 1547, B5; 1548, BY7; 390, PMED
- 194 Buff fabric with a pinker core, as (193). Patchy yellowish-green glaze with many copper filing spots. The horizontal combing is incised onto internally pressed-out finger grooves.
6006, EY2; 6240, EY1
- 195 Rim, neck, body and handle from a very ornate ‘three stage’ jug. Buff pink fabric as BBJ1, with a rare flat platelets of red ironstone up to 8mm. The applied slip decoration is in both body clay and a red-firing slip, as are the ‘rose’-stamped pellets on the upper shoulder and neck. Glossy and patchy green glaze with copper filing spotting. The vessel is very similar to a baluster jug found at Greyfriars, Northampton (Williams 1978), although that example was a baluster, and lacks the extra band of zig-zag applied strips which the West Cotton example has. The neck of the Northampton jug was more simply decorated, but the two vessels are strikingly similar.
591/1513/1549/1598/1646, BY7; 390, PMED; 1547, B5
- 196 Soft orange-pink fabric, as (193). The applied strips are in both body clay and a red-firing slip. Patchy glaze as (194).
383, DY1; 386, D11; 814, D12
- 197 Hard pale pink fabric with a white inner surface. Rich, glossy yellowish-green glaze with many copper filings. Applied strips of body clay and a brown firing clay.
1538, BY1
- 198 Very soft pink fabric as (193). Patchy, variegated yellow and green glaze with applied spirals in body clay and a brown firing clay spiral. Fragments of a vessels with similar spirals were found at College Street, Northampton (Gryspeerd 1982, fig. 12.17, 70). The vessel is said to be datable to between the late thirteenth century and the early fourteenth century. As both the contexts in which the sherds of this vessel were found were Ph3/2, this would appear to add further support to the postulated redating of 1275–1300 for that phase.
668/881, CPITS

Potterspurry ware

NDC fabric W18; CTS fabric F329
(Figs 10.32–10.34)

At just over 5000 sherds, Potterspurry ware is the most numerous glazed ware (in terms of sherd numbers) at the site. Few vessels could be reconstructed, probably because most of the material was deposited in the yard areas, with the presumed regular removal of midden heaps having taken away the rest of the vessels. The vessel types were limited to jars, bowls and jugs, with a single pipkin. In terms of sherd count, the ratio of Potterspurry to Lyveden B was 1.79:1. There are problems in comparing the occurrence of the two wares on this basis, as Potterspurry vessels are relatively thin walled and break into much smaller pieces than Lyveden. However, a count of rim sherds from individual vessels gave a Potterspurry to Lyveden ratio of 1.88:1, which reflects the sherd count in a fairly satisfactory manner and suggests that it is a reasonably accurate method of quantifying the material.

The range of decorative techniques on the West Cotton vessels are extremely limited. Glazing is fairly common, but usually restricted to the upper part of vessels, and sometimes only in patches. Only two forms of incised decoration are used, shoulder finger-grooving and wavy lines, with the techniques not appearing to have a typological significance. Despite its superior quality of manufacture when compared to the shelly wares or the Lyveden glazed wares, the material appears to have been manufactured with functionality as the prime concern. Certainly, examination of the rim diameter spreads and the limited decorative techniques demonstrate that the ware has many of the traits exhibited by the shelly coarsewares found at West Cotton.

Unpublished evidence suggests that some of the Lyveden and Stanion kilns were producing imitations of Potterspurry ware that are similar in both form and fabric. Once again, lack of publication and analysis of the kiln sites is a severe handicap to meaningful interpretation of the Potterspurry-type wares from the area.

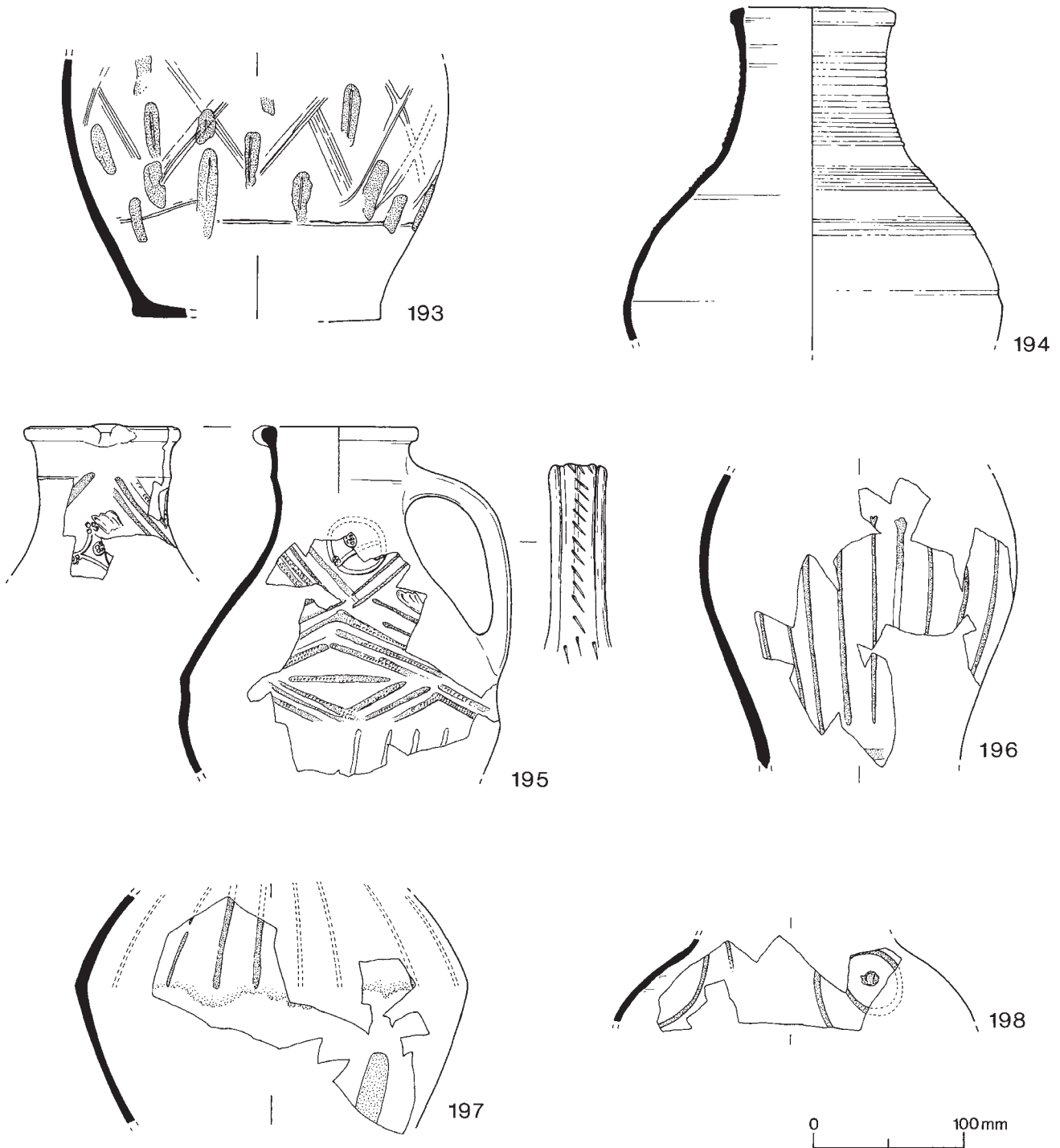


Figure 10.31: Medieval pottery, Brill/Boarstall ware jugs (193-198)

Individual fabric types cannot be defined, with all the vessels examined containing very fine clear quartz. Some examples had rounded red and/or black ironstone up to 3mm, sometimes in combination with rounded limestone (ooliths?), although these are often burned out, with surface spalling resulting. It is possible that the vessels with the limestone fabric may be the products of the Lyveden/

Stanion kilns, but this requires further investigation.

Four main fabric colours occur:

- Buff – brown, sometimes with a thin blue-grey core
- Grey, with buff surfaces
- Brick red – orange pink, often with a buff or grey core
- Grey with a buff outer surface.

It is possible that the various colours may be a hallmark of different kilns, but further investigation is needed before this can be stated with confidence.

Jars

Like the SHC and Lyveden coarsewares, the rim diameters of the Potterspury jars show a unimodal distribution, in this case clustering around 180mm diameter. It is not possible to correlate the rim diameters with the volume of the vessels, as there were simply too few reconstructed vessels to allow this.

The rim forms tended to be fairly simple everted or deeply lid-seated varieties.

Illustrations of Potterspury ware jars (Fig 10.32)

199 Moderately hard sandy fabric, with abundant fine sand and the occasional fragment of rounded red ironstone up to 1mm.

Grey with brick-red surfaces, patches of limescaling on the inner surface.

6123, E13, Ph2/2

200 Fabric as (199). Dark grey with orange pink surfaces. The surface of the lower body of the vessel is streaked with buff and orange swirls, suggesting two clays with different firing colours were used, but not properly mixed together.

6043, EY4; 6006/6242, EY2; 6164, EY1; Ph2/2?

201 Buff fabric with orange-pink surfaces. Red lumps of red ironstone up to 5mm.

202 Buff fabric with a grey core, single splash of yellow glaze on the inner surface.

203 Orange fabric with a grey core and brown outer surface.

204 Buff fabric with a grey core.

205 As (204).

Bowls

Potterspury bowls, like the shelly coarsewares, have a trimodal rim diameter distribution, with the peaks around

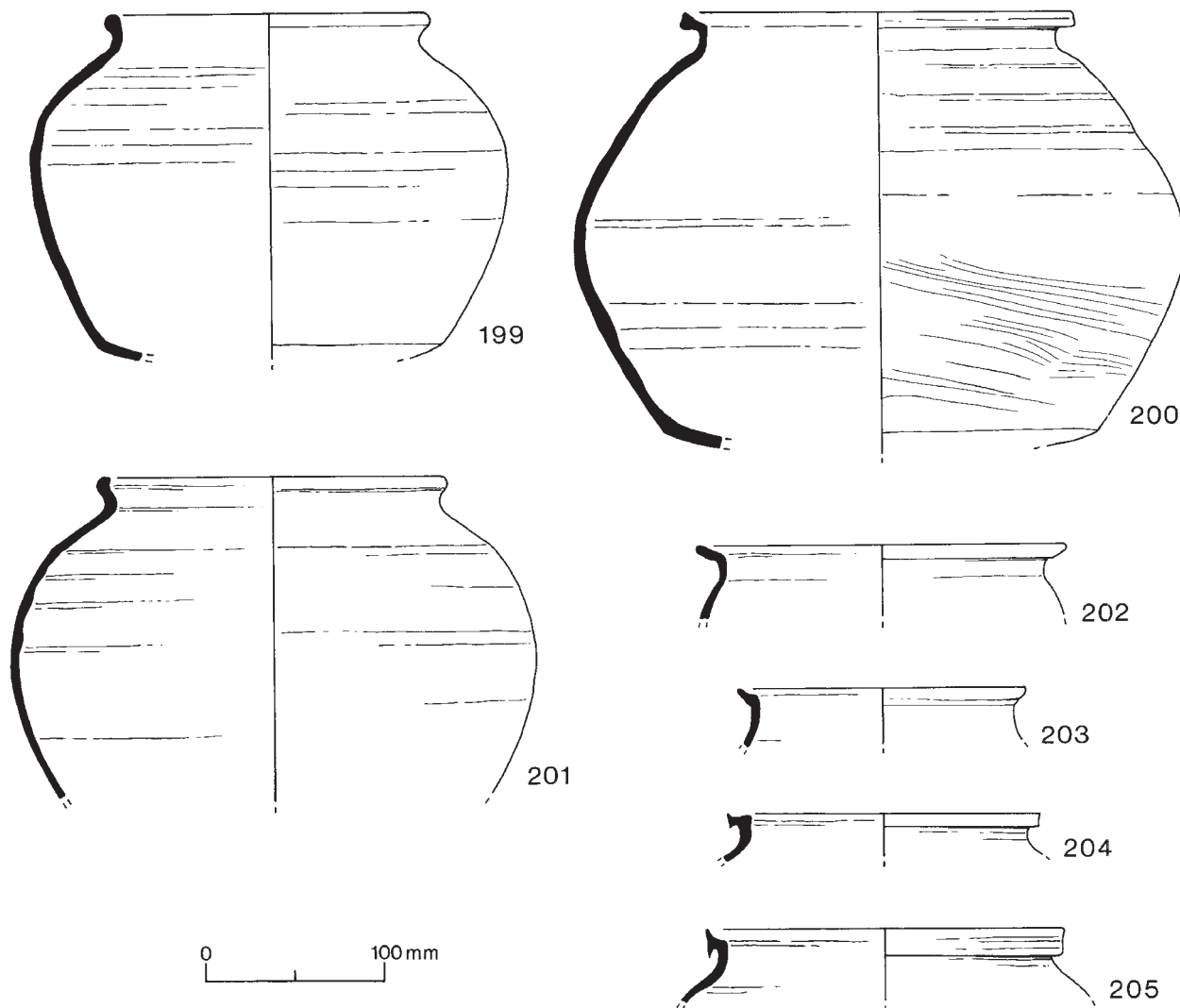


Figure 10.32: Medieval pottery, Potterspury ware jars (199–205)

220mm, 300–340mm, and 460mm. There are, however, too few reconstructed vessels to enable testing of any correlation between the diameter and the volume.

Illustrations of Potterspurgy ware bowls (Fig 10.33)

206 Fabric as (200), with occasional fragments of limestone up to 2mm. Surface is spalled. Thin green glaze covering the lower interior body and base pad.

1135, A/B; 1513/1522/1548/1598, BY7; Ph2/2

207 Fabric as (206). Outer body and rim are extensively smoke

blackened. Thin green glaze on lower body and surviving portion of the base pad.

3020, C8/1, Ph3/2

208 As (206).

1549, BY7, Ph3/2

209 As (206). Thick but dull green glaze with copper filings on the interior base pad and lower body. Spots of glaze on the outer rim, and a 'run' of glaze along the angle of the rim bead and body, indicating that the vessel was fired upside-down.

1538/1554, BY1

210 Buff fabric with grey core and brick-red surfaces.

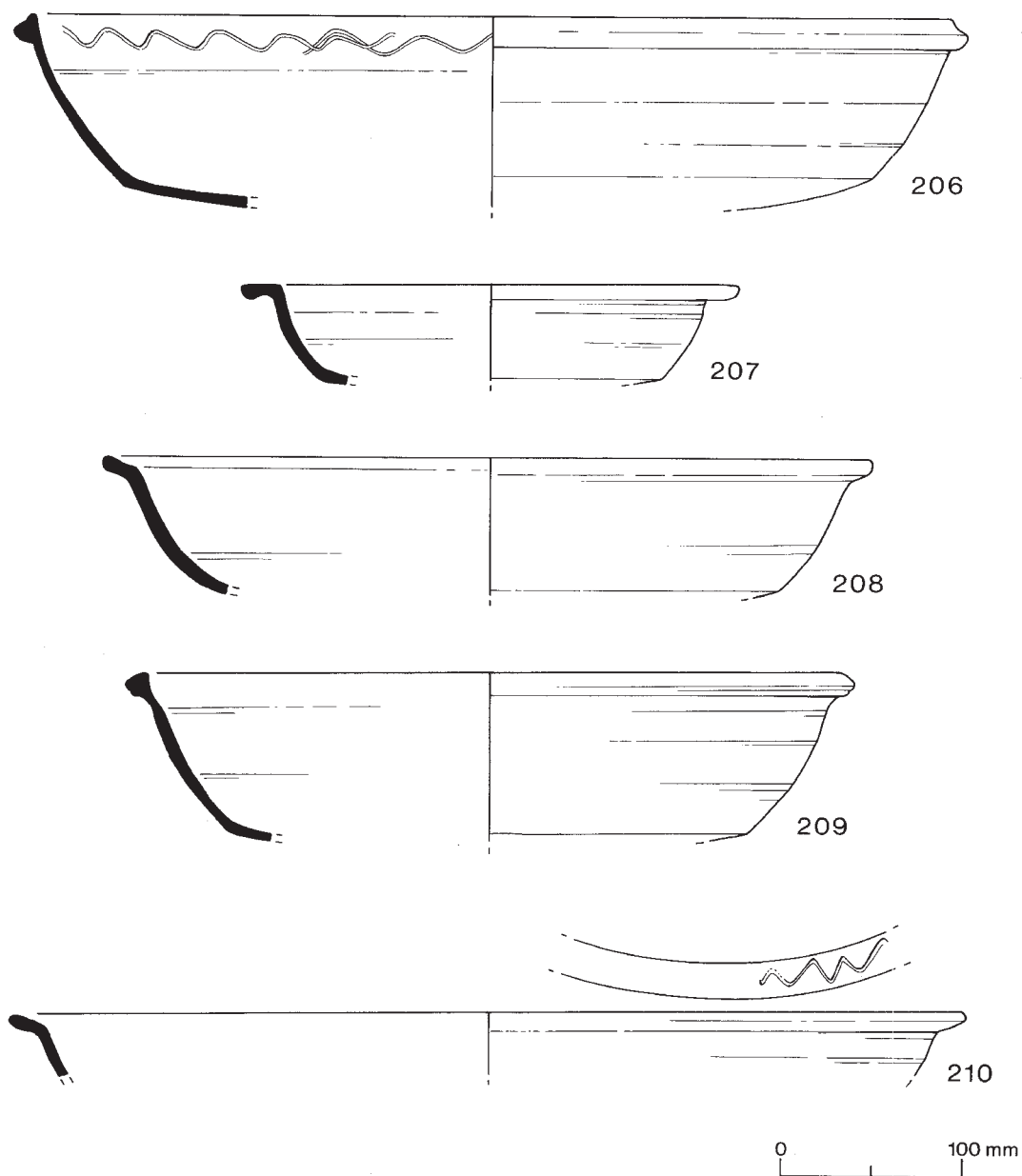


Figure 10.33: Medieval pottery, Potterspurgy ware bowls (206–210)

Jugs

It was not possible to reconstruct any jugs to a full profile. The various illustrated fragments indicate that there was a great variation in vessel size, but this line of inquiry cannot be pursued until more appropriate assemblages become available for analysis. The handles demonstrate a remarkable degree of consistency, with all the examples from West Cotton being diagonally slashed strap types. The rimforms were generally variations on rounded and triangular types, which once again show no typological significance.

Illustrations of Potterspurgy ware jugs (Fig 10.34)

211 Fine sandy fabric with few visible inclusions except for occasional fragments of sub-rounded ironstone up to 3mm. Grey core with buff margins and orange pink outer surface, which is degraded and pitted on the lower body.

quality green glaze, with the occasional undissolved copper filing.

859, D11/5, Ph3/2

212 Buff fabric with a grey core, inclusions as (211). Patches of green glaze on the upper part of the remaining body. 6007, EY2, Ph 2/2

213 Grey fabric with dark orange brown surfaces. Rare limestone fragments.

214 Orange fabric with a grey core, brown inner surface. A few runs of glaze on the outer surface, showing that the vessel was fired upside-down.

215 Buff fabric with a grey core. Thick green glaze on the inner surface and rim, patches of the same on the outer.

216 Buff fabric with orange-pink surfaces and a thin grey core.

Pipkins

The vessel from West Cotton is of a different form to that from the Potterspurgy kiln site (Mynard 1970, fig 2.45).

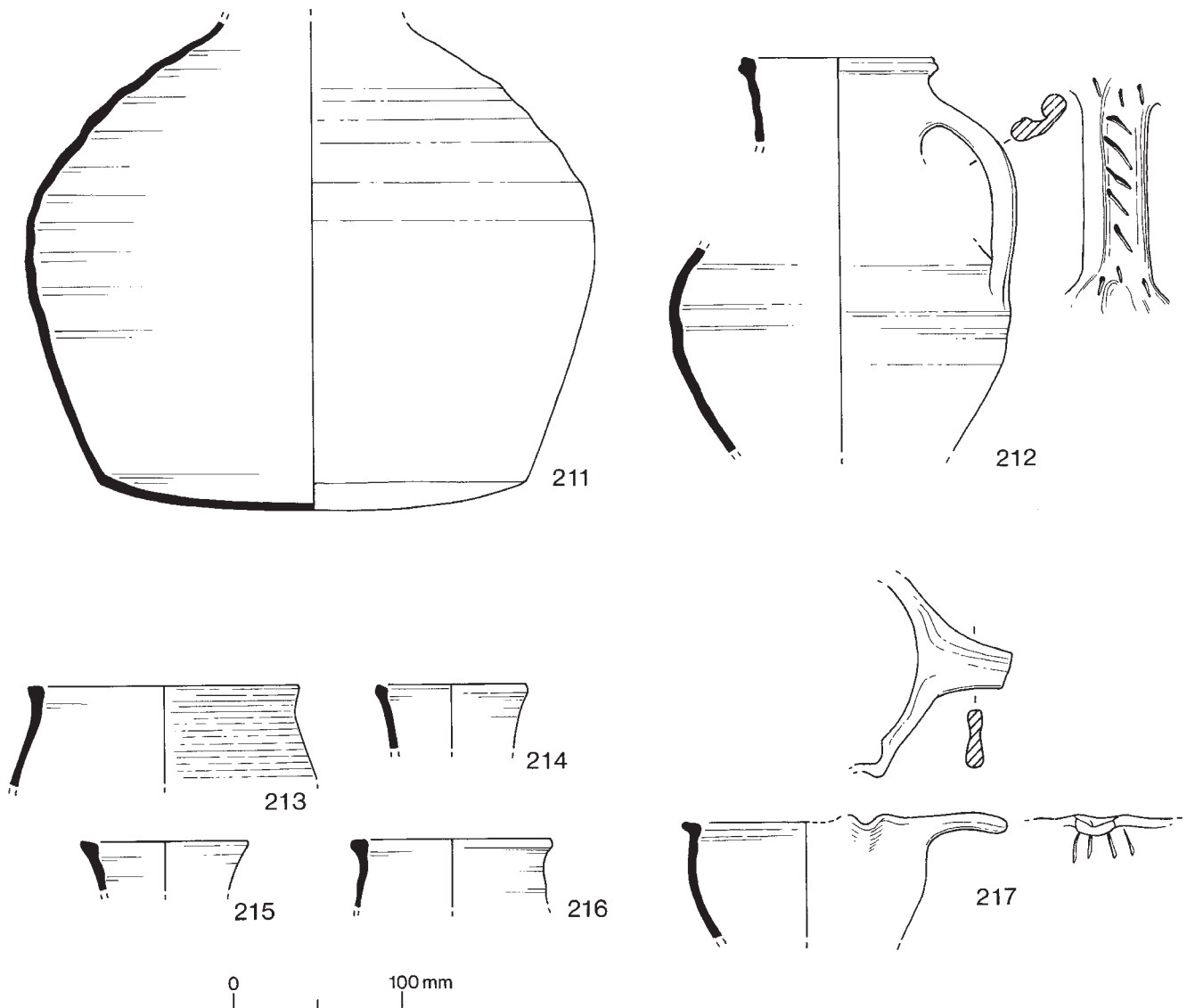


Figure 10.34: Medieval pottery, Potterspurgy ware jugs (211–212), jars (213–216), and pipkin (217)

The latter vessel resembles a small jar, whereas the West Cotton example is more of a bowl form.

Illustration of Potterspurty ware pipkin (Fig 10.34)

217 Fabric as (200). Splashes of pale green glaze below outer surface, with a more even covering on inner surface.
6259, AY6, Ph2/2?

Raunds-type Reduced ware

CTS fabric F366

Late Medieval Reduced Ware (LMR) is a generic type with several known manufactories in the south Midlands (Moorhouse 1974), such as Everton (Hassall, 1976) and Flitwick (Mynard *et al.* 1983), both in Bedfordshire, and Great Brickhill in Buckinghamshire (McCarthy and Brooks, 1988, 435).

Extensive evidence has been found for Reduced Ware production at Higham Ferrers, near Raunds. A group of kiln wasters and a possible kiln were discovered near King's Meadow Lane in the town in 1964. An estimated 63,000 sherds, with a total weight of around 600kg were recovered but, at the time, the pottery was simply weighed and the rim sherds counted and measured, and the site was published as a short interim report, which consisted of illustrations and a catalogue of the main forms and vessel types, which were mainly jugs, and large bowls with a date of the fifteenth century appearing likely (Hall 1974).

[*Editor's note:* Excavations at Kings Meadow Lane, Higham Ferrers between 1993 and 2003 located two kilns producing Late medieval reduced ware (Hardy *et al* 2007, 70–79), but it has not been possible to take the results of the pottery analysis (Blinkhorn 2007), or the broader overview of this new evidence for a substantial pottery industry in Higham Ferrers (Blinkhorn and Hardy 2007), into account in the consideration of the material from West Cotton, although this evidence does indicate that the Raunds-type Reduced ware was coming from a different source]

There are two references to a pottery kiln in the town in the Higham Ferrers Court Rolls. An entry for 1436 notes that one William Potter 'took a croft where there is a kiln for making pots', and there is also a reference to repairs being made to the kiln in 1467 (Serjeantson 1917). In 1991, surface collection in the field adjacent to the site of the excavation produced nearly 3,000 sherds of Reduced Ware, with the spread focussing towards the site of the kiln (Shaw 1991). More recently, excavations at King's Meadow Lane, Higham Ferrers undertaken by Oxford Archaeology, salvaged the remains of a further two Late Medieval Reduced Ware kilns. One had been all but destroyed by levelling in the twentieth century, but the other was well-preserved, and produced an archaeomagnetic date of AD 1385–1435. This perhaps is the most likely candidate for the kiln taken by William Potter. The products of these and the earlier kiln have been analysed by the author, and the results will be published in a overview of the Reduced

Ware industry undertaken by Anna Slowikowski of Albion Archaeology on behalf of English Heritage.

All the Reduced Ware from West Cotton is of a different type. This Raunds-type Reduced Ware (RRW) appears to have been first made in the century before LMR, around AD 1300 – 1400, and the fabric is different. It is softer than LMR, with denser, finer sand inclusions, although the vessel forms, mainly jars and large bowls (pancheons) are not dissimilar, although, curiously, jugs are entirely unknown at this time. The source of this earlier ware is unknown. There were no sherds of Raunds-type Reduced Ware amongst the fieldwalking material at the Higham kiln sites, and none was noted during the excavations of the kilns and associated medieval remains. It is possible that it was the product of another kiln in the area, but there is, as yet, no evidence for this, although the fact that the Raunds-type Reduced ware appears to have a distribution limited to Raunds and its environs would suggest that it is a local product.

Thin section of a few sherds of both Raunds-type Reduced ware and LMR from the 1964 Higham Ferrers kiln (Darren Hall – Unpub. MA Dissertation, University of Leicester) has shown that the fabrics are very similar, but LMR is somewhat harder and has larger, sparser quartz grits.

All the RRW sherds from West Cotton are undecorated apart from finger grooving on the shoulders of some of the jars. A maximum of 44 jars and 54 bowls were present, with both having a limited range of rimforms.

Jars

All the jar rims were everted types, the majority of which were lid-seated.

The reconstructed vessels suggest that there may have been two types of jar, the utilitarian 'cooking pot' (Fig 10.35, 218) and the much larger 'storage' vessel, (219). Examination of the rim diameters is inconclusive, however, with vessels having diameters in the range of 140–260mm, apart from two examples having diameters of 320mm. There are too few reconstructed vessels to investigate any correlation between rim diameter and volume and thus analysis must wait until a more suitable assemblage becomes available.

Illustrations of Raunds-type reduced ware jars (Fig 10.35)

218 Reddish brown fabric with dark grey core and surfaces. Dense temper of subrounded quartzite up to 1mm, but the majority up to 0.5mm. Rare flecks of ironstone and possibly limestone up to 0.5mm. Patches of sooting on lower exterior body and burnt interior base pad.
3021, C8/2, Ph3/2

219 Fabric as (218), but with grey core and pale grey margins. Patches of sooting over most of the lower body.
859, D11/5, Ph3/2

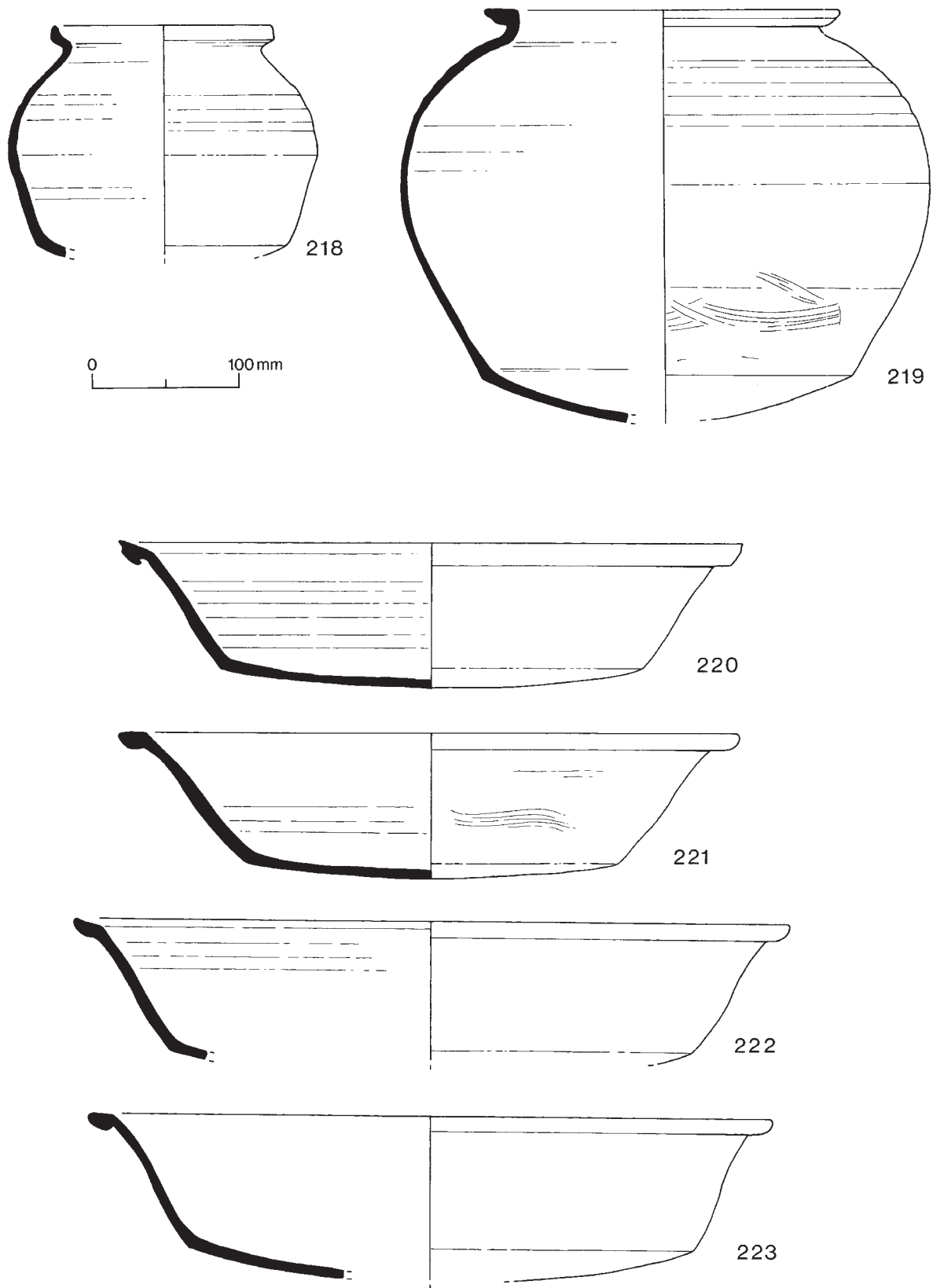


Figure 10.35: Medieval pottery, Reduced ware jars (218–219) and bowls (220–223)

Bowls

Like the shelly bowls, the Reduced Ware vessels appear to have a trimodal rim diameter distribution, clustering around 160, 280 and 420mm, but, once again, there are too few reconstructed examples to enable investigation of any possible correlation between diameter and volume.

Like the jars, the bowls have a limited range of rimforms, being mainly simple thickened types, although a few everted examples were noted.

Illustrations of Raunds-type Reduced Ware bowls (Fig 10.35)

- 220 Fabric and colour as (218). Patches of blackening on outer surface appear to be the result of firing rather than heating during use.
859, D11/5, Ph3/2
- 221 Fabric and colour as (218), although with larger average grain size. Base pad is scorched to an orange colour, no sooting.
853, C8/1, Ph3/2
- 222 Fabric and colour as (218). Sooting on upper outer body.
3003, CY1, Ph3/2
- 223 Fabric and colour as (218). Base pad is scorched orange. Patches of sooting on outer body.
6150, EY5, Ph3/2

Late medieval Oxidized ware

NDC fabric W29; CTS fabric F401
(Fig 10.36)

A kiln of possible fifteenth-century date producing wares similar to these was excavated at site J at Lyveden (Webster 1975), although it seems likely that there were other sources, as the material is widespread throughout the south-east midlands during the latest part of the medieval period. The Lyveden kiln produced wares with a slightly

different fabric, having sparse limestone oolites in addition to the dense sand which is typical of the tradition. The Lyveden fabric has been classified in the CTS as fabric F325, Lyveden E ware.

In Northampton, Late medieval Oxidized ware is most abundant in contexts dating to after 1470, but is found in contexts pre-dating that phase at the Tannery excavation (Shaw 1996, 87). The fabric is usually reddish-brown, sometimes with a grey core. It is usually very hard, with a moderate to heavy temper of fine sand and rare ironstone up to 1mm.

Absolute dating of the ware at West Cotton was not possible, but it is stratigraphically later than wheel-thrown Lyveden D wares.

The vast majority of the oxidized ware from West Cotton was found in contexts associated with the alluvial deposits which post-date the abandonment of the tenements. Most of the remaining material was found in tenement A and its associated yards, implying that there was still limited activity in this area of the site in the second half of the fifteenth century.

Illustrations of Late medieval Oxidized ware (Fig 10.36)

- 224 Small fragment of a bowl rim.
225 Rim and upper body of jar. Grey core.

Minor glazed wares

Developed Stamford ware

NDC fabric X1(2); CTS fabric F331

All the Developed Stamford ware at West Cotton appears to be from jugs, dateable to the late twelfth to mid-thirteenth century.

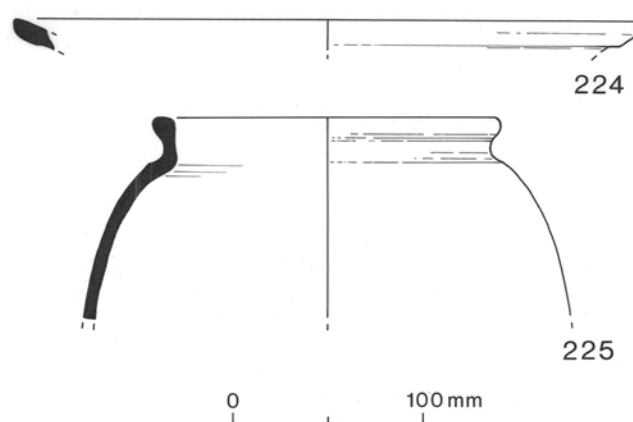


Figure 10.36: Medieval pottery, Late medieval oxidized ware (224–225)

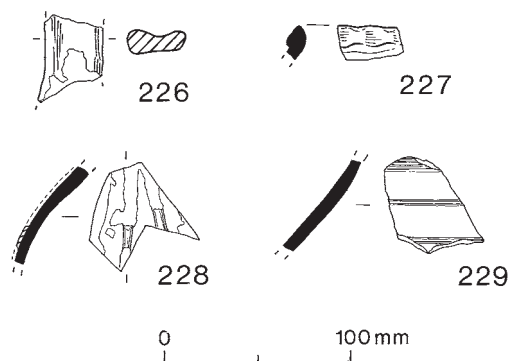


Figure 10.37: Medieval pottery, Developed Stamford ware (226–229)

Illustrations of Developed Stamford ware (Fig 10.37)

- 226 Fragment of a strap handle with combed, lightly thumb impressed edges. Soft, pale grey fabric with white surfaces, yellowish green glaze with green spots.
28, LSE10
- 227 Fragment of strap handle with combed, thumb-impressed edges. Abraded pale orange-pink fabric with rich olive-green glaze.
339, DY1, Ph 4
- 228 Two joining sherds. Smooth, hard white fabric. Decorated with applied strips of body clay, most of which are missing. Glossy, mottled rich copper green glaze.
1342, APITS, Ph 1
- 229 Fabric and glaze as (228).
6131, E13/4, Ph 3/2

Nuneaton ware

NDC fabric W11 + subdivisions; CTS fabric F347

At least two vessels of this type occurred at West Cotton. The sherds of one were widely scattered across the site, with the bulk of the jug found in a pit beside building D11/D12, but sherds also occurred in room 3 of building C9, yard DY1 and building E14.

Illustrations of Nuneaton ware jugs (Fig 10.38)

- 230 Nuneaton fabric A (Mayes and Scott 1984, 40). Hard grey sandy fabric with oxidized orange outer surface. Even covering of thick green glaze from top of vessel down to c50mm below the handle. Heavy temper of sub-angular quartzite c0.5mm. Baluster form is very typical of wasters from the kiln sites.
711/813, D11/2, Ph2/0; 6254, E14; 466 GREEN; 469, PMED; 477/552, C9/3
- 233 Nuneaton fabric 'Bi' (ibid). Brick red with a grey core. Thick green glaze above the waist cordons, rim, handle and base sherds are unglazed. The form and decoration indicates a vessel similar to Mayes and Scott 1984, fig 19.14.

Oxford ware

NDC fabric W7(1); CTS fabric F345

Mellor (1994) dated the ware in Oxford to the late eleventh century to mid-fourteenth century. Three vessels were noted; a tripod pitcher, typical of the early products of the industry (Fig 10.39, 236), and two decorated jugs (Fig 10.38, 231 and 232) more typical of the output during the period 1250 – 1350, suggesting that the postulated Ph2/2 dating for tenement C is acceptable. A few sherds of the ware occur at St Peter's Street in Northampton (Williams 1979), some of which are stratified in contexts as late as the fourteenth century.

Illustrations of Oxford ware jugs (Fig 10.38)

- 231 Exterior body is decorated with a latticework of iron-rich brown slip and covered with a glossy green glaze which becomes thinner towards the base, with the glaze on the lower body containing many undissolved copper filings (Plate 5). Form very typical, but the slip decoration appears to be somewhat unusual.
4471 (oven/pit 4473), LSE5, Ph2/0
- 232 Pale olive green glaze, which is thicker and more lustrous on the neck of the vessel. No obvious parallels at the production sites, although Mayes and Scott 1984, fig 98.73, has similarities.

Illustration of Oxford ware tripod pitcher (Fig 10.39)

- 236 Four non-joining sherds from the same vessel. Fairly heavy temper of sub-rounded white, grey and black quartzite up to 1mm, with some rounded red ironstone of the same size and shape. Patchy, variegated orange-brown and dark green glaze, of a poor quality with bubbled and semi-vitrified surface.

London ware

NDC fabric W8; CTS fabric F343

The two vessels of this type appear to be small, probable drinking jugs, one in the coarse-type fabric and one in the fine fabric (Pearce *et al* 1985). This type of vessel appears in London during the late thirteenth century, and lasts until the mid-fourteenth century.

Illustrations of London ware (Fig 10.39, 234–5)

- 234 Rim and handle from a small jug. Fine fabric. Brick red, slightly sandy fabric, with splashes of cream slip on the handle, rim and neck. A non-joining rim sherd from this vessel is completely covered in slip, and has a thin, clear glaze which appears yellow.
Ph 2/2
- 235 Base from a small jug, Coarse Sandy fabric. Orange fabric with a grey core, thick layer of creamy-white slip on the outer surface of the body. Large splash of glossy green glaze on the interior base pad.
Ph 3/2

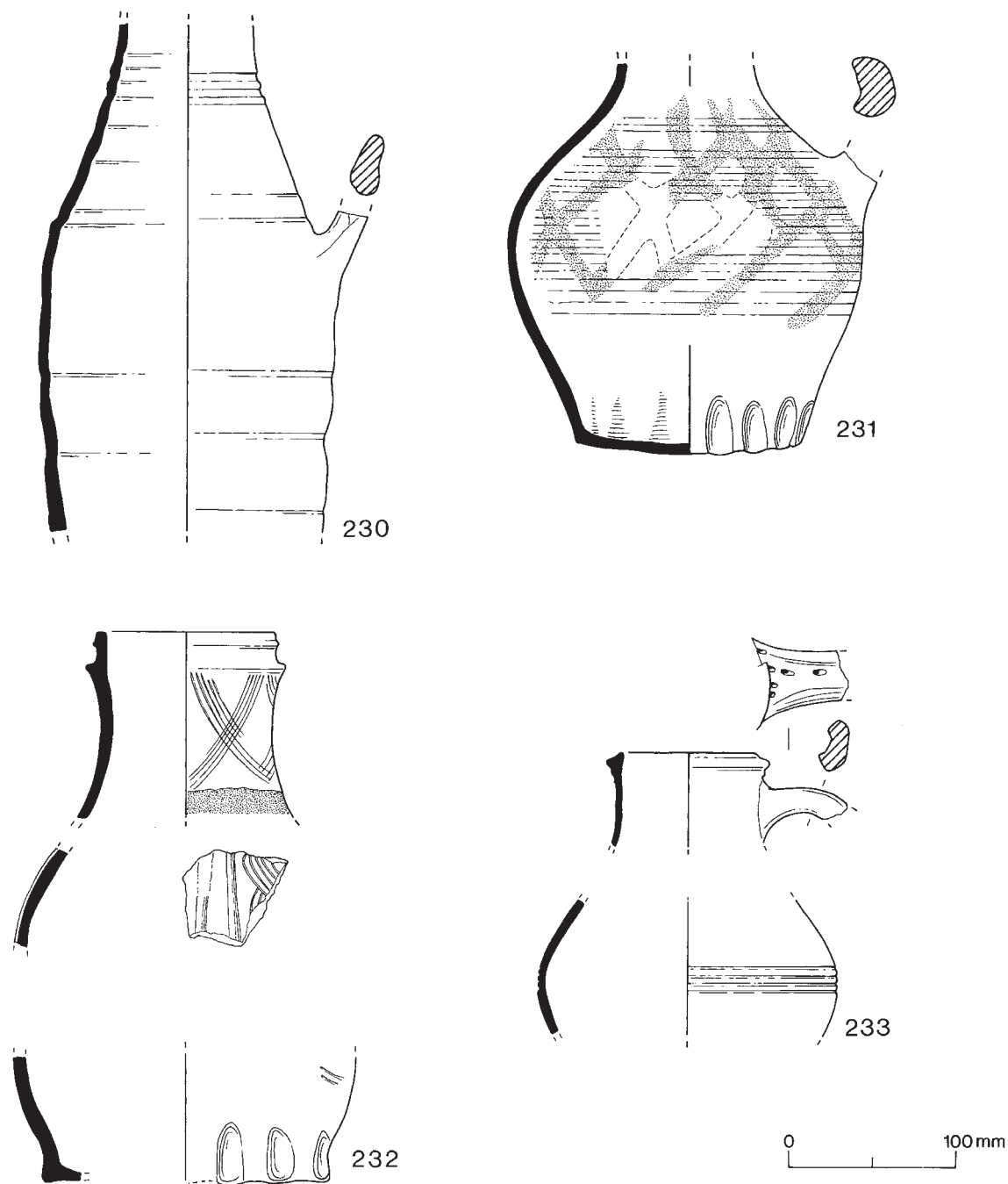


Figure 10.38: Medieval pottery, Nuneaton ware (230 and 233) and Oxford ware jugs (231–232)

Grimston ware

CTS fabric F328

Sherds from a single Grimston ware jug (Leah 1994). Most were found in various deposits in yard EY1, although two small sherds came from deposits in room 4 of building E13, giving credence to the argument that the yards contained rubbish middens. The vessel was extremely fragmented with the majority of the sherds occurring in Ph2/2 and

Ph3/2 groups, which generally agrees with the fourteenth-fifteenth century dating given to such vessels (Clarke and Carter 1977, 206). A single vessel of this type occurred at Mill Cotton, near Raunds (Blinkhorn 2006).

Illustration of Grimston ware (Fig 10.39)

237 Grey fabric with paler surfaces and dull olive-green glaze.
Unstrat.

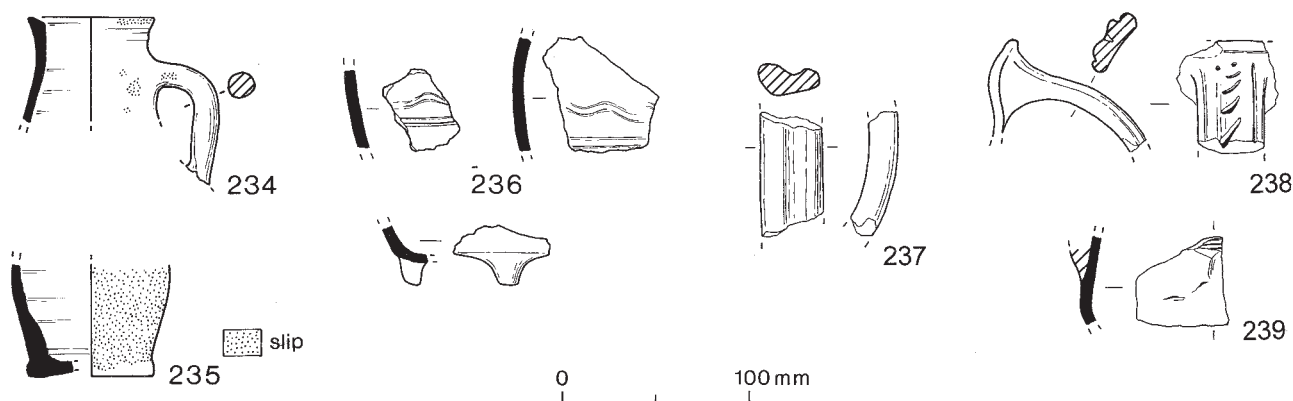


Figure 10.39: Medieval pottery, London glazed ware (234–235), Oxford tripod pitcher (236), Grimston ware (237), and Unprovenanced vessels (238–239)

Unprovenanced vessels (Fig 10.39)

238 Grey fabric with orange surfaces, fairly heavy temper of clear, grey and white subrounded and rounded quartzite up to 0.5mm. Some reddish sub-rounded ironstone up to 3mm, rare sub-rounded limestone up to 1mm. Single piece of angular pink grog c10mm. Patchy dark green glaze with very dark patches. Mineral suite suggests local source.

Ph3/2

239 Buff fabric with grey core and orange surfaces. Moderate temper of black ironstone, with some white, grey and pink sub-rounded quartzite up to 1mm. Pale yellowish green glaze. North midlands Coal Measures source?

Ph3/2

Ceramic Chronology

Early/middle Saxon

The dating evidence for the early/middle Saxon pottery from West Cotton relies mainly on two decorated sherds (Fig 10.1, 1 and 5). The former has a fragment of an incised pendant triangle and a stamp, and the latter has horizontal and vertical lines and the suggestion of a longitudinal boss, giving the appearance of a vessel decorated in the Bossed Panel Style (Myres 1976, figs. 116 – 118). The former style was common from the late fifth century to the early sixth century, the latter in the sixth century. The sherds with the incised lines on the neck carination are virtually impossible to date other than to within the early Saxon period. An unstratified saucer brooch fragment of the late fifth or sixth century complements the dating of these decorated sherds.

Late Saxon and medieval

As already stated, the chronology of the late Saxon and medieval ceramic from West Cotton is a refinement of the dating first postulated for the Burystead and Langham Road excavations in north Raunds. That chronology is

mainly based upon the dating schemes used and refined at Northampton by McCarthy, Gryspeerdt and Denham. There are obviously differences between the Northampton chronologies and those at Raunds, and it is felt that an overview of the various dating schemes is worthwhile, to place the West Cotton scheme within the context of the area.

The first broad-ranging fabric series and chronology for Northampton came in 1979, with the analysis of the Saxon and medieval pottery from the St Peter's Street site in the town (McCarthy 1979). All the generic ware types found at Raunds were present, with McCarthy constructing chronologies which still basically hold good, with only minor refinements in the face of fresh evidence being necessary for the Raunds material. The St Peter's Street report set the agenda for pottery studies in the town, with gradual additions and refinements being added to the type-series with successive excavations at smaller sites in the town. The next major step forward in the understanding of the ceramic came with Denham's work on the pottery from St Neots's Gardens. It was here that the fourfold division of St Neots-type ware was first defined (Denham 1985, 54). West Cotton has allowed some adjustment of the chronology for the Raunds area.

St Neots-type ware

The main area of chronological refinement resulting from the analysis of the West Cotton assemblage has concerned the end date of St Neots-type ware. A pit in enclosure 10 (LSE10) yielded a coin, dated to 1160 and probably deposited before 1180, associated with a fairly large group of pottery (51 sherds) that included only a single small sherd of T1(2), suggesting that the ware had virtually ceased to be used at West Cotton by this time. It is therefore given an end date of AD 1150 for the Raunds area, which is earlier than that given for the Northampton wares (Denham 1985).

Thetford-type ware

All of this material occurred in medieval or later contexts. This supports the findings from both north Raunds (Pearson 2009 and Blinkhorn 2009) and Mill Cotton (Blinkhorn 2006), where Thetford ware only occurred in post-Saxon contexts. Whether this is due to typological or trade considerations, or simply due to the fact that most of the vessels are storage jars whose long use-life ensured their survival into the twelfth century is not clear, but evidence from elsewhere suggests a similar pattern. At Lincoln Flaxengate, large Thetford ware jars do not appear until the early years of the eleventh century, and were still in use in the late twelfth century at the Bishop's Palace site in the city (Gilmour 1988, 151). The ware occurs in contexts dated to the late Saxon period in Northampton (McCarthy 1979, 158).

Stamford ware

All but four of the pitcher rim forms belong to the collared group 4 type (Kilmurry 1980, 136), indicating that they are of post-conquest date, which would explain the small amounts of Stamford ware in late Saxon features. Ten rims of this group occur in Ph0 and Ph1 contexts, although none were found in Ph2/0 groups, despite this phase being within the theoretical lifetime of the form. The jar rims are mainly of forms 2 and 3, which were in production from AD 850 onwards, and are generally commoner before AD 1100. Two pitcher rims and two jar rims with forms of this type occur in late Saxon contexts.

The vast majority of the bowl rims belong to group 12, which were again in production from AD 850 onwards, but none occur in late Saxon contexts. Two rims occur in Ph0 contexts. It is worthy of note that none occur in Ph1 contexts, as Kilmurry has indicated that there is a break in the production of this form between the late twelfth century and early/mid-thirteenth century (1980, 139).

Late Saxon Cotswolds-type Oolitic ware

No direct dating evidence was found in association with these wares at West Cotton, but one illustrated vessel (Fig 10.5, 32) has a direct parallel in a vessel from Chalk Lane, Northampton (Gryspeerd 1981, fig 18.110). The Northampton vessel was associated with features (site phase 3C) which cut a soil horizon (site phase 3B) sealing a cellar which contained a securely stratified Saint Edmund Memorial penny dated to the first quarter of the 10th century (site phase 3A). There was also a coin of Aethelred II with a circulation of AD 979–1000 from a phase 3C feature (Archibald 1981, 118). A few sherds of the Oolitic ware were found in the phase 3B soil horizon which the phase 3C features were cut through (Gryspeerd 1981, 115). It would therefore seem that the proposed start date of the ware of AD 975 at West Cotton is not inappropriate.

Developed Stamford ware

Developed Stamford Ware is traditionally dated to the second half of the twelfth century (Kilmurry 1980, 134), as a kiln producing the ware was discovered at Stamford School in 1963 and yielded an archaeomagnetic date of AD 1200 +/- 20, but there are reasons to suggest that the material was not being used at West Cotton before the thirteenth century.

The main thrust of the argument for the traditional dating is based on an assemblage of Developed Stamford Ware (DSW) found in the town of Stamford in a feature dated to the second half of the twelfth century (Kilmurry 1980). However, this assemblage, group 47, is said to be contemporary with another assemblage from the town, group 46, which contains a glazed Lyveden sherd, which indicates a date in the early thirteenth century or later.

DSW occurs in small quantities at King's Lynn, where it is given a later twelfth-century date (Clarke and Carter 1977, 219), although the phase in which it occurs is dated AD 1150–1250, with the DSW dating to the latest part of the phase. No definite evidence is forthcoming for pre-thirteenth century DSW at any of the major King's Lynn excavations.

It seems fairly certain that DSW had gone out of use before the end of the thirteenth century. A garderobe deposit from the Stamford, St Martins site, Group 65, (Kilmurry 1980, 197) produced a large deposit which included mainly Lyveden-type ware (41% of the assemblage) both glazed and unglazed, and a Saintonge Polychrome pitcher, which suggests a fairly secure date of 1275–1325. Only four DSW sherds were present. Several other thirteenth-century groups from various sources are also considered by Kilmurry, and there seems little doubt that DSW ceased production during the second half of the thirteenth century.

DSW appears in two contexts at West Cotton with Ph0 ceramic dates, but in both instances the contexts can be shown to be stratigraphically of later medieval dates.

In Northamptonshire, DSW is surprisingly scarce given the relative closeness of the production centre. For example, at Warmington (Blinkhorn pers comm) just two sherds of the material were noted, out of an assemblage of over 500 sherds dating to Ph0 – Ph2/0. The ware is also scarce in Northampton itself, but where it does occur, it is mainly in contexts of Ph1 or Ph2/0 date. It would appear therefore that a dating scheme of the late twelfth century to mid-thirteenth century is more appropriate for the ware here, and in the county generally.

Brill/Boarstall wares

Pottery of this type never exceeds more than 1.9% of the pottery from any of the later medieval Phases. Reconstruction of material suggests that only a few dozen vessels were brought to the site during its lifetime. All the sherds appear to be from jugs, and it is tempting to see them as a high-status table ware, due to the quality of their fabric and decoration, but there is little evidence to support this.

Brill/Boarstall forms other than jugs tend to be fourteenth century and later (Mellor 1994), and the fact that none occur at West Cotton can be seen to be further evidence of the rapid decline of the settlement in the fourteenth century. The dating of these wares is fairly secure, with early thirteenth-century coins being found in association with the material in Oxford and London (Bruce-Mitford, 1939). They were originally used as a defining fabric for a pre-Phase 2/0 phase in the RSP, being, in theory, slightly earlier than Lyveden B wares, but there is simply not sufficient stratigraphic evidence to support this. They are sometimes found as the only glazed wares in a groups consisting otherwise of only Ph1 coarseware, but Lyveden B wares are also found in the same circumstances. Consequently, the two wares are seen as contemporary and Brill/Boarstall ware is used as a defining fabric for Phase 2/0.

It is worthy of note that Brill/Boarstall ‘Tudor Green’-type wares, dateable to the late fifteenth century (Mellor 1994), do not occur at West Cotton, despite being found at most sites of that date in the county. This adds further credence to the suggestion that there was little activity at this site during that time.

The Relative Seriated Phase Dating System (RSP)

The late Saxon Relative Seriated Phase Dating

The original scheme, as first used with the pottery from north Raunds (Blinkhorn 2009) was as follows:

Table 10.13: Original Phases and Defining Wares for the late Saxon RSP

LS1	LS2	LS3
St Neots T1(4)	StNeots T1(3) Stamford Ware, Thetford wares	Cotswold Oolitic type ware
AD 850–900	900–975	975–1100

The initial classification of the pottery from late Saxon contexts at West Cotton utilized this dating scheme. The results were as follows:

Table 10.14: Pottery occurrence by fabric by sherd count by ceramic phase

Ware	LS1	LS2	LS3
St Neots	0 %	96.6	85.2
Stamford	–	3.4	5.9
Cotswolds Oolitic	–	–	8.9
Thetford Types	0	0	0
Total sherds	0	621	461

The late Saxon stratigraphy at West Cotton has allowed both confirmation and expansion of the late Saxon RSP. The lack of the early bowl types has meant that the LS1

phase cannot be examined.

Thetford-type ware has been dropped as a defining ware in the late Saxon RSP, due to the fact that only one of the 302 sherds found at West Cotton was found in a possible late Saxon context. It would appear therefore to be highly probable that the material was not present at Raunds until the twelfth century.

It was not possible to otherwise refine the LS2 phase, but the stratigraphic sequence from ditch system 10 (LSD10) confirmed the sequence. The earlier fills yielded an assemblages including T1(3) bowl rims, while later fills also contained a Cotswold Oolitic type rim sherd, indicating that the latter was a later introduction. The final backfill contained a large group of T1(2) St Neots ware, but no early medieval shelly wares, confirming that the ware is later than the Cotswolds material and earlier than the medieval shelly wares. As a result of this, it is has been possible to confidently divide the LS3 phase into two: LS3 and LS4, with the first part of the phase being dependant on the presence of Cotswolds-type Oolitic ware and the second defined by the presence of the T1(2) St Neots type. Whilst this was always the theoretical picture from Denham’s Northampton dating, it had not previously been confirmed that the same was true for Raunds.

Further confirmation of the validity of the sub-division of LS3 comes from the early watermill (M27) leat sequence. There was a Cotswolds Oolitic type rim sherd in the primary silting, which was sealed by several layers containing T1(3) type St Neots ware, with the final layer containing a large mixed group of T1(3) and T1(2) St Neots type wares.

The exact start date of the T1(2) wares at Raunds is uncertain, but the postulated start date for Northampton of AD 1000 (Denham 1985) appears reasonable in the light of the calibrated radiocarbon dates from timbers within the final mill (M25), which yielded quantities of the ware, which indicate a construction date early in the eleventh century.

General evidence from the site has also confirmed that THP vessels begin during LS3, as was suggested by the evidence from north Raunds. This vessel type has been added to the RSP as a defining parameter for LS3 contexts. The revised RSP for the late Saxon period is therefore as follows:

Table 10.15: Enhanced Phases and Defining Wares for the late Saxon RSP

LS1	LS2	LS3	LS4
St Neots T1(4)	St Neots T1(3) Stamford Ware	Cotswolds type Oolitic Top Hat Jars	St Neots T1(2)
AD 850–950	900–975	975–1000	1000–1100

Despite the efficiency of the scheme, there are still weaknesses. The RSP only provides a *Terminus Post Quem*, and the LS3 phase is both short lived and defined by a relatively rare fabric type and a rare vessel type (only five

Top Hat vessels were found in late Saxon contexts) and so whilst being a useful dating tool, caution must be exercised. This is demonstrated by the watermill sequence, where the second mill (M26) has RSP dates that are earlier than the first mill (M27) due to the absence of the defining wares of phase LS3 within the small pottery assemblage.

The Medieval Relative Seriated Phase Dating

The original dating scheme for the Medieval Relative Seriated Phase Dating, like that for the late Saxon ceramic, is based on the Northampton (NDC) type series and the evidence from the excavations at north Raunds. The stratigraphic sequences at West Cotton have confirmed that seriation of the major wares is as originally postulated:

Table 10.16: Defining wares and Phases, medieval RSP

Ph0	Ph1	Ph2/0	Ph2/2	Ph3/2	Ph4	Ph5
T1(2) St Neots, SHC, SAC	Lyveden A	Lyveden B Brill	Potterspurty	RRW	Lyveden D LMR	LM Oxidised ware
AD 1100–1150	1150–1225	1225–1250	1250–1300	1300–1400	1400–1450	1450–1500

SHC	Medieval Shelly Coarseware
SAC	Medieval Sandy Coarseware
Lyveden A	Lyveden/Stanion Coarseware
Lyveden B	Lyveden/Stanion Coil-built Glazed Ware
Brill	Brill/Boarstall Ware
PT	Potterspurty-type Ware
RRW	Raunds-type Reduced Ware
LMR	Late Medieval Reduced Ware
Lyveden D	Lyveden/Stanion wheel-thrown Glazed Ware
LMO	Late Medieval Oxidized Ware

Table 10.17: Medieval Fabrics by percentage sherd count by stratified phases

Phase/wares	Ph0	Ph1	Ph2/0	Ph2/2	Ph3/2	Ph4	Ph5
SHC	85.2%	67.5	52.4	40.5	37.0	29.2	43.2
Stamford	6.9	1.8	1.3	0.8	0.4	1.1	0.7
Oolitic	4.6	5.1	3.4	2.1	2.0	2.6	4.3
SAC	3.3	1.5	1.1	0.6	0.8	0.6	0.8
Lyveden A	–	24.1	35.2	41.1	35.8	32.6	33.6
Lyveden B	–	–	5.4	3.5	4.4	6.0	4.7
Brill	–	–	1.3	2.0	0.6	2.4	0.8
Potterspurty	–	–	–	9.4	9.2	14.8	7.9
RRW	–	–	–	–	10.1	5.1	2.1
Lyveden D	–	–	–	–	–	6.3	0.3
Oxidized	–	–	–	–	–	–	1.4
Sherd total	6938	14124	10326	17238	23707	3741	1208

Absolute dating of the Relative Seriated Phase Dating

The evidence from the excavations at West Cotton has allowed enhancement of the original absolute dating of certain areas of the RSP.

Phase 0 (AD 1100–1150)

Little can be added to the original absolute chronology (AD 1100–1150) for this Phase.

Phase 1 (AD 1150–1225)

The original dating scheme for this Phase appears to hold good, with further evidence from West Cotton providing support for the postulated chronology of AD 1150–1225.

A context containing 51 sherds of pottery but only three sherds of Lyveden A, also yielded a coin with deposition range of AD 1160–1180, with the paucity of sherds of Lyveden A suggesting that the group dates to the early period of use of the ware.

There is some evidence for the Phase possibly continuing into the thirteenth century. It has already been demonstrated that there were no type 12 Stamford ware bowl rims in Ph1 contexts. There was a hiatus in the production of this vessel form between the later twelfth century and the early part of the thirteenth century, so their absence in contexts of this phase, despite being otherwise one of the more common Stamford Ware forms at West Cotton, can be seen to support the Ph1 chronology.

Three secure Ph1 contexts contained Developed Stamford Ware, which had its *floruit* during the late twelfth century

to thirteenth century. One sherd is from dumping over the largely silted millpond (Context 6905), one from the backfill of a pit in enclosure 10 (3060, LSE10), and four from the backfill of a pit (1342, APITS) beneath building S17.

A limestone surface related to a possible lean-to structure adjacent to the stone-built hall, S18, contained a large Ph1 assemblage and produced a silver finger ring which can be broadly dated stylistically to the twelfth century to thirteenth century.

Phase 2/0 (AD 1225–1250)

There was no absolute dating evidence for this Phase, but the presence of Developed Stamford Ware (DSW) does support the postulated chronology. There were quantities of glazed Lyveden ware were found at Stamford and King's Lynn, but a reappraisal is necessary of the dating of the former as a group dated to the mid-twelfth century (Kilmurry 1980, 118), yielded a glazed Lyveden sherd and had evidence of disturbance and redeposition, suggesting that the quarry pit in question should actually have been dated to the early thirteenth century, along with the other contexts containing Lyveden sherds. Glazed Lyveden wares occur in post-mid thirteenth-century contexts at King's Lynn.

The DSW from Ph1 contexts at West Cotton general occur within Ph2/0 groups from secure contexts in and around the tenements. Similarly, the sherds in later contexts are securely stratified, although they are probably part of the residual portion of the groups.

Phase 2/2 (AD 1250–1300)

A silver brooch of probable thirteenth-century date was found in association with a group of Ph2/2 ceramic in tenement E.

Phase 3/2 (AD 1300–1400)

The dating of this Phase is somewhat problematic, mainly due to the uncertainty of the exact dating of the medieval Raunds-type Reduced Ware (RRW). However, West Cotton produced three different groups of the pottery in direct association with coins of this period, and another assemblage was found in the same context as a Brill/Boarstall jug of the late thirteenth century to early fourteenth century.

A further group was in a floor (building A1/3), with a coin of Edward I, which was probably deposited before 1350, either directly associated with this or the overlying floor. This provides a *Terminus Ante Quem* of 1350 for the introduction of Reduced ware. There thus remains the problem of finding a *Terminus Post Quem* for the material.

The ceramic and numismatic evidence suggest a date of 1300, at the latest, for the introduction of RRW to the settlement. Four coins were found in association with Reduced Ware. The earliest, a penny of King John, has

a given date of 1205–1247 with the earlier part of the circulation being suggested as the loss date, however, as this is from a robber trench of building E13 it is likely to be a residual find.

The other three were pennies of Henry III, with circulation dates of 1250–79, recovered from the floor of the tenement A hall (A1/1) and two from a yard in tenement A (AY6). This would indicate that RRW may have first arrived at the site at some point during this period, so that Ph3/2 begins earlier than the original postulated dating. The contexts which contained the later thirteenth-century coins all produced a low proportion of RRW, suggesting that the ware had not been in use for very long when they were deposited.

Further support for this dating comes from contexts in tenement C which contained sherds from a Brill/Boarstall jug (Fig 10.31, 198) datable to the late thirteenth century to early fourteenth century. Both the contexts have only one sherd each of RRW, which would again suggest that the material had not long been in use at that time. The fact that there are none of the late fourteenth-century Brill/Boarstall non-jug vessel forms present at the site adds further weight to the argument.

It is suggested from this that a date of 1275–1300 can be postulated with confidence for the arrival of RRW in the area, and, by implication, the start of Ph3/2, with there being strong evidence to indicate a break in the supply of the material at the time of the Black Death in 1349.

This dating scheme disagrees with the postulated chronology for the Reduced Ware found at the medieval pottery production centre at Lyveden (Steane and Bryant 1975). However, there is a strong case to be made that the interpretation of Area J, which provides the dating, is unreliable. Doubts about the chronology have been expressed before (McCarthy and Brooks 1988, 288), and a re-examination of the published evidence appears to be necessary. However, it is also uncertain if the Reduced Ware found is the Raunds type or the later, 'true' LMR as was being made at Higham Ferrers, but it is certain that the latter was not made until around 1400, whereas the Raunds-type is definitely earlier.

An analysis of the report reveals a number of contradictions that make reinterpretation difficult, but an industrial building to the north of the longhouse had a stone floor covered with 'large quantities of Lyveden ware' (Steane and Bryant 1975, 22), but no Reduced Ware. The floor level yielded a cut halfpenny of Edward II which was struck in about 1256 which 'is unlikely to have survived very much after the introduction of round halfpence in 1279' (Archibald 1975, 149). There were, however, 13 sherds of Reduced Ware in the 'destruction level' of this building (Webster 1975, 63). The fact that the structure did not contain any Reduced Ware in the earliest levels, despite containing a coin contemporary with the West Cotton examples, would therefore indicate that LMR came into the area after the start of the circulation range of the coin.

There would appear to be little doubt, therefore, that the introduction date of Reduced Ware of 1275–1300 is valid.

Phase 4 (AD 1400–1450)

The redating of Phase 3/2 has obvious implications for the dating of wheel-thrown Lyveden wares, and by definition, the start date of Ph4. Unfortunately, absolute dating evidence is scant, due to the apparent decline in the occupation of West Cotton at that time.

As mentioned above, the kitchen in building A1 yielded a coin probably deposited before 1350 from one of the final two floor phases. This room did not contain Lyveden D ware except in the overlying rubble, but the hall, A1/1, did have fragments of the ware in the latest floor. Despite the fact that the kitchen cannot be dated to later than Ph3/2, there is little evidence of major structural changes in the tenement at that time. It seems probable, therefore, that Lyveden D did not appear until after 1350.

Phase 5 (AD 1450–1500)

The figures from this phase would suggest that a large proportion of the pottery in assemblages of this date is residual, presumably as a result of the demolition and stone robbing of the abandoned tenements. This is demonstrated by the fact that SHC, which appears to have ceased production by Ph4, and declines steadily from 85.2% in Ph0 to 29.2% in Ph4, increases to 43.2% in Ph5. The Cotswold Oolitic ware demonstrates a similar pattern. Consequently, the figures for this Phase are best discounted. A measure of the amount of activity (in terms of ceramic deposition) can be gauged by the fact that only 17 sherds of oxidized ware, the Phase defining fabric, were present amongst the 1208 sherds of Ph5 pottery. This would suggest that whilst there was some activity in and around the tenement A buildings at this time, the idea that they were probably used as outbuildings, rather than dwellings, appears reasonable.

The lack of some relatively common fifteenth-century wares from the site further supports this. ‘Tudor Green’, Cistercian wares, later Brill/Boarstall wares and German Stoneware are all absent, despite such pottery types occurring at a number of sites in the county.

Comparison with the figures for the pottery from the tenement sequence from Midland Road, Raunds (Blinkhorn 2009), would appear to confirm this. There, occupation starts around Ph4, and continues through into the post-medieval period. The combined proportion for shelly coarseware and Lyveden A declines from 34.0% to 25.3% from Ph4 to Ph5, whilst the figure for LMR increases from 18.5% to 42.3% for the same period, and the figure for Lyveden D increases slightly from 7.1% to 7.4%. This is quite at odds with the picture at West Cotton, where the three fabrics are show a noticeable decline from Ph4 to Ph5. At Midland Road, Oxidized Ware forms 7.4% of the Ph5 assemblage, whereas at West Cotton the material forms only 1.4% of the contemporary groups, further suggesting that there was little activity at this time.

Primary Groups

One of the problems with the construction of the RSP was the estimation of the length of production and use of the various wares. The stratigraphic sequences can demonstrate when a ware came into use, but identifying the end is more difficult, as the secondary nature of many of the deposits makes it virtually impossible to differentiate between residual and contemporary material in assemblages which consist of small, scattered sherds. It was therefore decided to attempt to identify and analyze groups which could be defined as primary, to try and assess which wares were in use during a specific RSP phase. The exercise was always going to be subjective, as the very definition of a primary assemblage is somewhat problematic, but groups with large sherds and a good number of vessels partially or wholly reconstructed is probably the best definition that can be given.

It was also a useful exercise in terms of examination of the rubbish disposal patterns at different periods. For example, Ph2/2 did not yield any groups that could really be considered as primary. The majority of the larger groups of pottery from this period consisted of large numbers of individual sherds, usually from the yard areas of the tenements, suggesting that domestic rubbish was dumped in these areas in middens, which were periodically removed. Relatively little late medieval pottery was found outside the yard areas, indicating that the material was being disposed of away from the hamlet, with the implication that the land adjacent to the settlement was being used for livestock rather than arable.

The best primary deposits of pottery came from the earlier use of the twelfth-century manor, Ph1, and the medieval tenements, Ph3/2. In the former case, it would seem that when many of the boundary ditches were being backfilled during reorganization of the settlement domestic refuse was, in some instances, either directly incorporated with the backfill material or was allowed to accumulate in partially silted and redundant ditches.

The reasons for the profusion of Ph3/2 groups is less easy to explain. Much of the pottery was sealed within floor levels, with later features and deposits sealing them. The kitchen group from building C8, the manorial barn converted to a peasant tenement, is particularly interesting. It produced a very large group of large sherds, with joining sherds from many of the different features within the room. This would indicate that there was a great deal of rubbish scattered all around, which seems a little puzzling when generally the living areas of the tenements appear to have been kept relatively clean of refuse. However, together with the additional occurrence of a primary group of metalwork finds in the same building, it is possible to see this as a particular instance in which a building was temporarily abandoned but without the full removal of its fixtures and fittings.

Phase 0

This phase did not yield any primary assemblages, despite the presence of some fairly large groups of material. By far the biggest (in terms of sherd numbers) came from ditch systems 18 and 19 (LSD18 and 19) and the final filling of the mill leat prior to the construction of the flood bank, but the groups consisted of scattered, fragmentary material from a large number of different vessels.

In the case of ditch system 18, lying close to the successive timber (T29) and stone (S18) halls, the pottery may have accumulated either rapidly or over a more extended period of time, but in the other two instances there is little doubt that the material was incorporated in soils deposited as a deliberate and rapid backfilling; and it would appear that the ceramic came from either middens or a similar source.

Phase 1

Two major primary deposits of pottery were datable to this phase, and both of them appear to have been related to settlement reorganization rather than simple rubbish disposal.

KITCHEN RANGES T32 AND S21

This group consisted of a large dump of pottery between the kitchen S21 and the garderobe S23, and overlying the then largely silted enclosure ditch 8 (LSD8). The majority of the material came from backfill of the garderobe construction pit and an upper ditch fill probably immediately pre-dating the construction of the kitchen S21, and there were cross-joins between these groups. This material is probably contemporary with the final use of timber building T32, possibly an earlier kitchen. There were other small deposits within later contexts, certainly associated with the use of kitchen S21, which yielded pottery which joined to vessels from the two major groups, while some vessels (49, 58, 93 and 98) were only represented in the later contexts. All of the vessels which were partially reconstructed had many other non-joining sherds from the various contexts.

The full group comprised illustrated vessels (Fig 10.6, 49 and 51; Fig 10.7, 58; and Fig 10.15; 93, 97 and 98), and three vessels not illustrated; the rim from a large SHC Top Hat jar, with many non-joining bodysherds, in a thin, hard orange fabric with a grey core; and the rim and upper bodies of two SHC jars, both pale orange fabric, grey core.

Perhaps the most interesting aspect of this assemblage is the fact no SHC bowls could be reconstructed, when bowls are by far the most numerous reconstructed vessels at West Cotton, and represent over 12% of the coarseware rim sherds from groups of this period from the site as a whole. Conversely, Top Hat rim sherds were quite numerous in the group, but only make up 2% of the site assemblage of the period. The fact that so many THP sherds occur in what can be seen as a kitchen midden does lend support to the notion of them being specialist cooking vessels.

Conversely, the lack of bowls adds weight to the argument that those vessels were not generally used in cooking, but were more related to grain processing.

St Neots-type wares, including the late T1(2) types, were not represented amongst this group, suggesting that they had gone out of use by this time, despite their apparent continuation until 1200 in Northampton (Denham 1985).

DITCH SYSTEM 4

A very large group of material, consisting mainly of SHC, Lyveden A and Oolitic ware, came from the final fills towards the final eastern terminal of this boundary ditch, along with large quantities of limestone rubble. This ditch may have been backfilled either immediately prior to or within the earlier use of the barn and processing range S17.

The illustrated vessels comprise (Fig 10.6, 48; Fig 10.7, 56, 57, 64, 65; Fig 10.13, 76; Fig 10.14, 85, and Fig 10.20, 139).

It is noticeable that this group, despite being broadly contemporary with the group associated with the kitchen ranges, does not contain any reconstructed Top Hat vessels, or even any rim sherds from such vessels. However, there were two reconstructed SHC bowls, as well as rim sherds from several others of the type. The possible association with the barn and processing room, S17, further reinforces the theory that THPs were primarily cooking vessels and the bowls measuring devices.

There are also several large rim sherds of T1(2) St Neots ware present from this later group, despite the fact that the material is absent from the other primary assemblage. However, there were also two sherds of E/MS pottery present, suggesting that there is some residuality.

Phases 2/0 and 2/2

There were no groups of material of this date which could be considered to be the result of primary deposition. Many large groups of these dates were associated with the later medieval tenements, mainly from the yards of tenements B and E, and around the outbuildings of C (one 5m square in yard BY1 of tenement B contained 18.5kg of Ph2/2 material). However, detailed analysis of the pottery yielded few vessels that could be reconstructed. Indeed, few joining sherds were noted from these Phases generally, even within the same contexts. The problem is ably illustrated by the fact that it was not possible to reconstruct a single Lyveden B jug to a full profile, despite there being over 1000 sherds of the material from the phases. Similarly, no Potterspurjugs could be fully reconstructed. The overall picture therefore is one which suggests a continuous process of dumping of refuse in these areas, with much of the material then removed from the site, although the area was by no means kept spotlessly clean, as is demonstrated by the build-up of large amounts of pottery.

Phase 3/2

BUILDING C8, ROOMS 1 AND 2

The major ceramic producing features were the floors and internal features of the clay-floored domestic room (1) and the adjacent kitchen (room 2). They contained large sherds of pottery, and cross joins were possible between them all. Many fragmentary vessels were present, but it was possible to largely reconstruct the following vessels:

- Lyveden A bowl (Fig 10.23, 160). Soft, brick red fabric with grey core, the surface flaking away in places.
- Lyveden A jar. Orange brown fabric with grey core. Patch of sooting on the lower body.
- Rim and body from a large Potterspury jar. Unglazed.
- Base and lower body from Potterspury jar. Thin patchy green glaze on the inner base pad, a few glaze splashes on the outer body.
- Lower body from a Brill/Boarstall jug. A few glaze splashes on the exterior surface.
- Raunds-type Reduced Ware jar (Fig 10.35, 218). Thick black burnt residue on inner base pad.
- Raunds-type Reduced Ware bowl (Fig 10.35, 221).
- Raunds-type Reduced Ware bowl.
- Rim, handle and upper body from Lyveden B jug. Patchy but glossy green glaze on the shoulders. Orange brown fabric with a grey core, moderate amount of angular red ironstone up to 5mm.

This group is useful in several respects. It demonstrates fairly conclusively that the coil-built Lyveden A and B wares were still in use during Ph3/2, alongside the Raunds-type Reduced Wares. The fact that there are no wheel-thrown Lyveden D wares in the group confirms that these post-date the introduction of Reduced Ware. This would also negate the proposed fourteenth-century hiatus in the Lyveden/Stansion industry which has been suggested elsewhere (Pearson pers comm).

Phase 4

No primary groups of this date were found at West Cotton, probably due to the Phase seeing the effective end of the domestic usage of the hamlet. The largest group is just over 2kg of pottery from tenement C, which has the densest deposits of this Phase, but they are extremely small when compared to the amount of material which was deposited in the earlier phases.

Ceramic chronology of the major structural groups

Settlement origin

The pottery indicates that the late Saxon activity at the site did not begin until some time around the middle of the tenth

century. T1(4)-type St Neots ware bowls (Denham 1985) did not occur at West Cotton, despite the fact that these are known at other sites in the Raunds area. The vessels are dated to AD 800–950 at Northampton.

The later T1(3) type St Neots ware bowls were relatively common finds at West Cotton. These were dated to AD 900–1150 at Northampton (Denham 1985), with the lack of the earlier bowl types implying that the late Saxon activity did not commence at West Cotton until AD950.

There is the possibility that manufacture of the earlier bowl type ceased before this time, but the evidence from north Raunds (Blinkhorn 2009) suggests that this is not the case. There, both types of bowls were found together in some features, suggesting that there was an overlap in their usage, as originally postulated at Northampton.

Fabric occurrence in major features

All of the pottery found in all the related features of each defined structural group was quantified by number and weight of sherds, including all the wares which are considered to be residual or intrusive. The tabulated data is retained in archive.

The analysis of the stratigraphic sequences led to the elimination of groups of ceramic which are considered to be derived from, or contaminated by, later activity. This included such situations as the deposition of material within the subsidence hollows over boundary ditches or the wall trenches of the timber buildings. In some instances this could be demonstrated from the recorded stratigraphy. In other instances, where individual context numbers had included both upper and lower fills, leaving the original context of the pottery imprecisely defined, the presence of the later pottery types within the upper or subsidence fills could only be assumed on the overall balance of the evidence. Contexts were taken to be contaminated when the presence of small quantities of later ceramic was in distinct contrast to the overall balance of the phase dating from the major part of the assemblage. These instances were also checked against the dating of the overlying contexts from which the contamination was probably derived.

It was then possible to provide phase dates for the construction, occupation and abandonment of individual structural groups, although in many instances there was insufficient evidence to define all three parameters. In particular, the small amounts of pottery attributable to the primary fills of the boundary ditches and the wall-trenches of the timber buildings often left their dates of construction undefined. Following the provision of phase dating purely on the basis of the ceramic evidence, the stratigraphic relationships between the major structural groups were considered. From these relationships it was possible to suggest refinements to the phase dating for the construction and abandonment of several structural groups with good inter-relationships.

The chronology of the main structures, as summarized below (Table 10.18), therefore represents a balance between

the strict ceramic phasing and the stratigraphic phasing sequence of the structural groups. Phase dates followed by a single ? are those where the small quantity of the recovered pottery and a lack of inter-relationships leaves the date uncertain. Those followed by ?? are dates of construction or abandonment proposed after reference to the dating of inter-related structures.

Ceramic indicators of settlement function

The yards

The yard areas of the later medieval tenements produced 43,045 sherds, amounting to over 55% of the stratified medieval pottery from the excavation. The presence of such a large amount of ceramic is almost certainly at

Table 10.18: Ceramic chronology of the major structural groups

Building/room	Construction	Occupation	Abandonment
T28	Ph0	Ph0 – Ph1	Ph1?
T29 hall	LS2 ?	?LS2 – LS3? – Ph0	LS4 – Ph0
T30 domestic range	LS2	LS2 – Ph0 ?	Ph0?
T31	?	?	?
T32 kitchen	??	Ph0 ?	Ph0 ??
T33 (over T34)	LS4	LS4 – Ph0	Ph0
T34	Late LS2 ?	LS2 – LS3 ?	LS4?
T35	?	?	Pre-Ph0 ?
T38 palisade	?	?	Pre-Ph0 ?
M27 mill	LS2	LS2	LS2
M26 mill	LS4 ??	LS4	LS4 ??
M25 mill	LS4	LS4 – Ph0	Ph0
M25 (MILL) flood bank	Ph0	Ph0 – Ph1	–
Boundary ditches (LSDs)	LS2	LS2 – Ph0–Ph1	Ph0 – Ph1
S18 hall	Ph0	Ph0 – Ph2/0	Ph2/0
S19	Ph1	Ph1 – Ph2/0	Ph2/0
S20	Ph1 ?	Ph1	Ph1
S21 kitchen	Ph0	Ph1	Ph1 ?
S22 dovecote	Ph1 ?	Ph1 – Ph2/0 ??	Ph2/0 ??
S23 cess pit	Ph1	Ph1	Ph1
S24	??	??	Ph1 ??
S17 barn	Late Ph1	Ph1 – Ph2/0	Ph2/2 ?
A1/1	Ph2/2	Ph2/2 – Ph4	Ph4
A1/2–/5	Ph2/2	Ph2/2 – Ph3/2	Ph4 ?
A2	Ph3/2?	Ph3/2 – Ph5 ??	Ph5 ?
A3	?	? – Ph4?	Ph4 ?
B4	Ph2/0	Ph2/0 – Ph2/2 ??	Ph2/2 ??
B5	Late Ph1	Ph2/0 – Ph2/2	Ph2/2
B6/2	??	?? – Ph2/2	Ph2/2
B6/1	Ph2/2	Ph2/2 – Ph3/2	Ph3/2
B7	Ph2/2	Ph2/2	Ph2/2
C8 barn phase	Ph2/0??	Ph2/2 – Ph2/2	Ph3/2
C8 domestic phase	Ph3/2	Ph3/2	Ph3/2
C9 room 1	Ph2/0	Ph2/0 – Ph3/2	Ph4
C9 room 2	Ph3/2	Ph3/2	Ph4
C10 malt house	Ph2/2	Ph2/2	Ph2/2
D11	Ph2/2	Ph2/2 – Ph3/2	Ph4
D12	Ph2/0	Ph2/0 – Ph2/2	Ph2/2
E13	Ph2/0	Ph2/0 – Ph3/2	Ph3/2
E14	Ph2/2	Ph2/2 – Ph3/2	Ph3/2?
E15	Ph1??	??	Ph2/2??
E16 malt house	Ph2/0?	Ph2/0	Ph2/0?

least partially due to the yards containing middens for the temporary storage of domestic refuse, and the lack of cross joins and the fact that no vessels from the yards could be reconstructed to full profiles would confirm that any such middens were periodically removed. It can be seen that the groups were therefore the partial remains of primary assemblages and offered real potential in analytical terms.

Table 10.19: The mean sherd weights from the yard areas

Phase	Number	Mean weight (g)	Standard Deviation (g)
Ph1	4021	10.4	9.8
Ph2/0	5138	10.6	10.2
Ph2/2	12219	10.3	10.2
Ph3/2	18713	9.1	8.1
Ph 4	884	9.6	9.1
Ph 5	79	9.2	14.9

Table 10.20: The mean sherd weights for the whole site

Phase	Number	Mean weight (g)	Standard deviation (g)
Ph1	10834	12.1	12.7
Ph2/0	5981	10.5	11.5
Ph2/2	7338	10.2	10.0
Ph3/2	10518	10.5	11.3
Ph4	938	8.8	8.5
Ph5	412	10.1	7.1

Generally, there are few differences between the two assemblages (Tables 10.19 and 10.20). The Phase 1 material from the yards not only has a lower average sherd weight than that from the site as a whole, but also a lower standard deviation, suggesting an assemblage which is generally of a fairly uniform nature in terms of sherd size. This is presumably due to the fact that the tenements were not constructed until Phase 2/0, and thus the Phase 1 groups are largely residual material, with the sherd size data reflecting this.

The material from Phases 2/0 and 2/2 are generally similar to those from the rest of the site, but Phase 3/2 does differ. The mean sherd size of the yard assemblage is considerably smaller than that of the whole site, as is the standard deviation, presumably due to the fact that several primary assemblages of this Phase were found within buildings, and the yard material was probably subject to trampling.

The fact that the Phase 4 material from the yards has a larger mean sherd size and a greater standard deviation could be seen to be the result of the abandonment of the settlement, meaning that the final deposits in the yard, unlike the earlier material, were not subject to trampling and thus were not broken into smaller sherds, with the other deposits of material of this phase away from the yards being the result of secondary deposition.

Phase 5, which post-dates the abandonment, has an extremely large standard deviation, but the population is too small to be significant, although the data does support the assertion that most of the pottery from contexts datable to this phase was residual.

Pottery occurrence by sherd count by Phase: yard areas

It is possible that the separate yard areas 'serviced' individual structures within the tenements, with the pottery from them offering the opportunity to examine the suggested dating of the occupation of the buildings. Initially, the data was processed by simply counting the sherds per phase, and using the percentage of the total pottery from the yard by ceramic phase to give some idea of the activity in the yards during each phase. This, however, is an oversimplification; the phases are not all the same length, they vary between 25 and 100 years, and thus an 'activity indicator' could be assessed by dividing the percentage by the length of the period in years. Whilst this operation is always going to be an approximation and assumes a definite chronology and a constant rate of ceramic deposition, it is felt that it gives a truer representation of activity than bald percentage figures.

The resulting figure is then multiplied by 100, to make the data easier to view, giving a figure which can be referred to as the Relative Activity Quotient (RAQ). The individual phase scores for each yard can only be compared to the results for the other phases from that same yard; cross-comparison is not possible. The sherd totals contain only contemporary pottery; all the redeposited material was discounted before analysis.

Table 10.21: Relative Activity Quotients for the medieval yards

Yard	Ph2/0	Ph2/2	Ph3/2	Ph4	Ph5	Total sherds
AY1	9RAQ	53	41	53	6	4476
AY2	15	24	59	32	10	3279
AY6	99	63	43	0	0	1586
BY1	33	184	1	0	0	2355
BY2	33	160	11	0	0	550
BY3	291	53	0	0	0	665
BY4	171	90	12	0	0	1276
BY5	0	200	0	0	0	154
BY6	171	114	0	0	0	656
BY7	147	119	4	0	0	1126
CY1	60	35	51	34	0	1463
CY2	27	77	54	0	0	147
DY1	12	8	45	72	25	1408
DY2	30	115	27	16	0	257
EY1	69	41	62	0	0	4653
EY2	72	151	1	11	0	908
EY3	39	89	46	0	0	4951
EY4	48	25	75	0	0	1526
EY5	21	30	91	0	0	2815

Tenement A yards

Yard AY1 shows a fairly constant rate of ceramic deposition from Ph2/2 to Ph4, the period of domestic occupation of the tenement, after conversion from agricultural/industrial use during Ph2/0. The fact that the rate of deposition is much lower during the earliest Phase would suggest that pottery was in much greater use in domestic rather than agricultural/industrial activity. The constant rate of deposition through Ph4 and the small amount of Ph5 material would support the suggestion that structure A2 continued in use during this period.

Yard AY2 shows a similar pattern to AY1, although the RAQ is noticeably higher during Ph3/2, and the low value for Ph2/0 would again appear to demonstrate that less pottery was deposited in the yard during the non-domestic phase of activity in building S17. The yard has a small Ph5 deposit, indicating activity until this period. A2 also has a small Ph5 group within the demolition rubble.

Yard AY6 was faced by room A1/5, and the deposits confirm the dating of the use of the structure. The RAQ index has its highest score during Ph2/0, although this may be due to disturbance of earlier contexts during the construction of this room, which was an addition to the range.

Tenement B yards

The relatively high levels of Ph1 and Ph2/0 material are due to the soil horizons that pre-dated the buildings and yard surfaces, and therefore relate to the pre-tenement usage of these areas. The extremely low levels of Ph3/2 activity confirm the postulated dating of the use and occupation of the tenement B structures, with its early date of desertion.

Tenement C yards

The enclosed yard, CY1, behind the barn/domestic range C8 has broadly the same pottery dating as the building, with fairly constant RAQ figures for Phases 2/0 – 3/2. The fairly high level of Ph4 activity probably reflects the late usage of some of the buildings in tenements C and D.

Tenement D yards

Yard DY1 served buildings D11 and D12 successively, and the chronology confirms their general dating plan. The low level of Ph2/2 material would suggest that the conversion to domestic use of building D11 did not take place until the later part of this period. The high RAQ from Ph4 would suggest that the building was still in use at this time.

DY2: Serving D11/D12, the highest RAQ is from Ph2/2, in complete contrast to the pattern from DY1, and continuing until Ph4. This presumably reflects an intensive use of this area contemporary with the kitchen/bakehouse ranges D11 and D12, but with little usage after this.

Tenement E yards

The central courtyard, EY1, was surrounded by the tenement E building ranges. The RAQ suggests a fairly uniform level of activity throughout the lifetime of the tenement, but with no activity in Ph4.

The open area EY2 does not directly relate to any of the buildings, and may have functioned as a kitchen garden as the pottery is nearly all pre-Ph3/2, indicating that the yard may have fallen out of use or at least undergone a change of function.

The walled yard EY3, and the minor areas adjacent to the buildings, EY4 and EY5, have the same general ceramic characteristics as EY1, although there is a somewhat greater level of Ph2/2 activity in EY3.

Rate of ceramic deposition by yard area per Phase

The following Table (10.22) gives the weight of pottery per square metre deposited in the yards during each phase. Whilst this can obviously take no account of the amount of rubbish which has been removed by the occupants of the hamlet, it does generate a tool to compare the activity in the individual yards.

Table 10.22: Pottery weight (g) per square metre per phase

Yard	Area (sq.m)	Ph2/0 (g/sq m)	Ph2/2 (g/sq m)	Ph3/2 (g/sq.m)	Ph4 (g/sq.m)	Ph5 (g/sq.m)
AY1	225	5.9	64.4	82.9	55.0	7.6
AY2	90	13.6	156.6	204.7	48.5	27.9
AY6	155	22.4	36.9	42.4	0	0
BY1	22	123.4	948.7	14.3	0	0
BY2	24	21.3	175.7	24.3	0	0
BY3/4	62	161.4	123.2	23.3	0	0
BY5	50	0	367.5	0	0	0
BY6	50	82.9	160.9	0	0	0
BY7	45	93.4	186.6	7.3	0	3.4
CY1	30	95.2	113.9	247.9	75.5	0
CY2	25	8.1	15.2	25.4	0	0
DY1	190	4.0	3.4	46.3	24.2	10.9
EY1	145	54.1	63.8	186.1	0	0
EY2	120	14.8	56.6	0.7	3.3	0
EY3	130	42.7	130.3	142.0	0	0
EY4	105	17.9	17.0	90.6	0	0
EY5	120	8.7	33.4	154.0	0	0

Phase 2/0

The highest rates of ceramic deposition in the yards during this period occurs in tenement B, which is the earliest of the tenements, with most of the structures built during this or Phase 1. BY2 and BY5 yielded by far the smallest amount of pottery. BY5 was not fully excavated, unlike BY2 which appears to have been kept fairly clean in comparison to the other yards. The fact that BY2 produced similar amounts of pottery from Phase 2/2, the date of abandonment of tenement B, would indicate that the yard was cleaned more regularly rather than not used as a dumping area.

Tenement C yard CY1 produced similar amounts of pottery to the B yards, and this too was faced by buildings which were constructed during this phase. Tenement E also dates from Phase 2/0, but the yards do not show the same rate of deposition of ceramic, suggesting that they may have been built slightly later than the B and C structures, although other explanations are plausible.

Phase 2/2

Most of the yards were showing similarly high rates of ceramic deposition by this time. The figure for BY1 is exceptionally large, and this results from the presence of pottery associated with successive yard surfaces which were exceptional in showing little later disturbance.

The deposits in AY6 had generally less pottery than the other yards, probably due to the fact that this yard did not directly service any of the domestic structures. DY1 produced very little pottery, but the loamy fills of that area suggested that it may have been some sort of kitchen garden, similar to EY2, EY4 and EY5, which although producing more material than DY1, yielded far less pottery than the enclosed yards.

Phase 3/2

Few of the yards of this phase yielded large amounts of ceramic except for AY2, CY1, EY1, EY3 and EY5. AY2 was serving structure A1/1, the only part of tenement A which was in use throughout this period, as was the case with CY1 and structure C9. Tenement E was abandoned during this period, with the large deposits in the E yards perhaps representing uncleared middens.

Phase 4

The figures for Phase 4 show that there was very little activity in most of the hamlet after this time.

Vessel usage in the tenements

There are obviously variations in the proportion of the different vessel types in each yard when compared to the site average, which may indicate significant changes in the pottery assemblages in the individual tenements over time. As these may be related to building use, a statistical analysis of the data was necessary to see if the yards deposits are valid samples, or merely the normal variations found in any sample population.

The Student's t-test was used (eg Hayslett, 1978), and this indicated that the yard assemblages are a representative sample of the site population, and therefore useful in analytical terms with the inference that any variations in the individual collections may be archaeologically significant.

The most obvious area worthy of analysis is the apparent restructuring of the settlement between Phases

2/2 and 3/2, when many of the existing buildings undergo reconstruction. Consideration is thus given to the pottery assemblages in each yard, to determine if certain vessel types can be associated with specific activities.

It is possible to examine any major change in the overall site assemblage (Table 10.23) by using the chi-squared test, where the null hypothesis is that there is no significant change in the proportion of vessel types between the phases. This does not show a significant change across the site phase by phase, but indicates that there is a significant change between Ph2/0 and Ph3/2, with the proportion of bowls increasing at the expense of jars.

Table 10.23: Percentage occurrence of jars, bowls and jugs across the site

Phase	Jars	bowls	Jugs
Ph2/0	77%	14	9
Ph 2/2	72	20	9
Ph3/2	68	23	9

The individual yard assemblages (Tables 10.24–10.26) can be compared to themselves through time and to those from the other yards, to see if there are any statistically significant differences which may be attributable to either change in activity in the yards themselves, or due to different functional activity within the individual tenements which the yards serviced.

Tenement A

The statistical analysis indicates that the tenement A yards show significant differences in their functional assemblages between Ph2/2 and Ph3/2, with an increase in the proportion of bowls in each case (Fig 10.40 and Table 10.24). Residue analysis has shown that these vessels rarely, if ever, produce significant quantities of organic lipids, suggesting that they are not strongly associated with cookery. Conversely, jars, which are the main source of organic lipids, decrease when the change to domestic activity occurs. It would appear therefore, that the bowls had a domestic function which was not directly linked to cooking. This is investigated more fully below.

Table 10.24: Occurrence of vessels in yards of tenement A

Yard	Phase	Jars	bowls	Jugs
AY1	Ph2/2	82%	13	6
AY1	Ph 3/2	66	25	10
AY2	Ph2/2	88	8	4
AY2	Ph 3/2	73	24	3
AY6	Ph2/2	88	12	0
AY6	Ph 3/2	68	30	3

Tenement B

The tenement B yards show a definite drop in the proportion of jars in use between the two Phases, and it is worthy

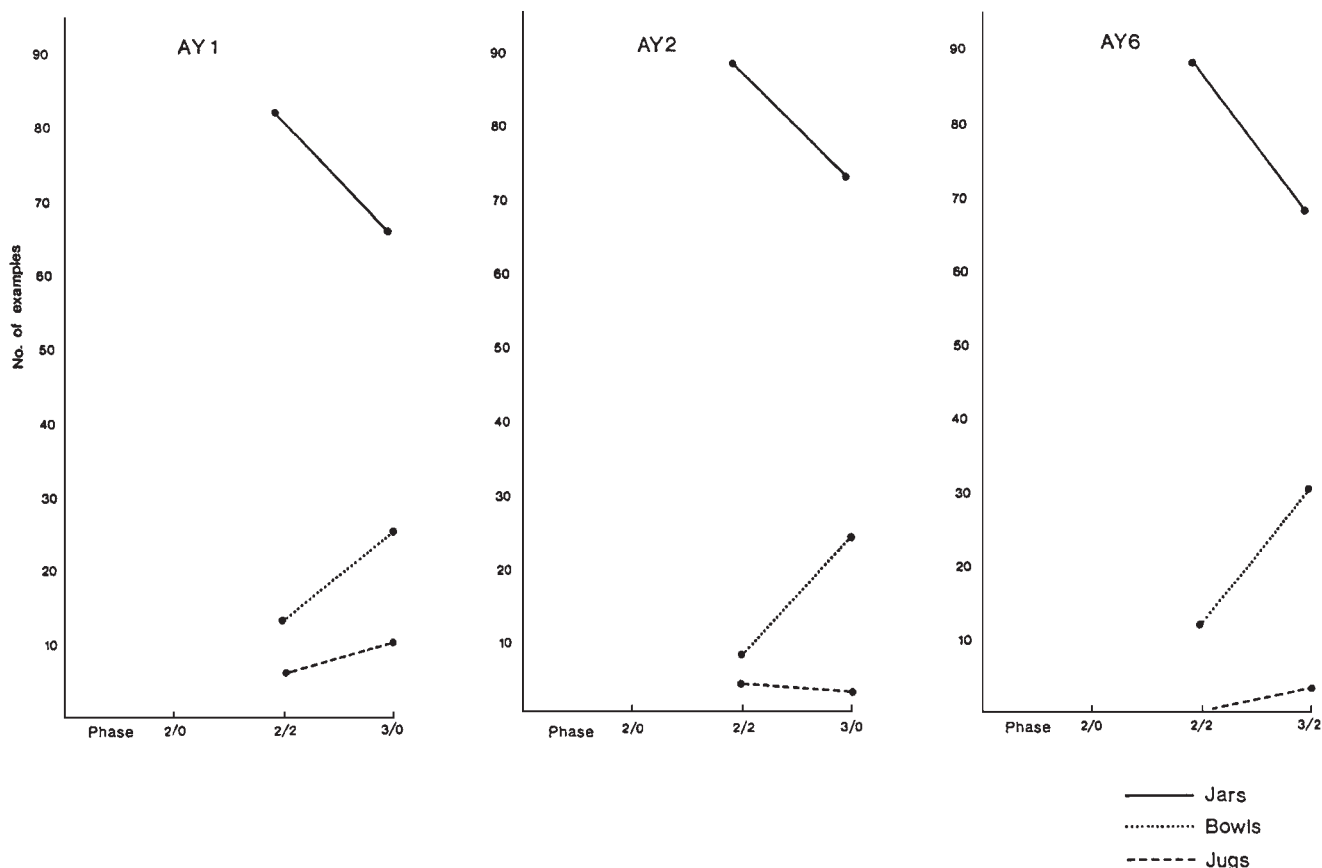


Figure 10.40: Medieval pottery, occurrence of jars, bowls and jugs within tenement A yards

of note that BY4 and BY7 both have a large increase in the proportion of bowls during Ph2/2, when the tenement contained a bakehouse along with the processing room (Fig 10.41 and Table 10.25). The tenement B yard assemblages show significant differences to those of tenement A during Ph2/2, with yard BY4 having a much higher proportion of bowl use, possibly as a result of different activities taking place.

Table 10.25: Occurrence of vessels in yards of tenement B

Yard	Phase	Jars	bowls	Jugs
BY4	Ph2/0	75%	19	6
BY4	Ph 2/2	64	32	4
BY7	Ph2/0	83	1	16
BY7	Ph 2/2	67	20	13

Tenement E

There are statistically significant differences between yards, EY1 and EY3, during Ph2/0, when the malt house E16 in EY3 was in use, with EY3 containing a much lower proportion of bowls (Fig 10.41 and Table 10.26).

Very little physical or functional change appears to take place in tenement E during the rest of its lifetime, and it

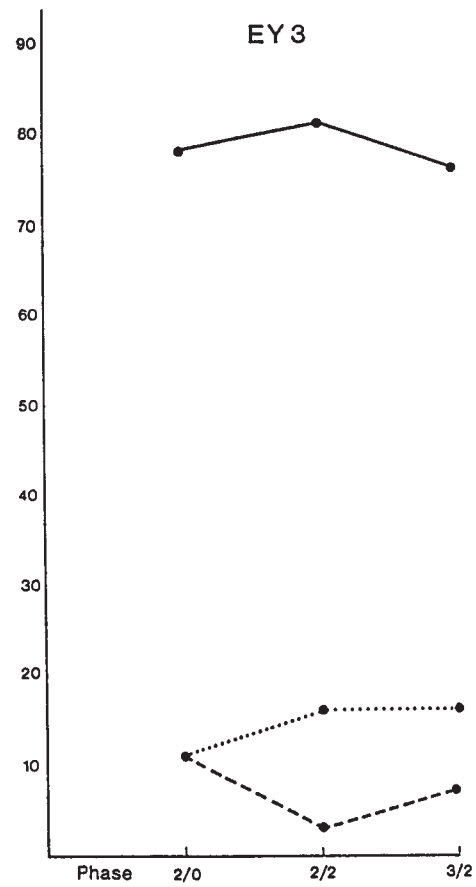
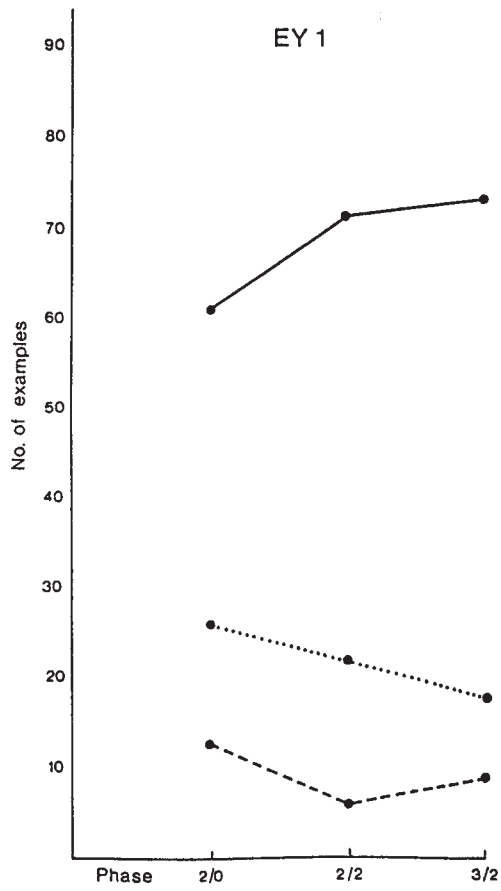
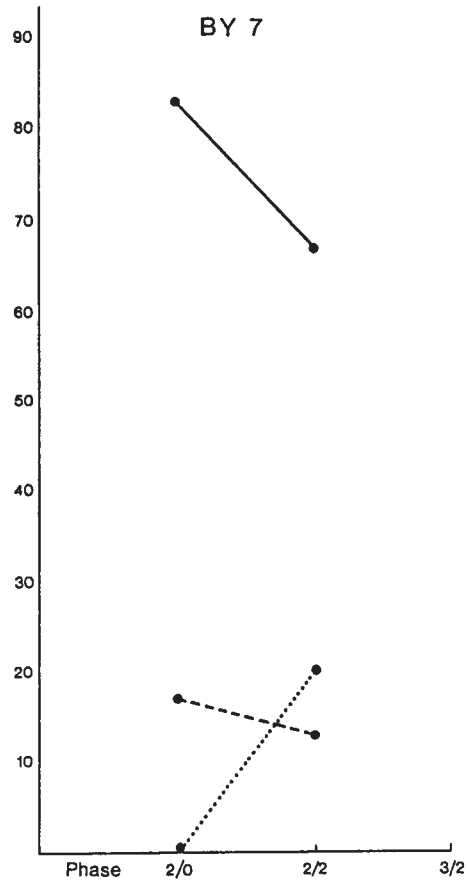
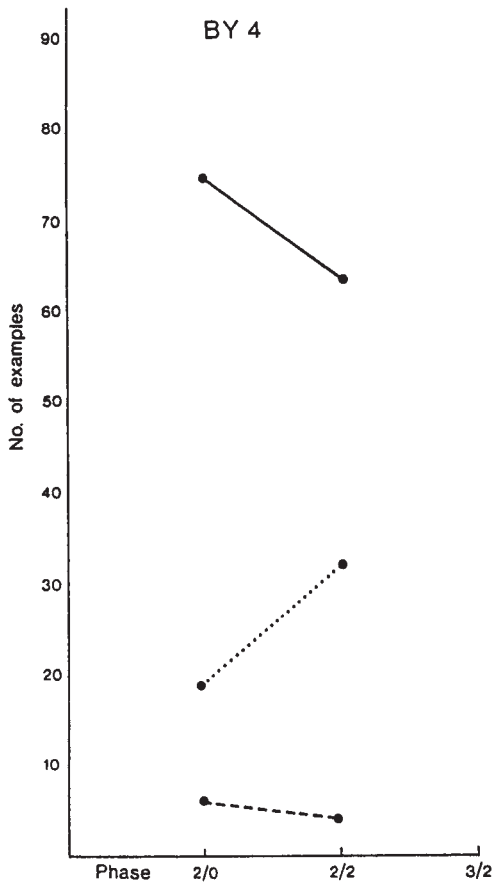
is significant that little change occurs in the proportion of vessel types in the main yards (EY1 and EY3) between Ph2/2 and Ph3/2. This suggests that the changes in the vessel proportions in the tenements which undergo functional changes may be significant.

Table 10.26: Occurrence of vessels in yards of tenement E

Yard	Phase	Jars	bowls	Jugs
EY1	Ph2/0	61	26	13
EY1	Ph 2/2	72	22	6
EY1	Ph3/2	73	18	9
EY3	Ph2/0	78	11	11
EY3	Ph 2/2	81	16	3
EY3	Ph3/2	76	16	7

Distribution and status of glazed wares

The purpose of this analysis was to see if there were any discernable differences in the distribution of the various glazed wares that would indicate differential status within the settlement. The medieval settlement at Faxton, Northamptonshire, is purported to have demonstrated evidence that ceramic from the different tofts reflected the wealth of the owners (McCarthy and Brooks 1988, 289).



— Jars
 Bowls
 - - - - Jugs

Figure 10.41: Medieval pottery, occurrence of jars, bowls and jugs within tenement B and E yards

At West Cotton, the three major glazed wares, Lyveden B, Potterspurty and Brill/Boarstall can be clearly seen, to modern eyes, to have significant differences in terms of quality of manufacture and finish, and by implication, cost. The wheel-thrown Brill and Potterspurty wares demonstrate a higher standard of manufacture than the Lyveden B wares. Similarly, the Brill jugs tend to be highly decorated, while the Potterspurty wares are plain apart from glazing and shoulder grooving. It does not therefore seem unreasonable to suggest that they were of a differing status, but such an assumption requires testing.

The three wares occurred together in Phases 2/2, 3/2 and 4. The analysis consisted of a comparison of the relative proportions of the glazed pottery population and also the proportion of the whole assemblage glazed wares represent, by yard and phase (Table 10.27). As with the vessel proportions an assessment of significance was made using the Chi-squared test.

The central yard of tenement E, EY1, which services the domestic hall in the tenement, had a far higher proportion of Brill/Boarstall ware during Ph2/2 than the walled yard, EY3, suggesting that the material was in greater use in the hall and was perhaps primarily a tableware.

The proportion drops dramatically in Ph3/2, except in yard CY1, which might indicate that there was an interruption in the pottery supply. If the figures for the whole of the site are examined (Table 10.17), Brill wares drop from 1.9% of the assemblage in Ph2/2 to 0.9% in Ph3/2, before increasing once again to 1.7% in Ph4. It is therefore possible that this is another example of the effect that the Black Death had on trade in the area. The Potterspurty wares do not show this decline, except in EY3, but it is possible that some of the West Cotton material classified as Potterspurty ware was made at a kiln in Stanion. A rescue excavation at Little Lane in 1990 has revealed wasters which were both stylistically similar to

Potterspurty ware and in a macroscopically identical fabric (Blinkhorn and Hurst 1991), but there are no plans for a formal analysis and publication of this kiln assemblage at the time of writing (but see Chapman *et al* 2008 for copies of notes by Blinkhorn and description of kiln).

It would seem, therefore, that the distribution of the glazed ware is related to functional considerations, as is suggested by the lack of aquamaniles, which appear to have been mainly used at the medieval high table. The Potterspurty and Lyveden jugs tend to be fairly large, globular vessels, whilst the Brill jugs are generally smaller (in terms of volume) baluster forms, and their distribution at West Cotton suggests that they did indeed tend to be used as tableware.

All the tenements yielded quantities of Brill jugs, and it could be said that this shows that the tenements were fairly egalitarian in terms of the wealth of the occupiers, but the evidence from medieval towns would indicate that apparently high status pottery cannot be seen as a measure of wealth or power. Large scale excavation of the medieval towns of Exeter (J Allen pers comm), Southampton (D Brown pers comm) and Waterford in Eire (A Gahan pers comm) have shown that the imported French glazed wares have a more or less homogeneous distribution around the towns, with the poorer areas yielding as much of the material as the richer parts. The implication that even imported exotica were well within the reach of the poorest, suggest that even pottery of the highest quality was still relatively cheap. Duncan Brown's analysis of the late medieval port rolls from Southampton has shown that even imported pottery was far cheaper than containers made from other materials, such as glass. This conclusion is further reinforced by the fact that pottery is very rarely mentioned in manorial estate inventories, despite excavations of such sites usually yielding large quantities of the material.

Table 10.27: The distribution of glazed wares in the tenement yards

Yard	Phase	Lyveden B ware	Brill	Potters- purty	Lyveden D	Total	% of assemblage
AY1	2/2	37%	8	56	0	144	12.1
	3/2	31	4	65	0	373	20.3
	4	18	3	64	15	442	37.0
AY2	2/2	0	0	0	0	55	0
	3/2	24	2	74	0	310	16.0
	4	32	5	44	20	179	34.6
BY1	2/2	24	16	60	0	348	16.1
	3/2	0	0	0	0	9	0
CY1	2/2	0	0	0	0	37	0
	3/2	40	10	50	0	125	16.9
	4	30	15	19	35	79	31.7
EY1	2/2	24	35	41	0	208	21.9
	3/2	42	2	56	0	362	12.5
EY3	2/2	18	3	79	0	366	16.6
	3/2	26	7	68	0	207	9.1

The early/middle Saxon assemblage in its regional context

At the time of writing, there is only one excavation which has revealed positive ceramic evidence of Saxon occupation before the end of the fifth century from anywhere within Northamptonshire. Sherds from two mid-fifth century *schalenurnen* were reported as being present amongst the pottery from a sunken-feature building (SFB) at Stoke Doyle Road, Oundle (Foard and Pearson 1985, 10; Pearson 1994).

None of the Raunds or Northampton sites (eg Williams and Shaw 1981) have pottery which can be dated to before this time, although the counties of Leicestershire and Buckinghamshire (eg Bancroft Mausoleum, Blinkhorn 1994a) have several sites which have yielded mid-fifth century carinated *schalenurnen*.

The cemetery at Wakerley, Northants yielded a fairly large assemblage of Early Saxon pottery, including a single decorated jar form (Pearson 1988). The vessel in question is a long-boss urn of late fifth or early sixth-century date, but it is worthy of note that it was in a fabric which did not occur in any of the other vessels from the site, suggesting that it may have been an heirloom.

None of the vessels from the cremation cemeteries at Kettering (George 1903 and Markham 1929), Islip (Smith 1918) or Nassington (Leeds and Atkinson 1944) can be dated to before the late fifth century. It is true that the handled urn from Great Addington, Northamptonshire (Roeder 1928, 5) is almost certainly late fourth or early fifth century in date, but the vessel could easily be a 'stray' or an heirloom, as it is of a type which is extremely rare in Britain.

It is possible that wider evidence of early to mid fifth-century occupation in the county awaits discovery. The Roman settlement at Stanwick, Northamptonshire, adjacent to West Cotton, has yielded coinage dating to the very latest issues in Roman Britain (J Davies pers comm) and two brooches of possible fifth-century date (A Olivier pers comm), but the Saxon pottery at the site appears sixth century (Blinkhorn pers comm), as does the glass (H Cool pers comm). There are, however, traces of occupation in the villa area of the site which appear to post-date the fourth century (D Neal pers comm), but do not have any associated artefacts. This would suggest that the Romano-British population of the Nene valley may have continued on at subsistence level after the end of Roman rule. The evidence from Stanwick suggests that there was no manufacture of items of material culture, other than ironworking, at the site, with metalwork, glass and pottery all arriving as traded goods from outside sources. Thus, the breakdown of the economy would leave the local population lacking in non-perishable items of material culture, resulting in them being almost invisible in the archaeological record.

Other evidence of continuity into the fifth century is rather scarce. Excavations at the Piddington Roman villa,

south of Northampton, have yielded a sherd of the so-called 'Romano-Saxon' pottery, a bossed and incised example almost identical to a vessel from Harston, Cambridgeshire (Myres 1986 fig 7d). The sherd, which is the only one of its type from the county, is associated with coins dated to the AD 380s (R Friendship-Taylor pers comm), and two handmade Saxon sherds occurred in a nearby feature.

The range of fabrics at West Cotton are basically the same as those from the other major sites in north Raunds, and all of the inclusions, with the exception of the granite temper, are available within the local geology.

There is no evidence for middle Saxon settlement at West Cotton, although a radiocarbon date indicates that the river channel was being used for flax retting. The only positive ceramic evidence from the Raunds area comprises Ipswich and Maxey wares at Langham Road and Burystead in north Raunds, and the occasional find of the Ipswich ware during fieldwalking (S Parry pers comm). It has been suggested that a decorated sherd from Furnells is comparable to a Merovingian biconical vessel (Pearson 2009, 155 and fig 6.3, 24), but as ceramic of this type is known only from major English settlements such as York, London and Ipswich, it is difficult to see how this material could have influenced Raunds potters. The suggestion that some of the rim forms of the Furnells vessels have been influenced by Ipswich ware is best discounted, as they are forms which are common throughout the early and middle Saxon periods in much of England.

The percentage of granite-tempered pottery at West Cotton is twice as high as any of the north Raunds sites. It has been shown that granite-tempered pottery can be early in date (Mackreth 1978), but none of the decorated pottery at West Cotton or north Raunds can be shown to be earlier than the sixth century. Both sites have granite-tempered wares, implying that an early Saxon assemblage cannot be assumed to be early in date solely on the presence of undecorated granite-tempered vessels.

The significance of the temper preparation and type was discussed at some length in the north Raunds pottery report, although no firm conclusions were reached (Blinkhorn 2009, 174–175). The picture is still no clearer, but it seems almost certain that the explanation is not a typological one. Various other domestic pottery assemblages from early/middle Saxon sites in the south-east midlands on similar geology have been analyzed using this approach, such as the settlement at Pennylands in Milton Keynes, Bucks (Blinkhorn 1993). The settlement could be divided into three distinct periods of ceramic activity: early Saxon (sixth century?), early/middle Saxon (seventh century?) and the middle Saxon (eighth century?), with other datable artefacts supporting the phasing. The gritty pottery formed 52.1% of the assemblage in the sixth century features, increased to 72.6% in the seventh century, but then fell to 59.6% by the eighth century. The chaff-tempered pottery declined steadily from 10.2% in the early Saxon to 2.8% in the middle Saxon, which is in direct opposition to the picture at Mucking, Essex (Hamerow 1987), where Chaff-tempered

material becomes commoner with time, and forms over 90% of the assemblage by the middle Saxon period.

It was not possible to phase the domestic pottery from Raunds sites in this manner due to the lack of dating evidence and relative stratigraphy, but there was a definite correlation between the distribution of sandy pottery and datable middle Saxon wares (Ipswich and Maxey-type) at Langham Road and Burystead, suggesting that the sandy pottery became more common with time.

The early Saxon pottery assemblage from the settlement at Chalk Lane, Northampton (Gryspeerd 1981) yielded fragments of 14 decorated vessels, five of which were in gritty fabrics, the rest being sandy. This is in contrast to north Raunds, where only one of the decorated sherds was in a sandy fabric. Overall, the site yielded 1253 sherds of early/middle Saxon wares (excluding the Maxey-type), 61.3% of which was in sandy fabrics, 36.7% gritty and 2.0% chaff-tempered. The contrast between the temper types used in the Chalk Lane decorated vessels to those of north Raunds is quite striking.

The early Saxon settlement at Caldecote, Milton Keynes (Blinkhorn 1994b), was fairly small in size, but was datable to the fifth century on the evidence of the presence of carinated bowls in the *Schalenurne* tradition and a complete lack of stamped pottery. Here, gritty pottery represented only 24.4% of the assemblage, with sand-tempered pottery 57.9% and chaff-tempered 17.7%.

There thus remains the problem of the interpretation of this data: three different methods of temper preparation were in use at the same time in the same settlements. They appear to have been contemporary and there seems to be no obvious reason why any of them should have been favoured above the other. It is possible, therefore that the explanation is rooted in cultural tradition.

It appears to be a general pattern in studies of modern potters in undeveloped cultures that the knowledge of pottery manufacture is learned on a kinship basis (eg Hodder 1979, 14), and there seems little reason to doubt that this was the case in early Saxon England. It is suggested that the different methods of temper preparation seen in the pottery of the period is a result of potting skills being learned in this way, with the method of manufacture originating from the homelands of the (latterly) culturally mixed groups of people who settled in England in the fifth century. The variation of the proportions of the temper preparation in each settlement could reflect the ethnic origins of the settlers, with the changing proportion of the techniques over time reflecting the success or otherwise of the various familial/cultural groups. There would appear to be no influence from the indigenous Roman-British population, as the coarseware traditions of that period in Northamptonshire is based mainly on shelly wares.

The late Saxon and medieval assemblage in its regional context

Comparison with ceramic assemblages from the other excavations in the Raunds area is only possible on a broad scale. The sites for comparison, Furnell's manor, Burystead and Langham Road have a broadly similar range of wares.

The major medieval glazed wares at Furnell's are basically as those from West Cotton, despite the fact that the former was a manorial site. Nottingham wares, which occur in extremely limited quantities at Furnell's and the other north Raunds sites, are not present at West Cotton, but vessels of this type are so rare in the region that their absence from the archaeological record here cannot be seen as significant.

The presence of an Lyveden/Stanion Aquamanile at Furnell's manor (Pearson 1983; Pearson 2009, 165, fig 6.8, 67) can be seen as significant, however. These vessels are generally regarded as being associated with the medieval high table, so the fact that vessels of this type were absent from the West Cotton assemblage offers further support for this. It has also been suggested that the presence of a Lyveden/Stanion jug with slip facemasks may be a mark of the status and influence of the owner of the western manor at Furnells, but at least three of these vessels have been found at West Cotton.

The late Saxon assemblages from Northampton do show significant differences as whilst they mainly consist of St Neots ware, they also include red-painted wares from Stamford or Beauvais, as well as the products of the late Saxon Northampton ware industry. None of these types occurs at Raunds. It does appear that, as at West Cotton, the majority of the Stamford Ware from Northampton post-dates the Norman Conquest (V Denham pers comm).

The range of later medieval wares at Northampton is broader than at West Cotton, but only in having a wider number of sources for the minor wares. A greater variety of sandy coarsewares are present, with material from Leicestershire and Bedfordshire being not uncommon. Shelly wares are the major ware, although Lyveden/Stanion types are much less common than in the Raunds area.

The most significant difference is that Potterspurty ware appears to be far commoner than Lyveden/Stanion wares at Northampton, with the former often making up over 50% of assemblages dating to after the middle of the fourteenth century (V Denham, pers comm). The range of Lyveden/Stanion wares is far more limited at Northampton, with jugs being the only vessel form known at this time.

Comparisons with the north Raunds sites, in terms of sherd count, yield some results worthy of comment. Buildings first appeared on the Midland Road frontage at Raunds in the later thirteenth century (Ph2/2), the period which saw the reorganisation of the tenements at West Cotton, and continued in a series of rebuildings into the post-medieval period. The pottery from the site shows a broadly similar range to that of West Cotton, with shelly

coarsewares dominating the assemblage, until Ph3/2, when major differences are apparent.

From that time, the Midland Road assemblage has Potterspurty (31.5% in Ph3/2) and Reduced Ware (21.6%) as the major wares, with the total shelly wares being only 31.2% (from 72.3% in Ph2/2), as opposed to the situation at West Cotton, where the shelly wares still formed 72.8% of the assemblage. However, the most likely explanation is that much of the shelly wares in the West Cotton yard assemblages are residual as, unlike West Cotton, there was very little medieval activity on the Midland Road frontage before the construction of the tenements in later thirteenth century.

At Furnells there is an apparent striking difference between the glazed assemblage of the western manor house, with Lyveden wares dominating, and the later medieval eastern manor, with Potterspurty ware dominant. However, these figures may be unduly biased by the omission of the Lyveden/Stanion coarsewares from the figures for the eastern manor on the grounds that they were all residual, when evidence from primary groups at West Cotton would indicate that the wares were certainly still in use at this time.

Recommendations for future research

Throughout this report many analytical problems have been highlighted, the solutions to which were beyond the scope of this project. There thus follows a series of recommendations for future research which, it is hoped, will answer many of the questions posed.

Overall, it would appear that the original objectives of the West Cotton ceramic analysis were generally met. This is one of the first wave of projects in the country to be carried out under the auspices of the revised English Heritage guidelines for the Management of Archaeological Projects (MAP2), and whilst such a rigorous methodological formalization of report structure is to be welcomed, some of the problems with working within the confines of such a framework are apparent. Some areas of the analysis, particularly those concerning the significance of the distribution and usage of the various vessel types and wares within the settlement could possibly have been more fully explored had more time had been built into the project design. This was also true for the analysis of the Shelly coarsewares. Initial examination of the material did not suggest that it would yield the amount of information that was finally forthcoming, and by the time this became apparent the project was too advanced to allow restructuring to take place, although this was often due to analytical methods evolving along previously unanticipated routes as more information was extracted from the raw data. There was also the problem of working to a deadline; avenues of investigation can be closed off before the possibilities have been fully explored, if it appears that the path being followed is fruitless, and time

is pressing. Whilst this is to be welcomed in terms of the saving of time and money, one is sometimes left with the feeling that opportunities may have been missed.

Early/Middle Saxon

The problems of analysis of the plain domestic wares of this period are well-documented, and Northamptonshire is no exception to them. It is not even certain, at this time, if a local middle Saxon ceramic tradition exists, apart from Maxey-type ware, and thus priority must be given to answering this question. There is no easy solution; it is simply a matter of waiting for a suitable site with well-stratified groups of identifiable middle Saxon pottery, ie Ipswich and Maxey-type wares, to be discovered, although the work carried out by Vince and Young (pers comm.) on the latter ware indicates that there is a tradition in the south-east Midlands which shows a different, presumably localized, source of the ware.

Late Saxon

This period is, in many ways, the best understood of the ceramic traditions of the county. The work in Northampton, by Denham in particular, provided a strong and accurate base for the understanding of the pottery of the period, with little extra refinement seeming possible. The only area which still seems lacking is the transition from Maxey-type wares to St Neots type, which is reminiscent of the East Anglian transition from Ipswich ware to Thetford types. Once again, this is simply a matter of waiting for suitable assemblages to appear.

Identification of St Neots-type production centres would also be useful, as it seems probable from the fabric analysis that there were many different sources, but this too would appear likely to be resolved only by chance.

The post-Conquest medieval

As mentioned many times, the pottery of this period is fraught with problems, despite the relatively large amounts of pottery found, and the number of kiln sites known.

Shelly coarsewares

The problems surrounding these wares are similar to those of the St Neots type. Production centres such as Olney Hyde, Harrold, Yardley Hastings and Lyveden/Stanion are known, and yet confident identification and dating of the wares from other sites remains difficult. Many groups of wasters, from Stanion in particular, remain unanalysed, and it is vital to our understanding of the pottery of the period that a full programme of analysis and publication is undertaken.

Glazed Wares

Two particular problems stand out above all others in this area. The Lyveden/Stanion industry is one of the most thoroughly excavated medieval pottery industries in the British Isles, and yet is probably one of the least understood. It is not even possible to differentiate between the products of the two centres at this time. The situation for Stanion is quite hopeful. Many groups of wasters and an unpublished kiln are held in archive. Most of the assemblages are the result of salvage excavation, but they at least have the potential to allow detailed analysis, which may lead to identification of the output of individual kilns (see Chapman *et al* 2008). The picture for Lyveden seems fairly hopeless. The excavation reports are too lacking in detail to allow identification of the industry and the vast majority of the ceramic has been reburied, so it is difficult to see any way of resolving the problem.

The other area requiring work is the question of the production of Potterspury-type wares at Lyveden and Stanion. Wasters from a kiln at Little Lane, Stanion, as well as some of the ceramic in the Lyveden reports, appears to

be macroscopically identical to Potterspury ware, which suggests that material which in the past was identified as Potterspury-type, may in fact be the product of the north-east Northamptonshire industries.

More recently, a number of kilns have been excavated at Potterspury. Publication of these would greatly enhance our understanding of the industry, which is one of the most important of the high medieval pottery industries in the region.

Reduced Ware

The problems with this ware are very much the same as those with the shelly coarseware. A local source exists, but there are also others which are near enough to have provided pottery to sites in the county. Fieldwalking and excavation, and publication of the kiln groups from Kings Meadow Lane, Higham Ferrers (Hardy *et al* 2007), has suggested that there was a different source for Raunds-type Reduced Wares. Identification of the source for the latter would be extremely useful, even though it would probably only affect sites in the Raunds area.



Plate 10.1: A shelly coarseware jar, showing blackening of the exterior (165mm high, see Fig 10.7, 64)

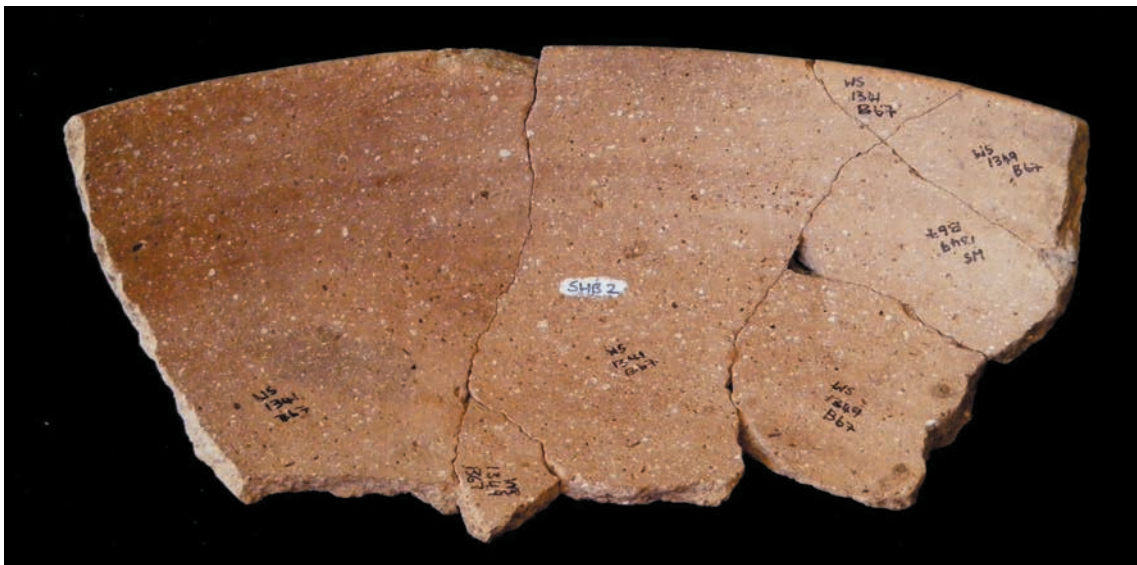


Plate 10.2: A shelly coarseware bowl (see Fig 10.13, 75)



Plate 10.3: A selection of sherds from Lyveden B ware glazed jugs (Fig 10.26, 175) and a jar (Fig 10.27, 186), showing the range of decorative techniques in white slip stripes and stamped pads



Plate 10.4: A Lyveden B ware jar, with internal glaze on lower body (155mm high, see Fig 10.27, 185)



Plate 10.5: An Oxford ware glazed jug, minus handle and rim, decorated with a latticework of iron-rich brown slip (surviving height 215mm, Fig 10.38, 231)

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11 Other finds

by Tora Hylton

with contributions by Andy Chapman, Graeme Lawson, Marion Archibald and Barbara Niemeyer

Introduction

The excavations at West Cotton produced nearly 3500 finds, excluding most ceramics. They span the period from the first to nineteenth centuries, but the small groups of Romano-British, early/middle Saxon and post-medieval finds are only briefly summarised.

The majority of the finds come from late Saxon and medieval contexts of the tenth to fifteenth centuries. They form an assemblage comparable with those from other medieval rural settlements with a similar date range; such as Goltho, Lincolnshire (Beresford 1987) and Faccombe Netherton, Hampshire (Fairbrother 1990), and also from the nearby excavations in north Raunds, particularly Furnells manor (Audouy and Chapman 2009). They represent most aspects of life at the settlement and include an exceptional assemblage of padlocks, keys and knives and an important group of tenth to twelfth-century millstones from the excavated watermill complex. In addition, the small groups of musical instruments and gaming pieces are also of particular interest.

The discussion and description of the majority of the finds groups are by Tora Hylton, while the discussion of the spatial and chronological distribution is by Andy Chapman. The illustrations are by Lesley Collet with assistance from Steve Allen and Tony Baker.

Specific specialist contributions to this report are acknowledged within the text, but the following people may be mentioned for their general advice and comments on many aspects of the assemblage: M Archibald (Department of Coins and Medals, British Museum), J Cherry (Department of Medieval and Later Antiquities, British Museum), S Davis (Ancient Monuments Laboratory), G Edwards (Ancient Monuments Laboratory), G Egan (MoLAS), D Hinton (University of Southampton), G Lawson (Cambridge Music-Archaeological Survey), A MacGregor (Ashmolean Museum, Oxford), B Niemeyer (Ancient Monuments Laboratory), G Rimer (Keeper of the Weapons, Royal Armouries), and D Sutherland (Consultant).

Quantification

There are 3479 individually recorded special finds, in nine material types, from the excavations (excluding worked flint and other material of Neolithic and Bronze Age date). The ceramic group includes early/middle Saxon pottery, already considered in the pottery report. Some stone items were subsequently discarded; the wood includes non-structural pieces retained only for wood identification; and the bone includes some human skeletal material. As a result of these factors, there will be some numerical differences in the various quantifications present below, but each is internally consistent.

Table 11.1: Recovered finds of Saxon, medieval and post-medieval date by material type

Material	Total
Silver (including coins)	13
Copper alloy	250
Iron objects	732
Iron nails	1502
Lead	29
Stone	453
Bone/antler	79
Glass	40
Ceramic	348
Wood	33
Total	3479

Methodology

Special finds were given individual finds numbers within a single numerical sequence. Over 10000 finds numbers were allocated, some 6500 applying to finds of prehistoric date not considered in this report. The location of most finds was recorded by context and three-dimensional coordinate, although some were only located by context to a 5m grid square. Each find was numbered and individually packaged on site, and boxed by material and object type.

The site archive

Each find was described, measured, sketched and known parallels were listed. All information was recorded on individual object record sheets; although the large quantities of nails were treated as bulk finds and merely classified into standard types. Full reference was given to numbers allocated during laboratory examination, as well as context information, and, where applicable, finds were cross-referenced with those of a similar style/type. A summary of this information was held on a computer data base system to permit rapid sorting on a range of parameters.

A total of 903 items were sent to the Ancient Monuments Laboratory (AML) for assessment, analysis and conservation. This included 730 ferrous metal objects (identifiable nails and minuscule fragments were excluded) and 173 of copper alloy, silver or wood. All iron objects were X-radiographed to provide a permanent record, to aid identification and to reveal technical details, and 103 iron objects were then selected for further investigation. The AML has a policy of minimum intervention, so objects were only partially cleaned, using air abrasive (with aluminium oxide powder) on heavily concreted items, to expose details of interest. Special attention was paid to iron objects coated or combined with non-ferrous metals. X-ray fluorescence was used to identify these metals, with the barrel padlocks and the keys producing the best evidence. Thirty copper alloy objects were chosen for further investigation, to reveal decoration and to analyze and sometimes determine the presence of a gilt coating. No stabilisation or lacquering was carried out in case of further work. Copies of all treatment cards, the X-radiographs and conservation reports have been incorporated into the archive.

The research archive

For the late Saxon and medieval finds, the research archive involved two distinct areas of study; finds-based and site-based. The former involved the general analysis of individual finds types, grouped within broader functional categories, to define the quantity and range of material present, while items or groups of intrinsic value or interest underwent closer scrutiny. The site-based study involved the spatial and chronological analysis of individual finds types or groups of finds in order to define their occurrence in relation to the structure of the settlement and potential relationships to the function or social status of individual areas or structures. This was achieved by compiling finds distribution plots for various permutations of data; by finds type or functional category per major period, or by total finds by structural groups. These two basic approaches enabled disparities in the distribution of individual finds types to be isolated, while their general significance could be evaluated by comparison with the overall finds distributions.

The published report provides a synthesis of both the finds-based and site-based aspects of the research archive so that the relationship of the finds to their context is provided. In the finds discussion a brief description of each finds type

is followed by a catalogue of the illustrated items. These have been chosen to provide a representative sample of the full range of types recovered from the site and also to illustrate pieces of intrinsic merit. Separate illustration numbers are allocated to each of the functional categories. Within the text, illustration numbers are in brackets, eg (1), while items referred to but not illustrated are referenced (NI). The catalogues contain brief descriptions and dimensions, however, when an item has been extensively described and discussed within the text the catalogue entry has been appropriately reduced to avoid repetition. The abbreviations for dimensions are:- D: diameter, L: length, T: thickness, H: height, W: width, and Wgt: weight. At the end of each catalogued item details of the context from which it was recovered are listed as follows:

special find number, context number, context description, structural group, ceramic phase date e.g. 10090, 4306, floor?, S21, Ph 2/0

The postulated absolute dates for the ceramic phases are summarised within the excavation report (see Tables 1.2 and 1.3) and within the pottery report, and these dates are used within the following text.

Prehistoric finds

Several thousand struck flints were recovered, in part from prehistoric contexts but with substantial quantities as residual finds within later contexts. Prehistoric pottery was largely recovered from prehistoric contexts, but a small amount was derived from later disturbances of the prehistoric mounds. All of this material has been considered within a separate report (Harding and Healy 2007).

Romano-British finds

A scatter of residual finds of Romano-British date was recovered from the site. They are summarised below but have not been examined in detail, any further discussion will occur within the analysis of all the Romano-British material from the Raunds area (Crosby and Neal forthcoming).

There are 43 copper alloy finds comprising 33 coins, dated from the early second to mid fourth centuries (Dr J Davies pers com), and ten items of personal adornment; four incomplete bow brooches, four bracelet fragments and two incomplete pins. The small quantity of glass recovered from medieval contexts includes some residual Roman pieces. Two base sherds display a relief design in the form of a concentric foot ring on the underside, which is common on prismatic and cylindrical bottles of Romano-British date (see Cunliffe 1971, fig 143–44). Some of the unidentifiable pieces of vessel glass could also be of Romano-British date.

There are 157 individual sherds of residual Roman pottery and a near complete Ecton ware jar was recovered from water-deposited silts sealed by the late Saxon to earlier medieval mill leats. In four instances there are

spindle whorls, probably of late Saxon or 12th-century date, fashioned from reused Roman sherds. A small quantity of Roman building material comprises 35 pieces of ceramic tile or tegulae. These were scattered across the site but there was, perhaps, a slightly higher concentration within the fills of mill leats. A conglomerate upper stone from rotary quern is probably also of Roman date.

Early to middle Saxon finds

(Figs 11.1 and 11.2)

The twelve finds of early Saxon date include items recovered from the two excavated sunken-features buildings (36 and 37) and pieces present as residual finds within later contexts.

Stylistically, the earlier of the two brooches is a copper alloy saucer brooch ornamented with a scroll motif, dated to the late fifth to early sixth centuries (2). The other is a silver gilt, Kentish style disc brooch with “keystone” recesses and zoomorphic elements in the interspaces, dated to the sixth century (1). A single copper alloy mount decorated with repousse dots forming concentric circles and straight lines (3), is stylistically similar to the silver pendants and decorative shield mounts often found as grave goods in Anglo-Saxon cemeteries. All of these were recovered as residual finds in later contexts.

The spindle whorls and loomweights, indicative of textile production, are associated with the two sunken-featured buildings. Two spindle whorls were found in Structure 37; one of lathe turned bone ornamented with incised grooves (4), and the other, crudely made, in fired clay (5). The handmade annular, ceramic loomweight fragments (6 and 7), for use with a warp-weighted loom, are from examples with exterior diameters of 110–120mm.

A single stone bead (NI), conical in shape, D: 6.5mm H: 5mm, was recovered from Structure 37.

A cylindrical block of sandstone with a flat base and a worn domed top (8), which may have been utilised as an anvil stone, was recovered from the base of structure 36. It has a lateral perforation, 16mm in diameter, which appears to have been bored as separate lengths from either side at slightly oblique angles.

Illustrated early Saxon finds (Figs 11.1 and 11.2)

- 1 Brooch, Ag. Keystone disc brooch of gilded silver. A white substance within the keystone recess is possibly the remains of an ancient adhesive (B Niemeyer, pers comm) for securing the garnet. This brooch typifies Avents Type 3.1 in his corpus of Anglo-Saxon Disc brooches (1975), and he has suggested that such brooches are dated from the second half of the sixth to the early seventh century. D (approx.): 40mm 10090, 4306, floor? S21, Ph 2/0
- 2 Brooch, AE. Fragment. Cast saucer brooch, ornamented with a motif of running scrolls, set within a pelleted concentric ring, surrounded by a plain rim. The outer edge is flanged forming a rim 6mm high. On the underside a vestige of the pin fitting is evident. Although it was burnt in antiquity, traces of mercury gilding have been detected. This brooch type is characteristic of the fifth-sixth centuries (Myres 1986, 61), often recovered as grave goods. They are relatively common in England, mainly distributed around the lower and upper Thames and as far north as the Wash and Icknield Way (Evison 1987, 47) and dating has been discussed by T Dickinson (1976). D: 40mm 10100, 4326, floor? S19, Ph 2/0?
- 3 Mount, AE. Fragment only. Flat sectioned disc decorated with a motif of repousse dots forming concentric circles and straight lines. A centrally placed rivet forms a raised boss. Corrosion deposits on the underside possibly indicate that it had been mounted on a larger ferrous metal object. Stylistically this item is identical to silver gilt pendants and mounts found on Anglo-Saxon sites like West Stow (West 1985, fig 33,1) and Buckland cemetery (Evison 1987, fig 37,3a/b). D: 24mm 10482, 4466, subsoil, ESAX
- 4 Spindle whorl, bone. The broken edges are charred and powdery, indicating that it was burnt in antiquity. Ext.D: 46mm, H: 13mm, Wgt: 16.5gm 5396, 5166, SFB 37, Ph E/MS
- 5 Spindle whorl, ceramic. Discoid, decorated with crude concentric lines. Ext.D: 39mm, H: 11mm 6364, 5186, SFB 37, Ph E/MS
- 6 and 7 Annular loomweight, fired clay. 5445, 5000, SFB 37 and 10821, 4952, SFB 36, Ph E/MS
- 8 Sandstone, anvil. Pinkish tinge, probably burning. H: 187mm, D: 180mm 10827, 4956, SFB 36, Ph E/MS

Late Saxon and medieval finds (AD 950–1250)

For the purposes of the general discussion the late Saxon and medieval finds are considered within two major groups; one relating to the late Saxon and medieval manor house (AD 950–1250), with the majority dated AD 1100–1250, and to other to the medieval tenements (AD 1250–1400).

Nearly 1000 finds (29% of the total) are from contexts dated to the first half of the thirteenth century (Ph 2/0) or earlier. These include finds from the late Saxon timber buildings, the medieval manor, the watermill system, the fills of the boundary ditches and the early pit groups and scattered pits and gullies within the enclosures. In addition, further finds dating to the twelfth century or earlier were recovered from remnant soil horizons under the medieval

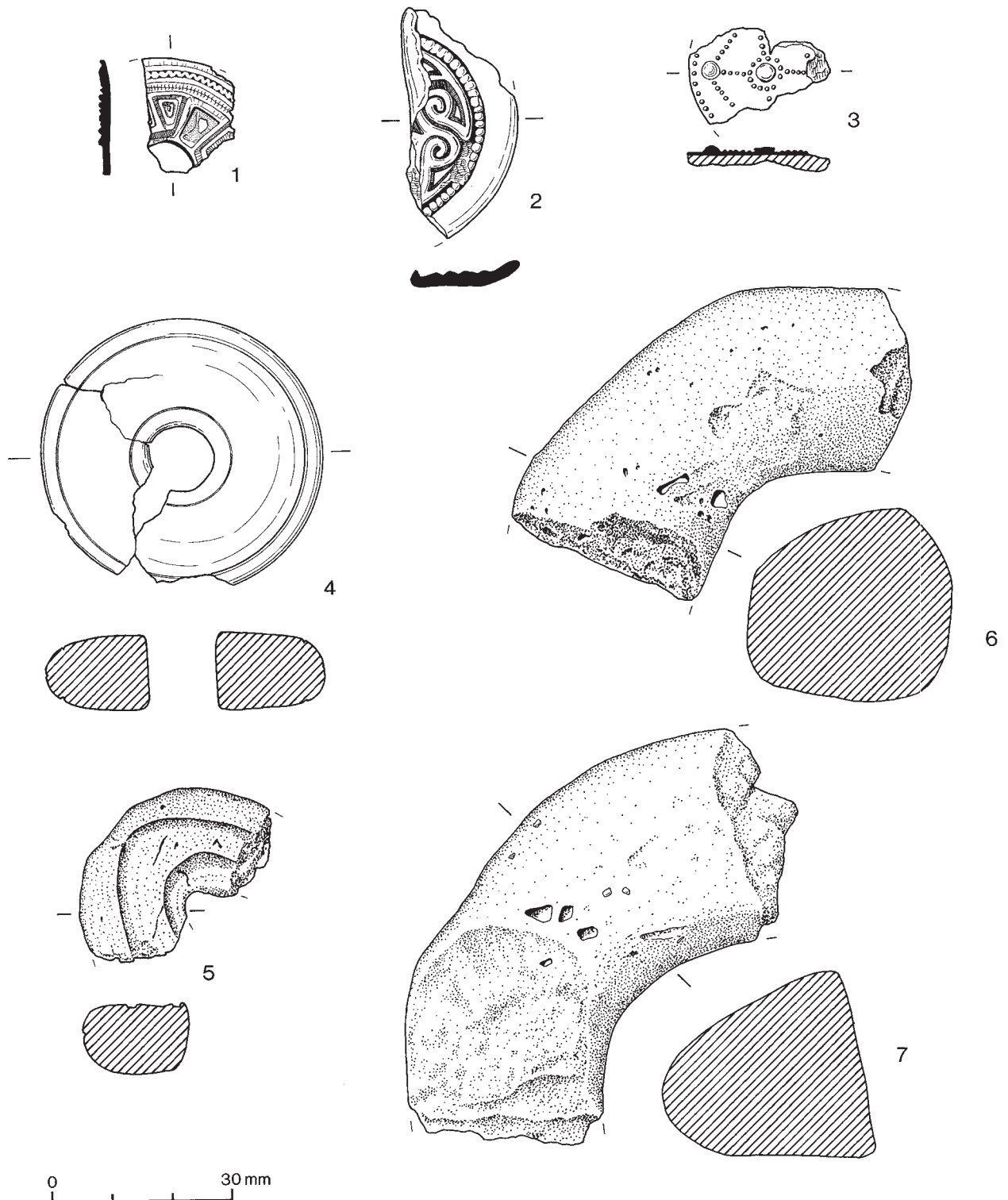


Figure 11.1: Early Saxon finds: brooches (1–2), mount (3), spindle whorls (4–5) and loomweights (6–7)

Table 11.2: Quantification of finds from the late Saxon and medieval manor (AD 950–1250)

Structural groups	Finds
The timber buildings	49
The medieval manor – buildings	106
– yards	106
The watermills	231 (121 millstones)
The boundary ditches	162
Pits and miscellaneous features	91
Remnant surfaces under later tenements	221
Total	966

tenements. Nearly 200 pieces of millstone or quern, derived largely from the watermill complex, form the largest single group within this total.

Unfortunately, very few finds can be securely assigned to a date earlier than 1100 as, with the exception of one timber building, T33/T34, contemporary floor levels and yard surfaces had been removed by later activity. Of the 48 finds from the late Saxon timber buildings the majority are from the upper fills of the wall-trenches and are most likely to derive from later subsidence hollow fills or, at best, backfilling at demolition. Similarly, the ditch fills producing quantities of finds were typically dated to the twelfth century, and the same is true for the datable features within the plots.

As a result, it is not possible to provide any general analysis of the material culture pertaining to the late Saxon settlement. The only individual items of note are a small barrel padlock key (Fig 11.20, 57) from the tenth-century cess pit at the eastern end of the building T34, parts of two barrel padlocks from the eleventh-century floors of the overlying building T33 (NI), and one of the three knives with copper alloy hilt fittings, from the eleventh-century fills of the second mill leat (Fig 11.21, 70).

The twelfth to earlier thirteenth-century building complex, the medieval manor, fares better, although again floor levels and yard surfaces were often either partially removed or disturbed by later activity. Just over 100 finds came from these buildings, with a similar total from the remnant yard surfaces and a further 34 pieces from the well-preserved road surfaces in front of the hall, S18.

Indications of status

The finds associated with the buildings of the medieval manor may be compared with the assemblages from the later tenements to seek any indication of differential status. As a general range of utilitarian items would be common to all levels of society, this is best achieved through the identification of specific items likely to reflect personal wealth, status and education. Using this approach we may list a series of items present through the twelfth and into the thirteenth century, but rare or absent within the later tenements:

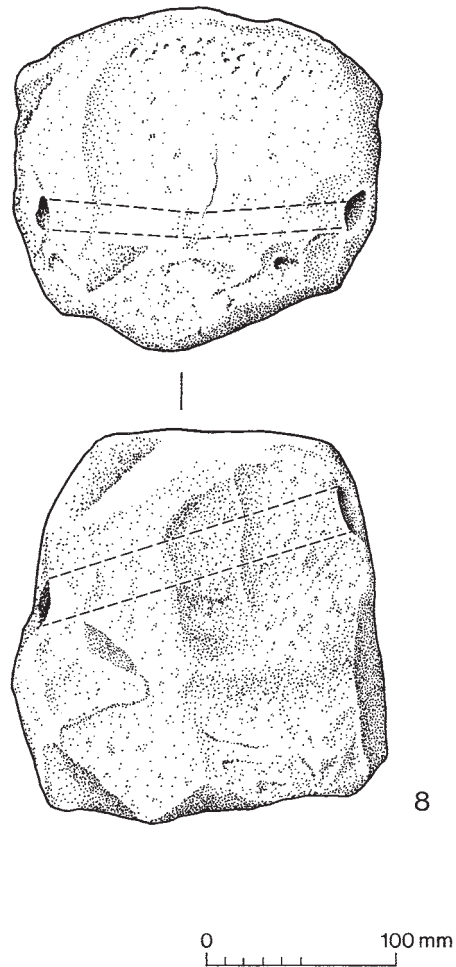


Figure 11.2: Early Saxon finds: anvil stone (8)

All three gilded buckle plates (Fig 11.3: 3, 8 and 9) came from the floors of the hall, S18.

All four of the finger rings (Fig 11.7: 36–39), including a silver ring with a stone, and three of the four earrings (Fig 11.7: 40–41 and NI) are from the northern holding.

An unfinished bone gaming piece, probably a chessman (Fig 11.9, 50), came from the floor of the hall, S18, while a further similar piece came from only a few metres away as a possible residual find in the overlying medieval levels (Fig 11.9, 51).

Whilst not clearly indicative of status, it may also be noted that three of the four bone combs (Fig 11.7: 42, 44 and NI) are from the northern holding.

In addition, it is likely that the large quantity of finds from the yards of tenement E is likely to include items residual from the occupation of the underlying buildings. This assemblage produced six of the nine brooches, including the two most ornate examples: a stylistically early brooch and the only silver-gilt brooch (Fig 11.7, 31 and 32). Four of the six tweezers are also from tenement E.

The evidence therefore indicates that finger rings,

earrings and probably brooches occurred in association with the medieval manor house on the northern holding but rarely within the later tenements, and they showed both a wider range and the occurrence of the most ornate examples, sometimes gilded or of silver or silver gilt. This alone suggests that the occupants of the twelfth-century buildings of the northern holding were wealthier and perhaps also of a higher status than the occupants of the later tenements, while the two possible chessmen would suggest that they were also educated. The finds evidence is therefore consistent with the interpretation of these buildings as a small manor house.

Finds deposition

The general distribution pattern inevitably shows a concentration of finds in and around the buildings of the northern holding, the manor house, given the loss of most contemporary ground surfaces elsewhere. There is also a concentration of finds within and immediately around the successive watermills, but this largely comprises millstone pieces. Beyond the watermill structures, there was only a sparse scatter of finds within the fills of the mill leats.

Although the contemporary ground surfaces have been lost, the distribution of finds within the fills of the ditch systems does provide a means for assessing the spatial distribution of finds across the site as a whole, as well as giving some indication of the processes of finds deposition.

A total of 162 finds were recovered from the twelfth-century fills of the boundary ditches (Table 11.3). Eight ditch systems produced 0–2 finds, five produced 5–10 finds, and six produced 16–24 finds. This correlates closely with

the incidence of pottery and animal bone in the ditches; those with only 0–2 finds contained no more than 120 sherds of pottery and little animal bone, those with 5–10 finds produced 300–750 sherds, while those with 16–24 finds produced 700–1500 sherds along with substantial quantities of animal bone.

The presence of ditch systems around the buildings of the northern holding containing both low and high finds densities shows that within the main occupation area there was some form of selective deposition of material in the ditches. It is true that the low finds densities come from the shallower ditch systems and the high densities from the broader, deeper and evidently frequently recut ditch systems, but this factor alone does not provide a full explanation for the disparity. The ditch systems (5, 6, 9–12) close to the buildings but containing few or no finds indicate that domestic debris was not generally discarded at random in the open ditches, so that these shallower ditch systems were largely filled with accumulated silt containing little domestic material. This is also true for the ditches producing high levels of finds, pottery and animal bone, as this material typically occurred within the upper secondary and final ditch fills, indicating that it had accumulated late in their use and not progressively throughout their usage.

Five of the six examples of high finds density can be related to late and fairly short-term episodes of ditch filling. Ditch systems 8, 18 and 19 went out of use in the earlier twelfth century (ph0) probably at the appearance, or early in the life of the manor house. Ditch systems 13 and 14 were backfilled in the mid to late twelfth century (Ph0–1), the latter prior to the construction of the barn and processing room S17. Two patterns of deposition may have been practiced: single acts of major backfilling immediately prior to rebuilding, with the domestic debris derived from the levelling of the existing buildings and/or the clearance of external activity areas; or a more progressive backfilling, perhaps with some specific lengths of major ditch systems which had become partly silted containing midden heaps.

Ditch system 3 also produced a high level of finds recovery, but here the finds were more scattered. This may reflect the long-term survival of this boundary, which separated the northern and southern holdings, with a low-level, long-term accumulation of material within its fills.

The intermediate levels of finds recovery in ditch systems within the southern holding (2) and the eastern enclosures (15–17), is also of interest, as it might be expected that the level of finds deposition would be noticeably lower well away from the known buildings. This could be accounted for by the presence of external activity areas but, given the additional presence of large quantities of pottery, it seems more likely to provide supporting evidence for the suggestion that both the southern holding and the eastern enclosures probably contained further building groups that lay beyond the excavated area.

Table 11.3: Quantification for finds from the boundary ditches

Ditch system (LSD)	Number of finds
1	0
2	5
3	17
4	8
5	2
6	1
7	2
8	16
9	0
10	0
11	0
12	0
13	23
14	17
15	8
16	10
17	9
18	20
19	24

Finds from the medieval tenements (AD 1250–1400)

The buildings and yards of the medieval tenements produced nearly 1400 finds, with a further 550 from demolition rubble and robber trench fills (together amounting to 59% of the total recovered). With the excavation of four major tenements and the survival of both floor levels and yard areas, it is possible to examine and compare the general distribution of finds within and between the tenements, and to determine the presence of primary finds groups.

Table 11.4: *Quantification of finds from the medieval tenements (AD 1250–1400)*

Period and structural groups	Finds
Tenement A – buildings	113
– yards	221
Tenement B – buildings	115
– yards	214
Tenement C – buildings	147
– yards	56
Tenement D – buildings	181
– yards	42
Tenement E – buildings	191
– yards	450
Tenement totals	1730
Miscellaneous contexts	195
Medieval total	1925
Occupation levels	1373
Demolition levels	552
Combined total	1925
Post-medieval/modern contexts	222
Unstratified	155

General processes of finds deposition

For three of the tenements (A, B and E) the yards produced two thirds of the finds and the buildings the remainder. The enclosed yards with metallated surfaces typically produced more finds than the un-surfaced external areas, suggesting that they were the main focus for external domestic activities. For instance, yard area AY1 of tenement A produced a total of 38 finds while the smaller metallated yard, AY2, produced 66 finds. This appears to be the normal pattern of finds distribution, with much of the material presumably deposited as a result of the casual loss or discarding of individual items outside the buildings, particularly across the metallated yards, and less frequently within buildings and other external areas. The finds were typically scattered across the yards but with a higher density within some 2–3m of the buildings, where there was generally a greater depth of soil accumulation. There were no clearly defined localised concentrations, potentially indicating the location of midden heaps, but the frequent removal, and perhaps relocation, of such features may have resulted in the loss of such specific concentrations. The same pattern was seen with the pottery distribution.

In tenement C nearly three quarters of the finds came from the buildings, but this is largely a result of the partial excavation of the yards and the exceptional presence of a primary deposit of finds within building C8, apparently coming from domestic items left in the building during a period of desertion and buried beneath a later raised floor. In tenement D four out of five finds came from the buildings, and in this instance it is probably due to the absence of any enclosed metallated yards combined with a dense scatter of nails within the early building D12, which formed half of the material recovered from this tenement.

Only one object category shows a distribution which consistently departs from the overall pattern described above. With the exception of tenement E, which is discussed below, the small items of costume and jewellery, such as buckles, strap-ends and brooches, were more commonly found within the floor levels of buildings, suggesting that they were most frequently lost indoors. The low representation of items of costume and jewellery in the yards might also suggest that the transfer of finds from inside buildings to the yards, as a result of the periodic cleaning or removal and relaying of floors, was probably not a significant process.

Allowing for differences in the size of the tenements and the presence of some primary finds groups, the level of finds recovery is fairly consistent between the tenements. There are variations in the representation of individual finds types, such as the dearth of knives within tenement A, but given the small numbers of any one type usually present within an individual tenement, rarely more than 10 examples, these variations cannot be regarded as significant and indicative of any variation in the wealth of, or the functional activities occurring within, any single tenement.

The one clear distinction between the tenements is the significantly greater quantities of finds recovered from the yards and, to a lesser extent, the buildings of tenement E. Tenements A–D produced overall totals of 203 to 333 finds while tenement E produced 639 finds. The central yard of the tenement, EY1, produced 170 finds and this might be a result of the exceptional depth of stratigraphy in this area. However, this does not explain why the other yard areas and the buildings also produced many finds. It is suggested that this excess can be best explained by the location of tenement E directly over the two earlier building complexes, the tenth to eleventh-century timber buildings and the twelfth to mid-thirteenth-century stone-built complex, the manor house, with a significant proportion of the material recovered from tenement E being residual from these earlier phases of occupation. This may be supported by the distribution pattern for personal possessions; in the other tenements a majority of these items were recovered from within the buildings, but tenement E produced a greater total quantity of these items with nearly three quarters of them coming from the yards.

Primary finds deposits

There are only two instances of primary finds deposits within buildings, but these are useful in indicating that the recovered material represents only a small fraction of that used through the lifetime of the settlement.

The floor levels of building D12 produced some 60 nails in a dense localised scatter and a further 30 were recovered from the immediately overlying floor levels of building D11, probably largely as residual finds from disturbance of the earlier floor. It is possible that these were deposited during a single episode of building refurbishment. The circumstances of their deposition is not certain but they may have come from removed and replaced structural timbers, although the additional presence of some 23 horseshoe nails might indicate that they had merely been stored and/or used within this building and were not recovered when the new floor was inserted.

The much more extensive building ranges of tenements A, B, C and E each produced totals of from 38 to 73 nails, while over 1000 were recovered in total. The presence of such a quantity of nails within a single building, nearly 9% of the overall total, demonstrates that the 1000 nails recovered from the site must be only a small percentage of the nails that were utilized during the lifetime of the settlement, where they would have had a wide range of uses, but particularly in structural timbers such as doors, shutters and roof beams. This under-representation of such a common object as the nail would suggest that they were generally recovered, rather than merely casually discarded, and as it is unlikely that many could have been directly reusable, it can be postulated that they were probably collected for recycling as scrap iron.

In this context, it may also be noted that many of the wide range of iron fittings and equipment that are likely to have been in use were not recovered in any significant quantities. This includes ironwork related to buildings: staples, hinge pivots and strap hinges; household ironwork: hooks, chains and iron vessels; and iron tools. Agricultural equipment, for instance, is only represented by three fragmentary sickles and a single weed hook. It is also notable that textile tools are the only tool group well represented, and then mainly by items in materials other than iron, such as the spindle whorls and bone pins. So we may conclude that the whole range of ironwork tools and equipment, down to the humble nail, was regularly collected as scrap iron for recycling.

This under-representation of ironwork is also illustrated by the second primary finds group, which comprised a dense scatter of some 25 nails and 25 pieces of mixed ironwork within the floors of building C8. The presence of numerous nails, fragments of iron strapping, staples and, in particular, parts of three lock mechanisms suggests that these were probably derived from a door or chest, or perhaps more than one such item, left to decay *in situ* while the building was standing but at least partially unused. There was also a primary pottery group from these levels, similarly suggesting

that there was a period of abandonment but without a total clearance of the possessions and fittings. This deposit was later sealed beneath the final floor level.

While it has been argued that the low representation of the full range of ironwork is indicative of the recycling of iron, the large assemblage of locks, keys and knives stand as obvious exceptions to this. In the case of the locks it may be suggested that the frequent coating of the cases with other metals made them unusable or at least undesirable for recycling, while perhaps the large assemblage of knives may merely indicate the common occurrence of this standard piece of domestic equipment.

The desertion of the tenements

Nearly a quarter of all finds recovered from later medieval contexts come from the demolition deposits of limestone rubble and robber trench fills. Even accepting that part of this total represents items residual from the occupation of the buildings, it still suggests that at abandonment a proportion of possessions and building fittings were discarded, or at least not removed. The full range of finds types are represented, so it would appear that no single type was being preferentially discarded at this time, although items of costume and jewellery were rarely found suggesting that these were, as might be expected, almost invariably taken away. The absence of any large primary deposits does indicate that in all the excavated tenements there was a general clearance of possessions and fittings at abandonment, and this is confirmed by the contrast provided by the primary group of ironwork related to the temporary abandonment of building C8, as discussed above. So it would appear that the process may have been one of the abandonment and discarding of only those fixtures and fittings that were surplus to requirements, perhaps old, worn or broken items which would normally have been retained or recycled but were too trivial to bother with in the context of the total desertion of the tenement.

The finds

The nearly 3000 late Saxon to medieval finds are considered below as individual types within broader functional categories (Table 11.5). Only the smaller groups and the miscellaneous and unidentified objects have been considered by material type.

Personal possessions (Figs 11.3–11.12: 1–56)

This category comprises all small portable items which would either have formed part of a person's clothing (costume fittings), been worn as jewellery or are likely to have been held by an individual for personal use (toilet equipment), including musical instruments and gaming pieces (recreational objects), and the unique carved figure.

Table 11.5: Quantification of finds by functional categories and individual types

Finds categories and types	No. of items
Personal possessions:	136
Costume and jewellery	114
Toilet equipment	10
Recreational objects	11
Carved stone figure	1
Building equipment:	1138
General ironwork	93
Nails	1023
Worked stone	22
Household equipment:	277
General	33
Locks and keys	56
Knives and shears	106
Hones/sharpeners	82
Tools:	135
Metalworking	6
Woodworking	21
Stone working	2
Leather working	16
Textile working	85
Agricultural	5
Weapons	11
Horse furniture:	573
Fittings	13
Horseshoes	78
Nails	482
Coins (with 4 post-medieval)	14
Millstones and querns	255
Sandstone millstones	163
Lava millstones	55
Querns	37
Wood	5
Glass	34
Lead	28
Miscellaneous	366
Total	2972

Costume fittings: buckles and buckle plates (1–14)

A total of 26 buckles, 13 of copper alloy and 13 of iron, and 17 buckle plates were found; comprising forms commonly found on medieval settlement sites. At least some of the iron buckles, particularly the larger examples, could have been used as heavy-duty strap buckles, such as harness fittings. None were recovered from contexts dated earlier than the twelfth century. Three (3, 8 and 9) are from floor levels of the manor hall, S18, of twelfth to mid-thirteenth-century date, and these are the only examples with gilded buckles or plates. Buckles were recovered from all of the medieval tenements, although tenement D produced only a single iron buckle. Tenement E produced the largest number, eight, but this may include residual examples from the underlying building phases.

Copper alloy buckles and buckle plates (1–10)

Two manufacturing techniques are evident; casting for the buckle frames and cold metal working for the buckle-plates and pins. The buckle plates of copper alloy sheet easily become detached from the buckle frame, hence only two buckles were found with plates attached (3, 4). Similarly, only three still had pins attached; two of copper alloy and one of iron. The pins have been made from shaped strips with one end curled around the bar of the buckle frame and held in place within a slot or, in one instance (7), a perforation within the buckle plate.

There is a variety of buckle forms: D-shaped, rectangular, trapezoid and figure-of-eight, but there are too few examples to indicate the relative occurrence of these forms. Buckle frames are often furnished with a pin rest in the form of a transverse recess (6), or a small protruding lip (1). In addition, one example (4) has a small punch mark with a lattice design immediately beside the notch for the pin. Two buckles are furnished with revolving cylinders of sheet metal (2). One buckle frame fragment (NI) has an integral forked spacer to which two sheets were soldered to form a buckle plate.

There are 16 rectangular buckle plates (3 and 4) and one D-shaped (9). All would have been attached to the buckle by folding the end round the frame and securing it to the strap or belt by rivets. One buckle plate (8) shows signs of reuse, with much of the plate having been cut away.

Five buckle plates are ornamented with zigzag motifs executed with a walked scorpa. The most ornate example is embellished with a punched motif of grooves, zigzags and lozenges forming a rectangular panel (10). In addition, one has a double border (9), one an incised linear motif (NI) and one is ornamented with a border of punched back-to-back triangles (4). One buckle frame is ornamented with a zigzag motif marking the point where the pin rests (3). Four of the ornamented buckle plates are coated, one in tin (10) and three are gilded (3, 8, 9), the first fire gilded and the others mercury gilded.

One of the earliest stratified examples (5), AD 1100–1150, is D-shaped with two projecting mouldings. Bu'lock (1960, 21 ff) argues that this form may originate from early zoomorphic styles with outward and inward facing heads. Another, with less pronounced rectangular knobbed projections at each corner (1), is from a thirteenth-century context. D-shaped frames are common but they can differ slightly to produce different effects; one example (6) has two projected mouldings positioned either side of the bar, possibly symbolising a Lombardic "C".

Illustrated buckles and buckle plates (Fig 11.3 and Plate 11.1)

- 1 Buckle, AE. Cast frame with small "knops" protruding from the corners. A small projecting lip creates a recessed notch for the pin. L: 11mm, W: 28mm 10326, 4434, clean, SY1, Ph 2/1–2/2
- 2 Buckle, AE. Cast frame with rounded mouldings

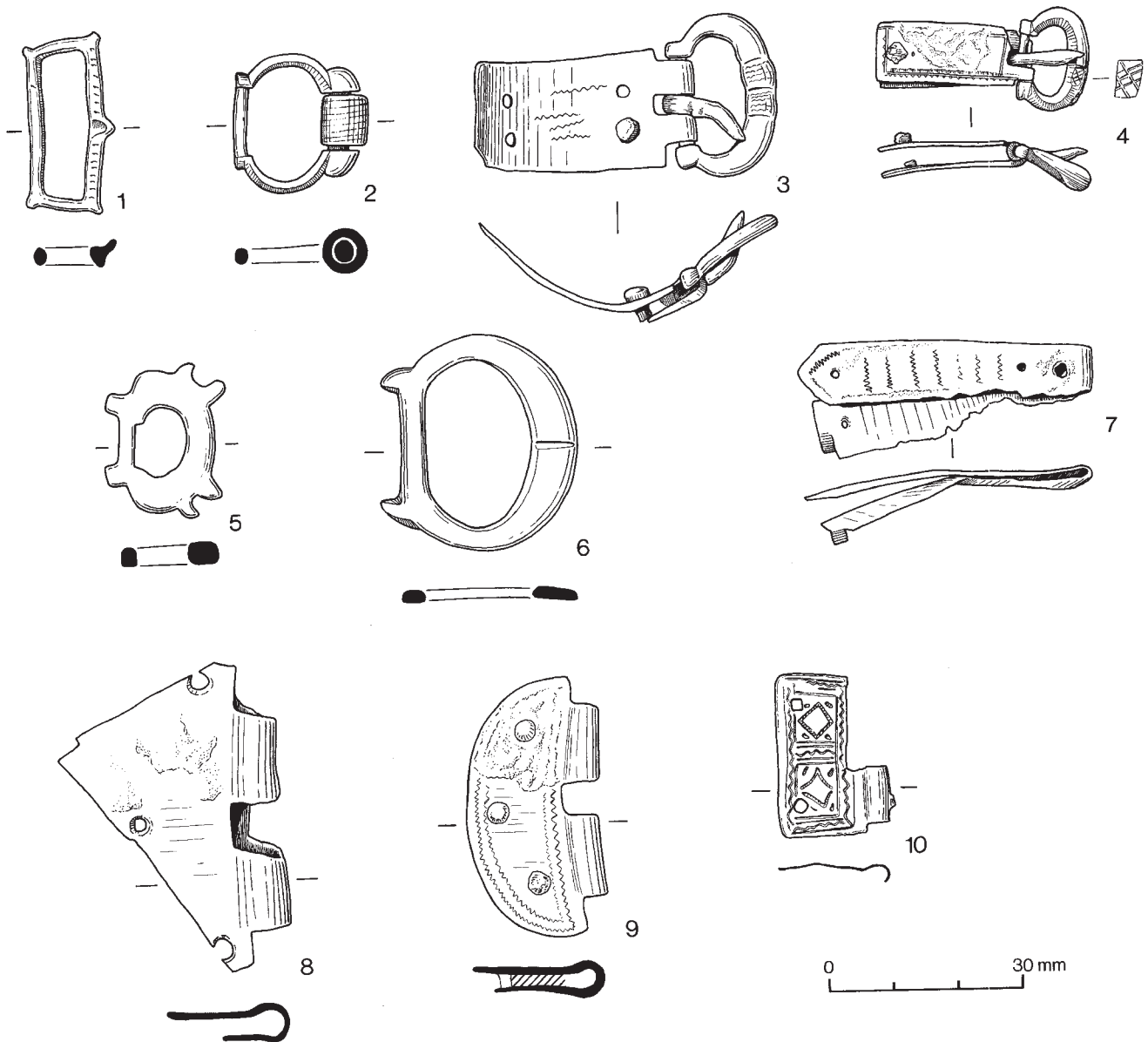


Figure 11.3: Personal possessions: costume fittings; copper alloy buckles (1–6) and buckle plates (7–10)

flanking a constriction, around which a revolving cylinder is wrapped. Buckles of this type are known locally; eg Lyveden, Northants (Steane and Bryant 1975, fig 42, 17), and Furnells manor, Raunds (Oakley 2009, fig 7.7, 4), but an example from Germany (Fingerlin 1971, fig 73, 73–5) shows that they were widespread. L: 19mm, W: 21mm
6936, 6383, yard surface, EY1, Ph 3/2

- 3 Buckle and plate, AE. Cast D-shaped frame, with raised transverse mouldings decorated with a zigzag motif creating a recess for the pin. The pin, ornamented with a transverse moulding, curls round bar. The plate is tapered, ornamented with a crude zigzag motif and still retains a single dome headed rivet. Both buckle and
- loop retain patches of gilding (fire gilding). Buckle: L: 19mm, W: 25mm, Plate: L: 42mm, W: 19mm
6887, 6411, floor, S18, Ph 2/0
- 4 Buckle and plate, AE. Cast D-shaped frame with notch for the pin and small cross-hatched punch mark, and a decorated plate secured with a single iron rivet. Buckle: L: 11mm, W: 16mm, Plate: L: 25mm, W: 9mm
1013, 324, wall, A1/3, Ph 2/2
- 5 Buckle, AE. Cast D-shaped frame, with two pairs of projected mouldings. L: 19mm, W: 24mm
1082, 904, ditch fill, LSD13, Ph 0
- 6 Buckle, AE. Cast frame, with groove for retaining the pin. Identical examples from London (Ward Perkins

- 1940, pl VXXVI,6), Lyveden, Northants (Bryant and Steane 1971, fig 11, C2), and Furnells manor, Raunds (Oakley 2009, fig 7.7, 12). L: 31mm, W: 33mm
5455, 6211, layer, EY1, Ph3/2
- 7 Buckle plate, AE. Length of sheet metal folded in half and crudely perforated three times through both layers. Decorated with a zigzag motif. L: 45mm, W: 10mm
10312, 6603, leat fill, M25, Ph 0
- 8 Buckle plate, AE. Incomplete, with remains of the gilded (mercury gilding) surface around the perforations. Trimming and reuse probably occurred after the loss of the gilded coating (AML). W: 48mm
10195, 6509, floor, S18, Ph1
- 9 Buckle plate, AE. D-shaped, gilded (fire/mercury) and decorated with a double zigzag motif border. Plate retains three dome-headed rivets. L: 20mm, W: 40mm
6918, 6408, hearth, S18, Ph2/0
- 10 Buckle plate, AE. Rectangular, coated in tin and ornamented with an incised motif of zigzag lines and lozenges. Plate perforated after motif was executed. L: 17mm, W: 26mm
6356, 4168, layer, AY6, Ph3/2
- 13 Buckle and plate, Fe. Incomplete rectangular buckle frame with a vestige of the pin curled round the bar. The rectangular plate is coated in silver and pierced by two copper rivets secured with brass roves. Buckle: L: 30mm W: 40mm; Plate: L: 5mm W: 39mm
681, 344, layer, CY1, Ph4
- 14 Buckle, Fe. D-shaped frame with squared pin recess flanked by transverse grooves. Coated with lead/tin alloy. Similar example from Goltho (Goodall 1987, fig 159,139). L: 50mm, W: 45mm
6836, 6340, "bench", E13/2, Ph2/2-3/2

Costume fittings: strap-ends (15–16)

There are eight copper alloy strap-ends; two from late twelfth or early thirteenth-century contexts and the remainder from fourteenth-century contexts. A single example comes from building S22, and, unlike many other types of personal possessions, there are no examples from tenement E while they are present within all the other medieval tenements.

There are three types, defined by manufacturing techniques of varying complexity. There are three examples of the simplest form, the one piece type (NI), manufactured from a strip of sheet metal folded in half with the strap inserted between the sheets and secured by a single, centrally placed rivet. There are four examples of two piece strap ends, one is complete (NI) and the remainder survive as single plates (16). These comprise two identical plates held together by a single rivet at one end. The three-piece composite type, with one example (15), comprises a spacer plate sandwiched between larger front and back plates held in place by two rivets, one to secure the spacer and one to secure the strap.

One terminal is angled (16) and another is more ornate, in the form of a stylistic "flory" cross surmounted on a lozenge (15). Seven plates were fixed by rivets of either ferrous metal, used on crude one-piece strap-ends, or copper alloy, while on one plate lines of solder are visible on the under side.

Illustrated strap ends (Fig 11.5 and Plate 11.1)

Illustrated iron buckles (Fig 11.4)

- 11 Buckle, Fe. A two-piece frame, with flat-sectioned pin folded round the frame. L: 45mm, W: 72mm
3528, 3099, ditch fill, LSD17, Ph1
- 12 Buckle, Fe. Same as (11). Parallel oblique incisions on loop are either decoration or keying lines for non-ferrous coating (lead/tin alloy). Similar example from Goltho (Goodall 1987, fig 159,144). L: 58mm
3286, 1635, floor, B5/2, Ph0-2/2
- 15 Strap-end, AE. Three piece composite type with ornamental terminal; one side embellished with a zigzag motif. Similar examples from Thetford (Goodall, A R, 1984, fig 111, 30) and Northampton (Goodall, A R, 1997). L: 54mm
1377, 3019, floor, C8/2, Ph3/2
- 16 Strap-end, AE. Two-piece, sheet metal tapered to an angled terminal, with one perforation. Similar example from London (Egan and Pritchard 1991, fig 90, 640). L: 38mm
1037, 591, layer, BY7, Ph3/2

There are ten complete and two fragments of iron buckles. Four of the buckle frames are D-shaped, four rectangular, one square and one is an elongated oval. Ten are one-piece buckle frames while two rectangular-framed examples are in two pieces (11, 12), with a C-shaped frame with terminal ends folded loosely around a revolving bar, to decrease friction and reduce wear on leather straps. Four buckle frames are complete with pins attached by curling one end around the bar of the frame.

Six buckles or plates have non-ferrous coatings; three of lead/tin alloy, two of tin and one of silver, this visually enhances and protects the buckle from corrosion. A complete buckle plate with a vestige of a frame (13) is coated in silver and fixed with copper alloy rivets secured by brass roves.

Linear ornament is evident on two of the coated buckles; one has parallel oblique grooves (12), the other has a squared pin recess flanked by transverse grooves (14).

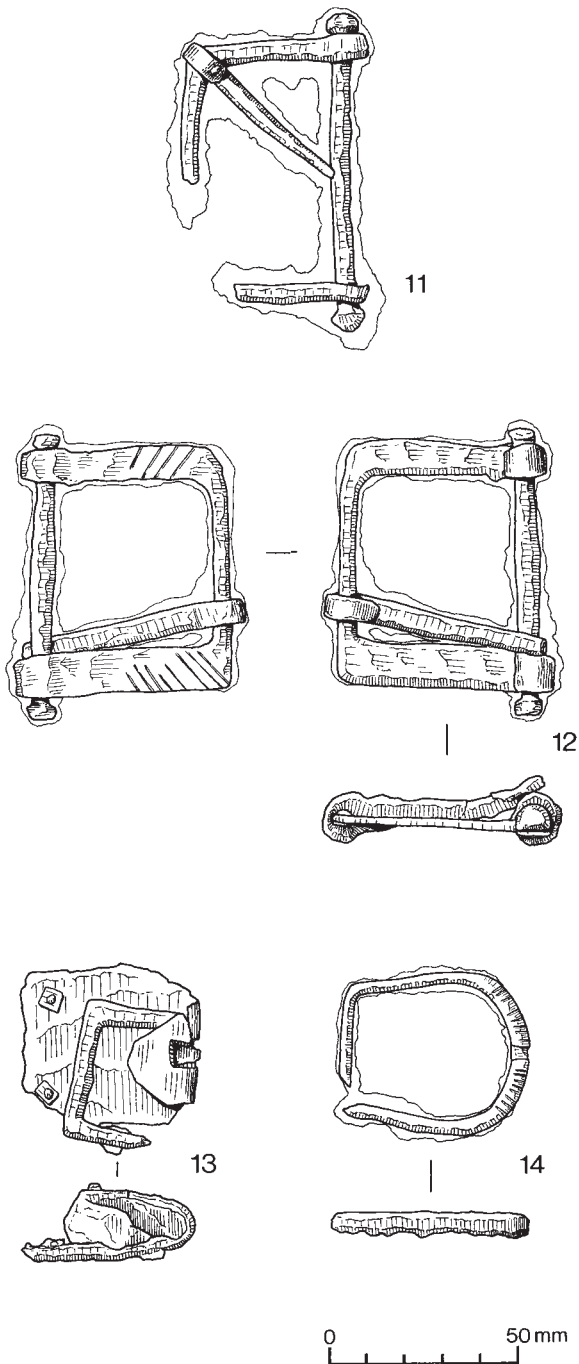


Figure 11.4: Personal possessions: costume fittings; iron buckles (11–14)

Costume fittings: mounts (17–22)

Mounts are fittings used to strengthen and/or visually enhance textile and leather items, and are generally attached by one or more rivets. Thirteen copper alloy mounts were found but none is certainly earlier in date than the early thirteenth century. There are examples from all the medieval tenements, apart from D, and one of the illustrated examples (19), an arcaded pendant hanger, could be of a late fourteenth or even fifteenth-century date. They vary in style from plain

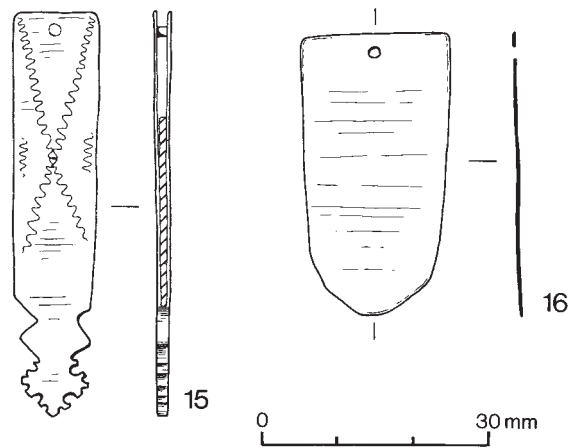


Figure 11.5: Personal possessions: costume fittings; strap-ends (15–16)

rectangular bars to a repousse sexfoil and two types are evident; purely decorative and dual functional.

The different methods of manufacture comprise casting and cold metalworking in metal plate or sheet. Decorative techniques are basic and none of the examples are gilded. The most ornate example (20) is a cast openworked mount in the form of a squared quatrefoil. Three display repousse work; a sexfoil mount (21) and two bars with terminal lobes (17 and 18). Three of the small rectangular plates (NI) are ornamented with beading or moulded grooves. Of the cast pieces, (20) has an integral centrally placed stud protruding from the underside, possibly for attachment to leather, while (19) would have been attached to a belt for suspending purses and knives (Egan and Pritchard 1991, 219).

Three dual functional mounts give some indication as to the width of the strap on which they would have been used. A belt stiffener (NI), comprising two sheet plates fixed by rivets, indicates a strap width of 21 mm, while two rectangular mounts (22 and NI) with perforated terminals indicate strap widths of 37 mm and 43 mm respectively.

Illustrated mounts (Fig 11.6, 17–22)

- 17 Mount, AE. Bar with a central lobe flanked by terminal lobes. Underside recessed. L: 9.5mm, W: 5.5mm
10250, 4163, yard surface, SY1, Ph0–3/2
- 18 Mount, AE. Bar with transverse ridges and terminal lobes. Underside recessed. L: 18mm, W: 7.5mm
1040, 1106, surface, C10, Ph2/0
- 19 Mount, AE. Cast pendant mount. Arcaded with raised mouldings and knobbed terminals. Identical item from London (Egan and Pritchard 1991, fig 140, 1198). W: 44mm
5671, 6232, ditch fill, PM2, Ph3/2–4
- 20 Mount, AE. Cast openworked ‘floral’ quatrefoil with centrally placed integral stud. Possibly a leather fitting. 30 x 30mm
1096, 1424, hollow, LSE3, Ph0

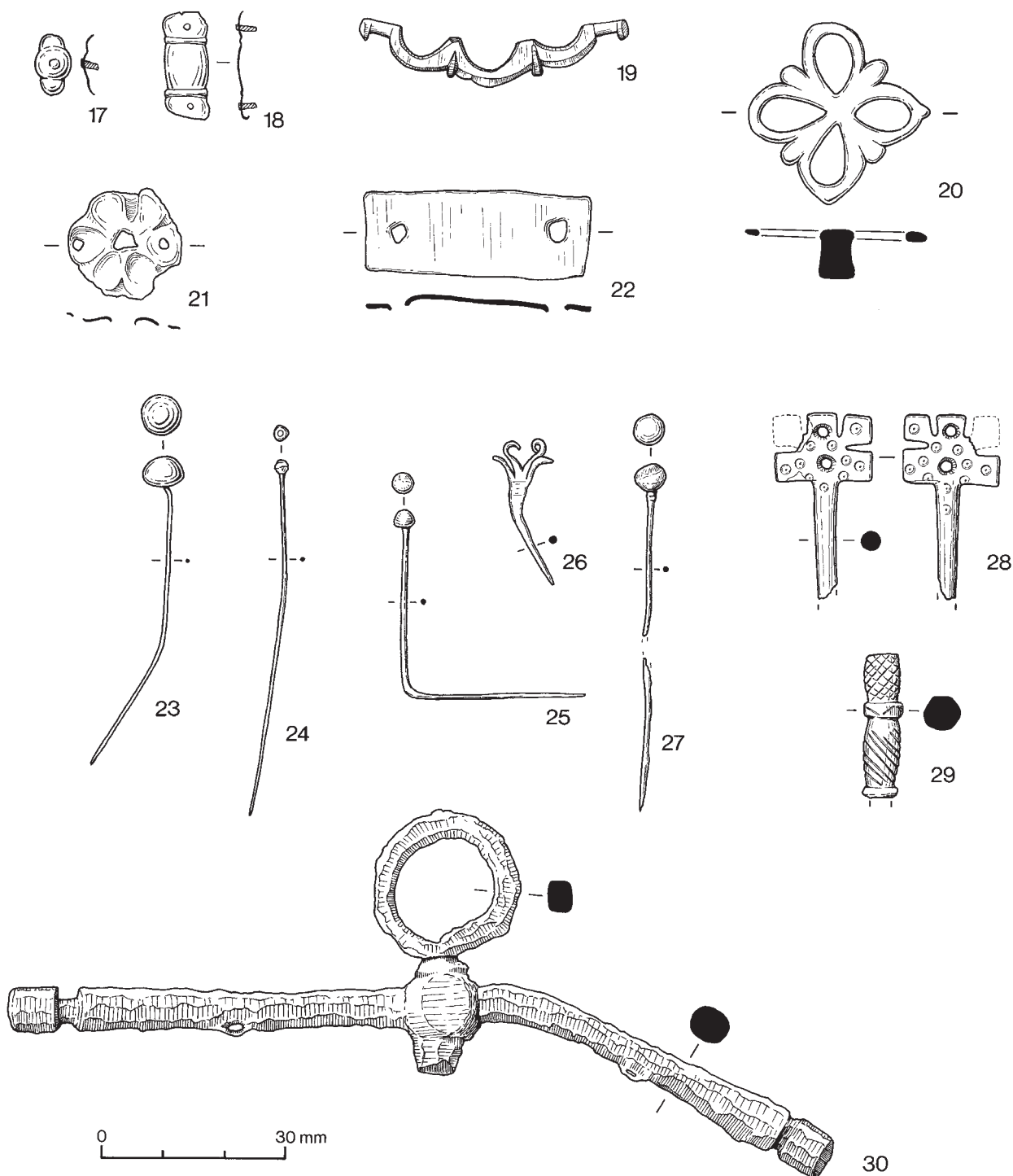


Figure 11.6: Personal possessions: costume fittings; mounts (17–22), pins (23–29), and purse bar (30)

- 21 Mount, AE. Domed sexfoil, irregularly trimmed with three perforations. D: 19mm
717, 740, floor, A1/2, Ph3/2
- 22 Mount, AE. Rectangular with perforated terminals. L: 37mm, W: 14mm
437, 478, rubble, CY1, Ph3/2

Costume fittings: pins (23–29)

There are 21 pins used for hair and fastening robes and veils, with 19 in copper alloy and two of bone, in styles commonly found on medieval sites. Twelve are complete and the remainder comprise shaft fragments, with a single pointed terminal. None can be dated earlier than the twelfth century and of the six dated AD 1100–1150, three come from fills of the final mill, M25.

A copper alloy pin (23) has a head of pale green glass, cooled on the shaft without the use of a solder: similar examples from Winchester (Biddle 1990, fig 150, 1440) and London (Egan and Pritchard 1991, 299) are also similarly of twelfth-century date.

Three copper alloy pins have shafts surmounted with white metal heads which are either globular (27) or an inverted hemisphere (NI). Two of these are from fills of the final mill leat and may date to AD 1100–1150. Although the sample is small, as only a single pin of composite form comes from a later context, in tenement C, it would appear that pins of this form were most commonly in use in the twelfth-century manor.

Of the pins manufactured solely from copper alloy, four have fine shafts surmounted by spherical or globular heads (25), three have heads of coiled wire (24), where the end of the shaft has been coiled round itself, and a single pin (26) is short (33mm) with a shaft which flattens out towards the head and branches into coiled tendrils.

The two bone pins, both incomplete, are highly embellished. One (29) has an ornate, lathe-turned head, while the other (28) is crenellated and ornamented with regularly spaced ring-and-dot motifs. Both are associated with the medieval manor, dating to the twelfth to early thirteenth centuries.

Illustrated pins (Fig 11.6)

- 23 Pin, AE. Globular head of pale green glass on a shaft of thin wire. L: 56mm
3902, 1661, ditch fill, LSD14, Ph0
- 24 Pin, AE. Head of coiled wire, stamped to secure it. Identical to Oakleys Type H2 (Oakley 1979b, fig 113, 220). L: 60mm
1341, 853, floor, C8/1, Ph3/2
- 25 Pin, AE. Hemispherical head, circular sectioned shaft. L: 61mm
1824, 505, wall, A1/4, Ph1?
- 26 Pin, AE. Short circular sectioned shaft, expanding into ornamental head of “coiled tendrils”. L: 26mm
675, 344, layer, CY1, Ph4
- 27 Pin, AE. Spherical head of white metal (lead), with circular sectioned shaft. L: 54mm
10639, 7084, fill, M25, Ph0
- 28 Pin, bone. Incomplete. Rectangular head with four V-shaped cut-outs, and two perforations, ornamented with compass drawn ring-and-dots. Similar pin with castellated head from Eastgate, Beverley (Foreman 1992, fig 84,500),
10178, 4356, yard surface, SY2, Ph2/0
- 29 Pin, bone (cow bone?), incomplete. Lathe-turned head; the bead is ornamented with knife cut diagonal grooves, and there is a polygonal sectioned reel with chevron motif, surmounted by a cross-hatched cylindrical moulding. L. (incomplete): 24mm
789, 778, surface, LSE3, Ph0

Costume fittings: miscellaneous items (30)

An iron purse bar (30), recovered from the topsoil, is of a form in use from the mid-fifteenth to mid sixteenth centuries, and is similar to Ward Perkins type A5 (1940, fig 50).

Studs of copper alloy (NI), of around 10mm diameter, were generally used as fittings to decorate and possibly strengthen textile and leather items. Both examples have domed heads; one is unstratified and the other is from a twelfth-century ditch fill.

Hooked tags (NI) are decorative fittings of copper alloy thought to have been used as fasteners for clothing. Although they are often ornately embellished, the only two recovered are relatively crude. Both are triangular, with the lower corner folded over to form a hook, and they are pierced by a centrally placed rivet for attachment. One has a countersunk rivet, which is encircled by a recessed ring, giving the impression of a single ring-and-dot. There is a similar example from Southampton (Harvey 1975, fig 245, 1863).

There are three crude lace tags, 34–81mm long, made from rolled copper alloy sheet (NI). The two larger examples, both unstratified, are hammered closed at one end and one is ornamented with oblique incisions over the longitudinal seam. The smallest example, from a late thirteenth-century context, is similar to Oakleys type H1 (1979b, fig 113, 288): it has been rolled lengthways leaving a longitudinal opening, with a crude decoration of irregularly spaced oblique grooves.

Illustrated purse bar (Fig 11.6)

- 30 Purse bar, Fe. Circular suspension loop with sub-circular sectioned projection, through which passes a circular sectioned bar with knobbed terminals and perforated lugs. L: 148mm. 68, 1, topsoil, MODN, N/A

Personal possessions: jewellery (Fig 11.7, 31–41)

Jewellery: brooches (31–35)

There are nine brooches, one in silver and eight of copper alloy, comprising seven annular and two penannular brooches. There are three manufacturing techniques: casting, composite and manufactured from circular sectioned wire. Only two retain their pins, but there are also four brooch pins, including one of silver. They would have been used by both men and women.

None of the brooches are from contexts dated earlier than the mid thirteenth century, but eight of the nine are from tenements E and A, and only a single example, from tenement B, lies away well from the area of the medieval manor. It is therefore suggested that this group may well include residual items from the underlying buildings, perhaps including the two most ornate brooches. One of these is stylistically early; a zoomorphic ring brooch (31) given a late twelfth to early thirteenth-century date by J.

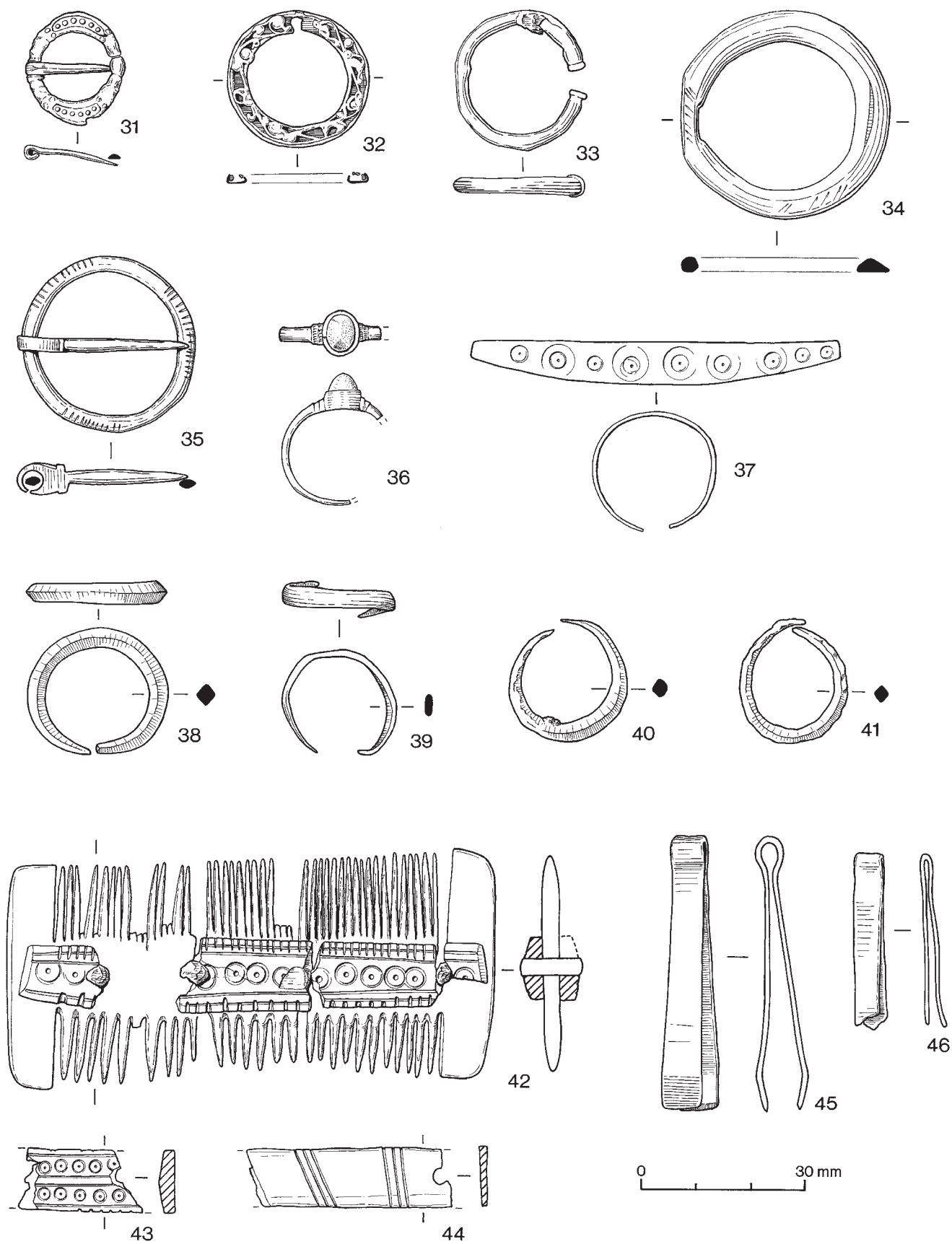


Figure 11.7: Personal possessions: jewellery; brooches (31–35), finger rings (36–37), earrings (40–41); toilet equipment, combs (42–44), tweezers (45–46)

Cherry (pers comm). The other is the only silver gilt brooch recovered (32), which is similar to an example from Milton Keynes dated by J. Cherry to the thirteenth century.

The smaller more ornate brooches are too delicate to be used for fastening and must have been purely decorative; two of these are gilded. One is stylistically zoomorphic, ornamented with two pairs of back to back dragons heads, with snouts that grasp the point at which the pin is attached and rests (31). The other is of silver gilt and comprises a recessed back plate embellished with an elaborate filigree and pellet decoration (32). The penannular examples are embellished with shaped terminals. One is circular sectioned with expanded, flat ended terminals (33) and the fragmentary remains of another (NI), made from wire, has a coiled terminal.

The two largest brooches have external diameters of 39mm. One of these (34) has a triangular cross-section and is similar to an example from Furnells manor, Raunds (Oakley 2009, fig 7.7, 7). The large brooches are cast and generally simple in appearance, with little or no decoration; the functional aspect was obviously more important than the decorative. Two are ornamented with crude grooves. One has three equidistant panels of irregularly-spaced transverse grooves (35), the other (NI) is ornamented with two rows of opposing oblique incisions forming a herring bone type motif (chevrons).

Illustrated brooches (Fig 11.7 and Plate 11.2)

- 31 Brooch, AE. Gilded annular brooch, poor condition, probably zoomorphic, with stylized back to back animal heads grasping the point where the pin is attached and rests, and separated by recessed crescent shaped panels containing a pelleted motif. The pin is tapered with a D-shaped cross-section. D: 21 by 18mm 6452, 4165, layer, EY3, Ph1–2/2
- 32 Brooch, Ag. Incomplete, pin missing. Annular gilded silver brooch, embellished with a raised scroll of foliage above a recessed back plate. The surface is heavily worn and obviously had a great deal of wear before it was lost (J Cherry pers comm). Composite, with a sheet-metal back plate, the exterior edge folded at right angles to form a flange 1.5–2mm in height. The plate has a single circular perforation (now broken) which would have held the pin. Attached to the plate are two wires, a circular sectioned wire behind the flange and a rectangular sectioned wire on the inside edge of the brooch forming an internal support wall, which form a secure base to which the filigree decoration can be applied by brazing. Gilding is visible in places, and analysis indicated that a thin coat of gold leaf was applied by mercury gilding (AML). Similar examples are known from a pottery kiln at Laverstock (Musty *et al* 1969, fig 28, 1) and the deserted medieval village of Caldecotte, Milton Keynes (King 1994, 58, fig 58.9). Ext.D: 26mm, H: 3mm 5170, 6195, rubble, EY5, Ph2/2

- 33 Brooch, AE. Cast, penannular brooch/buckle, with a circular cross-section which expands slightly towards buffered terminals. Ext.D: 25mm 6551, 6004, layer, EY1, Ph3/2
- 34 Brooch, AE. Cast, annular brooch with an irregular triangular cross-section and constriction for holding the pin. Tooling marks evident on the underside. Similar examples from Winchester (Hinton 1990a, fig 134, 25). Ext.D: 39mm 5673, 6170, layer, EY3, Ph3/2
- 35 Brooch, AE. Cast, annular brooch with D-shaped cross-section, ornamented with three equidistant panels of irregularly spaced transverse grooves. The cast pin is attached by means of a rectangular sectioned strip folded over the brooch to form a loop. Ext.D: 31mm 6809, 6278, floor, E13/2, Ph2/2

Jewellery: finger rings (36–39)

One annular silver ring and three penannular copper alloy finger rings were recovered. The silver ring is from a mid-twelfth to early thirteenth-century limestone surface within the lean-to structure adjacent to the manor house, S18. The copper alloy rings are also of twelfth to early thirteenth-century date; the decorated example (37) is probably the earliest, 1100–1150, coming from the fills of the final mill, M27.

The silver ring (36) has moulded shoulders elegantly embellished with a double transverse rib containing a punched motif. The bezel is oval and set with a yellow glass cabochon. A twelfth to thirteenth-century date has been suggested by John Cherry and a similar example of thirteenth-century date, in gold and set with a garnet, has been found in Norwich (Castle Keep excavation 1986).

The penannular finger rings are less ornate. Two are ribbon strip types (37 and 39), and one is decorated with a punched motif of single and double ring-and-dots. One ring has a quadrilateral cross-section (38), and is heavily worn and large, indicating that it must have been for a man. This type goes out of fashion in the late twelfth century.

Illustrated rings (Fig 11.7)

- 36 Finger ring, Ag. Slender hoop with a D-shaped cross-section, which widens slightly towards the rectangular sectioned shoulders, which are decorated with two transverse ribs containing a punched motif. The oval bezel is set with a cabochon of transparent yellow glass which is pitted and worn. Underneath the stone white plaster (chalk), used as a paste to secure the stone, is evident. Ext.D: 21mm 10111, 6514, surface, LSE8, Ph1
- 37 Finger ring, AE. Penannular with flat cross-section and tapered terminals. Ornamented with a motif of punched double and single ring-and-dots. Decoration executed before the ring was shaped, using two punches, one

with a single ring and the other with two. Ext.D: 23mm, H: 3–8mm

10340, 6633, leat fill, M25, Ph0

- 38 Finger ring, AE. Penannular with quadrilateral cross-section and tapered terminals. The internal edge is well worn. Similar example from Winchester (Hinton 1990b, fig 175, 2052). Ext.D: 25mm, H: 4mm
1376, 2045, ditch fill, LSD13, Ph0–1?
- 39 Finger ring, AE. Penannular with flat cross-section (ribbon strip type) and tapered terminals. H: 4mm
3972, 1697, ditch fill, LSD14, Ph1

Jewellery: earrings (40–41)

Four complete copper alloy earrings were found. All are basic in style exhibiting no form of decoration. Two are furnished with quadrilateral cross-sections (41), and two with circular to sub-circular cross-sections (40). Three of the earrings, including those illustrated, are from eleventh to twelfth-century contexts; two from boundary ditch fills and one from the fill of the second mill leat M26. The fourth example comes from a fourteenth-century yard in tenement E.

Illustrated earrings (Fig 11.7)

- 40 Earring, AE. Sub-circular cross-section.
966, 902, ditch fill, LSD13, Ph0
- 41 Earring, AE. Quadrilateral cross-section.
10712, 7185, leat, M25, Ph LS3/2

Jewellery: Beads (NI)

Only six beads were recovered; four glass, one shale and a possible spherical copper alloy bead which is badly corroded. They are from contexts ranging in date from the eleventh to fourteenth centuries.

Personal possessions: toilet equipment (Fig 11.7, 42–46)

Toilet equipment: combs (42–44)

There are parts of four bone combs, three from contexts dated AD 1150–1250 within the northern holding, while the fourth (43) is from a fourteenth-century context in tenement D.

One comb is nearly complete (42), the others are fragments of tooth-plate and side-plates (43 and 44). Both double-sided composite combs (constructed from three separate pieces, a tooth-plate and two side-plates, fixed together by iron rivets) and single-sided combs are represented, although only a single piece of tooth-plate remains of the latter (NI).

Like many examples of double-sided composite combs, the tooth-plate of the complete example (42) displays different tooth sizes; one side coarse and the other fine.

The coarse teeth, 27 in total, have oval cross-sections, some with transverse grooves created during the manufacturing process by chamfering. The coarse teeth decrease in length towards the centre, most probably a sign of much use. The fine teeth, 46 in total, have rectangular cross-sections which taper towards a flattened point. The single-sided comb (NI) has fine teeth 22mm long.

The side-plates of the complete example (42) and one of the fragments (43) have plano-convex cross-sections, and are embellished with longitudinal grooves and ring-and-dot motifs, while the other side-plate (44) is flat-sectioned, embellished with parallel oblique incisions in groups of three, and has been made from a rib bone split longitudinally. On the complete comb notches on the side-plate correspond with the position of the teeth, indicating that the individual pieces were assembled prior to the cutting of the teeth.

Illustrated combs (Fig 11.7 and Plate 11.3)

- 42 Comb, bone/antler. A double-sided composite comb, with squared ends and decorated side-plates. The side-plates taper slightly towards the terminals and are secured by four iron rivets. L: 86.5mm, H: 42mm
10213, 4356, yard surface, SY2, Ph2/0
- 43 Comb, bone/antler. Fragment of decorated side-plate with plano-convex cross-section. W: 11mm
985, 736, layer, DY2, Ph3/2
- 44 Comb, bone. Fragment of decorated side-plate, made from a rib bone split lengthways. W: 11mm
10094, 6514, surface, LSE8, Ph1

Toilet equipment: tweezers (45–46)

Six pairs of tweezers were found, four of which are complete. All are manufactured from folded strips of sheet copper alloy, and two are furnished with pronounced bows which would have efficiently held the tension to enable gripping (45). Three have arms which widen towards the blades, and the others are parallel sided (46). They are 30–51mm long and 5.0–7.5mm wide.

Four of the six are from yard deposits associated with the earlier use of tenement E, AD 1150–1300, and another is from a yard in tenement A, suggesting that at least some may be residual from the underlying manor house. The sixth pair (45) are from a later medieval boundary ditch and could be of fourteenth-century or later date.

Illustrated tweezers (Fig 11.7)

- 45 Tweezers, AE. One-piece type with flared arms and chamfered blades. L: 50mm, W: 5.5–7mm
751, 684, ditch fill, PM2, Ph4 or later
- 46 Tweezers, AE. One-piece type, beaten from a sheet strip. Parallel sided arms, blades missing. W: 5mm
6881, 6151, wall, EY3, Ph2/0–2/2?

Personal possessions: recreational objects
(Figs 11.8–11.12, 47–56 and 11.40, 13–15)

Recreational objects: musical instruments (47–49)
 by Graeme Lawson

Although by now a numerous and firmly established category amongst objects of worked bone from excavations, our knowledge of the forms and functions of simple bone pipes is still sufficiently incomplete for new finds to require sometimes major interpretative adjustments. Three such pipes from West Cotton are unusually productive in this respect, adding significantly to our appreciation not only of medieval popular instrument-making in the East Midlands but of the nature and sounds of medieval music itself: two bear irregular details of manufacture, while a third seems to represent a new and discrete type of instrument possessing a quite different and highly distinctive musical character. To these may be added five small perforated metapodial bones of domestic pig (Fig 11.40: 13–15), previously described as “toggles” but now interpreted as “buzz-bones”, a type of simple sound-making device or toy widespread amongst surviving European folk-musical traditions.

These instruments join a small but remarkable selection of musical finds from nearby excavation at Furnells manor, Raunds (Audouy and Chapman 2009), in a part of the county already noted for its richness in medieval sculptural representations of music-making (Henderson 1991, 135–7 and Lawson 1991). The finds from Furnells manor comprise a bone tail-piece from a three-stringed instrument, probably a fiddle (Audouy and Chapman 2009, fig 3.16 and Oakley 2009 in Audouy and Chapman, fig 7.8, 1); an iron-framed jew’s harp; a small clapper bell; a bird bone whistle (Oakley 2009, fig 7.8, 2) ; and a bird-bone tube of less certain musical significance. Indeed, taken as a whole, the Raunds group now ranks in importance alongside the best-known published musical assemblages from the United Kingdom. Comparable urban groups within the East of England include Lincoln (Mann 1982), Norwich (Lawson and Margeson 1993) and Thetford (Megaw 1968, 149 and Pl. XXIII.D; Lawson 1984, 1993 and forthcoming). Its value is further enhanced not only by its unusual rural location but by its distinctly secular context. Outside the medieval urban centres, with their rich finds deposits, such localised groups have hitherto been limited to monastic and military sites, with secular locations tending to yield only solitary and isolated examples: the ratio of musical finds to other identifiable small finds of worked bone and antler from West Cotton is 8:79, or approximately 10.1% by number.

Of the three pipes two are fashioned from sheep/goat tibia (47 and 48) while the third is probably of deer metatarsal (49). Each has been carefully worked using a sharp, pointed blade, probably an ordinary sheath-knife or a closely similar implement. The bones, naturally hollow, have been opened at each end either by sawing off or drilling through the epiphyses, while along the lengths of the shafts the finger-holes and other perforations are of a

conical section consistent with knife-point drilling. Such lack of technical sophistication suggests that, as with similar finds elsewhere throughout the United Kingdom, manufacture was local and probably part of everyday social activity. Nevertheless at least two show signs of having been intended to conform to particular technical specifications.

Pipes of sheep/goat tibia (Fig 11.8, 47–8 and Plate 11.4)

The general forms of bone flutes and their principles of operation are by now sufficiently familiar to require little introduction. Such pipes utilise the natural cavity of the bone, opened at each end, with the addition of a single, usually D-shaped, sound-hole to generate the sound, and between one and six circular finger- (and thumb-) holes to control pitch. Enough remains of pipe (47) to show that it originally had four of these, clustered closely together towards the distal end. No evidence remains either of the form of the mouth-piece, which would presumably have been of the characteristic block-and-duct type, or of any thumb-hole to the rear. The enlarged rear perforation close to the distal end would have served only for suspension, probably by a cord from the owner’s belt. As such it would have had some effect upon tuning, but only of the pitch achieved by closing the adjacent (fourth) finger-hole: the others would not have been affected. Such suspension points, although not universal, are well represented amongst both tibia-based and other bone instruments both here and on the continent.

More unusual are the instrument’s overall dimensional characteristics: in particular the slenderness of the tibia selected, the tight grouping of the finger-holes and the method used in opening up the distal end. Since such instruments employ the natural cavity of the bone there is often variation in bore between instruments of the same type, according to the breed and growth of the animal selected. Normally this affects tone quality rather than pitch. Nevertheless such a narrow bore as this (measuring as little as 6.2mm by 4.2mm diameter at mid-point) would have had an equally important practical implication: longer and narrower bores facilitate the playing of additional, higher harmonics by over-blowing. Over-blowing is not normally thought to have been associated with tibia-based instruments such as this, usually requiring the longer bores characteristic of, for example, swan or crane ulna. However, tight distal clustering of finger-holes is a characteristic normally associated precisely with those longer bird-bone pipes, and although breakage in this case precludes reliable estimate of the total original length it may be significant that the harmonic potential of the instrument has been extended by the very unusual treatment of its distal extremity. By drilling into the epiphysis from the end, instead of simple sawing it off as elsewhere, the available length of the pipe has been deliberately maximised. Were the same technique to have been employed at the missing proximal

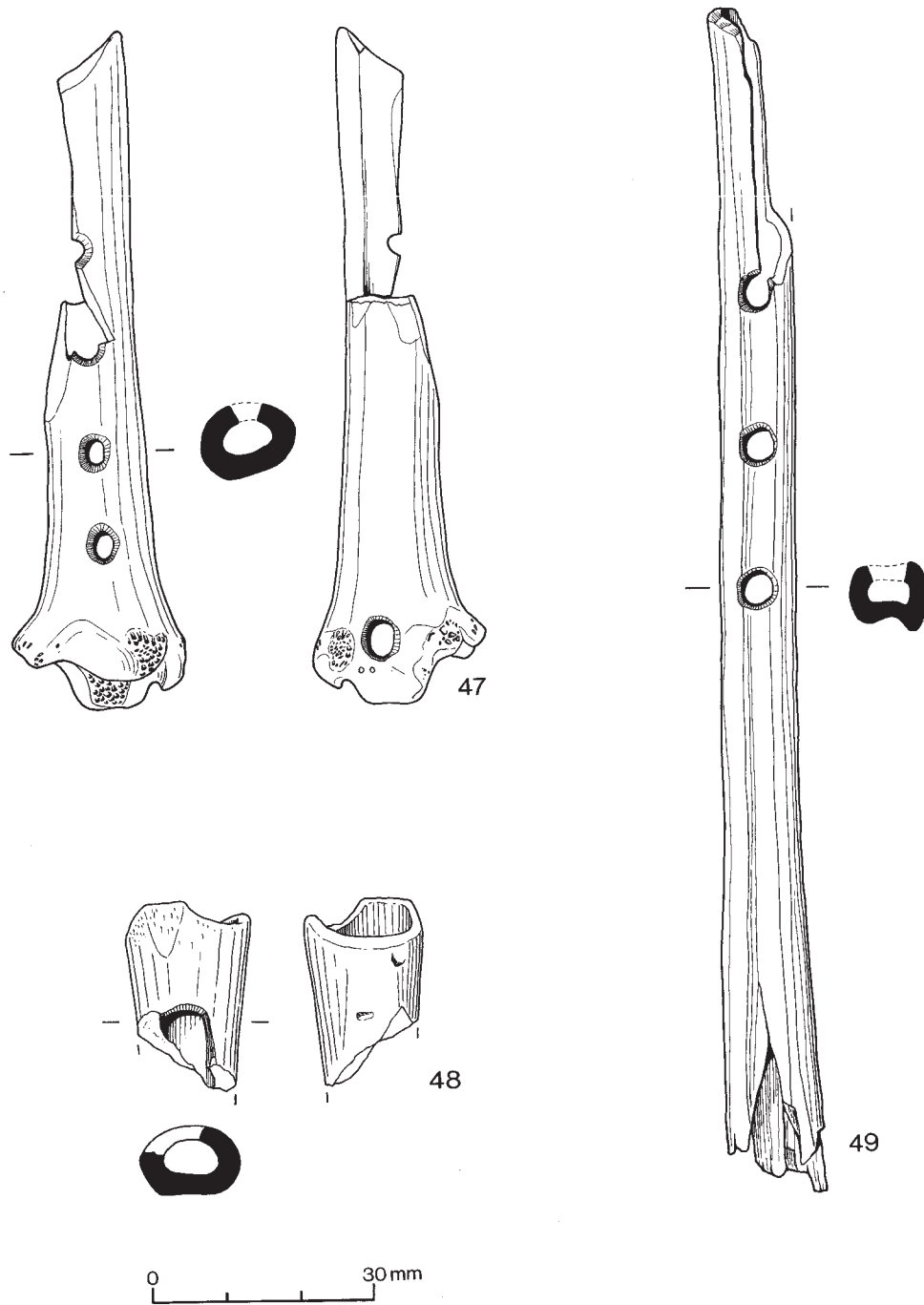


Figure 11.8: Personal possessions: recreational objects; musical instruments (47–49)

end the extra length obtained could have been in excess of 20mm overall.

In the absence of much of proximal portion of the instrument it is not possible to reconstruct exactly the musical scale which this instrument was intended to produce. Nevertheless it is clear from re-touching to the edges of finger-holes 2, 3 and, particularly, 4, that, as elsewhere, a particular scale of some sort was intended. It

also seems likely from the irregular placement and varying diameters of the four finger-holes that this comprised narrow, slightly unequal intervals in the tone/semitone range – rather than a gapped (eg pentatonic) scale. Such a tuning would have rendered the instrument well suited to melodic performance. Moreover, although high-pitched, the volume and tone it produced need not have been piercing. That the character of sound achieved satisfied

its maker's requirements in actual performance is testified by extensive use-wear polishing, especially to the rims of finger-holes 2 and 3. Often, though not always, a feature of ancient instrument surfaces (Lawson 1986, 128), its presence here confirms that this instrument must have seen considerable usage prior to eventual abandonment, which was thus presumably precipitated not by any deliberate rejection but by accidental breakage.

Examples of similar instruments from East Anglia and the East Midlands include an almost complete tibia with four finger-holes from Great Massingham, Norfolk and a complete tibia with one thumb- and five finger-holes from Stanton Low, Buckinghamshire (both unpublished). The Great Massingham pipe is in Kings Lynn, Norfolk (Lynn Museum acc. no. A832) and the Stanton Low pipe is in private ownership, information courtesy of Milton Keynes Archaeology Unit. They suggest that it was common practice not just to make and play such pipes but to carry them about, ready to hand, even when not actually in use. [Note from Andy Chapman: a further example from just a few miles away was found during excavations of manorial farm buildings at Irthlingborough in 2001. This flute was fashioned from a sheep/goat tibia, and was complete, apart from the mouth-piece block, and was 141mm long, with two finger holes (Hylton 2003, 96–97, Plate 6 and fig 10, 1).]

Of the second sheep/goat tibia pipe (48), only a fragment was recovered, yet enough remains to confirm positive musical identification as the proximal (mouth-piece) terminal of another instrument of broadly similar form. The shaping of the rim, slightly undercut rather than sawn straight across, is typical. On the line of fracture part of a well-formed sound-hole of characteristic shape can also be seen. Here again, however, there are unusual features. In particular the mouth-piece is set, not at the usual, proximal end of the bone as it would have been in (47), but at the narrower, distal end.

Whether this fragment represents a true flute, that is to say with finger-holes, or merely a whistle, is not confirmed by its extant form. However, simple whistles are rare amongst other sheep/goat tibia pipes, and a more strictly musical interpretation here may be supported by the especially careful shaping of what remains of the sound-hole. This is of an unusually extended form, not merely D-shaped but elongated, probably sub-rectangular and, as such, perhaps similar to some of the more sophisticated examples of later medieval date, such as the late thirteenth-century instrument from White Castle, Gwent (Megaw 1961, plate XXIX). This same detail is evident amongst the craftsman-made wooden instruments of the later Middle Ages and was to reach its finest expression, at least within the archaeological record, in the three large three-hole pipes recovered from the wreck of the *Mary Rose* (Palmer 1983, 55, 57–8). Regrettably no trace of the form of its cutting edge remains here.

Whatever function this piece may originally have had, it again bears distinct traces of use-related wear, in addition to tool-marks consistent with manufacture and finishing

by knife. These use-wear traces clearly post-date those of manufacture, confirming that the pipe subsequently saw active employment, and could not have been jettisoned until considerably later. As an indicator of success this may help a little in the difficult task of trying to assess the wider significance of its irregular design. Whether it represents the unique surviving example of an established but otherwise unrecorded local tradition, or whether it is simply the result of an individual experiment, on site or nearby, is a tantalising question common to all such finds for which exact parallels are absent, even if these were only one-off trials, they were nevertheless successful.

Pipe of deer metatarsal (Fig 11.8, 49 and Plate 11.4)

The third pipe is without doubt the most unusual and remarkable of the three. Close inspection reveals that, unlike the two tibia-pipes, it is probably not a flute, as such, but a reed-pipe characterized by an altogether different type of mouth-piece. This is a type, hitherto unrecognized amongst surviving medieval bone pipes: amongst the small number of narrow-bore wooden pipes that survive from the early Middle Ages (and which are presumed to be reed-pipes, either horn-pipes or chanters from early bag-pipes) the solitary English specimen from Hungate, York, is of probable tenth-century date (Richardson 1959, 84–5, 20); published parallels on the Continent comprise five from Blija and other sites in Friesland, Netherlands (Rimmer 1981, 238–239), and another from Lund, Sweden (Lund 1974, 17 and 39, No. 62; 1981, 261–2).

Superficially, there seems little to distinguish it from a flute: there are three finger-holes which, together with the surviving terminal, are cut, as usual, by knife, and although at its broader end it is damaged, the instrument survives to a length of 169.5mm, probably within 10mm of its original length. Despite this completeness, at neither end is there any sign of that most diagnostic feature of all block-flutes, the sound-hole. Moreover, examination of the bone from which the instrument has been made reveals a most unusual choice: whereas most English medieval bone flutes utilise sheep/goat tibia or bird (usually swan, crane or goose) ulna, this bone is a deer metatarsal.

The presence on site of a deer metatarsal is in itself of no great surprise, since the recovery of a small amount of deer remains amongst the general faunal sample confirms the local availability of such bones at West Cotton, just as elsewhere in the East of England at this time. But there has until now seemed to be no support for any coherent tradition of European instrument manufacture using this particular bone. The only well-known example is the flute from White Castle, Gwent (Megaw 1961), which is an isolated occurrence with a number of so far quite irregular features of its own. Nevertheless, re-examination of irregular, previously problematical 'flutes' from other excavated medieval sites yields at least two possible parallels. Both are of deer metapodial.

The first, an incomplete specimen from late Saxon Thetford, comprises around one half of a plain bone tube of oval cross-section, with extensively modified surfaces, bearing a total of three finger-holes. The difficulties in reconciling its finger-hole placement with identification as the distal end of a flute have been discussed elsewhere (Lawson forthcoming). No such problems would attend its re-identification as the proximal end of a reed-pipe. The second instrument, from Winchester, is an almost complete example possessing a total of two finger-holes and, again, no sound-hole (Megaw 1990, 719 and fig 205, No. 2265). Breakage at one end has hitherto been assumed to mask the loss of this feature, despite a similarly awkward and unconvincing finger-hole layout. As a reed-pipe no such difficulty would arise, its undamaged end, without sound-hole, representing the mouth-piece instead. Perhaps significantly, both Thetford and Winchester instruments share with pipe (49) a further irregular detail not previously noted amongst bone flutes: their terminal edges are chamfered asymmetrically, at one or both ends. The significance of this feature has yet to be fully determined, but early experiments suggest that it may indeed prove to be related to construction methods peculiar to reed-pipes of composite structure (Lawson in preparation).

Discrimination between bone flutes and bone reed-pipes in the archaeological record, if valid, would have two major acoustical consequences. Reed-pipes are not voiced like flutes, by directing a jet of air across a sharp-edged sound-hole, but by blowing into a separate, vibrating reed. This is no mere arbitrary distinction. The beating of a reed produces a raucous squeaking tone which contrasts dramatically with the piping of a flute mouth-piece. When incorporated into the proximal end of a bone pipe, moreover, its practical effect upon tuning is also quite different. A flute of similar finger-hole layout will produce a high-pitched musical scale (in an instrument of this length typically in the upper half of the second octave above middle C), perhaps with additional, even higher notes potentially available through over-blowing. The effect of a reed on the acoustical behaviour of the same air column is twofold. Firstly, it generates a much lower range of musical pitches; secondly, with a simple, single reed of folk-clarinet type over-blowing can provide no additional harmonics. In consequence the three finger-holes of a reed-pipe such as this West Cotton pipe limit its musical range very tightly indeed, in fact to not more than four notes. Although by modern standards this may seem to have very limited applications, music surviving in medieval manuscript sources confirms the circulation of broadly contemporaneous melodies of equally narrow compass.

Reconstruction of the exact musical scales produced by such instruments is complicated by the effects of variation in the size and manufacture of their reeds, for which there is no direct evidence. Nevertheless it is clear from the unequal spacings of the finger-holes of this instrument, like (47), that a particular tuning was indeed intended. Interim experimental results with replicas, using idioglottal reeds cut from the common reed *Phragmites communis*

(*Phragmites Australis*) sealed in place with softened beeswax, suggest an effective operating range somewhere within the first octave above middle C, made up of intervals of between one and slightly over two semitones. In an idioglottal reed the tongue is partially cut from, but still remains attached to, the main stem of the reed, against which it vibrates when blown: in the heteroglottal reed of the modern orchestral or jazz clarinet the tongue is made from a separate piece of cane and clamped in place: the larger diameters of the imported cane reeds used in some Roman and later medieval instruments would not have fitted into a pipe of such narrow bore.

The instrument's tone quality is startlingly robust but rich in the upper partials, reminiscent of the sound of the cylindrically-bored chanters of the traditional Uilleann and Northumbrian small-pipes. Indeed, the emergence of a popular tradition of bone reed-pipe manufacture within the late Saxon period and the twelfth century promises to expand considerably our appreciation of the relationship between these modern reed- and bag-pipe traditions and their most ancient ancestors of Roman and even earlier date. It also invites still greater caution in interpreting the remains of the earliest of all musical relics, the bone pipes of Upper Palaeolithic Europe.

Perforated pig metapodials (Fig 11.40, 13, 14 and 15)

Discussion of musical remains from West Cotton would be incomplete without reference to interpretation of those ubiquitous objects, pig metapodials with central perforations, of which five were recovered. Traditionally identified as 'toggles' their practicality as sound-making tools or toys, which has emerged in recent years (eg Lund 1974, 18–19 and 37, Nos. 43–5; Lawson 1986, 124–5; Spenneman 1988 and Lawson and Brown 1990).

The three West Cotton examples examined are technically consistent with interpretation as buzz-bones, in terms both of balance and wear. A knife-stroke across the balance-point of (13) seems to represent marking-out prior to drilling: its ends have also been pared. Indeed in all three cases the balance point falls within the width of the perforation. The ends of (15) are particularly notable for the extent of paring and other adjustment. Its other surfaces are in sufficiently good condition to show clear tool-marks from knife-scraping there too.

Illustrated pipes (Fig 11.8 and Plate 11.4)

47 Musical pipe, sheep/goat tibia, incomplete, probably a flute. There are four finger-holes (the full original complement) and a single suspension hole. External surfaces are smoothed throughout by knife, and areas around the finger-holes are well polished through use. The proximal end is fragmented and the mouth-piece details are missing. L: 93.6mm.

194, 343, rubble, D11, Ph4 (1300–1450)

48 Fragment from mouth-piece terminal of a musical pipe,

sheep/goat tibia, probably a flute. Exterior surfaces are worked by knife, with traces of use-wear polishing. The sub-rectangular form of the perforation suggests function as the sound-hole rather than a finger-hole. Probably a flute rather than a simple whistle, despite the unusual setting of the mouth-piece at the distal end of the bone. L: 27mm

10849, 539, rubble, B5, Ph4–5

- 49 Musical pipe, deer metatarsal, probably a reed pipe. There are three perforations (the full original complement) all cut by knife point. The interior is partly worked, the septum deliberately reduced. Exterior surfaces have been shaved to reduce dorso-ventral indentation. The surviving terminal is cut obliquely and its rim chamfered: the absence of the usual D-shaped sound-hole combines with unusual choice of bone to suggest identification as a rare example of an early reed-pipe. L: 169.5mm

10832, 4594, ditch fill, LSD11, Ph1–2/0? (1150–1250)

Recreational objects: gaming pieces and boards (50–55) by Andy Chapman

Two pieces of worked bone (50 and 51) are identified as gaming pieces and, more specifically, as very plainly-fashioned examples of stylised chess pieces (Fig 11.9). They are worked from a sheep/goat metacarpal and a sheep tibia; both are hollow. The flat-cut ends indicate that they would have stood upright, while their tops have been fashioned by knife trimming, into paired points. On one (50), the fresh trimming facets around the points and the lack of wear suggest that it was probably discarded before completion, perhaps as a result of the evident breakage. The highly-polished surface on the other piece (51) indicates that it had been well used. The rounded front and sides are simply decorated with parallel incised lines and the points are offset towards the undecorated, flatter, face, which would have formed the back of the piece. On the unfinished piece it is uncertain which side would have formed the front, but the points are again offset towards the flatter surface. The unfinished piece was recovered from a twelfth-century floor in the hall, S18, of the manor house. The other was recovered only a few metres away at the base of the fourteenth-century robber trench for building E13, which directly overlay the levelled walls of the hall S18. It could be residual in this context, with both pieces possibly related to the use of the hall in the twelfth century.

The game of chess was probably introduced into Christian Europe in the tenth century from the Muslim areas of Spain and is believed to have reached England in the eleventh century (MacGregor 1985, 137). Early European chess pieces, and indeed all subsequent pieces, occur in two forms, naturalistic or figurative and stylised, with the latter derived directly from the Muslim tradition, which does not allow naturalistic representations. Early figurative pieces are most vividly exemplified by the famous Lewis collection, dated to the later twelfth century (Taylor 1978 and Stratford

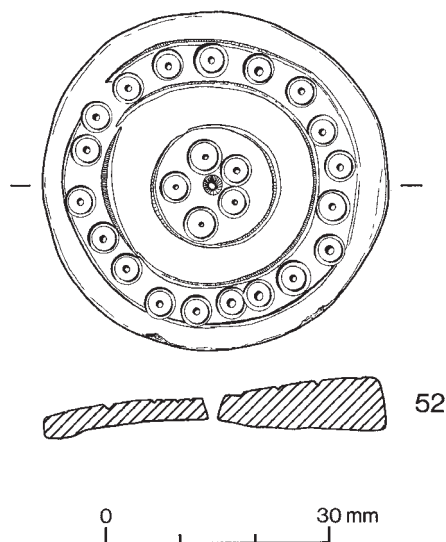
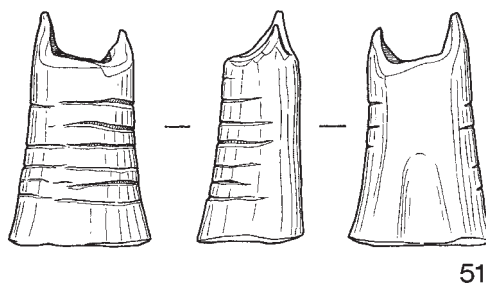
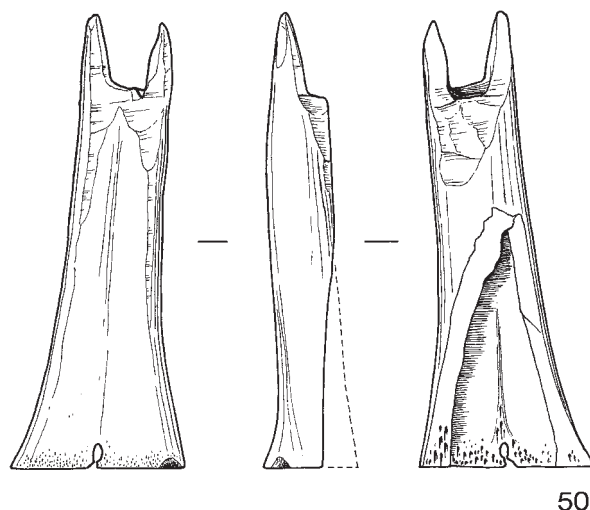


Figure 11.9: Personal possessions: recreational objects; gaming pieces (50–52)

1997). Early stylised chess pieces are uncommon but not rare finds, they have been recognised for well over a century and nearly 50 have been published in this country (Chapman 2005a and Egan 1998, 291–294), and there are

numerous examples from the continent (MacGregor 1985, 137–139). A majority of the English examples from rural sites have come from manorial or monastic sites, as typified by an elaborately decorated rook from a moated manor in Tempsford Park, Bedfordshire (Chapman 2005b, 79–80, fig 6.3 and plate 15).

They are fashioned in bone, antler or jet and are decorated to varying degrees with incised lines and ring-and-dot motifs. The individual pieces are identified by the form of the upper part and the forms may be briefly summarised as follows: pawn-plain cylinder; rook (castle)-bifurcated top; knight-forward projecting stylised head; bishop-paired “horns” projecting forward; king/queen- rebated upper part and sometimes a stylised upstanding head.

The West Cotton pieces may be equated with the bifurcated top of the rook, although it is just possible that the unfinished example could have been intended to form the paired “horns” of a bishop. They are small in comparison to many of the recognised pieces and much simpler in form, as the standard pieces are fashioned from long bone or antler and usually have a solid central plug replacing the cancellous tissue. However, a parallel for small, hollow and simply fashioned pieces is provided by a knight from the medieval settlement at Lyveden, Northamptonshire (Bryant and Steane 1971, 67–68, fig 19a, pl 18), which is formed on a hollow length of bone, 39mm high by 33mm in diameter. This piece has a stylised head with ring-and-dot eyes and the body is also decorated with ring-and-dot motifs but, like the West Cotton pieces, it lacks the decorative complexity generally present. A piece from Thetford (Rogerson and Dallas 1984, 182, fig 199,96) is closely similar to the West Cotton examples, at 43mm high, hollow, undecorated, with two upstanding points offset towards the flatter face, although this item was identified as a cord-making tool. An unidentified bone object from Winchester (Biddle 1990, 1137, fig 371, 4403), fashioned on a sheep/goat metacarpal, also has paired points, it stands at least 49mm high but the base has been lost. Finally, an identified chessman from Bradwell Bury, Milton Keynes (Leveson Gower 1994, 33–5, fig 18.20) may be seen as lying between the simple pieces listed above and the more elaborate and decorative pieces. This antler chessman is cylindrical and undecorated apart from two carved chevrons and an inserted plug which forms a conical dome or “head”. It was tentatively identified as a bishop, although the noted alternative that it may be a king or queen is the correct identification. Incidentally, a chessman in jet from Great Linford, Milton Keynes (Leveson Gower 1992, 167–8, fig 76.191), with its stepped chevron and top ridge, is also a king or queen and not a bishop, as noted in the published report.

While the more decorative stylised chessmen have long been recognised, it is suggested that the West Cotton pieces are examples, and not the sole examples, of particularly simple chessmen that have gone largely unrecognised previously. The more elaborate pieces are likely to have been produced industrially by craftsmen (MacGregor 1985, 44ff) while it is suggested that the simple

pieces are more likely to have been casually produced as handicraft, utilising the smaller animal bones such as the sheep/goat metacarpal and the sheep tibia represented here. Within the recognised chessmen there is a marked absence of the simple, cylindrical pawns and this must be due to these either being missed during excavation or being left unpublished as minor items of miscellaneous or unidentified worked bone. The same may be true for these simply fashioned chess pieces.

The third gaming piece (52) presents no difficulties. This is of discoid form with a simple inscribed decoration of ring-and-dot motifs within concentric circles. Such pieces were apparently first introduced “within a few decades of the Norman conquest” and were probably used in the game of tables (MacGregor 1985, 135–137). This example comes from a yard of tenement E, dated to the fourteenth century but overlying the tenth to thirteenth-century manor buildings. Similar pieces come from medieval sites throughout England and the continent; there is a single example from Furnells manor, Raunds (Oakley 2009, fig 7.5, 3) and the report on several from Goltho provides references to some of the numerous comparable examples (MacGregor 1987, 190–192).

There are three complete examples of gaming boards, all for nine-men's morris (53–55), lightly inscribed or scratched on irregular fragments of limestone. They were all recovered from building D11 and can be dated to the thirteenth and fourteenth centuries. On the two larger boards (53–4) the surfaces are uneven and undulating, indicating that there was no careful preparation of the stones. The smaller example (55) is inscribed on a flat surface but again there appears to have been no special preparation of the shape or surface of the stone. One has been partially reworked following the inscription of the board (54), part of the original surface has been removed and there are several wedge-shaped tool marks. They are all therefore casually produced boards intended for short-term use only.

A further two fragments of limestone, from the fourteenth-century floors of buildings C8/1 and C9/1, retained partial patterns of parallel scratched lines (NI). These may also be from gaming boards, but neither appeared to be for nine-men's morris. While it is possible that other similar examples may have been missed during excavation, given the large quantity of limestone in use on the site, it seems unlikely to be mere coincidence that the three complete examples were all from a single building. One lay face-up (53) forming part of the base of the stone-lined pit containing the upstanding carved figure (56) (see Fig 7.27). One side of the stone was partly overlain by the pit lining so that it would have been difficult, but not impossible, to utilise the board in this position. The possible significance of the location of this piece will be considered in the discussion of the carved figure, see below. Another board (54) came from a wall of the same building, D11/4, while the small board (55) was within the demolition rubble above the floor levels.

Nine-men's morris boards are fairly common finds on

medieval sites (Croft 1987 and Mynard 1994, 156–7, fig 86). There was a single example from Furnell's manor, Raunds (Oakley 2009, fig 7.9), which had been lain face down in a floor surface of the later medieval, eastern, manor. In contrast with those from West Cotton, it had been formed on a squared slab of limestone with a level and smoothed surface with deeply incised linear, V-shaped grooves, and was therefore intended for long-term use.

Illustrated gaming pieces and boards (Figs 11.9–11.10 and Plates 11.5–11.7)

- 50 Gaming piece, bone (Sheep/goat metacarpal). Chess piece, rook? H: 60mm
10095, 6516, floor, S18, Ph1
- 51 Gaming piece, bone (Sheep tibia). Chess piece, rook? The anterior surface is decorated with six crude transverse grooves, each comprising a succession of tiny nose end-to-end incisions, creating a feathery line. H: 30mm
5663, 6121, robber trench fill, E13, Ph3/2
- 52 Gaming piece, bone (Scapular, cow). Tableman. Discoid with uneven section, ornamented with ring-and-dots within concentric rings, scribed from the central tapered perforation (MacGregor 1985, 60). The outer edge is slightly faceted indicating that it was trimmed by hand. D: 45mm
6864, 4228, stone-lined pit, EY5, Ph3/2
- 53 Gaming board, limestone. Nine-men's morris. Consisting of intersecting scratched lines forming three concentric rectangles with the sides bisected by single lines. D: 370 x 310mm
787, 806, D11/2, pit fill, Ph2/0–2/2
- 54 Gaming board, limestone. Nine-men's morris. D: 340 x 300mm
1025, 974, wall, D11/4, Ph2/2–3/2
- 55 Gaming board, limestone. Nine-men's morris. D: 135 x 155mm
212, 349, rubble, D11/2, Ph3/2–4

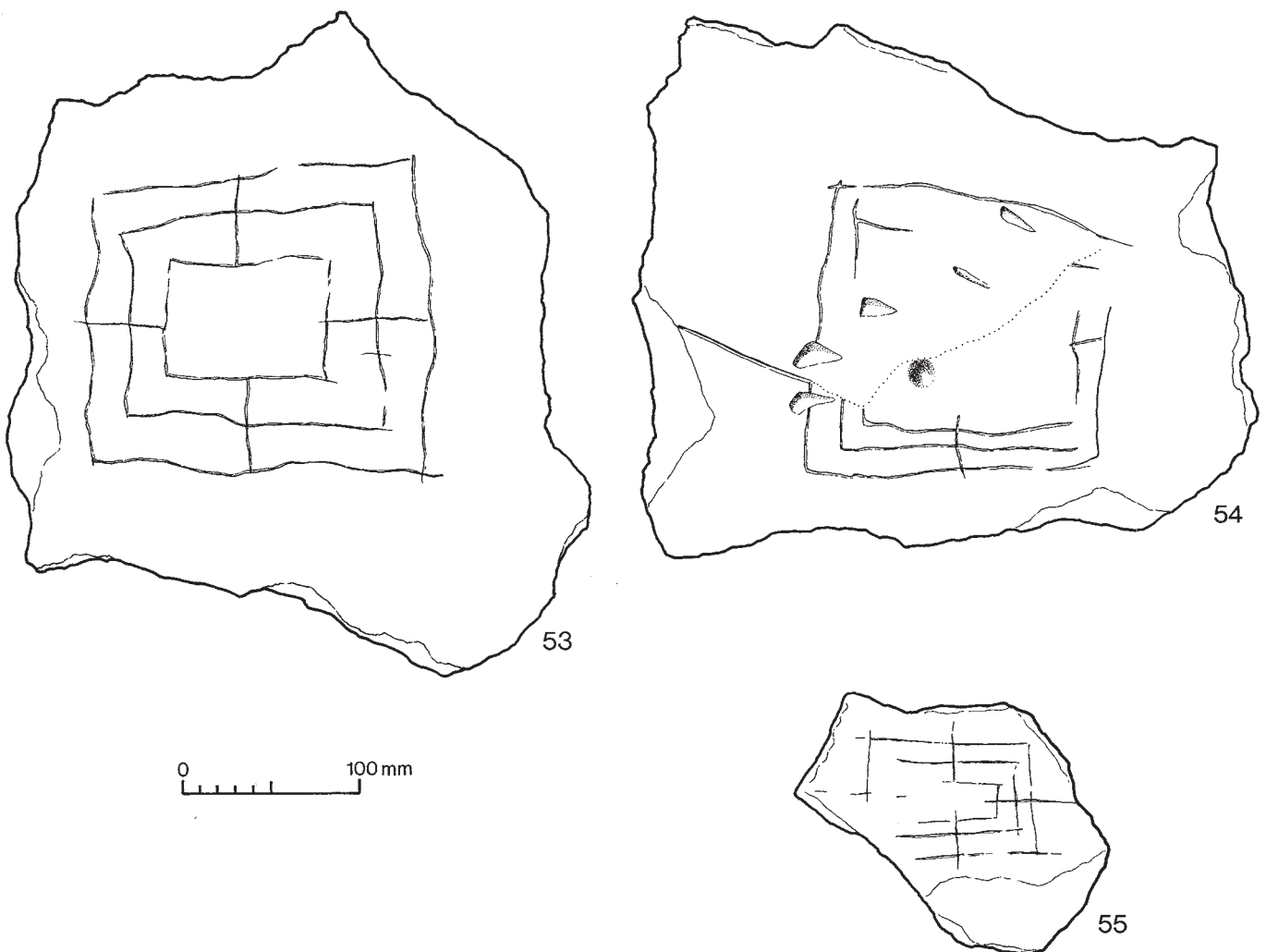


Figure 11.10: Personal possessions: recreational objects; nine-men's morris boards (53–55)

Recreational objects: the carved stone figure (56)
by Andy Chapman

This is the only figurative piece of worked stone from the site (Figs 11.11 and 11.12; Plate 13). It is fashioned on a roughly rectangular block of limestone, 260mm long by 140mm wide and up to 75mm thick. The sides are irregular but roughly shaped. The back has a stepped fracture so that the upper third of the stone is irregular and only 35–40mm thick. Below the fracture, the back has been roughly worked to a level surface but with the thickness decreasing from 75mm to 35mm at the base. Only the front surface has been carefully worked. The figure is 225mm in length and has been carved in a combination of high and low relief, with the surface of the stone cut away so that the surround is slightly concave. The head, torso and legs are in low relief, standing 5–10mm high. The arms are in high relief, well rounded and standing up to 10mm above the adjacent surfaces. The distinctive, shield-shaped face has lightly incised eyes while the nose, which is damaged, is accentuated by slight concavities to either side. The mouth is more deeply incised and shallow, curving hollows above it appear to define a moustache. The pointed chin stands 3mm above the neck.

Lightly incised lines on the upper torso probably represent the folds of a tunic or surcoat. Three closely-spaced lines encircling the upper part of the left arm may be intended to suggest a short-sleeved tunic. The upper part of the right arm is damaged. The belt, visible between the arms, is defined by two deeply incised lines and there is a lightly incised strap-end, with a series of fine transverse lines, hanging from the belt. The surcoat terminates at about mid-calf length and the folds are indicated by rounded ridges between incised grooves. The lower legs and feet are plain and simply shaped, although the pointed feet may be intended to indicate that the figure is wearing leather shoes or boots.

The figure appears to be a piece of peasant or domestic art, but while the form is simple, with its “plastic” arms and stylised head, the combination of high and low-relief carving shows considerable subtlety and skill in the handling of the subject and the material.

Comment on this figure has been sought from various people, who have all declined any direct involvement in the preparation of a report, and comments as to its possible significance and interpretation have taken in such possibilities as a connection with cabalistic rituals and the suggestion that it may have been a modern fake planted on the site. This latter suggestion is dismissed by the excavation team. The head was exposed during cleaning and was photographed *in situ*, and there was no indication of any recent disturbance of the surrounding ground.

One of the major difficulties is the lack of any known direct parallels. The general form is comparable to the semi-stylised anthropomorphic figures on some medieval pottery jugs, while in terms of relief carvings some of the figures on the walls of Royston Cave, Hertfordshire (Jones 1979,

fig 6:1) are broadly similar. This underground chamber was discovered in the eighteenth century but the figures are, unfortunately, undated. Connections with the Knights Templar and the use of the chamber as a hidden place of worship for a heretical sect have been suggested.

At its simplest, the figure may be seen as a foundation deposit associated with the rebuilding of the manorial detached kitchen (D11). It stood at one end of a small stone-lined pit with a nine-men’s morris board at its feet, forming part of the floor of the pit. Whether there is any deliberate connection or association with the nine-men’s morris board is another matter for speculation.

Illustrated carved stone figure (Figs 11.11–11.12, and see Plate 13)

56 Carved figure, limestone.
736, 806, stone-lined pit, D11/2, Ph2/0



Figure 11.11: The carved stone figure



Figure 11.12: Personal possessions: recreational objects; the carved stone figure (56)

Building equipment (Figs 11.13–11.16: 1–30)

This group comprises items that would have formed part of or been attached to the permanent structure of the buildings, although much of the ironwork comprises general fittings that could have been used on a wide range of items in wood, anything from chests to carts.

Iron fittings: staples (1–3)

There are 34 iron staples; 25 U-shaped (1, 2) and nine rectangular (3). The U-shaped staples are manufactured from rods typically with square or rectangular sections which taper towards the terminals, although two examples have sub-circular sections. The terminals are frequently damaged or missing and while most of the complete terminals are straight a few have been clenched. The head ends vary from rounded (1) to squared (2). Most staples are 45–65mm long but there are a few exceptionally long examples, at 70, 80 and 84mm. The smaller examples are all damaged, but it appears that staples 30–45mm long were not uncommon.

These staples would have been driven into timbers to leave the end protruding to form a fixing point for such items as chains, rings or hasps. Within buildings they could have been attached to structural timbers, doors or even window shutters and also to internal furniture such as chests. Externally, they would have been used on gates, vehicles and agricultural equipment. The range of sizes is indicative of the wide variety of uses.

The rectangular staples are manufactured from iron plate and have short tapered terminals (3) turned at right-angles to the plate. The terminals are generally short, although in one example they are of similar lengths to the main plate, and one is clenched. They vary in length from 40–79mm. Those with straight terminals would have been driven into thicker timbers, while examples with clenched terminals (3) would have been driven right through thinner planks (Goodall 1990a, 328ff). They would probably have been used to support or bind edge-joined wooden planks used to form items such as doors, shutters or chests.

Five examples, three U-shaped and two rectangular, are from twelfth-century contexts, with a U-shaped staple coming from a floor level of the hall S18. The others are from later contexts and there are examples from all tenements, although tenement E produced the greatest number, eight. However, it should be noted that the seven from tenement C, five U-shaped and two rectangular, are all from a dense scatter of ironwork within building C8, room 1, the only primary deposit of mixed iron fittings on the site, which also contained a range of nails, a strap hinge and a group of lock fittings (see locks and keys). It is suggested that these fittings derive from either a door or chest, or perhaps more than one such item, left to decay *in situ*.

Illustrated staples (Fig 11.13)

- 1 Staple, Fe. U-shaped. W: 29mm, L: 50mm
6987, 6449, stone-lined “trough”, E13/3, Ph3/2
- 2 Staple, Fe. U-shaped. W: 43mm, L: 81mm
5384, 6130, rubble, EY1, Ph2/2
- 3 Staple, Fe. Rectangular with expanded central section and tapered terminals. W: 63mm, L: 12mm
1696, 1562, layer, BY2, Ph2/2

Iron fittings: hinge pivots (4–6)

The eight iron hinge pivots (or pintles) comprise a circular-sectioned pivot (guide arm) and a tapered, rectangular-sectioned shank, which would have been driven into wood to leave the pivot free to retain the hanging eye of a strap hinge attached to a door, shutter or gate. The pivots are typically much shorter than the shanks, although one is furnished with a pivot of similar length (6). The smaller pivots measure 15–40mm with shanks 45–55mm long (4). The larger examples are furnished with pivots measuring 35–62mm and shanks 92–120mm long (5).

One example comes from a deliberate backfilling of part of ditch system 3 and could date to the late tenth century. The others are from contexts ranging in date from the twelfth to fifteenth centuries. There are single examples from tenements A, C and E, three from tenement B and one from the final filling of the mill leats.

Illustrated hinge pivots (Fig 11.13)

- 4 Hinge pivot, Fe. L: 55mm, H: 15mm
157, 296, layer, FLOOD, Ph5
- 5 Hinge pivot, Fe. L: 105mm, H: 41mm
808, 799, rubble, B7, Ph2/2
- 6 Hinge pivot, Fe. L: 45mm, H: 40mm
10242, 6553, clean, MILLS, Ph0

Iron fittings: strap hinges (7–8)

Five iron strap hinges, used as fittings to carry doors, gates, and window shutters, were found. Most are incomplete and fragmentary, but all have U-shaped hanging eyes. The most complete example has a plain square-ended terminal (7), while another tapers and then expands to form a shaped, perforated terminal (8).

Illustrated strap hinges (Fig 11.13)

- 7 Strap hinge, Fe. Plain square-ended terminals, with two perforations, tapering to a U-shaped hanging eye. L: 115mm
5034, U/S
- 8 Strap hinge, Fe. Tapered with a shaped terminal and a U-shaped hanging eye. L (incomplete): 83mm
900, 853, floor, C8/1, Ph 3/2

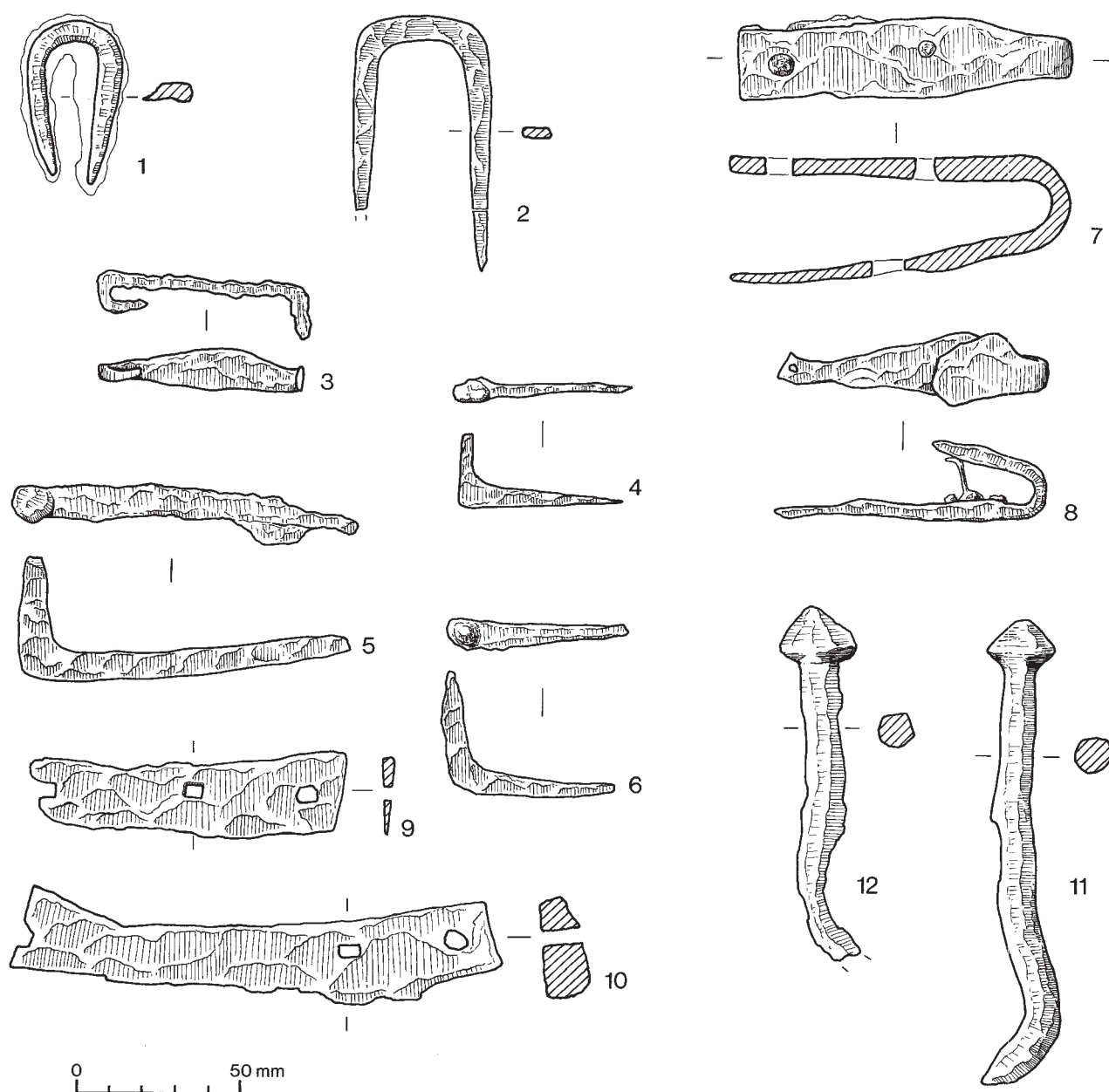


Figure 11.13: Building equipment: staples (1–3), hinge pivots (4–6), strap hinges (7–8), straps (9–10), door stud nails (11–12)

Iron fittings: straps (9–10)

Forty-six miscellaneous iron strap fragments were recorded, and twelve are furnished with one or more central perforations. Most are parallel-sided lengths of plate, 40–146mm long, ranging from 10–38mm wide. Two examples have organic remains on the surface, most probably of wood. Most of these straps were probably used as binding straps on wooden items, being attached by rivets through the central perforations.

Illustrated straps (Fig 11.13)

- 9 Strap fragment, Fe. Slightly tapered with equidistant, centrally placed, squared perforations. L: 109mm, W: 21–27mm
2769, 1578, layer, BY3, Ph 2/0
- 10 Strap fragment, Fe. Curved, slightly waisted, with two perforations, one circular and the other rectangular. L: 146mm, W: 24mm
6847, 4222, yard surface, EY3, Ph 3/2

Iron fittings: nails (11–21)

One thousand and twenty-three structural iron nails were recovered (horseshoe nails are considered separately). Using the shape of the head as the main criteria, nine types were identified, and it was possible to classify 652 nails. Typical examples of each type are illustrated (Figs 11.13 and 11.14), and the general description, size range and the totals recovered are included in the illustration catalogue.

The nails include a single large door stud (11) with a bi-conical head and sub-circular sectioned shank. This is clenched indicating that the timber, probably a door, into which it was set was 105mm (*c* 4") thick. It was recovered from an internal partition wall in building D11, immediately beside the doorway. A possible second example (12) comes from an undated context well away from any buildings, and could be part of a swivel loop.

The nails are hand forged and have rectangular or square cross-sections. The most common nail type, with 295 examples, is a wedge shaped nail with no distinct head, type 1 (13). The distinctive tapering profile makes it unlikely that many of these are in fact other types with the head missing. Nails with L-shaped heads are also fairly common, type 2 (14), and often have slightly tapering profiles. On some of these their head shape probably results from the hammering over of the ends of wedge shaped nails, but in many the head is quite rectangular and does appear to be deliberately formed. Both of these types occur in a range of lengths up to 110–120mm. They would only have been used on timber, for attaching timbers or boards perhaps as much as 90mm thick, and would have been hammered into the wood so that the head was flush with the surface.

The second most common type, with 183 examples, has a flattened, countersunk head, type 3 (15), while another frequently occurring nail, type 4 (16), has a flat rectangular head. Both of these types could also have been hammered in so that the head was flush, or at least level, with the surface. They do not exceed 80mm in length and so would have been used on thinner timbers or boards, but they could also have been used for attaching iron strap hinges or strapping or even for attaching leather to chests.

Nails with raised or domed heads are far less common with only 21 examples of types 5, 6 and 7 (17, 18 and 19). They range from 30–75mm long, and would have been used to provide a decorative effect on items such as doors and chests, and would have been particularly effective for attaching iron fittings. A further 11 examples with a raised head, type 8 (20), have a very distinctive, and usually carefully formed, trapezoidal head shape that is particularly large in proportion to the shank. They range from 55–85mm long. These may also have been for decorative effect but it is possible that they may have served some specific, but unknown, function. Finally, there are three nails, Type 9 (21), with cruciform heads, presumably with a specific but unknown purpose.

No attempt has been made to undertake a full,

quantitative, analysis of nail types and their spatial and chronological distribution, but it is possible to make a number of general observations. Virtually no nails come from contexts certainly pre-dating AD 1100. Only four were recovered from the fills of the wall-trenches of the early buildings and these could all derive from the subsidence fills. There was therefore little, if any, use of iron nails in the timber buildings. While the earliest phase of stone buildings produced some nails, the numbers are small in comparison to the quantities recovered from many later buildings. The manorial buildings, S18–S22 and S24, produced a total of only ten nails, although this is clearly artificially low due to the loss of floor levels, and larger quantities were recovered from the contemporary yards. It would appear that while there was a considerable use of nails in the twelfth century, presumably both in the structural elements and for furniture and equipment, it may have been at a lower level than the later use.

The thirteenth and fourteenth-century contexts contain large quantities of nails. Tenements A to E all produced a scatter of nails both within the floor levels of buildings and the immediately adjacent yard deposits. While most of the recovered nails clearly derive either from casual loss during the lifetime of the buildings or as a result of abandonment and demolition, there are two instances of primary nail scatters. Some 70 nails were recovered from the floors towards the southern end of building D12, and 45 nails were present in the primary scatter of ironwork fittings within building C8, probably derived from a chest and/or door left to decay *in situ*. In both instances, the representation of individual types closely follows the general pattern, with wedge-shaped and flat-headed nails being most common.

Illustrated nails (Figs 11.13 and 11.14)

- 11 Door stud, Fe. Bi-conical head with sub-circular sectioned shank. Terminal end clenched indicating a door depth of approximately 105mm. L: 244mm
263, 415, wall, D11, Ph1
- 12 Door stud? Fe. Bi-conical head with sub-circular sectioned shank, point missing. Remainder of terminal clenched, possibly indicating a timber thickness of 72mm. L: 117mm
5387, 5083, LMS, Ph ??
- 13 Type 1, 295 examples. Wedge shaped nails with flat head and rectangular-sectioned shank. L: <122mm, head W: <38mm
6132, 6266, layer, EY1, Ph3/2
- 14 Type 2, 51 examples. L-shaped nail with rectangular-sectioned shaft. Head flat and mostly sub-rectangular, large examples are exceedingly solid and sturdy. Head possibly a result of having been hammered flat. L: <111mm, Head: <27x25mm.
2503, 1544, yard surface, BY1, Ph2/2
- 15 Type 3, 183 examples. Flattened sub-circular head

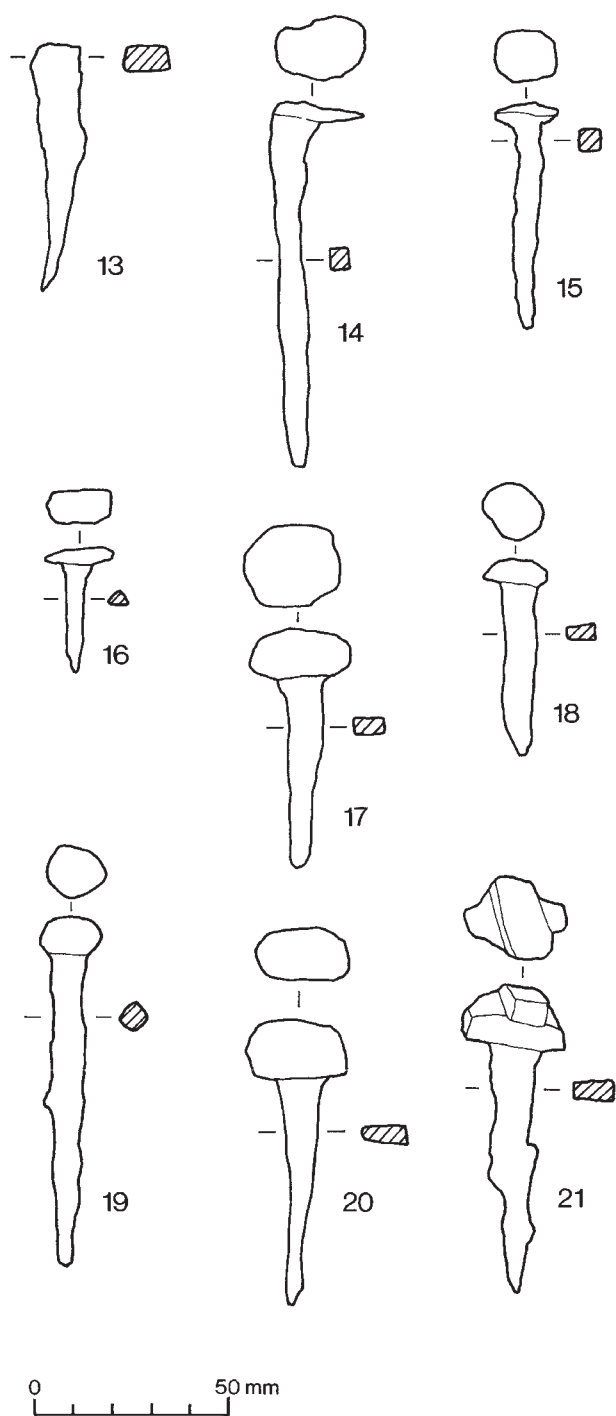


Figure 11.14: Building equipment: nail types 1–9 (13–21)

with rectangular-sectioned shank. L: <77mm, head D: 17mm

417, 502, rubble, AY3, Ph3/2

- 16 Type 4, 88 examples. Flat, rectangular head with rectangular-sectioned shank. L: <77mm, Head: <22x7mm

5353, 6130, rubble, EY1, Ph2/2

- 17 Type 5, 17 examples. Stud type nails with large

rectangular head (slightly convex) and rectangular-sectioned shanks. L: 45–73mm, Head: 30x35mm.

6268, 4157, rubble, EY5, Ph1–3/2

- 18 Type 6, 3 examples. Sub-circular domed head with rectangular-sectioned shank. One example has a clenched terminal, possibly indicating a timber width of 26mm. L: 27–51mm, head D: 15–16mm.

519, 515, yard surface, AY2, Ph

- 19 Type 7, 1 example. Spherical head with square-sectioned shank.

879, 839, floor, C8/1, Ph3/2

- 20 Type 8, 11 examples. Large trapezoid head with thick rectangular-sectioned shank. L: 55–85mm Head W: 20–30mm.

1257, 1482, floor, B5/2, Ph2/2

- 21 Type 9, 3 examples. Nails with cruciform heads and square-sectioned shanks. L: 26–80mm. Similar to a type found at Lyveden (Steane and Bryant 1971, fig 17c).

639, 634, floor, D11/1, Ph3/2

Building equipment: structural stone

Structural stone: pivot stones (22–28)

by Andy Chapman

Of the fourteen pivot stones, five were found *in situ* within doorway openings (22–24, 26, 27), one was *in situ* within a floor level but apparently not as a door pivot (25), two lay at the end of a yard wall in tenement C, at least one of which was *in situ*, and presumably supported a gate, and the others were residual finds. A single pivot stone (28), may have been *in situ* within the probable wheel-pit of the second mill, M26, and could have been a pivot for a wheel-shaft or a sluice gate, see below.

No pivot stones were recovered from the twelfth-century manor complex, buildings S18–S21. In these buildings large post-pits define the presence of substantial timber surrounds and so, presumably, doors suspended on hinges from the door jambs. A pivot stone *in situ* within the doorway of the processing room, S17/2, which was constructed around 1200, is the earliest example. The other *in situ* examples are from the medieval tenements of the thirteenth and fourteenth centuries. In two instances they were on internal doorways, A1/1–A1/2 and B5/1–B5/2, while the other two were on the external doorways of an ancillary room, D11/4, and an ancillary building with a wide doorway, E14. In the latter two instances the adjacent walls were still standing and it could be seen that the pivot stones were set into the floor surface adjacent to a wall face that did not contain a door jamb recess. None were found *in situ* within doorways provided with recesses for timber door jambs. It would appear, therefore, that the practice of supporting the base of a door with a pivot stone was used on some internal doors, external doors to ancillary rooms and also on some gates. They do not appear on the

doorways to the main domestic rooms, where the doors must have been either hinged to the door jamb or pivoted on sill beams.

The pivot stones are typically of limestone, although the two from the external gateway in tenement C are on large blocks of ironstone and have particularly large pivot holes. Most are on slabs or small blocks of irregular or roughly-squared stone, although in one instance (24) three of the faces are well squared. The pivot sockets are typically 80–90mm in diameter by up to 50mm deep and there are three forms. Some are broad but shallow, with steep sides and a near flat base (22, 23). In these it is possible that the end plank of the door itself was extended and rounded to rotate within the socket. Others have a conical profile (25, 27) and these are generally more heavily worn and possess fine concentric striations. It is likely that these were produced by a door provided with a large conical stud, presumably of iron. Two are of an intermediate form (24, 26), with broad shallow sockets containing a slightly deeper hollow. In these instances it is possible that the wear was caused by a combination of a projecting, rounded base to the door with a small metal stud attached.

The pivot stone (28) recovered from watermill M26 is formed on a squared block of limestone. The well-worn conical socket has a maximum radius and a maximum depth of 40mm, but it lies immediately adjacent to one edge so that on this side there is only a low, 10mm high, ridge of stone flanking the socket. This has possibly been lowered by breakage, but there is no suggestion that more than a thin flake of stone has been lost. This stone sat upright within a shallow pit, and was flanked by stone packing, within what is assumed to be the wheel-pit area. It is therefore potentially a bearing block forming the seating for the gudgeon at the base of the vertical wheel/shaft/upper stone assembly of a horizontal wheel arrangement. Given the total weight of such an assembly, the upper stone itself might have weighed some 160kg, the location of the socket towards the edge of the block would hardly appear to provide sufficient support. In the report on the Tamworth watermill, Rahtz and Meeson (1992, 86–7 and 151–2) also suggest that “mills of this kind almost invariably have the whole shaft assembly supported on a sole-tree with bearing”, so that the assembly could be adjusted to vary the spacing between the upper and lower millstones, and a probable steel bearing block set into a plank was found loose on the wheel house floor. However, stone pivot stones that may have been used as bearing blocks have been recovered in association with watermills in Ireland (Lucas 1953), although none were *in situ*.

While this pivot stone did appear to be *in situ*, and certainly lay so that it could have functioned as a pivot, whether it was used as a bearing block for a wheel/shaft/upper stone assembly must remain uncertain. An alternative explanation is that it may have formed a bearing for some other piece of mill machinery and so carried much less weight. One possibility is that it may have been part of a sluice gate setting, functioning in a similar fashion to

a recently excavated example at Nendrum Monastery, Northern Ireland (McErlean and Crothers, 94–95).

Illustrated pivot stones (Fig 11.15)

- 22 Pivot stone, limestone, *in situ*. L: 242mm, W: 150mm, T: 83mm
844, 696, floor, A1/1, Ph2/0
- 23 Pivot stone, limestone, *in situ*. L: 210mm, W: 162mm, T: 100mm
986, 979, layer, D11/4, Ph3/2
- 24 Pivot stone, limestone, *in situ*. L: 178mm, W: 134mm, T: 140mm
6768, 6351, threshold, E14, Ph2/2–3/2
- 25 Pivot stone, limestone, *in situ*? L: 200mm, W: 189mm, T: 72mm
1028, 1139, layer, D12, Ph2/0
- 26 Pivot stone, limestone, *in situ*. L: 340mm, W: 236mm, T: 80mm
1074, 1160, wall, AS17/2, Ph1
- 27 Pivot stone, limestone, *in situ*. L: 310mm, W: 285mm, T: 92mm
3599, 1638, threshold, B5/1, Ph2/0
- 28 Pivot stone, limestone, Mill wheel or sluice gate pivot.
L: 261mm, W: 235mm, T: 125mm
10717, 7179, hollow, M26, Ph3/2

Structural stone: decorative “finials” (29–30) by Andy Chapman

Two decorative “finials”, both fleur-de-lys, were recovered within 0.30m of each other within demolition rubble along the frontage of tenement A, in front of room 2. There is no doubt that they are from a single piece of decorative stonework probably broken up when tenement A was levelled. The larger piece (30) is symmetrical while the other (29) is asymmetrical, and it can be suggested that the original piece most probably comprised two asymmetrical fleur-de-lys flanking a central, upstanding, fleur-de-ly, as indicated in the reconstruction drawing. Lacking the rest of the piece, it is difficult to specify where this would have been used. The fine working of both faces shows that the piece was intended to stand proud of any associated stonework, so there would appear to be two likely locations; either at the gable end of a roof or standing above a doorway.

Illustrated “finials” (Fig 11.16)

- 29/30 Finials, limestone (Possibly from Upper Lincolnshire, eg Barnack type). Decorative finials in the form of a fleur-de-lys. L: 105mm, W: 107mm, Depth: 97mm
L: 179mm, W: 117mm, Depth: 85mm
269/602, 3/686, clean/bank, GREEN/AY4, Ph5/Ph4

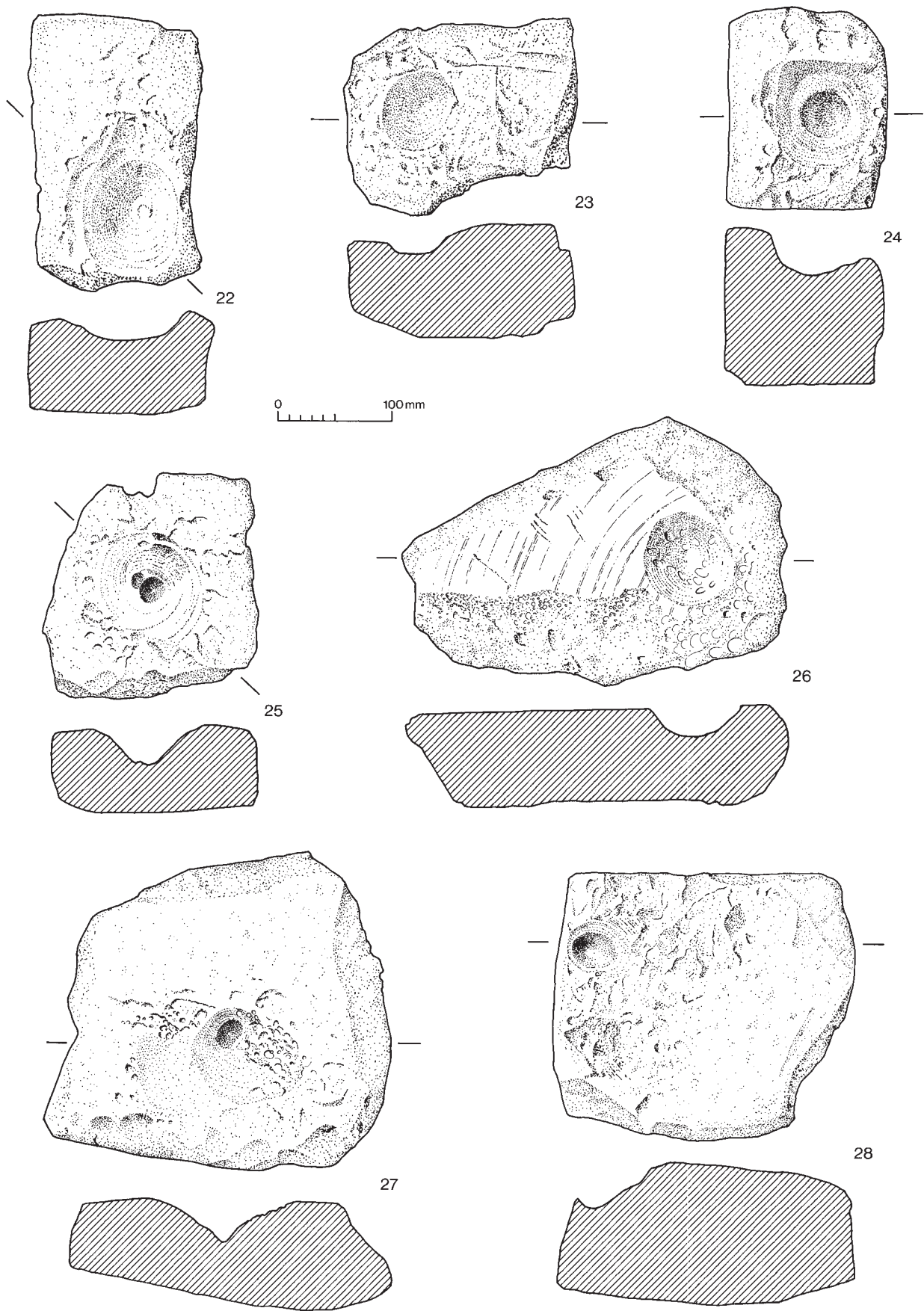


Figure 11.15: Building furnishings: pivot stones (22–28)

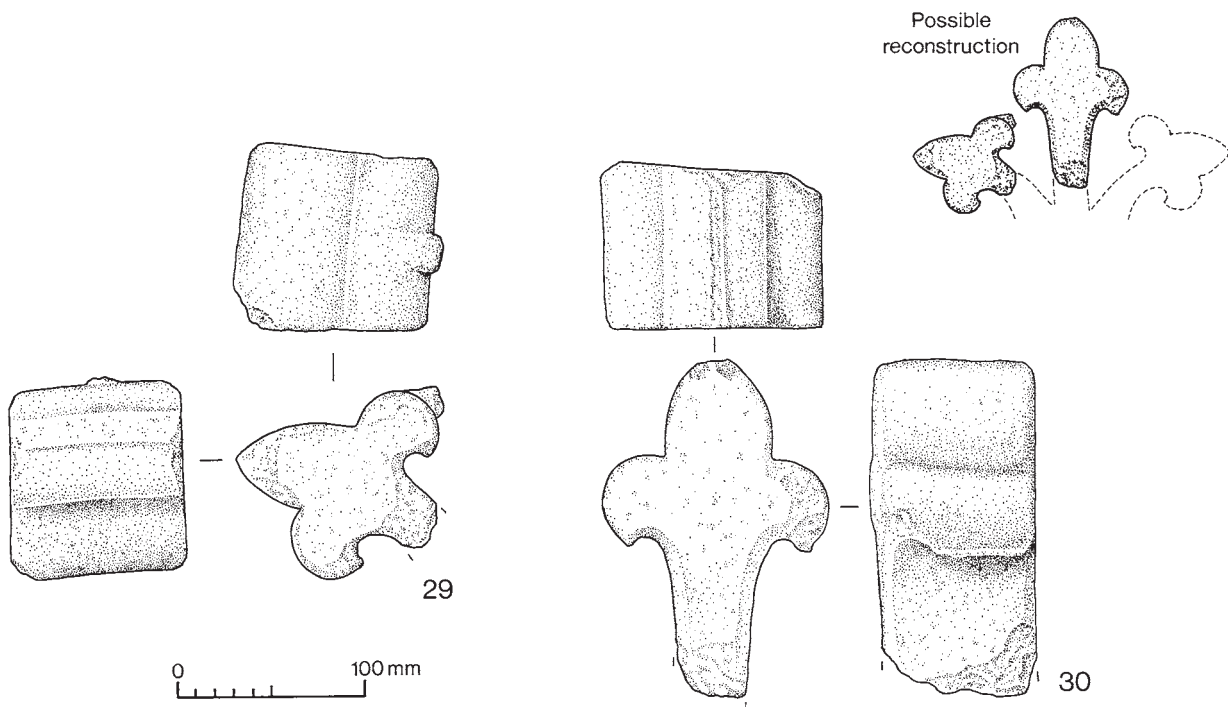


Figure 11.16: Building furnishings: decorative "finials" (29–30)

Structural stone: other worked stone (NI)

Eight miscellaneous fragments of worked stone were found, seven of limestone and one of an unidentified fine grained siltstone. A fragment of a larger piece of limestone, has a series of tooled grooves running across the surface and at right angles to a straight, tooled edge. This could be a fragment from a piece of decorative stonework.

Three large irregular slabs, 20–40mm thick, have roughly worked semi-circular notches, 30mm diameter, in one edge. Two thicker fragments, 40–60mm thick, have worn circular perforations, 30mm diameter, while the possible siltstone fragment has a rectangular perforation or recess, 40mm wide. In each example the stone has broken at the perforation. The uses of these worked stones are unknown; it is most likely that they were utilised either within building construction, where they may perhaps be associated with shuttered window openings, or within stone-built internal or external fittings; the two with worn, circular perforations may have held rotating bars of wood or iron.

In addition, there is a single fragment of limestone with a scatter of individual tool marks, similar to those on one of the nine-men's-morris boards (Fig 11.10, 54).

Building equipment: Tiles

The majority of the small quantity of ceramic tile comprises residual pieces of Romano-British tile. There is therefore no indication that any of the medieval buildings had roofs with either ceramic or stone tiles. There are, however, two

pieces of medieval ceramic floor tile with a brown, iron oxide, glaze. These are both from a thirteenth-century layer below the metalling of the narrow utilised space between buildings C8 and C9. There was no evidence that any of the excavated buildings had tiled floors, but it is possible that they may have come from an unexcavated building further to the east.

Household equipment (Figs 11.17–11.23: 31–99)

Household equipment includes the range of fittings that would be applicable to household use, particularly in the kitchens, although much of the ironwork could also have had other uses. There are particularly large and interesting assemblages of locks and keys and also knives and hones, but otherwise there is a distinct lack of domestic equipment, only 33 items, giving little indication of the full range of domestic furnishings and fittings that would certainly have been utilised.

General household equipment (31–35)

A copper alloy spoon fragment is from a yard of tenement B and a bronze foot from a vessel is from tenement D. There are three circular-sectioned, curved iron handles with perforated or looped terminals and one is coated in tin. Two are from eleventh to twelfth-century contexts and the third

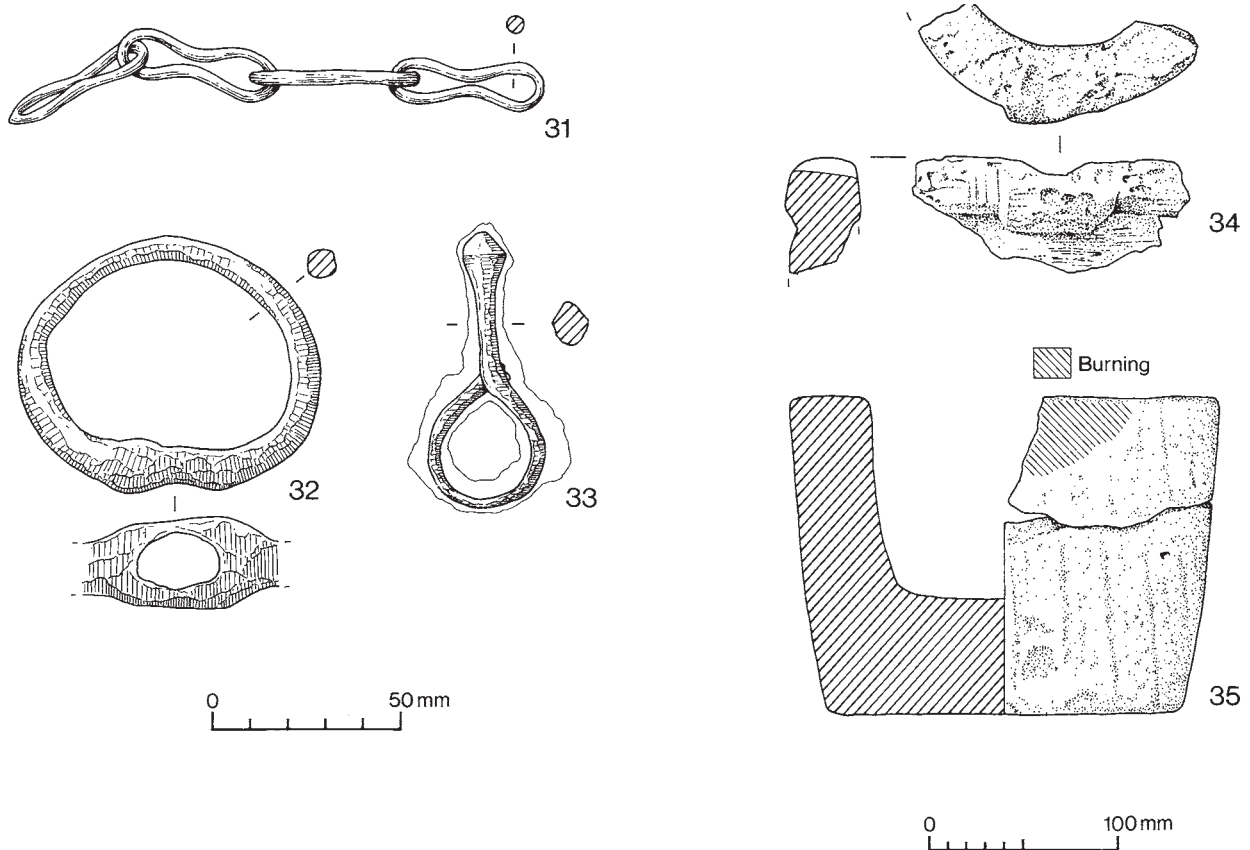


Figure 11.17: Household equipment: general iron equipment (31–33) and mortar (34–35)

from a late thirteenth to fourteenth-century context. There are parts of three stone mortars: a rim fragment with a pouring channel from tenement C (34); joining pieces of a virtually complete mortar from tenement A (35) found 22m apart, with the base set upright within a metallised surface adjacent to the eastern wall face of room 4 of building A1; and a small fragment (NI) from a yard of tenement E.

The other items are fittings for attaching or suspending; five hooks, three chains, ten rings and six swivels/loops. These are from widely scattered contexts of twelfth to fourteenth-century dates, and some are from contexts post-dating the abandonment of the central tenements. One of the chains (31) is identical to an example from London (Ward Perkins 1940, Pl. 4, A9935) used as a suspension chain for hanging a vessel.

Illustrated iron and mortar equipment (Fig 11.17)

- 31 Chain, Fe. Possible suspension chain for a cooking vessel, Individual links measure 40–45mm. 472, 539, rubble, B5, Ph4–5
- 32 Swivel loop, Fe. Circular-sectioned sub-circular loop, perforated for retaining swivel. 82x68mm 584, 296, clean, CY1, Ph5

- 33 Looped swivel, Fe. L: 76mm 3582, 1705, stream, NCA, Ph ??
- 34 Mortar, limestone (probably Lincolnshire, Wansford area). Rim fragment with vertical sides, exterior edge undercut to accentuate the rim. Recess in rim forms a pouring channel. Tooling marks visible on exterior surface, interior surface worn. 548, 567, layer, C9/3, Ph2/1
- 35 Mortar, limestone (probably Lincolnshire, Wansford area). Slightly tapered with thick set base, vertical sides and a flat topped rim. Interior surface worn, exterior surface pitted with tooling marks. D: 214mm, H: 167mm. 729, 744, surface, AY4, Ph3/2–4 (large piece) 970, 908, robber trench fill, A1/1, Ph4? (small piece)

Household equipment: locks and keys
(Figs 11.18–11.20:36–65)

In contrast to many other finds types, locks are well represented. Twenty-six individual pieces of lock mechanism have been identified, coming from 22 barrel padlocks, cylindrical in shape with an exterior U-shaped

free arm connected to a bolt, and three mounted locks, with a tumbler and sliding bolt mounted within an iron or wooden housing. Both types were used for securing doors, gates and furniture.

Barrel padlocks (36–46)

Barrel padlocks comprise three main elements; a hollow cylindrical case, within which fits a bolt with attached spines and leaf springs. Depending on the type of lock, the bolt mechanism was either directly attached to a U-shaped free arm or retained a shackle attached to the case. Although no complete lock was found, there are examples of all the composite parts. The classification is based on the five types defined by Goodall (1990b, 1001 ff), four of which have been identified at West Cotton.

The basic difference between three of the locks is the position and form of the housing for securing the free arm. In Type A the free arm slots into a tube located directly adjacent to the case and held in place by sub-circular end plates, a single example was found (36). The keyhole is the rectangular slot in one end plate while a bolt with paired spines would have been retained by the two slots in the other end plate. Pivoting fins (37) can be associated with this type, but they are usually found as isolated finds detached from the case, as with the single example recovered.

On Type B the tube is located away from the case but is joined to it by an integral rectangular fin. There are three case fragments; the most complete example (39) still retains a vestige of the longitudinal fin, while another is a small fragment of a tube and fin (38). Similar examples have been noted from Winchester (Goodall 1990b, fig 311, 3647, 3643) and Thornholme Priory (AML No 77001).

There is a complete case (43) of Type C, furnished with U-shaped sleeves at each end of the case, which has a number of parallels, most notably Norwich (Goodall, I H, 1984, fig 38.44), Faccombe Netherton (Goodall 1990e, fig 9.7, 345) and Lyveden (Steane and Bryant 1975, fig 49, 146, 147).

The examples of lock types B and C have more complex keyhole openings, comprising transverse slots on the underside of the case with a central gap connecting with rectangular openings in the end plate. One has a cruciform aperture in the opposing end plate (39), indicating a bolt with four spines, while the three square openings on the other example (43) would have had a bolt with three spines forming an L-shape.

The fourth padlock type, D, has a different form. There is no tube and the U-shaped free arm, now referred to as a shackle, interconnects with a separate bolt through the top of the case. One possible case fragment was found (NI).

The cylindrical cases were all formed from rolled ferrous metal sheet, but a variety of techniques had been used to support and strengthen them. The type A case (36) has six rods, 4 twisted and 2 plain, which protrude through the end-plates holding the entire case and tube together. The

second type (39) is strengthened by closely spaced plain rods brazed directly onto the case and, in addition, there are two substantial longitudinal bands either side of the transverse key hole slot, presumably to reinforce the weak points of the key hole. The Type C example (43) has a more complex composite structure. The U-shaped housings, formed from ferrous metal sheets, were strengthened by pairs of vertical straps and were attached to the terminals of two parallel, longitudinal rods. The end plates were inserted into the U-shaped housings and then body of the case was attached. The rolled sheet was lapped over the rods to which the U-shaped housings were attached, one side underlying and the other side overlying the rods. Additional support for the case was provided by four vertical straps, with a further, broader strap placed on opposing sides of the keyhole. All the cases are coated externally with copper alloy, and one is also coated internally (39). This acted as a braze, to fix the rods, straps and end plates; a preservative, ensuring the longevity of the sheet iron, and would also have enhanced the locks appearance, see Niemeyer below.

There are seven U-shaped free-arms, all with fragments of spines (40, 41). As the bolt mechanism and free arm differ little on the first three padlock types, they cannot be assigned to individual lock types. They can be plain or embellished with looped projections (scrollwork) sited just above the closing plate (40, 41). There are numerous examples of free arms decorated in this manner, and Goodall (1987, 105) states that this addition is not only decorative but functional too, supporting the closing plate and, if necessary, providing a loop to which a chain might be attached and used as a grip (B Niemeyer pers comm) for removing the free arm from the tube. The three embellished examples all have non-ferrous coatings, two of bronze and one of brass, while a plain free arm is the only lock part coated in tin.

There are eight bolts, comprising a closing plate with spines furnished with single or double leaf springs of folded metal strips attached by rivets. One is fixed with a circular rivet (44) and another with a square rivet. In some instances no rivet is visible and the springs may have been attached by brazing. The bolts have differing configurations of spines, varying from simple single or paired spines (46, 41), through spines set at right angles forming a T-shape (42, 44, 45), to a square pattern of 4 spines (40). Each could only have been released by a key of the appropriate size and shape.

The distribution of locks is discussed below together with the distribution of keys.

Mounted locks (47–50)

Mounted locks are represented by three sliding bolts, one of which was associated with a tumbler. In this form of lock mechanism the key is inserted and turned past wards to lift a tumbler, which releases the sliding bolt. The sliding bolts are square or rectangular-sectioned bars; the two larger examples, 174 and 215mm long, clearly come from

large lock mechanisms (48, 50), while the third is only 115mm long and from a small lock, perhaps for a casket or chest (49). The projections allow the key to throw the bolt, while on upper edge a low projection, the stop, retains the thrown bolt in the locked position. The tumbler (47) is flat-sectioned, slightly tapered with one terminal bent at right angles, for attachment to the case, and the other terminating in a narrower parallel sided strip, which would have been engaged by the key.

Hasps and shackles (51–53)

A hasp and two shackles are of forms likely to be associated with barrel padlock mechanisms.

Illustrated locks and bolts (Fig 11.18–11.19 and Plates 11.8–11.9)

- 36 Padlock case, Fe. Type A. Completely coated in copper alloy (brass). L: 66mm. A padlock of this type is known from Winchester (Goodall 1990b, fig 311, 3643). 3407, 3059, layer, LSD15, Ph1
- 37 Pivoting fin, Fe. Often associated with Type A barrel padlocks. L: 120mm. A complete example is known from Northampton (Oakley 1979a, fig 116, 3). 10309, 4425, fill, S19/2, Ph2/0
- 38 Padlock case, Fe. Tube and fin fragment bound by a narrow strip. Non-ferrous coating (bronze) on interior and exterior surfaces. 588, 296, clean, PMED, Ph5
- 39 Padlock case, Fe. Type B. Completely covered in a non-ferrous coating (brass). L: 74mm 6761, 6349, floor, E13/1, Ph3/2
- 40 Padlock bolt, Fe. U-shaped padlock bolt with remains of two spines set below the remaining vestige of the closing plate. Sited above the closing plate on the spring arm are seven looped projections (scrollwork). Non-ferrous coating (bronze). L: 72mm 6143, 6266, layer, EY1, Ph3/2
- 41 Padlock bolt, Fe. U-shaped padlock bolt with remains of two spines set below the remaining vestige of the closing plate. Sited above closing plate on the spring arm are three looped projections (scrollwork). Non-ferrous coating (bronze). L: 50mm 903, 871, layer, C9/3, Ph2/0
- 42 Padlock bolt, Fe. T-shaped with a circular closing plate and one complete spine with a double leaf spring, formed from length of sheet metal folded in half over the spine terminal. A second projection sited above the spine is either a guide for the key (AML) or an incomplete spine. Aperture in the bit of the key would have been T-shaped. L: 50mm 5943, 6253, fill, EY1, Ph3/2
- 43 Padlock case, Fe. Type C. Completely coated in copper alloy (brass). L: 66mm 1362, 853, floor, C8/1, Ph3/2
- 44 Padlock bolt, Fe. T-shaped with a circular closing plate and two spines with double leaf springs. There is a small perforation near the terminal of one of the spines, it retains a rivet for attaching springs. Completely covered in a non-ferrous coating (brass). L: 70mm 10449, 6741, fill, M26, Ph LS3/2
- 45 Padlock bolt, Fe. T-shaped with circular closing plate and one spine with two double leaf springs. At the terminal of one spine there is a square perforation for fixing double leaf springs. L: 85mm 22, U/S
- 46 Padlock bolt, Fe. T-shaped with circular closing plate with one spine and a double leaf spring. Non-ferrous coating (bronze) on head of closing plate. L: 89mm 439, 4, layer, GREEN, Ph5
- 47 Tumbler, Fe. L: 106mm, W: 27mm, found with (48). 273, 419, floor, C8, Ph3/2–4
- 48 Sliding bolt, Fe. A tapered square-sectioned bar, L: 216mm, found with (48). 273, 419, floor, C8, Ph3/2–4
- 49 Sliding bolt, Fe. Similar examples from Goltho (Goodall 1987, fig 158, 117–118) and Thetford (Goodall, I H, 1984, fig 131, 178). L: 115mm 286, 295, floor, C8, Ph3/2–4
- 50 Sliding bolt, Fe. Rectangular-sectioned bar, L: 174mm, W: 14–22mm 1313, 1543, layer, BY2, Ph1–3/2
- 51 Hasp, Fe. Figure-of-eight shaped, forged with a slight curvature. Similar example from Goltho (Goodall 1990b, fig 158, 92). L: 146mm 1222, 1480, floor, B4, Ph2/0
- 52 Shackle, Fe. Oval, with rectangular-section. Overlapping terminals are tapered and still hold the tension. L: 88mm, W: 42mm 463, 624, layer, BY4, Ph2/2
- 53 Shackle/link, Fe. Elongated oval with parallel sides and rounded ends. Signs of wear at the poles. L: 69mm 644, 294, layer, PM1, Ph4

Barrel padlock keys (54–59)

Seventeen iron keys with long stems and shaped bits were for barrel padlocks. Classification is determined by the alignment of the bit in relation to the stem, and is based on the type series defined by Goodall (1990b, 1005). There are seven examples with the bit set laterally to the stem, Type A (54–57); three have a bit set centrally on the stem, Type B (58, 59); while a single example has a bit in line with the stem, Type C (60). The remaining six do not have surviving bits.

Bits occur in a variety of forms, which correspond with the varying arrangements of the spines and springs on the bolts. The keys with intact lateral bits (54–57) are all simple, squared bits with one or two perforations. Those

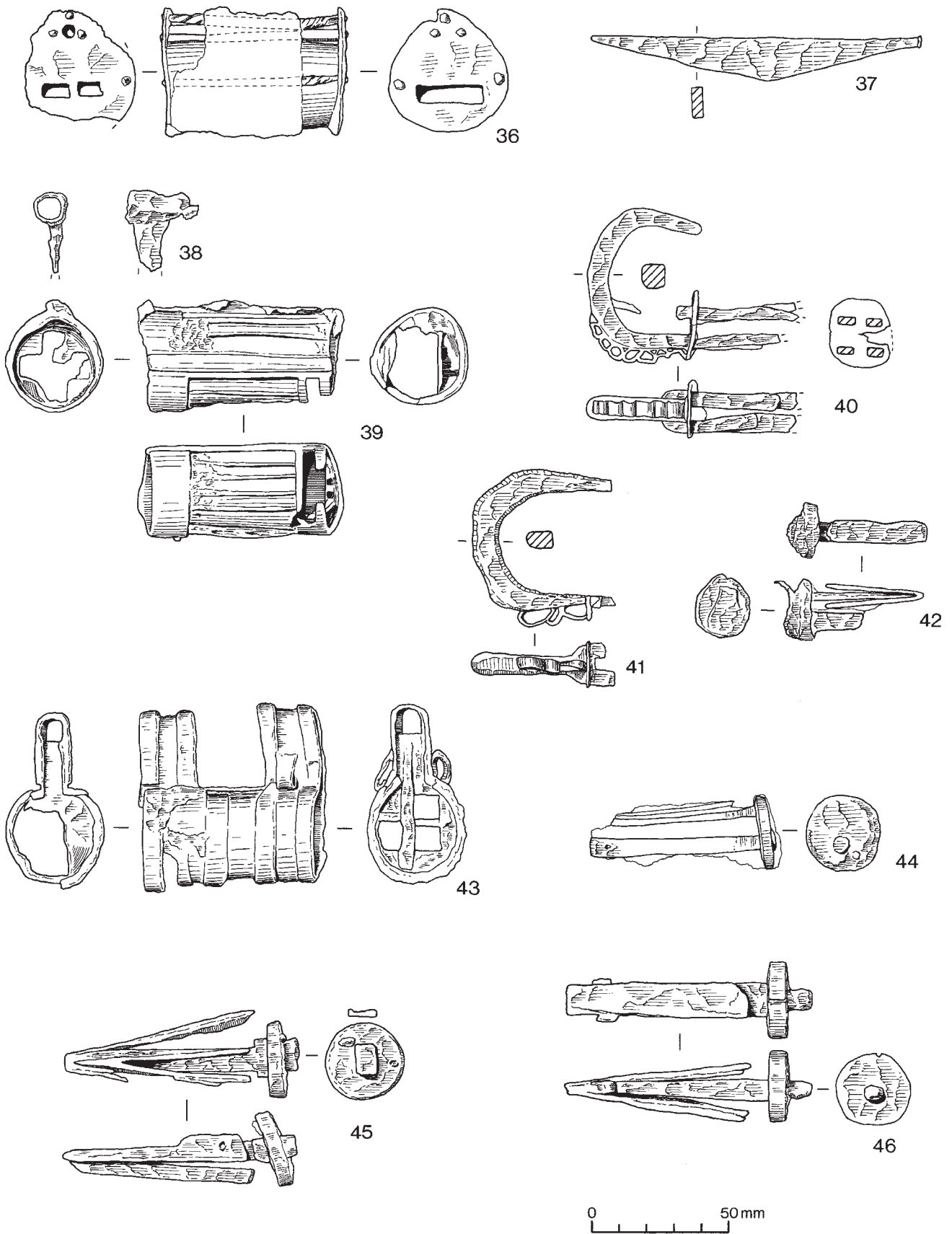


Figure 11.18: Household equipment: barrel padlock cases (36–39 and 43), free-arms (40–41) and bolts (42, 44–46)

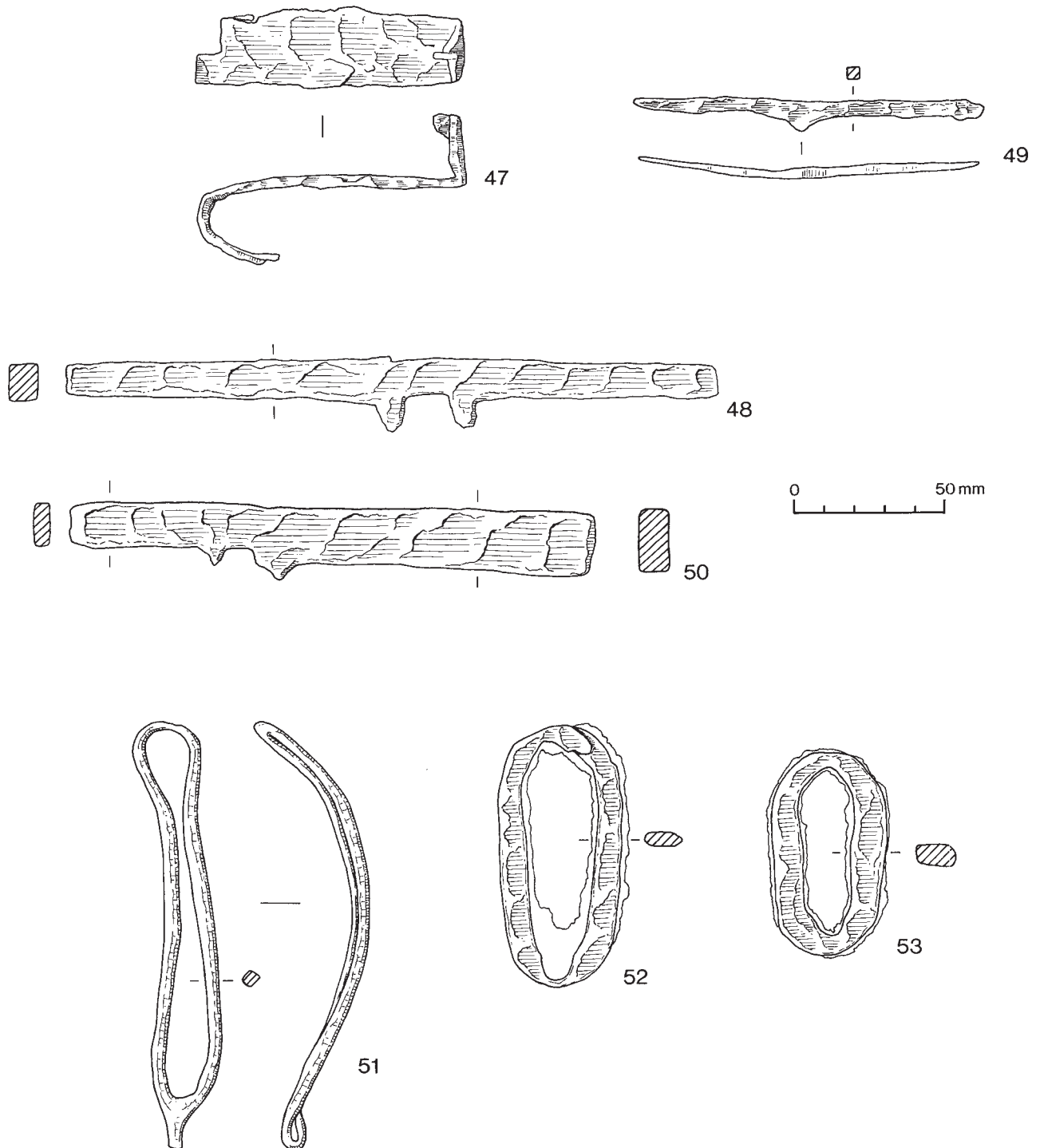


Figure 11.19: Household equipment: mounted locks (47–50), and lock fittings (51–53)

with central bits (58, 59) have four lobed projections radiating from the central stem. The remaining bit differs greatly from the others, it is furnished with an elaborate, openworked bit with four rectangular and one T-shaped perforation (60), and is coated in tin.

The stems are in three distinct forms; elegant waisted stems with shaped terminals and rear hook (54 and 57,

hooks missing) only occur on keys with a lateral bit; parallel sided stems terminating in a loop (55, 58) or flat end (56, 59), appear on keys with laterally and centrally placed bits. The remaining form is tapered with a swollen sub-circular cross-section (60). The stem lengths are roughly comparable, 80–120mm, although there are both longer, 162mm (54) and shorter, 60mm (58), examples. The

particularly small key is coated with tin and was presumably used on a small padlock for a casket or chest.

Mounted lock keys (61–65)

Seven keys were for mounted locks, five of iron and two of copper alloy with decorative mouldings. They all have asymmetrical bits which protrude from the shank in the same plane as the bow. These have to correspond with the wards in the lock to enable the bolt to be moved, and the complicated arrangement of the wards evident on some keys indicate advances made in lock design to improve security. There are two main types of shank; solid shank (61, 64) and hollow shank (62, 65), with the latter affording more security as the bore has to fit over a corresponding pin in the lock, as well as passing over the wards.

The shanks are circular-sectioned and terminate in a variety of bows. The iron keys are furnished with simple oval (61) and D-shaped bows (62, 64). The copper alloy examples have lozenge-shaped bows, and one is ornamented with corner bosses (65). The lengths are typically within a range of 100–125mm, although the small casket key measures only 36mm. One iron key (61) has a non-ferrous coating of a tin/lead alloy; keying lines are evident on the terminal of the shank.

The locks and keys are broadly scattered across the site both temporally and spatially, although there is a distinct concentration of examples related to the twelfth-century manor and the overlying tenement, E. The earliest example is a barrel padlock key (57) from the external cesspit related to timber building T34, dated to the late tenth century; while three bolts are from eleventh-century contexts; two from floor levels of building T33 and one from the second watermill, M26 (44).

Three locks can be dated to the twelfth century, with one of these coming from the floor of the hall, S18, and another from a layer sealing the limestone road in front of the hall. At Winchester the Type A padlock is both stylistically and stratigraphically the earliest example, said by Goodall (1990b, 1001) to be a pre-conquest type not in use after the twelfth century. The complete case from West Cotton is from a later twelfth-century ditch fill, while the pivoting fin is probably residual in a robber trench fill dated to the first half of the thirteenth century. In addition, there are five keys from twelfth-century contexts, including one from manorial range S21, and two from layers associated with the road in front of the hall. One of these latter two is the small key for a mounted lock (63), the only such key to come from a twelfth-century context.

Locks and keys are present in all the later tenements, but in varying quantities. Six locks and eight keys were scattered across the yards of Tenement E, with a single lock from a floor level of Room E13/1. In the domestic range of Tenement C, building C8, a barrel padlock case (43) and two of the three mounted locks (47–49) formed part of a dense scatter of ironwork within the later floor levels within and around the doorway between Room 1 and

2. The other ironwork includes 25 nails of assorted types, three pieces of iron sheet or strip and four staples. This material lay within a roughly rectangular area measuring 2.5 by 1.5m, and the presence of locks suggest that it may have derived from a door or chest left to decay *in situ* within the abandoned building, together with a general accumulation of domestic rubbish.

Illustrated keys (Fig 11.20 and Plates 11.8–11.9)

- 54 Key, Fe. Bit lateral to narrow stem which broadens into a shaped terminal. L: 162mm
10033, 4302, layer, EY5, Ph2/2
- 55 Key, Fe. Bit lateral to parallel-sided stem with looped terminal. L: 118mm
6353, 6291, layer, EY2, Ph2/2
- 56 Key, Fe. Bit lateral to parallel-sided stem with squared terminal. L: 126
848, 803, pit fill, A/B, Ph0
- 57 Key, Fe. Bit lateral to narrow stem which broadens into a shaped terminal with rear hook. L: 80.5mm
10519, 4497, pit fill, T34P, Ph LS3
- 58 Key, Fe. Bit central to parallel sided stem with looped terminal. Non-ferrous coating (tin). L: 60mm
10096, 4302, layer, EY5, Ph2/2
- 59 Key, Fe. Bit central to rectangular-sectioned stem. L: 115mm
6151, 4155, layer, EY3, Ph1–3/2
- 60 Key, Fe. Bit in line with expanded sub-circular stem. Elaborate circular bit with rectangular and T-shaped cut-outs. Non-ferrous coating (tin). Similar example from Northampton (Oakley 1979a, fig 116, 8). L: 112mm
10063, 4311, layer, SY2, Ph1–2/2
- 61 Key, Fe. Solid shank, tapered and terminating on same alignment as bit. Oval bow. Non-ferrous coating (tin/lead alloy), keying lines visible on terminal of shaft. L: 118mm
260, 390, layer, PMED, Ph5
- 62 Key, Fe. Hollow shank, expanding towards terminal. D-shaped bow. L: 102mm
5939, 6248, layer, EY1, Ph 3/2
- 63 Key, AE. Solid shank with bored terminal, leaving conical recess. Moulding at end of shank is surmounted by a lozenge-shaped bow. Identical example from Northampton (Goodall, A R, 1997). L: 36mm
6946, 6450, layer, LSE8, Ph 0
- 64 Key, Fe. Solid shank, tapered and terminating on same alignment as bit. D-shaped bow. L: 114mm
803, 584, layer, BY6, Ph 2/0
- 65 Key, AE. Hollow circular-sectioned shank with asymmetrical bit. Mouldings at end of shank are surmounted by a lozenge-shaped bow with corner bosses. L: 103mm
5408, 6198, rubble, EY3, Ph 2/2

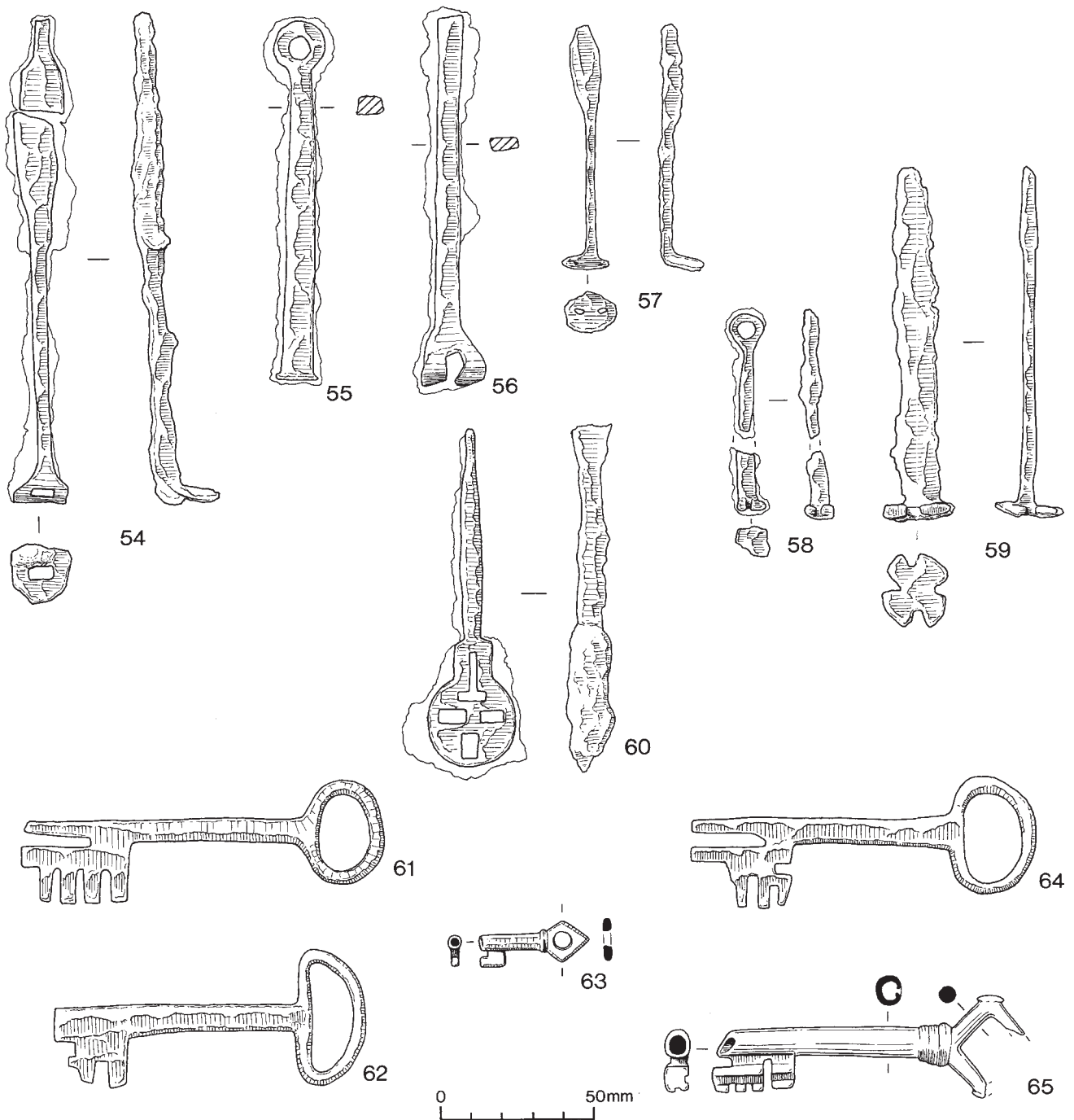


Figure 11.20: Household equipment: keys for barrel paddlocks (54–60) and mounted locks (61–65)

Household equipment: knives
(Figs 11.2–11.22: 66–87)

“Blades from knives are among the most common and varied metalwork finds on medieval sites” (Grew 1987), and those from West Cotton are no exception. In total, 103 complete or fragmented blades and tangs were identified, with 93 from stratified contexts and 62 complete enough to be classified. They provide a good sample of the range

of domestic/industrial knives required for everyday use in the medieval period. Knives are classified according to the method of attaching the handle. Whittle tang knives terminate in a tapered prong onto which a handle of perforated wood, bone or horn would have been hafted. The blades of scale tang knives terminate with a parallel-sided perforated strip, to which scales of wood or bone would have been riveted. Whittle tang knives were in use into the

late medieval period, while the scale tang knife is thought to have appeared in the thirteenth century (Goodall 1990d, 838); the earliest examples at West Cotton are from late thirteenth-century contexts.

Whittle tang knives (66–81)

Fifty whittle tang knives, all with single-edged blades, were identified. Fourteen are complete, and these provide a continuous range of overall lengths from 82–225mm. Blade lengths range from 42–137mm and widths from 9–23mm. The average blade thickness is 3.2mm, although in some instances a thickness of 4mm was recorded. Six blade types were identified, based on the respective and relative alignments of the cutting edge and the back of the blade. The definitions and the recovered totals are given within the catalogue of illustrated examples. One type, with the back of the blade tapering down to the tip, is represented by only a single knife (66). The other types range from knives with parallel sides (67–69) or a broader central section (70–72), sometimes with a flat back (76); to knives with continuously tapering blades, either symmetrical (73–75) or asymmetrical (77). The individual types are represented by between six and fourteen examples, so no single form predominates. However, knives with tapering tips are twice as common as continuously tapering blades.

The tangs are tapered and shorter than the blades, up to 50mm long, and they tend to be longer in later examples. The shoulder at the junction of the back of the blade and the tang has two main forms; either in line with back of blade (68, 78) or set below the back with either a stepped (67, 77) or sloping shoulder (74, 75, 76, 79). The latter form occurs in nearly two thirds of the examples. The junction of the blade and the tang is typically either sloping or stepped, although there are some exceptions (74). There is no clear relationship between blade type and tang form, although few of the smaller group of continuously tapering blades have a tang in line with the back of the blade.

Three large, broad-bladed knives are furnished with multiple ferrous and non-ferrous plates at the junction of the tang and blade. These are both highly decorative and functional, preventing the organic materials used for the handle from swelling and splitting. The fittings have been applied in two ways: one has a brass hilt band which has been cast onto the blade, followed by two hilt plates of iron and copper alloy (71); two others (70, 72) have been manufactured by threading a series of identically shaped plates on to the tang, to form a hilt band displaying three different coloured metals; copper-red, copper alloy-yellow (because of a higher zinc content) and iron. One hilt band (72) has 23 plates; five copper, five copper alloy (brass) and 13 iron. The other (70) has 18 or 19 plates in copper and copper alloy (brass). In both cases the plates are preceded by an iron shoulder plate. As with an example from Goltho (Goodall 1987, fig 157, 64/65), it is possible that the ferrous and non-ferrous plates were originally separated by thin plates of organic material.

There are no knives with pattern-welded blades. One knife (76) is ornamented on both sides with a single engraved groove, just below and parallel to the back of the blade. Four have protrusions at the blade/tang junction (81), probably produced by narrowing of the blade as a result of extensive use and resharpening. Seven knives had mineralised organic remains, four of wood including one with carbonized wood. A single knife (80) displays evidence of secondary use; a series of roughly parallel oblique incisions along the cutting edge, possible indicate that the broken blade was used as a file (B Neimeyer pers comm)

The whittle tang knives were widely distributed across the site. Two were recovered from eleventh-century contexts; in the second mill leat, M26, and the earlier fills of ditch system 18. Several were recovered from widely scattered twelfth-century contexts, but with a slight concentration around the building complex. From thirteenth to fourteenth-century contexts, tenement E produced the greatest number, while knives were scarce in tenement A; in parallel with the general levels of finds recovery from these tenements. The only possible specific concentration of knives was in thirteenth-century contexts within and around building B6. Five knives or knife fragments came from the later floors and a further five from the yards immediately around the building. The same contexts also produced a possible concentration of schist hones, perhaps suggesting that the later use of this building particularly involved the frequent use of sharp knives. Whether this related to food processing or some manufacturing process is unknown, but one possibility is that the building was utilised as a slaughter house or at least for the butchering of carcasses.

Given the range of sizes and the variations in blade types and tang forms, it must be postulated that some sort of specialisation of knife types related to specific uses is present, but it is not possible to attribute specific uses to any of the knives. Knives with the cutting edge and the back parallel (69) are common and Neergaard (1987, 51 ff) has suggested that long examples of this particular blade form were used for carving and presenting meat. The knives with elaborate and highly-decorative hilt plates or bands would also seem likely to have been intended to be seen, and were perhaps used at the table. It would also seem probable that the particularly small knife blades would have been used for particularly delicate work.

Scale tang knives (82–87)

Only twelve scale tang knives were found, but as West Cotton was deserted quite soon after the appearance of this knife form this is not surprising, and there are no examples from tenement B, which was deserted at around the end of the thirteenth century. There are one to three examples each from late thirteenth to fourteenth-century contexts in tenements A, C and D, all of which were in use until the end of the fourteenth century, while there are two

from late thirteenth to mid fourteenth-century contexts in tenement E. None are complete and it was only possible to obtain three full blade lengths, 85–113mm (85–87). The average blade widths range from 12–25mm and the average thickness is 2.8mm. All have blades with horizontal backs in line the tang.

Some examples of this knife type have decorative and functional shoulder plates at the junction of the blade and tang. One has L-shaped brass fittings, fixed by rivets, inserted between the tang and the handle to protect the ends of the scales (84). The other has moulded copper alloy shoulder plates which have been soft soldered with a lead/tin alloy and covered in sheet silver (83). Two knives are furnished with integral thickened expansions, bolsters (85, 86) and one is decorated on both sides with single incised grooves marginally placed and had been filed to ensure the scales fitted perfectly (86). Four knives have mineralised organic remains of the scales on the tang, indicating the use of bone (86), wood and horn. One also had preserved organic residues on the blade, possibly the remains of a scabbard. The scales would have been fixed by rivets and two types are apparent, rod rivets in iron (86) and copper alloy (84) and tubular rivets of rolled copper alloy sheet (83).

Two knives had a manufacturers (cutlers) mark. One (82) is in the shape of a cross, a common symbol on medieval knives (Cowgill 1987, page 17 ff), with a copper inlay probably hammered cold into a punched impression. The other (86) is stamped and is amoebic in form. Both marks are set close to the back of the blade and the shoulder, the thickest part, to prevent distortion during stamping. Cutlers marks first appeared in the thirteenth century but only become common in the fourteenth century; a writ of Edward III in 1365 ordered that every maker of swords and knives in the City of London should place his mark on his work (Goodall 1975, 79). One example (82) is from a context dated to the second half of the fourteenth century, while the other is from the topsoil. Finally, one unusual knife (87) has no distinct shoulder and the rivet holes show that the tang is both wider and longer than the blade.

Illustrated whittle tang knives (Fig 11.21 and Plate 11.10)

- 66 Knife, Fe. Type 1 (1 example); back of blade rises up then angles down to tip. Cutting edge horizontal. Blade L: 75mm, W: 12mm, T: 3mm.
964, 902, ditch fill, LSD13, Ph0
- 67 Knife, Fe. Type 2 (14 examples); back of blade and cutting edge parallel then taper to tip. Tang central to blade with stepped shoulder. Ferruginous wood fragments on tang. Blade L: 110mm, W: 15mm, T: 4.5mm.
10031, 6495, floor, S18, Ph0
- 68 Knife, Fe. Type 2, complete. Tang in line with back of blade. Blade L: 65mm, W: 11mm, T: 4mm, Tang L: 36mm
1335, 1550, layer, BY3, Ph2/2
- 69 Knife, Fe. Type 2, part of tang missing. Tang central to blade with sloping shoulder. Blade L: 52mm, W: 10mm, T: 3mm.
813, 783, layer, AY1/2, Ph3/2
- 70 Knife, Fe/Ae. Type 3 (7 examples); blade widens slightly towards tapered tip. Tang central to blade, and hilt band comprising 18/19 copper/copper alloy plates threaded on to the tang. For parallels see (72) below. Blade L: 122mm, W: 23mm, T: 1.5mm.
10702 5623, leat fill, PDL, Ph LS3
- 71 Knife, Fe/Ae. Type 3, tip of blade missing. Tang central to blade. Brass shoulder plate at junction of tang and blade, followed by two hilt plates of iron and brass. imilar example from Eastgate, Beverley (Goodall 1992, fig 80, 328) Blade W: 25mm, T: 3mm, Tang L: 50mm.
1192, 2000, clean, P-MND, Ph1–2/2
- 72 Knife, Fe/Ae. Type 3, end of tang missing. Tang central to blade with iron hilt band with grooved ornament, followed by 23 copper/copper alloy/ferrous metal plates threaded on to the tang. Similar examples from London (Cowgill et al 1987, fig 54, 15), Winchester (Goodall 1990d, fig 225, 2748) and Goltho (Goodall 1987, fig 57, 64–65). Blade L: 122mm, W: 20mm, T: 3mm.
6463, 4165, layer, EY3, Ph1–2/2
- 73 Knife, Fe. Type 4 (10 examples); back of blade and cutting edge taper to tip. Tang set just below blade, sloping shoulder. Blade L: 43mm, W: 9mm, T: 4mm.
971, 759, layer, AY2, Ph3/2
- 74 Knife, Fe. Type 4, complete. Tang set below back of blade, sloping shoulder. Blade L: 58mm, W: 12mm, Tang L: 35mm.
2963, 2010, ditch fill, LSD13, Ph1
- 75 Knife, Fe. Type 4, complete. Tang central to blade, sloping shoulder. Blade L: 92mm, W: 20mm, T: 4mm, Tang L: 55mm.
317, 339, layer, DY1, 4
- 76 Knife, Fe. Type 5 (11 examples); back of blade horizontal, cutting edge parallel then curving to tip. Complete. Investigation revealed a single marginally placed (2.5mm) engraved groove on either side, parallel to the back. Tang central to blade, sloping shoulder. Blade L: 85mm, W: 15mm, T: 3mm, Tang L: 40mm.
10230, 6485, ditch fill, LSD18, Ph LS3
- 77 Knife, Fe. Type 6 (6 examples); back of blade curving to tip, cutting edge horizontal. Complete. Tang set below back, stepped shoulder. Blade L: 120mm, W: 18mm, T: 5mm, Tang L: 58mm.
5428, 4043, pit fill, LSE5, Ph1
- 78 Knife, Fe. Part of tang missing. Back of blade curving to tip, cutting edge horizontal. Back of blade in line with tang. Blade L: 44mm, W: 10mm, T: 4mm.
10318, 4347, pit fill, S23, Ph0
- 79 Knife, Fe. Complete. Back of blade tapers to tip, cutting edge horizontal. Tang set below back, sloping

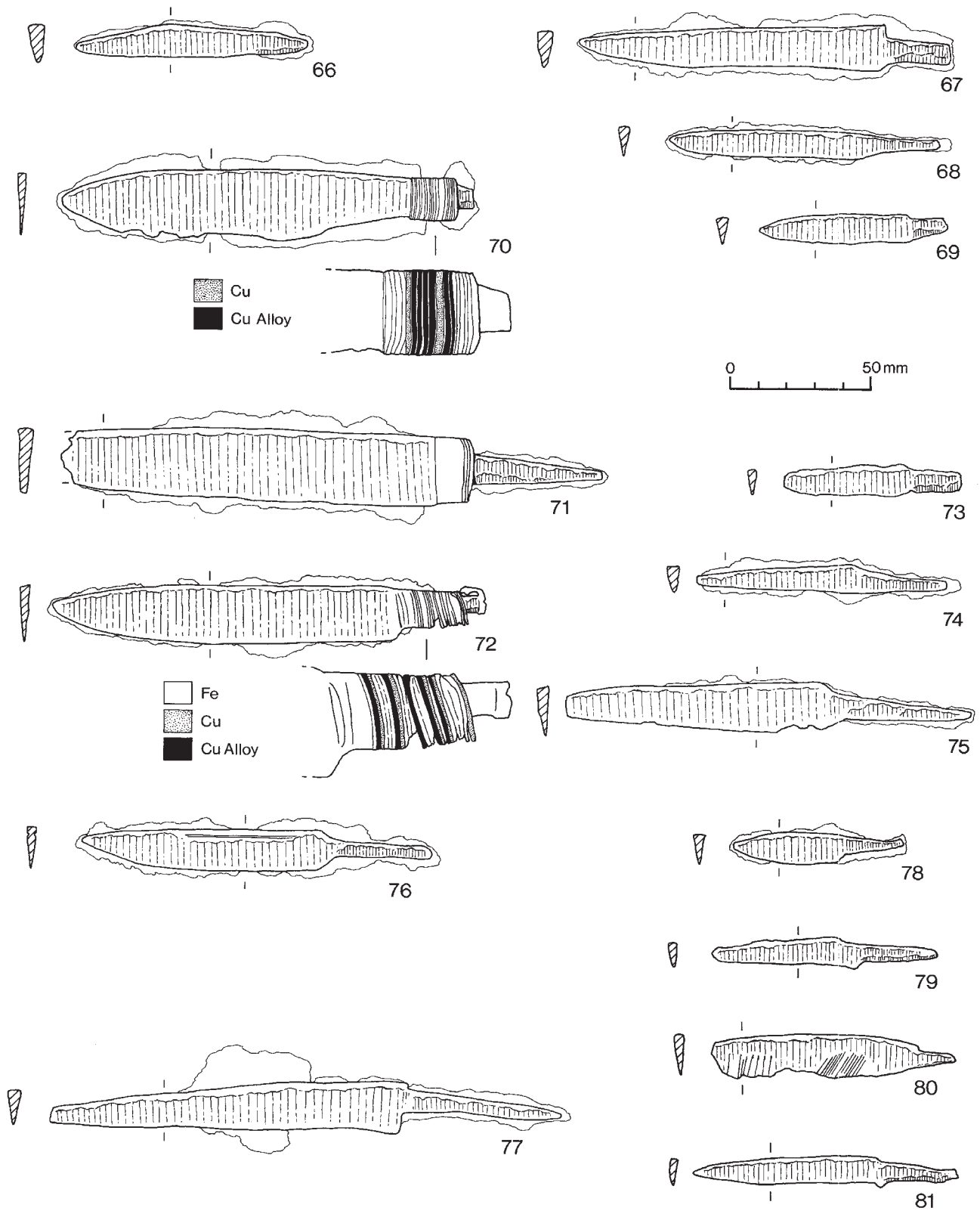


Figure 11.21: Household equipment: whittle tang knives (66–81)

- shoulder. Blade L: 48mm, W: 9mm, T: 3mm, Tang L: 39mm.
3421, 1644, layer, BY4, Ph1
- 80 Knife, Fe. Tip and end of tang missing. Back of blade curved, cutting edge missing. Tang set just below back, sloping shoulder. Oblique incisions visible along cutting edge, possibly use as a file. Blade W: 15mm, T: 2mm.
6837, 6340, “bench”, E13/2, Ph3/2
- 81 Knife, Fe. Complete. Back of blade and cutting edge parallel. Tang central to blade, sloping shoulder. Distinctive S-shaped curve apparent, caused by sharpening. Blade L: 68mm, W: 9mm, T: 3mm, Tang L: 31mm
965, 902, ditch fill, LSD13, Ph0

Illustrated scale tang knives (11.22 and Plate 11.11)

- 82 Knife, Fe. Tang missing. Back of blade and cutting edge parallel then taper to tip. Cutting edge heavily corroded. Inlaid cutlers mark of pure copper (AML) in the form of a cross. Similar mark on a knife from Trig Lane, London (Cowgill *et al* 1987, fig 66,255) and a pair of shears from Baynards Castle, London (*ibid*, fig 71,328). Blade L: 94, W: 15mm, T: 3mm
82, 1, topsoil, MODN
- 83 Knife, Fe. Tip of blade missing. Back of blade horizontal, cutting edge widens. Tang in line with back of blade. The tang expands towards the terminal and is pierced by two copper alloy tubular rivets. The moulded copper alloy shoulder plates have been soldered to the tang with a tin/lead alloy and covered in sheet silver. Similar example from Winchester (Goodall 1990d, fig 257, 2832). Blade W: 12mm, T: 2mm, Tang L: 55mm.
590, 339, layer, DY1, Ph4
- 84 Knife, Fe/Ae. Tip of blade and end of tang missing. Back of blade and cutting edge parallel. Tang in line with back of blade and pierced by two ferrous metal rivets, for fixing scales. Brass shoulder plates at junction of blade and tang. Organic remains of scales preserved on tang. Blade W: 16.5mm, T: 3mm.
140, 243, layer, AY1, Ph3/2
- 85 Knife, Fe. Most of tang missing. Back of blade horizontal, cutting edge curved to tip. Tang in line with back of blade, one rivet hole is evident. Slight thickening at the junction of blade and tang forms a bolster. Blade L: 103mm, W: 19mm, T: 3mm
579, 466, yard surface, GREEN, U/S
- 86 Knife, Fe. Tip of blade and end of tang missing. Back of blade horizontal, cutting edge curves to tip. Stamped cutlers mark sited just below back. Tang in line with back of blade. The tang which is in line with the back of the blade widens towards the terminal, and still retains remnants of the bone scales. Thickening at junction of blade and tang forms a bolster/shoulder plate which is ornamented with a single groove on both sides. Analysis revealed that the bolster had been filed to ensure an perfect fit with the scales (AML). Blade L: 113mm, W: 19mm, T: 3mm.
146, 243, layer, AY1, Ph3/2
- 87 Knife, Fe. Incomplete, tip and end of tang missing. Back of blade and cutting edge parallel, both taper to tip. Tang in line with back of blade. Tang longer and wider than blade. Blade L: 85mm, W: 14mm, T: 3.5mm, Tang L: 87mm.
5289, 6008, rubble, EY2, 2/2

Household equipment: shears (Fig 11.22: 88–89)

There are only three incomplete examples, but with one sufficiently intact (89) to obtain the full length measurement, 173mm. Two have blades 11–13mm wide and 2mm thick; the other example (NI) is a fragment of bow with a vestige of the arm.

Shears were commonly in use during the medieval period for both domestic and industrial tasks. They comprise two short blades, connected by integral arms and a centrally placed bow, the latter efficiently holding the tension to enable the cutting of wool, cloth or any other organic fibre. The characteristics displayed by the fragments, circular sectioned arms and plain blades, indicate shears of an early date, and (89) is stylistically similar to a pair of shears from Winchester (Goodall 1990c, fig 260, 2875) dated to the thirteenth century.

One example comes from a late twelfth century context on the roadway in front of the hall S18 (89), while the other two are from fourteenth to fifteenth-century contexts in Tenements E and A.

Illustrated shears (Fig 11.22)

- 88 Shears, Fe. Plain blade with tip missing. Blade W: 15mm, T: 2mm, Handle L: 126
750, 449, layer, AY1, Ph 4–5
- 89 Shears, Fe. Plain blade with tip missing. Slagging lines visible on X-radiograph. Blade L: 68mm, W: 11mm, T: 2mm, Handle L: 105mm.
10138, 6533, layer, LSE8, Ph 1

Household equipment: hones and sharpeners (Fig 11.23, 90–101)

There are 82 stones used for sharpening ferrous metal knives and tools. The hones are stones deliberately fashioned into smooth-faced elongated rods, and the sharpeners are utilised irregular pebbles or stone fragments with smoothed surfaces and sometimes knife point sharpening grooves. The assemblage is comparable with local sites of a similar date; eg Lyveden (Bryant and Steane 1971) and St Peter’s Street, Northampton (Williams 1979). Stone identifications are by Dr D Sutherland.

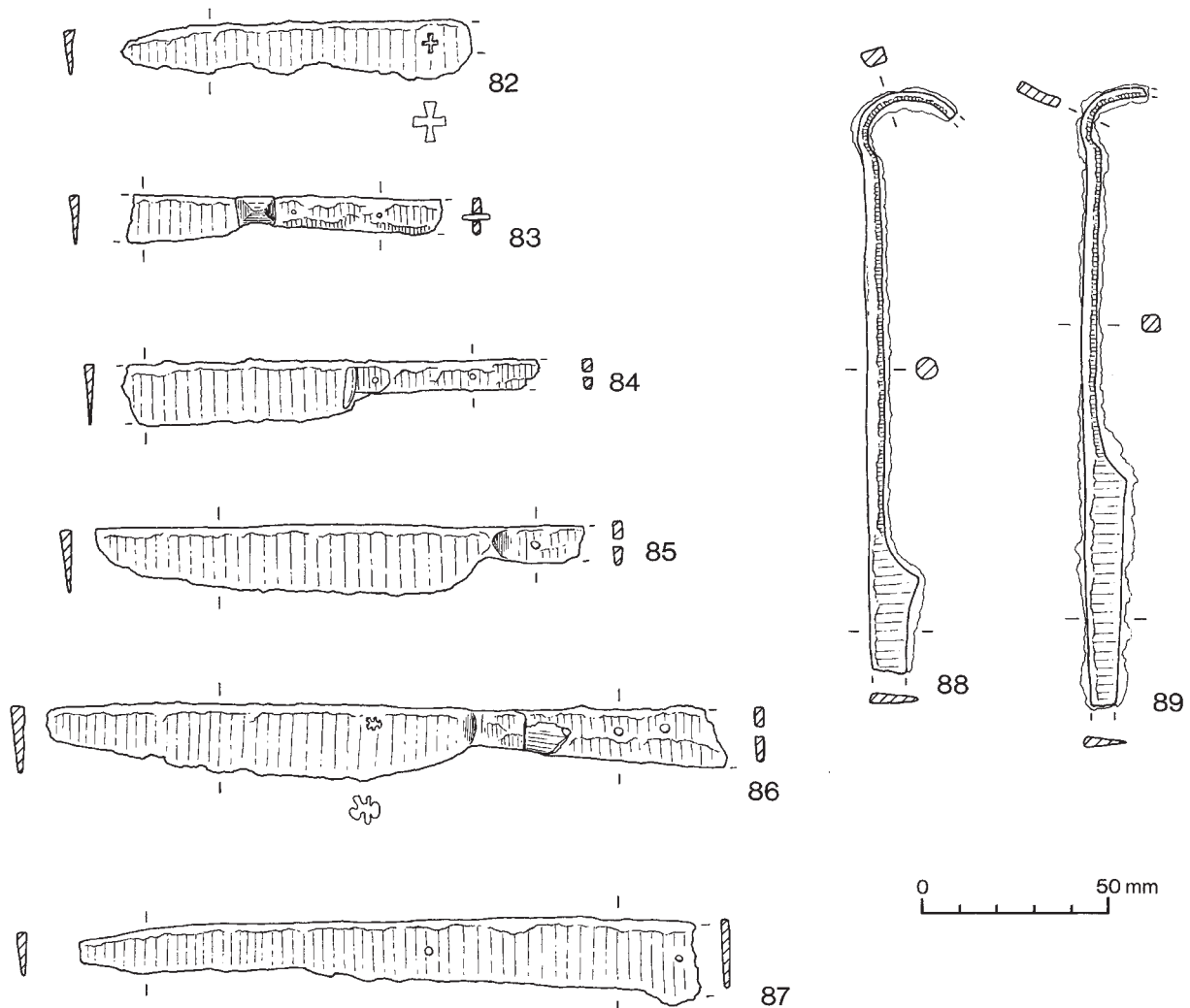


Figure 11.22: Household equipment: scale tang knives (82–87) and shears (88–89)

Hones

There are 64 hones, with 40 of micaceous schist (Norwegian ragstone) while the others are of various sandstones, siltstone or slate. There are two distinct forms; small, regular hones perforated at one end for suspension (90–93), and unperforated hones for general use, which are longer, thicker and less well made (94–98).

Of the thirteen small personal hones nine are perforated, with holes drilled from both sides, while a further four are probably the broken terminals of perforated hones. They are all under 90mm long and no more than 20mm wide, with rectangular sections. A majority are of schist (90–91), but all four of the slate hones are perforated (92–93) along with a single siltstone example. Those in schist and two in slate are from eleventh to twelfth-century contexts, while the other two in slate are from fourteenth-century contexts.

The unperforated schist hones are typically rectangular sectioned bars, although a few are square or sub-rectangular, and complete examples vary from 46–158mm long and

17–48mm wide, although a single example is 59mm wide. Most have a cleavage planes running down the length of the hone, while those with cleavage planes at other angles had evidently been more liable to fracture. The small group of siltstone hones are generally similar in size and form. No larger schist hones were recovered from the twelfth-century buildings, while only a single example comes from the fills of the boundary ditches. The later thirteenth to fourteenth-century contexts in all the tenements, apart from tenement D, produced quantities of schist and some siltstone hones. There are three possible concentrations of hones related to particular buildings. There were six within and around building B6 in the later phase of its use, which also produced a concentration of knives. There are also a similar number from the kitchen and processing rooms of the main domestic range of tenement E. In addition, there are three hones from a small area within the kitchen of building C8, room 2, while a further example came from the adjacent room, 1. There were no schist hones

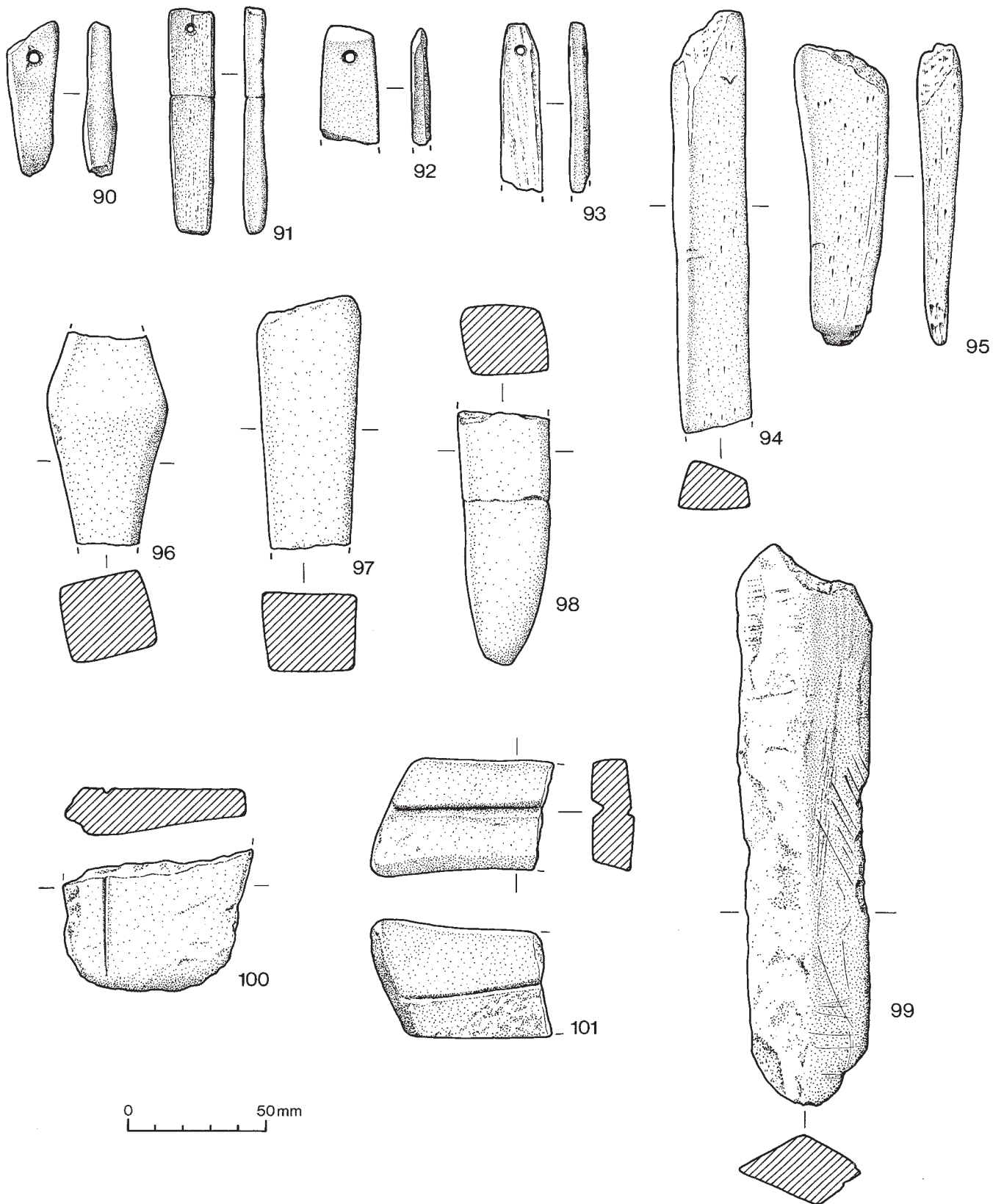


Figure 11.23: Household equipment: hones and sharpeners (90–101)

within contexts post-dating the abandonment of the central tenements.

The use of well-shaped sandstone hones appears only in late to post-medieval contexts. The earliest examples are two square-sectioned hones from late thirteenth to fourteenth-century contexts in tenement E. The other three square-sectioned sandstone hones and all four with circular sections, are from contexts post-dating the abandonment of the central tenements; one from the fifteenth-century ditch encircling the central yard, while the others are either unstratified or from the topsoil. Four of these have knife point sharpening grooves, generally at the terminals. The use of square sectioned sandstones hones appears therefore to have come in late in the life of the central tenements, while the use of circular hones cannot be dated earlier than 1400 and could be entirely post-medieval.

Sharpeners

There are 19 sharpeners with one or more smoothed surfaces. Several stone types are represented; three slate, three sandstone (fine grained and calcareous), one limestone and twelve unidentified pebbles and small rocks, most probably glacial erratics from the local gravels. This assorted assemblage indicates that the stones used were picked up at random. Six examples have knife point sharpening grooves, some with deep V-shaped recesses (100, 101). Ten of the sharpeners are from eleventh or twelfth-century contexts, with six of these scattered around the building complex. Eight are from the later tenements and one is from the topsoil.

The usage of hones and sharpeners shows distinct chronological changes. The eleventh to twelfth-century examples show a preference for irregular or semi-regular sharpening stones in a range of stone types which may well have been obtained purely locally from the gravels. It would appear that at this time there was some schist being brought to the site, but mainly for use as small, perforated personal hones. Slate, possibly from Leicestershire, was probably also imported and used for small personal hones. By the later thirteenth century schist was being acquired in some quantity and was used for the majority of the hones until well into the fourteenth century, while smaller quantities of slates from the Charnwood forest may also have been imported. Schist, often referred to as Norwegian ragstone, was mined at Eidsborg in southern Norway, and traded in great quantities during the medieval period. Apart from the shaped and utilised hones, a single large bar of unworked schist, 151 x 65 x 15mm, was recovered from a fourteenth-century context in tenement E. This suggests that at least some of the schist was obtained as roughouts that were fashioned into hones on-site as required.

By the mid-fourteenth century the use of schist had declined and probably ceased at about this time, being replaced by sandstone stones with rectangular or square sections and later still, possibly post-medieval, circular-sectioned sandstone hones appear.

Illustrated hones and sharpeners (Fig 11.23)

- 90 Hone, schist (Eidsborg?). Perforated, drilled from both sides. Rectangular cross-section, tapered to rounded terminal, three smoothed surfaces. Possibly reused terminal of larger hone that broke. L: 57mm, W: 18mm, T: 12mm.
1375, 2007, ditch fill, LSD14, Ph1
- 91 Hone, schist (Eidsborg?). Perforated, drilled from both sides. Rectangular cross-section, bulging towards squared terminal. All sides smoothed. L: 83mm, W: 34mm, T: 8mm.
6806/6807, 4222/4229, yard surface, EY3, Ph 1 and Ph1-3/2
- 92 Hone, slate (purplish grey, Swithland, Leicestershire). Perforated, drilled from both sides. Rectangular cross-section, all sides smoothed. W: 21mm, T: 16mm
10700, 7152, fill, M25, Ph0
- 93 Hone, slate (purplish grey; Swithland, Leicestershire). Perforated, drilled from both sides. Rectangular cross-section, all sides smoothed. L: 62mm, W: 15mm, T: 7mm
10738, 7280, ditch fill, LSD8, Ph LS??
- 94 Hone, schist (Eidsborg?). Rectangular section, all sides smoothed. L: 157mm, W: 24mm, T: 22mm
1823, 2058, ditch fill, LSE3, Ph??
- 95 Hone, schist (Eidsborg?). Rectangular section, all sides smoothed. L: 110mm, W: 32mm, T: 15mm
2505, 1570, stone-lined pit, B5/1, Ph2/2
- 96 Hone, sandstone. Squared cross-section with bulbous terminal, all sides smoothed. W: 53mm, T: 52mm
6128, 4151, layer, EY3, Ph2/2
- 97 Hone, sandstone. Squared cross-section, all sides smoothed. L: 92mm, W: 35mm, T: 35mm
5368, 5083, clean, LMS, Ph??
- 98 Hone, sandstone. Rectangular cross-section, all sides smoothed. L: 92, W: 34, T: 27
5281, 6117, rubble, E13, Ph3/2
- 99 Hone, slate (greenish grey, Charnwood Forest?). Rhomboidal cross-section. All sides smoothed with oblique point sharpening grooves on two faces. L: 212, W: 46mm, T: 28mm
4664, 343, rubble, D11, Ph 4
- 100 Sharpener, sandstone (Jurassic, Northamptonshire/Yorkshire). Two surfaces smoothed, one with V-shaped point sharpening groove. 64 x 48 x 17mm
758, 771, layer, DY2, Ph 2/2
- 101 Sharpener, sandstone (fine grained, British but not local). All sides smoothed, two with a single V-shaped knife point sharpening groove. 61 x 44 x 14mm
10372, 4461, clean, S19/1, Ph 0-2/0

Tools (Figs 11.24–11.27: 1–38)

There is a range of tools which can certainly or tentatively be assigned to specific processes and, with the exception of textile working, most of them are of iron. The situation is similar to that seen with the iron building and household equipment, tools are present but in very small numbers, and the explanation is probably the same. It seems likely that the majority of such items were rarely lost or discarded as they were either retained for use, and so were taken away when tenements were abandoned, or, if broken or otherwise unusable, they still had a value as scrap metal. It is suggested therefore that the recovered evidence for cold metalworking, woodworking and especially agricultural tools is likely to under represent the role that they actually played in the daily life of the settlement. The leather and textile working tools, which include items in other materials, are probably more representative of the true level of these activities. The probable exception is the stone working tools, as the buildings are only of roughly worked limestone so there would have been little need for specialised tools, while the paucity of tools required for the dressing of millstones, at least from the excavated watermills, may indicate that this process was carried out by a visiting millwright.

Metalworking tools (1–4)

There was no structural evidence for iron smelting or smithing being carried out at West Cotton and the site produced only a single piece of slag or clinker. However, six examples of tools used for cold metalworking were found; five punches or drifts and one reamer. This indicates that there was some capacity for carrying out simple maintenance and repair work on fittings and equipment brought in from outside. These tool types are quite common and comparable examples have been found on many sites of a similar date.

Punches and drifts were used, respectively, for the initial piercing and the enlarging of holes in metal sheet or plate. They range in length from 59–112mm and the smallest example (4), which is clearly a punch, has a burred head.

Reamers were used with a rotating motion to enlarge holes in thin plates or soft metals. The single possible reamer (2) has a square sectioned stem and an expanded square sectioned terminal which tapers to a rounded point.

Four of these tools were recovered from tenement E; the reamer and a drift/punch from yard deposit and punches/drifts in rooms 2 and 4 of building E13. A further drift/punch came from building B6 while the other example was unstratified.

Illustrated metalworking tools (Fig 11.24)

- 1 Drift/punch, Fe. Rectangular-section with worn tapered terminal. Faccombe Netherton provides several parallels (Goodall 1990e, fig 9.1, 11–14). L:

80mm, W: 10mm
51, U/S

- 2 Reamer, Fe. Rectangular-sectioned stem with expanded square sectioned terminal, point rounded. Parallel from Northampton (Oakley 1979a, fig 119,62). L: 94mm 6466, 4165, layer, EY3, Ph1–2/2
- 3 Drift/punch, Fe. Sub-rectangular sectioned grip terminating in a point. Parallel from Norwich (Margeson 1985, fig 46,85). L: 112mm 5443, 6132, robber trench fill, E13/4, Ph3/2
- 4 Punch, Fe. Rectangular-sectioned grip terminating in a point. L: 59mm 6796, 6338, robber trench fill, E13/2, Ph3/2

Woodworking tools (5–10)

Wood was an important material for the manufacture of many items during the medieval period but, as very few wooden artefacts survive, evidence for carpentry can often only be indicated by the presence of the particular tools required for woodworking. There were no tools related to the felling of trees, but 21 tools required for splitting and shaping (cleaving, drilling and shaving) were found. The small size of all these items would suggest that they were used for general maintenance or the construction of domestic furniture or other small pieces of equipment.

Augers were used to drill holes. The most complete example (5) is a small auger with a square-sectioned terminal, a square-sectioned twisted shaft and a spoon bit blade. There are three examples of broken bit heads with rectangular sectioned lanceolate terminals, although one (7) is socketed making its identification somewhat dubious.

Draw-knives would have been used for shaping and smoothing. The single example (10) is quite small and would have been used on domestic items and not on the preparation of large timbers.

Wedges (8, 9) were driven into timbers causing it to split along the grain, cleaving, while smaller wedges could also have been used to secure structural fittings and the heads of hafted tools (Goodall 1990e, 404). The 16 wedges recovered are from 37mm to 64mm long and this size range suggests that they were used for securing and for splitting smaller timbers.

Illustrated woodworking tools (Fig 11.24)

- 5 Spoon bit, Fe. Parallel from Thetford (Goodall, I H, 1984, fig 117, 15). L (incomplete): 152mm 565, 668, hollow fill, CPITS, Ph3/2
- 6 Bit head, Fe. Lanceolate terminal with rectangular section. L (head): 38mm 722, 449, layer, AY1, Ph4–5
- 7 Bit head?, Fe. Lanceolate terminal with rectangular section and vestige of a socket. A socketed terminal is unusual and this may be some other implement, possibly an unforged arrowhead? L (head): 49mm

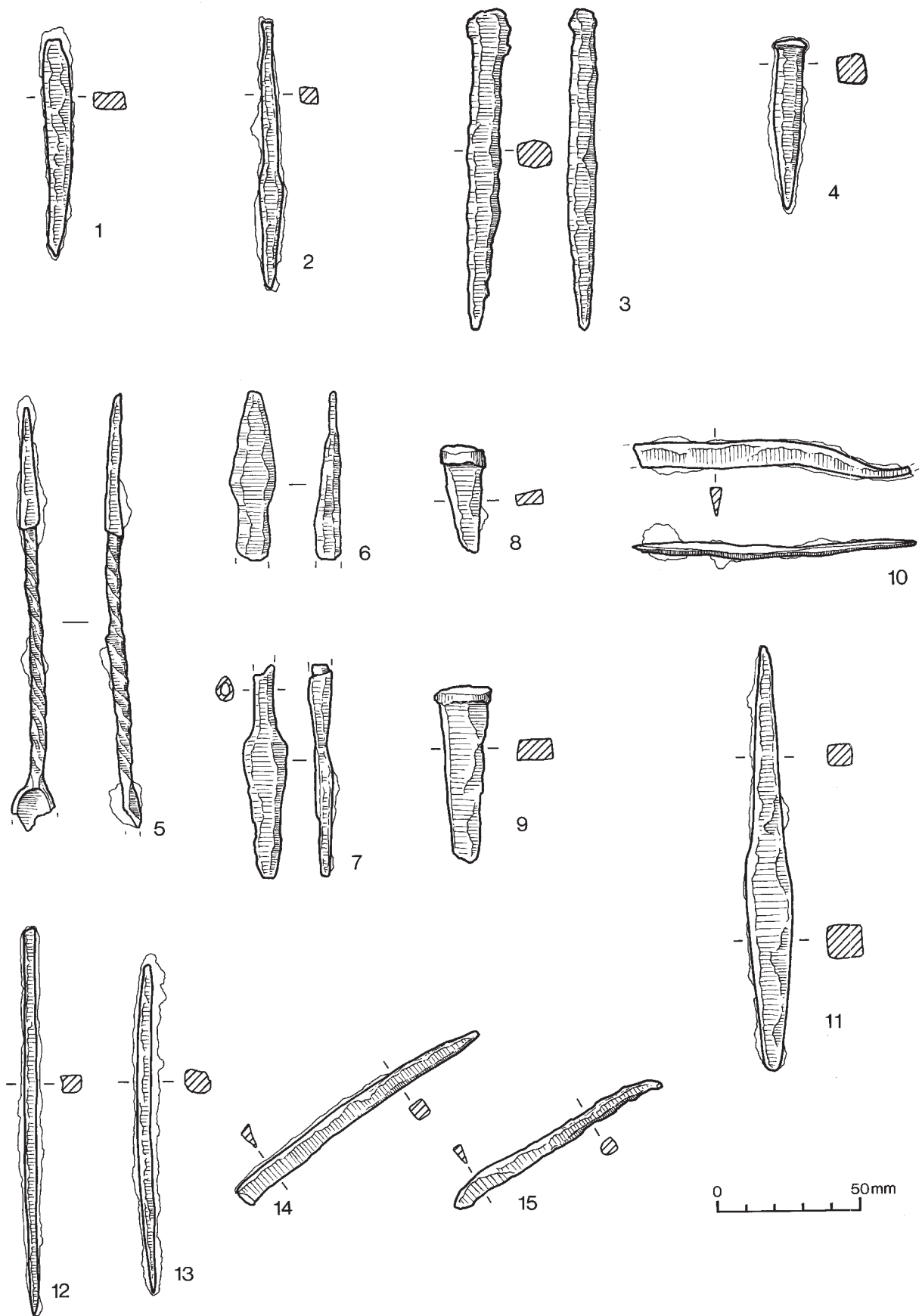


Figure 11.24: Tools: metalworking (1-4), woodworking (5-10), stone working (11) and leather working (12-15)

- 10271, 6555, clean, LSD19, Ph0
- 8 Wedge, Fe. Rectangular-sectioned shank with burred head. L: 37.5mm
399, 449, layer, AY1, Ph4–5
- 9 Wedge, Fe. Rectangular-sectioned shank with burred head. L: 61mm
6855, 6161, wall, E14, Ph2/2
- 10 Draw-knife, Fe. Incomplete, part of blade and one tang missing. The shoulder is curved and raised and terminates in a short tang or handle. Blade W: 9.5mm, T: 4mm, tang/handle L: 28mm
10289, 4414, posthole, S19/2, Ph1–2/0
- 13 Awl, Fe. L: 120mm.
5228, 5061, clean, SY2, Ph LS??
- 14 Creaser, Fe. L: 102mm
91, 1, topsoil, MODN
- 15 Creaser, Fe. L: 82mm, Blade L: 24mm
1319, 1547, robber trench fill, Ph 2/1

Stone working tools (11)

The only identified items are two mill picks used for dressing millstones, both from later medieval contexts in tenement B. One is 150mm long (11) and the other (NI) is 102mm long but has lost a short part of one end. An identical example has been found at Kings Lynn (Goodall and Carter 1977, 296, 134, 36). The presence of these implements in contexts of thirteenth to fourteenth-century date supports the suggestion that there may have been a medieval watermill on the eastern side of the settlement.

Illustrated stone working tools (Fig 11.24)

- 11 Mill pick, Fe. Double-ended. Square-sectioned with central expansion and tapered terminals. L: 150mm
1036, 591, rubble, BY7, Ph2/2–3/2

Leather working tools (12–15)

The presence of awls and creasers indicates that at least some basic leather working took place, but probably only on a small scale basis to fulfil some of the requirements of the inhabitants.

Awls are square-sectioned rods with tapered terminals (12, 13), used to pierce leather prior to sewing. Fourteen were identified, although with the shortest incomplete example measuring 83mm it is likely that other shorter fragments have been identified merely as rods. Nine examples are complete, 91–137mm long. Two have terminals with rounded cross sections, probably caused by wear through use. They come from contexts dated from the twelfth century onwards with three from tenement B.

Creasers have long tangs, for hafting, and short blades. The blade would have been heated and used to crease a line onto leather (Goodall, I H, 1984, 81). Two creasers were found, one unstratified (14) and the other (15) from tenement B. The tangs are square-sectioned while the blades have triangular cross-sections and measure 45mm (14) and 24mm (15) in length.

Illustrated leather working tools (Fig 11.24)

- 12 Awl, Fe. L: 137mm
546, 475, rubble, D11, Ph 3/2

Textile working tools (16–34)

There is a range of items associated with textile working. Most relate to the basic activity of hand spinning, while some are associated with weaving.

Heckle teeth (16–19)

Heckle or woolcomb teeth are tapered ferrous metal rods with a single pointed terminal. They were supported in rows on a piece of iron sheet binding a wooden block, a heckle (Goodall, I H, 1984, fig 119, 20–1). Heckles were used for preparing, carding, wool and bast (flax and hemp) fibres, by removing unwanted material and aligning the fibres for spinning into thread.

Thirty-three heckle teeth were found, 20 complete and 13 incomplete. Fifteen have rectangular cross-sections while on 18 the upper half has a rectangular section while the lower half is circular, probably as a result of wear. Complete teeth are 50–150mm long, with the full size range represented in the twelfth century contexts while shorter examples (50–99mm) are uncommon in later contexts. They occur in contexts of twelfth-century date and later, some examples are associated with the manor complex while they are also present on all of the later tenements.

Illustrated heckle teeth (Fig 11.25)

- 16 Heckle tooth, Fe. Rectangular section, tapered to a rounded point. L: 150mm
1767, 3016, robber trench, C8/3, Ph3/2
- 17 Heckle tooth, Fe. Rectangular section, tapered to a circular sectioned point. L: 130mm
6720, 6344, hollow, EY1, Ph3/2
- 18 Heckle tooth, Fe. Rectangular section, tapered to a point. L: 120mm
593, 705, layer, DY1, Ph3/2
- 19 Heckle tooth, Fe. Rectangular section, tapered to a rounded point. L: 90mm
10695, 4762, slot fill, T34/2, Ph LS??

Spindle whorls (20–25)

Twenty-nine spindle whorls were found; one was unstratified and one has subsequently been lost. They are most commonly in stone (13 limestone, 6 chalk and 3 probably siltstone), but other materials are represented; one bone, four ceramic and one lead. The limestone and siltstone examples are generally lathe-turned and are globular (22), conical (24) or bi-conical (23); four

are decorated with fine concentric grooves (23). The chalk whorls are conical (25) or hemispherical and one has flat facets probably resulting from knife trimming. The hemispherical bone whorl is cut from the proximal end of a bovine femur (21), and the ceramic spindle whorls are all made from reused Romano-British pottery sherds which have been trimmed and perforated (NI).

The perforations are typically 9–12mm in diameter, although two chalk examples have perforations 15mm in diameter. Most taper towards the centre, indicating that they were drilled from both sides, and one globular limestone whorl still has grooves within the perforation. The weights of the 16 complete examples range between 15–37g, with no indication of any grouping by weight although there are only two examples over 30g. There is no general correlation between material type and weight, although the two heaviest examples are in siltstone. As chalk is less dense than limestone, this appears to have been compensated for by having larger diameters.

There are probably chronological changes in the form and possibly the weight of the spindle whorls. Those from contexts earlier than AD 1200 are typically conical, bi-conical or hemispherical and this group includes four of the six in chalk and three of those fashioned on reused pot sherds. A smaller number of similar whorl types were recovered from later medieval contexts, but whether this indicates the continued use of such types throughout the life of the settlement or merely the presence of earlier types as residual finds, is uncertain. A single spindle whorl in lead (20) was retrieved from the mortar-filled threshold slot of the eastern doorway of the manor hall, S18, and it can be suggested that it may have been deliberately placed there as a protective deposit; an iron nail was also recovered. While most of the twelfth-century whorls were recovered around the manorial buildings or within the mill leats, two examples lay within plot 12 towards the south-eastern limit of excavation, where they may relate to a further, unexcavated focus of occupation.

Globular limestone whorls (22) only occur in contexts of thirteenth-century or later date, where they provide nine out of 14 examples. They tend to be smaller, and thus also lighter, than the whorls from twelfth-century contexts. The seven complete examples have an average weight of 19.7g while the eight complete whorls from twelfth-century contexts have an average weight of 28.2g. It may be suggested that this could indicate a change in either the material or the fineness of the thread being spun. Spindle whorls were recovered from all the tenements, except tenement C.

Illustrated spindle whorls (Fig 11.25 and Plate 11.8)

- 20 Spindle whorl, Pb. Conical with large central perforation. Ext.D: 26mm, Int.D: 10mm, H: 12mm, Wgt: 28.5mm 10343, 6582, S18, Ph0
- 21 Spindle whorl, bone (Bovine longbone). Hemispherical, central perforation tapered towards flat-end. Parallel from Goltho (MacGregor 1987, fig 161, 8). Ext.D: 43mm, Int.D: 10.5mm, H: 20mm, Wgt: 15gm 1033, 1145, layer, D12, Ph1?
- 22 Spindle whorl, limestone. Globular, tapered perforation. Ext.D: 30mm, Int.D: 11–12mm, H: 21mm, Wgt: 26gm 202, 348, layer, D11/1, Ph4
- 23 Spindle whorl, limestone. Biconical, with decorative lathe-turned concentric grooves. Ext.D: 35mm, Int.D: 11mm, H: 18mm, Wgt: 30gm 5377, 4026, ditch fill, LSE5, Ph1
- 24 Spindle whorl, siltstone? Conical, tapered perforation. Ext.D: 37mm, Int.D: 10–12mm, H: 25mm, Wgt: 34gm 1237, 1486, layer, LSE12, Ph1
- 25 Spindle whorl, chalk. Conical, waisted perforation. Ext.D: 33mm, Int.D: 12mm, H: 23mm, Wgt: 22gm 10574, 6905, layer, PDL, Ph1

Pinbeaters (26–31)

Pinbeaters were used during the process of weaving to separate coarse threads which catch on each other when the shed is changed. Double-pointed tools used with warp-weighted looms are common on settlement sites of the early and middle Anglo-Saxon period. Combined spatulate and pointed-ended tools are thought to be associated with the vertical two-beam loom which may have come into use in the ninth century (Riddler 1994, 32–3). The pointed end is for picking up and weaving a small group of warp threads while the flat end is for beating the weft threads. This type would probably have been used for tapestry weaving rather than cloth (see Brown 1990, 227).

There are 16 pinbeaters, three incomplete examples of the double-pointed form, with sub-circular or oval-sectioned shafts which taper towards each terminal (26), while the remainder have sub-rectangular or D-sectioned shafts which broaden at one end to form a flattened spatulate terminal and are pointed at the other end. The majority of these have a well-worn or partially worn concavity at one end (27–30); Brown suggests (1990, 227) that this is caused by constant wear from being held between the thumb and forefinger. One example (28) displays transverse grooves on the right hand side of the anterior and posterior surfaces, these are said by MacGregor (1985) to be formed by friction against the warp. There are varying degrees of wear. Most have well polished surfaces, an essential prerequisite for a weaving tool, as rough edges would snag on the threads, although one is only lightly worn (NI), the cutting facets are still visible and the concave recess is just evident. The five complete examples range in length from 75–124mm and one (31) is decorated with an incised motif.

Two of the sub-circular sectioned points and all but four of the spatulate ended tools come from late eleventh or twelfth-century contexts, mainly ditch fills; they are fairly widely scattered across the site. Although there is no structural evidence for the presence of looms, the pinbeaters suggest that at least the two-beam loom was in use in the twelfth century, but perhaps not in the later tenements, given the dearth of pinbeaters in these contexts.

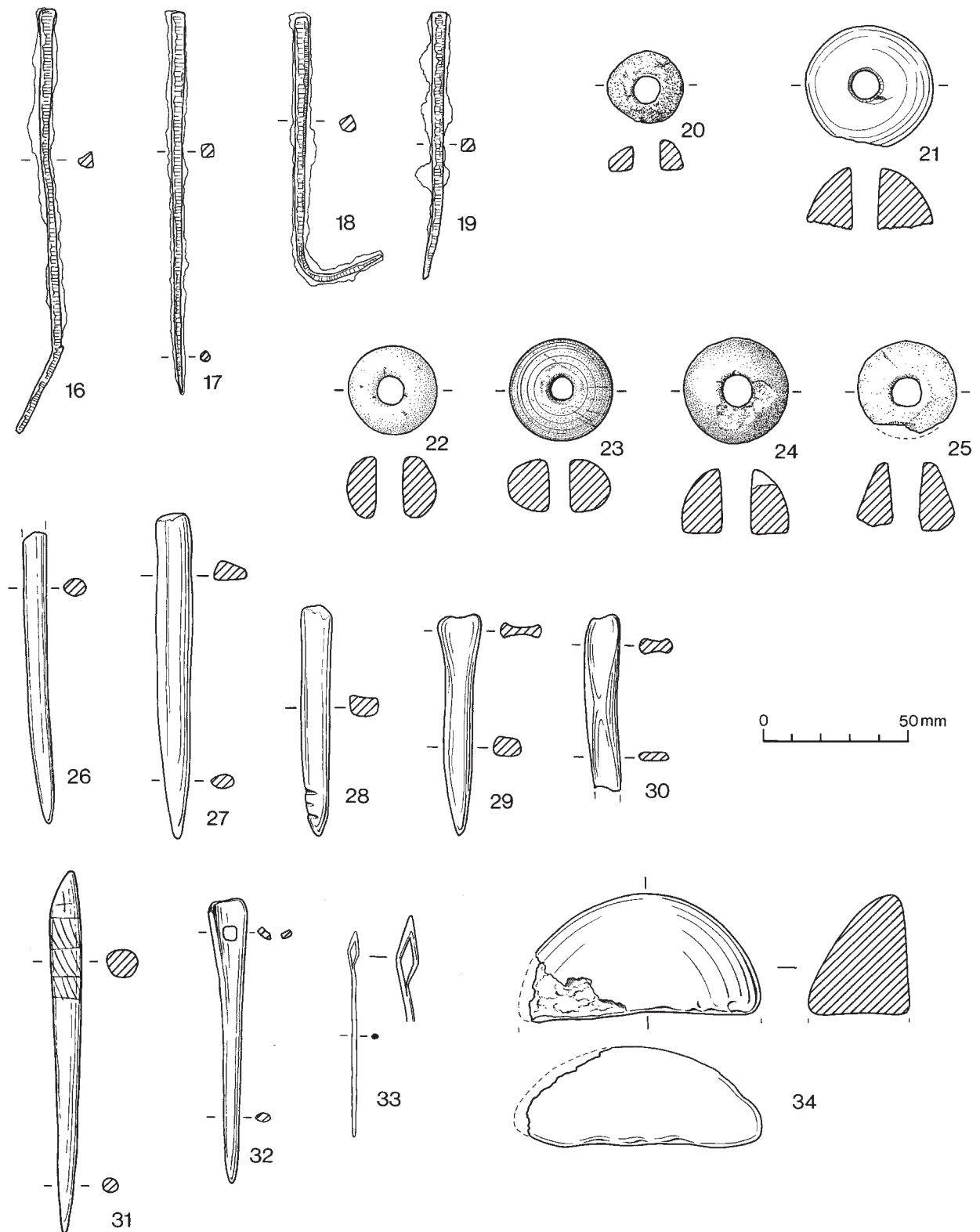


Figure 11.25: Tools: textile working; heckle teeth (16–19), spindle whorls (20–25), pinbeaters (26–31), needles (32–33), and linen smoother (34)

Illustrated pinbeaters (Fig 11.25 and Plate 11.8)

- 26 Pinbeater point, bone. Oval cross-section with pointed terminal. L(incomplete): 118mm
1083, 783, layer, AY1/2, Ph3/2
- 27 Pinbeater, bone. Spatulate terminal tapered to a pointed terminal. Irregular cross-section, facets from trimming visible on thin side. L:110mm
2959, 902, ditch fill, LSD13, Ph0
- 28 Pinbeater, bone. D-section, transverse grooves on the right side and left side of both surfaces. Other end spatulate with shallow longitudinal recesses. L: 78mm
10698, 7148, hollow, M26, Ph LS3
- 29 Pinbeater, bone. Shaft sub-rectangular sectioned, broadens into a flattened spatulate terminal, each side slightly concave. L: 75mm
3549, 997, ditch fill, LSD14, Ph1
- 30 Pinbeater, bone. Spatulate terminal with slight convex recesses on each side. L(incomplete): 60mm
6362, 4162, bank A/E boundary, Ph2/2
- 31 Pinbeater/awl, antler. Tapered with pointed terminal. Upper section embellished with a spiral motif of oblique incisions. L: 124mm
10925, 4393, floor, T33, Ph LS3/2

Needles (32, 33)

Six needles were recovered; three iron, two copper alloy and one bone. The bone needle (32), of eleventh or twelfth-century date, is worked from a sheep tibia, although needles of this type are often worked from pig fibulae. The iron and copper alloy needles are from twelfth to fourteenth-century contexts.

Illustrated needles (Fig 11.25 and Plate 11.8)

- 32 Needle, bone (sheep tibia). Triangular head tapered to an oval sectioned point. Terminal not heavily worn. L: 97mm
10707, 4781, posthole, T30, Ph LS3/2-0
- 33 Needle, AE. Lozenge-shaped head with elongated eye, most probably cut by hand.
783, 639, yard surface, CY1, Ph3/2

Linen smoother (34)

Glass linen smoothers, or slick stones, are known from the seventh to the nineteenth centuries. The early types, like the West Cotton example, are "bun-shaped", with one side convex and the other slightly concave. Underneath the decayed, friable skin, which has partially flaked away, the glass is black but, as with an example from Thetford (Harden 1984, fig 151), it is amber in thin section. It is from an early thirteenth-century context, the earliest floors of building E13, but could be residual from the underlying hall S18.

Illustrated linen smoother (Fig 11.25)

- 34 Linen smoother, glass (incomplete). D: 84mm, H: 35mm
6928, 6417, layer, E13/2, Ph2/0

Agricultural tools (35-37)

Only four agricultural tools were recovered. Of the three sickles, two comprise the tang and part of the blade (35-6) while the third is a tip fragment (N1). The largest example (35) is of particular interest as the X-radiograph shows that the blade was repaired in antiquity; the broken ends of the blades have been over-lapped and fixed with two large square-headed rivets.

The tanged weed hook (37) has a crescent-shaped

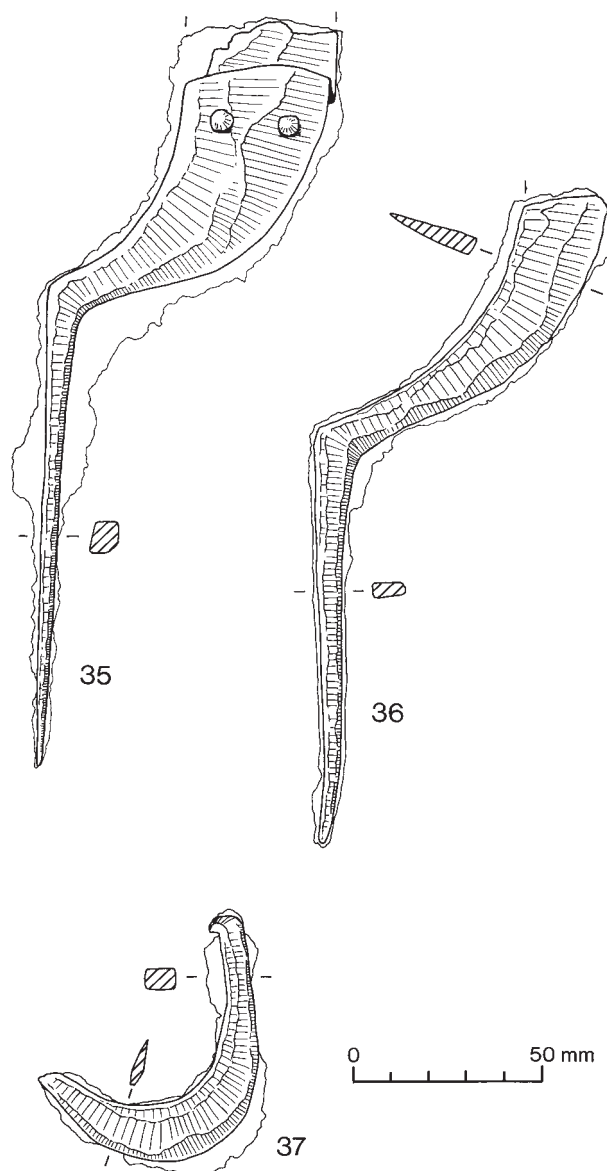


Figure 11.26: Agricultural tools; sickles (35-36), and weed hook (37)

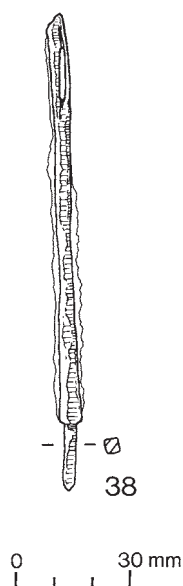


Figure 11.27: Miscellaneous tools, netting needle? (38)

blade and is similar to examples from Thetford (Goodall, I H, 1984, fig 121, 47) and Faccombe Netherton (Goodall 1990e, fig 9.2,80–85)

Two sickles and the weed hook are from late thirteenth to fourteenth-century contexts while one sickle is from a twelfth-century context.

Illustrated sickles and weed hook (Fig 11.26)

- 35 Sickle, Fe. Tang and part of blade only. Tang L: 120mm, Blade W: 40mm
3554, 3116, ditch fill, LSD17, Ph0
- 36 Sickle, Fe. Tang and part of blade only. Tang L: 100mm, Blade W: 20mm
578, 551, layer, D11, Ph3/2
- 37 Weed hook, Fe. Tanged with crescent-shaped blade.
L: 68mm, Blade W: 15mm
6980, 6334, floor, E14, Ph2/0

Miscellaneous tools (38)

Illustrated possible netting needle (Fig 11.27)

- 38 Netting needle? Fe. Rectangular-sectioned shaft with pointed terminal, separated by marked shoulders. At the other end there is a hand-cut elongated perforation. The pointed terminal and marked shoulders resembles those seen on an iron stylus. L: 124mm
823, 839, layer, C8/1, Ph3/2

Weapons (Fig 11.28: 1–6)

Arrowheads (1–5)

Arrowheads are commonly found on medieval settlement sites and may be indicative of either military or hunting use. All ten arrowheads are socketed for attachment to a wooden shaft and one still retained fragments of wood (4). They have been classified with respect to the type series devised by Ward Perkins (1940) and helpful comments were obtained from Graeme Rimer, Keeper of Weapons, Royal Armouries. Four blade forms are represented and all would have been for use with a long bow, the most effective and widely used projectile weapon of the medieval period.

Type 1, leaf-shaped, includes the only complete arrowhead (1), 77mm long. A further example (NI), from the topsoil, is slightly more triangular in shape with pronounced shoulders. A tiny perforation in the socket wall would have retained a small pin to secure the arrowhead to the shaft. This type cannot be accurately dated, but in the Middle Ages it was common and would most probably have been used for general hunting (small game) and military purposes.

Type 2 (Ward Perkins Type 8) has a solid quadrangular head, the junction between the blade and socket is waisted and a closed seam is visible (2). It would have been used for military purposes and is thought to have been in use from the twelfth to fifteenth centuries: it was ideal for breaking through chain mail.

Two examples are barbed, Type 3. One is fragmentary (NI), but the X-radiograph indicates that the barbs may have been hammer-welded onto the socket. The other is leaf-shaped with the barbs set close to the socket (3); a Ward Perkins Type 16 (G Rimer pers comm). These were most probably a general purpose arrowhead used predominantly for hunting.

There are three examples of bodkins, Type 4 (Ward Perkins Type 7), which are tapered with a square/rectangular cross-section. One is slightly waisted (4) and another (5) although similar, would have been much longer. This type was also for military use, the slender pointed form being introduced to counteract the introduction of plate armour. This type were thought to have come into use in the fourteenth century, but recently a large quantity of bodkins were retrieved from twelfth to thirteenth-century contexts during excavations on the River Thames. Use of this type declined in the early fifteenth century.

The only arrowhead from a twelfth-century context is in fact one of the bodkin type (4), and this is from an area of metalling set in the angle of the hall S18 and the building S19/20. The others are from thirteenth to fourteenth-century contexts, apart from one from the topsoil, with four of the eight coming from a single yard, EY1, within tenement E.

Illustrated arrowheads (Fig 11.28)

- 1 Arrowhead, Fe. Leaf-shaped blade, socketed. L (blade): 45mm, L (socket): 22mm
6144, 6266, layer, EY1, Ph3/2

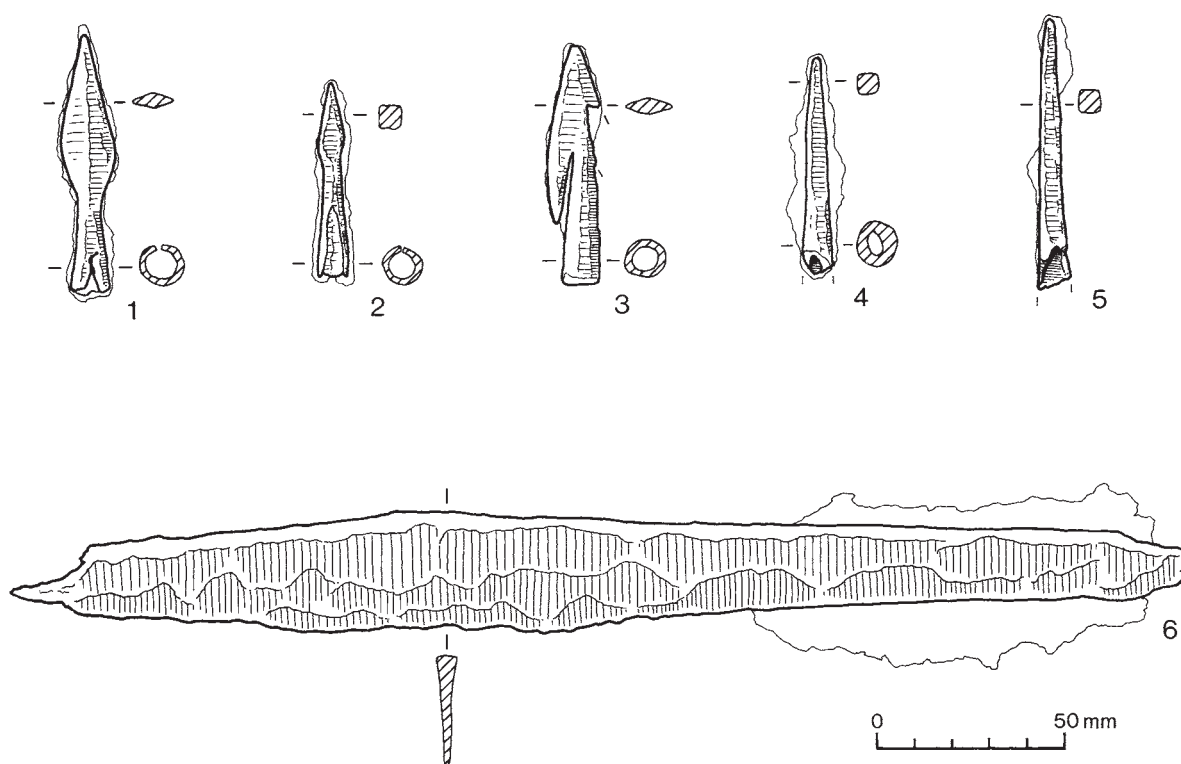


Figure 11.28: Weapons: arrowheads (1–5) and sax (6)

- 2 Arrowhead, Fe. Quadrangular head, socketed with closed seam. Similar examples from Faccombe Netherton (Goodall 1990e, fig 9.11, 589). L (blade): 22mm, L (socket): 28mm
6858, 6347, layer, EY1, Ph1–2/0
- 3 Arrowhead, Fe. Leaf-shaped blade with barbs, Museum of London Type 16 (Ward-Perkins 1940, fig 16, 16). L: 58mm
5935, 6237, layer, EY1, Ph 2/2
- 4 Arrowhead, Fe. Part of shaft missing. Bodkin with tapered square-sectioned blade, slightly waisted before start of socket. Fragments of wood still retained within socket. Similar examples from Goltho (Goodall 1987, fig 41, 99). L (incomplete): 56mm
10284, 6594, fill, LSE8, Ph0–1
- 5 Arrowhead, Fe. Most of socket missing. Bodkin with square sectioned blade, longer type than previous example. L (incomplete): 69mm
6140, 6266, layer, EY1, Ph3/2

Sax

In the early Middle Ages, sheath-knives of a kind typified by the Saxon sax, furnished with a horizontal single-edged blade and a back which rises slightly and then angles down to the tip, were widely popular. Small examples were intended for use as domestic implements and larger examples, sometimes referred to as a “scramasax” were

used as fighting knives. The example from West Cotton was found associated with a knife/dagger (Fig 11.21, 70) in the fill of the second mill leat, indicating an eleventh-century date. The blade is broad (31mm) and 5mm thick, and 300mm long, although the tip is missing. The tang is set just below the back, with a sloping shoulder. Only a single small knife displays the influence of the angled back and horizontal cutting edge.

Illustrated sax (Fig 11.28)

- 6 Sax, Fe. Blade L: 300mm, W: 31mm, T: 5mm
10847, 5623, fill, PDL, Ph LS3

Horse furnishings

(Figs 11.29 and 11.30, 1–23)

Items associated with the use of horses may be either both functional and decorative (spurs and bridle bits), purely decorative (pendants) or purely functional (horseshoes and horseshoe nails).

Spurs (1–4)

Parts of four spurs were found, and both prick spurs, with a spiked projection, the goad, protruding from the heel, and rowel spurs, with a multi-pointed rotating wheel, are represented. Prick spurs were introduced into Britain

by the Vikings and remained in use until the thirteenth century, which marks the appearance of the rowel spur. Three spurs (2, 3 and 4) retain remains of pure tin and tin/lead alloy coatings.

One example of a prick spur has a short neck and quadrangular lozenge-shaped goad to prevent excessive penetration of the flesh (1), a style common in the twelfth to thirteenth centuries. It was recovered from a yard in tenement B dated to the second half of the thirteenth century. The other example (2) is heavily encrusted but the X-radiograph indicates an elongated goad. The curvature of the shank and the figure-of-eight type terminal (Ward Perkins 1940, fig 28) suggests a possible twelfth to thirteenth-century date; it was recovered from a pit dated to second half of the twelfth century.

One of the two examples of a rowel spur has the remains of a six or seven-spiked rowel fixed by a rivet (3). Both were recovered from fourteenth-century yard deposits in tenement E.

Illustrated spurs (Fig 11.29)

- 1 Prick spur, Fe. Goad and part of shank only. Shank D-sectioned expanding slightly towards neck. Short circular sectioned neck with quadrangular lozenge-shaped goad. Similar examples from Thetford (Ellis 1984, fig 141, 275) and Furnells, Raunds (Oakley 2009, fig 7.3, 6). L (neck): 5mm, L (goad): 16mm. 1132, 1440, layer, BY4, Ph2/2
- 2 Prick spur, Fe. One terminal missing. Non-ferrous coating of tin. The D-sectioned shank curves round the back of the heel and down towards the underside of the foot. Elongated goad with pointed terminal. L: 130mm, L (goad/neck): 45mm. 5276, 4040 (F4039), pit fill, LSE5, Ph1
- 3 Rowel spur, Fe. Terminals missing. Coated in pure tin. The shank is shaped to fit around the heel and slopes down towards the ankle. Shank D-sectioned with marked shoulders 28mm from neck, followed by a much smaller oval-sectioned shank. Neck (24mm) bifurcates to form a rowel box. L: (incomplete): 92mm, D (rowel): 30mm. 6033, 6264, layer, EY4, Ph3/2
- 4 Rowel spur, Fe. Fragment of neck, rowel box and small part of shank. Coated in tin/lead alloy. Shank D-sectioned and shaped to fit round the back of the heel. Sub-circular-sectioned neck bifurcates to form a rowel box, which houses a vestige of the rowel. L (neck): 23mm, L (box): 15mm (incomplete). 6891, 6409, yard surface, EY1, Ph3/2

Bridle bits (5–8)

One curb bit and three snaffle bits were found. The remains of a non-ferrous coating, tin, is evident on two items (5, 6) while another is ornamented with a non-ferrous inlay (8). The single curb bit (5) is from an undated context,

and could be either medieval or post-medieval in date. The part recovered is forged from a single piece of iron with a sub-circular section. It comprises a transverse bar with perforated eyes at either end, to which the reins were attached, and a thicker, curved side bar with a remnant of a loop or eye at the upper end, for attachment to the cheek-pieces of the bit. The left hand eye retains a swivel hook attached to a remnant of a further hook or loop. The right hand side had been badly damaged, leaving only a remnant of the eye and a stub of the side bar twisted through almost 180 degrees. The side bars are often plain and straight, as on contemporary representations from the Luttrell Psalter, while the West Cotton example has curved bars similar to a curb bit from Kings Lynn (Goodall and Carter 1977, fig 134, 44) with a date range of 1050–1250.

Three snaffle bits were found, in contexts ranging in date from the eleventh to fourteenth centuries. The nearly complete example (6) is a two-linked mouthpiece joined by interlocking looped terminals, a type in use throughout the medieval period and similar to Ward Perkins Type II (1940, fig 196). The other examples are incomplete; one terminates in a complete loop (7) and the other (8) is ornately decorated with an inlaid motif, comprising five rows of twisted copper and copper alloy wires. Each row consists of two wires, two rows are purely of copper, one of copper alloy and two combine copper and copper alloy. Only a short length of this motif was exposed by full cleaning.

Illustrated bridle bits (Fig 11.29)

- 5 Curb bit, Fe. Coated in tin (AML). L (transverse bar): 230mm, L (side bar): 120mm. 6202, 5098, clean, LEATS, Ph ??
- 6 Snaffle bit (mouthpiece), Fe. Incomplete, terminals missing, originally coated in tin. Ordinary two linked type, joined by interlocking looped terminals. L: 130mm. 10500, 6433, layer, EY2, Ph0–2/0
- 7 Snaffle bit, Fe. Incomplete, terminal missing. Swollen circular-sectioned bar with looped terminal. Mouldings evident just below broken terminal (possibly a hook). L (incomplete): 88mm. 10089, 6510, layer, S18, Ph3/2 (contaminated?)
- 8 Snaffle bit? Fe. Incomplete, both terminals missing. Oval-sectioned shaft, terminating in an incomplete bifurcated terminal (possibly a loop). Upper surface of the shaft is ornately decorated with an inlaid motif of twisted copper and copper alloy wires. L (incomplete): 57mm. 10503, 6485, ditch fill, LSD18, Ph LS3

Pendants and bells (9–11)

There are three other items of possible horse furniture; a decorative gilded pendant (9), a possible harness fitting (10) and a highly decorated bell (11). Two of these are from post-medieval contexts, although the harness pendant (9)

is medieval in form, and the other possible harness fitting is from a thirteenth-century context in tenement B.

Illustrated pendants and bells (Fig 11.29)

9 Harness pendant, AE. Gilded (mercury gilding),

rectangular in shape with the upper corners removed. Decorated with a centrally placed six-sided star within a circular field of punched dots. The centre of the star is marked by seven punched dots. On three sides a marginal incised groove forms a border. 46 x38mm 5434, 5085, clean, LEATS, Ph??

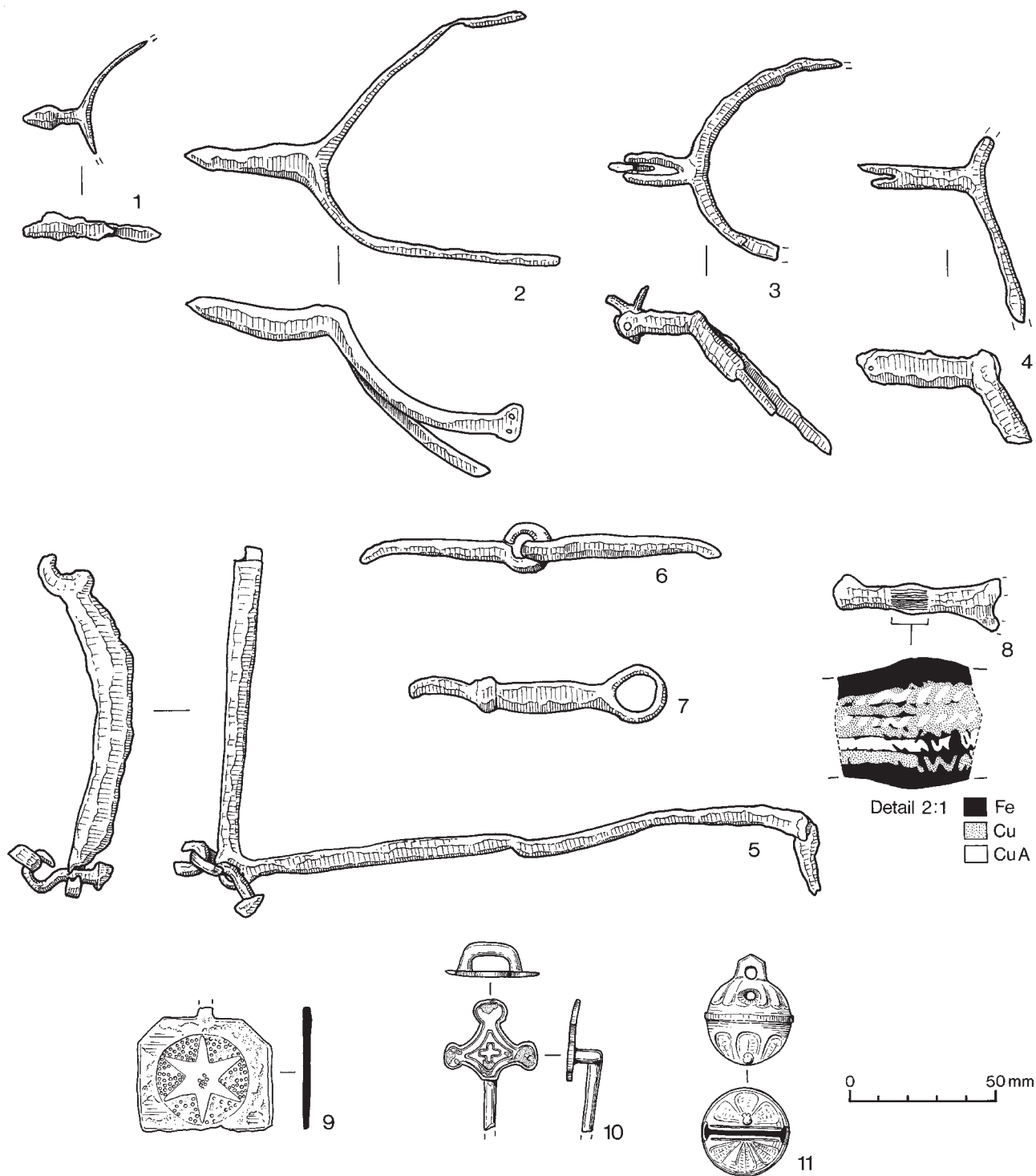


Figure 11.29: Horse furniture: spurs (1–4), bridle bits (5–8), pendants (9–10) and bell (11)

- 10 Harness fitting, AE. Heraldic cruciform fitting in the form of a stylised “pomme” cross (one lobe missing). Decorated with an incised marginal groove, the central field contains a small irregular incised cross within a concave-sided lozenge. The pendant projects upwards by means of a rigid oval-sectioned supporting bar attached to a U-shaped loop which has been soldered to the underside. Patina flaking, no evidence of enamelling. As yet no parallels have been located, although decorative tri-lobed fittings on curb bits are represented in the Luttrell Psalter (Ward Perkins 1940, fig 18, 4–5).
3280, 1528, fill, BY3, Ph2/0
- 11 Pellet bell, AE. Spherical with a suspension loop at the top. Pierced for acoustic and decorative effect and sounded by the rattling of a ferrous metal ball retained within. Upper section decorated with a “sunburst” motif. The lower section carries the design of a stylised spider’s web with a bust sited by the aperture. D: 29mm, H: 37mm
41, 1, topsoil, MODN

Horseshoes (12–18)

Seventy-eight horseshoes were found, including 16 complete examples, but 28 were either unstratified or from the topsoil. Six types were identified; based on shoe shape, counter sinking and nail hole types (Clark 1986).

Types 1–4 are types of “Norman” shoe, with varying degrees of waviness and different shaped countersinking and nail holes. The sinuous outline is created during the punching of the countersunk depressions. Horseshoes of these types, dated to the eleventh to twelfth centuries, usually have three holes on each branch. From the thirteenth century changes occurred in the method of production, resulting in squared nail holes with no countersinking, Type 5. Sometimes the shoe is fullered, a marginally placed recess through which the nail holes, now occurring in threes and fours per branch, are punched, Type 6.

Calkins are thickened terminals often present on one or both heels of the shoe. They are made during the forging process, by bending down or folding back the end of the branch, and help to prevent slipping. Three types were identified: Type A, a thickened terminal (16); Type B, terminal bent down at right angles (18); Type C the terminal folded twice to form a squared/angular U-shape (14). Twenty-six horseshoes were furnished with calkins, Type A is predominant, 17 examples, and like Type B, with six examples, occurs on shoes dated from the twelfth century through to the probable post-medieval examples. Three examples were found with Type C calkins, one on a shoe of fourteenth-century date and two on unstratified shoes of Type 6, possibly of post-medieval date.

No horseshoes were recovered from pre twelfth-century contexts and only ten from twelfth-century contexts; largely from ditch and mill leat fills, although a single example came from the probable barn S17. These are all

of types 1 and 2. All types, with the exception of Type 6, are represented in medieval contexts of thirteenth to fifteenth-century date with Type 2, with deep oval counter sinking, the most common. There are examples from all tenements, but tenement E produced the largest group, 12, while only three were recovered from tenement C where the yards were only partially investigated. Type 6, occurs only in modern and unstratified contexts.

Illustrated horseshoes (Fig 11.30)

- 12 Type 1 Horseshoe, Fe. Outer edge slightly wavy, nail holes crude and irregular with rectangular countersinking and circular holes.
6194, 5098, clean, LEATS, Ph ??
- 13 Type 2 Horseshoe, Fe. Outer edge wavy, more prominent than before. Deep oval or rectangular countersinking with circular holes. Terminal of shoe (heel) tapered.
1002, 903, floor, AS17, Ph1
- 14 Type 2 Horseshoe, Fe. Calkin Type B.
10210, 6459, layer, EY1, Ph3/2
- 15 Type 3 Horseshoe, Fe. Outer edge wavy (as above). Deep oval or rectangular countersinking with rectangular holes.
6150, 4154, clean, A/E, Ph1–2/2
- 16 Type 4 Horseshoe, Fe. Calkin Type A. Exterior edge of shoe less wavy, rectangular countersinking with rectangular hole. Inner profile of shoe with pointed arch.
1272, 1525, layer, BY4, Ph 2/2
- 17 Type 5 Horseshoe, Fe. Square-shaped nail hole, which is not counter sunk.
343, 262, surface, D11, Ph 5
- 18 Type 6 Horseshoe, Fe. Calkin Type C. Square/rectangular nail holes, usually four on each branch. Often fullered with nail holes in recess.
71, 1, topsoil, MODN

Horseshoe nails (19–23)

Four hundred and eighty-two horseshoe nails were found. On many examples the points were broken off, presumably on removal from the shoe. With the intact nails some were straight, suggesting that they were either unclenched or had not been used, while others were clenched (23). On the basis of the head shape four types were identified: Type 1, fiddle key shaped; Type 2, T-shaped; Type 3, trapezoid and Type 4, square headed. They are comparable with examples found on other sites of the same date range and cover the complete typological and chronological range.

Type 1 is the most common, with 205 examples, and was for use with the earlier types of shoes furnished with rectangular/oval countersinking (Types 1–4). There are two schools of thought as to the origin of Type 2. Sparks (1979, 10) states that the T-shaped nail replaced the fiddle key nail, while both Goodall (1990e, 421) and Clark (1986,

2) suggest that the T-shaped nail is a well worn fiddle key nail. The latter argument may be supported by the presence of T-shaped nails in a Type 2 shoe of later twelfth-century date (13). However, the sharply rectangular heads on some examples do not appear to be merely a product of wear, so perhaps there is truth in both arguments. No nails can be securely dated earlier than the twelfth century. In contexts dated to the twelfth century and unlikely to be subject to

any later contamination, fiddle key type form by far the largest group, while there are small quantities of T-shaped nails and no examples of the other two types.

Nails with trapezoid heads, Type 3, are normally considered to have been in use prior to the appearance of the square headed nail, Type 4. As stated above, neither type appears in secure twelfth-century contexts, while both are present in contexts of thirteenth century and later

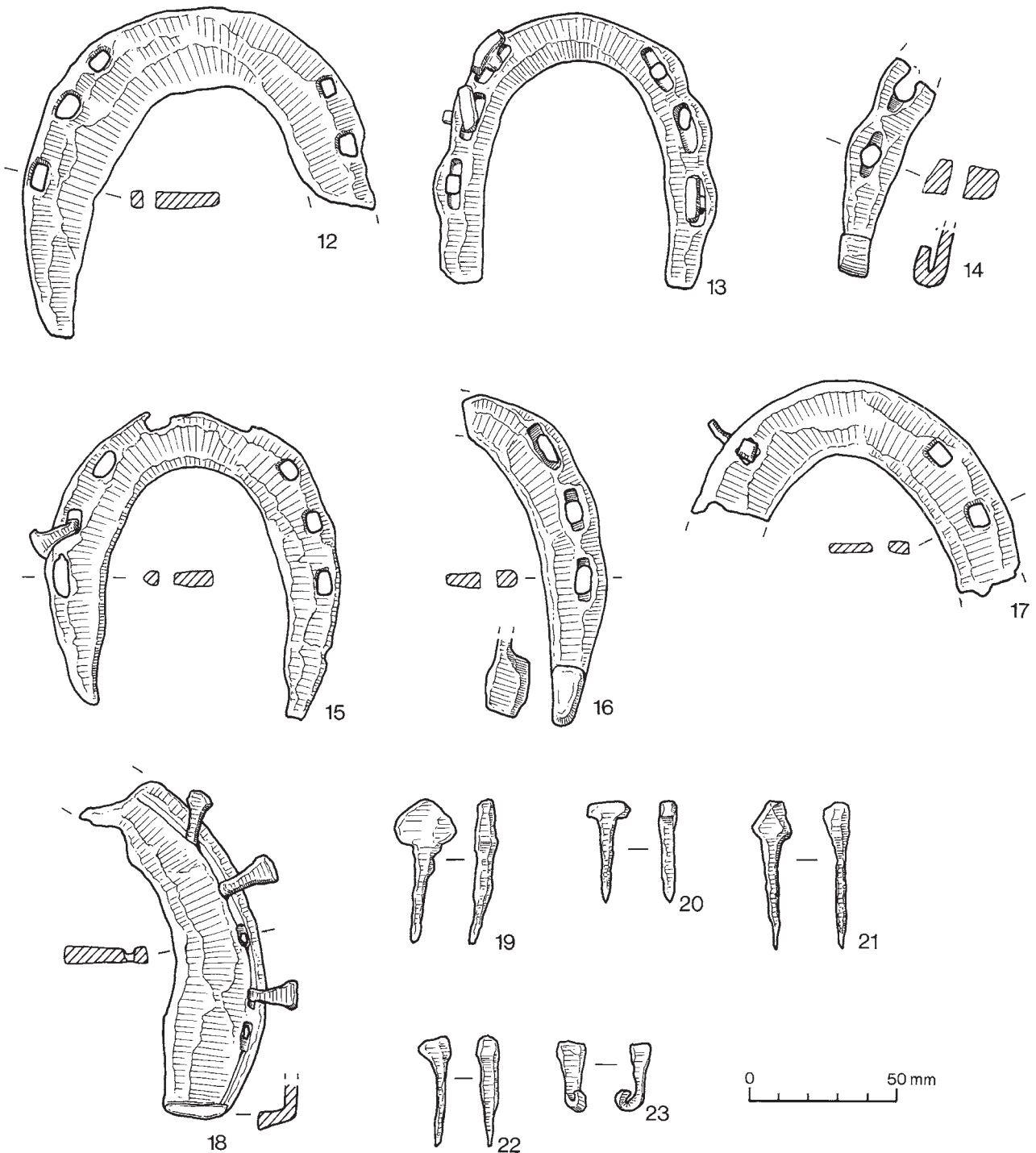


Figure 11.30: Horse furniture: horseshoes (12–18) and horseshoe nails (19–23)

dates. A greater number of Type 3 nails were recovered, 99 as opposed to 58, but this could merely result from a difference in use rather than different dates of introduction. These contexts also produce significant numbers of Types 1 and 2, with fiddle key nails still being the most common. Although this total will include an unknown proportion of residual finds, there is no indication that fiddle key or T-shaped nails had gone out of use, and the same conclusion is suggested by the presence of the early type horseshoes with which they were used in contexts of thirteenth and fourteenth-century date.

Illustrated horseshoe nails (Fig 11.30)

- 19 Type 1 Horseshoe nail, Fe. Fiddle key nail. Semi-circular head with rectangular/square sectioned shank, 211 examples.
10101, 4326, clean, S19, Ph 1–2/0
- 20 Type 2 Horseshoe nail, Fe. T-shaped head. Rectangular-shaped head with rectangular/square-sectioned shank, possibly worn fiddle key nail, 71 examples.
6375, 4165, layer, EY3, Ph 1–2/2
- 21 Type 3 Horseshoe nail, Fe. Trapezoid-shaped head. Head expands towards terminal, rectangular/square sectioned shank, 101 examples.
680, 294, layer, PM1, Ph 4
- 22 Type 4 Horseshoe nail, Fe. Square-shaped head. Wedge-shaped, no collar at junction of head and shaft, 58 examples.
487, 353, ditch fill, PM2, Ph 3/2
- 23 Type 4. Horseshoe nail, Fe, clenched.
735, 350, surface, GREEN, Ph 3/2

Coins by Marion Archibald

Ten coins of late Saxon to medieval date were recovered, although one of these was stolen before it had been cleaned and identified. This small number of medieval coins may be contrasted with the 33 Roman coins recovered as residual finds.

The earlier coins are too few for any inferences to be made from them alone about the *floruit* of the site. The ratio of 2/4 of Short Cross to Long Cross is unusual given the longer duration of Short Cross and the find-pattern familiar from other sites. This suggests that the site may have been more active, at least as far as coin-use was concerned, in the later thirteenth century than in the previous period. Also, the representation of post-1279 medieval coinage is low, just one farthing of Edward I. This would suggest a decline in the wealth of the site or at least in the use of coin on the area covered by the excavation.

Types and inscriptions which are standard are not detailed. Weight and references for modern coins are not quoted. Only for English medieval coins are weights converted into grains (gr).

Late Saxon and medieval coins

Cnut, penny, Pointed Helmet issue, Stamford, moneyer Osward, 1024–30

Obv: +CNVT/REX A:

Rev: +OSPERD MO STAN

Wgt: 1.01g (15.6 gr)

Ref: North I, 787

Although this coin looks fresh and unworn and was probably lost during the issue period, 1024–30, hoards buried at the end of Edward the Confessor's reign show that coins of Cnut still survived in significant numbers, so a deposition later than 1030 is possible.

3218, 1620, layer, BY2, Ph2/2 (1250–1300)

Henry II, cut-halfpenny Cross-and-Crosslets ('Tealby') issue, Thetford, moneyer Siwate, Bust A2 1160

Ref.: +SIWA ()

Wgt: 0.49g (7.5 gr)

Ref: North I, 952

This coin could have been lost at any time from 1160 until the end of the issue in 1180.

410, 495, ditch fill, LSE10, Ph1 (1150–1225)

William I, The Lion, of Scots (1165–1214) penny Short Cross issue, Perth, moneyer Walter, 1180

Obv: +WILEL.MVS REX Bust to left of fine style

Rev: +WATER.ON.PER (N reversely barred)

Wgt: 1.41g (21.7 gr)

Ref: IH Stewart, *The Scottish Coinage* 2nd edn. 1967

This coin is one of the earliest of the issue and could have been lost at any time from 1180 until the end of the issue in 1250, but its unworn and unclipped condition suggests that it was deposited early in the possible bracket, say 1180–1200. Scottish coins circulated freely in England at this time. This is a particularly nice coin.

1094, 1434, fill, A/B, Ph 2/0 (1225–1250)

John, penny Short Cross issue, Class Vb, Winchester (?), moneyer Andreu, 1205–10

Rev: (+)A(N)DREV.ON.(?pin)

Wgt: 1,03g (15.9 gr)

Ref: North I, 970

The moneyer of the coin is certainly Andreu who worked at London and Winchester at this time. If the coin were cleaned the mint reading would probably be clearer, but what is visible suggests PIN rather than LON. This coin could have been lost at any time from 1205 until the end of the issue in 1247. It is unclipped and relatively unworn, so a date earlier rather than later within this bracket is perhaps more likely.

5664, 6121, robber trench fill, E13, Ph3/2 (1300–1400)

Henry III, penny, Long Cross issue, Class IIIa, London, moneyer Nicole, 1250

Rev: NIC/OLE/ONL/VND

Wgt: 1.38g (21.3 gr)

Ref: North I, 986

This coin could have been lost at any time from 1250 until the end of the issue in 1279.

6914, 6438, layer, AY6, Ph3/2 (1300–1400)

Henry III, cut-farthing, Long Cross issue, Class III, unknown mint and moneyer, 1250.

Rev: () ER O (N)

Wgt: 0.31g (4.8 gr)

Ref: North I, 985–8 (details to distinguish sub-type not present)

There are too many moneyers whose name ends in -ER to identify this coin. It could have been lost at any time from 1250 until the end of the issue in 1279.

1064, 1274, clean, AY1/2, Ph??

Henry III, penny, Long Cross issue class Vb. London, moneyer Davi, 1255

Rev: DAVI ON LVN (DEN)

Wgt: 1.48g (22.8 gr, including some corrosion products; bent)

Ref.: North I, 992

This coin could have been lost at any time from 1255 to the end of the issue in 1279.

661, 619, floor, A1/1, Ph3/2 (1300–1400)

Henry III, penny, Long Cross issue, Class Vb, Canterbury, Robert, 1255.

Rev: ROB/ERT/ONC/ANT

Wgt: 1.42g (21.9 gr)

Ref: North I, 992

Deposition date as above.

6018, 6258, layer, AY6, Ph3/2 (1300–1400)

Edward I, farthing; class IV.

Obv: ER ANGLIE

Rev: CIVI/TAS/LON/DON

Wgt: 0.33g (5.1 gr)

Ref: North II, 1054/1

Although relatively unworn, this coin could have survived in circulation for sometime before being deposited. In this condition it was almost certainly deposited before AD 1350 but a later date cannot be ruled out.

766, 757, hearth, A1/3, Ph 3/2 (1300–1400)

Millstones and querns by *Andy Chapman* (Figs 11.31–11.34)

There were 255 recorded finds of millstone and quern fragments with a total weight of 428kg. Pieces from millstones of Millstone Grit form the largest group, approximately three-quarters of the total by number and weight. Most of these, and some additional examples in sandstone and lava, were recovered from contexts directly or closely associated with the watermills and can be dated to the later tenth to early twelfth centuries. A scatter of smaller pieces occurred as residual finds across the entire site and from features of all phases of occupation, but

less frequently towards the eastern side of the site. The smaller quantity of rotary querns has a similar distribution, suggesting that they too were in use in association with the watermills. A few rotary querns were probably in use during later phases of occupation, with most of these related to buildings of probable manorial status.

All large fragments and smaller pieces with diagnostic features were recorded individually, while the quantities of other small pieces from within and around the watermills were grouped by context and 5m grid square. These finds were sub-divided in post-excavation by geological type and sub-type. The recorded finds comprise at least 392 individual fragments ranging in size from substantial parts of single stones to pieces measuring 50mm or less and recognizable only by their distinctive geological types.

For the purpose of analysis and discussion the assemblage is divided into three groups: sandstone millstones, lava millstones and querns. Geological identifications have been provided by Dr Diana Sutherland, who examined a representative sample of the total assemblage. No petrological analysis has been undertaken. Note that where both surfaces of a stone have been illustrated the grinding surface is at the top or to the right.

Sandstone millstones (1–5)

This is by far the largest group, comprising 163 recorded finds, some 277 individual fragments weighing 337kg. Of this total, 229 fragments weighing 260kg was recovered from contexts directly or closely associated with the watermills and it is this group that includes all the joining pieces. The largest and best-preserved stones are those which had been utilised within structural elements of the watermills. In the earliest mill, M27, the larger pieces were recovered from the sluice or chute setting and the clay and stone infilling behind the stake and wattle revetments of the wheel-pit and tail race. They generally lay within the upper part of the filling, indicating that some millstones were discarded during the lifetime of this mill with the pieces incorporated into refurbishment of the revetments. Further pieces were recovered from the metalling of the wheel-pit, but these were typically smaller and water worn. Very few pieces were recovered from the second mill, M26, which had been extensively disturbed by the final mill. In the final mill, M25, the larger pieces were again those that had been incorporated into the wheel-pit revetments. The large quantity of smaller pieces from the final mill came mainly from the accumulated fills of the wheel-pit and tail race following abandonment.

From beyond the mill area pieces were recovered from the fills of the timber slots of several of the early buildings, but these are all probably from the twelfth-century backfilling or subsidence fills following demolition. Further pieces were recovered from the manorial buildings and from tenement E, while smaller quantities were from the tenements further to the east. While many of the smaller pieces from contexts beyond the mill area are certainly residual finds from broken

millstones, some probably derive from querns, but as this is likely to be a small proportion of the total these have all been included with the millstone group.

With the exception of four pieces in fine-grained sandstone, the millstones are all of Millstone Grit, a medium to coarse-grained arkose (feldspar rich) most probably from the Millstone Grit Series of the Northern Midlands, perhaps Derbyshire. Three of the sandstone pieces, probably from a single set of stones, are in fine-grained sandstone possibly from the Northern Midlands Coal Measures. The fourth piece is an unprovenanced, post-cretaceous sandstone; the only millstone that is unlikely to be associated with the excavated watermills.

In order to classify the large quantity of Millstone Grit a three-fold stone type-series was defined: fine, medium and coarse-grained stones. Each type was then sub-divided by the variations in the proportion of the feldspar to quartz mineral inclusions. The coarser-grained stones contained roughly equal proportions of quartz and feldspar inclusions typically 3–5mm in diameter and were pink in colour, due to the feldspar. The finer-grained stones contained largely quartz inclusions of 1–2mm diameter and were white to pale-brown in colour, due to the lower proportion and small size of any feldspar inclusions.

As might be expected, the largest group of material, approximately half the total, lies within the centre of the range; a medium-grained Millstone Grit with quartz and feldspar inclusions typically 2–4mm in diameter. Finer-grained stones form the second largest group, while the coarser-grained stones make-up less than a tenth of the total. Whilst much of the recovered Millstone Grit has a fairly homogeneous matrix, banded examples are not uncommon, with a fine or medium-grain juxtaposed with a band, up to 40mm thick, of exceptionally coarse-grained stone. These bands are generally less well cemented and would probably have been more liable to fracture. In one example the grinding surface is exceptionally coarse-grained but it is possible that this stone was abandoned once a finer-grained surface had been worn away to expose the undesirable coarse-grained band. It is suggested that many of the smaller coarse-grained pieces, which often lack any original surfaces, may derive from such bands within otherwise fine to medium-grained stones.

A number of approaches were used in the analysis of the millstones. The larger fragments enabled a number of distinct stones to be identified, and the entire assemblage was examined to locate any further joining pieces. A few examples were found, but these were all joining pieces from the same or closely associated contexts in the mill area. The individual stones identified within the mill area are all far from complete, typically 5–15% has been recovered with the two most complete stones (3 and 4) amounting to 22% and 40%. This indicates that substantial quantities of broken-up millstones were removed from the mill area, probably for reuse and, as a result, any such pieces cannot now be related to the parent stone or have been lost. With the material from the watermills it was also possible in

some instances to group pieces that did not join but were likely to have been derived from the same stone on the basis of a common geological type and form, closely comparable dimensions, surface treatment or wear pattern and their presence in related contexts. Using these criteria a list of distinct, individual millstones was compiled as an approach to estimating the minimum number of stones represented by the entire assemblage.

For the larger pieces there is little difficulty in identifying upper and lower stones. The upper, or runner, stones have concave grinding surfaces and are thicker at the edge than towards the centre. Conversely, the lower stones, or bedstones, have convex grinding surfaces and are thickest at the centre. The curvature midway between the centre and circumference is often barely perceptible, and the most complete lower stone (4) has a slightly raised central area partially surrounded by a band with a slightly concave grinding surface. As a result of these variations it is often impossible to determine whether pieces with no marked curvature and no identifiable edge or centre are from upper or lower stones.

A total of 14 individual stones in Millstone Grit have been identified; seven upper stones, five lower stones and two indeterminate, indicating the presence of at least seven sets in Millstone Grit. The pieces accounted for within the identified stones have a total weight of 200kg, leaving 100kg of smaller pieces unassigned while a further 55kg of Millstone Grit was recovered as querns, at least some of which were probably fashioned from old millstones, see below. If, as seems likely, the millstones were generally obtained and used as matching sets of upper and lower stones, then it would be expected that a genuine pair would probably have closely similar geologies. Using this assumption, there is one instance of upper and lower stones with closely similar geologies, one of the unassigned stones closely matches an upper stone while the other matches a lower stone; for all others no close match was found. This suggests that while at least seven sets of Millstone Grit stones were brought to the site, matching the geologies indicates that there were perhaps as many as eleven sets.

The four pieces in other sandstones come from only two stones. Two pieces in a probable Northern Midlands Coal Measures sandstone, including a part of a lower stone (5) are from the earliest mill, M27, while a third small piece of the same geological type was recovered as a residual find within tenement D. The fourth piece is a post-cretaceous sandstone, without an identified provenance. It is of particular interest as it comes from a later medieval context in tenement H to the east of the Cotton Lane. This is clearly part of an upper millstone (not illustrated) and is the only piece of this geological type from the site. This appears to be from a millstone that was not in use within the excavated watermills and therefore provides circumstantial evidence supporting the suggestion that tenement I, to the south of tenement H, may have been the location of a watermill in the thirteenth and fourteenth centuries.

From the most complete examples recovered, we can

characterise the typical form of the millstone assembly and the subsequent use and reuse of the stones. The diameters of six upper stones and four lower stones were measurable and these range between 900 and 1100mm, but with seven of the ten examples between 950 and 1000mm. The lower stone in sandstone (5) has the greatest diameter, 1100mm, but in this instance there is a 50mm wide band around the circumference that is only lightly worn, indicating that the upper stone was 1000mm diameter.

Other characteristics are best considered by examining the upper and lower stones separately. The thickest upper stone (1) is 120mm thick, with its concave grinding surface and the upper surface closely parallel. This stone has had little use; there are no tool marks on the medium to coarse-grained grinding surface and although some wear is indicated by the concentric grooving the quartz inclusions are quite angular and have been only lightly worn. It is possible that this represents the initial shaping of the grinding surface, with the stone being abandoned, presumably due to breakage or some other flaw, before the final tooling, or dressing, of the grinding surface. Two of the three joining pieces were reused together within a sluice or chute setting in the earliest mill, M27, while the third piece came from the wheel-pit revetment of the same mill. The edges of the stones were scorched perhaps suggesting that the stone had been broken up by heating and rapid cooling with water.

A fine-grained upper stone which had been well used (2) is 85mm thick at the edge and tapers to a minimum of 60mm, although the central area is missing. The upper surface is near flat and lightly worn while the grinding surface is concave and worn smooth, although there are faint traces of circular tool marks. Around part of the circumference there are shallow, vertical tooled grooves. This is probably fairly typical of a well-used upper stone, and the faint tool marks would suggest that it was abandoned at the point where it would have required re-dressing. Tool marks on the two curving “breaks” indicate that this stone was reused. It is likely that the recovered piece is an off-cut from the preparation of two circular stones of 400–450mm diameter, which were most probably used to form a small rotary quern.

The thinnest upper stone (3) is exceptional as it is the only example with grinding surfaces on both sides. It has an edge thickness of 65mm and tapers to only 32mm before thickening to 45mm immediately inside the central hole, or eye. In this instance there can be no doubt that the use of the stone was taken as far as was physical possible. One surface is worn smooth and has a series of low concentric ridges. The other surface is worn smooth apart from a 90mm wide band at the circumference which is flat, lightly worn and covered with closely-spaced circular or oval tool marks which are probably representative of the typical surface dressing of the stones, see below. The unworn band indicates that this grinding surface was probably used with a lower stone of smaller diameter, and this is perhaps more likely to derive from the second use of the stone. This is

also the only stone with a partially surviving rynd socket. The rynd, probably of iron or steel, would have bridged the eye of the upper stone and enabled it to be hung on the top of the spindle coming up through the central hole in the lower stone. The rectangular rynd socket is 20mm deep and up to 50mm wide, tapering in width towards the centre. The surviving length is 55mm, but originally it may have been some 70–80mm long with the eye around 140mm in diameter. It is closely similar to the rynd sockets on several examples from the mill at Tamworth (Wright 1992, 70–79) but there is no evidence for a sunken inner track, as on some Tamworth examples, and it cannot be determined in this case whether the full rynd arrangement would have been of a two, three or four-winged form. This stone was also reused; both of the broken edges had been smoothed and rounded, probably through use as a sharpening stone.

The most complete example of a lower stone (4) is up to 120mm thick at the centre and 70mm thick at the outer edge. The bottom surface is flat and the grinding surface is slightly convex. This is the only lower stone for which the central hole can be accurately measured, at 140mm diameter. This medium-grained stone had been well used, with the grinding surface exhibiting three distinct tracks of differential wear, indicated by the varying survival of the circular tooling marks, which are typically 10mm in diameter and no more than 3mm deep. There are both inner and outer tracks where the tooling marks are relatively unworn while the middle track is worn smooth, with only sparse and faint tool marks surviving. The inner track is on a raised central dome and around part of its circumference the grinding surface is slightly concave. The extent of these tracks varies considerably as does the profile of the grinding surface, suggesting that the upper stone was not well balanced and was running unevenly.

A further example of a lower stone, not illustrated, was also 120mm thick, although as the central area was missing it would have had a greater maximum thickness. This also had a well-worn grinding surface. The other examples of lower stones were all thinner, 30–40mm at the outer edge and with none more than 75mm thick, although in all cases the central area was missing.

A further lower stone is the single sandstone example from the excavated watermills (5). This fine-grained stone is 98mm thick and, unlike the Millstone Grit examples, the flat bottom surface and the grinding surface are near parallel. The grinding surface has been dressed in the same fashion as those in Millstone Grit, with the raised and lightly-worn outer band covered with closely-spaced tool marks, while faint traces of similar tool marks survive on the heavily worn, almost polished, grinding surface.

From the available evidence it is seen that the probably unused upper stone was 120mm thick while the worn examples were typically from 40–70mm thick, indicating that the upper stones had been used until they were at a half or, exceptionally, a third of their original thickness. The evidence from the lower stones is less clear. They

were certainly well used but there is probably a narrower range of variation in the surviving thickness of the stones. The thickest examples, at 120mm, are closely comparable to the thickest upper stone, but as these are both used they might suggest that the lower stones were originally somewhat thicker than upper stones. There is also a significant difference in the effect of wear on upper and lower stones. The concave grinding surfaces of the upper stones make them thinner, and weaker, at the centre; the very place where the weight is being supported by the rynd. It is probably the threat of structural failure of this part of upper stones that leads to them being discarded, and also results in the lack of centre holes and rynd sockets within the recovered material. For the lower stones, thinning of the outer edge would have posed less threat to their structural integrity.

These conclusions suggest the possibility that the lower stones may have outlived the upper stones. The millstones from Tamworth (Wright 1992, 70) produced five certain upper stones but no certain lower stones. One of the offered explanations of this imbalance was that it might result from the lower stones being significantly thicker than the upper stones, so that several successive upper stones would be used with a single lower stone. However, the millstones from West Cotton do not show such a marked bias between upper and lower stones, 7 to 5 with two indeterminate. The West Cotton material does suggest that lower stones may have been slightly thicker than upper stones when new, but with well-used stones the difference in thickness is probably largely due to the upper stones wearing at a faster rate than the lower stones. Even if the upper stones did become unusable before the lower stones, due to the danger of structural failure around the rynd, it may be that the lower stones were still sufficiently well worn to make it desirable or even essential to replace the entire assembly.

For the most complete millstones it is possible to estimate their full weight. The unused upper stone (1), at 950mm diameter and 120mm thick, would have weighed 159kg (350lb), while the used upper stone (2) weighed 110kg, and the exceptionally thin, double-faced upper stone (3) weighed 68kg. Other upper stones have estimated weights of 84kg, 92kg and 100kg. The most complete lower stone (4) weighed 135kg while thinner examples have been estimated at 101kg and 102kg. The sandstone lower stone may have weighed as much as 175kg, being of a denser stone. From these figures it can be suggested that a set of new stones 900–1000mm in diameter and each around 120mm thick would have weighed between 300–350kg (660–770lb), while a well-used set may have been reduced to a weight of 150–200kg (330–440lb). The single set in sandstone must have weighed in excess of 350kg when new.

As has been noted, the dressing of the grinding surfaces consists of closely-spaced circular or oval hollows. The oval examples actually comprise a circular hollow, 4–6mm in diameter (but enlarged to as much as 10mm by wear)

by up to 5mm deep, with shallower “tails”, up to 10mm long, extending radially either inwards or outwards. On the worn surfaces it is likely that the shallower tails have been totally worn away to leave only shallow circular dimples. The dressed surface facilitates the grinding process while the radial alignment would aid the passage of the grain and flour towards the outer edge of the stone, as an addition to the effect already provided by the inclined surfaces of the lower stones. A pointed implement, a mill pick, must have been used to form the circular hollows, while the “tails” could have been cut with either the same implement or a chisel-ended tool, a mill bick. A single probable example of a mill pick was recovered from the site (Fig 11.24, 11), but this is from a thirteenth-century context in tenement B and may therefore be associated with the postulated medieval mill. The probably unused upper stone is shaped but not dressed and this suggests that at least the dressing was carried out on-site, and it is probable that the final shaping was carried out immediately prior to this. The millstones and querns in Millstone Grit recovered from the twelfth-century mill at Castle Donington, Leicestershire (Clay and Salisbury 1990, 295–298) are closely comparable to those from West Cotton in size and dressing. This group included some dressed but apparently unused millstones, while a number of smaller diameter stones (0.55–0.60m), either for use as rotary querns or as small powered stones, were recovered as roughouts.

Three small pieces of Millstone Grit (not illustrated) have grinding surfaces with parallel linear grooves, stitching, but these are all from a single later medieval building, D11, and may derive from a millstone or quern of fourteenth-century date. On one piece there are two linear grooves, 8mm wide and 45mm apart, formed by intercutting, circular pick marks. On another piece there are two parallel, slightly curving grooves, 10mm wide with 12mm between them, with well worn circular profiles. The third piece is heavily worn but there is a radial pattern comprising two pairs of oppositely curving, parallel grooves flanking a central linear groove. These examples suggest that while no millstones with grooved, or stitched, grinding surfaces were used in the tenth to twelfth-century watermills such stones were in use by the fourteenth century.

Lava millstones (6–7)

There are 55 finds of lava stone, weighing 31.59kg, comprising 30 individual pieces and a further 25 finds comprising small fragments probably from one or more larger pieces which had fragmented either *in situ* or during excavation. Nearly two-fifths of the material, mainly large pieces, came from the early mill, M27, where they occurred within the revetments of the wheel-pit and tail race and in and immediately over the metalling of the first phase wheel-pit. Only a single piece was recovered from a later mill context, so it would appear that lava millstones were only used in the early mill. The scatter of pieces from

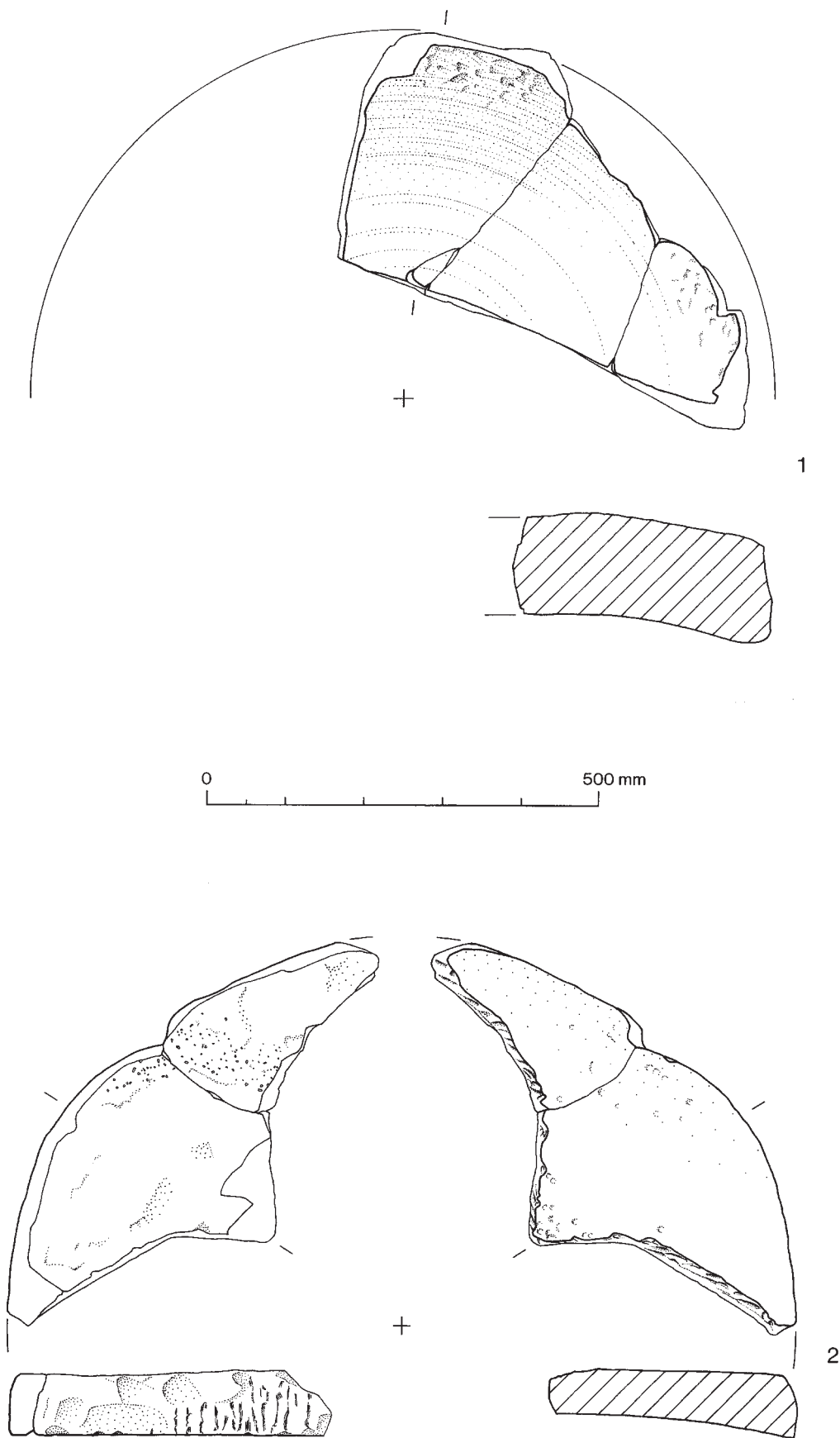


Figure 11.31: Millstones: upper stones in Millstone Grit (1-2)

beyond the mill area largely came from contexts dated no later than the twelfth century, and some of these could be from rotary querns and not millstones. The small quantity of pieces from later contexts are generally small, eroded and probably residual.

The lava is grey and vesicular and is most probably from the Mayen-Niedermendig area of the Eifel, Germany. A useful discussion of possible alternative sources is contained in the Tamworth report (Wright 1992, 72–73).

As a high proportion of the recovered material consists of small eroded pieces without any surviving surfaces, there is a limit to how far the lava millstones may be characterised in terms of size and form. Only six pieces, five lower and one upper stone, retained a sufficient portion of the circumference to enable stone diameters to be estimated, although the short lengths and frequent irregularities make these estimates liable to error, mainly overestimating, by perhaps 50–100mm. Four pieces have diameters of 1000–1200mm while another is 900mm in diameter. The final piece (not illustrated) is only 600mm in diameter and no more than 22mm thick: this is likely to be from a rotary quern and was recovered from a post-pit in the timber hall T29.

It would appear that the lava millstones were of similar diameters to the sandstone millstones. However, it should be noted that these values considerably exceed those for other finds of probable lava millstones, as the Tamworth stones (Wright 1992, 72–77) are only 650–850mm in diameter. There is a suggestion on some stones that the circumference may have comprised a series of flattened facets and this may have resulted in the diameters being overestimated, but many of the pieces from West Cotton are much thicker than the 30–45mm of the Tamworth examples. The lack of any substantially complete stones makes it impossible to resolve this discrepancy.

The single piece certainly from an upper stone (not illustrated) is 85mm thick at the edge and tapers to 70mm thick, and has a well worn, slightly concave grinding surface. Unfortunately, the absence of any central areas of upper stones means that no examples of rynd sockets had survived.

The lower stones vary in thickness at the edge from 26–43mm while the maximum thickness, with one exception, is from 45–85mm. The best-preserved example of the circumference of a lower stone (6) is also the thinnest. On the underside of this stone there is a sub-square socket, 30mm by 25mm and 40mm deep, set 95mm in from the outer edge. It is assumed that this socket would have been located over a peg serving to locate and retain the bottom stone in position. The base of this socket lies only 16–20mm below the grinding surface, indicating that this stone had been utilised to almost the greatest extent possible.

A single piece still retains the central hole or eye (7). This is 130mm in diameter with an uneven and unworn surface. In addition, the base of the stone immediately around the central hole has a raised band or collar, 50mm wide by up to 15mm thick. This is uneven, with the lack of

tool marks indicating that it was either only roughly shaped or had been subsequently damaged. At the collar the stone is up to 115mm thick and immediately outside the collar it is 100mm thick. The remainder of the bottom surface is flat with well defined tool marks. On the grinding surface of this stone a rectangular recess partially survives. This is 90mm long, at least 40mm wide and 15mm deep, with steep sides and a flat base, which are uneven and show no signs of wear. The function of this recess or socket is unclear, as there is little doubt that this is a lower stone. It is possible that the recess belongs to a later reuse of the stone.

In all instances where the original grinding surface has survived, it consists of a heavily worn and smoothed surface interrupted by irregular pits or hollows partly resulting from the vesicular nature of the lava stone and partly from the loss of the mineral inclusions present within the lava. Differential wear is evident on a number of examples, with an outer track either more heavily or less-heavily worn than the remainder. On the less worn areas it is evident that the lava millstones have been dressed in a similar fashion to the sandstone millstones, with closely-spaced, roughly circular hollows up to 60mm in diameter, probably produced with a mill pick. The piece with part of the central hole (7) is the only one showing well developed concentric striations, presumably caused by the presence of fresh cereal grain immediately adjacent to the central hole.

The treatment of the opposing surfaces may also be mentioned. These are typically approximately flat but undulating and uneven with some signs of wear. Frequently there are oval or crescent-shaped depressions, up to 20mm long, where the lava is visibly “crushed”. These appear to have been formed by a chisel-ended implement, a mill pick, perhaps with a curved end, used to roughly work these surfaces to a general level. These tool marks are usually radially aligned but towards the outer edge they are aligned at an oblique angle.

By weighing the largest fragments of lava stone and calculating the proportion of a full stone represented, it is possible to suggest that an average lower stone, 900–1100mm in diameter and on average 64mm thick, would have weighed around 80–85kg, with a pair weighing perhaps 160–170kg. As a result of the lower density of the lava stone, a set would have been about half the weight of a millstone assembly in Millstone Grit. It is the lighter weight of these stones that probably entailed the need for retention sockets on the underside of the lower stones. In addition, the presence of a thicker central collar on one example might suggest that the lower stones were also laid on a supporting bed or seating, perhaps of similar form to the clay seating recovered from the Tamworth mill (Wright 1992, 80–82).

The 31.59kg of lava stone recovered from the site does not even amount to a single stone. However, at least one bottom stone had been broken up and incorporated into revetments and metalling of the early mill, M27, to a total weight of 12kg. In addition, a further group of fragments, with a total weight of 3kg, were found in and around an

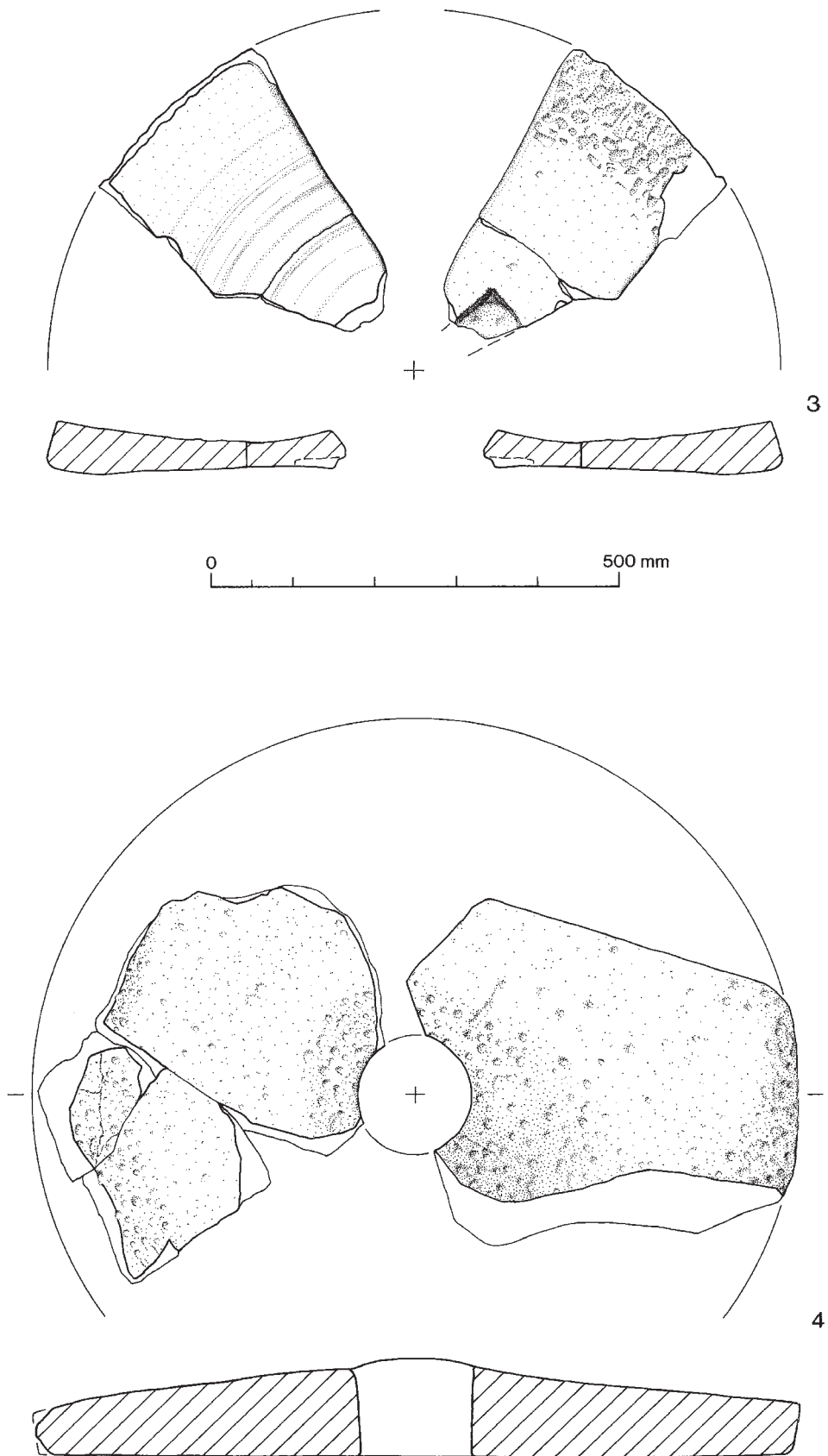


Figure 11.32: Millstones: upper stone with rynd socket (3) and lower stone (4) in Millstone Grit

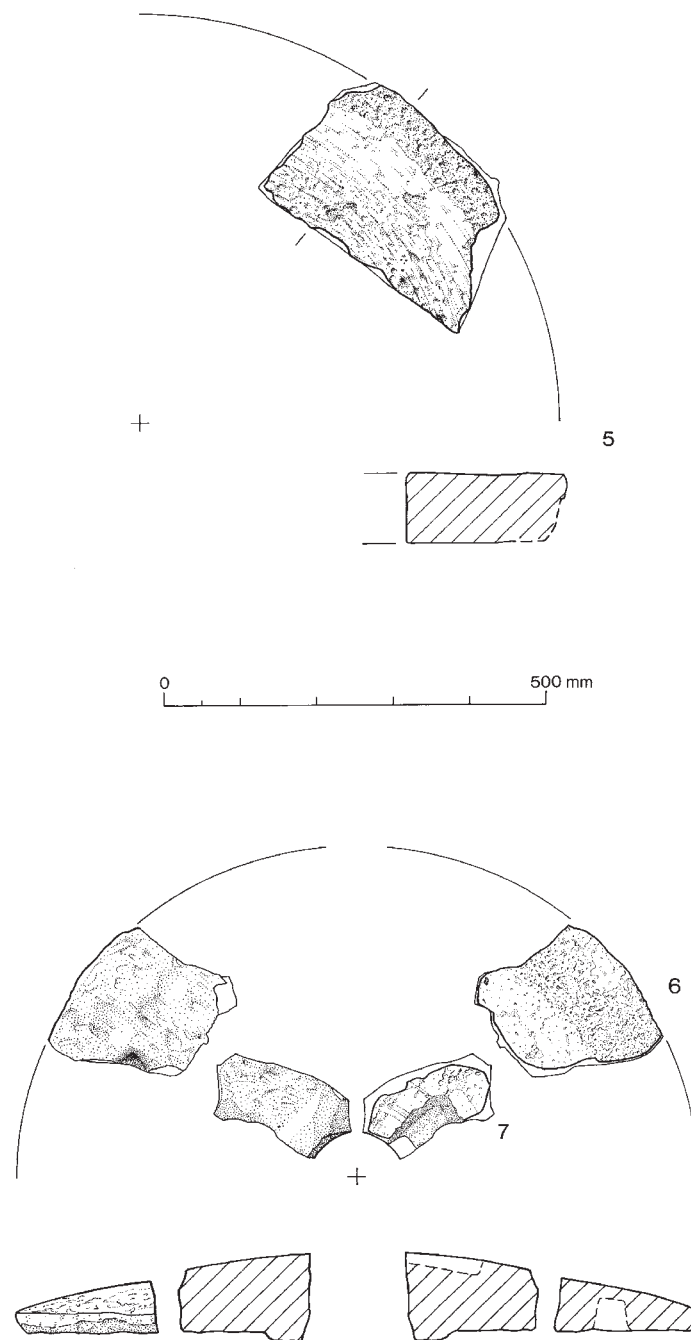


Figure 11.33: Millstones: sandstone lower stone (5) and lava lower stones (6–7)

oven within plot 10 and these could all derive from another stone. It must also be remembered that at least one piece is from a thinner, smaller diameter rotary quern, which was probably imported separately and not fashioned from a reused millstone. The variations in stone thickness within the smaller pieces also suggest that more than one set of stones is represented. As pieces of lava stone fragment more readily than the sandstones, it is impossible to estimate

how much material may have been lost. Certainly far fewer lava millstones were brought to the site than Millstone Grit stones, and they were also only in use in the earliest mill. We are left, at an absolute minimum, with at least a single set of lava millstones in use in the earliest mill, and probably at least one rotary quern, but the diversity of the total assemblage would be better represented by at least two sets of millstones.

Querns (8–11)

A total of 37 finds of certain or probable pieces of rotary quern were recovered, with a total weight of 59kg. In addition there is the probable rotary quern in lava, discussed previously, which is not included in any following quantification. On the basis of joining pieces and pieces with closely similar forms and geologies, these finds may represent no more than 24 or 25 separate stones and probably even fewer complete querns. Thirteen were recovered from the watermill area and so would have been in use at this time and probably within the mill buildings themselves. A single piece of rotary quern came from a building contemporary with the use of the watermills, and had been used as part of the packing of a post-pit in the timber hall, T29. However, this is the only piece of a conglomerate quern recovered from the site and it could be a residual piece of Romano-British date.

All but two stones are in Millstone Grit closely comparable to that used for the millstones, and it is likely that at least some were fashioned from old millstones, while a stone in biotite granite and a stone in a fine-grained sandstone are both from later medieval contexts away from the mill area.

A number of criteria were used to identify querns. The most complete examples are defined by a combination of their small diameters, small central holes or eyes and the presence of handle or retention sockets. In addition, the majority are thin, 20–50mm, with closely parallel faces, and grinding surfaces that are quite level in comparison to the millstones. Three examples are at the other extreme and have steeply-angled, domed, grinding surfaces, steeper than the millstones. These are from contexts post-dating the abandonment of the watermills. For the smaller pieces their identification as querns is based on perhaps only one or two of these criteria, leaving some room for misidentification. In addition, it is likely that some small pieces grouped with the millstones are in fact from querns.

The frequent presence of handle sockets indicates that most of these smaller diameter stones were from hand-turned rotary querns, and not merely small diameter powered millstones. The handle sockets are typically circular or oval, 25–40mm in diameter by 25–40mm deep. They are set some 70mm in from the circumference. The two examples of rynd sockets on upper stones (9 and NI) are square or rectangular, 30–36mm wide by 20mm long and 10mm deep. The measurable central holes of flat querns range from a spindle hole on a lower stone (10) only 16mm in diameter to central holes on upper stones of 30–80mm diameter (NI and 8). Retention sockets, generally of similar sizes to the handle sockets, were found on the underside of some lower stones (11).

Approximate diameters are measurable for 14 examples and range between 300mm and 600mm. The majority of the 11 measurable flat querns are 400–450mm in diameter, but there are isolated examples at 500, 540 and 600mm. Within the 400–450mm diameter range it would have been possible

to fashion them from old millstones, as suggested for millstone (2). However, for the larger diameter examples, including the most complete upper stone (8), it is likely that they were fashioned from blanks specially imported, and the importation of at least one quern is demonstrated by the example in granite. A general distinction between imported stones and those fashioned from old millstones may be indicated by the thickness of the stones and the nature of the non-grinding surface. The thinner examples, 50mm or less, have a non-grinding surface that is quite level and closely parallel to the grinding surface while the thicker stones, 50–70mm (such as 9), have an uneven and irregular non-grinding surface indicating that little attempt was made to bring them more than roughly parallel with the grinding surface. It is suggested that it is likely that these thicker, uneven stones are those most likely to have been fashioned from reused millstones. At least five stones of this form are represented in the total of 24 stones and all of these are from the mill area.

The grinding surfaces of the querns are typically worn smooth, but on a few examples there are faint indications of circular hollows suggesting that at least some had been dressed in a similar fashion to the millstones.

Of the querns from later medieval contexts, two from tenement E can be matched, and in one case joined, with stones from the mill area, indicating that they are residual in these contexts. Of the nine or ten rotary querns represented only by pieces from twelfth to fourteenth-century contexts, it is possible that some may be residual finds from the mill area, especially as four of the nine are from tenement E, which was closest to the mill area. However, this still leaves a small group in Millstone Grit and two in other stone types that are probably contemporary with the structures in which they were found, and indicative of a limited use of rotary querns following the abandonment of the watermills.

An upper stone in Millstone Grit was utilised as a hearth base in the final floor of the manorial hall, S18, and the most complete upper stone (8), also in Millstone Grit, was from a floor in the manorial processing room, AS17/2. An upper stone in fine-grained sandstone and with a steeply-angled grinding surface came from the malt house of tenement C, and at 300mm diameter this is the smallest stone recovered. In tenement B, a near complete lower stone in Millstone Grit (10) had been used as part of the surfacing of a stone-lined trough in the processing room, B5/1, and three pieces from a probable upper stone were recovered from the same room.

The two examples of domed lower stones in Millstone Grit are of interest as no clearly similar stones were recovered in association with the mills. Two pieces, probably from the same lower stone, were recovered from a yard from tenement A, while part of another, similar lower stone (11) came from a hearth base within the kitchen of tenement E, E13/2. This example is 540mm in diameter and between 45 and 90mm thick. The central hole is 120mm in diameter and there is a retention socket on the base of the stone. It is possible that this form of rotary quern was

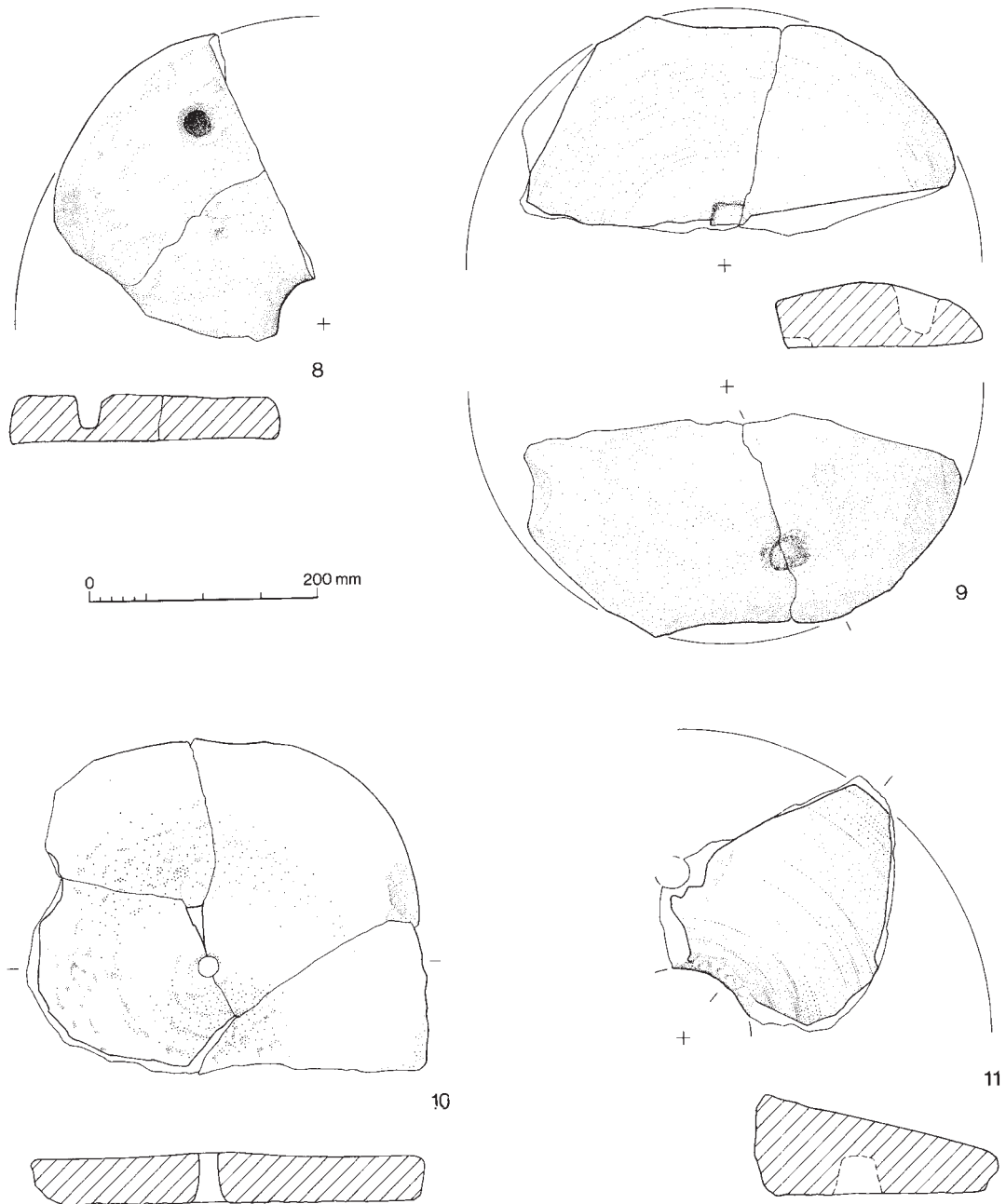


Figure 11.34: Querns: upper stones with handle sockets (8–9) and lower stones (10–11) in Millstone Grit

only in use following the abandonment of the mills. An upper stone from a similar quern, but in sandstone, from the malt house of tenement C has already been noted. One possibility is that these might have been used for the milling of malt, rather than the milling of grain for flour.

With the exception of the domed quern from tenement E, the other examples are from buildings possibly belonging to manorial holdings: the hall, S18; processing room, AS17/2; the malt house of tenement C and the processing room of

tenement B. There is therefore no unequivocal evidence for hand-milling being carried out by peasant tenants, although a settlement producing quantities of millstone and quern pieces as residual finds is not the ideal place to seek such evidence.

Illustrated millstones and querns (Figs 11.31 to 11.34)

- 1 Millstone, upper; Millstone Grit. D: 950mm, T: 120mm

- 10751:10763, 7227:7362, slot/slot, M27, PhLS3/1
- 2 Millstone, upper; Millstone Grit (see Fig 6.27). D: 1000mm, T: 60–85mm
10623:10680, 5590:7145, leat/layer, PDL:M26, PhLS3/2
- 3 Millstone, upper; Millstone Grit (see Fig 6.26). D: 900mm, T: 32–60mm
10652:10890, 7088:6645, fill/fill, M25, Ph0
- 4 Millstone, lower; Millstone Grit (See Fig 6.28). D: 940mm, T: 70–120mm
10344:10388:10391, 6645:6710, fill/fill, M25, Ph0
- 5 Millstone, lower; sandstone. D: 1100mm, T: 95–98mm
10729, 7245, stone-lined pit, M27, Ph LS3/1
- 6 Millstone, lower; lava (See Fig 6.29)
10721, 7231, fill, M27, PhLS3/1
- 7 Millstone, lower; lava
10771, 7311, fill, M27, PhLS3/1
- 8 Rotary quern, upper; Millstone Grit. D: 540mm, T: 43mm
1072, 1263, floor, S17/2, Ph2/0
- 9 Rotary quern, upper; Millstone Grit. D: 450mm, T: 42–68mm
6863:10719, 4237:7178, layer/fill, EY3:M26, Ph2/0–3/2:PhLS3/2
- 10 Rotary quern, lower; Millstone Grit, D: 420mm, T: 49mm
3282, 1571, stone-lined pit, B5/1, Ph2/0–2/2
- 11 Rotary quern, “domed” lower; Millstone Grit, D: 540mm, T: 45–90mm
6744, 6236, hearth, E13/2, Ph3/2

Wood (Figs 11.35 to 11.37)

Structural timbers (1–4)

Small quantities of wood, either well-preserved or semi-decayed and fragmented, were recovered from both the palaeochannel and the watermills.

A number of stakes (NI) made from timbers that were apparently unworked (some still had the bark intact) apart from the cut facets forming the tapered, sharpened ends, were recovered from the palaeochannel. Two have been radiocarbon dated to the eighth century.

Very little wood was recovered from the early watermill, M27. A single, largely decayed, oak stake (NI) came from a sluice gate posthole while the stakes and wattles of the wheel-pit revetments were, with one exception, too decayed to recover. The only wood recovered from the second mill was some displaced timbers in the final fills (3). These could be contemporary with this mill, but disturbed by later activity, or they could be derived from disturbances contemporary with the use or abandonment of the final mill. The wheel-pit of the final mill, M25, produced the largest quantity of wood (1, 2, 4), all of oak. However, although much of this must originally have been either cleft or sawn with further working to finish them, such as the cutting of the mortice holes in the sill beam and the trimming of the stakes, the surfaces were all in poor condition, soft, eroded and decaying, so that any original cutting or saw marks had been lost.

The major structural timber recovered was an *in situ* sill beam formed from a cleft oak trunk or branch (1). The bark was still attached when it was placed *in situ*, cleft face uppermost, but had subsequently fallen away. One end was cut square and it is likely that the same was true for the other

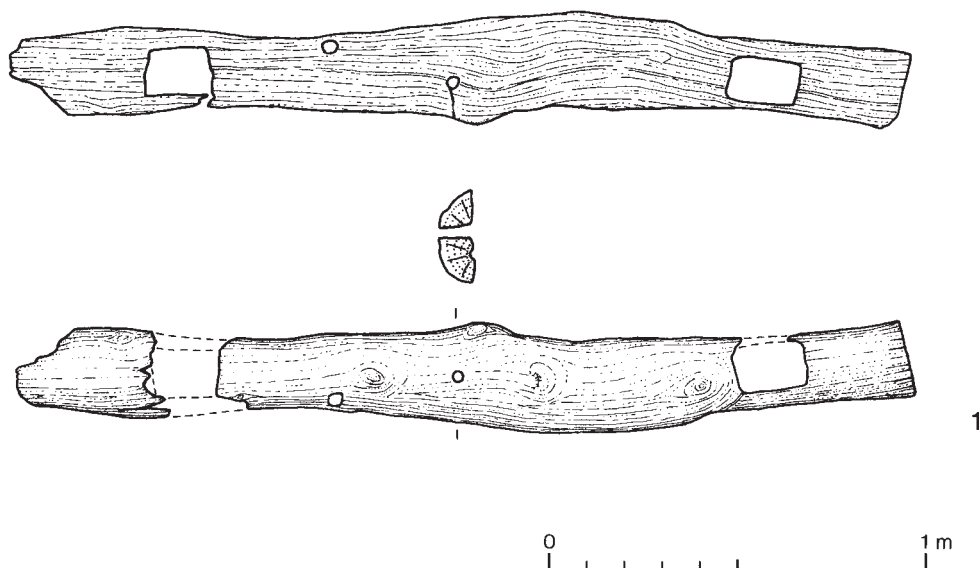


Figure 11.35: Structural timbers: oak sill beam from third watermill (1)

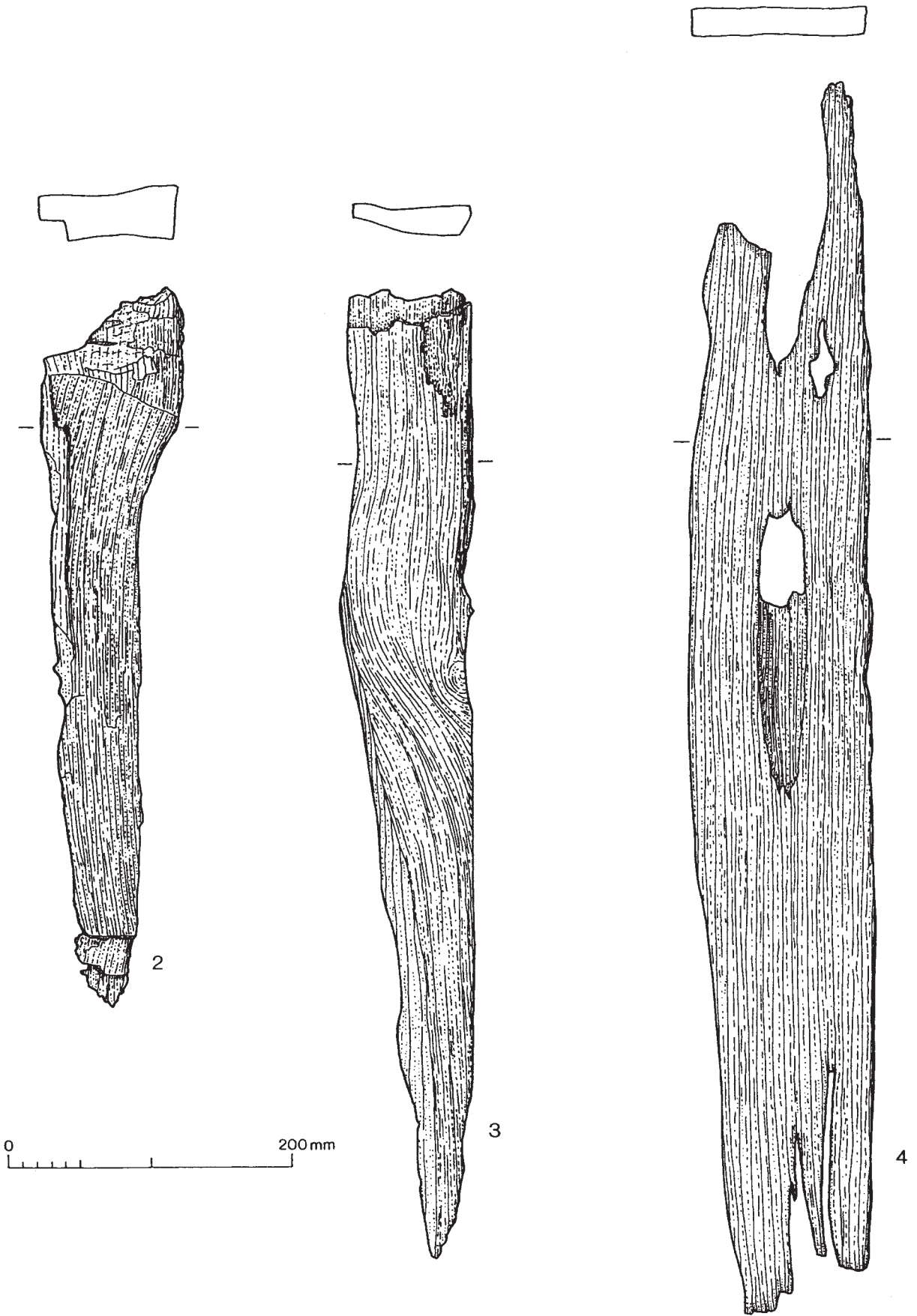


Figure 11.36: Structural timbers from watermills, oak posts (2–3) and plank (4)

end, although this was too decayed to be certain. Towards either end it was perforated by rectangular mortice holes, each 170mm long by 130mm wide, and set 1.33m apart and 0.3–0.4m from the ends. In addition, it was perforated by two drilled or bored holes, 30mm and 35mm in diameter. It was not possible to obtain a date by dendrochronology as the timber contained a sequence of only 43 rings (Sample WC144, Groves 1989), however, it produced a calibrated radiocarbon date of 990–1220 cal AD (95% confidence; 941+/-53 BP; UB3325). This beam formed the head sill of a square wheel house and it is likely that the other half of the cleft trunk had formed the tail sill.

A large part of an oak trunk or branch (NI), 1.20m long by up to 0.23m in diameter, was recovered from the wheel-pit revetment but showed no indications of having been worked. This too did not produce a dendrochronological date, even though it possessed 84 rings (Sample WC141, Groves 1989), but was radiocarbon dated to 880–1020 cal AD (95% confidence, 1086+/-29 BP, UB3326).

A single oak post (2) was recovered *in situ* within a sluice gate post-pit, although it was a subsidiary post, not the main post. It had a rectangular section gradually tapering to a squarer-sectioned and damaged point. Another similar oak post (3) was recovered loose within the final fills of the sluice area of the second phase mill, M26. The disturbed contexts in this area left it unclear whether this was related to the second or third mill structure. These posts were 90–100mm wide by 35–40mm thick. The tapered ends were 400–450mm long, while the decayed upper ends leave the original lengths of the upstanding posts unknown.

From the lower fills of the final wheel-pit there was a considerable quantity of small displaced wood pieces largely derived from rectangular-sectioned planks or posts and other even smaller wood fragments. Among these

there was a single substantial length of a rectangular-sectioned oak plank (4). Despite being partially decayed, the surviving width and thickness, 128mm by 32mm, are probably close to the original dimensions. The decayed ends leave it uncertain whether the surviving length of 870mm is close to the original length. It is possible that this piece is indicative of the planking used to form the walls and floors of the wheel house. The recovered timbers, including the many smaller pieces, were of oak indicating that at least the lower wheel house structure and probably the sluice gate posts, were primarily constructed in oak.

Illustrated mill timbers (Figs 11.35 and 11.36)

- 1 Sill beam; oak (*Quercus* sp.), cleft trunk. L: 2.39m, W: 270mm, T: 170mm
9071, 6644, wheel house: *in situ*, M25, Ph0
- 2 Post; oak (*Quercus* sp.). L: 0.51m, W: 100mm, T: 40mm
9075, 6691, sluice: *in situ*, M25, Ph0
- 3 Post; oak (*Quercus* sp.). L: 0.685m, W: 90mm, T: 35mm
9070, 6709, leat fills, M25/M26, Ph0?
- 4 Plank; oak (*Quercus* sp.). L: 0.87m, W: 128mm, T: 32mm
9077, 6690, wheel house fills, M25, Ph0

Miscellaneous object (5)

A single worked wooden object was recovered from the lower fills of the earliest mill pond at the junction with the mill leat. It is most likely that it was intended to be threaded onto a rope rather than a wooden haft, and may have been a net float, perhaps from fish nets set across the end of the mill pond. Alternatively, it could be from rope tackle, perhaps used for moving millstones.

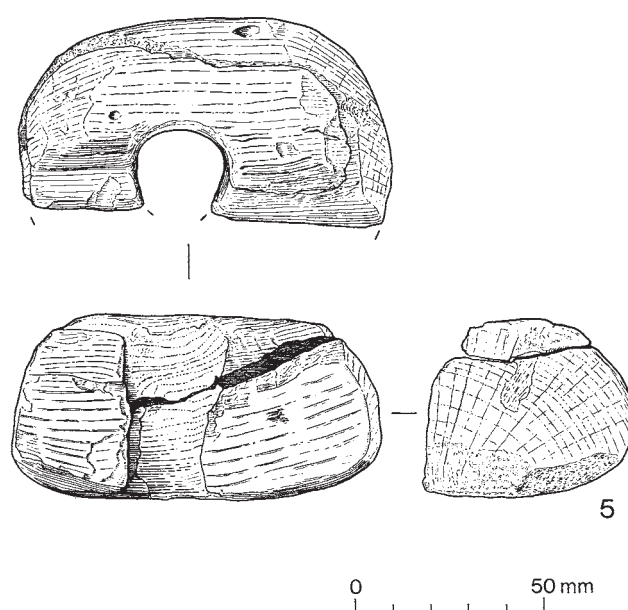


Figure 11.37: Miscellaneous wood, oak net float or tackle block (5)

Illustrated possible net float (Fig 11.37)

- 5 Net Float? oak (*Quercus* sp.). Rounded, sub-rectangular wooden block with a drilled hole, 25mm diameter. Steve Allen comments: that the object shows no sign of having been used as a hammer or mallet, and the block would have split into two had it been so used. Similar objects from Westgate Street, Gloucester (Morris 1979, 200 and fig 12, 12) and All Saints, Kings Lynn (Carter 1977, 370 and fig 172, 650) are identified as “rope woods”, although it could be a float from a fishing net (Steane and Foreman 1989, 172). L: 100mm, W: 55mm (incomplete) est. *c* 85mm, T: 48mm 10701, 5622, PDL, Ph LS2?

Glass

Thirty-four fragments of glass were retrieved, although twelve were either unstratified or from contexts no earlier in date than the fifteenth century.

All are small, the largest being only 40mm long while most measure 10–30mm. They range in thickness from less than 1mm to a vessel fragment 4mm thick. The presence of distinct rims, necks, bases or curved body sherds identifies 19 pieces as vessel glass. There are eight fragments of sheet glass, at least some of which may also derive from vessels. The majority of the glass is transparent and pale green or blue-green in colour. There are two pieces of blue vessel glass and four pieces of sheet glass, one of which is dark and opaque, having decayed surfaces typical of potash glass. These latter pieces are all unstratified or from contexts dated to the fifteenth century or later. The remaining pieces are all unidentifiable fragments. At least two fragments of vessel glass are of Romano-British vessel forms and it is possible that other pieces are also of this date.

Few conclusions can be drawn from this sparse assemblage. It is likely that some fragments derive from medieval glass vessels, while the few likely pieces of medieval window glass cannot be dated earlier than the fifteenth century. They therefore provide no evidence for glazed windows within the excavated tenements, although they might suggest that there were glazed windows in the tenements further to the east, at least one of which is likely to have been in use into the sixteenth century.

Lead

Twenty-nine lead alloy items were retrieved. A spindle whorl has already been considered (see Tools; textile working), and of the remaining 28 items only one can be positively identified, a 72mm length of window came (NI) from fourteenth to fifteenth-century demolition rubble within tenement A. It could suggest that at least one building had a glazed window although, as has been suggested for the few pieces of probable window glass, this may have been a tenement further to the east in use in the fifteenth to sixteenth centuries.

A single square piece of lead sheet, from a fourteenth-century context, has two circular perforations, and is a fitting or mount; while a disc 19mm in diameter and decorated with an incised cross-hatch motif was recovered from the final, late twelfth-century metalling in front of the hall, S18. The remaining items are unidentifiable and comprise pieces of thin strips and sheets and some rods, many of which appear to be offcuts, while there are a few amorphous lumps. They occur in contexts from the twelfth century onwards, with 12 of the total of 29 pieces either from the manorial buildings, S18–S22, or the overlying medieval tenement, E. This may suggest a greater use of lead in association with the twelfth-century buildings.

Miscellaneous and unidentified finds**(Figs 11.38–11.41: 1–24)**

It was not possible to classify all artefacts by functional category. Inevitably, some are too fragmentary to identify while for others their usage is uncertain or unknown.

Miscellaneous copper alloy (1–9)

There are 59 miscellaneous copper alloy objects. These are mainly small fragments of rod, wire, strips and sheet. Of the remainder nine have been chosen for illustration; a late Saxon mount, four other mounts/fittings, three balance pans and a hook possibly for use with a set of scales.

Illustrated stirrup-strap cover (Fig 11.38)

- 1 Stirrup-strap mount, AE. Cast, with a symmetrical, pierced open-work design in the form of animal heads in high relief. The attachment plate is pierced for two rivets, the rounded terminal has a single perforation and the surfaces are stained with iron. Animal heads with protruding spherical eyes, upstanding ears and flattened snouts, project from each side. When reversed, these heads form the ears of a much larger zoomorphic ornament. The raised central motif depicts another pair of protruding eyes and a flat-ended snout embellished with curved grooves which accentuate the facial features. The linear grooved ornament radiating from behind the ears possibly symbolises the pelt.

This mount has been published as part of the corpus of late Saxon stirrup-strap mounts (Williams 1997, fig 58, 442). Typologically, it falls within Class B, Type 2, Group 6, as a zoomorphic sub-rectangular mount. The closest parallel is an incomplete example from Jevington, near Eastbourne, East Sussex (Williams 1997, fig 58, 441).

Mounts of this type would have been placed at the junction of the stirrup and stirrup leather, and are attached by a single rivet at one end and two above the flange. They date to the eleventh century.

1839, U/S, Metal detector find

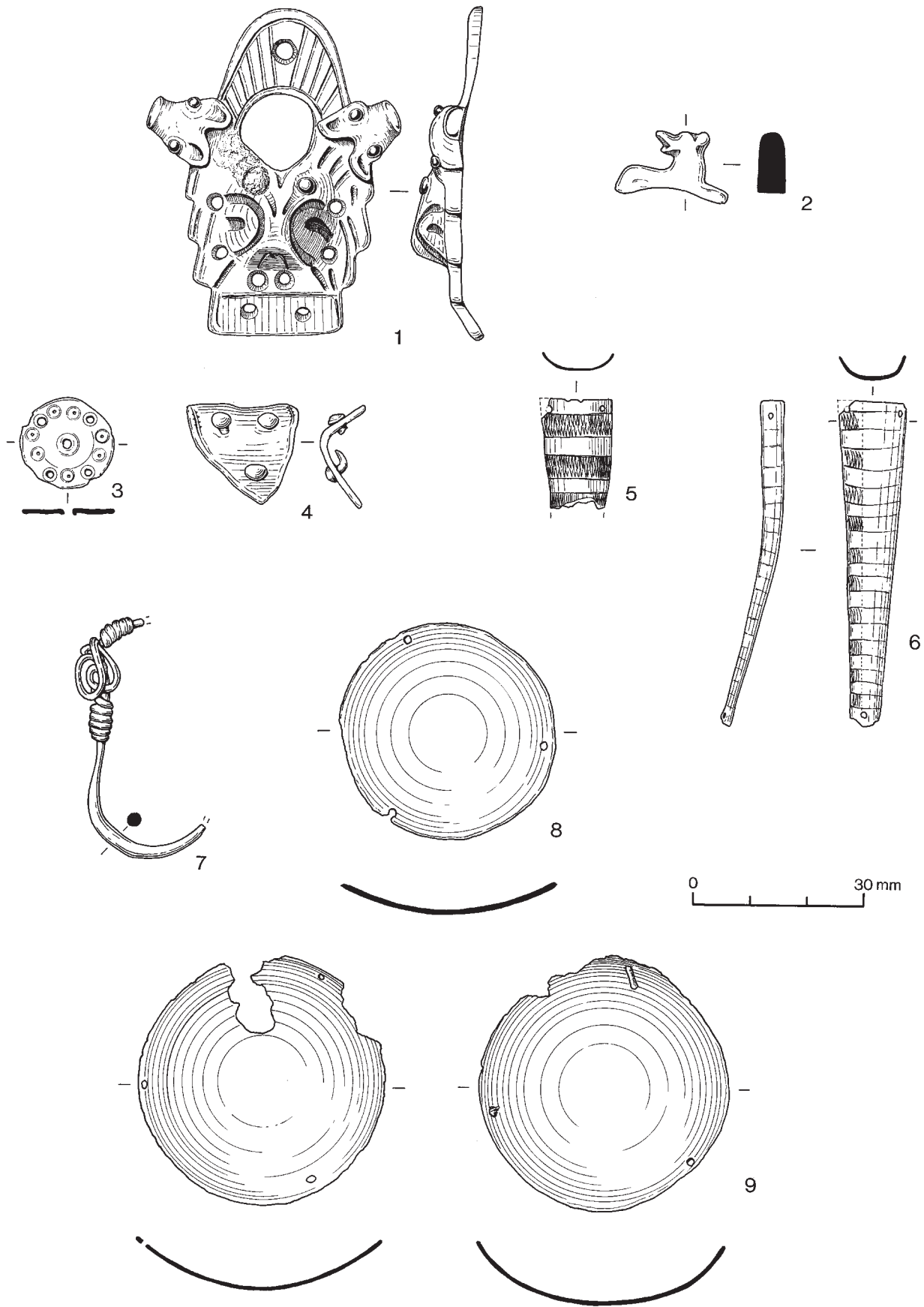


Figure 11.38: Miscellaneous finds: copper alloy; mounts (1-6), hook (from balance pans?) (7), and balance pans (8-9)

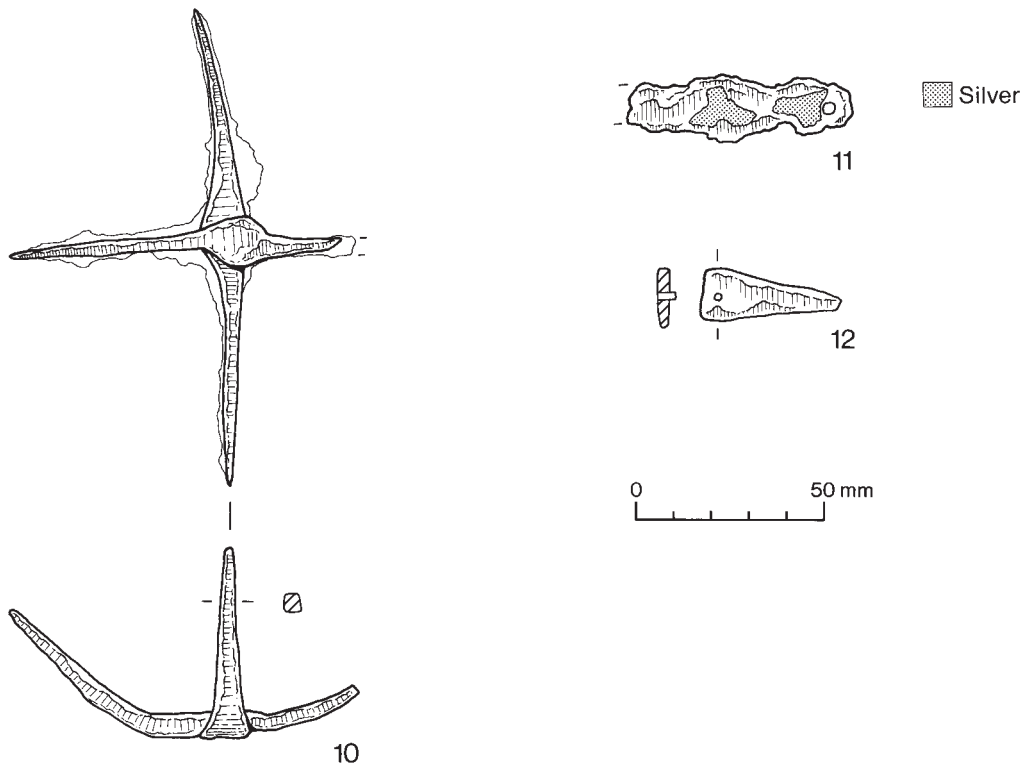


Figure 11.39: Miscellaneous iron finds: candlestick/pricket? (10), fittings with inlaid silver (11) and tin coating (12)

Illustrated copper alloy objects (Fig 11.38)

- 2 Mount, AE. Cast decorative fitting in the form of an animal (hound?) sitting sphinx like. The head is turned at an angle of 90degrees, facing rearward. Ears protrude and a snout points upwards, a small moulding beneath gives the impression of an open mouth. The underside is convex and retains the remains of a lead/tin alloy solder. L: 9.5mm, H: 13mm
10313, 6603, fill, M25, Ph0
- 3 Fitting, AE. Disc with central perforation, ornamented with ring-and-dots motifs. D: 16mm
5343, 6123, robber trench fill, E13, Ph3/2
- 4 Fitting, AE. Gilded (mercury). Curved plate, shield shaped, pierced by three dome-headed rivets and decorated with two rows of opposing triangles round outer edge.
6745, 6344, yard surface, EY1, Ph3/2
- 5/6 Mounts, Ae. Concave sheets, tapered with two rivet holes marginally placed at the broader terminal and, (6), a single rivet at the other terminal. The exterior surfaces are decorated with regularly-spaced transverse grooves creating a series of panels alternately tinned and decorated with a punched zigzag motif, only partially revealed by cleaning on (6). The underside is tinned and contains a higher percentage of tin than the front, which contains more lead. L: 20mm (incomplete), W: 13mm and L: 57mm, W: 14mm.
416/1118, 577/650, rubble, BY5/BY4, Ph2/2 and Ph3/2
- 7 Fitting, Ae. Irregular-sectioned hook attached to the vestige of another by a complex double-looped terminal. Possibly from a set of balances.
707, 734, floor, A1/1, Ph2/0
- 8 Balance pan, Ae. Concave disc of sheet metal, with three equidistant perforations round the edge. D: 48mm, Depth: 5mm
10244, 4163, yard surface, SY1, Ph0–3/2
- 9 Balance pans. Two concave discs of sheet metal, each with three equidistant perforations round the edge. Two holes still retain short lengths of the original knotted threads of bast fibres (G Edwards pers comm). D: 43mm, Depth: 9mm
1206, 2002, pit fill, APITS, Ph1?

Miscellaneous iron (10–12)

The 230 objects comprise miscellaneous pieces of sheet, strip, rods and minuscule fragments, while some are too corroded to be identified. Only three objects were deemed worthy of illustration, a four-pronged object and two fittings with non-ferrous coatings, see Neimeyer below.

Illustrated iron objects (Fig 11.39)

- 10 Pronged fitting, Fe. Possibly base of candlestick/pricket.
1274, 1525, layer, BY4, Ph2/2
- 11 Fitting, Fe. Incomplete, one terminal missing. Decorative strap with expanded central section and perforated terminal lobe. Upper surface decorated with an inlaid sheet of silver. L: 56mm
454, 597, rubble, B4, Ph2/0
- 12 Fitting, Fe coated with pure tin. Flat-sectioned triangular plate, pierced by a ferrous metal rivet. L: 35mm
6889, 4248, wall, EY3, Ph2/2

Miscellaneous bone and antler (13–20)

There are 20 miscellaneous bone artefacts and seven of antler. The presence of two bone offcuts and four antler tines with chopped terminals indicate that some level of bone and antler working took place on-site, most probably single items required as fittings or tools. The bones utilised have been identified as sheep and pig, possibly signifying that use was made of waste readily available in the settlement, while horse bone and both red and roe deer antlers are also represented.

There are five perforated pig metapodial bones (13–15), which have already been discussed as “buzz-bones” by Lawson in the section on musical instruments.

A small globular fitting with a central perforation (16), is lathe turned and has a flat, sawn?, base flanked by two fine concentric grooves. A broader groove on the upper surface encircles the perforation. The surface is highly polished. It may well have formed a decorative pommel or terminal.

A laterally perforated and trimmed length of equine metapodia (17), is of unknown use, but it has been suggested that it may have been a large securing toggle (A MacGregor pers comm).

Two perforated pieces formed from an antler burr (19), with the cancellous tissue removed, and a section of antler beam (20), may have been used as soft hammers. The sides of the first piece are worn and it has been suggested that it might have served as an anvil against which some material was hammered (A MacGregor pers comm). Both terminals of the second piece are abraded and burred.

Illustrated “buzz-bones” (Fig 11.40)

- 13 “Buzz-bone”, pig metacarpal. Perforated, no signs of wear. Ends knife trimmed to remove sharp edges and protrusions. L: 59mm
718, 449, layer, AY1, Ph 4–5
- 14 “Buzz-bone”, pig metacarpal. Identical to (13). L: 59mm
6909, 6127, rubble, EY3, Ph 2/2
- 15 “Buzz-bone”, pig metapodial. Perforated. Terminals trimmed to remove protrusions, cancellous tissue visible. Transverse incisions on shaft probably butchery marks. L: 61mm 10737, 7233, fill, M27, Ph LS2

Illustrated miscellaneous bone and antler (Fig 11.40)

- 16 Bone. Hemispherical, with central perforation, and ornamented with incised concentric rings. D: 21mm, H: 13mm
1070, 1315, pit fill, DY1, Ph 2/0
- 17 Horse metapodial. Perforated through distal end.
1089, 1342, pit fill, APITS, Ph 1
- 18 Antler tine (roe deer). Waisted just below cut end, possibly used as a peg. L: 172mm
5222, 4026, pit fill, LSE5, Ph 1
- 19 Antler burr (red deer). Beam cut open from the bezel to the burr, the edges trimmed and all cancellous tissue removed. Perforated, with edges worn through use. Ridges on surfaces trimmed and wear apparent on all edges.
1004, 902, ditch fill, LSD13, Ph 0
- 20 Antler beam (red deer). Circular perforation, tapered and passes through the point where the trez tine has been removed. L: 76mm, W: 66mm
10641, 7079, fill, M25, Ph 0

Miscellaneous pottery (21–23)

There are three shell tempered sherds ornamented with scratched or incised lines on the interior surfaces. Two pieces, a body sherd (21) and a base sherd (22), are ornamented with scratched, irregularly-spaced parallel lines, forming a chequerboard effect, and the former also has three irregularly-spaced perforations, drilled from both sides, and one small incomplete perforation.

The third piece (23) is a St Neots ware sherd from a shallow bowl or dish, which has been carefully trimmed and pared to shape, and then embellished with a symmetrical motif. The motif is centred on a deep conical depression with four linear incisions (three extant) radiating from it. From each line pairs of curving incisions branch off obliquely, and sets of four shallow, conical depressions were bored in each of the open quadrants. The significance of the symmetrical design and the function of the piece is unknown.

Illustrated reused pottery sherds (Fig 11.41)

- 21 Sherd (shelly ware). Ornamented with scratched cross-hatched motif.
10919, 1696, ditch fill, LSD14, Ph 1
- 22 Sherd (shelly ware). Interior surface decorated with incised linear motif and circular perforations.
10920, 1570, stone-lined pit, B5/1, Ph 2/2
- 23 Sherd (St Neots ware). Rim sherd, internal surface ornamented with a linear motif.
10411, 4478, floor, S19/1, Ph 1

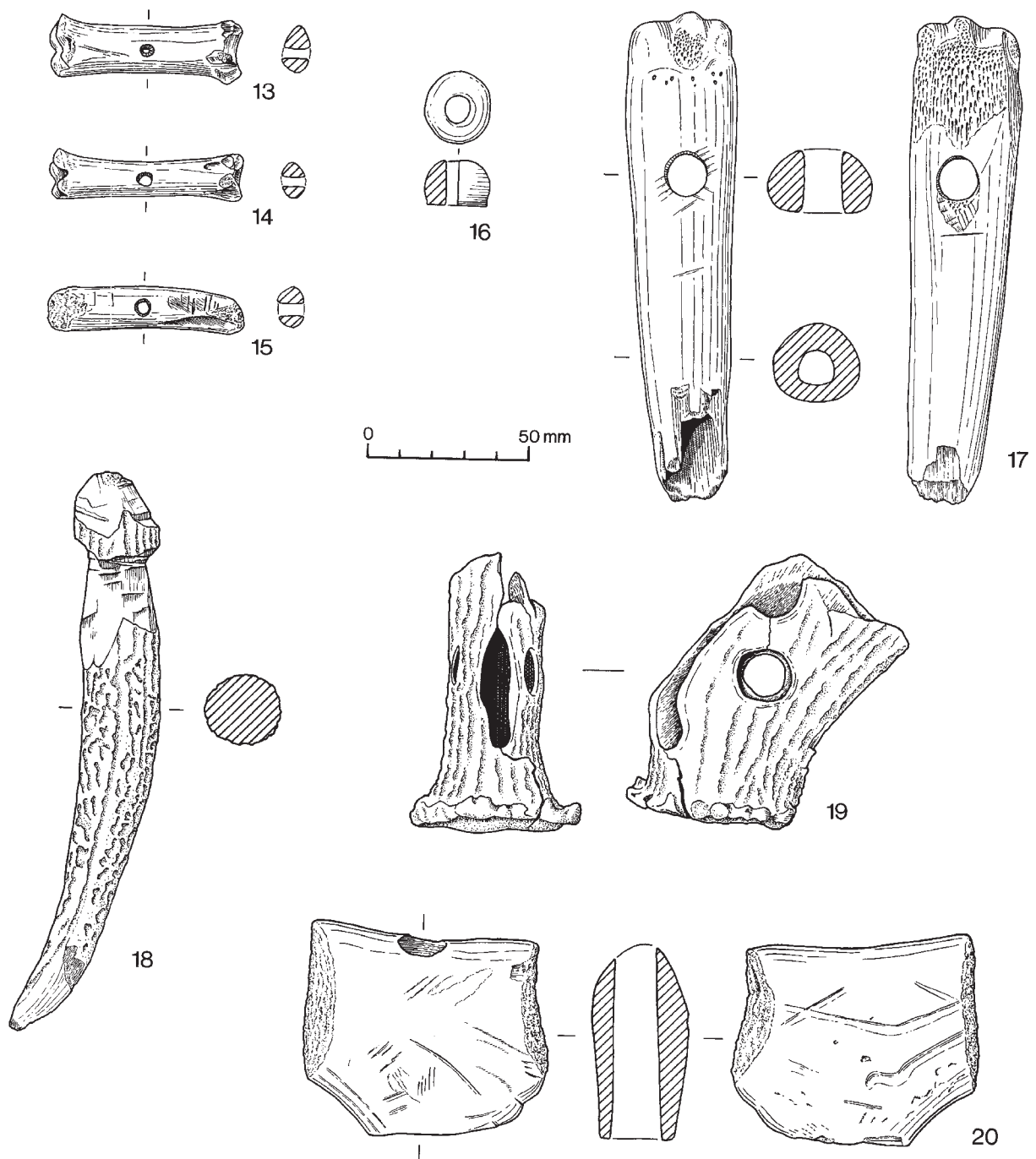


Figure 11.40: Miscellaneous finds in bone and antler: “buzzbones” (13–15), fitting (16), and miscellaneous objects (17–20)

Miscellaneous stone (Fig 11.42, 24)

A grinding or pounding stone or perhaps a large stone weight, in limestone, with a slightly convex base, a worn surface and a domed top with a conical recess, 23mm in

diameter and 28mm deep. Vertical chisel dressing marks apparent on outer edge. D: 125mm, H: 63mm, Wgt: 1.267kg.

1370, 3021, hollow, C8/2, Ph3/2

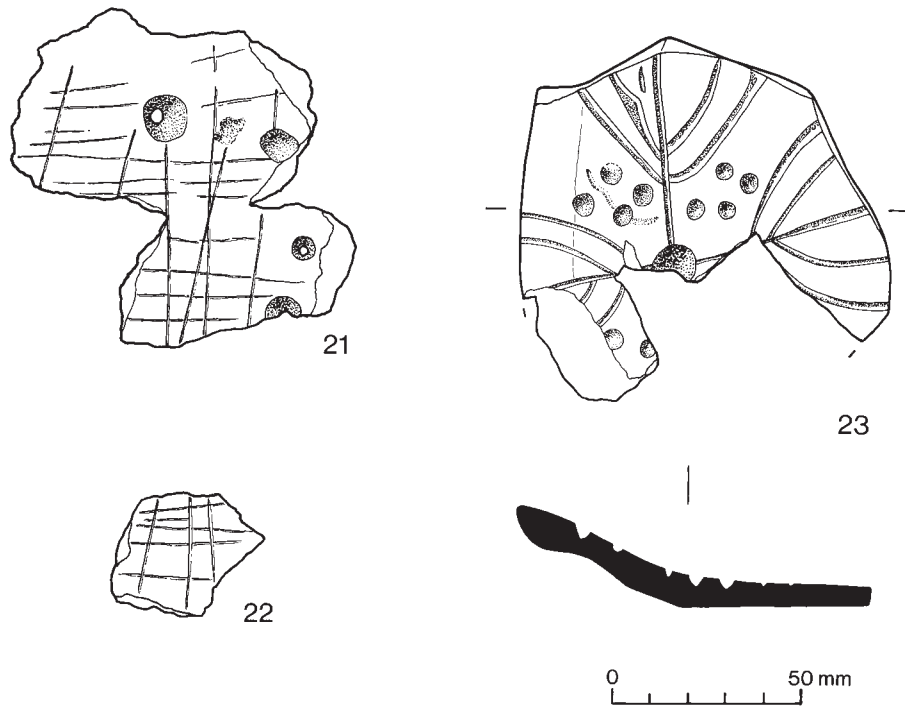


Figure 11.41: Miscellaneous ceramic finds: pottery sherds with parallel scratched lines (21–22), and a symmetrical, incised decorative motif (23)

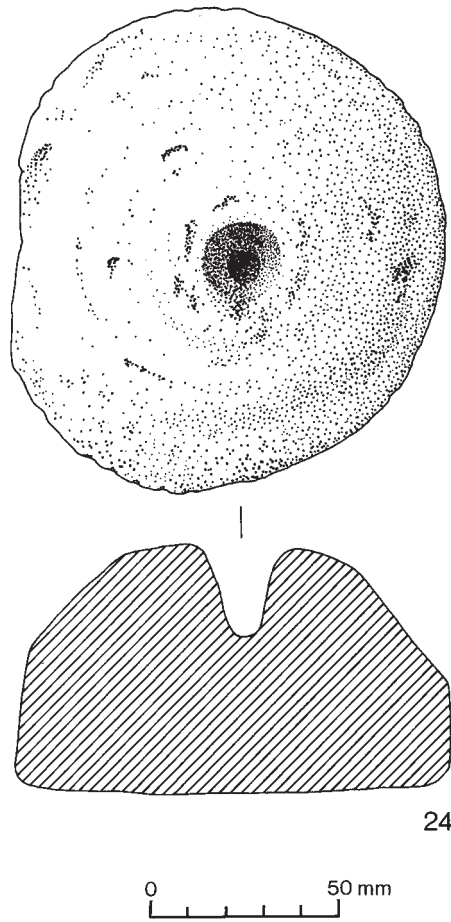


Figure 11.42: Miscellaneous finds: grinding/pounding stone (24)

Post-medieval finds

Some 380 items (12% of the total) were recovered either from post-medieval to modern contexts or as unstratified finds. The former group includes coins, clay tobacco-pipes and some other finds which can be clearly dated to the post-medieval period. Much of the remainder is likely to have been derived from disturbance of the medieval occupation levels, however, they are generally of types that could have still been in use into the late-medieval to post-medieval period. A few items of intrinsic merit from late to post-medieval contexts have been included with the late Saxon to medieval finds, and only those finds certainly of post-medieval date are described below.

Coins

The four post-medieval coins range in date from a jetton of late fifteenth-century date to two late eighteenth-century coins. Three are from the topsoil, while a late seventeenth-century coin comes from the late to post-medieval ditch along the boundary between tenements A and B.

Nuremberg jetton of French type, late fifteenth century
Obv: Nonsense legend, Lozenge shield of France ancient.

Ref: Nonsense legend, Cross fleury within inner circle, with a crowned fleur de lys in each angle.

Wgt: 1.76g. Diameter: 28mm. Holed for suspension at edge.

Ref.: M. Mitchiner, *Jetton Medalets and Tokens: the Medieval Period and Nuremberg* 1988, cf. No 1048 (minor variant with annulets below (is in each quarter absent in WC example; different fictitious legend).

30, 1, topsoil, MODN, N/A

William and Mary, halfpenny, 1694

This coin is relatively unworn, so was probably deposited early in the eighteenth century.

744, 684, ditch fill, PM2

George II, Halfpenny, Old Bust

Date illegible, but this type struck 1740–54.

This coin is well worn and was probably deposited in the late eighteenth century.

7, 1, topsoil, MODN, N/A

Forgery of an eighteenth-century halfpenny, George II?

This coin is so defaced that the details of the design are not visible; a G is discernible. The flan is slightly small, and is quite typical of the very large class of forgeries current in the late eighteenth century. These forgeries were often produced to look old and worn to merge more easily with the currency in circulation.

43, 1, topsoil, MODN, N/A

Buttons

Five white-metal alloy buttons of post-medieval types were recovered from the uppermost level of the clays filling the central open space, while a further similar button is unstratified.

Clay tobacco-pipes

A small group of 32 clay tobacco-pipe fragments were found. They comprise three complete bowls, 24 stem fragments and five bowl/stem junctions. The bowls are all unmarked and plain apart from a single bowl with a partial band of rouletting below the lip, typical of seventeenth-century bowls (Moore 1980, 6). It is most likely that they all date from the mid seventeenth to mid eighteenth centuries. Their distribution is limited to specific features of recognised post-medieval date. There is a scatter along the boundary between tenements A and B, with a stem fragment coming from the final boundary ditch itself. A further scatter occurs along the boundary bank and wall overlying both the demolished frontages of tenements A and B, while a few come from the uppermost level of the clays filling the central open space. Three pieces were associated with the final stream course along the western side of the settlement.

The post-medieval finds can all be attributed to casual loss during later use of the area, with most of them appearing to have been lost or discarded during the maintenance of the banks, boundary ditches and stream course that were still in use until the end of the eighteenth century for a combination of drainage and the demarcation of property boundaries.

Surface coatings of non-ferrous metals on iron objects: Corrosion protection or decoration?

by Barbara Niemeyer

During investigative conservation of iron objects from West Cotton in the Ancient Monuments Laboratory it was revealed that thirty-two artefacts had non-ferrous metal coatings. This was first discovered using X-radiography. The surface coatings or their remains are usually visible on the X-radiograph as a fine white line along the margin of the object, indicating the original surface. The reason for this is that the X-radiograph gives a two-dimensional image of a three-dimensional object; all remains over the objects whole thickness are “collected” by the X-rays and reproduced on the X-radiograph in one dimension. As the non-ferrous metals, both copper alloys and tin/tin-lead alloys, are denser to X-rays than iron and its corrosion products they are more clearly visible on the X-radiograph (Corfield 1982). Sometimes the X-radiograph gives a good image of a surface coating although no metallic remains

can be found when investigating the object. However, a detection of the coating metal is possible using X-ray fluorescence analysis (XRF) once corrosion is removed from selected areas of the object.

As a special feature, on most of the tin/tin-lead alloy coated buckles (and on one key) keying lines are visible on the X-radiograph in addition to the light line giving the original surface. These keying lines seem to correlate with the method by which the tin/tin-lead alloy coating was applied to the surface of the iron object, see below.

Theophilus Presbyter, as a nearly contemporary author on technology, gives recipes for brazing iron with copper-copper alloys and for coating iron objects with tin/tin-lead alloys (translations: Dodwell 1961, Hawthorne and Smith 1963).

As discussed below, the coatings seem to be primarily applied to protect the underlying iron from corrosion, because all these objects were more or less permanently exposed to the atmosphere, eg barrel padlocks, spurs and bits. On the belt buckles the tin/tin-lead alloy coatings seem more to be a decoration, but to differentiate exactly between both purposes is not really possible. As a third possibility, the coating of iron objects to simulate precious metals can be considered.

The objects

This paper focuses on the copper alloy-coated barrel padlock cases and padlock bolts, and the tin/tin alloy-coated objects, especially the buckles with keying lines. Individual objects mentioned in this paper are referenced to their catalogue number in the finds report together with their AML number.

Copper alloy-coated objects

Thirteen copper alloy-coated objects were identified. These include the three nearly complete parallel padlock cases (Locks 36/AML884013, 39/AML884021 and 43/AML884011); three fragments of cases (Locks 38/AML884007 and NI); and seven padlock free arms or bolts (Locks 40, 41, 44, 46 and NI). Due to the surface coating the shape of all objects are well preserved (Fig 11.43, X-radiograph of padlock free arm, 40), but like all the other iron objects, they are concreted with iron corrosion products and soil and are sometimes nearly completely corroded and therefore quite fragile. They are typically coated with brass, alloyed of copper, lead, tin and zinc (nine examples); although four are coated with a ternary bronze alloy containing copper, lead and tin.

Theophilus Presbyter gives a relatively detailed description for brazing and coating iron objects with copper and tin alloys. Interestingly, he takes locks as his example and describes the brazing of different parts of iron locks together. In doing this he gives a perfect description of how the West Cotton locks were probably made:

“...If you want to make locks... hammer out a flat thin piece of iron and bend it around... and fit a support to it above and below. Then put little strips of the same iron around it... in such a way,...that one piece always presses against the next, so it holds fast and cannot fall” (Hawthorne and Smith 1963, 186–7).

Tin or Tin-Lead alloy-coated objects

Twenty objects from West Cotton are coated with tin or a tin-lead alloy. They can be separated into three main categories: buckles (10 examples), door furniture (a key, 61, and a lock free arm, NI) and horse equipment (a spur, 2, and bits, 5 and 6). The other coated objects are difficult to identify but as they are all provided with rivet holes, sometimes containing rivets, they seem to be parts of fittings or mounts. The most interesting objects are the belt buckles, because some of their surfaces are prepared with keying lines sometimes clearly visible on the X-radiographs.

Contrary to the copper alloy coatings, it is quite rare to reveal well-preserved metallic remains of the tin or tin-lead alloy coatings (eg horse furniture (bit), 5/AML884041, and miscellaneous iron (fitting), 12/AML884508), but the fact that these objects were coated is usually detectable with the XRF. Of the twenty iron objects coated with tin or a tin-lead alloy, in thirteen cases pure tin and in seven cases a tin-lead alloy was used.

How were the coatings applied to the objects?

The question how copper and tin alloys were applied onto iron surfaces is still under discussion, but ancient literature and recent research on excavated iron objects can reveal



Figure 11.43: X-radiograph of padlock free arm (40), showing copper alloy coating

the methods which were presumably in use in antiquity.

As mentioned above, Theophilus gives two different recipes for brazing and coating iron objects with copper/copper alloys. In the first recipe strips of the coating metal are used as braze:

“At the point where they join, thin copper is wrapped round and a little clay smeared round. When the clay is dry, it is put under the coals in the front of the fire and blown and, when it is red hot, the copper immediately melts and flows round and brazes. In this way,...anything else of iron can be brazed” (Dodwell 1961).

The second recipe gives a mixture of a powdered copper-tin alloy and fluxes to coat the iron object:

“...mix two parts of copper and a third of tin, and grind it up finely with a pestle in an iron mortar. Burn some wine-stone, add to it a little salt, mix the water and apply this around, then sprinkle on the powder. When this is dry, you apply the preparation again, more thickly, and placing it on the burning coals and carefully covering it round..., you braze it in the same way...in this way you can braze what ever you like of iron” (Dodwell 1961).

The high amount of tin (more than 30%) in this copper alloy makes the metal very brittle and it is therefore possible to “grind it up finely”.

The first of Theophilus’ recipes seems to be demonstrated by inlays on Early Iron Age/Hallstatt objects from Southern Germany (Eichhorn *et al* 1974). The investigation in metallography and the micro-XRF analysis of wheel hubs, a belt plate and dagger handles leads the authors to suppose that the inlays are applied with molten bronze (a copper-tin alloy). The whole surface of an object must have been coated, and then filed down in order to leave the decoration remaining only in the previously cut grooves. One can suppose that for this purpose a large amount of

bronze was necessary and therefore strips or sheets of bronze might have been used.

As Theophilus gives his second recipe especially for brazing and coating locks, we can take this method as common practise in the Middle Ages. Additionally, the revealed copper alloy coatings of the West Cotton iron locks are very thin and sometimes only fragmentary, which is probably partially due to the corrosion of the underlying iron. However, one can imagine that using a powdery or pasty mixture for coating gives a thinner layer than the use of strips of metal. Only in the areas where the copper alloy has mainly been used to braze the added rods and sheets can thicker remains of the copper alloy be found on the objects (Lock 36/AML 884013).

The application of copper alloys onto iron surfaces in a molten state gives a better bonding between both metals than the use of tin/tin-lead alloys. This is due to the forming of intermetallic compounds: iron in small quantities is dissolved into the molten bronze, mainly at the contact region, as well as bronze is dissolved into iron up to approximately 8%. This value gives the maximum solubility of iron into copper at 1100°C (Eichhorn *et al* 1974). One fragmentary barrel padlock case from Helgo/Sweden has been studied metallographically, but the use of copper alloy is only mentioned as a solder, not as a surface coating (Modin 1978). On the other hand, this study confirmed the results of Eichhorn *et al* on Early Iron Age/Hallstatt objects from Southern Germany, as intermetallic compounds of iron and the copper alloy were found in the soldered areas as well on the padlock case from Helgo. Applying tin does not form such intermetallic compounds, presumably partially due to the low melting point, eg of 232°C for pure tin (Bayley 1992) and of 183°C for an alloy/soft solder of 63% tin and 37% lead (Corfield 1985, 40–3).

Theophilus also gives a recipe for coating iron with tin:

“If you want to tin over anything of iron, first file it and ... drop it in a pot of melted tin ... until it becomes white. Take it out, shake it vigorously and clean it ...” (Dodwell 1961).

Tinning following this recipe should give a thin continuous layer of tin. Finishing the chapter on brazing and coating iron objects, Theophilus interestingly mentions exactly the same types of objects which were also found with tinned surfaces in West Cotton: “spurs, bits and saddle trappings”.

As mentioned above, on four belt buckles and a key so-called keying lines are visible on the X-rays (Fig 11.44, X-radiograph of buckle 12, AML 884280). These lines are applied at regular distances to one another and are obviously deeply cut into the metal (Key 61, AML 884005). It seems probable, that the lines were intended to provide a better bonding of the tin onto the iron surface, which would make more sense if hammered tin/tin-lead alloy sheet was used for the plating. In the case of the West Cotton objects with keying lines, plating with metal sheets seems more likely given that on two buckles the tin-lead alloy could only be detected on one side, probably the front of the

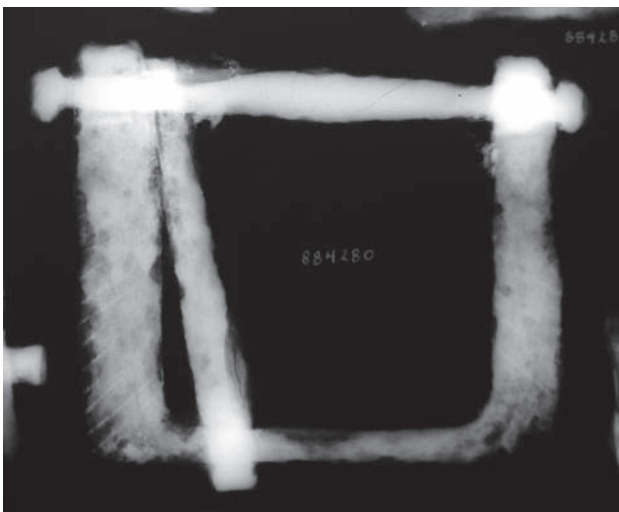


Figure 11.44: X-radiograph of buckle (12), showing keying lines for tin coating

buckles. Additionally, the keying lines are only applied on restricted areas and are not found over the whole surface. Keying lines are well known on silver inlaid/overlayed iron objects, but these lines are mainly criss-crossed over the surface to be covered and not as regular as those on the tin/tin-lead alloy coated objects (Urbon 1985).

Corrosion protection or decoration?

Most of the authors dealing with surface coatings (eg Ankner and Hummel 1985, Corfield 1985 and 1992, Wilthew 1992) give the protection of the underlying iron from corrosion as the main purpose for the coating, because coatings are mainly found on objects often or permanently exposed to the atmosphere and to humidity. Examples from West Cotton supporting this supposition could be the copper alloy-coated barrel padlock cases and bolts and the tin/tin-lead alloy-coated spurs, bits, keys and fitting fragments.

The coating of metals has a long tradition in practice as well as in the ancient literature. Pliny mentions tin coatings on copper alloy objects mainly to simulate silver objects, which is shown on finds like copper alloy brooches, spoons and vessels. Vessels are sometimes tinned only inside to protect the food from being infected by copper corrosion products, which are quite unhealthy. Tinning of iron does not seem to have been known and carried out during the Roman period.

Theophilus mentions tinning as a protection for iron from corrosion: "...iron bindings, tinned inside and out so that they cannot be destroyed by rust..." (Hawthorne and Smith 1963, 163). Accordingly, tinned objects are found from early medieval times, eg in Viking villages, and in the Middle Ages. Some of the objects from West Cotton are fine examples of this practice, though this is not really

obvious on the objects. One can suppose that tin and tin-lead alloy coatings on spurs and bits were more easily worn away than copper alloy coatings, because of their frequent mechanical use and also because of the weak bonding between tin or tin-lead alloy and iron.

Coating with non-ferrous metals seems to be used for both corrosion protection and to simulate a more valuable metal, such as silver for the tinned objects and presumably gold with copper alloys, which might have increased the status of the objects owners. To differentiate between simulation of a more valuable metal and only decoration purposes is difficult because, especially on the tin/tin alloy-coated objects, there is too little evidence.

Nowadays, the coating of iron objects with non-ferrous metals is still a common practice, though sometimes paints, lacquers and plastic films are applied for this purpose. Today's coating metals are mainly copper alloys, nickel alloys and zinc, usually applied by electroplating. The purposes for doing this are still the same as in earlier times: corrosion protection, eg on zinc coated nails and copper alloy coated coins, and simulation of more precious metals, eg on nickel alloy-coated fashion jewellery.

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Plate 11.1: Copper alloy buckles and buckle plates (illustration numbers, from top left: 10, 3, 2, 4, 9, 6 and 15)



Plate 11.2: Brooches (illustration numbers, from left: 34, 32, 35 and 31)



Plate 11.3: Bone comb (illustration number, 42)



Plate 11.4: Musical instruments (illustration numbers, from top left: 48, 47 and 49)



Plate 11.5: Gaming pieces (illustration numbers, from left; 50, 51 and 52)



Plate 11.6: Nine-men's morris board (illustration number, 55)



Plate 11.7: Nine-men's morris board (illustration number, 55)



Plate 11.8: Barrel padlock cases, bolts and keys (illustration numbers, from top; 54, 57, 39, 45, 41, 43 and 36)



Plate 11.9: Mounted lock fittings and keys (illustration numbers, from top; 47, 48, 63, 65, 61 and 62)



Plate 11.10: Whittle tang knives with decorative ferrous and non-ferrous hilt plates (illustration numbers, from top; 70, 71 and 72)



Plate 11.11: Scale tang knives (illustration numbers, from top; 84, 86, 83 and 82)



Plate 11.12: Textile working implements; needle (illustration number, 32), pinbeaters (29 and 27) and spindle whorls (22, 25 and 23)

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12 The environmental evidence

by Gill Campbell and Mark Robinson

Sampling and recovery

The bulk sieving programme

Standard samples of 10 litres were taken for the recovery of charred plant remains and bone, although larger samples of up to 50 litres were taken from some features such as the medieval garderobe. Samples were selected from as wide a range of contexts as possible in order to gain a good spatial and temporal distribution. In addition three 100 litre “whole earth” samples, one from each major phase, were taken specifically for the recovery of bone (Payne 1992), though plant remains recovered from these samples were also retained. The sample from the late Saxon phase (AD 950–1100) came from a pit within ditch complex LSD18, the samples from the medieval manor phase (AD 1100–1250) from a layer in plot 8 (LSE8), and the sample from the medieval phase (AD 1250–1400) from a layer within a yard of Tenement A (AY6).

Each sample or partial sample, in the case of larger volumes, was placed in a large dustbin to which water was added and the sample agitated. The material floating or in suspension was then decanted onto a 0.5mm mesh and the process repeated until no further charred material was washed over. In some cases where separation of the charred material proved difficult, the washed sample was allowed to partially dry out prior to re-washing. The residue from the washed sample was put through a 1mm sieve and dried before sorting for bone, any charred plant material that had failed to float, and other finds.

A critical review of the programme

Around 7000 litres of soil were processed for charred plant remains and bone. The sample size adopted for the recovery of charred plant remains appeared to be of the right order of magnitude. Even if larger samples had been taken from the later medieval hamlet phase deposits it is unlikely that the assemblages obtained would have added much to the evidence, apart from possibly adding to the number of species recorded for that phase.

Another factor, however, which may have affected the recovery of charred remains is the size of mesh used for the flots. Some very small weed seeds will pass through a 0.5mm mesh and for this reason a 0.3mm mesh is preferred by some workers. However, as yet no experimental work has been carried out on the extent of this problem and

whether the loss of material is sufficient to justify the extra work involved. The use of a 0.3mm mesh on sites where clay or silts are present does tend to cause the mesh to clog up and lead to dirty flots. There is also the extra work involved in sorting the 0.5–0.3mm fraction. It is not known whether the use of a 0.3mm mesh at West Cotton would have greatly altered the results. Possibly, for example, poppy seeds may be under represented.

Most of the bone from the site was recovered by hand and though the level of recovery was good it is inevitable that a significant percentage of the smaller bones would have been missed. The bulk sieving programme was mainly aimed at recovering bird, fish and small mammal bone although it also served as a check on recovery bias.

The amount of bird and fish bone recovered both by hand and by sieving was very low. However, given the scale of sampling it seems that even if larger samples had been taken the amount of fish and bird bone would still remain a very small part of the overall bone assemblage. The three ‘whole earth’ samples showed that sieving larger volumes of soil does lead to better recovery of the smaller bones of the major domesticates and had a record of the percentage of the context that was sieved as opposed to hand excavated been kept, it may have been possible to get some idea of the level of recovery bias.

Therefore, although the sieving programme did achieve its aim in terms of the recovery of fish and bird bone it is clear that in future sampling strategies for rural sites in similar situations need to be somewhat different. More effort needs to be directed towards estimation of recovery bias, with possibly very large volumes of soil being sieved to 8mm or 4mm from a limited number of contexts. In turn, the sieving of smaller samples for fish bone etc needs to be carefully targeted to a restricted range of context types such as pits and wells. However, any sampling programme should ensure that the full range of context types are sampled in order that the patterns of disposal can be investigated. The paucity of biological remains in some types of context or areas of a site is as important to establish as their richness and diversity in others.

Bulk samples from waterlogged deposits

Bulk samples of between 3 litres and 10 litres were taken for waterlogged plant remains, insects and snails from deposits within the palaeochannel adjacent to the site.

Sampling conditions were far from ideal and although 10 litre samples would have ensured that sufficient material was available for the recovery of all categories of remains it was not possible to obtain this much material from all the deposits sampled.

Sub-samples of 1kg were taken for the recovery of waterlogged macroscopic plant remains and snails, and for some insect remains. Each sub-sample was wet-sieved to 0.212mm using a simple wash-over technique. The resulting flotant was then put through a stack of sieves in order to separate it into fractions for ease of sorting. Each fraction was then sorted under a dissecting microscope for waterlogged plant remains, for insects and for any snails that were accidentally washed over with the organic component. Only a 10% sub-sample of the 0.5mm-0.212mm fine fraction (5% in the case of sample 7) was sorted in this way as this was sufficient for the recovery of waterlogged plant remains. The other 90% was added to the insect sub-sample prior to paraffin flotation (see below). The waterlogged plant remains recovered from the fine fraction were sorted and identified separately, and the results obtained from this fraction were multiplied-up to give the numbers that would be expected from a full kilogramme sample.

The residue from the 1kg sub-samples was dried and put through a stack of sieves down to 0.5mm. This material was sorted for snails. Sample 5 was very rich in Mollusca and it was only necessary to sort 10% of the dry residue in order to recover sufficient numbers.

Further sub-samples of 2kg were taken for the recovery of insect remains, except in the case of sample 7 where only a further 1kg of material was available. These samples were wet-sieved to 0.212mm but in this case the resulting flotant, along with the unsorted portion of the fine fraction from the 1kg sub-sample was subject to standard paraffin flotation in order to separate the insect remains from the other organic material. The insect remains so recovered were sorted under a dissecting microscope and added to those already obtained from the plant sub-sample.

Ten litre bulk samples were also taken from some of the waterlogged mill leat deposits. They were treated as above, but for these deposits only 1kg sub-samples were

processed and no larger sub-samples were taken for the recovery of insect remains. Although only 10% of the fine fraction was sorted for plant remains the whole of this fraction was sorted for insects.

Descriptions of the deposits sampled and details of the sample sizes used for each category of biological remains is given in Table 12.1.

Bulk samples from dry deposits

Bulk samples were taken for snails from a selected number of dry deposits across the site. The samples were wet sieved down to 0.5mm and the resulting material dried prior to sorting under a dissecting microscope. Descriptions of the deposits and sample sizes have been placed in archive.

The charred plant remains

by Gill Campbell

Work on the charred plant remains from West Cotton began in 1986 when Joy Ede was appointed as the environmental assistant to the Raunds Area Project. In order to assess the quality of the material being obtained from the excavations she sorted some of the samples from the excavation and analysed some of the richer assemblages and some assemblages that were of archaeological importance. As a result of her work it was decided that the sample size of 10 litres chosen for the recovery of charred plant remains was adequate, and that the site had great potential. The material was not only well preserved but also contained large amounts of cereal chaff as compared with other sites of the same period.

Work on the material from West Cotton continued over the next year or so along with similar work on the other Raunds project sites. Joy Ede left the project at the end of 1987 and the author was appointed in her place in March 1988. Following the completion of the excavations at West Cotton, it was decided to review the work already undertaken by Joy Ede, and to this end all the flots were scanned and evaluated as to their content. The results of this rapid scanning were recorded on computer and formed

Table 12.1: Deposit descriptions and bulk sample sizes from waterlogged deposits

[Sample] or Context	Description of deposit	Sample size (kg)		
		plant remains	molluscs	insects
[3]	Dark grey clay, oxidising to dark red-brown	1.0	1.0	2.0
[5]	Very dark almost black clayey-silt. On oxidation turns red-brown	1.0	0.1	3.0
[6]	Dark grey almost black silt	1.0	1.0	3.0
[7]	Dark grey almost black silty-clay	1.0	1.0	2.0
5645	Mottled grey-brown sandy-clay silt	1.0	–	1.0
5609	Mottled orange to mid-brown clayey silt	1.0	–	1.0
7183	Dark grey clay	1.0	1.0	1.0

the basis for the selection of samples for full analysis. The appropriate information from the samples already sorted and identified by Ms Ede was added to this database with a note to the effect that the samples were already completed. This database has been included in the archive.

When selecting samples for analysis an attempt was made to analyse c25% of the samples from each structural group identified by the excavator, and one sample from every fill of some rich features such as ovens. Initially samples were selected on the basis of their preliminary phasing, but as final phasing differed somewhat from this, the distribution of analysed samples is not as even as was intended. Some of the earlier sorting of charred plant remains by Joy Ede was probably unnecessary, but nearly all of the samples she identified have formed part of this report and I am indebted to her for all her hard work.

As is inevitable when two people work on the same material it has been necessary to correlate some of her results with my own in order to ensure consistency in recording. All the material has been identified by comparison with the reference collections held at the Oxford University Museum Environmental Archaeologically Unit and nomenclature follows Clapham, Tutin & Moore 1989, apart from the cereals and other cultivated plants.

The results are presented in a series of tables related to the main structural groups recorded and separated by phase. Where the number of items were estimated rather than fully quantified + indicates that 1 or 2 items, ++ several, +++ that the item was common, ++++ that the items was abundant, * indicates presence.

Samples were analysed from the early Saxon period, the late Saxon settlement (AD 950–1100), the medieval manor house (AD 1100–1250) and from medieval manor and hamlet (AD 1250–1400). Very few samples were available for the late medieval desertion phases (AD 1300–1450) and the post-medieval features (AD 1400+). Few charred remains were recovered from any of these samples and as much of this could be residual it was decided that the results were of little use.

Aims and objectives

- To establish what crops were grown in each period
- To try to identify the kinds of agricultural activity taking place in different periods.
- To try and establish for what purposes the different crops were grown.
- To try and discover some of the other plant resources that were utilized.
- To look for evidence for decreasing soil fertility in the later phases in order to test Postan's theory regarding 'land hunger' in the fourteenth century (Postan 1966).
- To try and investigate crop husbandry and answer such questions as where the different crops were grown and under what type of field system?

Origin and nature of the charred plant remains

Before discussing the results from the different periods and features in detail the origin and nature of the charred plant remains needs to be addressed. Three main factors need to be considered.

- To what extent do the assemblages contain material of mixed origin derived from any number of burning events as opposed to a single burning event or a limited number of burning events
- To what extent do the assemblages contain either intrusive or residual material
- What stages of crop processing can be recognised in the assemblages.

The concentration of charred plant material in the soil in conjunction with the state of preservation of the material has been used as an indicator of the rate of deposition of material and therefore as a aid to distinguishing between material burnt *in situ* and secondary or tertiary refuse (Jones 1987). Elsewhere Green (1991) has used the concentration of rye grain in the soil as an indicator of residuality. He demonstrated that the rye was burnt prior to the construction of the earliest archaeological feature and was associated with brick earth. Features with large amounts of brick earth contained large amounts of rye independent of their date.

The average concentration of charred plant remains per litre of soil was calculated for the different phases of the site. In the early Saxon period it was very low, at less than 5 items per litre, while the concentrations of material from the late Saxon settlement (950–1100) and the manor and hamlet (1250–1400) were both of the same intermediate order of magnitude, at around 10 items per litre, while that from the medieval manor phase (1100–1250) was much greater, at over 50 items per litre.

The abundance of charred material in the medieval manor phase can be attributed to the type of archaeological feature encountered, as this period produced three ovens and a possible oven dated to 1100–1150, as well as a pit group associated with an oven dated to 1150–1200. These features contained high concentrations of charred material and in the case of the earlier ovens the material was also very well preserved. In addition most of the deposits associated with mills and fills of the boundary ditch system are also dated to this period. These deposits were also sometimes rich in charred plant remains, although the concentration in different ditches was quite varied. Some were at less than 5 items per litre, a majority were between 10 and 40 items per litre, but ditch system 19 by the watermills reached nearly 80 items per litre and ditch system 15, on the eastern enclosures, was at nearly 220 items per litre. The deposits associated with the twelfth-century buildings all produced low concentrations of charred material, at less than 10 items per litre, which was poorly preserved, with the exception of samples from the later phase of the manor house, where some samples produced from 20–80 items per litre.

It is clear that the assemblages from the twelfth-century ovens have undergone minimal mixing and although the assemblages probably do not result from a single burning event they are likely to be result of a series of related events involving the drying of grain or malted grain with cereal chaff being used as part of the fuel for this process. It also clear that some of the richer assemblages associated with the mills system and from ditch deposits consist of dumps of material derived from these ovens or from similar activities.

The assemblages containing lower concentrations of charred plant remains from the deposits of this date may also largely be the result of corn drying accidents. However, the general state of preservation of the material, as well as its concentration in the soil would suggest that these assemblages are derived from any number of burning events and accumulated over a considerable period of time. As such they must represent general background rubbish.

Thus for the medieval manor phase we can distinguish only a very small number of samples, namely those from the twelfth-century ovens and some dumps within the leats or ditches, that can be regarded as Class B samples as described by Hubbard and Clapham (1992), ie they have undergone some mixing but this can be explained with some degree of confidence. All the other samples belong to Class C (Hubbard and Clapham, 1992), ie the archaeological context in which they were found is such that mixing is inevitable. These samples will derive from a number of different events and are also likely to contain material from earlier or later activity. They cannot be interpreted in terms of stages of crop processing. Items in the assemblage may have had different origins and also some items, particularly chaff, are likely to be grossly under-represented due to mechanical damage prior to burial. However, the presence or absence of material in these samples and its distribution across the site may still be significant.

Nearly all the samples from the other phases of the site can also be regarded as Class C samples. The assemblages from the early Saxon phase all belong to class C. However, here the concentration of the charred plant remains is so low and the preservation of material other than charcoal, so poor, as to suggest that some of this material is intrusive. The samples from the manor and hamlet period were mainly recovered from floors or hearths within buildings, and the concentration of charred plant remains was low, generally less than 15 items per litre, and preservation generally poor.

The assemblages from the late Saxon deposits are somewhat different. Those derived from floor layers within the timber buildings are clearly of a similar nature to the samples from the medieval manor phase. The samples from the leats and ditch fills, however, are more akin to similar samples from the medieval manor phase and may largely be derived from grain drying accidents. All but one can be regarded as Class C.

The very different nature of the assemblages from the different phases makes any interpretation of changes taking place between phases difficult since it can always be argued that the absence of material in one phase is due to an accident in preservation rather than any changes that took place in the types of activity occurring. The only real comparison that can be made is between samples from deposits associated with buildings, which are present in the three main phases.

Having identified those samples that fall into Class B it is then possible to discuss the site in terms of the stages of crop processing that are represented, or can be identified. However, as already stated, the material from the Class B samples (ovens and dumps within ditches, mill leats etc) is believed to result from the drying of cereal grain and or the killing of malted grain with cereal chaff being used as fuel or part of the fuel for this process. Thus this material does not represent a single stage of crop processing as discussed by Hillman (1981, 1984) and Jones (1984) but rather the products from one or more stages of crop processing combined with the by-products from earlier stages. The fuel is possibly derived both from threshing (stage 3, Hillman 1981, 135) and from raking, winnowing and cleaning (stages 4–6, Hillman 1981, 135). The grain or malt being dried is probably clean grain (possibly stage 27 or 28, Hillman, 1981 137) but cleaning may not have been thorough.

Such a combination of products and by-products is very difficult to interpret especially since the crops may have been harvested by different methods. Also the fuel is likely to have been taken from a store where harvests from different fields etc were mixed. In addition, material other than chaff seems to have been used for fuel. Some patterns do seem to emerge, however, and these are discussed below.

Summary

Most of the archaeobotanical evidence from the site relates to the late Saxon period onwards. Both rivet (*Triticum turigidum*) and bread wheat (*Triticum aestivum*) are present from the late Saxon period, suggesting that the former may have been introduced as part of an agricultural package associated with the laying out of open fields. These two wheats either grown as a mixture, or as a pure crop or as a maslin with rye, appear to have been the major crops from this period onwards with barley and oats either grown as a mixture (dredge) or as pure crops were also important especially in the production of malt. Rye appears also to have been grown as a pure crop at least in the twelfth century, contemporary with the medieval manor.

Legumes were recovered from the assemblages in small quantities. Celtic or broad bean *Vicia faba* var. *minor* was cultivated from the late Saxon/post-Conquest period onwards and peas from the twelfth century onwards although evidence from Burystead, in Raunds, shows that pea was present in the middle Saxon period (Campbell

2009). Fodder crops notably cultivated common vetch (*Vicia sativa* ssp. *sativa*) and possibly lentil appear to have been introduced in the early twelfth century. Flax was also grown and *Brassica* seed may have been cultivated in the thirteenth and fourteenth centuries.

Charred plant remains from early Saxon features

A total of seven samples was available for study from the two structures dated to this period. The flots from the sunken-featured building, ES36, were rich in charcoal, mainly hazel and oak, but other plant remains were scarce. Similarly, the richest of the three samples from the possible sunken-featured building, ES37, was dominated by charcoal, including fast-growing oak, but few other plant remains were recovered. Three samples were examined in detail, two from ES36 and one from ES37 (Table 12.2).

The presence of a well-preserved *Prunus/Crataegus* type thorn, a *Prunus* sp (sloe/ plum/ bullace) stone fragment, as well as a possible fruit of *Cornus sanguinea* (dogwood) would indicate that thorny scrub was available locally, and was gathered for fuel.

A few grains of barley and free-threshing wheat were also found as well as a few weed seeds. However, the poor state of preservation of this material and its low concentration may mean that these items are intrusive.

Charred plant remains from late Saxon features (AD 950–1100)

Thirty-eight samples were available for study from a variety of different contexts. The samples from early contexts

within the enclosed plots produced very little material and this was also the case for the early ditch fills, with the exception of some of the deposits in ditch systems 3 and 18. A total of five samples were analysed (Table 12.3).

Of the samples from the late Saxon timber buildings, only those from T33 and T34 produced reasonably large assemblages, where floors had been preserved by slumping into an underlying ditch (Table 12.4).

Two samples from dumps within the earliest mill leat, M27, and a single sample (1080) from a dump on the raised riverbank, all produced rich assemblages (Table 12.3).

The late Saxon enclosed plots and ditch complexes

In plot 1, on the southern holding,, sample 29 was a typical ‘background’ sample, producing a few battered cereal grains that could well be intrusive from later activity. Most of the samples from late Saxon contexts which were not examined in detail were of a similar nature.

An early fill within ditch system 3, sample 476, produced a rather poor assemblage consisting in the main of badly preserved cereal grain, but including some better preserved grain. One possible hulled wheat grain was identified as well as some hexaploid free-threshing wheat chaff and some free-threshing wheat type grain. The sample also produced a single large seeded, possibly cultivated legume, and among the weeds, a possible grain of *Lolium temulentum* (darnel).

Another early fill within ditch system 3, sample 538, produced a reasonably rich assemblage, although clearly one of mixed origin. Cereal grain dominated, with *Avena* sp. grain, about half of which had germinated, being the

Table 12.2: Charred plants remains from early Saxon features

Taxa	Common name	Building/ (Sample no)		
		36/ (785)	36/ (786)	37/ (838)
<i>Ranunculus</i> sp.	Buttercups	–	1	–
<i>Vicia Lathyrus</i> sp. cf. <i>Trifolium</i> sp.	Vetch/tare Clover/trefoil	–	–	2
<i>Prunus</i> sp.	Plum/sloe etc	–	1	–
<i>Prunus/Crataegus</i> sp.	Thorn	–	1	–
cf. <i>Cornus sanguinea</i> L.	Dogwood	–	1	–
cf. <i>Bupleurum rotundifolium</i> L.	Thorowax	1	–	–
<i>Polygonum aviculare</i> gp.	Knotgrass	1	–	–
<i>Valerianella locusta</i> (L.) Laterrade	Common cornsalad	–	1	–
Gramineae indet.	grain	–	1	–
<i>Triticum</i>	Free-threshing wheat	–	–	1
<i>Triticum</i> sp.	Grain	15	–	–
cf. <i>Triticum</i> sp.	Grain	4	–	–
<i>Hordeum</i> sp.	Grain	–	1	–
Cf. <i>Hordeum</i> sp.	Grain	1	–	–
Cereales indet.	Grain	6	2	3
Herbage		+	–	–
IGNOTA		–	–	2
Number of items identified		28	10	8
Sample size (litre)		10	10	10
Items per litre of soil sieved		2.8	1	0.8

Table 12.3: Charred plant remains from the late Saxon settlement (950–1100)

	Structure	LSD3	LSD10	LSD18	river bank	Mill M27	Mill pond
	Sample no/ (context)	538	763	1036	1080	1080/	(5646)
	Sample size (litre)	20	10	100	10	1083 10 / 10	1kg
Taxa	Common name						
<i>Ranunculus acris/repens/bulbosis</i>	Buttercups	–	–	–	1	– / –	–
<i>Brassica</i> cultivated sp.		–	–	–	–	– / –	1
<i>Raphanus raphanistrum</i> L. (seed case)	Wild radish			1	–	– / –	–
<i>Silene</i> cf. <i>vulgaris</i> (Moench) Garka s. str.	Bladder campion	–	1	–	–	– / –	–
cf. <i>Silene</i> sp.	Campion/catchfly	–	–	1	–	– / –	–
<i>Agrostemma githago</i> L.	Corncockle	3	1	–	–	1 / 1	–
<i>A. githago</i> L. (capsule fragment)	Corncockle	1	–	–	–	– / –	–
<i>Stellaria media</i> sp.	Chickweed	–	–	–	2	– / –	–
<i>Spergula arvensis</i> L.	Corn spurrey	1	–	–	–	– / –	–
<i>Atriplex</i> sp.	Orache	–	–	2	8	– / –	1
Chenopodiaceae indet.		–	1	1	1	– / –	–
Carophyllaceae/Chenopodiaceae indet.		–	–	2	–	2 / –	–
<i>Vicia sativa</i> app. <i>Nigra</i> (L.) Ehrh.	Common vetch	–	–	–	1	– / –	–
cf. <i>Vicia faba</i> var. <i>minor</i> L.	Field bean	–	–	1	–	– / –	–
<i>Vicia/Lathyrus</i> sp.	Vetch/tare	4	–	26	8	– / 3	1
cf. <i>Vicia/Lathyrus</i> sp.	Field bean	–	–	–	1	– / –	–
<i>Vicia/Lathyrus/Pisum</i> sp.	Vetch/tare/pea	8	1	3	1	– / –	–
<i>Vicia/Lathyrus</i> / ? <i>Pisum</i> sp.		–	–	5	–	– / –	–
cf. <i>Medicago</i> type	Medick, clover etc	–	–	–	–	1 / –	–
cf. <i>Trifolium</i> sp.	Clover/trefoil	1	–	–	4	– / –	–
Leguminosae (small) indet.		–	–	–	1	– / 1	–
Leguminosae indet. (pod fragment)		–	–	3	–	– / –	–
cf. <i>Potentilla</i> sp.	Cinquefoil/tormentil	–	–	–	–	1 / –	–
cf. <i>Rose</i> sp.		–	1	–	–	– / –	–
<i>Pyrus</i> sp.	Pear	2	–	–	–	– / –	–
<i>Scandix pectin-veneris</i> L.	Shepherd's needle	–	–	–	8	– / –	–
<i>Bupleurum rotundifolium</i> L.	Thorowax	–	–	–	–	3 / –	2
Umbelliferae indet.		–	–	1	–	– / –	–
cf. Umbelliferae indet.		–	–	–	–	– / –	1
<i>Polygonum aviculare</i> agg.	Knotgrass	1	–	–	2	– / –	–
cf. <i>Polygonum aviculare</i> agg.	Knotgrass	–	–	2	–	– / –	–
<i>Polygonum</i> sp.	Knotgrass	–	–	–	2	1 / –	–
<i>Fallopian convolvulus</i> (L.) Löve	Black bindweed	–	–	–	17	– / –	–
<i>Rumex</i> spp.	Dock	–	–	10	20	2 / 1	2
cf. <i>Rumex</i> sp.	Dock	–	–	1	–	– / –	–
Polygonaceae indet.		–	–	–	1	– / –	–
<i>Corylus avellana</i> L. (nut frag)	Hazel	–	–	2	–	– / –	–
<i>Anagallis arvensis</i> L.	Scarlet pimpernel	8	–	–	2	– / –	–
<i>Euphrasia/Odontites</i> sp.	Eyebright/red bartsia	–	–	1	–	– / –	–
<i>Prunella vulgaris</i> L.	Selfheal	–	–	–	1	1 / –	–
<i>Plantago lanceolata/media</i>	Plantain	–	–	–	1	– / –	–
<i>Sherardia arvensis</i> L.	Field madder	1	–	–	–	– / –	–
<i>Gallium</i> cf. <i>aparine</i> L.	Cleavers	–	–	1	3	2 / 1	1

Table 12.3 continued

	Structure	LSD3	LSD10	LSD18	river bank	Mill M27	Mill pond
	Sample no/ (context)	538	763	1036	1080	1080/	(5646)
	Sample size (litre)	20	10	100	10	1083 10 / 10	1kg
Taxa	Common name						
<i>Gallium</i> sp.	Bedstraw	–	–	1	1	1 / –	–
cf. <i>Sambucus nigra</i> L.	Elder	–	–	–	–	1 / –	–
<i>Viburnum opulus</i> L.	Guilder rose	–	–	1	–	– / –	–
<i>Valerianella dentate</i> (L.) Pollich	Narrow-fruited cornsalad	1	–	1	1	– / –	–
<i>Knautia arvensis</i> (L.) Coulter	Corn scabious	–	–	–	1	– / –	–
<i>Anthemis cotula</i> L.	Stinking mayweed	13	1	39	9	12 / 4	6
<i>A. cotula</i> L. (seedhead fragment)		1	–	–	–	– / –	–
<i>Anthemis</i> sp.	Mayweed	–	1	–	–	– / –	–
cf. <i>Anthemis</i> sp.		–	–	2	–	– / 1	–
<i>Cirsium/Carduus</i> sp.	Thistle	–	–	–	1	– / –	–
<i>Centaurea</i> sp.	Cornflower	4	–	–	–	– / –	–
<i>Lapsana communis</i> L.	Nipplewort	–	–	–	1	– / –	–
Compositae (small) indet		–	–	1	1	– / –	–
<i>Eleocharis palustris</i> type	Spike-rush	1	–	5	4	3 / 1	–
<i>Carex</i> sp.	Sedge	–	–	–	10	1 / –	–
Cyperaceae indet.		–	–	1	1	– / –	–
cf. <i>Lolium temulentum</i> L. (grain)	Darnell/rygrass	–	–	–	–	– / –	–
<i>Pos annus</i> type (grain)		–	–	1	–	– / –	–
<i>Bromus secalinus</i> type (grain)	brome	–	–	5	–	7 / 5	3
cf. <i>Bromus</i> sp. (grain)		–	–	–	–	3 / –	–
<i>Hordeum</i> cf. <i>murinum</i> L. (grain)		–	–	–	–	– / 1	–
<i>Avena sativa</i> L. (grain)	Cultivated oat	–	–	–	13	– / –	–
<i>Avena</i> , hexaploid sp.(florete bse)	Oat	–	–	–	–	2 / –	–
<i>Avena</i> sp. (grain)	Oat	1	1	32	173	25 / 8	1
cf. <i>Avena</i> sp. (grain)	Oat	38	1	25	–	5 / 2	2
<i>Avena</i> sp. (coleoptile)	Oat	–	–	–	4	– / –	–
<i>Avena</i> sp. (sprouted grain)		3	–	3	59	3 / –	–
cf. <i>Avena</i> sp. (sprouted grain)	Oat	11	–	–	–	– / –	–
cf. <i>Avena</i> sp. (twisted awn)	Oat	–	–	–	–	– / –	–
<i>Avena</i> sp. (florete base)	Oat	2	–	–	–	1 / 1	–
cf. <i>Avena</i> sp. (florete base)	Oat	–	–	1	–	– / –	–
Gramineae. (large) indet. (grain)	Grass	–	4	45	–	11 / 14	4
Gramineae (small) indet. (grain)	Grass	–	1	8	–	6 / 2	2
Gramineae indet. (grain)	Grass	–	–	–	12	– / –	–
Gramineae indet. (rachis)	Grass	–	–	–	–	1 / –	–
Gramineae indet. (chaff) – silica	Grass	–	1	–	–	– / –	–
? Gramineae indet (rachis)	Grass	–	–	2	–	– / –	–
<i>Triticum</i> (grain)	Free-threshing wheat	27	4	201	–	14 / 23	11
<i>Triticum</i> cf. (t/awn base)	Free-threshing wheat	–	–	–	–	– / 1	–
<i>Triticum</i> tetraploid (rachis)	Free-threshing wheat	–	–	5	–	1 / –	4
<i>Triticum</i> hexaploid (rachis)	Free-threshing wheat	–	–	9	1	– / –	1

Table 12.3 continued

	Structure	LSD3	LSD10	LSD18	river bank	Mill M27	Mill pond
	Sample no/ (context)	538	763	1036	1080	1080 / 1083	(5646)
	Sample size (litres)	20	10	100	10	10 / 10	1kg
Taxa	Common name						
<i>Triticum</i> cf. hexaploid (rachis)	Free-threshing wheat	1	–	6	1	4 / –	8
<i>Triticum</i> (rachis)	Free-threshing wheat	1	3	12	–	2 / 1	3
<i>Triticum</i> cf. (rachis)	Free-threshing wheat	–	1	–	1	16 / 1	3
<i>Triticum spelta</i> L. (grain)	Spelt wheat	–	–	–	–	– / –	–
<i>Triticum</i> cf. <i>spelta</i> L. (glume base)	wheat	–	–	–	–	– / –	1
<i>Triticum dicoccum/spelta</i> (grain)	Hulled wheat	–	–	–	–	– / 1	–
<i>Triticum</i> cf. <i>dicoccum/spelta</i> (grain)	Hulled wheat	–	1	–	–	– / –	–
<i>Triticum</i> sp. (grain)	Wheat	–	4	64	5	1 / 9	2
<i>Triticum</i> sp. (glume base)	Wheat	–	–	–	–	– / –	1
<i>Triticum</i> sp. (glume fragment)	Wheat	–	–	–	–	– / +	–
<i>Triticum</i> sp. (glume base) cf. <i>Triticum</i> sp. (grain)	Wheat	–	–	–	–	– / –	1
<i>Secale cereale</i> L. (rachis)	Rye	1	1	3	–	1 / –	3
<i>S. cereale</i> L. (awn) cf. <i>Secale cereale</i> L. (grain)	Wheat/rye	–	–	–	–	– / –	1
cf. <i>S. cereale</i> L. (rachis)	Rye	6	–	–	–	1 / –	1
<i>Triticum/Secale</i> sp. (grain)	Rye	–	1	–	1	– / –	1
<i>Triticum/Secale</i> sp. (awn)	Wheat/rye	–	–	3	–	– / 1	–
<i>Hordeum vulgare</i> L. (rachis)	Wheat/rye	–	–	–	–	– / –	6
<i>Hordeum</i> sp. (hulled straight grain)	Six-row barley	–	–	–	–	– / –	1
<i>Hordeum</i> sp. (hulled twisted grain)	Hulled barley	–	–	6	12	1 / 6	–
<i>Hordeum</i> sp. (hulled straight sprouted grain)	Hulled barley	1	1	8	7	3 / 6	–
<i>Hordeum</i> sp. (hulled twisted sprouted grain)	Hulled barley	–	–	–	5	– / –	–
<i>Hordeum</i> sp. (hulled grain)	Hulled barley	–	–	–	4	– / –	–
<i>Hordeum</i> sp. (hulled sprouted grain)	Hulled barley	–	–	14	–	6 / 1	–
<i>Hordeum</i> sp. (grain) cf. <i>Hordeum</i> sp. (grain)	Hulled barley	–	–	–	–	– / 1	–
<i>Hordeum</i> (sprouted grain)	Barley	2	2	10	99	4 / 5	–
<i>Hordeum</i> sp. (rachis) cf. <i>Hordeum</i> sp. (rachis)	Barley	2	–	18	2	3 / –	1
<i>Hordeum/Secale</i> sp. (rachis)	Barley	–	–	–	23	– / –	–
<i>Hordeum/Secale</i> sp. (rachis)	Barley	–	–	–	7	– / –	3
<i>Hordeum/Secale</i> sp. (rachis)	Barley	–	–	–	–	2 / –	–
<i>Hordeum/Secale</i> sp. (rachis)	Barley/rye	1	–	2	6	5 / –	–
Cereales indet. (grain)	Barley/rye	–	–	3	–	1 / –	–
Cereales indet. (rachis)	Cereal	67	15	324	47	36 / 20	8
Cereales indet. (basal node)	Cereal	–	–	13	1	4 / 1	–
Graminaeae size (embryo)	Cereal	–	–	–	–	– / –	1
Gramineae size (culm node)	Grass	–	–	–	–	– / –	1
Gramineae size (culm base)	Grass	–	–	1	–	12 / –	1
	Grass	–	–	–	–	2 / –	–

Table 12.3 continued

	Structure Sample no/ (context)	LSD3 538	LSD10 763	LSD18 1036	river bank 1080	Mill M27 1080 / 1083	Mill pond (5646)
	Sample size (litre)	20	10	100	10	10 / 10	1kg
Taxa	Common name						
Cereal size (embryo)		4	–	11	–	4 / 3	2
Cereal size (coleoptile)		–	–	–	129	– / –	–
Cereal size (culm node)		–	–	2	7	1 / 2	–
Cereal size (culm node – silica)		–	–	1	–	– / –	–
Bud		–	–	–	–	1 / –	–
Twig		–	–	–	–	4 / –	–
Herbage		–	–	–	+++	++ / +	+
Concretion		–	–	–	+++	– / –	–
IGNOTA		–	2	15	15	10 / 3	–
Number of items identified		218	50	982	741	237 / 133	–
Items per litre of soil sieved		10.9	5	9.82	74.1	23.7 / 13.3	–

most abundant identified cereal. Some floret bases were also found and these were tentatively identified as *Avena sativa* (cultivated oat). Free-threshing wheat grain was also common and barley and rye grain were also present. There was very little chaff in the sample.

Most of the weed seeds in the assemblage were characteristic arable weeds of winter cereals on calcareous soils (phytosociological alliance, *Caucalidon-lappulae*) (Silverside 1977), with the exception of the single seed *Spergula arvensis* – small seeded- (corn spurrey) which is confined to base poor, soils and more generally associated with spring sown cereals, especially oats and barley (Silverside 1977). Two of the seeds of *Agrostemma githago* (corncockle) were still joined together and fragments of capsule were also found. As well as seeds of *Anthemis cotula* (stinking mayweed) part of a seed head was found.

A number of large-seeded, possibly cultivated legumes (*Vicia/Lathyrus/Pisum* sp.) were also recovered from the sample, and one the smaller vetches or tares (*Vicia/Lathyrus* sp.) showed signs of germination. Two pear (*Pyrus* sp.) pips were also present. There were also a number of fragments that might be charred dung.

The assemblage, though obviously mixed, would appear to include oat which had either sprouted in the ear and was burnt during an attempt to save the crop, or the remains of malted grain that was accidentally burnt whilst it was being killed prior to grinding for brewing.

Other items in the assemblage may have had different origins, eg the barley grain, or could have been present as contaminants.

The earlier fills of ditch system 18, sample 1036 (context 6845), produced a large quantity of material, though given the unusually large sample size, the concentration of

material was not high. It was rich in charcoal but otherwise was dominated by cereal grain with few weeds and very little chaff. The assemblage also produced two hazel-nut fragments and a single of *Viburnum opulus* (guelder rose). Several large, possibly cultivated legumes (*Vicia/Lathyrus/Pisum* sp.) were recovered and a single specimen was identified tentatively as *Vicia faba* spp. *minor* on the basis of its size and shape.

Of the identifiable cereal grain, most was free-threshing wheat, with some six-row hulled barley and also some oat, including some germinated grain. Floret bases were absent so it is possible that only wild oat was present.

Both hexaploid and tetraploid free-threshing wheat rachis fragments were identified from the sample as well as some rye chaff. No definite barley chaff was found.

Weeds characteristic of heavy calcareous soils were present, eg *Galium* cf. *aparine* (cleavers) and *Anthemis cotula* (stinking mayweed) as well as weeds more normally associated with slightly acid soils, eg *Raphanus raphanistrum* (wild radish). In addition seeds of *Eleocharis palustris* (spike-rush) may indicate the use of poorly drained or damp ground.

The assemblage would appear to represent a general mixture of rubbish from cereal processing and other activities.

A fill of ditch system 10, sample 753 (context 4556), adjacent to the timber building T33/T34 produced another somewhat poor assemblage of 50 items excluding charcoal. Again cereal grain predominated, with both free-threshing wheat grain and possibly also hulled wheat grain present as well as hulled barley grain and some oat grain. Chaff of rye and free-threshing wheat was present as well as some weeds. A possible rose pip was also identified.

Table 12.4: Charred plant remains from the late Saxon timber buildings (950–1100)

Taxa	Structure/ (context) Sample size (litre)	T33 (714) 10	T33 (717) 10	T33 (721) 10
	Common name			
<i>Ranunculus acris/repens/bulbosus</i>	Buttercups	–	–	1
<i>Ranunculus</i> Subgen <i>Ranunculus</i>		1	–	–
<i>Brassica/Sinapsis</i> sp.	Cabbage/mustard	1	–	–
Cruciferae (large) indet. (capsule fragment)		1	–	–
<i>Silene</i> sp.	Campion/catchfly	4	–	–
Caryophyllaceae indet.		2	–	–
<i>Chenopodium</i> cf. <i>album</i> L.	Fat hen	–	1	–
<i>Atriplex</i> sp.	Orache	2	–	1
cf. <i>Atriplex</i> sp.		–	1	–
Chenopodiaceae indet.		11	2	–
<i>Vicia/Lathyrus</i> sp.	Vetch/tare	–	1	3
<i>Vicia/Lathyrus/Pisum</i> sp.	Vetch/tare/pea	2	1	4
cf. <i>Medicago lupulina</i> L.	Black medick	–	1	–
Leguminosae (small) indet.		2	1	1
<i>Scandix pecten-veneris</i> L.	Shepherd's needle	1	–	–
<i>Bupleurum rotundifolium</i> L.	Thorowax	2	–	–
cf. <i>Bupleurum rotundifolium</i> L.		1	–	–
Umbelliferae indet.		–	1	–
<i>Polygonum aviculare</i> gp.	Knotgrass	1	–	–
<i>Rumex</i> sp.	Dock	6	5	1
<i>Corylus avellana</i> L. (nut fragment)	Hazel	2	–	–
<i>Anagallis arvensis</i> gp.	Scarlet pimpernel	1	1	–
<i>Lithospermum arvense</i> L.	Corn gromwell	1	1	–
<i>Euphrasia/Odontites</i> sp.	Eyebright/red bartsia	–	–	1
<i>Gallium</i> cf. <i>aparine</i> L.	Cleavers	–	–	1
<i>Anthemis cotula</i> L.	Stinking mayweed	41	5	10
cf. <i>Anthemis</i> sp.	Mayweeds	8	–	–
<i>Typha</i> sp.	Bulrushes	–	8	–
<i>Eleocharis palustris</i> type	Spike-rush	1	14	1
<i>Carex</i> sp.	Sedge	3	1	–
Cyperaceae indet.		1	–	–
<i>Poa annua</i> type (grain)	Annual meadow grass	–	1	–
cf. <i>Bromus</i> sp. (grain)	Brome	1	–	–
<i>Avena</i> sp. (grain)	Oat	3	–	–
<i>Avena</i> sp. (sprouted grain)	Oat	–	–	1
cf. <i>Avena</i> sp. (grain)	Oat	5	1	5
Gramineae (large) indet. (grain)	Grass	24	6	18
Gramineae (small) indet. (grain)	Grass	19	4	–
Gramineae indet. (chaff–silica)	Grass	1	2	–
<i>Triticum</i> cf. tetraploid (rachis)	Free-threshing wheat	–	1	2
<i>Triticum</i> cf. hexaploid (rachis)	Free-threshing wheat	–	–	2
<i>Triticum</i> (grain)	Free-threshing wheat	38	6	18
<i>Triticum</i> (rachis)	Free-threshing wheat	2	2	18
<i>Triticum</i> sp. (grain)		11	2	10
<i>Triticum</i> sp. (awn base)		–	1	–
<i>Secale cereale</i> L. (rachis)		1	–	–
<i>Hordeum</i> cf. <i>distichon</i> (rachis)		1	–	–
<i>Hordeum</i> sp. (grain)	Barley	3	–	2
<i>Hordeum</i> sp. (rachis)	Barley	2	–	–
cf. <i>Hordeum</i> sp. (grain)	Barley	2	7	6
<i>Secale/Hordeum</i> sp. (rachis)		1	1	1
Cereales indet. (grain)	Cereal	50	17	7
Cereales indet. (rachis)	Cereal	–	–	1
Cereal size (embryo)		1	–	1
herbage		+	–	–
IGNOTA		21	10	–
Number of items identified		280	105	103
<i>Items per litre of soil sieved</i>		<i>28</i>	<i>10.5</i>	<i>10.3</i>

The timber buildings T33 and T34

Three samples were examined from T33 (Table 12.4) and three from T34. The samples from T34 produced far less material, mainly battered cereal grain, along with a few weeds seeds and some chaff, although one sample was unusual in that it produced a single grain reminiscent of naked barley.

Samples from T33 all produced reasonable assemblages of charred plant remains and were also rich in charcoal. Weed seeds formed a much larger percentage of the samples, although they still produced lots of badly preserved cereal grain, which included wheat, barley and some indeterminate oat grains. Some weeds were again characteristic of the *Caucalidon lappulae*, eg *Scandix pecten-veneris* (shepherd's needle), *Lithospermum arvense* (corn gromwell), and *Anthemis cotula* (stinking mayweed) but the many Chenopodiaceae and Polygonaceae seeds would suggest that the order *Polygono-Chenopodietalia*, is also present. These weeds may have been growing in or around the site and entered the assemblages with household waste etc, or may be derived from spring sown cereals or both.

Chaff was very scarce in these samples. Both tetraploid free-threshing and hexaploid free-threshing wheat rachis were present as well as rye. A single rachis fragment which could have come from two-row barley was also identified.

The mill, pond and riverbank

Some waterlogged material found in samples from the earliest mill, M27, gave similar information to that obtained from the bulk samples and will not be reported in detail. Both samples, 1082 and 1083, were from black loams that accumulated or were dumped within the abandoned wheel-pit area before it was deliberately backfilled. Sample 1083 contained two seeds of *Papaver somniferum* (opium poppy), which may have been cultivated. Seeds which were not recorded as waterlogged sub-fossils from other samples were *Bupleurum rotundifolium* (thorowax), *Fallopia convolvulus* (black bindweed), *Rumex acetosella* agg. (sheep's sorrel), *Valerianella dentata* (narrow-fruited corn salad), and *Isolepis setacea* (bristle club-rush). These species probably grew alongside the leat or in and around the settlement, or are possibly derived from crop processing waste.

The charred assemblage from sample 1082 was richer than that from 1083 and contained a greater percentage of chaff, although in both assemblages cereal grain, and wheat grain more specifically, predominated. Sample 1082 produced some sprouted oat and sample 1083 some sprouted barley, but un-sprouted grain far outnumbered sprouted grain suggesting poor harvest conditions rather than malting. There were very few weed seeds in either sample. Chaff of all four cereals was present in sample 1082, including both tetraploid and hexaploid free-

threshing rachis fragments. Both assemblages appear to represent a mixture of cereal processing debris.

The charred material from a 1kg bulk sample from context 5645, a blue clay lower fill at the end of the early pond, that was processed for waterlogged material (see report on waterlogged plant remains) produced roughly equal proportions of grain, weeds and chaff. As this deposit was well sealed by later deposits and had remained permanently waterlogged and thus not subject to earthworm activity, the record of tetraploid free-threshing wheat chaff from this sample is of particular importance. It would strongly suggest that free-threshing tetraploid wheat was present in the late Saxon period. This would constitute the first pre-Conquest record of this form of wheat in Britain.

The assemblage also contained a possible spelt glume base which might indicate that spelt wheat continued to be grown, though it is more likely that speltoid types were present within the free-threshing wheat crop or that spelt was present as a weed. The presence of hulled barley, rye and oat in the sample would clearly indicate that this is a mixed assemblage.

A localised dump on the raised riverbank adjacent to the mills, sample 1080 (context 7153, see Fig 6.5c), produced the richest and most well-preserved assemblage that could be assigned to this phase. It was rich in charcoal and dominated by a mixture of barley and oat grain about one quarter of which showed clear signs of sprouting. Some of the oat grain was still within its florets and was identified as *Avena sativa* (cultivated common oat). Indeterminate cereal grain was also present and there was also a little wheat grain. The small amount of chaff present included some wheat chaff but was mainly barley. Oat chaff was notably absent.

Most of the weed seeds, which formed about 20% of the assemblage were large-seeded though some smaller seeds were also present. Seeds of *Fallopia convolvulus* (black bindweed) and *Scandix pecten-veneris* (shepherd's needle) were especially common, but sedges and docks were also well represented. Some seeds more generally regarded as characteristic of pasture such as *Ranunculus acris/repens/bulbosus* (buttercup), *Prunella vulgaris* (self-heal), *Plantago lanceolata/media* (plantain) and *Knautia arvensis* (corn scabious) were present in small numbers.

This assemblage does not appear to be of mixed origin and can be interpreted as the remains of barley and oat grain which had been germinated to produce malt and was accidentally burnt whilst it was being dried to halt germination by killing the grain. Most of the weed seeds are probably present as a result of being retained with the grain; the small amount of wheat as a contaminant of the crop.

The barley and oat could have been mixed after harvest but it seems more likely that they were grown together as a mixture. A mixture of barley and oats sown in the ratio 1:1 was grown in the medieval period (Slicher van Bath 1963) and was known as dredge or drage. It was typically spring sown. The presence of relatively large numbers of *Fallopia convolvulus* (black bindweed), which according

Table 12.5: Charred plant remains from the western ovens and pit group (1100–1250)

Feature (context)	Oven (4039)	Oven (4437)	Oven (4437)	Pit (4848)	Pit (4874)
Sample no.	612 / 615 / 621	720 / 723 / 724	755 / 779	773	774 / 775
Sample size (litre)	10 / 10 / 10	10 / 10 / 10	10 / 10	8	10 / 10
% analysed (if not 100%)	25 / 25 / 50				
Taxa					
<i>Pteridium aquilinum</i> (L.) Kuhn (frond)	- / - / 2	- / - / -	- / -	-	- / -
<i>Caltha palustris</i> L.	- / - / -	7 / - / -	- / -	-	- / -
<i>Ranunculus acris/repens/bulbosus</i>	- / - / -	34 / - / -	1 / -	-	- / 1
<i>Ranunculus</i> cf. <i>acris/repens/bulbosus</i>	- / - / -	- / - / -	- / 2	-	- / 1
<i>Ranunculus arvensis</i> L.	- / - / -	- / - / 1	1 / -	-	- / -
<i>Ranunculus parviflorus</i>	- / 1 / -	- / - / -	- / -	-	- / -
<i>Ranunculus</i> Subgen. <i>Ranunculus</i>	- / - / 2	2 / - / -	- / 1	-	- / -
<i>Ranunculus</i> sp.	- / - / -	- / - / 2	- / -	-	- / -
cf. <i>Ranunculus</i> sp.	- / - / -	- / - / -	- / -	-	1 / -
<i>Papaver rhoeas</i> etc	1 / - / -	2 / - / -	- / -	-	- / 1
<i>Brassica/Sinapis</i> sp.	- / 7 / 2	- / - / 1	4 / -	-	- / 1
cf. <i>Brassica/Sinapis</i> sp.	- / 1 / -	- / - / -	- / -	-	- / -
<i>Raphanus raphanistrum</i> L.	- / - / -	- / - / -	1 / -	-	- / -
<i>Nasturtium microphyllum</i> (Boenn.) Reichenb	- / - / -	1 / - / -	- / -	-	- / -
Cruciferae (large) indet.	- / - / -	3 / - / -	- / -	-	- / -
Cruciferae indet. (capsule fragment)	- / - / -	- / - / 1	- / -	-	- / -
Cruciferae indet. (capsule tip)	- / - / -	- / - / -	- / -	-	- / 1
<i>Silene</i> cf. <i>vulgaris</i> (Moench)	- / - / -	- / - / -	5 / -	-	- / -
Garcke <i>s.str.</i>					
<i>Silene</i> sp.	9 / 3 / 8	4 / 6 / 1	- / -	-	- / -
<i>Agrostemma githago</i> L.	- / 1 / -	1 / - / -	- / -	-	- / -
<i>A. githago</i> L. (capsule tip)	- / - / -	- / - / -	- / -	1	- / -
cf. <i>Agrostemma githago</i> L.	1 / - / -	- / - / -	- / -	-	- / -
<i>Cerastium</i> sp.	- / - / -	- / - / -	1 / -	-	- / -
<i>Stellaria media</i> gp.	3 / 1 / -	1 / - / -	- / -	-	- / -
cf. <i>Stellaria media</i> gp.	- / - / -	- / 1 / -	- / -	-	- / 1
<i>Stellaria graminea</i> L.	- / - / -	- / - / -	1 / -	-	- / -
<i>Stellaria</i> sp.	- / - / 3	- / - / -	- / -	-	- / -
Caryophyllaceae indet.	3 / - / 2	1 / - / -	1 / 1	-	1 / -
Caryophyllaceae indet. (capsule fragment)	- / - / 1	- / - / -	1 / -	4	- / -
Caryophyllaceae indet. (capsule tip)	- / 1 / -	- / - / -	- / -	-	- / -
<i>Chenopodium</i> cf. <i>album</i> L.	- / - / 1	- / - / -	2 / -	-	- / -
<i>Chenopodium</i> sp.	- / - / -	1 / - / -	- / -	-	- / -
<i>Atriplex</i> sp.	6 / 4 / 4	21 / 2 / 4	40 / 8	5	8 / 1
Chenopodiaceae indet.	1 / 1 / -	5 / 1 / -	15 / 1	2	4 / 1
cf. Chenopodiaceae indet.	- / - / -	- / - / 1	- / -	-	- / -
Caryophyllaceae/Chenopodiaceae indet.	2 / - / -	- / - / -	- / -	-	- / -
<i>Malva</i> sp.	- / - / 1	- / - / -	- / -	-	- / -
cf. <i>Malva</i> sp.	- / - / -	- / - / -	- / 1	-	- / -
Malvaceae indet.	- / - / -	- / - / -	1 / -	-	- / -
<i>Linum usitatissimum</i> L.	- / 1 / -	2 / - / -	- / -	-	- / -
<i>Linum usitatissimum</i> L. (capsule fragment)	- / - / -	36 / - / 11	- / -	-	- / -
cf. <i>Linum usitatissimum</i> L.	- / - / 1	- / - / -	- / -	-	- / -
<i>Linum usitatissimum</i> L.	- / 1 / -	2 / - / -	- / -	-	- / -
<i>Vicia tetrasperma</i> (L.) Schreber	2 / - / -	- / - / -	- / -	-	- / -
<i>Vicia</i> cf. <i>tetrasperma</i> (L.) Schreber	- / 7 / -	- / 3 / -	- / -	-	- / -
<i>Vicia sativa</i> ssp. <i>sativa</i> L.	- / - / -	- / - / -	1 / -	-	1 / -
<i>Vicia sativa</i> cf. ssp. <i>sativa</i> L.	- / - / -	- / - / -	1 / -	-	1 / -
cf. <i>Vicia sativa</i> cf. ssp. <i>sativa</i> L.	4 / 4 / 2	1 / - / -	- / -	-	- / -
<i>Vicia sativa</i> ssp. <i>nigra</i> (L.) Ehrh.	- / - / -	- / - / 1	- / -	-	- / -

Table 12.5 continued

Feature/ (context)	Oven/ (4039)	Oven/ (4437)	Oven/ (4437)	Pit/ (4848)	Pit/ (4874)
Sample no.	612/615/621	720 / 723/ 724	755 / 779	773	774 / 775
Sample size (litre)	10 / 10 / 10	10 / 10 / 10	10 / 10	8	10 / 10
% analysed (if not 100%)	25 / 25 / 50				
Taxa					
cf. <i>Vicia sativa</i> cf. ssp. <i>nigra</i> (L.) Ehrh.	- / - / 1	- / - / -	- / -	-	- / -
<i>Vicia</i> cf. <i>tetrasperma</i> (L.) Schreber	- / 7 / -	- / 3 / -	- / -	-	- / -
<i>Vicia faba</i> L. var. <i>minor</i>	- / - / -	- / - / -	4 / 1	-	- / -
cf. <i>Lens culinaris</i> Medik.	- / - / -	1 / - / -	- / -	-	- / -
<i>Lathyrus aphaca</i> L.	- / - / -	- / 2 / -	5 / -	-	- / -
cf. <i>Lathyrus aphaca</i>	5 / 3 / 3	- / - / 1	- / -	1	- / -
<i>Lathyrus nissolia</i> L.	- / - / 1	- / - / -	- / -	-	- / -
<i>Vicia/Lathyrus</i> sp.	76 / 126 / 92	53 / 75 / 10	41 / 16 /	3	3 / 3
<i>Vicia/Lathyrus</i> sp. (peduncle)	- / - / -	- / - / -	7 / -	-	- / -
cf. <i>Vicia/Lathyrus</i> sp.	- / 11 / -	6 / 12 / -	- / 3	-	- / -
cf. <i>Vicia/Lathyrus</i> sp. (peduncle)	- / 1 / -	- / - / -	- / -	-	- / -
<i>Vicia/Lathyrus/Pisum</i> sp.	7 / 2 / 5	11 / - / 1	14 / 3	1	- / 2
cf. <i>Vicia/Lathyrus/Pisum</i> sp.	- / - / -	- / 1 / -	- / -	-	- / -
<i>Medicago lupulina</i> L.	30 / 67 / 39	73 / 210 / 6	5 -	2	- / 2
<i>Medicago</i> type	28 / 41 / 56	70 / 100 / 8	9 / -	4	- / 1
cf. <i>Medicago</i> type	- / 4 / -	- / 23 / -	- / -	-	4 / -
? <i>Trifolium</i> sp.	6 / 3 / -	- / - / -	- / -	-	- / -
Leguminosae (small) indet.	36 / 6 / 4	62 / 423 / 30	34 / 10	-	2 / 2
Leguminosae indet. (pod fragment)	209 / 177 / 263	65 / 10 / 9	++++ / 7	3	2 / -
cf. Leguminosae indet.	- / 17 / -	19 / - / -	- / -	-	- / -
cf. Leguminosae indet. (peduncle)	- / - / -	- / 1 / -	- / -	-	- / -
cf. Leguminosae indet. (tendrils)	- / - / 1	- / - / -	- / -	-	1 / -
<i>Aphanes arvensis</i> agg.	- / - / -	- / - / -	- / -	1	1 / -
cf. <i>Rosa</i> sp.	1 / - / -	- / - / -	- / -	-	- / -
<i>Rosa/Rubus</i> type (thorn)	- / 1 / -	- / - / -	- / -	-	- / -
<i>Scandix pectin-veneris</i> L.	1 / - / 2	1 / 1 / -	- / -	-	2 / 1
? <i>Scandix pectin-veneris</i> L.	1 / 2 / -	- / - / -	- / -	-	- / -
cf. <i>Berula erecta</i> (Hudson) Coville)	- / - / -	1 / - / -	- / -	-	- / -
<i>Bupleurum rotundifolium</i> L.	6 / 7 / 6	2 / 3 / 3	5 / -	-	2 / 1
cf. <i>Bupleurum rotundifolium</i> L.	- / - / -	- / - / -	1 / -	-	- / -
<i>Torilis</i> sp.	- / - / -	- / - / -	- / -	-	1 / -
Umbelliferae indet.	- / - / -	- / 1 / 1	1 / -	-	- / 1
cf. Umbelliferae indet.	- / - / -	1 / - / -	- / -	-	- / -
<i>Euphorbia exigua</i> L.	- / - / -	1 / 1 / -	- / -	1	- / -
cf. <i>Euphorbia exigua</i> L.	- / - / -	1 / - / -	- / -	-	- / -
<i>Polygonum aviculare</i> gp.	- / 1 / 3	3 / 2 / -	7 / -	-	- / 1
<i>Polygonum</i> cf. <i>persicaria</i> L.	- / - / -	- / - / -	1 / -	-	- / -
<i>Polygonum</i> sp.	- / 1 / -	4 / 2 / -	- / 1	-	- / -
cf. <i>Polygonum</i> sp.	- / - / 2	- / - / -	- / -	-	- / -
<i>Polygonum aviculare</i> gp.	- / 1 / 3	3 / 2 / -	7 / -	-	- / 1
<i>Fallopia convolvulus</i> (L.) A. Löve	1 / 1 / 1	- / - / -	- / -	1	- / -
cf. <i>Rumex acetosella</i> gp.	- / 2 / 1	- / - / -	- / -	-	- / -
<i>Rumex</i> spp.	20 / 27 / 23	51 / 21 / 6	32 / 3	2	9 / 4
cf. <i>Rumex</i> sp.	- / - / -	- / 1 / -	1 / -	-	- / -
Polygonaceae indet.	- / - / 7	- / 1 / -	- / -	1	1 / -
? Polygonaceae indet.	1 / - / -	- / - / -	- / 1	-	- / 1
<i>Corylus avellana</i> L. (nut fragment)	- / 1 / -	- / - / -	- / -	-	- / -
<i>Salix</i> sp. (bud)	- / 1 / -	- / - / -	- / -	-	- / -
<i>Anagallis arvensis</i> L.	- / 3 / 2	1 / - / -	1 / -	-	- / -
cf. <i>Anagallis arvensis</i> L.	- / - / -	- / 1 / -	- / -	-	- / 2
cf. <i>A. arvensis</i> L. (head)	- / - / 1	- / - / -	- / -	-	- / -
<i>Lithospermum arvense</i> L.	6 / 5 / 1	2 / - / 1	- / 1	2	2 / -
Solanaceae indet.	1 / - / -	- / - / -	- / -	-	- / -

Table 12.5 continued

Feature/ (context)	Oven/ (4039)	Oven/ (4437)	Oven/ (4437)	Pit/ (4848)	Pit/ (4874)
Sample no.	612/615/621	720/723/724	755/ 779	773	774/775
Sample size (litre)	10/10/10	10/10/10	10/10	8	10/10
% analysed (if not 100%)	25/25/50				
Taxa					
? <i>Melampyrum</i> sp.	-/-/-	3/-/-	-/-	-	-/-
<i>Odonites verna</i> (Bell.) Dumort.	-/-/-	-/-/-	2/-	-	1/4
cf. <i>Odonites verna</i> (Bell.) Dumort.	-/-/11	-/-/-	-/-	-	-/-
<i>Euphrasia/Odonites</i> sp.	81/67/91	16/12/2	11/2	18	18/10
Labiatae indet.	-/-/-	-/-/-	1/-	-	-/1
<i>Plantago major</i> L.	-/-/-	3/-/-	-/-	-	-/-
cf. <i>Plantago lanceolata/media</i>	-/-/-	-/-/-	-/7	-	-/-
<i>Legousia hybrida</i> (L.) Delarbre	-/-/-	-/-/-	-/1	-	-/-
Campanulaceae indet.	-/-/-	-/1/-	-/-	-	-/-
<i>Gallium</i> cf. <i>aparine</i> L.	-/-/-	-/-/-	1/-	-	1/-
<i>Gallium</i> sp.	-/-/-	-/-/-	3/-	-	-/-
<i>Sambucus nigra</i> L.	1/-/-	-/-/-	-/-	-	-/-
<i>Sambucus</i> cf. <i>nigra</i> L.	-/-/1	-/-/-	1/-	-	-/-
<i>Sambucus</i> sp.	-/-/-	-/-/-	1/-	-	-/-
<i>Valerianella dentate</i> (L.) Pollich	2/1/4	8/12/-	-/-	1	1/1
cf. <i>Valerianella dentate</i> (L.) Pollich	1/-/-	-/-/-	-/-	-	-/-
<i>Knautia arvensis</i> (L.) Coulter	-/-/1	-/-/-	-/-	-	-/-
<i>Succisa pratensis</i> Moench	-/-/1	-/-/-	-/-	-	-/-
<i>Anthemis cotula</i> L.	73/100/127	49/43/15	87/30	3	69/37
<i>A. cotula</i> L. (part of seed head)	-/3/-	-/-/-	-/-	1	-/-
<i>A. cotula</i> L. (clean seed head)	1/-/-	-/-/-	-/-	2	-/-
<i>Anthemis</i> sp.	-/2/-	2/4/-	8/1	-	-/-
cf. <i>Anthemis</i> sp.	-/-/3	-/-/-	-/-	-	1/2
<i>Anthemis</i> sp. (clean seed head)	-/-/1	-/-/-	-/-	-	-/-
<i>Tripleurospermum</i> sp.	-/-/-	2/1/2	2/-	-	-/-
<i>Onopordum acanthium</i> L.	-/-/2	-/-/-	-/-	-	-/-
<i>Centaurea cyanus</i> L.	-/-/-	2/-/-	-/-	-	-/-
<i>Centaurea</i> cf. <i>cyanus</i> L.	-/-/-	-/-/-	-/-	-	-/1
<i>Centaurea nigra</i> L.	1/-/-	-/-/-	-/-	-	-/-
<i>Centaurea</i> sp.	-/3/1	1/1/-	2/-	-	-/-
cf. <i>Centaurea</i> sp.	-/-/-	1/-/-	-/-	-	-/-
<i>Lapsana communis</i> L.	-/-/-	-/-/-	1/-	-	-/-
Compositae indet.	1/2/1	-/1/-	1/1	1	-/-
<i>Alisma plantago-aquatica</i> L.	1/-/-	-/-/-	-/-	-	-/-
<i>Damsonium alisma</i> Miller	-/-/-	-/-/-	-/-	1	-/-
? <i>Damsonium alisma</i> Miller	-/-/-	-/-/-	-/-	1	-/-
<i>Eleocharis palustris</i> type	7/6/7	3/-/-	-/4	-	-/-
<i>Carex</i> sp.	-/-/-	1/-/1	1/1	1	-/-
Cyperaceae indet.	-/-1	-/-/-	-/-	-	-/-
Cyperaceae indet. –silica	-/-/1	-/-/-	-/-	-	-/-
<i>Lolium temulentum</i> L. (grain)	8/5/-	13/5/3	-/-	-	-/-
<i>Lolium temulentum</i> L.(sprouted grain)	-/-/-	1/-/-	-/-	-	-/-
cf. <i>Lolium temulentum</i> L. (grain)	1/5/4	4/-/-	-/3	1	-/-
<i>Festuca/Lolium</i> sp. (grain)	-/-/-	-/-/-	4/-	-	-/-
cf. <i>Festuca/Lolium</i> sp. (grain)	-/-/-	-/-/-	1/-	-	-/-
<i>Bromus secalinus</i> type (grain)	-/7/1	2/-/-	1/-	-	3/-
<i>Bromus</i> cf. <i>secalinus</i> type grain	-/-/-	-/-/1	-/-	-	-/-
<i>Bromus</i> sp. (grain)	-/-/-	-/2/-	-/-	-	-/1
cf. <i>Bromus</i> sp. (grain)	-/2/1/-	1/-/1	-/-	-	-/-
<i>Avena fatus</i> type (floret base)	5/4/3	1/-/-	-/-	-	-/-
<i>Avena</i> cf. <i>sativa</i> L. (grain)	-/-/-	3/-/1	-/-	-	-/-
<i>Avena</i> cf. <i>sativa</i> L. (floret base)	-/-/2	-/3/-	-/-	-	-/-
<i>Avena</i> sp. (grain)	5/13/10	25/15/19	7/-	4	1/-
<i>Avena</i> sp. (sprouted grain)	-/-/1	4/-/2	2/3	-	-/-
<i>Avena</i> sp. (twisted awn)	5/1/3	4/-/-	1/-	-	-/2
<i>Avena</i> sp. (floret base)	-/1/2	-/-/1	-/1	-	-/-

Table 12.5 continued

Feature/ (context)	Oven/ (4039)	Oven/ (4437)	Oven/ (4437)	Pit/ (4848)	Pit/ (4874)
Sample no.	612/615/621	720/723/724	755/779	773	774/775
Sample size (litre)	10/10/10	10/10/10	10/10	8	10/10
% analysed (if not 100%)	25/25/50				
Taxa					
<i>Avena</i> sp. (floret base) – silica	-/-/-	1/-/-	-/-	-	-/-
cf. <i>Avena</i> sp. (grain)	2/5/6	9/8/2	8/6	-	1/-
cf. <i>Avena</i> sp. (floret base) – silica	-/-/-	29/-/-	-/-	-	-/-
Gramineae (large) indet. grain	31/69/35	83/55/35	25/6	3	13/8
Gramineae (small) indet. (grain)	5/15/12	17/12/6	15/7	1	16/6
Gramineae indet. (embryo)	-/-/-	-/1/-	-/-	-	-/-
Gramineae indet. (rachis)	3/4/8	3/-/-	-/1	4	2/1
Gramineae indet. (culm base / rhizome)	-/1/-	-/1/-	-/-	-	-/-
Gramineae indet. (chaff) – silica	11/1/12	-/1/1	-/-	-	-/-
Gramineae indet. (rhizome)	-/-/-	-/12/-	-/-	-	-/-
Cf. Gramineae indet. (grain)	1/1/-	-/-/-	-/-	-	-/-
<i>Triticum</i> tetraploid (rachis)	9/13/5	21/1/10	8/18	4	11/6
Free-threshing wheat					
<i>Triticum</i> cf. tetraploid (rachis)	8/3/11	18/3/19	-/6	4	-/7
Free-threshing wheat					
<i>Triticum</i> hexaploid (rachis)	11/32/33	5/1/3	4/-	4	9/5
Free-threshing wheat					
<i>Triticum</i> cf. hexaploid (rachis)	11/20/8	8/2/5	4/-	3	8/6
Free-threshing wheat					
<i>Triticum</i> cf. hexaploid (basal node) Free-threshing wheat	1/-/-	-/-/-	-/-	-	-/-
<i>Triticum</i> (grain)	142/398/164	45/25/14	-/11	1	1/34
Free-threshing wheat					
<i>Triticum</i> (rachis)	53/86/124	64/7/30	-/9	13	22/-
Free-threshing wheat					
<i>Triticum</i> (rachis) – silica	-/-/-	13/-/-	-/-	-	-/-
Free-threshing wheat					
<i>Triticum</i> (basal node)	-/-/-	-/2/-	-/-	-	-/2
Free-threshing wheat					
<i>Triticum</i> cf. (grain)	-/3/8	-/-/-	-/-	-	
Free-threshing wheat					
cf. <i>Triticum</i> (rachis)	-/2/-	-/-/-	-/-	-	-/-
Free-threshing wheat					
cf. <i>Triticum</i> (rachis)	-/1/-	-/-/-	-/-	-	-/-
Free-threshing wheat					
<i>Triticum</i> cf. <i>spelta</i> L. (rachis internode)	-/-/-	-/-/-	-/-	1	-/-
<i>Triticum dicoccum/spelta</i> (grain)	5/7/1	-/-/-	-/-	-	-/-
<i>Triticum</i> cf. <i>dicoccum/spelta</i> (glume base)	-/7/-	-/-/-	-/-	-	-/-
<i>Triticum</i> sp. (grain)	82/32/68	16/19/9	87/10	144	62/21
<i>Triticum</i> sp. (short awn/glume beak)	-/-/59	-/-/-	-/-	-	-/-
<i>Triticum</i> sp. (short awn/glume beak) – silica	68/75/-	39/2/-	10/-	4	-/-
<i>Triticum</i> sp. (awn)	-/-/3	-/-/-	-/-	-	-/-
<i>Triticum</i> sp. (awn beak)	-/-/93	-/-/-	-/-	-	-/-
<i>Triticum</i> sp. (glume beak) – silica	104/106/-	43/4/-	-/-	-	-/-
<i>Triticum</i> sp. (basal node)	-/-/5	-/-/-	-/1	-	-/-
Wheat gall from infection by <i>Anguina Tritici</i>	-/-/-	3/-/-	-/-	-	-/-
cf. <i>Triticum</i> sp. (grain)	-/12/16	2/-/-	10/-	19	14/2
cf. <i>Triticum</i> sp. (awn)	-/-/-	1/-/-	-/-	-	-/-
<i>Triticum</i> sp. (rachis)	1/-/1	-/1/1	-/-	-	-/-
cf. <i>Triticum</i> sp. (basal node)	-/-/1	-/-/-	-/-	-	-/-
<i>Secale cereale</i> L. (grain)	5/33/4	3/-/-	1/-	1	-/-
<i>S. cereale</i> L. (awn)	-/-/1	-/-/-	-/-	-	-/-
<i>S. cereale</i> L. (awn) – silica	1/-/-	-/-/-	1/-	-	-/-
<i>S. cereale</i> L. (rachis)	15/35/18	12/-/2	6/1	7	2/7

Table 12.5 continued

Feature/ (context)	Oven/ (4039)	Oven/ (4437)	Oven/ (4437)	Pit/ (4848)	Pit/ (4874)
Sample no.	612/615/621	720/723/724	755/779	773	774/775
Sample size (litre)	10/10/10	10/10/10	10/10	8	10/10
% analysed (if not 100%)	25/25/50				
Taxa					
<i>S. cereale</i> L. (basal node)	- / 4 / -	- / - / -	- / -	-	- / -
cf. <i>Secale cereale</i> L. (grain)	3 / 14 / 2	- / - / -	5 / -	2	1 / -
cf. <i>S. cereale</i> L. (awn)	1 / 3 / -	- / - / -	- / -	-	- / -
cf. <i>S. cereale</i> L. (awn) – silica	- / - / -	1 / - / -	- / -	-	- / -
cf. <i>S. cereale</i> L. (rachis)	- / 7 / 3	1 / 1 / -	- / -	-	- / -
<i>Triticum Secale</i> sp. (grain)	2 / 4 / 6	- / - / -	3 / -	-	3 / 1
<i>Triticum Secale</i> sp. (awn)	- / 56 / 59	- / - / -	3 / -	1	- / 3
<i>Triticum Secale</i> sp. (awn) – silica	64 / - / -	44 / - / -	- / -	-	- / -
<i>Hordeum vulgare</i> L. (rachis)	- / 1 / -	1 / - / -	1 / -	-	- / -
<i>Hordeum</i> sp. (hulled straight grain)	2 / - / 1	6 / - / -	1 / -	-	1 / -
<i>Hordeum</i> sp. (hulled twisted grain)	2 / - / 1	6 / - / -	3 / 1	-	- / -
<i>Hordeum</i> sp. (hulled twisted sprouted grain)	- / - / -	1 / - / -	- / -	-	- / -
<i>Hordeum</i> sp. (hulled grain)	1 / 2 / -	8 / - / -	- / 3	3	- / -
<i>Hordeum</i> sp. (cf. hulled grain)	- / - / -	- / - / 1	- / -	-	- / -
<i>Hordeum</i> sp. (hulled sprouted grain)	- / - / 1	1 / - / -	- / -	-	- / -
<i>Hordeum</i> sp. (grain)	7 / 11 / -	10 / - / -	17 / 4	2	1 / -
<i>Hordeum</i> sp. (sprouted grain)	- / - / -	- / - / -	2 / 1	-	- / -
<i>Hordeum</i> sp. (awn) – silica	1 / - / -	- / - / -	- / -	-	- / -
<i>Hordeum</i> sp. (rachis)	4 / 2 / 8	19 / - / 4	4 / 7	-	- / 1
cf. <i>Hordeum</i> sp. (grain)	6 / 6 / 10	11 / 3 / 4	8 / 2	4	- / -
cf. <i>Hordeum</i> sp. (rachis)	- / - / 8	8 / - / -	1 / 2	-	- / -
<i>Hordeum/Secale</i> sp. (rachis)	- / 10 / 5	32 / 4 / 10	20 / 5	-	2 / -
Cereales indet. (grain)	132/341/151	106 / 33 / 38	152 / 25	144	64 / 34
Cereales indet. (sprouted grain)	- / - / -	- / - / -	- / -	1	- / -
Cereales indet. (glume fragment)	- / - / -	- / - / -	- / -	1	- / -
Cereales indet. (rachis)	34 / 57 / 46	17 / 3 / 11	11 / 2	17	4 / 10
Cereales indet. (rachis) – silica	- / - / -	2 / - / -	- / -	-	- / -
Gramineae (large) size (culm base/rhizome)	- / - / 14	- / - / -	- / -	-	- / -
Gramineae size (culm node)	4 / - / 3	20 / 2 / 4	2 / 1	5	- / -
Gramineae size (culm base/rhizome)	- / - / -	- / - / -	- / 2	-	- / 10
Gramineae size (rhizome)	2 / - / -	23 / - / 6	- / -	2	11 / -
Cereal size (embryo)	4 / 22 / 14	22 / - / 2	- / 3	7	4 / 1
Cereal size (sprout)	- / - / 2	- / - / -	- / -	-	- / -
Cereal size (glume fragment)	- / - / 4	- / - / -	- / -	-	- / -
Cereal size (culm node)	8 / 15 / 11	14 / 5 / 3	4 / 28	25	- / 5
Cereal size (culm base/rhizome)	2 / 16 / -	- / - / -	- / 22	-	- / -
Cereal size (culm base)	- / 5 / -	- / - / -	- / 7	-	- / -
Cereal size (rhizome)	5 / - / -	- / - / 9	- / -	-	11 / -
cf. Cereal size (culm node)	- / - / -	- / 2 / -	- / -	-	- / -
Gramineae/Cereal size (rhizome)	- / - / -	- / - / -	- / -	78	32 / -
Straw	- / - / -	- / - / -	++ / -	-	- / -
Leaf fragment	- / 1 / 4	- / - / -	- / -	-	- / 1
Bud and twig	- / - / -	- / - / -	- / 1	-	2 / -
Bud	- / 1 / 1	1 / - / -	- / -	-	- / -
Anther	- / - / 1	- / - / -	- / -	-	- / -
Moss capsule	- / - / 12	- / - / -	- / -	-	- / -
Rhizome/root	- / - / -	- / - / -	++++ / -	-	- / -
Herbage	- / - / ++++	- / + / +	- / -	+	+ / +
Concretion	- / - / -	- / - / -	- / -	+	- / -
IGNOTA	7 / 26 / 15	21 / 14 / 8	16 / 10	20	11 / 10
IGNOTA – silica	- / 1 / -	- / - / -	- / -	-	- / -
Number of items identified	1640 / 2336 / 1891	1506 / 1228 / 381	1134 / 316	588	447 / 269
Items per litre of soil sieved	608 / 934.4 / 378.2	150.6 / 122.8 / 38.1	113.4 / 31.6	73.5	44.7 / 26.9

to Silverside (1977, 179) is typical of spring barley may indicate that this crop was spring sown. Other weed seeds such as *Scandix pecten-veneris* (shepherd's needle) and *Galium aparine* (cleavers) might be regarded as more typical of winter sown crops, but some may be present in spring barley (Warrington 1924).

The weeds more typical of grassland may be present as the result of using cut grass as part of the fuel to dry the grain or could have been growing arable weeds. *Knautia arvensis* (corn scabious) is of interest in this respect. This grassland perennial can regenerate from damaged roots and will therefore survive ploughing, though within fields, plants are normally rather small (Salisbury, 1964 261).

Charred plant remains from the medieval manor (AD 1100–1250)

A total of 358 samples were available for analysis, and 144 were analysed in detail. Samples were recovered from a large number of different types of feature but the richer assemblages came mostly from ovens and associated pits and dumps of burnt debris within the northern holding, and from certain of the ditch complexes. The samples from or associated with the buildings contained only a few remains which were generally rather poorly preserved.

The western ovens and pits

The western pit group, near the kitchen range and partly under the dovecote, comprised a number of demolished ovens and associated pits containing dumped burnt debris from the ovens. Several samples from ovens 4039 and 4437 were examined in detail as well as samples from nearby pits, 4874 and 4848 (Table 12.5).

OVEN 4039

Three samples, 612, 615, and 621, from three oven fills, 4026, 4108 and 4200, were all very rich in material, while a further sample 622 produced very little. Weed seeds and grain were recovered in roughly equal proportions, and chaff, in the form of charred rachis fragments, glume bases and floret bases formed between 15–20% of the assemblages. However, the calculation of these percentages ignores the presence of light chaff such as awns, the silica remains of which formed an important component of these assemblages, particularly in samples 615 and 621.

As well as the remains of cereals, the samples also produced large numbers of legume pod fragments in comparison with other features. Seeds of large legumes were also present and some were identified as *Vicia sativa* spp. *sativa* (cultivated common vetch). Samples 615 and 621 produced a single seed each of *Linum usitatissimum* (flax) and a variety of other material including leaf fragments, thorns and buds. In addition, sample 615 contained a part of a hazel-nut shell, and sample 621 frond fragments of *Pteridium aquilinum* (bracken), some possible moss capsules and a large amount of unidentified herbaceous material.

The cereal grain component in the three samples was dominated by free-threshing wheat, and the cereal grain that could be identified to species outnumbered that which could not, indicating good conditions of preservation. Hulled wheat, rye, oat and barley grain were present in all three samples, but rye was more abundant in sample 615 which also produced more rye chaff than the other samples. Sample 615 was also the only sample to produce hulled wheat chaff. Sample 621, contained sprouted grain, one oat grain and one barley grain and also more barley chaff than the other samples. It was the only sample to produce floret bases of cultivated oat. In all three samples hexaploid free-threshing rachis fragments outnumbered tetraploid free-threshing rachis fragments, although, in each case, most of the rachis fragments could not be assigned to either ploidy level.

The weed assemblages from the three samples were large and included seed heads of *Anagallis arvensis* (scarlet pimpernel) and *Anthemis cotula* (stinking mayweed) in addition to individual seeds. Weeds characteristic of winter cereals grown on calcareous soils dominated the assemblages, though a single seed of *Ranunculus parviflorus* (small-flowered buttercup) in sample 615 and the possible presence of *Rumex acetosella* (sheep's sorrel) are likely to be derived from the soils on the floodplain. Possibly they were growing on the site itself. In sample 621, where weeds formed the majority of the assemblage, several unusual species were recorded. These were *Lathyrus nissolia* (grass vetchling), possible *Lathyrus aphaca* (yellow vetchling) which was also recorded in sample 615, *Legousia hybrida* (venus's looking-glass), *Succisa pratensis* (devil's-bit scabious), and *Onopordum acanthium* (scotch thistle). Some of these species are more characteristic of grassland than of arable fields, eg *Succisa pratensis*, while the two species of *Lathyrus* may be associated with the cultivation of fodder legumes.

Overall the three samples are very similar in content, though minor variation between the samples is evident. None of them appear to represent a single event but rather the remains of a number of different events. They appear to result primarily from the drying of wheat grain prior to grinding. However, the presence of sprouted oat and barley grain in sample 621 along with oat and barley chaff would suggest that the oven may also have been used for killing malted grain, while the amount of rye in sample 615 might indicate that rye grain or a maslin of wheat and rye was also dried in the oven.

The presence of legume pod fragments and seeds of *Vicia sativa* spp. *sativa* (cultivated common vetch) is more problematical. It seems unlikely that a fodder crop would have been dried unless it had been subject to fungal or insect attack or was harvested wet. Heating the crop in order to kill the fungus or insects would have saved the crop in the short term but the seed would have been killed in the process and making it more vulnerable to subsequent attack. Drying a crop harvested wet would have had the same drawback and it would seem more logical to leave the crop in the field until better conditions prevailed or to allow livestock to feed directly off it in the field.

However, it is possible that the remains could derive from the use of threshing waste as fuel. Vetches were fed unthreshed to horses, but were threshed when fed to working cattle (Campbell 1988). Another possible explanation is that *Vicia sativa* spp. *sativa* occurred as a weed of the wheat or other cereal crop. Flax seeds in the samples might have a similar origin.

The relative abundance of chaff in the samples is probably due to its use as a fuel to dry grain. Items such as bracken fronds and buds and twigs, as well as the fragments of herbage in sample 621 in particular, probably also derive from material used as fuel. Rough grassland may also have been cut for use as fuel and this may be the origin of the seeds of grassland plants. However, the species identified would be equally happy growing as arable weeds.

The light chaff in the samples, which had been oxidised to silica, consisted mainly of awns and glume beaks. It is apparent from the samples that short and long awned wheats were present, with short awns predominating. When this evidence is taken in conjunction with that from the rachis fragments it is tempting to suggest that short-awned free-threshing hexaploid wheat and a long-awned tetraploid wheat were being cultivated. However, it must be recognised that any number of different types of free-threshing wheat may have been grown which might have included short-awned tetraploids or long-awned hexaploids.

OVEN 4437 AND RELATED PITS

The three samples from fill 4457 (samples 720, 723 and 724), produced the richest assemblages, and one sample each from fills 4565 (sample 779) and 4571 (sample 755) were also analysed (Table 12.5). Variation between samples from different fills does not appear to be significant. Weed seeds dominated all the assemblages with chaff and grain in roughly equal proportions, except for sample 723 where approximately 90% of the assemblage was made up of weeds with some grain but hardly any chaff.

Wheat remains outnumbered those from the other cereals in the samples but in contrast to samples from oven 4039 tetraploid free-threshing rachis fragments outnumbered hexaploid ones. Sample 720 produced large numbers of awns and glume beaks. There were slightly more fragments from long awns, which could be from wheat or rye, than short awns or glume beaks, and lots of definite wheat glume beaks.

All the samples, except 723, produced some sprouted grain. Sample 720 contained comparatively large numbers of barley grain and chaff, and quite a bit of oat. Rye was less common in these samples than in those from oven 4039.

As well as a seed of *Vicia sativa* spp. *sativa* (cultivated common vetch), sample 755 produced four seeds of *Vicia faba* var. *minor* (celtic bean) and numerous pod fragments. A possible *Lens culinaris* (lentil) was found in sample 720 and another celtic bean in sample 755. Samples 720 and 724 produced charred flax (*Linum usitatissimum*) capsules, and two flax seeds were recovered from sample 720.

The weed component in the samples is somewhat

different to that found in samples from oven 4039. This may be due to the larger numbers recovered in samples from this oven. Sample 720 contained seeds of *Caltha palustris* (kingcup) and *Ranunculus acris/repens/bulbosus* (buttercup), a single seed of *Nasturtium microphyllum* (narrow-fruited watercress), and a possible seed of *Berula erecta* (lesser water-parsnip). These species are generally found in or beside water, on mud or in wet grassland. Sample 720 also produced *Centaurea cyanus* (cornflower).

Samples 720 and 723 contained large numbers of leguminous weed seeds. Over 200 seeds of *Medicago lupulina* (black medick) were identified in sample 723. These two samples also produced several seeds of *Valerianella dentata* (narrow-fruited cornsalad) and the occasional seed of *Euphorbia exigua* (dwarf spurge).

Sample 755 produced relatively large numbers Chenopodiaceae and Polygonaceae seeds. There was a constant low presence of *Tripleurospermum* sp. (mayweed) in all the samples. This genus was absent from oven 4039.

In pit 4848 the sample, 773, was dominated by cereal grain, mainly wheat and indeterminate grain, with a little rye, barley, and oats. Both wheat and rye chaff were found, with roughly equal proportions of both types of free-threshing wheat rachis being recovered along with a single possible spelt wheat rachis internode. Many culm nodes were recovered, as well as seed heads of *Anthemis cotula*, and quite a few *Euphrasia/Odontites* sp. (eyebright/red bartsia). *Euphorbia exigua* and *Valerianella dentata* were again present. Seeds of *Damasonium* sp. (star-fruit) were also found.

In pit 4874 the samples, 774 and 775, produced roughly equal numbers of weeds and cereal grain, and some chaff. Again free-threshing wheat remains were abundant with tetraploid chaff dominant. The usual weeds were present, with *Anthemis cotula* and *Odontites verna* or *Euphrasia/Odontites* as the most common taxa.

The assemblages from oven 4437 were similar to those from oven 4039 and probably result from the same activities, namely the drying of wheat grain and malted barley and oat. Assemblages from the pits associated with the oven were less well preserved with the remains less concentrated. They were probably derived from the cleaning of the oven.

The records of *Lens culinaris* and *Vicia faba* spp. *minor* may indicate that these crops were dried in the oven prior to threshing or that threshing waste from these crops was used as fuel. Alternatively they may have entered the assemblages as weeds of the wheat or other cereals.

The dominance of tetraploid free-threshing rachis over hexaploid free-threshing rachis in the oven assemblages in contrast to the results from oven 4039 is of interest in relation to the fragments of awns etc in oven 4437. The numbers of long awn fragments and definite glume beaks might be taken as further evidence for the presence of a long-awned tetraploid wheat with pronounced glume beaks.

The weeds associated with wet habitats from oven 4437,

e.g. *Caltha palustris*, and *Damsonium* species seeds, may indicate that wet grassland of the MG8 type (Rodwell 1992, 79) growing alongside the river or streams was being cut and used for fuel or tinder. However, studies undertaken by Pat Hinton (1990) in Shetland showed that some wetland species, including *Caltha palustris*, may be found in grain, and effectively act as arable weeds, at least in peaty soils. The occurrence of such wetland species in the samples therefore might also indicate the use of poorly drained boggy areas for arable land.

The presence of *Euphorbia exigua* and *Valerianella dentata* in the samples, both of which are low growing, would suggest that straw was used as fuel or tinder. Either cereals were being harvested close to the ground or they were cut close to the ear, and the stubble harvested separately and stored for this purpose. In the post-medieval period in the area wheat was reaped with a sickle and the stubble mowed separately with scythes, while the other crops were all mown (Donaldson 1794). In addition, local medieval manorial accounts refer to payments made for the raking and gathering of stubble (Courtney 2006).

The harvesting of wheat with sickles close to the ear may also explain the high numbers of *Medicago lupulina* in some of the samples. This plant is generally of low habit (Stace 1991, 496) although it would scramble up the cereal stalks.

Oven 393 (LSE 10) and associated deposits

Five samples were analysed from the fills of oven 393, another two from layers of dumped burnt debris over and around the ovens and three samples came from different dumps within the adjacent ditch system, LSD18 (Table 12.6). The majority of the samples produced very rich assemblages all dominated by cereal grain, with weed seeds accounting for about 10–30%, and chaff for about 8–20% of the assemblages. The samples from the oven itself and from deposits around the oven all contained either cereal sprouts or sprouted grain. In sample 47 cereal sprouts accounted for 10% of the assemblage and 68% of the barley grain and 45% of the oat grain showed definite signs of germination. Only straight grains of barley were identified and this would suggest that a two-row, rather than a six-row, form of hulled barley was being malted. This is in contrast with sample 1080 from the riverbank, where it appears hulled six-row barley was used (see Table 12.3).

A single six-row barley rachis from sample 45, in a nearby ditch, and the number of twisted, hulled grains in the samples overall from this area, illustrates that hulled six-row barley was also present. Either some six-row forms were present in two-row barley crop or it entered these assemblages as a result of being present as a volunteer in this, or other crops. Other assemblages from this period did contain significant amounts of six-row hulled barley. Probably both types of barley were cultivated with the two-row barley being particularly favoured for brewing.

Also in contrast to sample 1080, the percentage of

germination of the oat and the barley differed. In sample 1080, just under a quarter of the oat grain and the barley grain had definitely germinated, whereas in sample 47, the percentage germination of the barley was much higher than that in the oat. This may indicate that the two grains had been malted separately and only mixed before being dried prior to grinding.

The chaff element in the samples was dominated by wheat, although unlike the western ovens and pit group, neither types of free-threshing rachis dominated. Samples that contained more rye chaff and those with barley chaff, tended to produce more tetraploid free-threshing rachis, but the pattern is rather unclear. Sample 47 produced large amounts of wheat chaff.

The weed assemblage in the samples was varied, with weeds of both heavy calcareous soils and weeds of lighter soils both present. The poppy seeds in sample 47 were notably absent from the other samples, with the exception of a single seed from sample 114. These small seeds are more likely to have been associated with the chaff element in the sample. They are characteristic of light soils and, according to Silverside (1977, 179), particularly associated with winter wheat. Their presence in this sample might suggest that wheat was being sown on the light soils of the floodplain. This would tend to imply that these soils were not subject to much winter flooding at this period. The large number of *Urtica urens* (small nettle) seeds recovered in sample 56 also suggests the use of light soils.

Southern holding, plot 1 (LSE1)

Three samples from this enclosure produced rich assemblages (Table 12.7). Samples 5 and 11 were from the fills of a shallow irregular hollow, context 24 (Fig 4.27), while sample 31 was from a possible relict soil surviving within shallow surface depressions. They contain material that may have come from a small drying oven, context 73.

The samples were all grain dominated, but only sample 5 and sample 31 had significant amounts of chaff. Wheat remains were in the majority, but the other cereals were also represented. Sample 31 produced more barley and oat than the other samples, including a single sprouted barley grain. No large legumes were identified to species.

Weeds characteristic of spring sown and autumn sown crops were present, including species typical of both heavy and lighter soils, such as *Thlaspi arvense* (field penny-cress). This may mirror the relative importance of barley in the samples. As well as weed seeds, the samples also contained some fragments of hazel-nut and seeds of *Sambucus nigra* (elder).

The assemblages would tend to suggest that the oven was mainly used for drying wheat grain prior to grinding, with wheat and rye chaff being used as fuel or tinder. It may also have been used for drying malted grain, but there is very little evidence.

Table 12.6: Charred plant remains from eastern oven 393 and associated deposits (1100–1250)

Feature/ (context)	Oven/ (393)	Layers in LSE10	LSD18
Sample no.	47 / 48 / 55 / 56 / 66	50 / 58	45 / 54 / 114
Sample size (litre)	10 / 10 / 10 / 10 / ?	10 / 10	10 / 10 / 10
% analysed (if not 100%)	– / – / 50 / 50 / 50	– / 12	
Taxa	Common name		
cf. <i>Caltha palustris</i> L.	Marsh marigold	– / –	– / –
<i>Papaver rhoeas</i> etc	Common poppy	– / –	– / – / –
<i>Papaver argemone</i> L.	Long prickly-headed poppy	– / –	– / – / –
<i>Papaver</i> cf. <i>argemone</i> L.		1 / – / – / – / –	– / – / –
<i>Papaver</i> sp.	Poppies	4 / – / – / – / –	– / – / –
cf. <i>Papaver</i> sp.		– / – / – / – / –	– / – / 1
<i>Sinapis arvensis</i> L.	Wild mustard	2 / – / – / – / –	– / – / –
<i>Raphanus raphanistrum</i> L. (seed case)	Wild radish	– / – / – / – / –	1 / – / 1
<i>Silene</i> cf. <i>latifolia</i> ssp. <i>alba</i> (Miller) Greuter & Burdet		– / – / – / – / –	3 / – / –
<i>Silene</i> sp.	Campion/catchfly	5 / – / – / 3 / –	2 / – / –
<i>Agrostemma githago</i> L.	Corncockle	2 / – / – / – / –	1 / 1 / –
<i>Agrostemma githago</i> L. (capsule fragment)	Corncockle	1 / – / 1 / 1 / –	2 / 1 / 1
Caryophyllaceae indet.		1 / – / 1 / 2 / – / –	1 / – / 1
Caryophyllaceae indet. (capsule fragment)		– / – / – / 2 / 1	– / – / –
<i>Chenopodium</i> cf. <i>album</i> L.	Fat hen	– / 2 / – / 2 / –	– / – / –
<i>Chenopodium murale</i> L.	Nettleleaf goosefoot	1 / – / – / – / –	– / – / –
<i>Chenopodium</i> sp.		1 / – / – / – / –	– / – / –
<i>Atriplex</i> sp.	Orache	5 / – / 1 / 2 / –	2 / 5
Chenopodiaceae indet.		5 / 3 / – / 1 / –	3 / – / 4
<i>Malva sylvestris</i> L.	Common mallow	– / – / – / – / 1	– / – / –
cf. <i>Linum usitatissimum</i> L.	Flax/linseed	– / – / – / – / –	– / – / 1
<i>Vicia hirsute</i> (L.) S F Gray	Hairy tare	– / – / – / – / –	– / 1 / –
cf. <i>Vicia tetrasperma</i> (L.) Schreber	Smooth tare	– / – / – / – / –	2 / – / 1
<i>Vicia sativa</i> ssp. <i>nigra</i> (L.) Ehrh	Common vetch	– / – / – / – / –	– / 2 / –
<i>Vicia sativa</i> indet.	Narrow-leaved vetch	– / – / – / – / –	1 / – / –
<i>Vicia/Lathyrus</i> sp.	Vetch/tare	18 / 4 / – / 17 / 7	11 / 10
<i>Vicia/Lathyrus/Pisum</i> sp.	Vetch/tare/pea	– / – / – / 1 / –	3 / 1
<i>Vicia/Lathyrus/? Pisum</i> sp	Vetch/tare/pea	– / – / – / – / 2	– / 2
<i>Vicia/Pisum</i> sp	Vetch/pea	– / – / – / – / –	1 / – / –
cf. <i>Medicago</i> type	Medick	– / – / – / 2 / –	2 / – / 1
Leguminosae (small) indet.		4 / 1 / – / – / –	– / – / –
Leguminosae indet. (pod fragment)		– / – / – / 2 / –	– / – / 1
<i>Scandex pectin-veneris</i> L.	Shepherd's needle	– / – / – / – / –	2 / – / 1
<i>Bupleurum rotundifolium</i> L.	Thorowax	– / 1 / – / 4 / –	4 / – / 1
cf. <i>Bupleurum rotundifolium</i> L.	Thorowax	– / – / – / – / –	– / 1 / –
Umbelliferae indet.		3 / – / – / 1 / –	– / – / –
? Umbelliferae indet.		– / – / – / – / –	2 / – / –
<i>Polygonum aviculare</i> gp.	Knotgrass	3 / – / 2 / – / 1	– / – / 2
<i>Polygonum</i> sp.		1 / – / – / – / –	– / – / –
<i>Fallopian convolvulus</i> (L.) A Löve	Black bindweed	– / – / 1 / – / –	– / 1 / –
<i>Rumex</i> spp.	Dock	2 / – / – / – / 1	1 / –
<i>Urtica</i> cf. <i>urens</i>		– / 6 / – / – / –	– / – / –
<i>Urtica dioica</i> L.	Common nettle	– / – / 3 / 19 / 1	– / – / –
<i>Corylus avaelana</i> L. (nut fragment)	Hazel	– / 1 / – / – / –	– / – / –
<i>Lithospermum arvanse</i> L.	Corn gromwell	– / 2 / – / 1 / –	– / – / –
<i>Hyoscyamus niger</i> L.	Henbane	1 / – / – / – / –	– / – / –
<i>Euphrasia/Odontites</i> sp.	Eyebright/red bartsia	1 / 2 / – / 11 / –	1 / –
? <i>Melampyrum</i> sp.	Cow-wheat	– / – / – / – / –	– / – / –

Table 12.6 continued

Feature/ (context)		Oven/ (393)	Layers in LSE10	LSD18
Sample no.		47 / 48 / 55 / 56 / 66	50 / 58	45 / 54 / 114
Sample size (litre)		10 / 10 / 10 / 10 / ?	10 / 10	10 / 10 / 10
% analysed (if not 100%)		- / - 50 / 50 / 50	- / 12	
Taxa	Common name			
<i>Urtica urens</i> L.	Small nettle	- / - / - / 111 / -	- / -	- / - / -
? <i>Lamium</i>	Dead nettle	- / - / - / - / -	- / -	1 / - / -
<i>Plantago major</i> L.	Common/greater plantain	1 / - / - / - / -	- / -	1 / - / -
<i>Plantago lanceolata/media</i>	Ribwort plantain	- / - / - / - / -	- / 1	- / - / -
<i>Gallium cf. aparine</i> L.	Cleavers	- / 1 / - / - / -	- / -	- / - / 1
<i>Gallium</i> sp.	Cleavers	1 / - / - / 3 / -	- / -	- / - / -
<i>Sambucus nigra</i> L.	Elder	- / - / - / - / -	- / -	3 / - / -
<i>Sambucus cf. nigra</i> L.		- / 1 / - / 1 / -	- / -	- / - / -
<i>Valerianella dentate</i> (L.) Pollich	Narrow-leafed cornsalad	- / - / - / - / -	- / -	1 / - / 2
<i>Anthemis cotula</i> L.	Stinking mayweed	50 / 7 / 37 / 49 / 1	2 / 10	62 / 12 / 52
<i>Anthemis</i> sp.	Mayweeds	- / - / - / 8 / 1	- / -	- / - / -
cf. <i>Anthemis</i> sp.		9 / - / - / - / -	- / -	- / - / -
<i>Centaurea</i> sp.	Hardheads	- / - / 1 / - / -	- / 4	1 / - / -
cf. <i>Centaurea</i> sp.		- / - / - / - / -	- / -	- / - / 1
<i>Lapsana communis</i> L.	Nipplewort	- / 1 / - / 1 / -	- / -	- / - / 1
Compositae (large) indet.		- / - / - / 1 / -	- / -	- / - / -
<i>Eleocharis palustris</i> type	Spike-rush	5 / 1 / 3 / 2 / -	- / 3	- / - / -
cf. <i>Eleocharis palustris</i> type		- / - / - / - / -	- / -	1 / - / -
<i>Carex</i> sp(p).	Sedge	- / - / - / - / 1	- / -	- / - / -
cf. <i>Lolium temulentum</i> L. (grain)	Darnell/ryegrass	- / - / - / - / -	- / 1	- / - / -
<i>Poa annua</i> type (grain)	Annual meadow grass	- / - / 1 / 6 / -	- / -	- / - / -
<i>Bromus secalinus</i> type (grain)	Rye-brome	- / 2 / - / 5 / 1	3 / 5	- / 2 / 4
cf. <i>Bromus</i> sp. (grain)		- / 1 / - / 2 / -	- / 1	- / 1 / 2
<i>Avena cf. fatua</i> L. (floret base)	Oat	- / - / - / - / -	- / -	1 / - / -
<i>Avena cf. sativa</i> L. (grain)	Oat	- / - / 2 / - / -	- / 1	- / - / -
<i>Avena cf. sativa</i> L. (sprouted grain)	Oat	- / - / - / - / -	- / 2	- / - / -
<i>Avena</i> sp. (grain)	Oat	78 / 1 / 13 / 8 / 1	3 / 5	12 / 12 / 11
<i>Avena</i> sp. (sprouted grain)	Oat	52 / 4 / 2 / - / 2	1 / 1	- / 1 / -
<i>Avena</i> sp. (twisted awn)	Oat	- / - / - / 11 / -	- / -	3 / - / -
<i>Avena</i> sp. (floret base)	Oat	14 / - / - / - / -	- / -	- / - / -
cf. <i>Avena</i> sp. (grain)	Oat	- / 2 / - / 17 / -	3 / 8	43 / 9 / 20
cf. <i>Avena</i> sp. (sprouted grain)	Oat	- / - / - / - / -	- / -	- / - / 1
Gramineae (large) indet. (grain)	Grass	17 / 16 / 8 / 2 / 10	12 / 32	35 / 18 / 11
Gramineae (small) indet. (grain)	Grass	15 / 1 / 2 / 9 / 1	- / 5	7 / 1 / 6
Gramineae indet. (rachis)	Grass	16 / - / 2 / - / -	- / -	- / - / -
<i>Triticum</i> tetraploid (rachis)	Free-threshing wheat	19 / 3 / 5 / 5 / 2	- / 5	4 / 2 / 14
<i>Triticum</i> cf. tetraploid (rachis)	Free-threshing wheat	- / 1 / - / 12 / -	1 / 1	15 / 1 / 17
<i>Triticum</i> hexaploid (rachis)	Free-threshing wheat	18 / 5 / 3 / 5 / 2	3 / 17	8 / 6 / 8
<i>Triticum</i> cf. hexaploid (rachis)	Free-threshing wheat	- / 5 / - / 9 / 2	- / 7	5 / - / 6
<i>Triticum</i> (rachis)	Free-threshing wheat	132 / 18 / 18 / 92 / -	7 / 18	37 / 15 / 44
<i>Triticum</i> hexaploid sp. (rachis internode)	Bread wheat	4 / 1 - / - / -	- / -	- / - / -
<i>Triticum</i> cf. <i>dicoccum/spelta</i> (grain)	Emmer/spelt wheat	- / 1 / - / - / -	- / -	- / - / -
<i>Triticum dicoccum/spelta</i> (glume base)	Emmer/spelt wheat	2 / - / - / - / -	- / -	- / - / -
<i>Triticum</i> sp. (grain)	Wheat	- / 20 / - / 2 / 5	6 / 46	9 / 13 / 9
<i>Triticum</i> sp. (rachis internode)	Wheat	8 / - / - / - / -	- / -	- / - / -
<i>Triticum</i> sp. (basal node)	Wheat	- / 1 / - / - / -	- / -	- / - / -
Wheat gall from infection by <i>Anguina Tritici</i>		- / - / - / - / -	- / -	1 / - / -
cf. <i>Triticum</i> sp. (grain)	Wheat	- / - / - / - / -	- / 6	- / 4 / -

Table 12.6 continued

Feature/ (context)		Oven/ (393)	Layers in LSE10	LSD18
Sample no.		47 / 48 / 55 / 56 / 66	50 / 58	45 / 54 / 114
Sample size (litre)		10 / 10 / 10 / 10 / ?	10 / 10	10 / 10 / 10
% analysed (if not 100%)		- / - 50 / 50 / 50	- / 12	
Taxa				
cf. <i>Triticum</i> sp. (awn base)	Wheat	- / - / - / - / -	1 / -	- / - / -
<i>Secale cereale</i> L. (grain)	Rye	- / 4 / - / - / -	- / 1	- / - / -
<i>S. cereale</i> L. (rachis)	Rye	12 / 1 / 2 / 11 / 4	- / 1	11 / - / 10
cf. <i>Secale cereale</i> L. (grain)	Rye	- / - / - / - / -	- / 2	7 / - / 7
cf. <i>S. cereale</i> L. (rachis)	Rye	- / - / - / - / -	- / -	- / 2 / -
<i>Triticum/Secale</i> sp. (grain)	Wheat/rye	- / - / - / - / -	2 / -	- / 2 / -
<i>Triticum/Secale</i> sp. (awn)	Wheat/rye	- / - / 20 / 5 / -	- / -	- / - / -
<i>Triticum/Secale</i> sp. (awn) – silica	Wheat/rye	- / - / - / 6 / -	- / 1	- / - / -
<i>Hordeum vulgare</i> L. (rachis)		- / - / - / - / -	- / -	1 / - / -
<i>Hordeum</i> sp. (hulled straight grain)	Hulled barley	62 / - / 9 / - / -	4 / 25	6 / 1 / 5
<i>Hordeum</i> sp. (hulled twisted grain)	Hulled barley	- / 2 / 1 / - / -	- / 3	4 / 2 / 3
<i>Hordeum</i> sp. (hulled ?twisted grain)	Hulled barley	- / - / - / - / -	1 / -	- / - / -
<i>Hordeum</i> sp. (hulled straight sprouted grain)	Hulled barley	68 / 1 / 8 / - / -	- / 42	- / 1 / -
<i>Hordeum</i> sp. (hulled twisted sprouted grain)	Hulled barley	- / - / - / - / -	- / 2	- / - / -
<i>Hordeum</i> sp. (hulled grain)	Hulled barley	2 / 3 / 15 / - / 1	- / 1	- / 2 / -
<i>Hordeum</i> sp. (hulled sprouted grain)	Hulled barley	- / - / 16 / - / 1	2 / 19	- / - / -
<i>Hordeum</i> sp. (grain)	Barley	101 / 4 / 2 / - / 2	2 / 48	26 / 2 / 26
cf. <i>Hordeum</i> sp. (grain)	Barley	8 / - / 2 / 6 / -	4 / 4	9 / 4 / 5
<i>Hordeum</i> sp. (sprouted grain)	Barley	66 / 1 / - / - / -	- / 5	- / - / -
<i>Hordeum</i> sp. (rachis)	Barley	1 / - / - / 1 / -	- / -	2 / - / 2
? <i>Hordeum</i> sp. (rachis)	Barley	- / 2 / - / - / -	- / -	- / - / -
<i>Hordeum/Secale</i> sp. (rachis)	Barley/rye	- / - / - / 5 / -	- / -	- / 1 / 8
Cereales indet. (grain)		328 / 105 / 69 / 315 / 40	21 / 144	874 / 94 / 483
Cereales indet. (sprouted)		- / - / - / - / 1	- / 4	- / - / -
Cereales indet. (coleoptile)		- / - / 15 / - / -	- / -	- / - / -
Cereales indet. (awn)		30 / - / - / - / -	- / -	- / - / -
Cereales indet. (rachis)		- / 2 / - / 36 / 1	1 / 5	12 / 15 / 4
Gramineae size (embryo)		- / 2 / - / - / -	- / -	- / - / -
Gramineae size (coleoptile)		10 / - / - / - / -	- / -	- / - / 2
Gramineae size (culm node)		- / - / - / - / -	3 / -	- / - / 2
Gramineae size (rhizome)		- / - / - / - / -	- / 3	- / - / -
Cereal size (embryo)		- / - / 5 / 9 / -	- / 2	12 / 1 / 1
Cereal size (coleoptile)		132 / 1 / - / 4 / 1	- / 13	- / 1 / -
Cereal size (culm node)		4 / - / - / - / 1	1 / -	3 / 2 / 2
Herbage		- / - / - / - / -	- / +	- / - / ++
IGNOTA		22 / 5 / 15 / 12 / 4	2 / 4	- / 8 / 5
Number of items identified		1455 / 283 / 329 / 998 / 141	140 / 764	1696 / 308 / 1141
Items per litre of soil sieved		291 / 56.6 / 65.8 / / 99.8 / -	14 / 91.7	169.6 / 30.4 / 114.1

Other enclosed plots

Samples from other enclosed plots produced very poor assemblages, with the exception of a single posthole near the entrance to plot 2, sample 845, which is typical for West Cotton in that it was dominated by wheat grain along with some free-threshing wheat chaff. The other cereals were

present in small amounts, with rye grain being slightly better represented than is usual (Table 12.7).

The samples analysed from plots 3 and 12 (LSE 3 and LSE12) have been amalgamated in the table to produce totals for each enclosure. The data set is extremely small but it may be worth noting that the samples from plot 3

Table 12.7: Charred plant remains from plots 1, 2, 3 and 12 (1100–1250)

Enclosed plot		LSE1	LSE2	LSE3	LSE12
Sample (no of samples combined)		5 / 11 / 31	845	(5)	(2)
(Total) sample size in litres		10 / 10 / 10	10	(49)	(16)
Taxa	Common name				
<i>Papaver rhoeas</i> etc	Common poppy	2 / - / -	-	-	-
<i>Brassica/Sinapis</i> sp.	Cabbage/mustard	- / - / 2	-	-	-
<i>Thlaspi arvense</i> L.	Field mustard	- / - / 1	-	-	-
<i>Silene</i> sp.	Campion/catchfly	6 / - / 2	-	-	-
<i>Agrostemma githago</i> L.	Corncockle	- / - / 1	-	1	-
<i>A.githago</i> L. (capsule frag)	Corncockle	1 / - / -	-	1	-
<i>Stellaria media</i> gp.	Chickweed	- / - / -	2	-	-
Caryophyllaceae indet.		4 / - / 12	-	-	1
Caryophyllaceae indet. (capsule fragment)		- / 1 / -	1	-	-
? Caryophyllaceae indet.		- / - / -	-	-	1
<i>Chenopodium murale</i> L.	Nettleleaf goosefoot	1 / - / -	-	-	-
<i>Chenopodium</i> sp.		- / - / 1	-	-	-
<i>Atriplex</i> sp.	Orache	4 / 4 / 4	-	1	1
Chenopodiaceae indet.		- / - / 1	1	-	-
cf. Chenopodiaceae indet.		- / - / 3	-	-	-
<i>Lathyrus aphaca</i> L.	Yellow vetchling	- / 1 / -	-	-	-
<i>Vicia/Lathyrus</i> sp.	Vetch/tare	33 / 18 / 11	5	6	4
cf. <i>Vicia/Lathyrus</i> sp.		- / - / 1	-	1	-
<i>Vicia/Lathyrus/Pisum</i> sp.	Vetch/tare/pea	3 / - / 2	1	1	-
<i>Medicago</i> type	Medick	3 / 1 / -	-	-	1
Leguminosae (small) indet.		8 / 2 / 1	-	-	-
cf. <i>Scandix pectin-veneris</i> L.	Shepherd's needle	- / - / -	-	1	-
<i>Bupleurum rotundifolium</i> L.	Thorowax	- / - / 1	-	-	1
Umbelliferae indet.		- / 1 / 1	-	-	-
cf. Umbelliferae indet.		2 / - / -	-	-	-
<i>Polygonum aviculare</i> gp.	Knotgrass	- / 2 / 1	-	-	-
<i>Fallopian convolvulus</i> A. Löve	Black bindweed	- / - / -	-	1	-
cf. <i>Rumex acetosella</i> gp.	Common sorrel	- / - / -	1	-	-
<i>Rumex</i> spp.	Dock	3 / 8 / 3	1	3	1
cf. <i>Rumex</i> sp.		1 / - / 1	-	-	-
cf. <i>Urtica urens</i> L.	Small nettle	1 / - / -	-	-	-
<i>Corylus avellana</i> L. (nut frag)	Hazel	- / 2 / 3	-	1	-
<i>Anagallis arvensis</i> L.	Scarlet pimpernel	- / 1 / -	-	-	-
<i>Lithosperm arvense</i> L.	Corn gromwell	- / 1 / -	-	-	-
<i>Veronica arvensis</i> L.	Wall speedwell	- / - / 1	-	-	-
<i>Euphraia/Odontites</i> sp.	Eyebright/red bartsia	17 / 10 / 11	-	-	2
? <i>Plantago</i> sp.	Plantain	1 / - / -	-	-	-
Campanulaceae indet.		- / 1 / -	-	-	-
<i>Sherardia arvensis</i> L.	Field madder	- / 2 / -	-	-	-
<i>Galium</i> cf. <i>aparine</i> L.	Cleavers	- / - / -	-	1	-
<i>Galium</i> sp.	Cleavers	- / 1 / -	-	-	-
<i>Sambucus nigra</i> L.	Elder	- / 2 / 1	-	-	-
<i>Anthemis cotula</i> L.	Stinking mayweed	86 / 18 / 58	4	8	10
cf. <i>Anthemis cotula</i> L. (seedhead)	Stinking mayweed	- / - / -	2	-	-
<i>Anthemis</i> sp.	Mayweeds	13 / - / 1	-	1	-
<i>Centaurea</i> sp.	Hardheads	- / 2 / 1	1	-	-
Compositae indet. (immature seedhead)		- / - / -	-	1	-
<i>Eleocharis palustris</i> type	Spike-rush	- / 1 / -	-	1	-
cf. Cyperaceae indet.		- / - / -	-	1	-
<i>Bromus secalinus</i> type (grain)	Rye brome	- / - / 2	-	-	-
<i>Avena sativa</i> L. (floret base)	Oat	- / - / 1	-	-	-
<i>Avena</i> sp. (grain)	Oat	2 / - / 4	-	-	-
<i>Avena</i> sp. (twisted awn)	Oat	8 / 2 / 4	-	-	-
<i>Avena</i> sp. (floret base)	Oat	- / - / 2	-	-	-
cf. <i>Avena</i> sp. (grain)	Oat	4 / 6 / 6	3	4	3
Gramineae (large) indet. (grain)	Grass	- / 16 / 52	23	3	1
Gramineae (small) indet. (grain)	Grass	- / 8 / 15	1	1	-
Gramineae indet. (grain)	Grass	27 / - / -	-	3	9

Table 12.7 continued

Enclosed plot		LSE1	LSE2	LSE3	LSE12
Sample (no of samples combined)		5 / 11 / 31	845	(5)	(2)
(Total) sample size in litres		10 / 10 / 10	10	(49)	(16)
Taxa	Common name				
Gramineae indet. (rachis)	Grass	- / - / 4	-	-	-
<i>Triticum</i> tetraploid (rachis)	Free-threshing wheat	25 / 3 / 17	-	4	-
<i>Triticum</i> cf. tetraploid (rachis)	Free-threshing wheat	6 / - / 27	1	2	-
<i>Triticum</i> hexaploid (rachis)	Free-threshing wheat	2 / - / 27	5	-	-
<i>Triticum</i> cf. hexaploid (rachis)	Free-threshing wheat	2 / 5 / 18	2	2	1
<i>Triticum</i> (grain)	Wheat	184 / 43 / 158	40	4	29
<i>Triticum</i> (rachis)	Wheat	208 / 6 / 78	10	5	1
<i>Triticum diococcum/spelta</i> (grain)	Emmer/spelt wheat	- / - / -	1	-	-
<i>Triticum</i> sp. (grain)	Wheat	10 / 20 / 66	13	4	-
cf. <i>Triticum</i> sp. (grain)		- / 10 / -	3	-	-
<i>Secale cereale</i> L. (grain)	Rye	- / 1 / -	1	-	-
<i>S. cereale</i> L. (rachis)	Rye	10 / - / 14	1	1	-
cf. <i>Secale cereale</i> L. (grain)	Rye	- / - / 5	3	1	-
<i>Hordeum</i> sp. (hulled straight grain)	Hulled barley	- / 1 / -	-	-	1
<i>Hordeum</i> sp. (hulled twisted grain)	Hulled barley	1 / - / -	-	-	-
<i>Hordeum</i> sp. (grain)	Barley	2 / 1 / 2	-	2	2
<i>Hordeum</i> sp. (sprouted grain)	Barley	- / - / 1	-	-	-
<i>Hordeum</i> sp. (rachis)	Barley	1 / - / -	-	-	-
cf. <i>Hordeum</i> sp. (grain)	Barley	8 / 4 / 15	4	2	1
cf. <i>Hordeum</i> sp. (rachis)	Barley	- / - / 1	-	-	-
<i>Secale/Hordeum</i> sp. (rachis)	Rye/barley	- / 3 / 5	2	-	-
Cereales indet. (grain)		522e / 10 / 362	46	38	22
Cereales indet. (rachis)		- / 6 / 17	-	-	-
Gramineae size (embryo)		- / - / 2	-	-	-
Cereal size (embryo)		14 / 3 / 6	-	2	-
Cereal size (culm base/rhizome)		- / - / 2	-	-	-
Cereal size (rhizome)		- / - / -	1	-	-
herbage		- / + / -	-	-	-
IGNOTA		9 / 10 / 12	1	26	-
Total no. of items identified		1234 / 237 / 1050	182	144	92
Items per litre of soil sieved		123.4 / 23.7 / 105	18.2	(2.9)	(5.8)

were generally weed and chaff rich while those from plot 12, the yard of the southern holding, produced very little chaff and were dominated by grain. In addition, samples from plot 3 produced hazel-nut fragments (one noted from a sample that was only scanned). These were absent from plot 12 and the other plots not containing ovens or possible ovens.

The later mill leats and pond, and the final watermill, M25 (AD 1100–1150)

Nine samples were analysed from deposits associated with the later use of the mill system, three from the western leats, two from the mill pond, and four from the latest mill, M25 (Table 12.8).

The samples from the western leats were from the fills of the later leats, with sample 804 coming from the area

of the metalled fords (see Fig 6.2). They followed the usual pattern, consisting mostly of cereal grain with some weeds and chaff and with wheat remains far outnumbering the remains of other cereals. Bread wheat chaff was more common than rivet wheat chaff and the weed assemblages were rather small and uniform. However, the presence of *Centaurea scabiosa* (greater knapweed) in sample 804 is worth noting. This is a perennial weed and is normally regarded as typical of rough calcareous grassland. However, it is also found on arable land where its ability to form adventitious roots from a tap-root allow it to survive damage from ploughing (Salisbury 1964, 260).

The two samples from the mill pond, 885 and 886, both came from a dumped layer above the accumulated pond silts, 6905 (see Fig 6.7). In these samples weeds were more abundant than cereal grain, and chaff formed a larger percentage of the sample than usual. Wheat remains

Table 12.8: Charred plant remains from the mill leats, pond and watermill, M25 (1100–1150)

Structure	dung	Leats	Pond/leat	M25
Sample number	162	14 / 610 / 804	885 / 886	1057 / 1058 / 1046
(Context)	(7101)			/ 1067
Sample size (litre)	–	10 / 10 / 10	10 / 10	10 / 5 / 1 / 10
% analysed (if not 100%)		– / – / 50%		– / 50% / – / –
TAXA (element if not a seed)				
<i>Caltha palustris</i> L.	–	– / – / –	1 / –	– / – / – / –
<i>Ranunculus</i> cf. <i>acris/repens/bulbosus</i>	–	– / – / –	3 / –	– / – / – / –
<i>Ranunculus</i> Subgen <i>Ranunculus</i>	–	– / – / –	– / 3	– / – / – / –
<i>Ranunculus</i> sp.	–	1 / – / –	– / –	– / – / – / –
<i>Thalictrum flavum</i> L.	–	– / – / –	– / –	* / – / – / –
<i>Papaver rhoeas</i> etc	–	1 / – / –	– / –	* / – / – / –
<i>Papaver</i> cf. <i>rhoeas</i> etc	–	– / – / –	– / 2	– / – / – / –
<i>Papaver argemone</i> L.	–	– / – / –	1 / 18	* / – / – / –
<i>P. argemone</i> L. (capsule top)	–	– / – / –	– / –	2 – / – / – / –
<i>Brassica/Sinapis</i> sp. (seed case)	–	– / – / –	– / –	– / – / 2 / –
<i>Raphanus raphanistrum</i> L. (seed case)	–	– / – / 1	1 / –	– / – / – / –
<i>Thlaspi arvense</i> L.	–	– / – / 2	– / –	– / – / – / –
Cruciferae (large) indet. (seed case)	–	– / 1 / –	– / –	– / – / – / –
cf. Cruciferae (large) indet. (seed case)	–	– / – / –	– / 1	– / – / – / –
<i>Silene</i> cf. <i>vulgare</i> ?Moenchi Garke <i>s.str.</i>	–	– / – / –	– / 15	– / – / – / –
<i>Silene</i> sp.	1	– / – / –	– / 1	* / – / 2 / 1
<i>Agrostemma githago</i> L.	–	– / – / –	– / 3	– / 5 / 19 / –
<i>A. githago</i> L. (capsule fragment)	–	– / – / –	– / –	– / 3 / – / –
cf. <i>Cerastium</i> sp.	–	– / – / –	– / 1	– / – / – / –
<i>Stellaria media</i> gp.	–	– / – / –	2 / 6	– / – / – / –
<i>Stellaria/palustris/graminea</i>	–	– / – / –	– / –	* / – / – / –
<i>Stellaria</i> sp.	–	– / – / –	– / 1	– / – / – / –
Caryophyllaceae indet.	–	– / – / –	2 / 1	– / – / 1 / 1
Caryophyllaceae indet. (capsule fragment)	–	2 / – / 2	4 / 2	– / – / 7 / –
<i>Chenopodium polyspermum</i> L.	–	– / – / –	– / –	* / – / – / –
<i>Chenopodium</i> cf. <i>album</i> L.	–	1 / – / –	2 / 1	* / – / – / –
<i>Chenopodium</i> cf. <i>murale</i> L.	–	– / – / –	– / 1	– / – / – / –
<i>Atriplex</i> sp.	1	4 / – / –	17 / 87	* / – / – / –
cf. <i>Atriplex</i> sp.	–	– / – / –	1 / –	– / – / – / –
Chenopodiaceae indet.	–	– / – / 1	– / 20	– / 1 / – / –
Carophyllaceae/Chenopodiaceae indet.	–	– / – / –	– / –	– / – / – / 1
<i>Malva</i> sp.	–	– / – / –	– / 3	– / – / – / –
<i>Unum usitatissimum</i> L.	–	– / – / –	– / –	– / – / 1 / –
<i>Vicia sativa</i> ssp. <i>sativa</i> L.	–	– / – / –	– / –	– / – / – / –
cf. <i>Vicia sativa</i> ssp. <i>sativa</i> L.	–	– / – / –	2 / –	– / – / – / 1
cf. <i>Vicia faba</i> var <i>minor</i> L.	–	– / – / –	– / –	– / – / – / 1
<i>Lathyrus aphaca</i> L.	–	– / – / –	– / –	– / – / 1 / –
<i>Vicia/Lathyrus</i> sp.	1	9 / 1 / 2	48 / 19	18 / 3 / 22 / –
cf. <i>Vicia/Lathyrus</i> sp.	–	– / – / 1	– / 1	6 / – / – / –
<i>Vicia/Lathyrus/Pisum</i> sp.	–	– / – / –	3 / 1	– / 1 / 2 / 6
cf. <i>Vicia/Pisum</i> sp.	–	– / – / –	– / 2	– / – / – / –
<i>Medicago lupulina</i> L.	–	– / – / –	– / 46	– / – / – / –
cf. <i>Medicago lupulina</i> L.	–	– / – / –	– / 1	– / – / – / –
<i>Medicago</i> type	–	– / – / –	9 / –	– / – / – / 1
cf. <i>Medicago</i> type	–	– / – / –	– / 67	1 / – / – / –

Table 12.8 continued

Structure	dung	Leats	Pond/leat	M25
Sample number	162	14 / 610 / 804	885 / 886	1057 / 1058 / 1046
(Context)	(7101)			/ 1067
Sample size (litre)	–	10 / 10 / 10	10 / 10	10 / 5 / 1 / 10
% analysed (if not 100%)		– / – / 50%		– / 50% / – / –
TAXA (element if not a seed)				
cf. <i>Trifolium</i> sp.	–	– / – / –	– / 4	– / – / – / –
Leguminosae (small) indet.	–	– / – / –	1 / 154	– / – / – /
Leguminosae indet. (pod fragment)	–	– / 6 / –	31 – 32	– / 1 / 2 / –
cf. Leguminosae indet.	–	– / – / –	– / 11	– / – / – / –
<i>Rubus</i> sp.	–	– / – / –	1 / –	– / – / – / –
<i>Potentilla</i> sp.	–	– / 1 / –	– / –	– / – / – / –
<i>Scandix pectin–veneris</i> L.	–	– / – / –	2 / –	1 / – / – / –
cf. <i>Scandix pectin–veneris</i> L.	1	– / – / –	– / 1	– / – / – / –
<i>Aethusa cynapium</i> L.	–	– / – / –	– / –	* / – / – / –
<i>Conium maculatum</i> L.	–	– / – / –	– / 1	– / – / – / –
<i>Bupleurum rotundifolium</i> L.	–	2 / – / 1	2 / 2	* / – / 2 / –
cf. <i>Bupleurum rotundifolium</i> L.	1	– / – / –	– / –	– / – / – / –
Umbelliferae indet.	–	– / – / –	– / –	* / – / 1 / –
cf. Umbelliferae indet.	–	– / – / –	– / 2	– / – / – / –
<i>Euphorbia exigua</i> L.	–	– / – / –	– / 4	– / – / – / –
<i>Polygonum aviculare</i> gp.	–	– / – / –	4 / 106	– / – / – / 1
<i>Polygonum</i> cf. <i>aviculare</i> gp	–	– / – / –	– / 4	– / – / – / –
<i>Polygonum persicaria</i> L.	–	– / – / –	– / 1	– / – / – / –
<i>Polygonum lapathifolium</i> L.	–	– / – / –	– / 2	– / – / – / –
<i>Polygonum</i> sp.	–	– / – / 1	– / 1	– / – / – / –
cf. <i>Polygonum</i> sp.	–	– / – / –	– / –	– / – / 1 / –
<i>Fallopian convolvulus</i> (L.) A Löve	–	1 / – / –	1 / 1	1 / – / – / –
cf. <i>Rumex acetosella</i> gp.	–	– / – / –	8 / 2	– / – / – / –
<i>Rumex</i> spp.	4	6 / 1 / –	159 / 136	* / 12 / 12 / –
<i>Rumex</i> sp. (perianth fragment)	1	– / – / –	– / –	– / – / – / –
cf. <i>Rumex</i> sp.	–	– / – / –	3 / 2	1 / – / – / –
Polygonaceae indet.	–	– / – / –	– / 18	– / – / – / –
<i>Urtica urens</i> L.	–	1 / – / –	– / –	– / – / – / –
<i>Urtica dioica</i> L.	–	– / – / –	– / –	* / – / – / –
<i>Corylus avellana</i> L. (nut fragment)	–	– / – / –	1 / –	– / – / 7 / 1
<i>Anagallis arvensis</i> L.	–	– / – / –	– / 65	* / – / – / –
<i>A. arvensis</i> L. (seedhead)	–	– / – / –	– / 5	– / – / – / –
Primulaceae indet.	–	– / – / –	– / –	1 / – / – / –
<i>Lithospermum arvense</i> L.	1	1 / – / –	– / 1	2 / – / – / –
<i>Hyoscyamus niger</i> L.	–	– / – / –	5 / 18	* / – / – / –
<i>Rhianthus minor</i> L.	–	– / – / –	– / –	1 / – / – / –
cf. <i>Melampyrum</i> sp.	–	– / – / –	– / 1	2 / – / – / –
cf. <i>Odontites verna</i> (Bell.) Dumort.	–	– / – / –	2 / –	– / – / – / –
<i>Euphrasia/Odontites</i> sp.	–	8 / 2 / 1	10 / 17	* / 2 / 1 / 3
cf. <i>Mentha</i> sp.	–	– / – / –	– / –	* / – / – / –
<i>Plantago major</i> L.	–	– / – / –	– / –	– / – / – / –
cf. <i>Plantago lanceolata</i> L.	–	– / – / –	– / 1	– / – / – / –
<i>Plantago media/ lanceolata</i>	–	– / – / –	– / –	1 / – / – / –
Campanulaceae indet.	–	– / – / –	– / 1	– / – / – / –

Table 12.8 continued

Structure	dung	Leats	Pond/leat	M25
Sample number	162	14 / 610 / 804	885 / 886	1057 / 1058 / 1046
(Context)	(7101)			/ 1067
Sample size (litre)	–	10 / 10 / 10	10 / 10	10 / 5 / 1 / 10
% analysed (if not 100%)		– / – / 50%		– / 50% / – / –
TAXA (element if not a seed)				
<i>Galium</i> cf. <i>aparine</i> L.	–	– / – / –	4 / –	– / 1 / – / –
<i>Galium</i> sp.	–	– / – / –	– / –	* / – / – / –
cf. <i>Galium</i> sp.	–	– / – / –	– / –	* / – / – / –
<i>Sambucus nigra</i> L.	–	1 / – / –	– / –	– / – / – / –
<i>Anthemis cotula</i> L.	3	32 / – / 30	274 / 364	* / 34 / 18 / 9
<i>A. cotula</i> L. (seedhead)	–	– / – / –	– / –	– / – / 1 / –
<i>Anthemis</i> cf. <i>cotula</i> L. (bare seedhead)	–	– / – / –	– / 3	– / – / 1 / –
<i>Anthemis</i> sp.	–	– / – / –	– / 6	– / – / – / –
cf. <i>Anthemis</i> sp.	–	5 / – / 1	– / 7	– / – / – / –
<i>Tripleurospermum</i> sp. (seedhead fragment)	–	– / – / –	– / 1	– / – / – / –
cf. <i>Cirsium arvense</i> (L.) Scop.	–	– / – / –	– / –	– / 2 / – / –
<i>Cirsium</i> sp.	–	– / – / –	24 / –	– / – / – / –
cf. <i>Carduus/Cirsium</i> sp.	–	– / – / –	1 / –	– / – / – / –
<i>Onopordum acanthium</i> L.	–	– / – / –	– / 2	– / – / – / –
<i>Centaurea scabiosa</i> L.	–	– / – / 1	– / –	– / – / – / –
<i>Centaurea cyanus</i> L.	–	– / – / –	1 / 1	– / – / 2 / –
<i>Centaurea</i> cf. <i>cyanus</i> L.	–	1 / – / –	– / 1	– / – / – / –
<i>Centaurea</i> sp.	–	1 / – / –	2 / 5	– / – / 3 / 1
<i>Lapsana communis</i> L.	–	1 / – / –	– / –	– / – / – / –
Compositae (large) indet.	–	– / – / –	– / 9	– / – / – / –
cf. Compositae indet.	–	– / – / –	– / 1	– / – / – / –
<i>Alisma plantago-aquatica</i> L.	–	– / – / –	– / –	* / – / – / –
<i>Lemna</i> sp.	–	– / – / –	– / –	* / – / – / –
<i>Eleocharis palustris</i> type	1	– / – / –	6 / 5	* / – / 1 / –
cf. <i>Eleocharis palustris</i> type	–	2 / – / –	– / –	– / – / 1 / –
<i>Carex</i> sp.	–	– / – / –	– / –	* / – / – / –
cf. <i>Lolium temulentum</i> L. (grain)	–	– / – / –	– / 1	– / – / – / –
<i>Pos annua</i> type (grain)	–	– / – / –	– / 1	– / – / – / –
<i>Bromus secalinus</i> type (grain)	–	– / 1 / –	4 / –	7 / – / – / –
cf. <i>Bromus</i> sp. (grain)	–	1 / – / –	– / 1	2 / – / – / –
<i>Avena</i> cf. <i>fatua</i> L. (floret base)	–	– / – / –	– / 2	– / – / 3 / –
<i>Avena</i> cf. <i>sativa</i> L. (floret base)	–	– / – / –	– / –	– / – / 1 / –
<i>Avena fatua/sterilis</i> (floret base)	–	– / 1 / –	– / –	– / – / 1 / –
<i>Avena</i> cf. hexaploid (floret base)	–	– / – / –	– / 2	– / – / – / –
<i>Avena</i> sp. (grain)	1	2 / 2 / –	3 / 4	25 / 2 / 7 / =
<i>Avena</i> sp. (twisted awn)	–	3 / – / 1	1 / 1	– / – / 3 / –
<i>Avena</i> sp. (floret base)	4	– / – / –	– / –	2 / – / 1 / –
<i>Avena</i> sp. (pedicle)	–	– / – / –	– / –	1 / 1 / – / –
cf. <i>Avena</i> sp. (grain)	–	2 / 1 / 2	6 / 4	38 / 4 / 15 / 2
cf. <i>Avena</i> sp. (floret base)	2	– / – / –	– / –	– / – / – / –
Gramineae (large) indet. (grain)	1	24 / 1 / 20	– / 55	92 / 1 / 61 / –
Gramineae (small) indet. (grain)	–	9 / – / 4	– / 40	10 / 4 / 11 / –
Gramineae indet. (grain)	–	– / – / –	37 / –	– / – / – / 6
Gramineae indet. (rachis)	–	– / – / 1	– / 5	– / 26 / 6 / –

Table 12.8 continued

Structure	dung	Leats	Pond/leat	M25
Sample number	162 (7101)	14 / 610 / 804	885 / 886	1057 / 1058 / 1046 / 1067
Sample size (litre)	–	10 / 10 / 10	10 / 10	10 / 5 / 1 / 10
% analysed (if not 100%)	–	– / – / 50%	–	– / 50% / – / –
TAXA (element if not a seed)				
Gramineae indet. (chaff–silica)	–	– / – / –	– / 1	– / – / 1 / –
<i>Triticum</i> tetraploid free–threshing (rachis)	–	2 / – / 18	55 / 54	24 / 32 / 2 / 4
<i>Triticum</i> cf. tetraploid free–threshing (rachis)	–	5 / 2 / 9	35 / 49	98 / 16 / 4 / 1
<i>Triticum</i> hexaploid free–threshing (rachis)	3	5 / – / 23	40 / 53	6 / 62 / 14 / 6
<i>Triticum</i> cf. hexaploid free–threshing (rachis)	–	3 / – / 17	22 / 28	2 / 20 / 16 / 3
<i>Triticum</i> free–threshing (grain)	–	75 / 15 / 276	– / 294	34 / 182 / 164 / 12
<i>Triticum</i> free–threshing (tail grain)	–	– / 1 / –	– / –	– / – / – / –
<i>Triticum</i> free–threshing (rachis)	–	36 / 2 / 81	189 / 95	16 / 84 / 95 / 9
<i>Triticum</i> free–threshing (rachis) – silica	–	– / – / –	– / 2	– / – / – / –
<i>Triticum</i> free–threshing (basal node)	–	– / – / –	– / 4	– / – / – / –
<i>Triticum</i> cf. free–threshing (grain)	–	– / 1 / 16	– / –	– / – / – / –
<i>Triticum</i> cf. free–threshing (tail grain)	–	– / – / –	– / 1	– / – / – / –
<i>Triticum</i> cf. tetraploid sp. (rachis internode)	–	– / – / –	– / 2	– / – / – / –
<i>Triticum</i> hexaploid sp. (rachis internode)	–	– / – / 3	– / –	– / 1 / – / –
<i>Triticum</i> cf. hexaploid sp. (rachis)	–	– / – / –	– / 2	– / – / – / –
cf. <i>Triticum</i> free–threshing (rachis)	–	– / – / –	– / 27	– / 14 / – / –
<i>Triticum</i> cf. <i>spelta</i> L. (glume base)	–	– / – / –	– / –	– / – / 1 / –
<i>Triticum diococcum/spelta</i> (glume base)	–	– / – / –	– / –	– / – / – / 1
<i>Triticum</i> sp. (grain)	–	20 / 6 / 102	154 / 56	5 / 86 / 31 / –
<i>Triticum</i> sp. (short awn/glume beak) – silica	–	– / – / –	– / 59	– / – / – / –
<i>Triticum</i> sp. (awn) – silica	–	– / – / –	– / 8	– / – / – / –
<i>Triticum</i> sp. (awn base)	–	4 / – / 17	– / –	1 / – / 8 / –
<i>Triticum</i> sp. (spikelet fork)	–	– / – / –	– / –	– / – / 1 / –
<i>Triticum</i> sp. (rachis internode)	–	– / – / 7	– / 5	– / 2 / – / –
<i>Triticum</i> sp. (basal node)	–	– / – / 1	– / –	2 / 4 / 2 / –
Wheat gall from infection by <i>Anguina Tritici</i>	–	– / – / –	– / 1	– / – 2 / – / –
cf. <i>Triticum</i> sp. (grain)	–	8 / 5 / 15	21 / 6	– / – / 17 / 7
Wheat gall from infection by <i>Anguina Tritici</i>	–	– / – / –	– / 1	2 / – / – / –
cf. <i>Triticum</i> sp. (awn base)	–	2 / – / –	– / –	– / – / – / –
cf. <i>Triticum</i> sp. (spikelet fork)	–	– / – / –	– / –	– / – / 1 / –
cf. <i>Triticum</i> sp. (basal node)	–	1 / – / –	– / 4	– / – / – / –
<i>Secale cereale</i> L. (grain)	–	1 / – / –	1 / 24	2 / 70 / 5 / –
<i>S. cereale</i> L. (rachis)	–	2 / – / 2	58 / 86	– / 129 / 68 / –
<i>S. cereale</i> L. (basal node)	–	– / – / –	– / –	– / – / 5 / –
cf. <i>Secale cereale</i> L. (grain)	–	2 / – / –	1 / 11	1 / 45 / 4 / –
cf. <i>S. cereale</i> L. (awn) – silica	–	– / – / –	– / 1	– / – / – / –
cf. <i>S. cereale</i> L. (rachis)	–	2 / – / –	6 / 18	1 / 24 / 10 / 2
cf. <i>S. cereale</i> L. (basal node)	–	– / – / –	– / –	– / 4 / – / –
<i>Triticum/Secale</i> sp. (grain)	–	– / – / –	2 / 10	– / – / – / –
<i>Triticum/Secale</i> sp. (awn)	–	– / – / 1	– / –	– / – / – / –
<i>Triticum/Secale</i> sp. (awn) – silica	–	– / – / –	– / 19	– / – / – / –
<i>Hordeum vulgare</i> L. (rachis)	–	– / – / –	2 / 2	– / 6 / – / –
<i>Hordeum</i> cf. <i>vulgare</i> L. (rachis)	–	– / – / –	– / 1	– / 2 / – / –

Table 12.8 continued

Structure	dung	Leats	Pond/leat	M25
Sample number (context)	162 (7101)	14 / 610 / 804	885 / 886	1057 / 1058 / 1046 / 1067
Sample size (litre)	–	10 / 10 / 10	10 / 10	10 / 5 / 1 / 10
% analysed (if not 100%)	–	– / – / 50%	–	– / 50% / – / –
TAXA (element if not a seed)				
<i>Hordeum</i> sp. (hulled straight grain)	–	– / – / –	– / –	– / 3 / 1 / –
<i>Hordeum</i> sp. (hulled twisted grain)	–	– / – / –	2 / –	– / 2 / – / –
<i>Hordeum</i> sp. (hulled grain)	–	– / – / 1	1 / 2	1 / 11 / 1 / –
<i>Hordeum</i> sp. (hulled sprouted grain)	–	– / – / –	– / 1	– / – / – / –
<i>Hordeum</i> sp. (grain)	–	3 / 1 / 5	8 / 6	3 / 17 / 5 / 1
<i>Hordeum</i> sp. (awn)	–	– / – / –	– / –	– / 1 / – / –
<i>Hordeum</i> sp. (rachis)	–	– / – / –	6 / 19	2 / 31 / 3 / –
<i>Hordeum</i> sp. (basal node)	–	– / – / –	– / 2	– / 3 / – / –
cf. <i>Hordeum</i> sp. (grain)	–	4 / 1 / 9	14 / 8	2 / 7 / 5 / –
cf. <i>Hordeum</i> sp. (rachis)	–	– / – / –	6 / 8	– / – / 3 / –
<i>Secale/Hordeum</i> sp. (rachis)	–	1 / – / 3	27 / 31	3 / – / 27 / 2
cf. <i>Secale/Hordeum</i> sp. (rachis)	–	– / – / –	– / 11	– / 44 / – / –
Cereales indet. (grain)	–	116 / 13 / 172	290 / 100	39 / 173 / 96 / 63
Cereales indet. (rachis)	–	18 / 1 / 19	94 / 50	– / 102 / 19 / 6
Cereales indet. (straw)	–	– / – / –	– / *	– / – / – / –
cf. Cereales indet. (rachis)	–	– / – / –	– / –	7 / – / – / –
Gramineae size (embryo)	–	3 / – / 1	– / 3	– / – / – / –
Gramineae size (culm node)	1	– / – / 1	– / 58	* / 5 / 10 / –
Gramineae size (culm base/rhizome)	–	– / – / –	– / 41	* / – / – / –
Cereal size (embryo)	–	3 / 1 / 1	3 / 12	1 / 5 / 3 / 1
Cereal size (chaff)	–	– / – / –	– / 6	– / – / – / –
Cereal size (culm node)	–	– / – / –	– / 56	* / 11 / 17 / –
Cereal size (cum base/rhizome)	–	– / – / –	– / 27	– / – / 2 / –
? small seeds	–	– / – / –	– / +++	– / – / – / –
straw	–	– / – / –	++ / –	– / – / – / –
bud	–	2 / – / –	– / –	– / – / – / –
herbage	–	++ / + / –	++ / +++	– / – / + / +
IGNOTA	5	11 / 1 / 1	16 / 19	4 / 14 / 13 / –
Total number of items identified	–	451 / 68 / 873	1742 / 2803	467 / 1315 / 875 / 155
<i>Items per litre of soil sieved</i>	–	45.1 / 6.8 / 174.6	174.22 / 280.3	186.8 / 1315 / 87.5 / 15/5

dominated, but rye grain and particularly rye chaff formed a significant part of the two assemblages. Sample 886 produced a single sprouted barley grain, but only 6-row barley chaff was identified from either sample. Two possible seeds of *Vicia sativa* ssp. *sativa*, a seed of *Rubus* sp. (blackberry/raspberry) and a single hazel-nut fragment were recorded in sample 885. Both samples produced quite a few legume pod fragments and leguminous weeds seeds were relatively common, especially in sample 886, which had the larger weed assemblage.

The weed assemblage from sample 886 produced many low growing and scrabbling weeds such as *Euphorbia exigua* (dwarf spurge), *Polygonum aviculare* gp. (knotgrass), and

Anagallis arvensis (scarlet pimpernel) including five seed heads. This aspect of the assemblage in conjunction with the presence of large numbers of cereal size culm nodes and culm bases or rhizomes, would indicate the use of cereal straw.

An aspect apparent in both weed assemblages is the number of waste ground as opposed to more typically arable weeds, for example *Conium maculatum* (hemlock), *Hyoscyamus niger* (henbane), *Cirsium* sp. (thistles) and *Onopordum acanthium* (scotch thistle). Some of these, eg *Hyoscyamus niger* may have been entered the fields along with manure. There are also a fair number of biennial and perennial weeds present.

Two of the samples from the final mill, 1057 and 1058, come from early accumulations of material around the oak head sill in the wheel-pit, while the other two, 1046 and 1067, are from late deposits accumulating following abandonment of the mill.

In three out of the four samples analysed from the mill area, M25 the percentage of chaff was roughly equal to that of grain. Sample 1067, which did not follow this pattern, produced far fewer items and was grain dominated. In sample 1058, rye formed a substantial part of the assemblage, along with both types of wheat. In sample 1057 oat grain was the most abundant cereal grain, although it is clear from the small amount of chaff recovered that both wild oat and cultivated oat were present. Sprouted grain was absent from these samples.

There appears to be an association in these samples of hexaploid free-threshing wheat chaff and rye chaff. This, along with the presence of large amounts of rye and wheat grain in sample 1058 might suggest that bread wheat and rye were grown as a maslin. However, in sample 886 from the mill pond area, which also contained large amounts of rye, tetraploid free-threshing rachis fragments were more numerous. This suggests that rivet wheat and rye may also have been grown as a maslin.

Sample 1058 produced very few weed seeds, though *Agrostemma githago* (corncockle) was relatively common. In contrast, sample 1057 was rich in weeds, especially those associated with winter cereals. Unusual records from this sample included *Rhinanthus* sp. (rattle) and *Mentha* sp. (mint). Hazel-nut fragments were identified in samples 1046 and 1067. Sample 1046 produced a single flax seed, and 1067 a possible bean and a possible seed of cultivated common vetch.

In addition to the floated samples from M25, a special soil sample, 162, from layer 7101, was taken from layer 7101, which was a dump of loose tumbled limestone filling used to backfill the leat of the second mill, M26, prior to the construction of the final mill. The sample consisted of a lump of charred material, most of which was made up of straw-like fragments. Part of the lump was broken off and dry sieved in the laboratory (Table 12.8). The lump is interpreted as charred horse dung on the basis of its appearance and contents. The presence of oat grain and bread wheat chaff would indicate that both were fed to horses.

The boundary ditch systems and pit groups (AD 1100–1250)

The medieval samples from the ditch systems can be divided into four groups.

- 1 Samples from ditch systems that produced very little material, equivalent to background noise, where no deliberate dumping of charred material had occurred. Ditch systems that fall into this category were LSDs 5, 6, 7, 10, 11, and 12. The results will not be discussed in detail, and the tabulated data is held in archive. No samples were taken from ditch system 1.
- 2 Samples from ditch systems in the open plots of the southern and northern holdings, which contained richer assemblages that probably relate to crop processing activities taking place nearby. These ditch systems comprise 2 and 3 (Table 12.9) and 14 (Table 12.10), and to a lesser extent 4 and 13 (Table 12.10). Superficially, samples from ditch system 4 appear to be rich in charred plant remains, much larger samples were taken than usual and the items recovered per litre of soil was actually quite low.
- 3 Samples from the eastern enclosures, ditch systems 15, 16 and 17 (Table 12.11). This represents another area where charred material was relatively abundant, possibly from another oven located outside the area excavated.
- 4 Ditch systems 8 and 19 where some of the samples represent dumps of charred material which has undergone minimal mixing. Material from these ditch complexes is believed to be closely associated with the main building complex of the late Saxon settlement and the medieval manor (Table 12.12).

The plots of the southern and northern holdings, ditch systems 2, 3, 4, 13 and 14

Nine samples were analysed from ditch system 2 (LSD2), of which four are tabulated in Table 12.9. The majority of these were particularly rich in chaff and this may be debris associated with the possible oven in plot 1, to the immediate south. Otherwise, the samples followed the more usual pattern for the site, with grain dominating, weeds accounting for between 20–40% of the assemblage and chaff averaging around 10% of the assemblages (Table 12.9).

Nine samples were analysed from ditch system 3, of which four are tabulated in Table 12.9. They were relatively rich in chaff and weeds and in some samples weed seeds formed the majority of the assemblage, eg sample 321.

The samples from ditch 14 were somewhat different in that two samples, 437 and 438, were dominated by chaff, and by the fact that small items of cereal chaff that had been fully oxidised to silica were common (Table 12.10). This may reflect the possible association of some of the deposits in this ditch complex with material from a nearby oven and pit group.

In general, wheat grain and chaff were recovered in greater amounts than the remains of other cereals in all the ditch systems in this group. Sample 321, from ditch system 3, was an exception in that oat grain, some of which had sprouted, was more numerous. Sample 487, from 14, was also an exception. In this case barley grain, some of which showed definite signs of germination, was more plentiful than wheat grain. Sample 460, also from ditch system 3, was the only other sample to produce sprouted cereal grain, again oat, while a single sprouted *Bromus* sp. grain was recovered in sample 816 from the same ditch system.

The sprouted oat grain in sample 321 is significant in that very little barley grain, and none that had sprouted was

Table 12.9: Charred plant remains from boundary ditches 2 and 3 (1100–1250)

Ditch system	LSD2	LSD3
Sample number	22 / 24 / 30 / 41	321 / 460 / 816 / 821
Sample size (litre)	10 / 10 / 10 / 10	10 / 10 / 10 / 10
TAXA (element if not a seed)		
cf. <i>Ranunculus</i> Subgen. <i>Ranunculus</i>	- / - / - / -	- / 1 / - / -
<i>Ranunculus</i> sp.	- / - / - / -	1 / 1 / - / -
<i>Papaver rhoeas</i> etc	- / - / - / -	7 / - / - / -
<i>Papaver argemone</i> L.	- / - / - / -	8 / - / - / -
<i>P. argemone</i> L. (capsule top)	- / - / - / -	1 / - / - / -
<i>Papaver</i> sp.	- / - / - / -	2 / - / - / -
<i>Brassica</i> sp.	- / - / - / -	2 / - / - / -
<i>Brassica/Sinapis</i> sp.	- / - / - / 2	- / - / - / -
<i>Raphanus raphanistrum</i> L. (case)	- / - / - / -	- / - / - / 2
<i>Thlaspi arvense</i> L.	1 / - / - / 1	- / - / - / -
<i>Reseda luteola</i> L.	- / - / - / 1	- / - / - / -
<i>Silene</i> cf. <i>latifolia</i> ssp. <i>Alba</i> (Miller) Greuter & Burdet	- / 1 / - / -	5 / - / - / -
<i>Silene</i> sp(p).	4 / - / 3 / 2	4 / 1 / - / 1
cf. <i>Silene</i> sp.	- / - / - / 3	- / - / - / -
<i>Agrostemma githago</i> L.	- / 1 / 4 / 3	4 / - / - / -
<i>A. githago</i> L. (capsule fragment)	5 / 2 / - / 2	- / - / - / -
<i>Cerastium</i> sp.	- / - / - / -	2 / - / - / -
<i>Stellaria media</i> gp.	- / 1 / - / 2	5 / - / - / -
<i>Spergula arvensis</i> L. (large seeded)	- / - / - / -	- / - / - / 1
Caryophyllaceae indet.	2 / - / - / -	13 / - / - / -
Caryophyllaceae indet. (capsule fragment)	- / - / 11 / -	- / - / - / 1
<i>Chenopodium</i> cf. <i>album</i> L.	- / - / - / 7	- / - / - / 1
<i>Chenopodium</i> sp.	1 / - / - / -	- / - / - / -
<i>Atriplex</i> sp.	- / - / 3 / 16	3 / - / - / -
Chenopodiaceae indet.	1 / 2 / - / -	5 / - / - / 1
<i>Malva</i> sp.	- / - / - / -	- / - / 1 / -
<i>Linum usitatissimum</i> L.	- / - / - / -	8 / - / - / 1
<i>L. usitatissimum</i> L. (capsule fragment)	- / - / - / -	- / - / - / 1
<i>Vicia</i> cf. <i>tetrasperma</i> (L.) Schreber	- / - / - / -	2 / - / - / -
<i>Vicia sativa</i> ssp. <i>sativa</i> L.	- / - / - / -	- / - / - / -
cf. <i>Vicia faba</i> var. <i>minor</i> L.	- / - / - / 1	- / - / - / -
cf. <i>Lathyrus aphaca</i> L.	- / - / - / -	- / - / - / 1
cf. <i>Lathyrus nissloia</i> L.	- / - / - / 1	- / - / - / -
<i>Vicia/Lathyrus</i> sp.	16 / 11 / 6 / 11	10 / 4 / 5 / 13
<i>Vicia/Lathyrus/Pisum</i> sp.	1 / - / - / 9	3 / 4 / 2 / -
<i>Vicia/Pisum</i> sp.	- / - / - / 1	- / - / - / -
Medicago type	- / - / - / 1	14 / 3 / - / -
cf. <i>Trifolium</i> sp.	- / - / - / -	- / 1 / - / -
Leguminosae indet. (pod fragment)	- / - / - / -	1 / 1 / 3 / 8
<i>Potentilla</i> sp.	- / - / - / 2	- / - / - / -
<i>Scandix pectin-veneris</i> L.	- / - / 1 / -	9 / - / - / -
<i>Bupleurum rotundifolium</i> L.	2 / 4 / - / -	8 / - / - / -
cf. <i>Bupleurum rotundifolium</i> L.	- / - / - / -	- / - / - / 1
Umbelliferae indet.	- / - / - / 1	- / - / - / -
<i>Polygonum aviculare</i> gp.	- / - / 6 / 14	- / - / - / -
<i>Rumex acetosella</i> gp.	- / - / - / -	3 / - / - / -
cf. <i>Rumex</i> sp.	- / - / - / -	- / - / - / 1
Polygonaceae indet.	- / - / - / 7	6 / - / - / -
<i>Urtica urens</i> L.	- / 1 / - / -	6 / - / - / -
<i>Urtica dioica</i> L.	- / - / - / 2	- / - / - / -
cf. <i>Urtica dioica</i> L.	- / - / - / -	2 / - / - / -

Table 12.9 continued

Ditch system	LSD2	LSD3
Sample number	22 / 24 / 30 / 41	321 / 460 / 816 / 821
Sample (litre)	10 / 10 / 10 / 10	10 / 10 / 10 / 10
TAXA (element if not a seed)		
<i>Corylus avellana</i> L. (nut fragment)	3 / - / - / -	4 / - / - / 4
<i>Salix</i> sp. (capsule)	- / - / - / 10	- / - / - / -
<i>Anagallis arvensis</i> L.	- / - / - / -	1 / - / - / -
Primulaceae indet.	- / - / - / 1	- / - / - / -
<i>Lithospermum arvense</i> L.	- / - / - / -	2 / - / - / -
<i>Hyoscyamus niger</i> L.	- / 1 / - / -	- / - / - / -
<i>Veronica arvensis</i> L.	- / - / - / -	1 / - / - / -
<i>Veronica</i> sp.	- / - / - / -	1 / - / - / -
<i>Euphrasia/Odontites</i> sp.	6 / 3 / - / 1	177 / - / - / 2
cf. <i>Euphrasia/Odontites</i> sp.	- / - / - / 2	- / - / - / -
<i>Verbena officinalis</i> L.	- / - / - / 1	- / - / - / -
<i>Lycopus europeus</i> L.	- / - / - / -	1 / - / - / -
<i>Plantago major</i> L.	- / - / - / -	1 / - / - / -
<i>Legousia hybrida</i> (L.) Delarbre	- / - / - / 1	- / - / - / -
<i>Galium aparine</i> L.	- / - / - / -	1 / - / - / -
<i>Galium</i> cf. <i>aparine</i> L.	- / - / - / 4	- / - / - / -
<i>Galium</i>	1 / - / - / 1	- / - / - / -
<i>Sambucus nigra</i> L.	- / - / 1 / 23	- / - / - / -
<i>Knautia arvensis</i> (L.) Coulter	- / - / - / -	1 / - / - / -
<i>Anthemis cotula</i> L.	26 / 12 / 44 / 50	367 / 4 / 7 / 13
<i>Anthemis</i> sp.	- / - / 5 / -	5 / - / - / -
<i>Tripleurospermum</i> sp.	- / - / - / -	2 / - / - / -
<i>Cirsium</i> sp.	- / - / - / 1	- / - / - / -
<i>Centaurea</i> cf. <i>cyanus</i> L.	- / - / - / -	3 / - / - / -
<i>Centaurea nigra</i> L.	- / - / - 3 / -	- / - / - / -
<i>Centaurea</i> sp.	- / - / 2 / 1	2 / - / - / -
<i>Lapsana communis</i> L.	- / - / 1 / -	- / - / - / -
<i>Leontodon</i> sp.	- / - / - / -	1 / - / - / -
cf. <i>Picris</i> sp.	- / - / - / -	1 / - / - / -
<i>Crepis</i> cf. <i>capillaries</i> (L.) Wallr	- / - / - / -	15 / - / - / -
<i>Sparganium</i> cf. <i>erectum</i> L.	- / - / - / 4	- / - / - / -
<i>Eleocharis palustris</i> type	- / - / - / -	7 / - / - / -
<i>Schoenoplectus lacustris</i> (L.) Palla	- / - / - / 5	- / - / - / -
<i>Carex</i> sp(p).	- / - / 1 / 2	1 / - / - / -
Cyperaceae indet.	- / - / 1 / 6	- / - / - / -
<i>Poa annua</i> type (grain)	- / - / 2 / -	- / - / - / -
cf. <i>Poa annua</i> type (grain)	- / - / - / -	- / 1 / - / -
<i>Bromus secalinus</i> type (grain)	- / 2 / 2 / -	6 / 1 / 1 / 1
cf. <i>Bromus</i> sp. (grain)	- / - / - / -	5 / - / - / -
cf. <i>Bromus</i> sp. (sprouted grain)	- / - / - / -	- / - / 1 / -
<i>Avena</i> cf. <i>sativa</i> L. (grain)	- / - / - / -	1 / - / - / -
<i>Avena</i> sp. (grain)	- / 1 / 4 / 13	37 / - / 1 / -
<i>Avena</i> sp. (sprouted grain)	- / - / - / -	6 / 1 / - / -
<i>Avena</i> sp. (twisted awn)	1 / 1 / 2 / 2	2 / - / - / 2
<i>Avena</i> sp. (floret base)	- / - / - / 1	- / - / - / -
cf. <i>Avena</i> sp. (grain)	9 / 4 / 5 / 31	2 / - / - / 1
cf. <i>Avena</i> sp. (floret base)	- / - / 1 / -	- / - / - / -
cf. <i>arrenatherum elatius</i> ssp. <i>bulbosum</i> (Wild.)	- / - / - / -	1 / - / - / 1
Schrübler & Martens (tuber)		

Table 12.9 continued

Ditch system	LSD2	LSD3
Sample number	22 / 24 / 30 / 41	321 / 460 / 816 / 821
Sample (litre)	10 / 10 / 10 / 10	10 / 10 / 10 / 10
TAXA (element if not a seed)		
Gramineae (large) indet. (grain)	- / 12 / 33 / -	17 / 4 / 6 / 7
Gramineae (small) indet. (grain)	- / 3 / 28 / -	46 / - / 4 / 4
Gramineae indet. (grain)	19 / - / - / 41	- / - / - / -
Gramineae indet. (rachis)	- / - / 5 / 9	- / - / - / 1
<i>Triticum</i> tetraploid free-threshing (rachis)	- / 3 / 9 / -	1 / 1 / 1 / 2
<i>Triticum</i> cf. tetraploid free-threshing (rachis)	3 / - / 10 / 3	- / - / 1 / 5
<i>Triticum</i> hexaploid free-threshing (rachis)	2 / - / 57 / -	- / - / 1 / 4
<i>Triticum</i> cf. hexaploid free-threshing (rachis)	1 / 2 / 27 / 2	- / 2 / - / 2
<i>Triticum</i> free-threshing (grain)	89 / 35 / 154 / 68	31 / 7 / 9 / 21
<i>Triticum</i> free-threshing (rachis)	47 / 19 / - / 17	15 / 4 / 6 / 11
<i>Triticum</i> cf. free-threshing (grain)	- / - / - / -	- / - / 1 / -
<i>Triticum</i> cf. free-threshing (rachis)	- / - / - / -	- / - / 1 / 2
<i>Triticum spelta</i> L. (glume base)	- / - / - / -	- / - / - / 2
<i>Triticum</i> cf. <i>spelta</i> L. (grain)	- / - / - / -	- / 1 / - / -
<i>Triticum dicoccum/spelta</i> (grain)	- / - / - / -	- / - / 2 / 3
<i>Triticum</i> cf. <i>dicoccum/spelta</i> (grain)	- / - / 4 / -	- / - / - / -
<i>Triticum dicoccum/spelta</i> (glume base)	- / - / 1 / -	- / - / - / 1
<i>Triticum dicoccum/spelta</i> (spikelet fork)	- / - / - / -	- / - / - / 1
<i>Triticum</i> sp. (grain)	- / 2 / 28 / -	3 / 3 / 7 / 16
<i>Triticum</i> sp. (awn)	- / - / - / -	3 / - / - / -
<i>Triticum</i> sp. (rachis)	- / - / 1 / 1	- / - / - / 4
<i>Triticum</i> sp. (basal node)	- / - / - / -	- / 1 / - / -
cf. <i>Triticum</i> sp. (grain)	- / - / 6 / -	- / - / 2 / -
<i>Secale cereale</i> L. (grain)	- / - / 3 / -	- / - / - / -
<i>S. cereale</i> L. (grain)	3 / 1 / 99 / 8	2 / - - / 2
cf. <i>Secale cereale</i> L. (grain)	- / - / 1 / 5	- / - / - / -
<i>S. cereale</i> L. (rachis)	- / - / 8 / -	- / - / - / 1
<i>Triticum/Secale</i> sp. (grain)	- / - / 3 / -	- / - / - / 1
<i>Hordeum vulgare</i> L. (rachis)	- / - / 1 / -	- / - / - / -
<i>Hordeum</i> sp. (hulled straight grain)	- / - / 1 / 1	- / - / - / -
<i>Hordeum</i> sp. (hulled twisted grain)	1 / 1 / 3 / 2	- / - / - / 2
<i>Hordeum</i> sp. (grain)	1 / - / 4 / 6	3 / 2 / - / 1
<i>Hordeum</i> sp. (rachis)	- / 1 / 16 / 6	- / - / - / -
cf. <i>Hordeum</i> sp. (grain)	4 / - / 14 / 2	- / - / - / 3
<i>Hordeum/Secale</i> sp. (rachis)	- / - / 7 / 7	- / 1 / 2 / -
Cereales indet. (grain)	200e/146e/ 162 /131e	27 / 19 / 25 / 67
Cereales indet. (rachis)	2 / - / 63 / -	11 / - / 1 / 27
Gramineae size (embryo)	- / - / 1 / -	- / - / - / -
Gramineae siae (culm node)	- / - / 2 / -	- / - / - / -
Cereal size (embryo)	8 / - / 12 / -	6 / - / - / 1
Cereal size (glume fragment)	- / - / - / -	- / - / - / +
Cereal size (culm node)	- / - / - / -	3 / - / 2 / 1
Cereal size (culm base)	- / - / - / -	- / - / - / 3
bud	- / - / 4 / 1	- / - / - / -
herbage	- / - / ++ / ++	++ / - / + / -
IGNOTA	11 / - / 16 / 8	++ / 2 / 1 / 9
Number of items identified	470e / 275e / 928 / 557e	994e / 69 / 94 / 259
Items per litre of soil sieved	47 / 27.5 / 92.8 / 55.7	99.4 / 6.9 / 9.4 / 25.9

Table 12.10: Charred plant remains from boundary ditches 4, 13 and 14 (1100–1250)

Ditch system	LSD4	LSD14	LSD13
Number of samples (), sample number	(5)	430 / 431 / 437 / 438 / 487	(6)
Sample size (litre)	100	10 / 10 / 10 / 10 / 10	60
TAXA (element if not a seed)			
<i>Ranunculus</i> Subgen. <i>Ranunculus</i>	1	- / - / - / - / -	-
<i>Nuphar lutea</i> (L.) Sm.	-	- / - / - / - / 1	-
<i>Papaver</i> sp. (capsule top)	-	- / - / - / 1 / -	-
cf. <i>Brassica</i> sp.	1	- / - / - / - / -	-
cf. <i>Raphanus raphanistrum</i> L. (seed case)	-	- / - / - / 1 / -	-
<i>Silene</i> cf. <i>vulgaris</i> (Moench) Garke s.str.	-	- / - / - / - / -	1
<i>Silene</i> sp.	-	1 / 2 / - / - / -	-
<i>Agrostemma githago</i> L. (capsule fragment)	-	- / - / - / - / -	1
? <i>Agrostemma githago</i> L.	1	- / - / - / - / -	-
<i>Stellaria media</i> gp.	1	- / - / - / - / -	-
cf. <i>Stellaria media</i> gp.	-	- / - / - / - / 1	-
<i>Stellaria</i> sp.	-	- / - / - / - / -	1
Caryophyllaceae indet.	-	2 / 1 / 1 / - / 1	1
Caryophyllaceae indet. (capsule fragment)	-	- / - / 1 / - / -	-
cf. Caryophyllaceae indet.	-	- / - / - / - / -	1
<i>Chenopodium</i> cf. <i>album</i> L.	-	- / - / 2 / 1 / 1	-
<i>Chenopodium</i> cf. <i>murale</i> L.	-	1 / - / - / - / -	-
<i>Chenopodium</i> sp.	-	1 / 1 / - / - / -	-
<i>Atriplex</i> sp.	4	8 / 10 / - / - / 6	3
Chenopodiaceae indet.	-	6 / - / - / 2 / 1	-
<i>Linum usitatissimum</i> L.	1-	- / - / - / - / -	1
cf. <i>Vicia tetrasperma</i> (L.) Schreber	1	- / - / - / - / -	-
<i>Vicia sativa</i> L. indet.	1	1 / - / - / - / -	1
? <i>Lathyrus aphaca</i> L.	1	- / 1 / - / - / -	-
<i>Vicia/Lathyrus</i> sp.	24	13 / 13 / 5 / 6 / 16	15
<i>Vicia/Lathyrus</i> sp. (pod fragment)	-	- / - / 5 / - / -	-
<i>Vicia/Lathyrus/Pisum</i> sp.	2	1 / - / - / - / -	4
cf. <i>Vicia/Lathyrus/Pisum</i> sp.	-	- / - / - / 1 / 1	-
<i>Medicago</i> type	-	14 / 15 / - / - / -	-
cf. <i>Medicago</i> type	2	- / - / 1 / - / -	-
Leguminosae (small) indet.	-	5 / 20 / - / - / 3	-
cf. Leguminosae indet. (pod fragment)	1	- / - / - / - / 4	-
cf. Leguminosae (small) indet.	2	- / - / - / - / -	-
? <i>Rubus</i> sp.	-	- / 1 / - / - / -	-
<i>Rosa</i> sp.	-	- / - / - / 1 / 4	-
<i>Scandix pectin-veneris</i> L.	2	1 / - / - / - / -	1
cf. <i>Scandix pectin-veneris</i> L.	-	- / - / - / - / -	1
<i>Bupleurum rotundifolium</i> L.	1	- / - / 1 / 2 / -	3
Umbelliferae indet.	-	2 / 3 / - / - / -	-
<i>Polygonum aviculare</i> gp.	-	2 / 1 / 1 / - / 6	-
<i>Polygonum lapathifolium</i> L.	-	1 / - / - / - / -	-
cf. <i>Polygonum</i> sp.	-	- / - / - / - / 1	-
<i>Fallopian convolvulus</i> (L.) A. Löve	-	- / - / - / - / 1	-
<i>Rumex acetosella</i> gp.	-	- / 1 / - / - / -	-
cf. <i>Rumex acetosella</i> gp.	-	2 / - / - / - / -	-
<i>Rumex</i> spp.	13	11 / 12 / 6 / 2 / 1	1
cf. <i>Rumex</i> sp.	1	- / - / - / - / -	-

Table 12.10 continued

Ditch system	LSD4	LSD14	LSD13
Number of samples ()/ sample number	(5)	430 / 431 / 437 / 438 / 487	(6)
Sample size (litre)	100	10 / 10 / 10 / 10 / 10	60
TAXA (element if not a seed)			
Polygonaceae indet.	–	– / – / – / – / –	1
<i>Urtica urens</i> L.	–	1 / 1 / – / – / –	–
<i>Corylus avellana</i> L. (nut fragment)	3	– / – / – / – / –	1
? <i>Corylus avellana</i> L. (nut fragment)	–	– / – / – / – / –	1
<i>Salix</i> sp.	–	– / – / – / – / 2	–
<i>Angallis arvensis</i> L.	–	– / – / 1 / – / –	–
<i>Lithospermum arvense</i> L.	–	2 / 2 / – / – / 1	1
<i>Hyoscyamus niger</i> L.	–	– / 1 / – / – / –	–
<i>Euphrasia/Odontites</i> sp.	3	21 / 26 / 2 / 5 / 12	1
cf. <i>Euphrasia/Odontites</i> sp.	–	– / – / 1 / – / –	–
Labiatae indet.	–	– / 1 / – / – / –	–
<i>Plantago lanceolata</i> L.	–	– / – / – / – / 1	–
<i>Sambucus nigra</i> L.	–	1 / – / – / 1 / –	–
<i>Sambucus</i> cf. <i>nigra</i> L.	1	– / – / – / – / –	–
<i>Valerianella dentate</i> (L.) Pollich	1	– / – / – / – / –	–
<i>Anthemis cotula</i> L.	102	28 / 44 / 7 / 12 / 39	40
<i>Anthemis</i> sp.	4	20 / 0 / – / 1 / –	1
cf. <i>Anthemis</i> sp.	–	– / – / – / – / 1	–
<i>Centaurea cyanus</i> L.	–	– / – / 1 / – / –	1
<i>Centaurea</i> cf. <i>cyanus</i> L.	–	– / – / – / – / –	1
<i>Centaurea nigra/scabiosa</i>	–	– / – / – / – / –	1
<i>Centaurea</i> sp.	–	– / 1 / 1 / – / –	1
<i>Lapsana communis</i> L.	1	– / 1 / – / – / –	–
<i>Eleocharis palustris</i> type	1	– / – / – / – / 1	2
cf. <i>Eleocharis palustris</i> type	–	– / – / – / 2 / –	–
Cyperaceae indet.	1	– / – / – / – / –	–
<i>Poa annua</i> type (grain)	1	– / – / 1 / – / –	2
cf. <i>Poa annua</i> type (grain)	–	– / – / – / – / –	–
<i>Bromus secalinus</i> type (grain)	8	– / – / – / – / –	2
cf. <i>Bromus</i> sp. (grain)	1	– / – / – / – / 1	–
<i>Avena</i> sp. (grain)	15	5 / 1 / – / 2 / 10	9
<i>Avena</i> sp. (twisted awn)	1	– / – / – / – / –	2
<i>Avena</i> sp. (floret base)	–	– / – / – / 1 / –	–
cf. <i>Avena</i> sp. (grain)	5	7 / – / 1 / – / 4	12
cf. <i>Avena</i> sp. (panicle node)	–	– / – / – / – / 3	–
cf. <i>Arrhenatherum elatius</i> sp. <i>bulbosum</i> (Wild.)	–	1 / – / – / – / –	–
Schübler & Martens (tuber)			
Gramineae (large) indet. (grain)	12	– / – / 9 / 6 / 26	9
Gramineae (small) indet. (grain)	13	– / – / 1 / – / 10	8
Gramineae indet. (grain)	14	– / 4 / – / – / –	13
Gramineae indet. (rachis)	1	– / 5 / 3 / 4 / –	–
cf. Gramineae indet. (grain)	1	– / – / – / 1 / 1	–
<i>Triticum</i> tetraploid free-threshing (rachis)	6	2 / 1 / 33 / 32 / 10	4
cf. <i>Triticum</i> tetraploid free-threshing (rachis)	10	2 / 1 / 32 / 17 / 12	–
<i>Triticum</i> hexaploid free-threshing (rachis)	6	– / – / 10 / 14 / 5	3
cf. <i>Triticum</i> hexaploid free-threshing (rachis)	1	– / 2 / 9 / 7 / 4	1
<i>Triticum</i> free-threshing (grain)	34	170 / 100 / 44 / 28 / 70	113

Table 12.10 continued

Ditch system	LSD4	LSD14	LSD13
Number of samples () / Sample number	(5)	430 / 431 / 437 / 438 / 487	(6)
Sample size (litre)	100	10 / 10 / 10 / 10 / 10	60
TAXA (element if not a seed)			
<i>Triticum</i> free-threshing (rachis)	15	47 / 18 / 64 / 44 / 36	22
cf. <i>Triticum</i> free-threshing (rachis)	1	- / - / 7 / 3 / -	-
<i>Triticum</i> hexaploid sp. (rachis internode)	-	- / - / - / 2 / -	-
<i>Triticum dicoccum/spelta</i> (grain)	-	- / - / - / - / -	1
<i>Triticum dicoccum/spelta</i> (glume base)	-	- / 1 / - / - / -	-
<i>Triticum</i> cf. <i>dicoccum/spelta</i> (grain)	-	- / - / - / - / -	2
<i>Triticum</i> sp. (grain)	50	4 / 6 / 16 / 13 / 54	23
<i>Triticum</i> sp. (tall grain)	-	- / - / - / - / -	4
<i>Triticum</i> sp. (short awn/glume beak)	-	1 / - / - / - / -	-
<i>Triticum</i> sp. (rachis internode)	-	- / - / - / 1 / -	-
<i>Triticum</i> sp. (basal node)	-	- / - / 2 / 1 / 2	-
cf. <i>Triticum</i> sp. (grain)	15	- / - / 1 / - / 6	-
<i>S. cereale</i> L. (rachis)	3	1 / - / 9 / 4 / 5	4
cf. <i>Secale cereale</i> L. (grain)	1	- / - / - / - / -	1
cf. <i>S. cereale</i> L. (awn base)	-	- / - / - / - / -	-
cf. <i>S. cereale</i> L. (rachis)	1	- / - / - / - / -	-
<i>Triticum/Secale</i> sp. (grain)	3	- / - / - / - / 1	2
<i>Triticum/Secale</i> sp. (awn)	-	- / - / 4 / 8 / -	-
<i>Hordeum vulgare</i> L. (rachis)	1	- / - / - / - / 3	-
<i>Hordeum</i> sp. (hulled straight grain)	1	3 / - / - / 1 / 12	-
<i>Hordeum</i> sp. (hulled twisted grain)	2	- / - / - / - / 20	1
<i>Hordeum</i> sp. (hulled grain)	1	- / - / - / - / 52	-
<i>Hordeum</i> sp. (grain)	13	20 / 7 / 2 / 2 / 18	8
<i>Hordeum</i> sp. (sprouted grain)	-	- / - / - / - / 26	-
<i>Hordeum</i> sp. (rachis)	-	1 / - / - / - / 4	-
cf. <i>Hordeum</i> sp. (grain)	7	- / - / 1 / 1 / 13	7
cf. <i>Hordeum</i> sp. (rachis)	-	- / - / - / - / -	2
<i>Hordeum/Secale</i> sp. (rachis)	2	- / - / - / 5 / -	3
Cereales indet. (grain)	1	- / - / - / - / -	-
Cereales indet. (awn) – silica	-	224 / 159 / 57 / 40 / 33	178e
Cereales indet. (rachis)	8	7 / - / - / - / -	-
Cereales indet. (embryo)	1	3 / - / 39 / 29 / 9	3
Gramineae size (culm node)	-	- / - / - / 2 / 3	-
Gramineae size (root/rhizome)	-	- / - / - / 2 / -	-
Cereal size (embryo)	3	- / 1 / 1 / 2 / 10	2
Cereal size (coleoptile)	1	- / - / - / - / 63	-
Cereal size (culm node)	4	- / - / 5 / 3 / 9	-
Cereal size (culm base/rhizome)	-	- / - / - / - / 7	-
chaff	-	- / - / + / + / -	-
bud	1	- / - / - / - / -	-
herbage	++	- / - / - / - / ++	+
IGNOTA	16	15 / 1 / 11 / 7 / 20	17
Total number of items identified	639	663 / 473 / 398 / 321 / 669	641e
Items per litre of soil sieved	6.39	66.3/47.3/39.8/32.1/66.9	9.0

recovered. Similarly, very little oat grain was recovered from sample 487 in ditch system 14 and again none of this showed signs of germination. If, as seems likely, the sprouted grain represents malted grain that was burnt during the drying process, this would indicate that oats and barley were grown as a crop in their own right and malted separately. Barley of course is likely to have been used on its own for beer making, but pure oats produced poor quality beer (Dyer 1989, 57). Possibly mixing of oats and barley occurred once the malted grain had been dried, or may have occurred prior to drying as suggested for oven 393. However, it is also possible that mixing occurred after milling or that ground malt was exported either as pure malt or as a mixture of two grains.

Tetraploid free-threshing wheat rachis fragments were generally more frequently recorded in the samples than hexaploid free-threshing rachis with chaff from the other cereals very poorly represented. Sample 30 from a discrete dump within ditch system 2 was the exception. The chaff was largely from rye and hexaploid free-threshing wheat with barley also well represented. The grain was mainly wheat with small amounts of the other cereals.

Seeds of large legumes (ie *Vicia/Lathyrus/Pisum* sp. and *Vicia/Pisum* sp.) were more frequent in ditch system 2 than other ditch systems. A possible *Vicia faba* var. *minor* (celtic bean) was recorded in sample 41, and a seed of *Vicia sativa* ssp. *sativa* (cultivated common vetch) was present in sample 444 (not tabulated).

From ditch system 3, eight *Linum usitatissimum* (flax) seeds were recovered in sample 321, and sample 821 not only produced a flax seed but also contained a large-seeded form of *Spergula arvensis*, a weed typical of flax. Single flax seeds were also recorded in ditch systems 4, 13 and 14. Both the cultivated legumes and flax were probably present in these assemblages as contaminants of cereal crops.

The usual weed seeds: *Scandix pecten-veneris* (shepherd's needle) *Bupleurum rotundifolium* (thorowax), *Lithospermum arvense* (corn gromwell), *Odontites/Euphrasia* sp. (red bartsia/eyebright), and *Anthemis cotula* (stinking mayweed), were scattered throughout the samples. The large weed assemblage recovered from ditch system 3, sample 321 included *Papaver* spp. (poppies), *Silene latifolia* spp. *Alba* (white campion), *Rumex acetosella* gp. (sheep's sorrel), *Urtica urens* (small nettle), *Anagallis arvensis* (scarlet pimpernel), *Knautia arvensis* (corn scabious), *Tripleurospermum* sp. (mayweed), and *Centaurea* cf. *cyanus* (cornflower). Most of these taxa would fall within the phytosociological association *Papaveri-Melandrietum noctiflora*, alliance *Caucalidon lappulae* which is typical of winter cereals on well drained calcareous soils (Silverside, 1977, 352–6). However, *Urtica urens* is more commonly associated with spring sown crops, and *Rumex acetosella* agg. is generally associated with more acid soils. These weeds may have entered the assemblage with the oat grain which could have been spring sown on the gravelly soils of the floodplain. The majority of the weeds may have been associated with the wheat chaff and grain, winter sown on the valley slopes.

There is also a slight presence in this sample of weeds more usually associated with pasture. *Crepis capillaries* (smooth hawk's-beard) and *Plantago major* (greater plantain) as well as *Ranunculus* Subgenus *Ranunculus* (buttercups), and *Leontodon* sp. (hawkbit) could be regarded as falling within this category. However, all these taxa can also be found as weeds of disturbed ground, including arable. The presence of these species may reflect conversion of pasture to arable or a rotation involving fallow. Silverside (1977) regards *Crepis capillaris* and *Leontodon autumnalis* in association with members of the phytosociological order *Plantaginea maioris* as possibly being indicative of fields on marginal land that was previously pasture.

Ditch system 2, sample 41, also produced a rich and varied 'weed' assemblage. *Lycopus europaeus* (gipsywort), *Sparganium erectum* (bur-reed), and *Schoenoplectus lacustris* (bulrush), which grow either in mud or shallow water, could not have been growing as arable weeds and their presence shows that this riverside vegetation was being cut and brought to the site. Either, it was used for fuel, or possibly as floor covering or litter for animals. The single seed of *Nuphar lutea* (yellow water-lily) in ditch system 14, sample 487 presents more of a problem. Possibly water-lilies were cleared out of the channel and the waste dried and burnt.

Seeds of *Sambucus nigra* (elder) and seed capsules of *Salix* sp. (willow) were also recovered from ditch system 2, sample 41. This would suggest that scrub was also being cut and used for fuel. It would seem likely that the seeds of *Reseda luteola* (dyer's rocket), *Verbena officinalis* (vervain) and *Urtica dioica* (stinging nettle) entered the assemblage with the scrub element. The presence of *Reseda luteola* indicates that this dye plant was also present in the twelfth century, and it was also recorded as a waterlogged macrofossil in eleventh and twelfth-century deposits.

Occasional finds of hazel-nut fragments in these ditch complexes, the rose seeds recovered from ditch system 14, and a seed of *Viburnum opulus* (guelder rose) were probably charred along with wood used for fuel. Hazelnuts and rose hips were no doubt used for food and even the berries of guelder rose which are edible, if not very palatable, once cooked (Phillips 1977, 162) may also have been consumed.

The eastern enclosures, ditch systems 15, 16 and 17

As with the samples from the other ditch systems, grain tended to dominate the assemblages, with remains of wheat grain and chaff forming the largest cereal component. However, no sprouted grain was recorded and oats were less common. Both two-row and six-row barley appear to have been present. Rye appears to be much more frequent (Table 12.11). One sample from ditch system 15, 385, was exceptional in this respect producing over 300 rye rachis fragments, but only about 30 rye grains. However, the sample did produce nearly 400 grains of free-threshing

Table 12.11: Charred plant remains from the eastern boundary ditches, 15–17 (1100–1250)

Ditch system	LSD15	LSD16	LSD17
Sample number	385 / 425	240 / 242 / 255	189 / 427 / 443 / 458
Sample size (litre)	5 / 10	10 / 10 / 10	20 / 10 / 10 / 10
% analysed (if not 100%)			50% / –
TAXA (element if not a seed)			
<i>Ranunculus</i> Subgen. <i>Ranunculus</i>	– / –	– / – / –	– / 1 / 1 / –
cf. <i>Papaver</i> sp.	– / –	– / – / –	– / – / – / 1
<i>Brassica/Sinapis</i> sp.	– / –	– / – / –	2 / – / – / –
<i>Raphanus raphanistrum</i> L. (seed case)	– / –	– / – / –	– / – / – / 1
<i>Silene</i> cf. <i>latifolia</i> ssp. <i>alba</i> (Miller) Greuter & Burdet	– / –	– / – / –	– / – / 1 / –
<i>Silene</i> cf. <i>vulgaris</i> (Moench) Garke s.str.	– / –	– / – / –	– / – / 3 / –
<i>Silene</i> sp.	– / 2	– / – / –	1 / – / – / –
<i>Agrostemma githago</i> L.	5 / –	– / – / –	1 / – / 1 / 1
<i>Agrostemma githago</i> L. (capsule fragment)	16 / –	– / – / –	– / – / 1 / –
Caryophyllaceae indet.	1 / –	– / – / –	– / – / 1 / 2
Caryophyllaceae indet. (capsule fragment)	– / –	– / – / –	1 / – / – / 2
<i>Atriplex</i> sp.	– / 1	– / 1 / –	6 / 6 / 2 / 5
Chenopodiaceae indet.	– / –	– / – / –	– / – / 1 / –
cf. <i>Vicia sativa</i> ssp. <i>sativa</i> L.	– / –	– / – / –	– / – / 2 / –
<i>Vicia/Lathyrus</i> sp.	4 / 7	5 / – / 2	5 / 3 / – / 19
cf. <i>Vicia/Lathyrus</i> sp.	– / 1	– / – / –	– / – / – / 1
<i>Vicia/Pisum</i>	1 / –	– / – / 1	– / – / – / –
<i>Vicia/Lathyrus/Pisum</i> sp.	8 / –	– / 3 / 2	– / – / – / 1
cf. <i>Vicia/Lathyrus/Pisum</i> sp.	– / 1	1 / – / –	– / – / 4 / –
<i>Medicago</i> cf. <i>lupulina</i> L.	– / –	– / – / –	2 / – / – / –
<i>Medicago</i> type	1 / –	– / 1 / –	1 / 4 / 4 / 2
cf. <i>Trifolium</i> sp.	– / –	– / – / –	– / 3 / – / –
Leguminosae (small) indet.	– / –	– / – / –	– / – / – / 4
Leguminosae indet. (pod fragment)	1 / –	– / – / –	– / – / 24 / 12
cf. Leguminosae indet. (pod fragment)	– / –	– / – / –	11 / – / – / –
<i>Potentilla</i> sp.	– / –	– / – / –	– / 6 / – / –
cf. <i>Rosa</i> sp.	– / –	– / – / –	– / – / – / 1
<i>Rosa/Rubus</i> type (thorn)	– / –	– / – / –	– / – / 1 / –
<i>Scandix pecten-veneris</i> L.	– / –	– / – / –	– / – / 2 / 3
cf. <i>Scandix pecten-veneris</i> L.	– / –	– / – / –	1 / – / – / –
<i>Bupleurum rotundifolium</i> L.	– / 1	1 / 1 / –	– / – / 3 / 3
cf. <i>Bupleurum rotundifolium</i> L.	1 / –	– / – / –	1 / – / – / –
Umbelliferae indet.	2 / –	– / – / –	– / – / – / 1
<i>Polygonum aviculare</i> gp.	– / –	– / – / –	– / 2 / 1 / 2
cf. <i>Polygonum aviculare</i> gp.	– / 1	– / – / –	– / – / – / –
<i>Polygonum persicaria</i> L.	– / –	– / – / –	– / 1 / – / –
<i>Fallopian convolvulus</i> (L.) A. Löve	1 / –	– / – / –	2 / 1 / 1 / –
<i>Rumex</i> sp(p).	5 / 1	2 / 1 / –	– / 6 / 7 / 4
Polygoniaceae indet.	– / –	– / – / –	– / – / 1 / –
<i>Corylus avellana</i> L. (nut fragment)	5 / 2	– / – / –	1 / – / 1 / –
<i>Anagallis arvensis</i> L.	1 / –	– / – / –	– / 1 / – / –
<i>Veronica arvensis</i> L.	– / –	– / – / –	– / – / – / 1
cf. <i>Odontites verna</i> (Bell.) Dumort.	– / –	– / – / –	1 / – / – / –
<i>Euphrasia/Odontites</i> sp.	5 / 1	– / – / 1	4 / 14 / 1 / 6
<i>Prunella vulgaris</i> L.	– / –	– / – / –	– / 1 / – / –
<i>Plantago</i> cf. <i>lanceolata</i> L.	– / –	– / – / –	– / 1 / – / –
<i>Legousia hybrida</i> (L.) Delarbre	– / –	– / – / –	– / – / 1 / –

Table 12.11 continued.

Ditch system	LSD15	LSD16	LSD17
Sample number	385 / 425	240 / 242 / 255	189 / 427 / 443 / 458
Sample size (litre)	5 / 10	10 / 10 / 10	20 / 10 / 10 / 10
% analysed (if not 100%)			50% / -
TAXA (element if not a seed)			
<i>Galium</i> sp.	- / -	- / - / -	- / - / - / 1
cf. <i>Galium</i> sp.	- / -	- / - / -	- / - / 1 / -
<i>Sambucus nigra</i> L.	- / -	- / - / -	- / - / - / 1
<i>Valerianella</i> cf. <i>dentate</i> (L.) Pollich	- / -	- / - / -	- / - / - / 1
? <i>Anthemis arvensis</i> L.	- / 1	- / - / -	- / - / - / -
<i>Anthemis cotula</i> L.	233 / 8	6 / 9 / -	14 / 30 / 26 / 35
<i>Anthemis cotula</i> L. (seedhead)	- / -	- / - / -	1 / - / - / -
<i>Anthemis</i> sp.	- / -	1 / - / -	- / 12 / - / 3
cf. <i>Anthemis</i> sp.	1 / -	- / - / -	- / - / 2 / -
<i>Centaurea</i> sp.	- / -	- / - / -	1 / - / 1 / -
Compositae (large) indet.	- / -	- / - / -	3 / 1 / 1 / -
Compositae indet. (clean seedhead)	2 / -	- / - / -	- / - / - / -
cf. Compositae indet.	- / -	- / - / -	- / - / 1 / 1
<i>Eleocharis palustris</i> type	- / -	- / 1 / -	3 / 3 / 1 / -
cf. <i>Eleocharis palustris</i> type	- / -	- / - / -	- / - / - / 4
<i>Carex</i> sp.	- / 2	- / - / -	1 / - / - / 3
Cyperaceae indet.	- / -	- / - / -	- / - / 1 / 1
<i>Poa annua</i> type (grain)	- / 1	1 / - / -	- / 1 / - / 1
<i>Bromus secalinus</i> type (grain)	- / 2	3 / - / -	2 / - / 1 / -
cf. <i>Bromus secalinus</i> type (grain)	- / -	- / - / -	- / 1 / - / -
cf. <i>Bromus</i> sp. (grain)	2 / -	- / - / -	- / - / 1 / -
<i>Avena</i> cf. <i>fatua</i> L. (floret base)	- / -	- / 1 / -	- / - / - / -
<i>Avena strigosa/sativa</i> (floret base)	- / -	- / - / -	- / 1 / - / -
<i>Avena</i> hexaploid sp. (floret base)	- / -	- / - / -	- / - / 1 / -
<i>Avena</i> sp. (floret base)	8 / -	- / - / -	- / - / - / -
<i>Avena</i> sp. (grain)	7 / -	4 / 7 / -	3 / - / 2 / 9
cf. <i>Avena</i> sp. (grain)	12 / -	- / 6 / -	- / 1 / 2 / 2
<i>Avena</i> sp. (twisted awn)	12 / -	- / - / -	- / - / 5 / 1
cf. <i>Avena</i> sp. (floret base)	1 / -	- / - / -	- / - / - / -
cf. <i>Avena</i> sp. (basal node)	- / -	- / - / -	- / - / - / 1
Gramineae (large) indet. (grain)	12 / 9	9 / 3 / -	9 / 5 / 17 / 13
Gramineae (small) indet. (grain)	11 / 6	7 / 3 / -	4 / 4 / 12 / 8
Gramineae indet. (rachis)	95 / -	- / - / -	- / - / 1 / 2
Gramineae indet. (chaff) – silica	2 / -	- / - / -	1 / - / 2 / 1
cf. Gramineae indet. (grain)	- / 15	- / - / 1	- / - / - / -
cf. Gramineae indet. (rachis)	- / -	1 / - / -	- / - / - / -
<i>Triticum</i> tetraploid free-threshing (rachis)	11 / 1	2 / - / -	- / - / 6 / 10
<i>Triticum</i> cf. tetraploid free-threshing (rachis)	1 / -	- / - / -	2 / 1 / 3 / 4
<i>Triticum</i> hexaploid free-threshing (rachis)	12 / 4	- / - / -	- / - / 10 / 13
<i>Triticum</i> cf. hexaploid free-threshing (rachis)	4 / -	- / - / -	1 / - / 6 / 6
<i>Triticum</i> free-threshing (grain)	380 / 18	16 / 32 / 24	43 / 15 / 76 / 41
<i>Triticum</i> free-threshing (rachis)	62 / 6	2 / 7 / -	1 / 2 / 28 / -
<i>Triticum</i> cf. free-threshing (grain)	- / -	- / - / -	- / 1 / 9 / -
<i>Triticum</i> cf. free-threshing (rachis)	2 / -	- / - / -	- / - / - / -
<i>Triticum</i> free-threshing (rachis internode)	- / -	- / - / -	- / - / 1 / -
<i>Triticum</i> hexaploid sp. (rachis internode)	1 / -	- / - / -	- / - / - / -
<i>Triticum</i> cf. <i>dicoccum/spelta</i> (grain)	- / -	2 / - / -	3 / - / - / 1

Table 12.11 continued.

Ditch system	LSD15	LSD16	LSD17
Sample number	385 / 425	240 / 242 / 255	189 / 427 / 443 / 458
Sample size (litre)	5 / 10	10 / 10 / 10	20 / 10 / 10 / 10
% analysed (if not 100%)			50% / –
TAXA (element if not a seed)			
<i>Triticum</i> sp. (grain)	11 / 14	14 / 5 / 1	3 / 8 / 42 / 11
<i>Triticum</i> sp. (short awn) – silica	1 / –	– / – / –	– / – / – / –
<i>Triticum</i> sp. (short awn/glume beak)	– / –	– / – / –	– / – . – / 2
<i>Triticum</i> sp. (short awn/glume beak) – silica	– / –	– / – / –	– / – / 8 / 5
<i>Triticum</i> sp. (rachis internode)	4 / –	– / – / –	– / – / – / –
cf. <i>Triticum</i> sp. (grain)	– / –	– / – / –	5 / – / – / 9
<i>Secale cereale</i> L. (grain)	26 / –	3 / 2 / –	– / 1 / – / –
<i>S. cereale</i> L. (rachis)	423 / –	1 / 2 / –	2 / – / 11 / 4
<i>S. cereale</i> L. (basal portion)	7 / –	– / – / –	– / – / – / –
cf. <i>Secale cereale</i> L. (grain)	7 / –	1 / – / –	4 / 2 / – / 1
cf. <i>S. cereale</i> L. (awn)	– / –	– / – / –	– / – / 1 / –
cf. <i>S. cereale</i> L. (rachis)	18 / –	– / – / –	– / – / 2 / –
<i>Triticum/Secale</i> sp. (grain)	5 / –	– / – / –	2 / – / 2 / –
<i>Triticum/Secale</i> sp. (awn)	1 / –	– / – / –	1 / – / – / –
<i>Triticum/Secale</i> sp. (awn) – silica	1 / –	– / – / –	– / – / 6 / 31
cf. <i>Triticum/Secale</i> sp. (grain)	– / –	– / – / –	– / – / 1 / –
<i>Hordeum</i> cf. <i>distichum</i> L. (rachis)	– / –	– / – / –	– / – / 1 / –
<i>Hordeum vulgare</i> L. (rachis)	9 / –	– / – / –	1 / – / – / –
<i>Hordeum</i> cf. <i>vulgare</i> L. (rachis)	5 / –	– / – / –	– / – / – / –
<i>Hordeum</i> sp. (hulled straight grain)	7 / –	1 / 2 / –	1 / – / 1 / –
<i>Hordeum</i> sp. (hulled twisted grain)	3 / –	– / 1 / –	2 / – / – / 1
<i>Hordeum</i> sp. (hulled grain)	– / –	– / – / –	1 / – / 1 / 3
<i>Hordeum</i> sp. (grain)	21 / 2	1 / 7 / 8	6 / 3 / 6 / 2
<i>Hordeum</i> sp. (awn) – silica	– / –	– / – / –	– / – / – / 3
<i>Hordeum</i> sp. (rachis)	27 / –	– / – / –	3 / – / 3 / 2
cf. <i>Hordeum</i> sp. (grain)	– / 4	4 / – / –	4 / – / 8 / 4
cf. <i>Hordeum</i> sp. (rachis)	– / 1	– / – / –	– / – / – / –
<i>Hordeum/Secale</i> sp. (rachis)	4 / 1	– / – / –	1 / – / 6 / 5
Cereales indet. (grain)	1477 / 85	79 / 38 / 43	74 / 61 / 270 / 200
Cereales indet. (awn)	– / –	– / – / –	– / – / 2 / –
Cereales indet. (rachis)	– / 1	1 / 1 / –	5 / – / 43 / 14
Gramineae size (culm node)	– / –	– / – / –	7 / – / 13 / 9
Gramineae size (culm base/rhizome)	– / –	– / – / –	17 / – / – / 5
Gramineae size (rhizome)	1 / –	– / – / –	– / – / – / –
Cereal size (embryo)	32 / 1	– / – / –	2 / 1 / 1 / –
Cereal size (glume fragment)	– / –	– / – / –	– / – / ++ / –
Cereal size (culm node)	5 / 1	– / – / –	8 / – / 11 / 13
Cereal size (chaff)	+ / –	– / – / –	– / – / – / –
bud	– / –	– / – / –	– / – / – / 1
herbage	+++	+ / – / –	15 / 2 / ++ / 12
IGNOTA	24 / 3	3 / ++ / –	9 / 14 / 14 / 11
IGNOTA – silica	– / –	– / – / –	– / – / 2 / 5
Total number of items identified	3055 / 204	171 / 134 / 83	305 / 220 / 736 / 588
Items per litre of soil sieved	611 / 20.4	17.1 / 13.4 / 8.3	30.5 / 2.2 / 73.6 / 58.8

wheat, as well as some barley and oat grain. Both tetraploid and hexaploid free-threshing rachis fragments were present, as well as a barley chaff, some of which was identified as coming from 6-row barley. Weeds only formed a small part of the assemblage, and included seeds and capsule fragments of *Agrostemma githago* (corncockle) and numerous *Anthemis cotula* seeds (stinking mayweed) as well as two seed heads. The sample possibly represents a single event, the remains of an attempt to dry wheat grain prior to grinding, with rye chaff being used for part of the fuel for this process or possibly as a straw bedding mat for the grain (Campbell 1994).

Large possibly cultivated legumes appeared to be well represented. Two seeds of possible *Vicia sativa* ssp. *sativa* were recorded from ditch system 17, sample 443, while a pea or bean (*Vicia/Pisum* sp.) was identified in ditch system 16, sample 255. The usual weeds were present in the assemblages but in samples from ditch system 17 taxa typical of the phytosociological order *Polygono-Chenopodietalia* were more numerous. There were also more leguminous weed seeds.

The domestic enclosure, ditch systems 8 and 19

Three samples were analysed from ditch system 8 (Table 12.12). Sample 740 came from the southern corner close to the western oven and pit group. The two richer samples, 701 and 772 were located closer to the mill leats, and may either represent further debris from the ovens, though they are situated at some distance from these features, or from the adjacent late Saxon kitchen range.

The samples were similar to those from the ovens. Wheat was the most common cereal, with rye, barley and oats only present in small amounts. Cultivated legumes and flax remains were absent, although two seeds of a large-seeded form of *Spergula arvensis* were found in sample 772. Hazel-nut fragments were recorded both in sample 740 and in one of the other scanned samples from this ditch complex.

Sample 701 was particularly rich in weeds, with leguminous weed seeds forming a significant proportion of the weed assemblage (24.5%). It would therefore appear to be similar to samples 720 and 723 from oven 4437. *Euphorbia exigua* was present in sample 772 and both samples produced some shrubby material such as seeds of *Rosa* sp. (rose), *Rubus* sp. (blackberry/raspberry), as well as *Sambucus nigra* (elder) and *Salix* sp. (willow) capsules.

Six samples were analysed from ditch system 19. The two richest samples, 1065 and 1066, came from fills of a pit cut into the fills of the earlier ditch, and probably pre-date the final watermill.

Sample 1066 was unusual in that oat grains outnumbered wheat grains and oat chaff, which tends to be poorly represented in the samples, was plentiful. Large amounts of rye and bread wheat chaff were also present and some six-row barley rachis. Legume pod fragments were abundant and tentative identifications were made of both *Vicia*

faba var. *minor* (celtic bean) and *Vicia sativa* ssp. *sativa* (cultivated common vetch). A single fragment of *Prunus* sp. (sloe/bullace/plum etc.) was also recorded.

The weed assemblage in the sample included relatively large numbers of *Agrostemma githago* (corncockle) which may relate to the abundance of rye in this sample. Both *Silene* cf. *noctiflora* (night-flowering campion), and the possible *Seseli libanotis* (moon carrot), which are typical weeds of chalk and other calcareous soils, were rare finds. They may have been growing on field margins along with *Torilis* cf. *japonica* (upright hedge-parsley), *Prunella vulgaris* (self-heal), and *Centaurea nigra* (lesser knapweed). The single seed of *Alisma plantago-aquatica* (water-plantain), and a possible stem of *Juncus effusus* (soft-rush) may once again indicate the use of wetland vegetation as fuel though both these species can grow in arable fields.

This sample clearly represents more than one burning event but the abundance of oat, none of which showed signs of germination, suggests that oats were dried in the same way as wheat, probably in preparation for milling. This would imply that oats were used for oatmeal, pottage corn and/or flour as well as for brewing.

Sample 1065 also produced large numbers of legume pod fragments, though none of the larger legume seeds could be identified to species. All four cereals were present, with wheat remains predominant. The sample produced a single sprouted barley and a possible 2-row barley rachis as well as a single hazel-nut fragment.

The other samples from the ditch system were also dominated by the remains of free-threshing wheat, with hexaploid free-threshing rachis fragments more numerous than tetraploid. Rye was also relatively common, with quite a bit of grain present. Sample 1060 produced two seeds of *Linum usitatissimum* (flax), and a single *Vicia faba* var. *minor* was identified in Sample 1071. Large legumes, including *Vicia/Lathyrus* sp. (vetches/tares) were well represented in all the samples. Small legumes were not as numerous.

The southern yard pit group

Three samples, 231, 236 and 237, were analysed from the possible oven, 1162/1355 (see Fig 4.29, A PITS) (Table 12.13). A further two samples, 280 and 284, from nearby associated pits are tabulated, along with two samples, 62 and 65, from a contemporary pit, 482, on the opposite side of the road (see Fig 4.31).

The assemblages were relatively rich in charred plant remains, but produced far less material, and it was less well preserved, than in the other ovens. Thus they are likely to have received material from a number of different sources and the proportion of grain, chaff and weeds may not be significant.

Wheat was the dominant cereal. Sprouted grain was absent, but there appeared to be more barley and oat in relative terms than in the samples from the ditches. Almost

Table 12.12: Charred plant remains from boundary ditches 8 and 19 (1100–1250)

Ditch system	LSD8	LSD19
Sample number	701 / 740 / 772	1060 / 1065 / 1066 / 1069 / 1071
Sample size (litre)	10 / 10 / 10	10 / 10 / 10 / 10 / 10
TAXA (element if not a seed)		
<i>Ranunculus</i> Sugen. <i>Ranunculus</i>	- / - / -	- / - / - / - / 1
<i>Papaver argemone</i> L. (capsule top)	- / - / -	- / - / 1 / 1 / -
<i>Papaver</i> cf. <i>argemone</i> L.	- / - / -	- / 1 / - / - / -
<i>Papaversp.</i>	- / - / -	- / - / 1 / - / -
cf. <i>Brassica/Sinapis</i> sp.	- / - / -	1 / - / - / - / -
<i>Raphanus raphanistrum</i> L. (seed case)	- / - / -	- / 1 / - / - / -
<i>Silene</i> cf. <i>latifolia</i> ssp. <i>alba</i> (Miller)	1 / - / -	- / - / - / - / -
Greuter & Burden		
<i>Silene</i> cf. <i>noctiflora</i> L.	- / - / -	- / - / 2 / - / -
<i>Silene</i> spp.	1 / - / -	- / 3 / - / 3 / -
<i>Agrostemma githago</i> L.	- / - / -	2 / 1 / 9 / - / -
<i>A. githago</i> L. (capsule fragment)	- / - / -	- / - / 3 / - / -
cf. <i>Agrostemma githago</i> L.	2 / - / -	- / - / 1 / - / -
<i>Stellaria media</i> gp.	1 / - / 2	- / - / - / - / -
<i>Spergula arvensis</i> L. (large seeded)	- / - / 3	- / - / - / - / -
Caryophyllaceae indet.	2 / - / -	1 / 6 / - / 2 / -
Caryophyllaceae indet. (capsule fragment)	- / - / 1	- / 10 / - / 1 / -
cf. Caryophyllaceae indet.	- / - / 1	- / - / - / - / -
<i>Chenopodium</i> cf. <i>polyspermum</i> L.	- / - / -	1 / - / - / - / -
<i>Chenopodium</i> cf. <i>album</i> L.	1 / - / -	- / 2 / - / - / -
<i>Chenopodium</i> cf. <i>murale</i> L.	2 / - / -	- / - / - / - / -
<i>Atriplex</i> sp.	11 / - / 4	1 / 3 / 1 / 2 / 1
cf. <i>Atriplex</i> sp.	- / 1 / -	- / - / - / - / -
Chenopodiaceae indet.	5 / - / 2	- / - / 1 / 2 / 1
<i>Linum usitatissimum</i> L.	- / - / -	2 / - / - / - / -
cf. <i>Vicia hirsute</i> (L.) S F Gray	- / - / -	- / - / - / 1 / -
cf. <i>Vicia sativa</i> ssp. <i>sativa</i> L.	- / - / -	- / 2 / 1 / 1 / -
<i>Vicia sativa</i> ssp. <i>nigra</i> (L.) Ehrh.	- / - / -	- / - / 1 / - / -
cf. <i>Vicia sativa</i> ssp. <i>nigra</i> (L.) Ehrh.	1 / - / -	- / - / - / - / -
<i>Vicia faba</i> var. <i>minor</i> L.	- / - / -	- / - / - / - / 1
cf. <i>Vicia faba</i> var. <i>minor</i> L.	- / - / -	- / - / 1 / - / -
<i>Vicia/Lathyrus</i> sp.	15 / 4 / 5	9 / 2 / 53 / 1 / 4
<i>Vicia/Lathyrus/Pisum</i> sp.	- / - / -	2 / 2 / 3 / 2 / -
<i>Vicia/Lathyrus/Pisum</i> sp. (peduncle)	- / - / -	- / 3 / - / - / -
cf. <i>Vicia/Lathyrus/Pisum</i> sp.	- / - / -	- / 4 / - / - / -
<i>Medicago lupulina</i> L.	1 / - / -	- / - / - / - / -
cf. <i>Medicago lupulina</i> L.	- / - / -	- / - / 2 / - / -
<i>Medicago</i> type	13 / 1 / -	2 / - / - / - / -
cf. <i>Medicago</i> type	2 / - / -	- / - / - / - / -
cf. <i>Trifolium</i> sp.	2 / - / -	- / 1 / 1 / - / -
Leguminosae (small) indet.	5 / 1 / 2	- / 1 / 8 / 3 / -
Leguminosae indet. (pod fragment)	1 / 1 / 4	- / 49 / 141 / 4 / 1
Leguminosae indet. (peduncle)	- / - / -	- / - / 3 / - / -
Leguminosae indet. (tendrill)	- / - / -	- / - / 4 / - / -
cf. <i>Rubus</i> sp.	1 / - / -	- / - / - / - / -
? <i>Potentilla</i> sp.	1 / - / -	- / - / - / - / -

Table 12.12 continued

Ditch system	LSD8	LSD19
Sample number	701 / 740 / 772	1060 / 1065 / 1066 / 1069 / 1071
Sample size (litre)	10 / 10 / 10	10 / 10 / 10 / 10 / 10
TAXA (element if not a seed)		
cf. <i>Rosa</i> sp.	- / - / 1	- / - / - / 4 / -
<i>Prunus</i> sp.	- / - / -	- / - / 1 / - / -
<i>Scandix pectin-veneris</i> L.	1 / - / -	- / 1 / 2 / 1 / -
cf. <i>Scandix pectin-veneris</i> L.	- / - / -	1 / - / 1 / - / -
? <i>Seseli libanotis</i> (L.) Koch	- / - / -	- / - / 1 / - / -
<i>Bupleurum rotundifolium</i> L.	2 / - / -	- / 3 / 11 / 1 / -
cf. <i>Bupleurum rotundifolium</i> L.	2 / - / -	- / - / - / - / -
<i>Torilis</i> cf. <i>japonica</i> (Houtt.) DC.	- / - / -	- / - / 1 / - / -
Umbelliferae indet.	1 / - / 1	- / 1 / 1 / 1 / -
cf. Umbelliferae indet.	- / - / -	- / 1 / - / 1 / -
<i>Euphorbia exigua</i> L.	- / - / 1	- / - / - / - / -
<i>Polygonum aviculare</i> gp.	14 / 1 / -	- / 1 / - / - / -
<i>Polygonum</i> cf. <i>aviculare</i> gp.	- / - / -	- / - / - / 1 / -
<i>Fallopian convolvulus</i> (L.) A Löve	1 / - / -	1 / - / 1 / - / 2
<i>Rumex acetosella</i> gp.	- / 2 / -	- / - / - / - / -
cf. <i>Rumex acetosella</i> gp.	1 / - / 1	- / - / - / - / -
<i>Rumex</i> sp(p).	9 / - / 3	1 / 9 / 3 / 16 / 2
Polygonaceae indet.	2 / - / -	- / - / 1 / - / -
<i>Urtica dioica</i> L.	- / - / -	- / - / - / - / -
<i>Corylus avellana</i> L. (nut fragment)	- / 2 / -	- / 1 / - / - / -
<i>Salix</i> sp. (capsule)	1 / - / -	- / - / - / 1 / -
<i>Primula</i> sp.	1 / - / -	- / - / - / - / -
<i>Anagallis arvensis</i> L.	1 / - / -	- / - / - / - / -
<i>Lithospermum arvense</i> L.	2 / - / -	1 / - / 1 / - / -
cf. <i>Melampyrum</i> sp.	1 / - / -	- / - / 1 / - / -
<i>Euphrasia/Odontites</i> sp.	6 / - / 4	1 / 4 / 16 / 2 / 1
<i>Prunella vulgaris</i> L.	- / - / -	- / - / 2 / - / -
<i>Galeopsis</i> sp.	- / - / -	- / - / - / 1 / -
<i>Campanula</i> sp.	1 / - / -	- / - / - / - / -
cf. <i>Legousia hybrida</i> (L.) Delarbre	- / - / 1	- / - / - / - / -
<i>Sambucu nigra</i> L.	2 / - / -	- / - / - / - / -
cf. <i>Knautia arvensis</i> (L.) Coulter	- / - / -	- / 1 / - / - / -
<i>Anthemis cotula</i> L.	83 / 5 / 48	16 / 53 / 152 / 73 / 21
<i>Anthemis cotula</i> L. (seedhead fragment)	- / - / -	- / - / - / 1 / -
<i>Anthemis cotula</i> L. (clean seedhead)	- / - / -	- / - / 1 / - / -
<i>Anthemis</i> sp.	5 / - / -	- / 2 / 10 / 5 / -
<i>Cirsium/Carduus</i> sp.	- / - / -	- / - / 1 / - / -
<i>Centaurea cyanus</i> L.	- / - / -	- / - / 1 / - / -
<i>Centaurea nigra</i> L.	- / - / -	- / 3 / 5 / 2 / -
<i>Centaurea</i> sp.	- / - / -	- / 1 / - / - / -
<i>Lapsana communis</i> L.	- / - / -	- / - / - / 1 / -
Compositae indet.	- / - / -	- / - / 2 / - / -
Compositae indet. (gall)	- / - / -	- / 1 / - / - / -
<i>Alisma plantago-aquatica</i> L.	- / - / -	- / - / 1 / - / -
<i>Juncos effuses</i> type (stem)	- / - / -	- / - / 1 / - / -

Table 12.12 continued

Ditch system	LSD8	LSD19
Sample number	701 / 740 / 772	1060 / 1065 / 1066 / 1069 / 1071
Sample size (litre)	10 / 10 / 10	10 / 10 / 10 / 10 / 10
TAXA (element if not a seed)		
<i>Eleocharis palustris</i> type	- / - / 1	3 / 1 / 6 / 1 / 1
<i>Eleocharis</i> sp.	1 / - / -	- / - / - / - / -
<i>Carex</i> spp.	- / - / -	- / - / 2 / 1 / -
cf. <i>Carex</i> sp.	- / - / -	- / 1 / - / - / -
Cyperaceae indet.	- / 1 / -	1 / - / - / 1 / -
cf. <i>Lolium temulentum</i> L. (grain)	- / - / 1	- / - / 3 / - / -
<i>Poa annua</i> type (grain)	1 / - / 3	- / - / 4 / - / -
cf. <i>Poa annua</i> type (grain)	1 / - / -	- / - / - / - / -
<i>Bromus sterillis</i> L. (grain)	1 / - / -	- / - / - / - / -
cf. <i>Bromus sterillis</i> L. (grain)	- / - / -	- / - / 1 / - / -
<i>Bromus secalinus</i> type (grain)	- / - / -	7 / 2 / 7 / 5 / -
cf. <i>Bromus</i> sp. (grain)	1 / - / -	- / - / - / - / -
<i>Hordeum</i> cf. <i>murinum</i> L. (grain)	- / - / -	- / 1 / - / - / -
<i>Avena fatua</i> L. (floret base)	- / - / -	- / 2 / - / - / -
<i>Avena sativa</i> L. (grain)	- / - / -	- / - / 15 / - / -
<i>Avena</i> cf. <i>sativa</i> L. (grain)	2 / - / -	- / - / 5 / - / -
<i>A.</i> cf. <i>sativa</i> L. (floret).	- / - / -	- / 2 / - / - / -
<i>Avena</i> hexaploid sp. (floret base)	1 / - / -	- / - / 45 / - / -
<i>Avena</i> cf. hexaploid (panicle)	- / 1 / -	- / - / - / - / -
<i>Avena</i> sp. (grain)	2 / - / -	18 / 38 / 462 / 7 / 1
<i>Avena</i> sp. (twisted awn)	- / - / -	- / 2 / - / - / -
<i>Avena</i> sp. (floret base)	- / - / -	- / - / 20 / - / -
cf. <i>Avena</i> sp. (grain)	- / 2 / 1	6 / 21 / 73 / 4 / -
cf. <i>Avena</i> sp. (twisted awn)	- / - / -	1 / - / - / - / -
cf. <i>Avena</i> sp. (floret base)	- / - / -	- / - / - / - / 1
cf. <i>Avena</i> sp. (floret fragment)	- / - / -	- / 3 / - / - / -
<i>Bromus/Avena</i> sp. (grain)	- / - / -	- / - / 1 / - / 1
Gramineae (large) indet. (grain)	- / 9 / 6	26 / 65 / - / 39 / 6
Gramineae (small) indet. (grain)	- / 4 / 8	2 / 21 / - / 14 / 3
Gramineae indet. (grain)	10 / - / -	- / - / 199 / - / -
Gramineae indet. (rachis)	- / - / 1	- / 4 / 59 / - / -
Gramineae indet. (culm node) – silica	- / - / -	- / 13 / - / - / -
<i>Triticum</i> tetraploid free-threshing (rachis)	8 / - / 1	- / 5 / 19 / - / -
<i>Triticum</i> cf. tetraploid free-threshing (rachis)	2 / 1 / -	4 / 5 / 11 / 5 / -
<i>Triticum</i> hexaploid free-threshing (rachis)	6 / - / 4	- / 8 / 83 / 6 / -
<i>Triticum</i> cf. hexaploid free-threshing (rachis)	- / 2 / 9	1 / 4 / 26 / 3 / 1
<i>Triticum</i> cf. hexaploid free-threshing (rachis internode)	- / - / 3	- / - / - / - / 1
<i>Triticum</i> hexaploid sp. (rachis internode)	- / - / -	- / 1 / - / - / -
<i>Triticum</i> free-threshing (grain)	- / 13 / 18	63 / 102 / - / 75 / 18
<i>Triticum</i> free-threshing (rachis)	14 / 2 / 9	14 / 28 / 48 / 16 / 6
<i>Triticum</i> cf. <i>spelta</i> L. (spikelet fork)	- / 1 / -	- / - / - / - / -
<i>Triticum dicoccum/spelta</i> (grain)	- / - / 1	- / - / - / - / -
<i>Triticum</i> cf. <i>dicoccum/spelta</i> (grain)	- / - / -	- / - / - / 2 / 1
<i>Triticum dicoccum/spelta</i> (glume base)	- / - / -	- / - / 1 / - / -
<i>Triticum dicoccum/spelta</i> (spikelet fork)	- / - / 2	- / - / - / - / -
<i>Triticum</i> sp. (grain)	96 / 15 / 24	8 / 50 / 283 / 32 / 3
<i>Triticum</i> sp. (awn)	- / - / -	- / - / 2 / - / -

Table 12.12 continued

Ditch system	LSD8	LSD19
Sample number	701 / 740 / 772	1060 / 1065 / 1066 / 1069 / 1071
Sample size (litre)	10 / 10 / 10	10 / 10 / 10 / 10 / 10
TAXA (element if not a seed)		
<i>Triticum</i> sp. (short awn/glume beak) – silica	- / - / -	- / - / - / - / 1
<i>Triticum</i> sp. (spikelet fork)	- / - / 1	- / - / - / - / -
<i>Triticum</i> sp. (rachis)	- / - / 1	- / - / - / - / -
<i>Triticum</i> sp. (rachis internode)	- / - / -	1 / 1 / - / - / -
<i>Triticum</i> sp. (basal node)	- / - / -	1 / - / - / - / -
Wheat gall from infection by <i>Anguina Tritici</i>	1 / - / -	1 / - / 1 / - / -
cf. <i>Triticum</i> sp. (grain)	20 / - / -	4 / 6 / 11 / - / 1
cf. <i>Triticum</i> sp. (rachis internode)	- / - / -	- / - / - / - / -
<i>Secale cereale</i> L. (grain)	3 / - / -	- / - / 22 / 2 / -
<i>S. cereale</i> L. (rachis)	3 / - / 4	2 / 8 / 116 / 5 / 1
cf. <i>Secale cereale</i> L. (grain)	1 / - / -	2 / 2 / 9 / 3 / -
cf. <i>S. cereale</i> L. (rachis)	- / - / -	- / - / 7 / - / -
<i>Triticum/Secale</i> sp. (grain)	- / - / -	1 / - / 11 / - / -
<i>Triticum/Secale</i> sp. (awn)	- / - / -	- / 2 / 4 / - / -
<i>Triticum/Secale</i> sp. (glume fragment)	- / - / -	- / - / - / - / 1
<i>Hordeum</i> cf. <i>distichon</i> L. (rachis)	- / - / -	- / 1 / - / - / -
<i>Hordeum vulgare</i> L. (rachis)	- / - / -	- / - / 7 / - / -
<i>Hordeum</i> sp. (hulled straight grain)	- / 1 / 1	1 / 5 / 2 / 3 / 1
<i>Hordeum</i> sp. (hulled twisted grain)	- / - / 2	3 / 3 / 6 / 2 / 1
<i>Hordeum</i> sp. (hulled grain)	- / 1 / 2	- / 31 / 2 / 2 / -
<i>Hordeum</i> sp. (hulled sprouted grain)	- / - / -	- / 1 / - / - / -
<i>Hordeum</i> sp. (grain)	- / 1 / -	7 / 6 / 10 / 10 / 2
<i>Hordeum</i> sp. (awn)	- / - / -	- / 1 / - / - / -
<i>Hordeum</i> sp. (rachis)	- / - / 1	2 / 7 / 8 / 5 / -
cf. <i>Hordeum</i> sp. (grain)	5 / - / 2	5 / 7 / 3 / 1 / 6
<i>Hordeum/Secale</i> sp. (rachis)	2 / - / 7	- / 5 / 12 / 5 / 1
Cereales indet. (grain)	179 / 32 / 28	81 / 159 / 276 / 63 / 19
Cereales indet. (rachis)	15 / 2 / 12	4 / 6 / 16 / 7 / 4
Gramineae size (embryo)	- / - / -	- / - / - / - / 1
Gramineae size (culm node)	- / - / 3	- / 3 / 64 / - / 1
Gramineae size (culm base/rhizome)	- / - / -	- / 1 / 3 / - / -
Gramineae size (rhizome)	3 / - / -	- / - / 77 / - / -
Gramineaea size (root/rhizome)	- / - / -	- / - / - / 1 / -
Cereal size (embryo)	10 / - / -	- / 6 / 13 / 7 / -
Cereal size (coleoptile)	- / - / -	- / - / 4 / - / -
Cereal size (glume fragment) – silica	- / - / 1	- / - / - / - / -
Cereal size (culm node)	? / 1 / 6	- / 3 / 31 / 1 / 1
straw	- / - / -	- / - / +++ / - / -
Leaf fragment	- / - / -	- / - / 1 / - / -
bud	2 / - / -	- / - / 1 / - / -
herbage	- / - / -	+ / ++ / +++ / - / -
IGNOTA	11 / - / 8	7 / 18 / 13 / 11 / 4
Total number of items identified	602 / 107 / 254	317 / 833 / 2548 / 472 / 123
Items per litre of soil sieved	60.2 / 10.7 / 25.4	31/7 / 83.3 / 254.8 / 47.2 / 12.3

Table 12.13: Charred plant remains from southern pit group (APITS) (1150–1200)

Structure	Pit	Oven 1162/1355	Pits
Sample number	62 / 65	231 / 236 / 237	280 / 284
Sample size (litre)	10 / 10	101 / 45 / 40	10 / 5
TAXA (element if not a seed)			
<i>Ranunculus</i> Subgen. <i>Ranunculus</i>	1 / 1	- / - / 1	- / -
<i>Papaver</i> sp.	- / -	- / 1 / -	- / -
<i>Brassica/Sinapis</i> sp.	- / -	- / 1 / -	- / -
cf. <i>Thlaspi arvense</i> L.	- / -	- / 1 / -	- / -
<i>Silene</i> sp.	1 / -	- / - / 1	- / -
<i>Stellaria media</i> gp.	1 / 4	- / - / 1	- / -
<i>Stellaria graminea</i> L.	- / 1	- / - / -	- / -
<i>Stellaria</i> sp.	- / -	- / - / 1	- / -
<i>Spergula arvensis</i> L. (small seeded)	1 / -	- / - / 1	- / -
Caryophyllaceae indet.	- / 7	- / - / 1	- / -
<i>Montia Fontana</i> ssp. <i>chondosperma</i> (Fenzl) SM Walters	- / -	- / 1 / -	- / -
<i>Chenopodium</i> cf. <i>album</i> L.	- / 1	1 / - / 1	- / -
<i>Chenopodium murale</i> L.	6 / 24	- / - / -	- / -
<i>Chenopodium</i> cf. <i>murale</i> L.	- / -	- / 1 / -	- / -
<i>Chenopodium</i> sp.	- / -	- / - / 1	- / -
<i>Atriplex</i> sp.	2 / 5	2 / - / 11	- / -
Chenopodiaceae indet.	- / 3	3 / - / 2	- / 1
Caryophyllaceae/ <i>Chenopodium</i> indet.	- / -	- / - / 3	- / -
<i>Malva</i> sp.	- / -	- / 3 / -	- / -
cf. <i>Malva</i> sp.	- / -	- / - / 1	- / -
<i>Vicia sativa</i> ssp. <i>nigra</i> (L.) Ehrh	- / -	- / - / 1	- / -
<i>Vicia faba</i> L. var. <i>minor</i>	- / -	- / - / 1	- / -
<i>Lathyrus nissolia</i> L.	- / -	1 / - / -	- / -
cf. <i>Lathyrus nissolia</i> L.	- / 1	- / - / -	- / -
<i>Vicia/Lathyrus</i> sp.	15 / 24	4 / 4 / 36	2 / 2
cf. <i>Vicia/Lathyrus</i> sp.	- / -	- / 1 / -	- / 1
<i>Vicia/Lathyrus</i> sp. (peduncle)	- / -	- / 1 / -	- / 1
<i>Vicia/Lathyrus/Pisum</i> sp.	2 / -	- / 1 / 1	- / -
<i>Vicia/Pisum</i> sp.	- / 2	- / - / -	- / -
<i>Medicago lupulina</i> L.	- / -	- / - / 3	- / -
<i>Medicago</i> type	16 / 18	2 / 4 / 11	3 / 3
cf. <i>Medicago</i> type	- / -	2 / - / -	3 / -
cf. <i>Trifolium</i> sp.	- / -	- / 1 / -	- / -
Leguminosae (small) indet.	- / -	2 / 7 / 67	- / 1
Leguminosae indet. (pod fragment)	- / -	- / - / 1	- / -
<i>Alchemilla</i> sp.	1 / -	- / - / -	- / -
cf. <i>Alchemilla</i> sp.	- / -	- / - / -	1 / -
<i>Prunus</i> sp. (stone fragment)	- / -	- / - / 1	- / -
cf. <i>Prunus</i> type (fruit skin)	- / -	- / - / 1	- / -
cf. Rosaceae indet.	- / -	- / - / 2	- / -
<i>Scandix pecten-veneris</i> L.	- / -	- / 1 / 1	- / 2
<i>Bupleurum rotundifolium</i> L.	- / 3	- / - / 3	- / -
Umbelliferae indet.	- / 2	- / 1 / 2	- / -
<i>Polygonum aviculare</i> gp.	1 / 5	- / 1 / 2	1 / -
<i>Polygonum persicaria</i> L.	1 / -	- / - / -	- / -

Table 12.13 continued

Structure	Pit	Oven 1162/1355	Pits
Sample number	62 / 65	231 / 236 / 237	280 / 284
Sample size (litre)	10 / 10	101 / 45 / 40	10 / 5
TAXA (element if not a seed)			
<i>Rumex acetosella</i> gp.	1 / -	- / - / -	- / -
<i>Rumex</i> cf. <i>acetosella</i> gp.	- / -	- / - / 4	- / 1
? <i>Rumex acetosella</i> gp.	- / 1	- / - / -	- / -
<i>Rumex</i> spp.	5 / 11	5 / - / 64	2 / 3
Polygonaceae indet.	- / -	1 / - / 4	- / -
<i>Urtica urens</i> L.	- / -	- / - / -	- / 1
<i>Corylus avellana</i> L. (nut fragment)	- / -	- / 1 / 1	- / -
<i>Anagallis arvensis</i> L.	- / -	- / - / 3	- / -
<i>Lithospermum arvense</i> L.	- / -	- / - / 3	- / -
<i>Hyoscyamus niger</i> L.	- / -	- / 1 / 4	- / -
<i>Veronica hederifolia</i> L.	- / -	- / - 2	- / -
<i>Euphrasia/Odontites</i> sp.	2 / 17	1 / 3 / 39	3 / 4
<i>Plantago major</i> L.	- / 1	- / - / 3	- / -
Campanulaceae indet.	- / -	- / 1 / -	- / -
<i>Sherardia arvensis</i> L.	- / -	- / - 1	- / -
<i>Gallium</i> cf. <i>aparine</i> L.	9 / 11	- / - / 2	- / 1
<i>Sambucus nigra</i> L.	- / 1	- / 1 / -	- / -
<i>Valerianella dentate</i> (L.) Pollich	- / 1	1 / - / -	- / -
<i>Anthemis cotula</i> L.	13 / 50	6 / 6 / 108	2 / 8
cf. <i>Anthemis cotula</i> L.	- / 10	- / - / -	- / -
<i>Anthemis</i> sp.	- / -	- / - / 8	- / 1
<i>Tripleurospermum</i> sp.	- / -	- / - / 3	- / -
<i>Centaurea cyanus</i> L.	- / 2	- / - / -	- / -
<i>Centaurea nigra</i> L.	- / 1	- / - / -	- / -
<i>Centaurea</i> sp.	- / 2	- / - / -	- / -
cf. <i>Centaurea</i> sp.	- / -	- / - / 1	- / -
cf. <i>Picris echioides</i> L.	- / 1	- / - / -	- / -
<i>Sparganium</i> cf. <i>erectum</i> L.	- / 1	- / - / -	- / -
<i>Eleocharis palustris</i> type	- / -	- / 2 / 12	- / -
<i>Carex</i> sp (p).	1 / -	- / - / -	- / -
Cyperaceae indet.	- / -	- / - / 2	- / -
<i>Lolium temulentum</i> L. (grain)	- / -	- / - / 1	- / -
cf. <i>Lolium temulentum</i> L. (grain)	- / -	- / - / 1	- / -
<i>Poa annua</i> type (grain)	- / -	- / - / 1	- / -
<i>Bromus secalinus</i> type (grain)	- / 3	- / - / 2	- / 1
cf. <i>Bromus</i> sp. (grain)	- / -	- / - / 1	- / -
<i>Avena</i> sp. (grain)	1 / 1	- / 3 / 4	- / -
<i>Avena</i> sp. (twisted awn)	- / 6	- / - / 2	1 / -
cf. <i>Avena</i> sp. (grain)	2 / 10	- / 1 / 2	1 / 7
cf. <i>Avena</i> sp. (floret base)	- / -	- / 1 -	- / -
Gramineae (large) indet.(grain)	5 / 28	6 / 4 / 56	- / 1
Gramineae (small) indet.(grain)	- / -	2 / 6 / 41	- / 5
Gramineae indet.(grain)	12 / -	- / - / -	1 / -
Gramineae indet.(rachis)	2 / 21	- / - / 2	- / -
cf. Gramineae indet.(grain)	- / -	- / - / 3	- / -

Table 12.13 continued

Structure	Pit	Oven 1162/1355	Pits
Sample number	62 / 65	231 / 236 / 237	280 / 284
Sample size (litre)	10 / 10	101 / 45 / 40	10 / 5
TAXA (element if not a seed)			
<i>Triticum</i> , tetraploid free-threshing (rachis)	3 / 9	1 / - / 3	1 / -
<i>Triticum</i> , cf. tetraploid free-threshing (rachis)	2 / 5	- / 1 / 9	- / 2
<i>Triticum</i> , hexaploid free-threshing (rachis)	1 / 2	- / 1 / 9	- / -
<i>Triticum</i> , cf. hexaploid free-threshing (rachis)	- / -	- / - / 12	- / 1
<i>Triticum</i> , free-threshing (grain)	104 / 294	3 / 10 / 226	10 / 17
<i>Triticum</i> , free-threshing (rachis)	14 / 66	- / 2 / 59	4 / 3
<i>Triticum</i> , cf. free-threshing (grain)	- / -	- / - / 12	- / -
<i>Triticum</i> , cf. free-threshing (rachis)	- / -	- / - / 2	- / -
cf. <i>Triticum</i> , free-threshing (rachis)	- / -	1 / - / -	- / -
<i>Triticum spelta</i> L. (glume base)	- / -	- / 2 / -	- / -
<i>Triticum dicoccum/spelta</i> (grain)	- / -	- / - / 1	- / -
<i>Triticum</i> sp. (grain)	- / 7	2 / 8 / 30	- / 2
<i>Triticum</i> sp. (short awn/glume beak)	- / -	- / 2 / 1	- / -
<i>Triticum</i> sp. (short awn/glume beak) – silica	- / 4	- / - / 23	- / -
<i>Triticum</i> sp. (glume base)	- / -	- / 1 / -	- / -
cf. <i>Triticum</i> sp. (grain)	- / -	1 / - / 4	- / -
<i>Secale cereale</i> L. (grain)	- / -	- / - / 7	- / -
<i>S. cereale</i> (rachis)	2 / 9	- / - / -	- / 2
cf. <i>Secale cereale</i> L. (grain)	- / 3	- / 1 / 5	1 / -
<i>Triticum/Secale</i> sp. (awn) – silica	- / -	- / - / 5	- / -
<i>Hordeum distichon</i> L. (rachis)	- / 3	- / - / -	- / -
<i>Hordeum</i> sp. (hulled straight grain)	2 / 7	- / 1 / 1	- / -
<i>Hordeum</i> sp. (hulled twisted grain)	3 / 3	- / - / 1	- / -
<i>Hordeum</i> sp. (hulled grain)	- / -	- / 2 / 1	- / -
<i>Hordeum</i> sp. (grain)	4 / 11	1 / 4 / 1	2 / -
cf. <i>Hordeum</i> sp. (grain)	5 / -	- / 1 / 2	- / 1
<i>Hordeum</i> sp. (rachis)	- / 5	- / - / -	- / -
cf. <i>Hordeum</i> sp. (rachis)	- / -	- / 1 / -	1 / -
<i>Secale/Hordeum</i> sp. (rachis)	- / -	- / 2 / 1	- / -
cf. <i>Secale/Hordeum</i> sp. (rachis)	- / -	1 / - / -	- / -
Cereales indet. (grain)	142 / 411	4 / 33 / 236	25 / 691
Cereales indet. (rachis)	1 / 1	- / - / 19	- / -
Gramineae size (embryo)	- / -	- / 2 / 8	- / -
Gramineae size (culm node)	- / -	- / - / 3	- / -
Gramineae size (root/rhizome)	- / -	- / - / 2	- / -
Cereal size (embryo)	1 / 20	- / - / 7	1 / - / -
Cereal size (chaff)	- / -	2 / - / -	+ / -
Cereal size (culm node)	- / 1	- / - / 6	- / -
Cereal size (root/rhizome)	- / -	- / - / 5	- / -
herbage	- / ++	- / ++ / +	- / -
IGNOTA	- / 33	8 / 13 / 50	6 / 4
Total number of items identified	385/1174	63 / 148 / 1292	71 / 766
<i>Items per litre of soil sieved</i>	<i>38.5/117.4</i>	<i>6.3 / 3.3 / 32.3</i>	<i>7.1 / 153.2</i>

all the chaff was from wheat. In sample 237 from the oven hexaploid free-threshing chaff was identified in greater numbers than tetraploid free-threshing wheat chaff, while tetraploid chaff was more common in pit 482, samples 62 and 65. Rye chaff was absent from the oven, although rye grain was recovered from sample 237, and rye chaff was present in the pits. Sample 65 produced three rachis fragments of 2-row barley.

Vicia faba var. *minor* (celtic bean) was identified from the oven, sample 237. This sample also produced a fragment of *Prunus* sp. (sloe/ plum/ bullace etc) skin and part of a *Prunus* sp. stone. Nut fragments were recorded in samples 236 and 237 and a seed of *Sambucus nigra* (elder) in sample 236.

The weed assemblages from the oven included a relatively large proportion of leguminous weed seeds and weeds of ruderal such as: *Stellaria media* gp. (stitchwort), *Malva* sp. (mallow), *Hyoscyamus niger* (henbane), and *Veronica hederifolia* (ivy-leaved speedwell) were frequent. In this respect the weed assemblages are similar to those from the mill pond.

As well as weeds characteristic of heavy clay soils, there was also a significant number of taxa present which are characteristic of lighter soils eg *Thlaspi arvense* (field penny-cress), *Spergula arvensis* (corn spurrey), *Chenopodium murale* (nettle-leaved goosefoot), and *Rumex acetosella* agg. *Tripleurospermum* sp. was also present.

The record of *Sparganium* cf. *erectum* (branched bur-reed) and small numbers of seeds of the Cyperaceae in the samples is of interest. This may once again represent the use of wetland vegetation as fuel or floor covering which subsequently accidentally or deliberately burnt.

Although the samples from this oven and associated pits probably contain remains derived from grain drying the absence of sprouted grain may indicate that this oven was not used for drying malt. The presence of a *Prunus* stone and skin fragments suggests that these deposits received some domestic rubbish and might imply that this oven was of a more domestic nature than the western oven group, and was possibly used for baking and cooking as well as grain drying, or perhaps received debris coming from the domestic ranges to the north. However, given the nature of these assemblages such an interpretation must be treated with caution.

The buildings of the medieval manor (AD 1100–1250)

Samples from subsidence fills of the wall trenches of the late Saxon timber buildings, dated to AD 1100–1150, produced very few charred plant remains and only five samples, three from T33, and two from T34, were analysed (not included in Table 12.14). The usual remains were present, although no sprouted grain was found, and cultivated legumes were absent.

A total of 19 samples from the buildings of the twelfth-century medieval manor were analysed and they produced

more material, though in rather low concentration (Table 12.14). None of the floated samples from the garderobe S23 were analysed as it was thought that no further information could be gained from these that had not already been obtained from the block sample (see below). The samples from S24 and the yards were so poor that analysis was not worthwhile.

A sample, 1045, from the hearth in the hall, S18, (sample 1045, S18) was weed rich, with little chaff, all of which was from wheat, including one hulled wheat glume base. Rye was absent. Several large, possibly cultivated legumes were present, but none could be identified to species. There was a single hazel-nut fragment, and a fragment of *Prunus* sp. stone was noted in one of the scanned samples from this building. The weed assemblage was somewhat unusual in that it included two seeds of *Caltha palustris* (kingcup) and a possible seed of *Stellaria palustris* (marsh stitchwort).

The nine samples analysed (of which five are tabulated) from the two rooms of the southern range, the barn and malt house, S19/1 and S19/2, produced very little material, with the exception of sample 647. Rye remains were rare, and in samples 644 and 664 barley was the dominant cereal grain. In sample 664 one of these grains had sprouted, and 644 contained a sprouted oat grain. Sample 646 produced a single flax capsule fragment, sample 670 a possible lentil, and a hazel-nut fragment was recorded in one of the scanned samples. Leguminous weed seeds, were common, especially in sample 647. This sample also produced some weeds which were thought to indicate the use of stubble as fuel in the oven samples, eg *Anagallis arvensis* (scarlet pimpernel) and *Valerianella dentata* (narrow-fruited cornsalad).

The sprouted grain from the samples would confirm the interpretation of this building as a malt house. The presence of large amounts of wheat would suggest that grain may also have been dried in this building.

Only one of the three samples (689) studied from the bakehouse, S21, from the kitchen/bakehouse oven, produced a reasonable assemblage. In this sample the percentage of cereal chaff was quite high, 27%, but there were few weeds. Wheat remains outnumbered those from other cereals though there was also quite a bit of barley and some oats. A single cereal type sprout was noted.

A small sample of 2 litres from the wall of the dovecote, S22, consisted largely of wheat remains, with very few weeds, but quite a bit of herbage and culm node fragments.

A sample (1039) from a destruction layer over the hall, S18, was relatively rich in remains. Once again, wheat was the most abundant cereal, but this sample also produced relatively large amounts of barley and some legume pod fragments and two possible legume peduncles. It also contained a single seed of *Viburnum opulus* (guelder rose).

Three samples from the processing room of the southern barn, S17 room 2, produced relatively few remains and the results have been combined. Samples were rich in weeds

Table 12.14: Charred plant remains from the buildings of the medieval manor (1100–1200)

Structure/room	Processing S17/2 & S17	Hall S18	Barn & malt house S19/2	Kitchen S21	Dove S22
Number of samples () / Sample number	(3) / 251	1045/1039	644/646/647/664/670	689	713
Sample size (litre)	28 / 10	5 / 5	10 / 10 / 10 / 10 / 5	10	2
TAXA (element if not a seed)					
<i>Caltha palustris</i> L.	-/-	2/-	-/-/-/-/-	-	-
<i>Ranunculus</i> Subgen. <i>Ranunculus</i>	-/1	-/-	-/-/-/-/-	-	-
<i>Papaver rhoes</i> etc	-/1	-/4	-/-/-/-/-	-	-
<i>Papaver</i> cf. <i>argemone</i> L.	-/-	-/-	-/-/-/-/-	1	-
cf. <i>Papaver</i> sp.	-/-	-/-	-/-/-/1/-	-	-
cf. <i>Papaver</i> sp. (capsule fragment)	-/-	-/-	-/-/-/1/-	-	-
<i>Brassica</i> sp.	1/-	-/-	-/-/-/-/-	-	-
cf. <i>Raphanus raphanistrum</i> L. (seed case)	-/-	-/-	-/-/-/-/-	1	-
<i>Thlaspi arvense</i> L.	-/1	-/-	-/-/-/-/-	-	-
cf. <i>Thlaspi arvense</i> L.	-/1	-/-	-/-/-/-/-	-	-
Cruciferae (large) indet. (capsule fragment)	-/-	-/-	-/-/-/-/1	-	-
<i>Silene</i> sp.	-/5	-/-	-/-/-/-/-	-	-
<i>Agrostemma githago</i> L.	-/-	-/1	-/1/-/-/-	-	-
<i>Stellaria media</i> sp.	-/5	-/1	-/2/-/-/-	-	-
cf. <i>Stellaria palustris</i> Retz.	-/-	1/-	-/-/-/-/-	-	-
cf. <i>Stellaria</i> sp.	1/-	-/-	-/-/-/-/-	-	-
<i>Scleranthus</i> sp.	-/2	-/-	-/-/-/-/-	-	-
Caryophyllaceae indet.	2/1	-/-	1/2/-/-/-	-	-
Caryophyllaceae indet. (capsule fragment)	-/1	-/-	-/-/-/-/-	-	-
<i>Chenopodium</i> cf. <i>album</i> L.	-/-	-/1	-/-/-/-/-	-	-
<i>Chenopodium</i> cf. <i>murale</i> L.	-/1	-/-	-/-/-/-/-	-	-
<i>Chenopodium</i> sp.	-/2	-/-	-/-/-/-/-	-	-
<i>Atriplex</i> sp.	1/8	3/4	-/-/7/-/-	1	-
cf. <i>Atriplex</i> sp.	-/-	-/-	-/-/-/-/1	-	-
Chenopodiaceae indet.	-/9	1/-	1/-/2/-/-	-	-
Caryophyllaceae/Chenopodiaceae indet.	-/-	-/-	1/-/-/-/-	-	-
<i>Linum usitatissimum</i> L.	-/1	-/-	-/-/-/-/-	-	-
<i>L. usitatissimum</i> L. (capsule fragment)	-/-	-/-	1/-/-/-/-	-	-
cf. <i>Linum usitatissimum</i> L.	-/1	-/-	-/-/-/-/-	-	-
<i>Vicia</i> cf. <i>tetrasperma</i> (L.) Schreber	-/-	-/-	-/-/-/-/-	1	-
cf. <i>Lens culinaris</i> Medik.	-/-	-/-	-/-/-/-/1	-	-
<i>Lathyrus aphaca</i> L.	1/-	-/-	-/-/-/-/-	1	-
<i>Vicia/Lathyrus</i> sp.	6/9	6/10	2/2/15/2/1	8	1
cf. <i>Vicia/Lathyrus</i> sp.	-/1	-/-	1/-/-/-/-	-	-
<i>Vicia/Lathyrus/Pisum</i> sp.	1/1	4/1	-/-/4/-/-	2	1
<i>Medicago lupulina</i> L.	-/-	-/-	-/-/9/-/-	-	-
cf. <i>Medicago lupulina</i> L.	-/-	-/-	-/-/-/-/-	1	-
<i>Medicago</i> type	17/10	5/4	-/1/17/5/-	-	4
cf. <i>Trifolium</i> sp.	-/-	-/-	-/-/2/1/-	-	-

Table 12.14 continued

Structure/room	Processing S17/2 & S17	Hall S18	Barn & malt house S19/2	Kitchen S21	Dove S22
Number of samples ()/ Sample number	(3) / 251	1045/1039	644/646/647/664/670	689	713
Sample size (litre)	28 / 10	5 / 5	10 / 10 / 10 / 10 / 5	10	2
TAXA (element if not a seed)					
Leguminosae (small) indet.	1 / 17	5 / 6	- / - / 95 / - / -	3	-
Leguminosae indet. (pod fragment)	- / 1	- / 10	- / - / 4 / - / -	11	1
? Leguminosae indet. (peduncle)	- / -	- / 2	- / - / - / - / -	-	-
cf. <i>Rosa</i> sp.	- / 1	- / -	- / - / - / - / -	-	-
<i>Prunus</i> sp. (stone fragment)	- / 1	- / -	- / - / - / - / -	-	-
<i>Scandix pecten-veneris</i> L.	- / 2	1 / -	- / - / - / - / -	-	-
cf. <i>Scandix pecten-veneris</i> L.	- / 1	- / 1	1 / - / - / - / -	-	-
<i>Bupleurum rotundifolium</i> L.	- / -	- / 1	- / - / - / - / -	-	-
cf. <i>Bupleurum rotundifolium</i> L.	- / 1	- / -	- / - / - / - / -	-	-
Umbelliferae indet.	- / 1	- / -	- / 1 / - / - / -	1	-
<i>Polygonum aviculare</i> gp.	- / 1	- / 2	- / 1 / 2 / - / -	1	-
cf. <i>Polygonum aviculare</i> gp.	1 / -	- / -	- / - / - / - / -	-	-
<i>Polygonum</i> sp.	- / -	- / -	- / - / 1 / - / -	-	-
<i>Fallopian convovulus</i> (L.) A. Löve	- / -	- / -	- / - / 1 / - / -	-	-
<i>Rumex acetosella</i> gp.	- / 1	- / -	- / - / - / - / -	-	-
<i>Rumex</i> sp(p).	- / 46	8 / 13	2 / - / 7 / - / -	2	1
cf. <i>Rumex</i> sp.	1 / 4	- / -	- / - / - / - / -	-	-
Polygonaceae indet.	- / -	2 / -	- / - / - / - / -	-	-
cf. Polygonaceae indet.	- / 1	- / -	4 / - / - / - / -	-	1
<i>Corylus avellana</i> L. (nut fragment)	- / 16	1 / -	- / - / - / - / -	-	-
<i>Anagallis arvensis</i> L.	- / -	- / 1	- / - / 1 / - / -	1	-
cf. <i>Anagallis arvensis</i> L.	- / 1	- / -	- / - / - / - / -	2	-
<i>Veronica arvensis</i> L.	- / -	- / -	- / - / - / - / -	1	-
cf. <i>Veronica arvensis</i> L.	- / 1	1 / -	- / - / - / - / -	-	-
<i>Veronica</i> cf. <i>agrestis</i> L.	- / -	- / -	1 / - / - / - / -	-	-
<i>Euphrasia/Odontites</i> sp.	1 / 20	1 / 6	- / 1 / 12 / 1 / 2	2	1
<i>Verbena officinalis</i> L.	- / -	- / 1	- / - / - / - / -	-	-
Labiatae indet.	- / -	- / -	- / - / - / - / 1	-	-
<i>Plantago major</i> L.	- / -	- / -	- / - / 1 / - / 2	-	-
<i>Gallium</i> sp.	- / -	- / 1	- / - / - / 1 / -	1	-
<i>Sambucus nigra</i> L.	- / -	- / -	- / - / - / - / -	1	-
<i>Viburnum opulus</i> L.	- / -	- / 1	- / - / - / - / -	-	-
<i>Valerianella dentate</i> (L.) Pollich	- / -	- / -	- / - / 1 / - / -	-	-
cf. <i>Knautia arvensis</i> (L.) Coulter	- / -	- / -	- / - / 1 / - / -	-	-
<i>Anthemis cotula</i> L.	8 / 56	10 / 18	4 / 1 / 11 / - / 2	31	7
<i>Anthemis</i> sp.	- / -	- / -	- / - / - / - / -	2	-
cf. <i>Anthemis</i> sp.	- / 25	- / -	2 / - / - / - / -	-	-
<i>Tripleurospermum</i> sp.	- / 1	- / -	- / - / - / - / -	-	-
<i>Carduus/Cirsium</i> sp.	- / 1	- / -	- / - / - / - / -	-	-
<i>Centaurea</i> sp.	- / -	- / -	- / - / - / - / -	2	-
<i>Lapsana communis</i> L.	- / 1	- / -	- / - / - / - / -	-	-
Compositae (large) indet.	- / 3	- / -	- / - / - / - / -	-	-
Compositae indet.	1 / 1	- / -	- / - / - / - / -	-	-
<i>Eleocharis palustris</i> type	2 / 1	- / 2	- / - / - / - / -	1	-
<i>Carex</i> sp.	- / -	1 / 1	- / - / - / - / -	-	-

Table 12.14 continued

Structure/room	Processing S17/2 & S17	Hall S18	Barn & malt house S19/2	Kitchen S21	Dove S22
Number of sample ()/ sample number	(3) / 251	1045/1039	644/646/647/664/670	689	713
Sample size (litre)	28 / 10	5 / 5	10 / 10 / 10 / 10 / 5	10	2
TAXA (element if not a seed)					
Cyperaceae indet.	- / 2	- / -	1 / - / - / - / -	-	-
<i>Lolium temulentum</i> L.	- / 1	- / -	- / - / - / - / -	-	-
cf. <i>Lolium temulentum</i> L.	- / -	- / 1	- / - / - / 1 / -	1	-
<i>Poa annua</i> type (grain)	- / -	1 / -	1 / 1 / - / - / -	-	-
cf. <i>Bromus</i> sp. (grain)	- / 1	- / -	1 / - / - / - / -	-	-
<i>Avena</i> cf. <i>fatua</i> L. (floret base)	- / -	- / -	- / 2 / - / - / -	-	-
<i>Avena</i> sp. (grain)	- / 10	1 / -	2 / - / - / - / -	4	-
<i>Avena</i> sp. (sprouted grain)	- / -	- / -	1 / - / - / - / -	-	-
<i>Avena</i> sp. (twisted awn)	- / 2	- / -	- / - / - / - / -	-	-
<i>Avena</i> sp. (floret base)	- / 1	- / -	- / - / - / - / 1	1	1
cf. <i>Avena</i> sp. (grain)	- / 15	- / 1	- / - / 2 / - / -	3	-
cf. <i>Avena</i> sp. (floret base)	- / -	- / 1	- / - / - / - / -	-	-
Gramineae (large) indet. (grain)	1 / 13	- / 6	5 / - / 11 / 2 / -	-	-
Gramineae (small) indet. (grain)	2 / 5	- / 4	4 / 1 / 2 / - / -	-	-
Gramineae indet. (grain)	- / -	11 / -	- / - / - / - / -	1	-
Gramineae indet. (rachis)	- / 6	- / 2	- / - / - / - / -	3	-
Gramineae indet. (chaff) – silica	- / -	- / -	- / - / - / - / -	1	-
cf. Gramineae indet. (grain)	- / -	1 / -	1 / - / - / 1 / -	-	-
<i>Triticum</i> , tetraploid free-threshing (rachis)	- / 2	- / -	- / - / - / - / -	3	3
<i>Triticum</i> , cf. tetraploid free-threshing (rachis)	- / 3	1 / -	1 / 1 / 2 / - / 2	2	1
<i>Triticum</i> , hexaploid free-threshing (rachis)	- / 1	1 / 5	- / - / 1 / 1 / -	5	3
<i>Triticum</i> , cf. hexaploid free-threshing (rachis)	- / -	1 / -	- / - / 2 / - / 1	2	1
<i>Triticum</i> , free-threshing (grain)	12 / 88	- / 46	- / 6 / 36 / 1 / 2	-	-
<i>Triticum</i> , free-threshing (rachis)	- / 19	2 / 3	1 / - / 11 / - / 2	22	3
<i>Triticum</i> , cf. free-threshing (grain)	- / -	- / 2	- / 1 / - / - / -	-	-
<i>Triticum</i> , cf. free-threshing (rachis)	- / 8	- / -	- / - / - / - / 1	-	-
<i>Triticum</i> , hexaploid (rachis internode)	- / 8	- / -	- / - / - / - / -	-	-
<i>Triticum spelta</i> L. (grain)	- / -	- / -	- / - / - / 1 / -	-	-
<i>Triticum dicoccum/spelta</i> (grain)	- / -	- / -	- / - / - / 1 / -	-	-
<i>Triticum dicoccum/spelta</i> (glume base)	1 / -	1 / -	- / - / - / - / -	-	-
<i>Triticum</i> sp. (grain)	- / -	14 / 22	2 / - / 9 / - / 3	29	10
<i>Triticum</i> sp. (short awn/glume beak)	- / -	- / 1	- / - / - / - / -	-	-
<i>Triticum</i> sp. (short awn/glume beak) – silica	- / -	- / 2	- / - / - / - / -	1	-
<i>Triticum</i> sp. (awn base)	- / -	- / -	- / - / 2 / - / -	-	-
<i>Triticum</i> sp. (spikelet fork)	- / -	- / -	1 / - / - / - / -	-	-
cf. <i>Triticum</i> sp. (grain)	- / -	3 / 6	- / 3 / - / 2 / -	12	4
cf. <i>Triticum</i> sp. (rachis internode)	- / -	- / -	- / - / - / - / 1	-	-
<i>Secale cereale</i> L. (grain)	- / -	- / -	- / - / 3 / - / 1	-	-
<i>S. cereale</i> L. (rachis)	- / 1	- / 2	- / - / 1 / - / 1	8	-
cf. <i>S. cereale</i> L. (rachis)	- / -	- / -	- / - / 1 / - / -	6	-

Table 12.14 continued

Structure/room	Processing S17/2 & S17	Hall S18	Barn & malt house S19/2	Kitchen S21	Dove S22
Number of samples (), sample number	(3) / 251	1045/1039	644/646/647/664/670	689	713
Sample size (litre)	28 / 10	5 / 5	10 / 10 / 10 / 10 / 5	10	2
TAXA (element if not a seed)					
<i>Triticum/Secale</i> sp. (grain)	-/-	-/-	-/-/4/-/-	-	-
<i>Triticum/Secale</i> sp. (awn)	-/2	-/-	-/-/-/-/-	-	-
<i>Triticum/Secale</i> sp. (awn) – silica	-/8	-/1	-/-/1/-/-	-	1
<i>Hordeum vulgare</i> L. (rachis)	-/-	-/-	-/-/-/-/-	1	-
<i>Hordeum</i> cf. <i>vulgare</i> L. (rachis)	-/-	-/-	-/1/-/-/-	-	-
<i>Hordeum</i> sp. (hulled straight grain)	-/3	-/-	-/-/-/1/-	-	-
<i>Hordeum</i> sp. (hulled twisted grain)	2/-	-/-	1/-/-/-/-	-	-
<i>Hordeum</i> sp. (grain)	3/5	-/1	1/1/3/3/1	4	-
<i>Hordeum</i> sp. (sprouted grain)	-/-	-/-	-/-/-/1/-	-	-
<i>Hordeum</i> sp. (rachis)	-/1	-/3	-/-/4/-/-	1	-
cf. <i>Hordeum</i> sp. (grain)	-/-	1/2	1/-/2/-/-	3	2
cf. <i>Hordeum</i> sp. (rachis)	-/-	-/-	-/-/1/-/-	1	-
<i>Secale/Hordeum</i> sp. (rachis)	-/4	-/1	-/-/7/-/-	17	-
Cereales indet. (grain)	28 / 248	31 / 64	-/8/45/6/13	139	14
Cereales indet. (rachis)	-/5	-/12	-/1/-/-/-	37	4
cf. Cereales indet. (grain)	-/-	-/-	-/1/-/-/-	-	-
cf. Cereales indet. (rachis)	-/-	-/-	-/-/-/1/-	-	-
Gramineae size (embryo)	-/-	-/-	-/-/2/-/-	-	-
Gramineae size (culm node)	-/2	1/1	-/-/-/-/-	-	5
Gramineae size (culm base/rhizome)	-/-	-/-	-/-/1/-/-	-	-
Gramineae size (rhizome)	-/1	-/-	-/-/2/-/2	-	14
Cereal size (embryo)	1/12	1/4	-/1/2/-/1	7	1
Cereal size (coleoptile)	-/1	-/-	-/-/-/-/-	1	-
Cereal size (culm node)	-/2	-/-	-/-/5/-/-	-	9
Cereal size (rhizome)	-/-	-/-	-/-/14/-/-	-	-
bud	-/-	-/-	-/-/-/-/-	1	-
chaff	-/-	-/ +	-/-/+/+/-/-	-	-
chaff – silica	-/-	-/-	-/-/-/-/-	3	-
herbage	-/++	+/+	-/-/+/+/-/-	+++	+++
IGNOTA	20 / 37	7 / 10	10 / 4 / 8 / 1 / -	1	2
Total number of items identified	116/782	131 / 296	66 / 44 / 385 / 38 / 43	398	90
Items per litre of soil sieved	4.1/78.2	26.2/59	5.6/4.4/38.5/3.8/ 8.6	39.8	45

but chaff was absent, apart from a single hulled wheat glume base. Only wheat and barley grain was present and a single large, possibly cultivated legume was recovered. A hazel-nut fragment was noted in one of the scanned samples. Leguminous weed seeds formed a large proportion of the weed assemblage.

A sample (251) from the later layer within this building produced a good large assemblage. Again it was weed rich, with very little chaff. Wheat remains dominated, but there was also quite a bit of barley and oat. Rye was only represented by a single rachis fragment. Two seeds of flax were found as well as some hazel-nut fragments, a *Prunus* sp. (plum/bullace/sloe etc.) stone fragment, and possible

rose seed. A single large, possibly cultivated legume was present.

Mineralised and charred remains from the garderobe (S23)

Part of the fill of the medieval stone-lined garderobe was taken as a block and was excavated in the laboratory at Oxford. An attempt was made to sub-sample the block at 100mm intervals but this proved impractical due to the presence of stone slabs within the block. However, three 500g sub-samples were taken at 0–50mm, 120–150mm, and 180–200mm from the bottom of the block, and a further 1kg

sample at 300–350mm. Each sub-sample was wet-sieved to 0.5mm and then allowed to dry before sorting under a dissecting microscope.

After sorting, the material from each sub-sample was identified (Table 12.15). As it largely consisted of fragments detailed quantification was not practical. Instead the level of abundance of the items identified was recorded as follows: + (1–3 items/fragments), ++ (4–25), +++ (26–100), and ++++ (>100) for the 500g sub-samples and as follows for the 1kg sample: + (1–5), ++ (6–20), +++ (20–200), and ++++ (>200).

The concentration of mineralised material was greatest at 300–350mm from the bottom of the block and gradually decreased towards the bottom. It consisted largely of fragments of coprolite (solid waste which had become mineralised), in which fragments of cereal bran and *Agrostemma githago* (corncockle) were clearly visible. Some of coprolite fragments were dissolved in dilute hydrochloric acid to free the bran from the matrix so that it could be mounted on slides and examined under a high power microscope in order to try and identify the type of cereal present. From this work it was evident that wheat and barley were present as well as fragments of *Bromus* sp. There were also some possible oat and rye fragments. The relative importance of the different cereals could not be determined since only a small fraction of the cereal bran was examined in this detail.

As well as the coprolite fragments the samples produced large amounts of herbage, which included some cereal chaff and indeterminate leaf fragments. Fragments of possible *Prunus* sp. (plum etc) skin and pips from an apple or pear (*Pyrus/Malus* sp.) were recorded in the 30–35cm sub-sample as well as a hilum, of a large legume, probably a pea (*Pisum sativum*). Arable weeds, familiar from the charred plant assemblages were also present.

In addition, large numbers of seeds of *Sambucus nigra* were recovered but these had not been mineralised, and their distribution in the sub-samples was different from the mineralised material suggesting that they did not enter the deposit with the faecal material. Large numbers of *S. nigra* seeds were also found at Alms Road, Norwich where they were believed to have survived because of their general durability in the soil (Murphy 1985). The seeds in this deposit would appear to have been preserved in a similar manner. They may be of medieval date.

The mineralised Arthropoda are typical of this type of deposit, with the exception of the springtail. This may have been entered the garderobe along with the cereal straw and herbage.

Most of the bone fragments recovered were from fish. Avian egg shell was also common. ‘Mystery mineralised objects’ (Carruthers 1989), which appear characteristic of cess pits, were present in the two richer sub-samples.

The charred material, mainly indeterminate cereal grain and chaff, was more plentiful in the upper part of the block. A few weed seeds were also recovered including a small-seeded form *Spergula arvensis* (corn spurrey).

The final phase of the hall, S18, and malt oven, E16 (AD1200–1250)

Three samples were from contexts probably associated with the final phase of the hall, S18, one of which (1043) from the fills of a pit, produced a decent assemblage (Table 12.16). One of two samples (673) from the malt house, E16, also produced a good assemblage. The other samples were rich in charcoal, but other remains were sparse. All the samples were dominated by weeds. Levels of chaff were low, with the exception of sample 673, and sprouted grain and cereal sprouts were absent.

Sample 673 was unusual in that remains of cereals other than wheat were absent, apart from two fragments of *Secale/ Hordeum* sp. (rye or barley) rachis. However, it did produce some large legume seeds and legume pod fragments.

In contrast, sample 1043, contained grain from all four cereals as well as large legumes and legume pod fragments, flax, elder, and fragments of hazel-nut and *Prunus* sp. stone. This sample also produced the largest and most varied weed assemblage. It included a waste ground element similar to that encountered in the samples from the southern pit group, dated 1150–1220, eg *Hyoscyamus niger* (henbane), as well as some low growing species such as *Valerianella dentata* (narrow-fruited cornsalad). In addition, three rare finds were tentatively identified from this sample: *Adonis annua* (pheasant’s eye), *Sison ammonum* (stone parsley), and *Valerianella rimosa* (broad-fruited cornsalad). Both *Adonis annua* and *Valerianella rimosa* have been recorded in Iron Age deposits (Jones 1984 and Robinson 1979). The former is typical of calcareous soils and is now rare due to modern screening methods (Salisbury 1964, 34).

As already mentioned, there is a marked concentration of charred material in these samples, which was also apparent in the sample from later layers within the processing room of S17 and from the destruction layer of the hall, S18. This is probably due to the site being reorganised during this period, resulting in dispersal and deposition of material.

The medieval tenements (AD 1250–1400)

From a total of 208 samples dated to this period, 116 were analysed. The concentration of material per litre of soil was very low but is generally similar to that in deposits associated with buildings from the earlier phases. It is just that for this period there are fewer cut features to contain potentially richer deposits.

Only one of the samples analysed produced over 400 identified items, and this was from 20 litres, with another six samples producing over 200 items, with these all coming from the malt houses. For this reason the results of analysis of the different samples have been combined to give a single assemblage for each room or building, with a separate table for each main tenement as follows: Tenement A (Table 12.17); Tenement B (Table 12.18); Tenement C (Table 12.19) and Tenement E (Table 12.20). The only results presented separately are the richer assemblages

Table 12.15: Biological remains from the medieval garderobe (1100–1250)

Sub-sample (distance from bottom of block)	0–50mm	120–150mm	180–200mm	300–350mm
Sample size (weight)	500g	500g	500g	1kg
MINERALISED REMAINS				
Earthworm egg	+	–	+	–
Diploda (millipedes)	–	+	–	+
Collembolan (springtails)	–	+	–	–
cf. Sphaeroceridae (fly puparia)	–	–	+	+
Diptera indet. (fly pupae and puparia)	–	+	++	++
Stalk-like fragment (including straw and chaff)	–	+++	++++	+++
Wood	–	+	+	–
Mystery objects (Carruthers 1988)	–	–	+	++
Leaf fragment	–	+	++	++
Coprolite fragment	–	–	+++	++++
cf. <i>Ranunculus</i> sp.	–	–	–	+
cf. <i>Papaver</i> sp.	–	+	–	–
<i>Brassica/Sinapis</i> sp.	–	+	–	–
<i>Thlaspi arvense</i> L.	–	–	+	–
cf. <i>Silene</i> sp.	–	–	–	+
<i>Agroemma githago</i> L. (fragment)	–	+	++	+++
cf. <i>Chenopodiaceae</i> indet.	–	–	–	+
cf. <i>Pisum sativum</i> L.	–	–	–	+
<i>Vicia/Lathyrus/Pisum</i> sp.	–	+	+	–
<i>Prunus</i> sp. (skin)	–	–	–	+
cf. <i>Pyrus/Malus</i> sp.	–	–	–	+
<i>Bupleureum rotundifolium</i> L.	–	+	–	+
<i>Rumex</i> sp.	–	–	+	–
<i>Polygonaceae</i> indet.	–	–	–	+
<i>Urtica dioica</i> L.	–	+	–	–
<i>Euphrasia/Odontites</i> sp.	–	–	–	+
<i>Myosotis</i> sp.	–	–	–	+
<i>Plantago lanceolata/media</i>	–	+	–	–
<i>Sambucus nigra</i> L. (not mineralised)	++	++	+	+
<i>Anthemis</i> cf. <i>cotula</i> L.	–	–	–	+
<i>Avena</i> sp.	–	–	–	+
Gramineae indet. (grain)	–	–	–	+
Bran fragments (Cereales indet.)	+	+++	++++	++++
IGNOTA	–	+	–	–
? Cotyledons	–	–	+	–
CHARRED MATERIAL				
Charcoal (>2mm)	+++	++	++	++
<i>Spergula arvensis</i> (small-seeded) L.	–	–	–	+
<i>Vicia/Lathyrus</i> sp.	–	–	–	+
<i>Vicia/Lathyrus/Pisum</i> sp.	–	–	–	+
<i>Sambucus nigra</i> L.	–	–	–	+
<i>Anthemis cotula</i> L.	–	–	+	+
<i>Bromus secalinus</i> type (grain)	–	+	–	–
<i>Triticum</i> , tetraploid free-threshing (rachis)	–	–	+	+
<i>Triticum</i> , free-threshing (rachis)	–	–	–	+
<i>Secale cereale</i> L. (rachis)	–	–	–	+
<i>Hordeum</i> sp. (rachis)	–	–	+	–
Cereales indet. (grain) +	+	+	++	++
Cereales indet. (rachis)	–	–	–	+
Cereales indet. (chaff)	–	–	++	++
Cereal size (culm node)	–	–	–	+
IGNOTA	–	–	+	+
Bone	++	++++	++++	++++
Avian egg shell fragment	+	+	++	++

Table 12.16: Charred plant remains from the final phase of the manor house (1200–1250)

Structure	E16	E13/S18	Structure	E16	E13/S18
Sample number	673	1030 / 1033 / 1043	Sample number	673	1030 / 1033 / 1043
Sample size (litre)	1	? / 5 / 5	Sample size (litre)	1	? / 5 / 5
TAXA (element if not a seed)			TAXA (element if not a seed)		
<i>Ranunculus acris/repens/bulbosus</i>	–	– / 1 / –	<i>Anthemis</i> sp.	–	1 / – / –
cf. <i>Adonis annus</i> L.	–	– / – / 1	cf. <i>Anthemis</i> sp.	–	– / – / 3
<i>Papaver argemone</i> L.	–	– / – / 1	<i>Lapsana communis</i> L.	–	1 / – / 2
<i>Brassica</i> cf. <i>nigra</i> (L.) Koch	–	– / – / 1	Compositae indet.	–	– / – / 1
<i>Brassica Sinapsis</i> sp.	–	– / – / 9	<i>Eleocharis palustris</i> type	7	– / – / 2
cf. <i>Raphanus raphanistrum</i> L. (seed case)	–	– / – / 3	<i>Carex</i> sp.	–	– / – / 1
<i>Silene</i> sp.	2	– / – / –	Cyperaceae indet.	1	– / – / –
<i>Stellaria media</i> gp.	–	– / 1 / –	<i>Poa annua</i> type	–	– / – / 1
Caryophyllaceae indet.	–	– / – / 1	cf. <i>Bromus</i> sp. (grain)	–	– / – / 1
Caryophyllaceae indet. (capsule fragment)	1	– / – / –	<i>Avena</i> sp. (grain)	–	– / – / 2
<i>Chenopodium</i> cf. <i>album</i> L.	–	– / – / 1	cf. <i>Avena</i> sp. (grain)	–	– / – / 1
<i>Atriplex</i> sp.	4	– / – / 10	Gramineae (large) indet. (grain)	2	3 / 2 / 7
Chenopodiaceae indet.	1	– / – / 4	Gramineae (small) indet. (grain)	4	– / – / 29
Caryophyllaceae/ Chenopodiaceae indet.	1	– / – / –	Gramineae indet. (culm base/rhizome)	9	– / – / –
<i>Linum usitatissimum</i>	–	– / – / 1	cf. Gramineae (small) indet. (grain)	1	– / – / –
<i>Vicia/Lathyrus</i> sp.	3	– / 1 / 16	<i>Triticum</i> , tetraploid free-threshing (rachis)	7	– / – / 3
<i>Vicia/Lathyrus/Pisum</i> sp.	2	– / – / 2	<i>Triticum</i> , cf. tetraploid free-threshing (rachis)	10	– / – / 1
<i>Medicago lupulina</i> L.	21	– / – / –	<i>Triticum</i> , hexaploid free-threshing (rachis)	4	– / 1 / –
cf. <i>Medicago lupulina</i>	–	– / – / 1	<i>Triticum</i> , cf. hexaploid free-threshing (rachis)	4	– / – / –
<i>Medicago</i> type	35	1 / 2 / –	<i>Triticum</i> , free-threshing (grain)	7	– / 4 / 10
cf. <i>Medicago</i> type	–	– / – / 34	<i>Triticum</i> , free-threshing (basal node)	2	– / – / –
Leguminosae (small) indet.	20	9 / – / 43	<i>Triticum</i> , free-threshing (rachis)	2	1 / – / 1
Leguminosae indet. (pod fragment)	16	– / – / 7	<i>Triticum</i> , cf. free-threshing (grain)	–	1 / – / –
Leguminosae indet. (peduncle)	–	1 / – / 1	cf. <i>Triticum</i> , free-threshing (rachis)	1	– / 1 / –
cf. Leguminosae indet. (pod stalk)	–	– / – / 1	<i>Triticum</i> sp. (grain)	2	– / – / –
cf. <i>Potentilla</i> sp.	–	– / – / 1	<i>Triticum</i> sp. (awn/beak)	–	– / – / 12
<i>Prunus</i> sp. (stone fragment)	–	– / – / 1	Wheat gall from infection by <i>Anguina Tritici</i>	–	– / – / 1
<i>Scandix pecten-veneris</i> L.	–	1 / – / 1	cf. <i>Triticum</i> sp. (grain)	3	– / 1 / 2
<i>Bupleurum rotundifolium</i> L.	–	– / 1 / 12	cf. <i>Triticum</i> sp. (rachis)	1	– / – / –
cf. <i>Sison amomum</i> L.	–	– / – / 3	<i>Secale cereale</i> (grain)	–	– / – / 1
Umbelliferae indet.	–	– / – / 1	cf. <i>Triticum/Secale</i> sp. (awn)	–	– / – / 8
<i>Polygonum aviculare</i> gp.	–	– / – / 1	<i>Hordeum</i> sp. (hulled straight grain)	–	– / 1 / –
<i>Rumex</i> sp(p).	3	1 / 1 / 8	<i>Hordeum</i> sp. (grain)	–	– / 1 / –
<i>Corylus avellana</i> L. (nut fragment)	–	– / – / 3	cf. <i>hordeum</i> sp. (grain).	–	– / 1 / 1
<i>Lithospermum arvense</i> L.	–	– / – / 1	<i>Hordeum/Secale</i> sp. (rachis)	2	– / – / –
<i>Hyoscyamus niger</i> L.	–	1 / – / 3	Cereales indet. (grain)	14	5 / 11 / 23
<i>Veronica arvensis</i> L.	–	– / – / 3	Cereales indet. (rachis)	32	1 / 4 / –
<i>Veronica</i> Section <i>Pocilla</i>	–	– / – / 1	cf. Cereales indet. (rachis)	–	– / – / 3
<i>Melampyrum</i> sp.	–	– / – / 3	cf. Cereales indet. (rachis)	–	– / 2 / –
cf. <i>Odontites verna</i> (Bell.) Dumort.	–	– / – / 11	Gramineae size (culm node)	3	– / – / –
<i>Euphrasia/Odontites</i> sp.	2	– / 1 / 126	Gramineae size (culm base/rhizome)	–	– / – / 3
<i>Plantago major</i> L.	–	– / – / 2	Cereal size (embryo)	4	– / 2 / 3
<i>Legousia hybrida</i> (L.) Delarbre	–	– / – / 2	Cereal size (culm node)	6	– / 1 / –
cf. <i>Legousia hybrida</i> (L.) Delarbre	–	– / – / 2	Cereal size (culm base/rhizome)	–	1 / – / –
<i>Gallium</i> cf. <i>aparine</i> L.	–	– / – / 3	herbage	+++	– / – / –
cf. <i>Sambucus nigra</i> L.	–	– / – / 1	IGNOTA	7	– / 7 / 17
<i>Valerianella</i> cf. <i>rimosa</i> Bast.	–	– / – / 1	Total number of items per litre	263	28 / 68 / 68
<i>Valerianella dentate</i> (L.) Pollich	–	– / – / 6	Items per litre of soil sieved	263	2.8 / 11.6 / 11.6
<i>Anthemis cotula</i> L.	7	– / 10 / 213			

Table 12.17: Charred plant remains from Tenement A (1250–1400)

Building number/room	A1/1	A1/2	A1/4	A1/4	A3
Number of samples ()	(19)	(2)	(15)	(2)	(17)
Total sample size (litre)	190	20	145	20	156
TAXA (element if not a seed)					
<i>Ranunculus</i> sp.	–	–	1	–	–
<i>Papaver rhoeas</i> etc	–	1	1	–	2
<i>Papaver argemone</i> L.	–	1	–	–	–
<i>Papaver</i> sp.	–	–	1	–	–
<i>Brassica</i> (cultivated) sp.	–	–	–	–	1
<i>Brassica rape</i> ssp. <i>sylvestris/nigra</i>	1	–	–	–	180
<i>Brassica/Sinapis</i> sp.	–	–	2	–	1
Cruciferae (large) indet.	–	–	–	–	1
? <i>Viola</i> sp.	–	–	1	–	–
<i>Silene</i> sp.	2	–	–	32	2
cf. <i>Silene</i> sp.	–	–	2	–	1
<i>Agrostemma githago</i> L.	1	–	–	–	–
<i>Stellaria media</i> gp.	–	–	29	2	1
<i>Spergula arvensis</i> L. (small-seeded)	–	–	–	–	2
Caryophyllaceae indet.	1	–	43	1	10
<i>Chenopodium</i> sp.	–	–	–	–	3
<i>Atriplex</i> sp.	4	–	3	1	66
cf. <i>Atriplex</i> sp.	–	–	1	–	–
Chenopodiaceae indet.	1	–	2	4	22
cf. <i>Lathyrus nissolia</i> L.	–	–	–	3	–
<i>Pisum sativum</i> L.	–	–	–	–	5
<i>Vicia/Lathyrus</i> sp.	23	2	14	9	17
cf. <i>Vicia/Lathyrus</i> sp.	–	–	3	–	–
<i>Vicia/Pisum</i> sp.	–	–	–	–	4
<i>Vicia/Lathyrus/Pisum</i> sp.	4	–	3	2	29
<i>Medicago lupulina</i> L.	–	–	–	1	–
<i>Medicago</i> type	–	1	66	2	239
cf. <i>Medicago</i> type	–	1	–	–	45
Leguminosae (large) indet.	1	–	–	–	–
Leguminosae (small) indet.	18	7	51	38	19
<i>Aphanes arvensis</i> agg.	–	–	1	–	–
<i>Rosa</i> sp.	–	–	1	–	–
<i>Prunus</i> sp.	–	–	1	–	–
<i>Pyrus/Malus</i> sp.	–	–	–	2	–
<i>Scandix pectin-veneris</i> L.	3	–	–	3	–
? <i>Scandix pectin-veneris</i> L.	–	–	–	–	1
cf. <i>Bupleurum rotundifolium</i> L.	1	–	–	–	–
<i>Anthriscus/Torilis</i> sp.	–	–	4	–	–
Umbelliferae indet.	–	2	12	–	–
<i>Polygonum aviculare</i> gp.	1	–	3	1	3
cf. <i>Polygonum aviculare</i> gp.	2	–	1	–	2
<i>Polygonum</i> sp.	–	–	1	–	–
<i>Fallopian convolvulus</i> Á Löve	–	–	–	–	5
<i>Rumex acetosella</i> gp.	–	–	–	–	1
cf. <i>Rumex acetosella</i> gp.	–	1	–	2	2
<i>Rumex</i> sp(p).	14	3	35	7	66
<i>Rumex</i> sp. (perianth)	–	–	–	–	3
cf. <i>Rumex</i> sp.	–	–	1	–	–
<i>Urtica urens</i> L.	–	5	5	–	–

Table 12.17 continued

Building number/room	A1/1	A1/2	A1/3	A1/4	A3
Number of samples ()	(19)	(2)	(15)	(2)	(17)
Total sample size (litre)	190	20	145	20	156
TAXA (element if not a seed)					
<i>Urtica dioica</i> L.	–	1	–	–	1
<i>Corylus avellana</i> L. (nut fragment)	–	–	1	2	–
<i>Anagallis arvensis</i> L.	–	–	–	1	–
Primulaceae indet.	–	–	1	–	–
<i>Lithospermum arvense</i> L.	–	–	–	–	2
<i>Hyoscyamus niger</i> L.	–	–	1	–	–
<i>Veronica</i> spp.	–	–	–	–	3
<i>Euphrasia/Odontites</i> sp.	12	2	11	6	10
cf. <i>Euphrasia/Odontites</i> sp.	–	–	–	–	1
<i>Laminum</i> sp.	–	–	4	–	1
<i>Galeopsis</i> Subgen. <i>Galeopsis</i>	–	–	–	–	1
Labiatae indet.	–	–	3	–	–
cf. <i>Plantago major</i> L.	–	1	–	–	–
<i>Plantago lanceolata/media</i>	–	1	3	–	–
<i>Gallium</i> cf. <i>aparine</i> L.	3	–	1	2	–
<i>Gallium</i> sp.	1	–	3	–	18
<i>Sambucus nigra</i> L.	–	–	–	1	–
<i>Valerianella dentate</i> (L.) Pollich	–	–	1	–	–
<i>Anthemis cotula</i> L.	21	–	17	3	15
cf. <i>Anthemis</i> sp.	1	–	–	–	–
<i>Tripleurospermum</i> sp.	–	4	–	–	3
cf. <i>Tripleurospermum</i> sp.	–	–	–	–	3
<i>Onopordum acanthium</i> L.	–	–	–	–	1
<i>Centaurea cyanus/scabiosa</i>	–	–	–	–	2
<i>Centaurea</i> sp.	–	–	–	1	1
cf. <i>Centaurea</i> sp.	–	1	–	–	–
<i>Lapana communis</i> L.	–	–	1	–	–
Compositae (large) indet. (pappus)	–	–	–	–	1
Compositae indet.	–	3	–	–	–
<i>Eleocharis palustris</i> type	–	–	5	–	1
<i>Scirpis</i> sp.	–	–	–	–	1
<i>Carex</i> sp.	–	–	–	–	1
<i>Bromus secalinus</i> type (grain)	–	–	–	–	1
<i>Bromus</i> sp. (grain)	–	1	–	–	1
<i>Avena</i> sp. (grain)	2	–	2	1	4
<i>Avena</i> sp. (twisted awn)	–	–	1	–	5
<i>Avena</i> sp. (floret base)	–	–	–	–	1
cf. <i>Avena</i> sp. (grain)	4	–	3	2	–
<i>Arrhenatherum elatius</i> ssp. <i>bulbosum</i> (Willd.) Schübler & Martens (tuber)	–	–	–	–	1
Gramineae (large) indet. (grain)	–	–	4	–	5
Gramineae (small) indet. (grain)	–	–	3	–	5
Gramineae indet. (grain)	14	1	23	2	31
Gramineae indet. (rachis)	2	–	–	2	–
cf. Gramineae (large) indet. (grain)	1	–	–	2	1
<i>Triticum</i> , tetraploid free-threshing (rachis)	4	–	–	–	1

Table 12.17 continued

Building number/room	A1/1	A1/2	A1/3	A1/4	A3
Number of samples ()	(19)	(2)	(15)	(2)	(17)
Total sample size (litre)	190	20	145	20	156
TAXA (element if not a seed)					
<i>Triticum</i> , free-threshing (grain)	21	–	22	27	165
<i>Triticum</i> , free-threshing (rachis)	3	–	8	3	17
<i>Triticum spelta</i> L. (glume base)	–	–	–	–	1
<i>Triticum dicoccum/spelta</i> (glume base)	2	–	–	–	–
<i>Triticum</i> sp. (grain)	36	4	49	1	39
<i>Triticum</i> sp. (sprouted grain)	1	–	–	–	–
<i>Triticum</i> sp. (glume base)	–	–	–	–	1
<i>Triticum</i> sp. (rachis)	2	–	–	–	–
cf. <i>Triticum</i> sp. (grain)	2	–	–	–	–
<i>Secale cereale</i> L. (rachis)	–	–	1	–	2
<i>Hordeum</i> sp. (hulled straight grain)	1	–	–	–	4
<i>Hordeum</i> sp. (hulled twisted grain)	–	–	1	–	2
<i>Hordeum</i> sp. (hulled grain)	–	–	–	–	1
<i>Hordeum</i> sp. (grain)	2	–	1	1	9
<i>Hordeum</i> sp. (sprouted grain)	–	–	–	–	1
<i>Hordeum</i> sp. (rachis)	1	–	–	–	–
cf. <i>Hordeum</i> sp. (grain)	1	–	4	1	11
cf. <i>Hordeum</i> sp. (rachis)	–	–	–	–	–
Cereales indet. (grain)	93	5	115	51e	653e
Cereales indet. (rachis)	4	–	7	–	45
Cereal size (embryo)	1	–	2	2	12
Cereal size (chaff)	–	–	–	–	4
Cereal size (culm node)	–	–	–	–	1
IGNOTA	41	12	129	+++	200
Total number of items identified	352	60	715	221e	2122e
Items per litre of soil sieved	1.9	3	4.0	11	13.6

from the malt houses of tenementa B and E. The results from tenement D were very poor and have been combined to give a single assemblage (Table 12.19). Very few remains were recovered from any of the yards, and only samples from tenement B were analysed (tabulations in archive).

Tenement A produced more material than the other tenements and samples from the kitchen and adjacent store room, rooms 3 and 4, of the domestic range, building A1, included samples that produced over 100 items. The processing room in tenement, B5/1, also produced two samples with over 100 items identified. Like the samples from the twelfth-century manor, the samples from the tenements also tended to be dominated by weeds. Wheat was generally the dominant cereal.

Chaff remains were relatively scarce, though present in the larger assemblages. Both types of free-threshing wheat, and hulled wheat chaff were present, but due to the general poor level of preservation identification to ploidy level was rarely possible. Rye chaff also tended to be recorded in the richer samples, though rye grain was

confined to the malt houses, B7, C10, and E16 (Tables 12.18–12.20). Both sample 206 from the tenement B malt house and sample 648 from the tenement E malt house produced rye grain and chaff along with wheat grain and hexaploid free-threshing wheat rachis.

The distribution of sprouted grain and sprouts is significant. They were never recovered in great numbers, but nearly all the evidence was obtained from three of the four malt houses. B7 produced sprouted oat and barley grain, and A3 and E16 sprouted barley. The only other sprouted grain recovered was a single sprouted wheat grain from the domestic range, A1/1. The absence of sprouted grain from C10/1 may not be significant, but as the layout of this building was somewhat different it may have had a slightly different function. Possibly it was used principally for drying wheat grain prior to grinding rather than for malting.

Another striking feature of the samples from the malt houses is the number of *Brassica* spp. (cabbage, mustard etc) seeds recovered. Both A3 and B7 (Tables 12.17–12.18) produced large numbers, and some were also recovered

Table 12.18: Charred plant remains from Tenement B (1250–1400)

Building number/room	B4	B5/1	B5/2	B6(2)	B7	B7
Number of samples ()/ sample no	(9)	(5)	(4)	(2)	(11)	206
Total sample size (litre)	99	58	35	20	105	5
TAXA (element if not a seed)						
<i>Ranunculus</i> Subgen. <i>Ranunculus</i>	–	–	–	–	3	–
<i>Papaver rhoeas</i> etc	–	1	–	–	2	–
? <i>Papaver</i> sp.	–	–	1	–	–	–
<i>Brassica</i> (cultivated) sp.	–	–	–	–	–	1
<i>Brassica</i> cf. <i>rape</i> ssp. <i>sylvestris</i> (L.) Janchen	–	–	–	1	9	–
<i>Brassica</i> cf. <i>nigra</i> (L.) Koch	–	–	–	2	6	–
<i>Brassica</i> cf. <i>rape</i> ssp. <i>sylvestris/nigra</i>	–	–	–	–	–	3
<i>Brassica</i> sp.	–	–	–	–	3	–
<i>Brassica/Sinapis</i> sp.	–	–	–	–	1	3
<i>Thlaspi arvense</i> L.	–	–	–	1	–	–
<i>Silene</i> sp.	–	1	–	–	4	3
<i>Agrostemma githago</i> L. (capsule tip)	–	–	–	–	–	1
<i>Stellaria media</i> gp.	1	1	–	–	–	–
Caryophyllaceae indet.	–	1	–	1	6	–
Caryophyllaceae indet. (capsule fragment)	–	1	–	–	–	–
cf. Caryophyllaceae indet.	1	–	–	–	1	–
<i>Chenopodium</i> cf. <i>album</i> L.	–	–	–	–	1	1
<i>Chenopodium</i> cf. <i>murale</i> L.	–	–	–	1	–	–
<i>Atriplex</i> sp.	1	6	–	–	3	2
Chenopodiaceae indet.	–	6	4	5	–	1
cf. Chenopodiaceae indet.	1	–	1	–	–	–
<i>Malva</i> sp.	–	–	–	–	–	1
<i>Linum usitatissimum</i> L.	–	1	–	–	–	–
<i>L. usitatissimum</i> L. (capsule fragment)	–	1	–	–	–	–
cf. <i>Vicia sativa</i> ssp. <i>nigra</i> (L.) Ehrh.	–	1	–	–	–	–
cf. <i>Vicia sativa</i> L. indet.	1	–	–	–	–	–
<i>Lens culinaris</i> Medik.	–	–	–	–	1	–
cf. <i>Lens culinaris</i> Medik.	–	–	–	–	3	–
<i>Pisum sativum</i> L.	1	–	–	–	–	–
<i>Vicia/Lathyrus</i> sp.	4	29	–	1	6	–
cf. <i>Vicia/Lathyrus</i> sp.	2	1	1	–	2	–
<i>Vicia/Lathyrus/Pisum</i> sp.	2	1	1	1	6	1
<i>Medicago lupulina</i> L.	–	–	–	–	15	2
cf. <i>Medicago lupulina</i> L.	–	–	–	–	1	–
<i>Medicago</i> type	18	4	–	–	92	5
cf. <i>Medicago</i> type	–	–	–	–	3	–
cf. <i>Trifolium</i> sp.	–	–	–	–	–	1
Leguminosae (small) indet.	11	22	9	–	80	22
Leguminosae indet. (pod fragment)	–	1	–	–	–	–
<i>Prunus</i> sp. (stone fragment)	–	1	–	–	–	–
<i>Bupleurum rotundifolium</i> L.	–	–	–	–	–	2
cf. <i>Bupleurum rotundifolium</i> L.	–	2	–	–	–	–
Umbelliferae indet.	–	1	–	–	3	–
cf. Umbelliferae indet.	–	–	–	–	1	–

Table 12.18 continued

Building number/room	B4	B5/1	B5/2	B6(2)	B7	B7
Number of samples ()/ sample no	(9)	(5)	(4)	(2)	(11)	206
Total sample size (litre)	99	58	35	20	105	5
TAXA (element if not a seed)						
<i>Polygonum aviculare</i> gp.	–	1	–	1	1	1
<i>Fallopian convolvulus</i> (L.) A. Löve	–	1	–	–	–	–
<i>Rumex acetosella</i> gp.	2	–	1	–	–	–
<i>Rumex</i> sp(p).	3	65	1	3	3	2
? Polygonaceae indet.	–	–	–	1	–	–
<i>Urtica dioica</i> L.	–	1	–	–	–	–
<i>Corylus avellana</i> L. (nut fragment)	–	2	–	–	–	–
<i>Anagallia arvensis</i> L.	–	1	–	–	–	–
Primulaceae indet.	1	–	–	–	–	–
<i>Lithospermum arvense</i> L.	–	1	–	–	2	–
<i>Hyoscyamus niger</i> L.	–	1	1	–	–	–
<i>Veronica arvensis</i> L.	–	–	–	–	–	1
<i>Veronica hederifolia</i> L.	–	1	–	–	–	1
<i>Euphrasia/Odontites</i> sp.	3	8	1	–	7	4
cf. <i>Euphrasia/Odontites</i> sp.	–	1	–	–	–	–
Labiatae indet.	–	–	–	–	1	–
<i>Plantago major</i> L.	–	–	–	–	1	–
<i>Sherardia arvensis</i> L.	1	–	–	–	–	–
cf. <i>Sherardia arvensis</i> L.	1	1	–	–	–	–
<i>Gallium</i> cf. <i>aparine</i> L.	1	–	–	–	1	–
<i>Sambucus nigra</i> L.	–	2	–	–	–	–
<i>Valerinella dentate</i> (L.) Pollich	1	–	–	–	–	–
<i>Anthemis cotula</i> L.	6	35	9	3	43	55
<i>Anthemis</i> sp.	1	9	–	–	2	–
cf. <i>Anthemis</i> sp.	–	1	–	–	–	–
<i>Picnis echioides</i> L.	–	1	–	–	–	–
cf. Compositae indet.	–	1	–	–	–	–
<i>Carex</i> sp.	–	1	1	–	–	1
Cyperaceae indet.	–	–	–	–	–	1
cf. <i>Lolium temulentum</i> L.	–	–	–	–	3	–
<i>Avena</i> sp. (grain)	1	5	1	4	3	–
<i>Avena</i> sp. (floret base)	–	1	–	–	–	–
<i>Avena</i> sp. (sprouted grain)	–	–	–	–	2	–
<i>Avena</i> sp. (twisted awn)	2	9	–	–	–	–
cf. <i>Avena</i> sp. (grain)	–	6	2	4	9	4
Graminae (large) indet. (grain)	5	7	–	4	23	22
Graminae (small) indet. (grain)	3	5	–	1	9	6
Graminae indet. (grain)	10	4	5	–	3	–
Graminae indet. (sprouted grain)	–	–	–	–	1	–
Graminae indet. (rachis)	4	–	1	–	–	–
Graminae indet. (culm node)	–	–	–	–	–	3
Graminae indet. (chaff) – silica	–	–	–	–	1	–
<i>Triticum</i> , tetraploid free-threshing (rachis)	2	3	–	–	3	–
<i>Triticum</i> , cf. tetraploid free-threshing (rachis)	–	1	–	–	2	–

Table 12.18 continued

Building number/room	B4	B5/1	B5/2	B6 (2)	B7	B7
Number of samples ()/ sample no	(9)	(5)	(4)	(2)	(11)	206
Total sample size (litre)	99	58	35	20	105	5
TAXA (element if not a seed)						
<i>Triticum</i> , hexaploid free-threshing (rachis)	–	3	–	–	–	–
<i>Triticum</i> , cf. hexaploid free-threshing (rachis)	–	–	–	–	–	1
<i>Triticum</i> , free-threshing (grain)	12	37	4	9	62	20
<i>Triticum</i> , free-threshing (rachis)	3	9	2	4	3	12
<i>Triticum</i> , cf. free-threshing (grain)	–	3	–	–	–	–
<i>Triticum</i> cf. <i>spelta</i> L. (glume base)	–	1	–	–	–	–
<i>Triticum dicoccum/spelta</i> (glume base)	2	1	–	–	1	–
<i>Triticum</i> sp. (grain)	9	2	9	2	29	7
<i>Triticum</i> sp. (short awn/glume beak)	–	1	–	–	6	1
<i>Triticum</i> sp. (short awn/glume beak) – silica	–	–	–	–	1	–
<i>Triticum</i> sp. (glume base)	3	–	–	–	–	–
<i>Triticum</i> sp. (rachis)	1	–	–	–	–	–
cf. <i>Triticum</i> sp. (grain)	–	–	–	–	7	3
<i>Secale cereale</i> L. (grain)	–	–	–	–	–	4
<i>S. cereale</i> L. (rachis)	–	3	–	–	–	–
cf. <i>Secale cereale</i> L. (rachis)	–	–	–	–	–	2
<i>Triticum/Secale</i> sp. (awn)	–	–	–	–	3	–
<i>Triticum/Secale</i> sp. (awn) – silica	–	2	–	–	–	–
<i>Hordeum</i> sp. (hulled straight grain)	1	–	–	–	3	–
<i>Hordeum</i> sp. (hulled teisted grain)	2	–	–	–	–	–
<i>Hordeum</i> sp. (hulled grain)	–	–	–	–	3	–
<i>Hordeum</i> sp. (grain)	–	–	–	2	6	1
<i>Hordeum</i> sp. (sprouted grain)	–	–	–	–	1	–
cf. <i>Hordeum</i> sp. (grain)	2	1	–	1	–	–
<i>Hordeum/Secale</i> sp. (rachis)	–	–	–	–	3	1
Cereales indet. (grain)	30	270	12	17	117	37
Cereales indet. (awn)	–	1	–	–	–	–
Cereales indet. (rachis)	–	7	2	3	–	–
Graminae size (sprout)	–	–	–	–	3	–
Graminae size (rhizome)	–	–	–	–	2	–
Cereal size (embryo)	1	3	–	2	8	–
Cereal size (sprout)	–	–	–	–	8	–
Cereal size (culm base/rhizome)	–	–	–	–	1	11
Cereal size (rhizome)	–	–	–	–	2	–
bud	–	1	–	–	–	–
rhizome/root	–	–	–	–	++	–
herbage	–	–	–	–	–	+
egg shell	–	–	–	–	+	–
IGNOTA	24e	51	9	17	75	8
Total number of items identified	180e	653	77	91	716	258
Items per litre of soil sieved	1.8	11.3	2.2	4.6	6.8	51.8

from E16 (Table 12.20). In addition, the odd seed was recovered from A1/3 and B6 and a *Brassica* sp. seed case from E13/3. Most of the seeds had a large raised surface network similar to that found in our native *Brassica nigra* or *B. rapa* ssp. *sylvestris*. It proved very difficult to assign

the seeds to either of two to species, however, as there was considerable variation, although an attempt was made for the seeds from Tenement B. Furthermore there is the possibility that the seeds belong to an alien member of the genus, for which no reference material was available.

Table 12.19: Charred plant remains from Tenements C and D (1250–1400)

Building number/room	C8/2	C9/1	C10/1	C10/2	all D
Number of samples summarised ()	(1)	(4)	(3)	(3)	(4)
Total sample size (litre)	10	40	40	45	80
TAXA (element if not a seed)					
<i>Papaver rhoes</i> etc	–	–	2	–	–
cf. <i>Papaver</i> sp.	–	–	1	–	–
<i>Brassica rape</i> ssp. <i>sylvestris/nigra</i>	–	–	49	–	–
<i>Silene</i> sp.	–	–	4	–	–
<i>Agrostemma githago</i> L.	–	–	–	–	1
<i>A. githago</i> L. (capsule fragment)	–	–	1	–	–
<i>Stellaria</i> sp.	–	–	1	–	–
Caryophyllaceae indet.	–	–	1	–	–
<i>Chenopodium</i> sp.	–	–	1	–	–
<i>Atriplex</i> sp.	–	1	16	–	–
Chenopodiaceae indet.	–	–	8	–	–
cf. <i>Malva</i> sp.	–	–	1	–	–
<i>Pisum sativum</i> L.	–	–	1	–	–
<i>Vicia/Lathyrus</i> sp.	–	9	5	2	1
<i>Vicia/Lathyrus/Pisum</i> sp.	–	2	9	2	–
<i>Medicago</i> type	1	1	220	6	4
Leguminosae (small) indet.	–	–	17	2	3
Umbelliferae indet.	–	1	–	–	–
<i>Euphorbia exigua</i> L.	–	–	1	–	–
<i>Polygonum aviculare</i> gp.	–	–	2	–	–
cf. <i>Polygonum aviculare</i> gp.	–	–	1	–	1
<i>Polygonum lapathifolium</i> L.	–	–	1	–	–
<i>Polygonum</i> sp.	–	–	1	–	1
<i>Rumex</i> sp(p).	–	2	18	3	1
<i>Anagallis arvensis</i> L.	–	–	1	–	–
<i>Veronica</i> sp.	–	–	1	–	–
<i>Euphrasia/Odontites</i> sp.	–	4	15	–	1
<i>Plantago major</i> L.	–	–	4	–	–
<i>Sambucus nigra</i> L.	–	–	2	–	–
<i>Valerianella dentate</i> (L.) Pollich	–	–	1	–	–
<i>Anthemis cotula</i> L.	1	14	17	1	1
cf. <i>Anthemis</i> sp.	–	–	1	–	–
<i>Centaurea</i> sp.	–	–	1	–	–
<i>Lapsana communis</i> L.	–	–	1	–	–
<i>Eleocharis palustris</i> type	–	–	1	1	1
? <i>Schoenoplectus lacustris</i> (L.) Palla	–	–	–	–	2
<i>Carex</i> sp.	–	–	1	–	–
cf. <i>Carex</i> sp.	–	–	–	1	–
<i>Bromus secalinus</i> type (grain)	–	–	1	1	1
<i>Avena</i> sp. (twisted awn)	–	–	1	–	–
cf. <i>Avena</i> sp. (grain)	–	1	3	7	–
Gramineae (large) indet. (grain)	1	2	–	1	–
Gramineae indet. (grain)	–	2	–	1	1
Gramineae indet. (rachis)	–	3	–	–	–
<i>Triticum</i> , tetraploid free-threshing (rachis)	–	–	–	1	–
<i>Triticum</i> , free-threshing (grain)	–	15	58	8	2
<i>Triticum</i> , free-threshing (rachis)	–	4	17	4	1
<i>Triticum spelta</i> L. (glume base)	–	–	1	–	–
<i>Triticum dicoccum/spelta</i> (grain)	–	–	–	–	1

Table 12.19 continued

Building number/room	C8/2	C9/1	C10/1	C10/2	all D
Number of samples summarised ()	(1)	(4)	(3)	(3)	(4)
Total sample size (litre)	10	40	40	45	80
TAXA (element if not a seed)					
<i>Triticum</i> sp. (grain)	–	–	40	7	2
cf. <i>Triticum</i> sp. (grain)	–	–	–	3	–
<i>Secale cereale</i> L. (rachis)	–	–	1	1	–
cf. <i>Secale cereale</i> L. (grain)	–	–	2	1	–
<i>Hordeum</i> sp. (hulled straight grain)	–	–	1	–	–
<i>Hordeum</i> sp. (hulled twisted grain)	–	1	–	–	–
<i>Hordeum</i> sp. (grain)	–	5	2	2	–
<i>Hordeum</i> sp. (rachis)	–	–	1	–	–
cf. <i>Hordeum</i> sp. (grain)	–	2	3	2	1
<i>Secale/Hordeum</i> sp. (rachis)	–	–	1	–	–
Cereales indet. (grain)	–	35	35	177e	12
Cereales indet. (rachis)	–	–	6	1	1
Cereal size (embryo)	–	–	4	–	–
IGNOTA	2	6	26	5	2
Total number of items identified	5	110	611	240e	41
Items per litre	0.5	2.75	15.3	5.3	0.5

Large legumes were present throughout the samples, though most could not be identified to species. Peas were common in samples from A3 and single peas were recorded from C10/1 and from B4. A possible cultivated form of *Vicia sativa* (common vetch) was identified from B4. B7 produced several lentils and a single possible lentil was recorded in E16.

Once again presence of cultivated legumes in the samples may be because they grew as contaminants of the cereal crops. This would seem the most likely origin of the fodder vetch, and possibly the lentils. The finds of pea, on the other hand, may reflect their use in brewing.

Hazel-nut fragments were recovered from A1/3, B5/1 and E13/3 while a single apple or pear pip was found in a sample from A1/4 and a fragment of *Prunus* sp. stone in C10/2. A1/3 produced the only evidence for flax. These remains probably reflect the domestic nature of these contexts.

The weed assemblages from the samples are somewhat different to the previous phase. Species typical of winter and spring sown cereals are present but leguminous weed seeds form a much larger proportion of the assemblages. There was very little *Euphrasia/Odontites* sp. and *Anthemis cotula* which may be due in part to the small amount of chaff present, with which these small seeds are likely to be associated.

Tenement A was somewhat different from the other tenements in that only these samples produced small-seeded *Spergula arvensis* and *Tripleurospermum* sp. *Rumex acetosella* was also abundant in these samples though it was also recorded in samples from tenement B and E.

General discussion

Cereal crops and the evidence for maslins or mixtures

The very few charred plant remains recovered from early Saxon deposits are difficult to interpret as they may be the result of intrusion. However, evidence from the north Raunds sites suggests that free-threshing wheat and barley were cultivated in the area during this period. Furthermore it would appear that the cultivation of spelt wheat in this area had ceased by the end of the Roman period and had been replaced by free-threshing wheat.

Small amounts of spelt wheat were recovered from a middle Saxon deposit at Burystead, north Raunds (Campbell 2009) and in the late Saxon mill leat at West Cotton. There are also occasional finds in later deposits but it is never present in great quantities. These occasional finds most probably result from genetic diversity in the free-threshing wheats grown, whereby occasional mutations arose, or because hulled wheat was present as a weed (Campbell 2009). Hulled wheat chaff tends to form a greater proportion of the chaff element in contexts interpreted as being of a domestic nature. However, in such situations hulled wheat chaff may be over-represented. This is because it would still be attached to the grain after threshing, unlike the majority of the chaff and would therefore enter the domestic building where wheat grain was being ground piecemeal or being used whole. This may explain the frequency of hulled wheat chaff in A1/1, B4 and C9/1 (Tables 12.17–12.19).

Table 12.20: Charred plant remains from Tenement E (1250–1400)

Building number/room	E13/2	E13/3	E16	E16	E16
Number of samples ()/ sample no	(6)	(1)	(7)	641	648
Total sample size (litre)	25+1	5	66.5	8	10
TAXA (element if not a seed)					
<i>Brassica nigra</i> (L.) Koch	–	–	–	–	1
Brassicaceae indet. (part of seed)	1	–	–	–	–
Caryophyllaceae indet.	1	–	–	–	–
<i>Atriplex</i> sp.	1	–	2	–	–
cf. <i>Atriplex</i> sp.	1	–	–	–	–
Chenopodiaceae indet.	–	–	1	–	–
cf. <i>Lens culinaris</i> Medik.	–	–	–	1	–
<i>Vicia/Lathyrus</i> sp.	7	–	4	2	3
<i>Vicia/Lathyrus/Pisum</i> sp	2	2	1	–	–
<i>Vicia/Lathyrus/?Pisum</i> sp	1	–	1	–	–
<i>Medicago</i> type	1	–	2	–	2
cf. <i>Medicago</i> type	4	–	1	–	1
cf. <i>Trifolium</i> sp.	–	–	1	–	–
Leguminosae (small) indet.	3	–	2	–	–
Leguminosae indet. (pod fragment)	4	2	5	1	–
cf. <i>Bupleurum rotundifolium</i> L.	–	–	1	–	–
cf. <i>Scandix pecten-veneris</i> L.	1	1	–	–	–
<i>Rumex acetosella</i> gp.	1	–	–	–	–
<i>Rumex</i> sp(p).	1	1	4	–	–
cf. <i>Corylus avellana</i> L. (nut fragment)	1	–	–	–	–
<i>Lithospermum arvense</i> L.	1	–	–	–	–
<i>Hyoscyamus niger</i> L.	–	–	1	–	–
<i>Veronica hederifolia</i> L.	–	–	1	–	–
<i>Euphrasia/Odontites</i> sp.	–	1	3	–	1
cf. <i>Legousia hybrida</i> L.	2	–	–	–	–
<i>Plantago major</i> L.	–	–	–	–	1
<i>Gallium</i> sp.	–	–	2	–	–
<i>Anthemis arvensis</i> L.	–	–	1	–	–
<i>Anthemis cotula</i> L.	5	–	7	–	–
cf. <i>Anthemis cotula</i> L.	1	–	1	–	–
<i>Anthemis</i> sp.	–	–	1	–	–
Compositae (large) indet.	–	–	1	–	–
cf. Compositae indet.	1	–	–	–	–
<i>Carex</i> sp.	1	–	–	1	–
<i>Poa annua</i> type (grain)	–	–	1	–	–
cf. <i>Bromus</i> sp. (grain)	–	–	1	–	–
<i>Avena</i> sp. (twisted awn)	1	–	1	–	–
cf. <i>Avena</i> sp. (grain)	1	1	1	–	–
cf. <i>Avena</i> sp. (panicle node)	–	–	–	2	–
Gramineae (large) indet. (grain)	2	1	1	–	1
Gramineae (small) indet. (grain)	5	2	1	2	–
cf. Gramineae (small) indet. (grain)	1	–	1	–	–
cf. Gramineae indet. (grain)	–	–	1	–	–
Gramineae indet. (rachis)	–	–	2	–	–
Gramineae indet. (chaff) – silica	–	–	1	–	–
<i>Triticum</i> , tetraploid free-threshing (rachis)	1	–	–	–	–
<i>Triticum</i> , cf. hexaploid free-threshing (rachis)	1	1	–	–	1
<i>Triticum</i> , free-threshing (grain)	2	4	11	–	6
<i>Triticum</i> , free-threshing (rachis)	3	–	2	–	–
<i>Triticum spelta</i> L. (glume base)	–	–	1	–	–

Table 12.20 continued

Building number/room	E13/2	E13/3	E16	E16	E16
Number of samples ()/ sample number	(6)	(1)	(7)	641	648
Total sample size (litre)	25+1	5	66.5	8	10
TAXA (element if not a seed)					
<i>Triticum dicoccum/spelta</i> (grain)	–	–	1	–	–
<i>Triticum</i> cf. <i>dicoccum/spelta</i> (grain)	–	1	1	–	–
<i>Triticum dicoccum/spelta</i> (spikelet fork)	–	–	–	1	–
<i>Triticum</i> sp. (grain)	1	3	4	–	–
<i>Triticum</i> sp. (short awn/glume beak) – silica	–	1	–	–	–
cf. <i>Triticum</i> sp. (grain)	4	1	3	1	2
cf. <i>Triticum</i> sp. (glume base)	–	–	1	–	–
<i>Secale cereale</i> (rachis)	1	–	–	–	1
cf. <i>Secale cereale</i> (grain)	–	–	–	–	1
<i>Hordeum</i> (hulled twisted grain)	–	–	1	–	–
<i>Hordeum</i> (hulled grain)	–	–	–	1	–
<i>Hordeum</i> sp. (grain)	–	–	–	3	–
<i>Hordeum</i> sp. (sprouted grain)	–	–	–	1	–
cf. <i>Hordeum</i> sp. (grain)	–	–	1	1	–
cf. <i>Hordeum</i> sp. (sprouted grain)	–	–	–	1	–
cf. <i>Hordeum/Secale</i> sp. (rachis)	–	–	–	1	1
Cereales indet. (grain)	38	8	60	7	5
Cereales indet. (rachis)	7	1	6	1	–
Cereal size (embryo)	1	–	–	–	1
Cereal size (sprout)	–	–	–	1	–
Cereal size (chaff) – silica	–	1	–	–	–
Cereal size (culm node)	1	1	–	–	1
Cereal size (culm base/rhizome)	–	–	4	–	–
herbage	++	–	++	1	–
IGNOTA	11	3	13	4	2
Total number of items identified	122	36	163	33	31
Items per litre of soil sieved	?4.9	7.2	2.5	4.1	3.1

Looking at the overall distribution of hulled wheat remains there appears to be a close association between hulled wheat and rye, though the two do not always occur together. This may indicate that spelt wheat occurred as a weed in rye or more probably a rye and bread wheat maslin (see below). Possibly it was present as a contaminant of bought seed corn.

Tetraploid free-threshing wheat would appear to have been present at West Cotton from the end of the tenth century and, as already stated, this would form the first pre-Conquest record for this type of wheat in Britain. The species involved is believed to be *Triticum turgidum* (rivet wheat) both on ecological grounds, and on the grounds of later documentary evidence. It has been found at a number of sites central and southern Britain but these tend to be late-eleventh to twelfth century or later (Campbell 1994 and Moffett 1991). Its appearance at this time may be associated with the laying out of open fields and the adoption of a new agricultural system.

Rivet wheat is generally not suited to bread making,

as it produces weak flour, but it can be mixed with bread wheat (hexaploid free-threshing wheat) to produce flour suitable for baking (Percival 1934, 89). Earlier on in the project it was thought that the two types of wheat may have been used for different purposes, bread wheat for bread and rivet for porridge and gruel or possibly biscuit making (Campbell 1994). However, it is also possible that the two types of wheat were nearly always grown as a mixture to produce an all purpose flour.

Any consideration of this possibility must be based on the chaff since the identification of the two types of grain was not attempted, see below. Most of the chaff present in the richer assemblages is believed to represent the by-products from threshing, winnowing, raking and cleaning, and as such probably represents more than one harvest. However, there were no large assemblages from West Cotton that produced only hexaploid or tetraploid free-threshing chaff, nor did either type greatly outnumber the other in any sample though the ratio of tetraploid to hexaploid rachis fragments did vary. Although this does not provide definite proof the

two wheats were grown as a mixture (Jones and Halstead 1995) the close association of the two types of chaff does suggest that this might have been the case. Experiments in cultivating rye and bread wheats together have shown that both will ripen together, even from a spring sowing (Mark Robinson pers comm) so there does not seem to be any reason why the two should not have been grown together. In addition, on the Greek island of Amorgos bread and macaroni wheat are grown as a mixture with no attempt to use the two types in different ways or to manipulate the proportions (Jones and Halstead 1995). A similar situation may have occurred at West Cotton and Raunds.

Growing the two types of wheat, either as mixture, or separately, would still have the advantage of helping to ensure a decent yield since even if, for instance, the bread wheat was badly affected by rust or the rye by frost, the other wheat would be less affected. However, if the two wheats were grown as a maslin, their straw, which as is suggested elsewhere may have been used for different purposes (Campbell 1994 and Campbell 2009) could only have been put to a single use. This would seem to argue against the growing of maslins, but may not have always been a consideration in deciding what to sow.

Separate from the close association of the chaff of the two free-threshing wheats there was also some evidence that bread wheat and possibly rye wheat may have been grown as a maslin with rye. The evidence for a bread wheat and rye maslin occurred in several of the twelfth to early thirteenth-century samples, eg sample 1058 from the latest mill leat and a sample from oven 4039 and also in two samples from the tenement malt houses.

The evidence for a rye wheat and rye maslin was more tenuous and confined to the twelfth-century deposits. The best evidence came from a mill pond deposit which contained relatively high numbers of rye grain and chaff, and where tetraploid free-threshing rachis fragments outnumbered hexaploid ones. Assemblages from oven 393 also produced relatively large amounts of rye, and tetraploid free-threshing rachis outnumbered hexaploid rachis fragments. In both these cases however, large numbers of hexaploid free-threshing rachis were also recorded, so given the likely over-recording of tetraploid rachis (Campbell 1994) the evidence remains inconclusive.

The only evidence for rye being grown as a pure crop came from ditch system 15, dated 1100–1250, where large amounts of rye chaff were recorded in association with free-threshing wheat grain and very little other chaff. This rye was probably from a locally grown judging from the small weed assemblage associated with it.

The other two main cereals, oats and barley, were also present from the late Saxon onwards at West Cotton. They were found to occur at roughly similar levels at both West Cotton and north Raunds (Campbell 2009), and though it must not be forgotten that in some cases the oat grain may all be derived from wild oats, it would appear that these two cereals were grown together as a mixture, ie as dredge (drage). The best evidence for this came from sample 1080

where in a mixture of barley and oats, about one quarter had sprouted. This sample also provided the only good evidence of dredge being used for brewing although there was also some evidence from later deposits, eg sample 621 from plot 5, dated 1100–1150, and from the tenement B malt house, where sprouted oat and barley grain were recorded in the same sample.

There is also evidence that oats and barley were grown as crops in their own right, and that both crops were malted separately. The evidence is surprisingly plentiful for oat in the earlier part of the site's history. Assemblages with oats where a reasonable proportion of the oat grain had sprouted were recovered from eleventh and twelfth-century ditch fills in plot 3, and from the early twelfth century oven, 393. Evidence for barley being malted on its own also came from oven 393, from ditch system 14, and from the tenement malt houses, E16 in particular. This may reflect a trend away from growing oats as a pure crop for brewing towards the use of dredge, and pure barley.

Both two-row and six-row barley seem to have been grown. Two-row forms of barley are generally better suited to brewing as their grain tends to have a lower proteid-content and high starch-content (Percival 1934). Evidence for the malting of two-row barley comes from oven 393 and it may have been grown specifically for this purpose from the twelfth century onwards.

Six-row barley may only have been malted as the result of being sown as dredge. However, it could also have been cultivated for fodder, or as pot barley. Possible evidence of this came from samples from ditch systems 15, 16, and 17, where oat remains were scarce but where barley was well represented.

Evidence for the cultivation of oats, other than for brewing purposes is stronger. Assemblages from ditch system 19 and from the latest mill both produced substantial numbers of oat grains none of which showed signs of germination. At least in the former case, the grain seems to have been accidentally burnt during drying prior to grinding. This, as already suggested, shows that some oats were probably grown for pottage grain or oatmeal. This use of oats for human consumption has also been suggested for other sites in the south Midlands (Moffett 1988). That oat was also used for animal fodder is evident from the sample of charred horse dung.

Cereal chaff as fuel

As compared with other Saxon to medieval rural sites in England the level of cereal chaff encountered in samples from West Cotton was very high: eg Eckweek (Carruthers 1995); Westbury (Letts 1995) and Wraybury (Jones 1991). This may in part be a reflection of the lack of systematic sampling, and the large mesh sizes used for the recovery of the charred plant remains at some sites in the past. There is also the question of the type of deposit that is available for sampling. For instance, the Saxon/medieval ovens at Stafford produced large amounts of chaff (Moffett 1988

and 1994). However, the level of chaff at West Cotton would still appear somewhat unusual.

Lisa Moffett (1988) has suggested that sites are rich in chaff because deliberate burning of chaff was taking place. Furthermore, she suggests that the burning of chaff is likely to be associated with the following criteria: a) sites with few animals, b) sites which can provide for their animals by other means, ie chaff is not needed as fodder, c) sites associated with a particular by-product, eg malt and d) sites where there is a lack of other fuel. She also believes that sites where both b) and c) are true are likely to produce the most chaff.

West Cotton would meet criteria b) and c). The proximity of the site to hay meadow would suggest that there would be ample supply of winter fodder, and it is likely that there would have been some permanent pasture, at least during the early medieval phase of the site. Demand for chaff for fodder, fuel for drying malt etc in the surrounding area would probably also have been minimal, unlike sites close to major towns or cities, eg those in and around London (Rackham 1994). In addition there is ample evidence for malting, and for drying grain from the site.

The choice of fuel for malting is particularly important as the malt takes on the flavour of the fuel used. Markham (1681) has stated that wheat straw is the best fuel to use followed by rye, then oat, and lastly barley. He then recommends the use of stubble, dried fen-rushes, straw of pea, vetches, lupins or tares, clean bean straw, furs, whims or small brushwood, bracken, wood, and coal in descending order of merit.

There is also the question of lack of other fuel (criterion d). It would appear that inhabitants of West Cotton had little or no access to woodland. This is suggested partly by the waterlogged wood from the mills and partly by the general low level of remains derived from woodland, in particular hazel-nuts. These are found at low levels across the site but they are never in great numbers. This forms a sharp contrast with sites such as Eckweek and Westbury where large numbers were recovered (Carruthers 1995 and Letts 1995). The high levels of nut fragments found at these sites may indicate the use of hazel-nut shells as fuel to dry grain etc where chaff was required for winter fodder.

Whether West Cotton also might meet Moffett's criterion a, which she regards as the least likely to produce a chaff rich site, is more debatable, since such a situation is difficult to detect archaeologically. However, since West Cotton lies within the Danelaw and to quote Finberg (1972, 480) "The Danes...put arable cultivation in the forefront of their husbandry and treated all other branches as appendant to it" we might suppose less emphasis on animal husbandry here. There is also the traditional view of the Midland Plain as a prime wheat growing area (Kerridge 1967) with sheep being kept "merely as a means of cultivating and manuring the soil" (Donaldson 1794, 59). Whether, however, such a state of affairs was already established in Northamptonshire in the early medieval period remains contentious.

Moffett's (1988) arguments regarding the likelihood of

cereal chaff being deliberately burnt at a site can be taken a stage further and be applied to types of cereal chaff. Of course there is the problem of whether some chaff is more likely to survive being burnt than other types. This may in part explain the very low levels of oat chaff recovered from West Cotton, and from other sites, eg Stafford (Moffett 1994). However, it is possible to look at which type of chaff was most palatable to animals, which was most valued for fuel, and at its use for other purposes, particularly for thatching.

Thomas Tusser (1557, 111) states that animals should be given first rye straw then wheat, pea, oat and barley straw, and lastly hay, since if they had tasted hay they would rather fast than eat straw. This would imply a descending order of preference. There is also the problem that long-awned cereals may irritate the eyes, nostrils and tongues of horses and cattle to which they are fed (Percival 1934, 39) and that this may also be a factor in which cereal straw is used as fodder (Campbell 1994).

As stated above, Markham (1681) recommends the use of wheat straw then rye, oat, and lastly barley straw, as a fuel for drying malted grain. He also recommends the use of rye straw mats as a support, or bedding, for the grain in the kiln. Rye straw was also highly valued for thatching (Green 1981, 140) and it has been suggested that rivet wheat straw, which has many of the properties of rye straw (Percival 1921), may have had similar uses (Campbell 1994, 67).

Based on this information it is possible to consider the various cereals and probable cereal mixtures as to their suitability for a given purpose. This model would predict that both types of wheat, and maslins of both wheats together, and with rye would be the most likely types of chaff to be used as fuel. However, since rivet wheat and rye-rivet wheat maslin would also make a good thatching material we would expect it to be less commonly recorded than chaff from a bread wheat and rye maslin. Similarly, we would also expect finds of pure rye to be less common, barring the accidental burning of rye straw mats.

In addition, we would also predict that bread wheat chaff, which tends to have short awns, is the more likely of the two wheats to have been fed to animals. There is evidence from the western oven and pit group that short-awned bread wheat and a long-awned rivet wheat may have been grown at West Cotton. While the presence of bread wheat chaff in the possible horse dung sample shows that bread wheat chaff was fed to animals.

The model would therefore predict that the most likely chaff to be deliberately burnt is that derived from maslins of rivet-bread wheat and of rye-bread wheat. This may go some way towards explaining the abundance of both types of wheat chaff, and rye with bread wheat chaff in assemblages from West Cotton. It would also account for the relatively low levels of barley and oat chaff and may explain why there is only one sample where pure rye chaff was abundant. Alternatively this sample may relate to the use of rye straw mats (Campbell 1994).

Agricultural activities at the settlement

Discussion of any change or continuity in the type of agricultural activities undertaken at the site in the different phases is hampered by the differences in the nature of the charred assemblages, as already discussed. It is clear that the early Saxon phase of the site was very different to the subsequent phases and that little if any agricultural activity took place at the site during this period.

The late Saxon (950–1100) assemblages from ditches and leats, and those from similar features dated to the medieval manor period (1100–1250) are believed to be derived from the drying of grain or malted grain with cereal chaff being used as part of the fuel for the process. These activities may have been associated with the presence of the mills at the settlement but whether such activities continued after the demise of the mills is impossible to determine. This is because assemblages dated after 1150 are all Class C, ie derived from a number of different burning events and probably formed over a considerable period of time. Lack of chaff in these samples cannot necessarily be taken as evidence that only the later stages of crop processing took place at the site after 1150 since it may purely be an artifact of archaeobotanical record.

The assemblages from the buildings from the different phases show a general similarity and thus it is tempting to suggest that the types of activity that took place within the Saxon timber buildings were broadly similar to those taking place within the medieval manor and the later tenements. This implies continuity but still does not answer the question of whether grain continued to be dried on a large scale at the site during the later part of the medieval manor period and in particular in the tenements. The lack of chaff and high numbers of weed seeds and grain in would imply that only the later stages of crop processing were involved but because of the nature of these assemblages such an interpretation must be treated with caution.

Legume crops

Legumes tend to be poorly represented archaeobotanically. They are rarely preserved under waterlogged conditions, and because exposure to fire is not generally part of their processing, are only rarely found charred. At West Cotton there was a general scatter of large legumes (*Vicia/Lathyrus/Pisum* sp.) across the site and throughout the three major phases, although as most had lost their testa and hilum, few could be identified to species.

Vicia faba var. *minor* (celtic/horse bean) was identified from a late Saxon deposit and from twelfth-century deposits, though it was apparently absent in later medieval deposits. The presence of four definite *V. faba* in sample 755 from western oven 4437 would indicate that bean threshing waste was used as fuel to dry grain.

Vicia sativa ssp. *sativa* (cultivated common vetch) threshing waste appears also to have been used as a fuel to dry grain. Seeds were recorded in western oven 4039, dated

to the early twelfth century, in association with numerous legume pod fragments. Threshing waste is recommended as a substitute for cereal chaff as a fuel for drying malt by Markham (1681).

The record of cultivated common vetch from this oven pre-dates the documentary evidence for this crop and is believed to be the earliest archaeobotanical record for this species in Britain (Campbell 1994). It was also recorded from many of the early medieval deposits and a single, possibly cultivated form was identified from tenement B.

Pisum sativum (pea) was tentatively identified from the medieval manor garderobe, but was otherwise confined to the medieval tenement deposits, where it may have been used in brewing, as peas and beans were added to the malt to increase starch content (Kaye 1936). Markham (1635) gives a recipe for march beer where peas, wheat and oats are added to the malted grain before grinding.

Peas may have been grown in the area from as early as the middle Saxon period (AD 600–800). A possible pea was identified from a middle Saxon deposit at Burystead (Campbell 2009). It appears to be absent from late Saxon sites in the region but relatively common in medieval deposits (Moffett 1988).

Lens culinaris (lentil) was identified from the medieval tenement B malt house and another possible lentil was recorded from the tenement E malt house. Tentative identifications were also made from oven 4437, dated to the first half of the twelfth century, and from the malt house of the medieval manor, S19/2). A possible lentil was also recorded in a late Saxon/post-Conquest pit at Burystead, where it was thought to be present as a contaminant of seed grain (Campbell 2009). This may be the explanation for the finds from West Cotton although it is also possible that lentil was grown for fodder.

Other crops

Evidence for the cultivation of flax for fibre comes mainly from the middle Saxon and eleventh-twelfth century waterlogged deposits. However, small numbers of flax seeds, and sometimes capsule fragments, occurred in many of the charred assemblages from the site. Flax was probably present in most of these assemblages because it occurred as a weed in the cereal crops, and its presence in some of the samples from the buildings suggests that the seeds may have been eaten. Flax was normally grown as a garden crop (Greig 1988), or on small plots of land known as 'plecks' (Hoskins 1957, 70). As such its importance in the medieval period may have been overlooked, since it would rarely have been recorded in written documents as these mainly refer to field crops.

The large number of *Brassica* ssp. seeds recovered from the malt houses of the tenements and the sporadic occurrence of seeds in earlier deposits illustrates that *Brassica* species were probably cultivated for their seeds, and probably also for their leaves from the twelfth century onwards. Putting aside problems of identification, whatever

the species present, the seeds could have been used as a condiment (Campbell 2009). Ale was sometimes spiced with mustard seed to reduce fermentation (Man and Weir 1988, 14). The addition of mustard seed to ale was also thought to increase the thirst as one drunk and was therefore added to ale intended for sale (La Pensée *et al* 1990). This may explain the close association of *Brassica* seed with the malt house floors. Alternatively, the abundance of *Brassica* spp. seed in the malt house samples may be because it grew as a major contaminant of the cereal crops.

Brassica/Sinapis sp. seeds often occur in faecal deposits of this period indicating that they were used as a spice (Greig 1991). A cess pit from Furnells manor, Raunds produced over a hundred seeds (Campbell 2009) and small numbers were present in the medieval garderobe at West Cotton. Elsewhere further evidence for the use of mustard seed, or mustard type seed, as an addition to ale comes from medieval Norwich, where large numbers were found charred, in association with sprouted grain (Murphy 1985).

There is documentary evidence for the cultivation of cole-seed in Norfolk during the medieval period (Campbell 1983). So its cultivation at West Cotton, possibly in same type of plots that were used for flax, would seem highly probable.

Other plant resources

The occasional finds of hazel-nut shell, pear pips, pear or apple pips and things such as rose pips, elder seeds and *Prunus* sp. (plum, bullace etc.) stones shows that these resources were brought to the site. They were no doubt used for food by the site's inhabitants. Opium poppy was recorded as a waterlogged macrofossil and may have been used as a spice. The dye plant *Reseda luteola* (weld) was recorded both as a waterlogged macrofossil and charred.

The assemblages from the western ovens suggest that, in addition to cereal and pulse threshing waste, bracken, and possibly, rough grassland vegetation lining hedges was probably used as a fuel for drying grain. Wet grassland species present in oven 4437, and encountered in other assemblages from the site may also indicate that this vegetation was cut and ended up as fuel. Possibly its primary purpose was to provide for covering floors etc, or in the case of bracken, as bedding for animals.

Association of particular weeds with specific crops

The weed flora from West Cotton was extremely rich and varied, but it has proved difficult to detect constant association of particular weeds with a given crop. Often a certain weed, or group of weeds occurred in a sample that produced a good assemblage of a particular cereal, but that weed was then found to be absent from other samples with high numbers of the same cereal. This may be because the same crop, or different varieties which were not detectable archaeobotanically, were grown on different soils from year to year. Alternatively it may reflect the fact

all the assemblages studied produced more than one cereal, quite often all four.

One of the exceptions to this pattern is *Agrostemma githago* (corncockle) where high numbers were nearly always associated with remains of rye. This association has been noted by Silverside (1977) for recent crops, and may appear constant because the seed is retained with the crop and sown with it, rather than being a characteristic of the land sown. *Fallopia convolvulus* (black bindweed) would appear to show a similar association with dredge, although the only strong evidence came from sample 1080, which was interpreted as malted dredge accidentally burnt during drying. To a lesser extent *Lithospermum arvense* (corn gromwell) would appear to be associated with wheat and possibly, wheat and rye maslins.

Scandix pecten-veneris (shepherd's needle) and *Bupleurum rotundifolium* (thorowax), two of the other large seeded weeds which are likely to be retained and sown with the grain, and which occurred frequently in the assemblages, are more problematic. Large numbers of *Scandix pecten-veneris* were recovered from the assemblage of dredge (sample 1080), while *Bupleurum rotundifolium* seeds were common in a sample (1066) that was dominated by oat grain and contained large amounts of wheat and rye chaff. In other samples the two weeds appeared to be associated with wheat remains in general. This pattern may be related to plant height. Both plants are rather low growing as compared with the other species mentioned above and would therefore be harvested only if the cereals were cut fairly low down. Wheat and rye may have been harvested close to the ear, and the stubble harvested separately. This would result in these two weeds being associated with the chaff rather than the grain. Barley and oat are traditionally mown, which would result in these two weeds being harvested with the grain and having a greater chance of association.

Soils under cultivation

The smaller seeded weeds are more likely to be indicative of the land sown. In the assemblages at West Cotton, most are typical of autumn sown crops on calcareous soils, phytosociological alliance *Caucalidon lappulae* (Silverside 1977). It would appear from the frequency of species such as *Anthemis cotula* (stinking mayweed) and *Odontites/Euphrasia* sp., probably *Odontites verna* (red bartsia) in most cases, that crops from the heavy calcareous claylands were processed at the site at least up to the establishment of the peasant tenements in the thirteenth century. There is also evidence of the use of well-drained, somewhat lighter calcareous soils, characterised by the presence of *Papaver* spp. (poppies) and weeds such as *Valerianella dentata* (narrow-fruited cornsalad), indicating the cultivation of the valley slopes.

A smaller proportion of the weed assemblage is characteristic of the circumneutral soils likely to be found on the gravels of the floodplain prior to alluviation: weeds such as the small-seeded form of *Spergula arvensis* (corn

spurrey) and *Rumex acetosella* gp. (sheep's sorrel). These weeds were rarely recovered in great numbers, possibly because the chaff from the crops grown on these soils was not used as fuel.

The spatial distribution of these weeds of circumneutral soils may help to throw light on this matter. In the twelfth-century samples, nearly all the records were obtained from the western half of the site, such as ditch systems 2, 3, 4, 8, 13 and 14, which produced some sprouted grain, relatively high numbers of oat and barley, and relatively little rye. In contrast, those from the eastern part of the site, 15, 16, and 17 produced much rye, hardly any oat, some barley and no sprouted grain. This would suggest that the western part of the site was receiving some crops from the floodplain, and that these crops were probably oats, barley or dredge intended for brewing, whereas the eastern enclosures were probably receiving some crops from the valley slopes where rye, rye and bread wheat maslin, and feed or pot barley were grown.

Similarly, the only medieval tenement to produce weeds characteristic of the floodplain gravels, in any quantity was Tenement A. The samples from this tenement produced very little rye but quite a bit of barley and were unusual in that the samples from the malt house contained large numbers of peas. This might suggest that tenement A had access to land on the floodplain that was unavailable to the other tenement holders and which it used for growing barley and peas.

The limited distribution of *Tripleurospermum* sp. (mayweed) in the samples, only one or two seeds of which were ever recovered from a given context, may also be related to the use of the floodplain. This taxa was recorded from Tenement A and from the medieval manor in one of the western ovens, 4437, from the southern oven group (APITS) and from ditch systems 3 and 14. In addition, two clean seed heads were recovered from the mill pond (sample 886). As these features do not overlie each other contamination of deposits seems unlikely. It is possible to suggest that this weed may have grown only in a small area under cultivation and that this land, originally under the control of the manor, ended up under the control of tenement A. In addition, the apparent association of tetraploid free-threshing wheat chaff with this taxa might indicate that these soils were sown to rivet wheat. Kay (1994) states that *Tripleurospermum inodorum* is most abundant on well-drained soils of medium light texture, and that in Europe it shows calcifuge tendencies. It may therefore have been confined to the floodplain or valley slopes at Raunds and sown to rivet wheat.

Evidence for decreasing soil fertility

Postan (1966) has argued that the expansion of arable land at the expense of pasture during the thirteenth century lead to a decrease in stocking levels and a lack of manure resulting in loss of fertility in the arable land and poor crop yields by the fourteenth century. One way of testing this theory

against the archaeobotanical evidence from West Cotton is to look at the proportion of leguminous weed seeds as part of the overall weed assemblage in samples since an increase in leguminous weeds is generally interpreted as indicating decreasing soil fertility (eg Jones 1978).

However, at West Cotton the percentage of leguminous weeds remains roughly constant, at 25–35% suggesting that no loss of fertility occurred during this time. However there is a sharp increase in leguminous weeds as compared to the late Saxon phase, where they formed less than 5% of the total. A similar pattern was observed at north Raunds, and in particular Langham Road (Campbell 2009). This may be due to decreasing soil fertility but a more likely explanation is that this change is associated with the introduction of leguminous fodder crops such as cultivated common vetch and or the setting aside of some fallow as temporary pasture.

Crop rotation and field systems

Although it is possible, from the archaeobotanical evidence, to be fairly certain of the suite of crops that were grown by the inhabitants of West Cotton from the late Saxon period onwards, establishing the nature of any crop rotation and under what type of field system this occurred is much more difficult. It was thought at one stage that where small amounts of a crop were found in a sample dominated by another crop the minor component was likely to represent the crop grown in the previous year in that field (Green 1984). However, recent work by Jones (1995) has shown that most such minor components are contaminants of seed corn and may not have been grown locally for a considerable number of years. Therefore, although it is possible that lentil was grown as fodder crop on the fallow by the inhabitants of tenement B it is equally possible that they obtained seed corn contaminated with lentil and never actually grew it. Similarly small amounts of oat and barley in samples dominated by wheat need not indicate that the field in which the wheat grew was previously sown to dredge.

The rotation of wheat, spring corn (normally dredge or barley), fallow associated with a 3-course field system could have been in operation at West Cotton in the thirteenth and fourteenth centuries, and indeed earlier. However, other crops could have been involved. For example maslin, rye, bigg (a lax-eared six-row barley) could have been sown the first year and peas, beans, oats, or barley in the second year. In the third year the field may have been bare fallowed or part of it sown to vetch, lentils or peas or left to develop a natural sward as pasture for livestock (Kerridge 1967, 92 and Postles 1989). Equally the same range of crops could have been grown under a two-course system with certain land being used for particular crops or mixtures.

There is evidence that a two-course field system was in operation at Raunds in 1327, but this need not have been in the case for West Cotton fields (Courtney this volume). Furthermore, there is the suggestion from the West Cotton

weed assemblage that the floodplain may have been sown to rivet wheat, dredge, oats, barley, and peas while the valley slopes were more favoured for rye, bread wheat-rye maslin, and feed or pot barley. This may point towards a three-course system but is not conclusive evidence of one, since the main difference between the two is the amount of acreage sown rather than the crops grown.

There is believed to be a connection between the adoption of a three-course field systems and the use of horses as traction animals. In a three-course system, the breach field (2nd-year cultivation) can be used to grow the fodder necessary to sustain the plough team (Slicher van Bath, 1963, 59).

One aspect of the two types of field system which may be detectable in archaeobotanical assemblages is the change in the frequency of ploughing. A three-course field system, whereby a third of the land is left fallow, is generally regarded as resulting in a reduction in amount of ploughing. In a three-course system the tilth field (first year) is deep ploughed in autumn, the breach field (second year) is left unploughed and sown in spring without thorough reworking, and the fallow field (third year) is deep ploughed in spring with further light ploughings taking place over the summer known as summer stirrings. This means that only two-thirds of the land is deep ploughed in any one year and that from the autumn of the first year to the spring of the third year, one third of the land suffers minimal disturbance. In contrast, in a two-course system all of the land is deep ploughed each year, the tilth field in autumn, and possibly again in spring, and the fallow field in spring.

Ellenburg (1988, 30) has argued that under the three-course system the number of perennials and grasses should greatly increase since at any one time one third of the land is left largely undisturbed for two years in three. In addition, if during the third year, part of the fallow was left unploughed and set aside for grazing areas could be left undisturbed for three years.

Detecting any such increase in perennials and grasses in assemblages from West Cotton is difficult. This is partly because evidence from the twelfth-century ovens would suggest that course grassland and wet grassland may have been cut and brought to the site for use as floor coverings or fuel. The presence of more ruderal type weeds such as *Hyoscyamus niger* (henbane), thistles etc. in samples from the twelfth century onwards may reflect a change from a two-course system to a three-course system. However, such weeds could also be associated with increased use of stable manure and night soil.

Comparison with documentary evidence

The earliest local documentary records date from middle medieval period. Most of the available records refer to the duchy of Lancaster estates and as West Cotton was under the influence of the Gloucester fee direct comparison is not possible (Courtney this volume). Manorial records for Burystead, one of the duchy manors, show that dredge

and peas or beans were the main crops from the second half of the fourteenth century and that the acreage sown to wheat decreased in the third quarter of this century. However, pre-plague records from the duchy estate at Higham Ferrers show wheat and dredge as the main crops. Evidence based on the total number of grains of each type of cereal recovered in samples from buildings at West Cotton would suggest that wheat was always the main crop, at 60–80% of the total, with barley and oats or dredge also being important from the tenth to twelfth centuries, when they form 20–30% of the total, and no more than 20% in the thirteenth and fourteenth centuries, but there is little substantial change between 1100 and 1400.

Wheat may have remained the main crop at West Cotton in the twelfth century because it formed part of the peasant economy rather than the manorial economy, and as such was subsistence rather than market driven. Courtney believes that a possible explanation for the rise in dredge is its marketability (Courtney this volume). Alternatively the evidence from West Cotton could just reflect the local pre-plague situation.

Rye also appears to have been grown at West Cotton either as a pure crop or as a maslin with wheat. It occurs only sporadically in the manorial records from the area although on the Peterborough Abbey estate at Kettering wheat was abandoned in favour of rye in the 1290s (Courtney 2006).

There is also no direct evidence for the growth of flax. However the 1313–4 Higham Ferrers account shows that there were eight linen merchants' shops in the town at this time. There is also no documentary evidence concerning *Brassicacae*.

Peas and beans are mentioned in the records but cultivated common vetch and lentil are not. This may be because the latter two were fodder crops and as such were probably grown on fallow. Such crops may not have been recorded in the manorial records.

Notes on identification

Spergula arvensis L.

The seeds of *Spergula arvensis* found with the waterlogged flax have no club-shaped papillae present/surviving and measure between 1.2 and 1.5mm. in diameter. Therefore fall within the range given by Berggren (1981) for *Spergula arvensis* var. *sativa* (Boenn.) Mert. et Koch.

There are large-seeded *Spergula arvensis* with club-shaped papillae surviving from the charred samples. They measure 1.2mm (ss821) 1.3mm, 1.4mm (ss772, a third seed was not measurable) and 1.5mm in diameter (ss321). Two whole small-seeded charred *S. arvensis* with no club-shaped papillae present/surviving measured 0.9mm (ss237) and 1mm. (ss68) in diameter. Other apparently small *S. arvensis* could not be measured accurately.

Pals (1987) also found a large-seeded form of *Spergula arvensis* associated with the remains of flax at Kootwijk 2, a Carolingian village in the Netherlands which ranged

between 1.54–1.75mm. in diameter and were as var. *maxima* on the basis of these measurements. Elsewhere Pals and van Dierendonck (1988) discussed records of *Spergula arvensis* found in association with flax from Dutch and German sites. Apart from the single seed from Feddersen Wierde which measured 1mm. and could therefore be attributed to var. *arvensis* all the other seeds recorded measured between 1.4–2.0mm and were either assigned to var. *sativa* or, in the case of the larger seeds, to var. *maxima*.

Medicago lupulina L. and *Medicago* type

Charred seeds were identified as *Medicago lupulina* when either some or all of the distinctive pod was present still adhering to the surface of the seed. Seeds identified as *Medicago* type were of the same size and shape as those identified as *Medicago lupulina* but without any of the distinctive pod. They could therefore also be seeds of a larger *Trifolium* species, *Melilotus* species etc. Badly preserved specimens or specimens of less distinctive shape were classed as small, indeterminate Leguminosae.

Centaurea species

The three 'native' *Centaurea* species were separated on the following basis. *Centaurea scabiosa* is generally larger than the other two species and seeds greater than 3.8mm in length were identified as this species. *C. cyanus* was separated from *C. nigra* on the basis of the oblique attachment-scar. In *C. cyanus* this takes up one third of the seed and in *C. nigra* only one quarter of the seed.

Free-threshing Wheat

Tetraploid and hexaploid free-threshing rachis fragments were separated following the criteria laid out by Hillman in his paper given at the 1993 at the International Work Group for Palaeoethnobotany (IWPG) in Groningen (Hillman & Mason forthcoming). The two different types of rachis fragment are illustrated in figure 8. No attempt was made to try and identify the free-threshing grain to ploidy level as was earlier hoped (Campbell 2009). This was partly because there were very few samples where large numbers of well-preserved grains were available but mostly because of the difficulty involved in trying to separate the two types of grain (see Moffett 1991). A wide range of variation was observed however including some very long grain and some very short fat grain.

Postscript regarding Wheat galls caused by *Anguina tritici*

Well-preserved examples of these galls, which are caused as a result of infestation by the eelworm *Anguina tritici*, were found by Wendy Carruthers in samples from medieval deposits at Wharram Percy Barn (Carruthers forthcoming). It is now clear that the items tentatively identified as *Melampyrum arvense*/ *Melampyrum* sp. from north Raunds (Campbell in Audouy and Chapman 2009) are in fact less

well-preserved examples of these galls. Further examples were found in samples dating from the eleventh century onwards at West Cotton.

The significance of these findings, which so far seem to all date from the medieval period (Carruthers *pers comm*), is that if infestation was severe the wheat crop would have been lost. In 1886 a wheat crop near Cirencester was almost ruined by an outbreak (Ormerod 1890, 104). Control of the pest is achieved by ensuring that the wheat galls, also known as purples or cockle galls, are not sown along with the seed corn. This can be done by putting the grain in water and gently stirring it so that the galls float and can be skimmed off (Ormerod 1890, 105). This method would have been available to medieval people, but not the use of a solution of copper sulphate solution or dilute sulphuric acid used as a means of killing the worms (Ormerod 1890, 105).

Infestation of wheat by these eelworms may have been facilitated by feeding livestock with crop-processing by-products and then spreading the resulting manure on the fields. The worms may have been introduced into Britain sometime during the medieval period but as yet we have only a small body of evidence to support this theory.

The waterlogged plant remains by Gill Campbell

Waterlogged plant remains from the river palaeochannel

Four samples from the deposits of middle Saxon to probable twelfth-century date in the palaeochannel adjacent to West Cotton were analysed (Table 12.21). The bottommost sample from the centre of the channel (sample 5) contained many fragments of flax capsules as well as whole capsules and seeds. Some of this material was radiocarbon dated to 620–890 cal AD (95% confidence, 1295±70, OxA-4079) and is therefore of middle Saxon date. The assemblage from sample 6 is very similar to that from sample 5 suggesting a similar date for this deposit. In contrast, the assemblages from sample 7 and sample 3 contained few flax remains. They also contained some charcoal, which was absent from the other two samples. This might suggest that these deposits are somewhat later in date and relate to the late Saxon to twelfth-century settlement. Apart from this, the assemblages from the deposits are very similar, though the preservation in sample 7 was not as good and the remains were less concentrated.

As well as being very rich in flax remains, samples 5 and 6 also produced seeds and capsule fragments of *Camelina sativa* sens. lat. (gold-of-pleasure). It was not possible to distinguish which subspecies was present from the capsules, but the seeds were clearly too large for subspecies *microcarpa*. The other two subspecies: ssp. *sativa* and ssp. *alyssum* are characteristic weeds of flax so it would seem reasonable to conclude that one or both of these

Table 12.21: Waterlogged plant remains from the palaeochannel adjacent to the mills

TAXA	Sample no Sample size	3 1kg	5 1kg	6 1kg	7 1kg	TAXA	Sample no Sample size
<i>Caltha palustris</i> L.		1	10	3	1	<i>Myriophyllum</i> sp.	
<i>Ranunculus</i> cf. <i>acris</i> L.		2	–	3	–	<i>Callitriche</i> sp.	
<i>Ranunculus acris/ repens/ bulbosus</i>		2	16	12	5	<i>Hydrocotyle vulgaris</i> L.	
<i>Ranunculus sceleratus</i> L.		2	–	–	–	<i>Sium latifolium</i> L.	
<i>Ranunculus</i> Subgen <i>Batrachium</i>		6	2	4	3	<i>Oenanthe pimpinelloides</i> type	
<i>Ranunculus</i> sp.		–	1	–	–	<i>Oenanthe aquatica</i> type	
<i>Thalictrum flavum</i> L.		–	–	2	–	<i>Oenanthe</i> sp.	
<i>Nymphaea alba</i> L.		1	–	–	–	<i>Aethusa cynapium</i> L.	
<i>Nuphar lutea</i> L.		3	15	16	5	<i>Apium nodiflorum</i> (L.) Lag.	
<i>Papaver rhoeas</i> etc		1	–	–	–	Umbelliferae Tribe Peucedaneae	
<i>Papaver</i> sp.		10	–	–	–	Umbelliferae indet.	
<i>Fumaria</i> sp.		–	1	–	–	Umbelliferae indet.(stalks)	
<i>Brassica rapa</i> cf. <i>sylvestris</i> (L) Janchen		–	1	–	1	<i>Polygonum aviculare</i> gp.	
<i>Sinapsis</i> cf. <i>arvensis</i> L.		1	–	–	–	<i>Polygonum persicaria</i> L.	
<i>Raphanus raphanistrum</i> L. (seedcase)		–	1	–	–	<i>Polygonum lapathifolium</i> L.	
<i>Barbaris vulgaris</i> R. Br.		4	–	1	2	<i>Polygonum hydropiper</i> L.	
<i>Rorripa</i> cf. <i>palustris</i> (L.) Besser		10	–	2	1	<i>Polygonum</i> sp.	
<i>Camelina sativa</i> (L.) Crantz <i>sens. lat.</i>		–	–	3	–	<i>Rumex c. acetosa</i> L.	
<i>Camelina</i> sp. (capsule fragment)		–	1	3	1	<i>Rumex crispus</i> L.	
<i>Hypericum</i> sp.		10	–	30	–	<i>Rumex</i> cf. <i>crispus</i> L.	
<i>Lychnis flos-cuculi</i> L.		4	4	5	3	<i>Rumex conglomeratus</i> Murray	
<i>Cerastium</i> cf. <i>fontanum</i> Baumg.		1	–	–	–	<i>Rumex</i> cf. <i>conglomeratus</i> Murray	
<i>Cerastium</i> sp.		1	1	–	–	<i>Rumex maritimus</i> L.	
<i>Stellaria media</i> gp.		7	8	8	4	<i>Rumex</i> sp.	
<i>Stellaria graminea</i> L.		–	–	2	–	<i>Urtica urens</i> L.	
<i>Spergula arvensis</i> L. (large-seeded form)		–	5	2	–	<i>Urtica dioica</i> L.	
Caryophyllaceae indet.		–	2	2	2	<i>Alnus glutinosa</i> (L.) Gaertner	
<i>Chenopodium polyspermum</i> L.		–	–	1	–	<i>Alnus glutinosa</i> (L.) Gaertner (catkin: fruit)	
<i>Chenopodium</i> cf. <i>album</i> L.		4	1	–	1	<i>Salix</i> sp. (bud)	
<i>Chenopodium rubrum</i> type		–	–	1	–	<i>Salix</i> sp. (capsule fragment)	
<i>Chenopodium</i> sp.		1	2	–	–	cf. <i>Salix</i> sp. (capsule fragment)	
<i>Atriplex</i> sp.		1	3	4	–	<i>Myosotis scorpioides</i> type	
<i>Linum usitatissimum</i> L.		4	85	199	10	<i>Myosotis</i> sp.	
<i>L. usitatissimum</i> L. (whole capsules)		<1	15	48	2	<i>Solanum</i> sp.	
<i>Medicago lupulina</i> L.		1	–	–	–	<i>Veronica</i> Subgen. <i>Beccabunga</i>	
<i>Trifolium</i> sp. (calyx)		3	–	–	1	<i>Veronica</i> sp.	
<i>Trifolium</i> sp. (petal)		14	1	2	10	<i>Rhinanthus minor</i> L. <i>sens. lat.</i>	
Leguminosae indet. (pod fragment)		3	1	–	–	<i>Mentha</i> cf. <i>aquatica</i> L.	
<i>Filipendula ulmaria</i> (L.) Maxim.		2	11	8	14	<i>Mentha</i> sp.	
<i>Rubus</i> sp.		–	1	–	–	cf. <i>Mentha</i> sp.	
<i>Aphanes arvensis sens. lat.</i>		1	–	–	–	<i>Lycopus europaeus</i> L.	
<i>Prunus</i> cf. <i>spinosa</i> L.		–	–	2	–	<i>Prunella vulgaris</i> L.	
<i>Crataegus</i> sp.		–	1	–	–	<i>Lamium</i> sp.	
<i>Crataegus/ Prunus</i> type (thorn)		1	2	–	–	<i>Plantago major</i> L.	
<i>Epilobium</i> sp.		1	–	–	–	<i>Sambucus nigra</i> L.	
						<i>Bidens tripartita</i> L.	

3 1kg	5 1kg	6 1kg	7 1kg
–	–	1	–
–	–	–	1
–	1	–	–
19	2	2	–
8	6	14	8
12	39	121	8
3	1	11	7
2	–	–	–
–	–	–	1
–	–	–	4
3	1	2	1
*	–	*	–
–	2	1	1
1	–	1	1
6	1	1	–
1	3	–	–
1	–	–	–
–	1	–	–
1	–	–	–
2	2	3	–
–	1	–	–
–	–	1	–
8	–	1	–
43	11	16	7
–	–	1	–
6	4	1	7
1	2	2	1
–	–	–	1
–	–	–	1
–	–	–	2
1	–	–	–
6	–	3	5
8	–	–	2
–	1	2	–
–	10	20	–
–	10	–	–
38	55	–	8
4	–	–	16
3	4	9	3
–	–	–	1
–	–	3	–
2	3	1	–
–	–	1	–
24	6	32	13
1	–	1	–
–	1	3	–

TAXA	Sample no Sample size	3 1kg	5 1kg	6 1kg	7 1kg
<i>Bidens</i> cf. <i>tripartita</i> L.	2	–	–	–	–
<i>Bidens</i> sp.	–	–	–	–	1
<i>Senecio</i> sp.	14	7	8	2	2
<i>Anthemis cotula</i> L.	22	5	13	2	2
<i>Achillea</i> sp.	2	1	1	5	–
<i>Leucanthemum vulgare</i> Lam.	3	1	1	2	–
<i>Articum</i> sp.	–	1	–	–	–
<i>Carduus</i> sp.	3	–	–	2	–
<i>Cirsium</i> sp.	1	1	2	1	–
<i>Carduus/ Cirsium</i> sp.	2	–	–	–	–
<i>Centaurea nigra</i> L. (involucral bracts)	–	1	–	2	–
<i>Centaurea</i> sp.	1	1	1	–	–
<i>Hypochaeris</i> sp.	1	–	–	–	–
<i>Leontodon</i> sp.	11	–	2	–	–
<i>Picris</i> sp.	2	–	1	–	–
<i>Sonchus oleraceus</i> L.	1	1	–	3	–
<i>Sonchus asper</i> (L.) Hill	9	–	3	–	–
<i>Crepis</i> sp.	–	–	–	1	–
<i>Taraxacum</i> sp.	–	1	4	–	–
Compositae indet.	4	–	1	1	–
<i>Alisma plantago-aquatica</i> L.	33	6	32	15	–
<i>Alisma lanceolatum</i> With.	5	8	5	16	–
<i>Alisma</i> sp. (seedcase)	15	4	2	13	–
<i>Sagittaria sagittifolia</i> L.	12	4	9	6	–
<i>Potamogeton</i> sp.	1	18	9	2	–
<i>Zannichellia palustris</i> L.	–	–	6	–	–
<i>Juncus</i> Subgen. <i>Sepati</i>	50	20	–	–	–
<i>Juncus effusus</i> type	90	20	–	–	–
<i>Juncus bufonius</i> gp.	271	40	–	–	–
<i>Juncus</i> sp.	20	70	40	–	–
<i>Iris pseudacorus</i> L.	–	1	–	–	–
<i>Schoenoplectus lacustris</i> (L.) Palla	197	163	149	92	–
<i>Carex</i> sp. (nutlet case)	1	–	1	2	–
<i>Carex</i> sp.	11	12	8	10	–
Cyperaceae indet.	2	3	4	7	–
<i>Bromus</i> Subgen. <i>Eubromus</i>	–	1	2	1	–
Gramineae indet.	72	24	70	32	–
Buds	–	+	+	–	–
Bud scales	+	++	+	++	–
Flower frags.	14	1	2	10	–
Leaf Frags.	–	*	–	*	–
Moss	++	++	+	+++	–
Characeae indet.	+	++	+++	+	–
Wood	+++	+++	+++	+	–
Charcoal	+	–	–	++	–
IGNOTA	9	1	3	11	–

subspecies were present as weeds of the flax crop. Also present in these samples were seeds of a large-seeded form of *Spergula arvensis* (corn spurrey), which appears to be a characteristic weed of flax. Other seeds which may have been weeds of the flax crop are *Urtica urens* (small-nettle), a single seed of which was found in sample 6, and possibly *Bidens tripartita* (tripartite bur-marigold), which though it could have been growing along the sides of the channel is another plant that seems to be associated archaeologically with flax finds (Pals and van Dierendonck 1988).

The deposits also produced many seeds regarded by Greig (1984, 224–5) as indicative of hay: *Ranunculus acris/repens/bulbosus* (buttercup), *Rhinanthus minor* (yellow rattle), *Prunella vulgaris* (self-heal), *Leucantheum vulgare* (ox-eye daisy), *Centaurea nigra* (lesser knapweed), and *Leontodon* species, as well as sedges and many grasses. It was hoped to study these latter taxa in more detail but unfortunately there was insufficient time.

As a group these taxa would suggest the presence of MG4 or MG5 grassland communities, ie managed hay meadow where animals are excluded in early or late spring, a hay crop removed in July with the aftermath grazed from August onwards until the following spring when the cycle begins again (Rodwell 1992, 57–66). The absence of *Sanguisorba officinalis* (great burnet) might be taken to suggest that grazing was continued into April or May as this species greatly decreases under such management (Rodwell 1992, 57). This would suggest that MG5 is the most likely community represented. However, Greig (1984, 219) notes that hay from MG4 flood meadow contained many immature seeds of *Sanguisorba officinalis*, and these may not preserve well. This may explain why there is as yet only one late Flandrian archaeobotanical record of this species from a waterlogged context. Some seeds were recovered from an Iron Age ditch at Farmoor, Oxfordshire, but this sample also produced large numbers of *Potentilla anserina* (silverweed) which is more closely associated with grazed floodplain grassland. As *Sanguisorba officinalis* can also be found growing in rush tussocks on floodplain pasture it seems more probable that this assemblage included material derived from grazed floodplain pastures rather than hay meadow (Lambrick and Robinson 1979). It therefore seems that the absence of *S. officinalis* seeds is not significant and that the distinction between MG4 and MG5 cannot be made on this basis.

Other species in the samples such as *Caltha palustris* (kingcup) and *Filipendula ulmaria* (meadow-sweet) would suggest that the assemblages also contain plants derived from MG8 grassland. This community occurs today on level or sloping ground close to streams or rivers which is subject to flooding (Rodwell 1992, 79) and it seems likely that similar vegetation would be found close to the channel and in the wetter parts of the haymeadow.

Other seeds identified from the deposits indicate that there was at least some disturbed ground: eg *Papaver* spp. (poppies), *Plantago major* (greater plantain) and *Anthemis cotula* (stinking mayweed). Although the *Anthemis cotula*,

in particular, could have been growing as an arable weed it seems more likely that there would have been bare, nutrient-enriched, trampled ground close to the channel associated with the flax processing and the activities involving sheep or wool (see Robinson, this volume).

There is also evidence for some tree and shrub cover in the form of seeds and fruiting catkins of *Alnus glutinosa* (alder), buds of *Salix* spp. (willow) and other trees, seeds of *Sambucus nigra* (elder), a possible sloe stone, and a few thorns of either *Prunus* sp. (sloe/bullace /plum etc. or *Crataegus* sp. (hawthorn). These species probably grew along the sides of the channel.

Also present in the assemblages are plants that would have been growing in the river itself. Two types of water lily were present. *Nymphaea alba* (white water-lily) is generally less tolerant of water movement than *Nuphar lutea* (yellow water-lily) and requires a depth of 0.5–3.0m of water (Clapham *et al* 1989, 54). It would probably have been found in the stiller, deeper areas of the river. *Nuphar lutea*, though also happy in deep water, would have been common in shallower areas with less sluggish flow, possibly alongside plants such as *Sagittaria sagittifolia* (arrowhead). The large numbers of *Schoenoplectus lacustris* (bulrush) seeds would indicate that there were stands of the true bulrush along the muddy sides of the river as well as a growths of *Mentha cf. aquatica* (water mint), *Myosotis scorpioides* type (water forget-me-not), and other marginal plants.

The absence of flax stems and fibres in the sample and the large number of seeds and capsules might suggest that the flax remains represent the waste from beating or rippling the flax to remove the seeds and capsules ready for retting, ie C1 or C2 stage of flax processing as described by Pals and Dierendonck (1988). However, this raises the question of where the flax was retted. There are three possibilities: 1) the flax was retted in pits close by the channel, 2) the flax was dew retted, and 3) it was retted in the river.

No features of middle Saxon date were found during the excavation, so unless the pits were beyond the area of excavation the flax was not being retted in pits. Dew-retting, where the flax is laid out in rows on a grassy surface and regularly turned (Boase 1918), would leave little archaeological trace. As flax is usually harvested sometime in July (Markham 1635) it is possible that the recently cut hay meadow could have been used for this purpose. However, this would mean that grazing on the meadow would have to be restricted.

Some sources, eg Slicher van Bath (1963), claim that flax was not retted in streams or rivers because of the risk of contaminating the water supply. However, Boase (1918) claims that retting in slow flowing streams which are warm in summer is ideal. The products of decay are dispersed by the flowing water and so do not pose a pollution risk. It seems reasonable to suppose, therefore, that the flax was retted in the river itself, and furthermore, that the isolated stakes, also radiocarbon dated as middle Saxon, found driven into earlier deposits in the channel

were used to secure bundles of flax, or containers holding flax, in the water.

The seeds and capsules, or flax bolls, may have been deposited separately in the channel or they may represent the surviving or remaining elements of flax that was retted without the bolls being removed. Bolls were not always removed in the nineteenth century (Boase 1918) and evidence from Yarnton, Oxfordshire where a bundle of flax was recovered from a Saxon channel deposit with bolls intact, shows that this was also the case in earlier times (M Robinson pers comm).

The excellent preservation encountered in the channel deposits would suggest that if stems or fibres were present they should have survived. Therefore they must either all have been removed from the deposit after retting, or not been present in the first place. Thus it is not possible to say for certain whether the channel was used for retting although it would seem likely that this was the case.

Waterlogged plant remains from late Saxon features

Three samples from late Saxon deposits related to the mills were analysed (Table 12.22 and see Table 12.1 for description of the deposits). Preservation was generally rather poor compared to that encountered in the palaeochannel and much of the material was fragmentary.

Two samples from silts at the eastern end of the early pond, contexts 5645 and 5605, associated with the first mill, both produced flax remains. This would suggest that flax processing was still occurring at the site after the establishment of the settlement. The three seeds of *Rhinanthus minor* from context 5609, along with the seeds of *Ranunculus acris/repens/bulbosus*, and *Leontodon* sp. might be derived from nearby hay meadow. However, in the absence of other indicators the evidence is inconclusive.

There is better evidence for trampled and disturbed ground close to the catchment from the presence of plants such as *Coronopus squamatus* (swine-cress), *Potentilla anserina* (silverweed), and *Plantago major* (great plantain). Ruderal weeds, for example *Reseda luteola* (dyer's rocket), *Hyoscyamus niger* (henbane), *Urtica dioica* (stinging nettle) and *Verbena officinalis* (vervain) are also well represented. The edge of the leat or pond seems the likely location for the trampled and bare ground. While the ruderal weeds probably grew in and around the settlement along with some species more generally regarded as characteristic arable weeds such as *Papaver argemone* (long prickly-headed poppy), *P. somniferum* (opium poppy), *Urtica urens* (small nettle), and *Anthemis cotula* (stinking mayweed).

The records of *Reseda luteola* (dyer's rocket) and *Papaver somniferum* (opium poppy) are of further interest. *R. luteola* is a useful dye plant, and although it will readily grow as a weed on calcareous soils it may have been cultivated at the site.

Papaver somniferum (opium poppy) may have been cultivated as a garden crop for its oil or as a spice, and

two waterlogged seeds were also recovered from the wheel-pit of the earliest mill (sample 1083). Its absence as a charred item would suggest that it was not growing as an arable weed.

The buds of *Salix* sp. (willow) and the seeds of *Sambucus nigra* (elder) identified in the samples were probably derived from shrubs or trees, either growing on the river edge or possibly in the settlement. Otherwise the vegetation in and around the mill pond and leats would appear to have been similar to that supported by the river channel itself, though the seeds in the samples could have been derived partly from the channel vegetation and therefore may not reflect the vegetation in the millpond and leats.

The assemblage from the clays at the base of the raised riverbank adjacent to the mill (Fig 6.5c, 7183) was dominated by seeds of *Schoenoplectus lacustris* (bulrush) and *Juncus* spp. (rushes). Other wet ground and aquatic species were common but there were few other taxa present, apart from a few weeds.

Waterlogged wood from the mills

Waterlogged wood was recovered from all three of the mills. It was generally in a very poor condition and many of the pieces had partially decayed making identification difficult and impossible in some cases.

The wood recovered from the latest mill (M25) was all oak. The stakes were squared-off pieces of timber and the revetment was probably originally made up of oak planking, though only slivers survived.

Five stakes were recovered in association with the second mill (M26) (see Fig 6.19). Stake 9262 (context 6795), stake 7220, and stake 7177 were all oak, again squared off pieces from larger timber. Stake 9261 (context 6856) was badly decayed but was possibly hazel or alder. Stake 7213 was Pomoideae (hawthorn, apple, pear, *Sorbus* spp. etc) type, again it was badly decayed.

The post from the sluice (7226) of the earliest mill (M27, see Fig 6.12) was of oak. The decayed wattle (7427, see Fig 6.17) was made up of a mixture of different woods. The larger pieces were of oak, again from squared-off timber, and another was Pomoideae type, round wood of 6–7 years growth. The smaller pieces were either hazel or alder. The perforation plates appeared to have decayed away so a more detailed identification was not possible. A displaced stake was Pomoideae type, round wood of 15–20 years growth. This piece has a middle Saxon radiocarbon date (see Table 9.1, UB3322), and therefore appears to be residual.

Other small pieces recovered from the earliest mill were almost all too badly decayed for identification. However, one piece from the wheel-pit (7254) was partially charred and was therefore much better preserved than the other pieces. It was identified as *Euonymus europeus* (spindle). This wood is hard and finely porous, and, as its name would imply, is used for making spindles etc. (Vedel and Lange 1965, 180). The shape of this piece would suggest it may have been part of a cog-tooth from a cog wheel.

Table 12.22: Waterlogged plant remains from deposits associated with the mills

TAXA (element if not a seed)	Context Sample size	5645 1kg	5609 1kg	7183 1kg
<i>Ranunculus acris/ repens/ bulbosus</i>		–	2	2
<i>Ranunculus</i> cf. <i>acris/ repens/ bulbosus</i>		1	–	–
<i>Ranunculus</i> Subgen. <i>Ranunculus</i>		1	–	1
<i>Thalictrum flavum</i> L.		–	1	–
<i>Nuphar lutea</i> (L.) Sm.		–	1	–
<i>Papaver argemone</i> L.		5	–	–
<i>Papaver somniferum</i> L.		1	–	–
<i>Brassica rapa</i> spp. <i>sylvestris</i> (L.) Janchen (seed case)		–	2	–
<i>Coronopus squamatus</i> (Forstal) Ascherson (seed case)		3	–	–
<i>Thlaspi arvense</i> L.		1	1	–
<i>Barbarea vulgaris</i> R. Br.		1	–	–
<i>Rorippa palustris</i> (L.) Besser		–	1	–
<i>Reseda luteola</i> L.		14	–	–
<i>Hypericum</i> sp.		1	–	–
<i>Silene</i> cf. <i>vulgaris</i> (Moench) Garcke s. str.		1	–	–
<i>Mysoton aquaticum</i> (L.) Moench		–	1	–
<i>Stellaria media</i> gp.		–	2	–
cf. <i>Stellaria media</i> gp.		2	–	–
Caryophyllaceae indet.		2	–	–
<i>Chenopodium</i> cf. <i>polyspermum</i> L.		2	1	–
<i>Chenopodium</i> cf. <i>album</i> L.		–	1	2
<i>Chenopodium rubrum</i> type		1	–	–
<i>Chenopodium</i> sp.		1	–	1
<i>Atriplex</i> sp.		11	3	3
Chenopodiaceae indet.		2	–	–
<i>Linum usitatissimum</i> L.		–	3	–
<i>Linum usitatissimum</i> L. (capsule fragment)		–	56	–
<i>Linum</i> cf. <i>usitatissimum</i> L. (capsule fragment)		1	–	–
<i>Potentilla anserina</i> L.		1	–	–
<i>Potentilla</i> cf. <i>reptans</i> L.		4	–	–
<i>Potentilla</i> sp.		2	–	–
<i>Potentilla/ Fragaria</i> sp.		2	–	–
<i>Aphanes arvensis</i> agg.		–	1	–
<i>Scandix pecten-veneris</i> L.		–	–	1
<i>Oenanthe aquatica</i> type		–	3	5
<i>Aethusa cynapium</i> L.		1	–	–
<i>Apium</i> not <i>graveolens</i>		2	–	–
<i>Daucus carota</i> L.		1	1	–
Umbelliferae indet.		–	1	2
<i>Polygonum aviculare</i> gp.		1	–	1
<i>Polygonum lapathifolium</i> L.		3	–	–
<i>Polygonum</i> sp.		2	2	–
<i>Rumex</i> spp.		15	3	1
<i>Urtica urens</i> L.		1	–	–
<i>Urtica dioica</i> L.		37	1	1
<i>Salix</i> sp. (bud)		2	–	–
<i>Anagallis arvensis</i> L.		2	–	–
<i>Myosotis scorpioides</i> type		–	2	–
<i>Hyoscyamus niger</i> L.		7	–	–
<i>Rhinanthus minor</i> L.		–	3	–
<i>Euphrasia/ Odontites</i> sp.		2	–	–
<i>Verbena officinalis</i> L.		4	–	–

Table 12.22 continued

TAXA (element if not a seed)	Context Sample size	5645 1kg	5609 1kg	7183 1kg
<i>Mentha</i> cf. <i>aquatica</i> L.		–	1	2
<i>Mentha</i> sp.		–	4	–
cf. <i>Mentha</i> sp.		1	–	1
<i>Lycopus europaeus</i> L.		1	1	3
<i>Stachys</i> sp.		–	–	1
cf. <i>Ballota nigra</i> L.		2	–	–
cf. <i>Lamium</i> sp.		1	–	–
<i>Galaeopsis</i> sp.		–	–	1
Labiatae indet		1	–	–
<i>Plantago major</i> L.		2	9	–
Campanulaceae indet.		1	–	–
<i>Galium</i> sp.		–	1	–
<i>Sambucus nigra</i> L.		6	–	–
<i>Anthemis cotula</i> L.		1	1	–
<i>Anthemis</i> sp.		–	1	–
<i>Carduus</i> sp.		–	1	–
cf. <i>Carduus</i> sp.		1	–	–
<i>Leontodon</i> sp.		–	2	–
<i>Sonchus</i> cf. <i>asper</i> (L.) Hill		–	1	–
Compositae indet.		1	2	–
<i>Alisma plantago-aquatica</i> L.		10	3	–
<i>Alisma lanceolatum</i> With.		2	–	–
<i>Sagittaria sagittifolia</i> L.		–	1	1
<i>Potamogeton</i> sp.		–	1	–
<i>Zannichellia palustris</i> L.		–	2	–
<i>Juncus</i> Subgen <i>Sepati</i>		10	200	10
<i>Juncus effusus</i> type		10	20	20
<i>Juncus bufonius</i> gp.		20	380	10
<i>Juncus</i> sp.		–	–	40
<i>Iris pseudacorus</i> L.		–	1	–
<i>Eleocharis palustris</i> type		1	1	–
<i>Schoenoplectus lacustris</i> (L.) Palla		–	1	57
<i>Carex</i> spp.		8	–	3
<i>Glyceria</i> sp.		–	1	–
Gramineae indet. (grain)		–	2	3
Characeae indet.		–	–	50
moss		1	5	–
IGNOTA		2	1	4

The general impression from the wood is that the latest mill was built from oak timber, which was probably brought in for the purpose. The two earlier mills, but particularly the earliest mill, may have been constructed partly from timber brought in and partly from whatever came to hand. The decayed wattle from the earliest mill is suggestive of this. It appeared to have been made from off-cuts, and possibly from wood cut from hedgerows, rather than from managed underwood. This would suggest that the inhabitants had poor access to woodland resources.

Soils, sediments and non-marine molluscs by Mark Robinson

A series of samples were analysed for molluscs from buried soils, the alluvial sequence and the fills of archaeological features. The shells were identified with reference to the Grenstead Collection at the University Museum, Oxford. In general terms, the faunas were not particularly interesting in their own right although some aspects, for example the occurrence of flowing-water species in particular samples,

are of significance. The concentrations of shells in some samples are also low. In many cases, the stratigraphic evidence of the deposit sampled was of considerably more interest than the fine details of molluscan content. Table 12.23 lists the results for selected samples from the buried soil and the alluvium as these faunas are of more general relevance. The nomenclature follows the British Conchological Society's lists (Kerney 1976 and Walden 1976).

The evidence of the molluscan samples from West Cotton is discussed in relation to the soils and sediments under a series of thematic headings which are roughly in chronological order.

The prehistoric and Saxon soil

The site was situated on the gravels of the Floodplain Terrace of the River Nene. The original soil covering, which survived beneath the Bronze Age barrow underlying medieval tenement D, was a red-brown sandy silt. Even though the gravels contain some limestone, this soil was non-calcareous and molluscan shells were absent.

By the Roman period, cultivation was mixing the underlying gravel into the soil and a ploughsoil filled the barrow ditches. Ploughing continued in the early to middle Saxon period over the site of the village. This ploughsoil, which contained early/middle Saxon pottery sherds, survived over much of the site and was cut by all the settlement features related to it. In the north-east corner of the site it contained shells but it was mostly non-calcareous. The brown gravelly loam produced a sparse fauna of *Vallonia excentrica* and *Trichia hispida* group (Table 12.23, layer 4949), appropriate to well-drained arable conditions, whereas shells were absent from the brown sandy silt with some gravel sealed beneath the medieval road surface on the central yard. Medieval ploughing to the south of the settlement resulted in the formation of ridge and furrow over the southern end of the Neolithic long enclosure.

The level of the top of the ploughsoil ranged from 33.96m OD to the west of the mill leats, and alongside the Neolithic long mound, where it probably contained sediment eroded from the monument, through 33.77m OD beneath the central yard, to 33.61m OD to the south of the settlement, and over the corner of the prehistoric long enclosure. The highest level at which late Saxon waterlogged organic material was recorded in the palaeochannel (Layer 7183, see Fig 6.5c) was at 32.25m OD. The permanent water table is unlikely ever to have fallen below this level for long after the deposition of this sediment. However, heavily gleyed blue-grey clay (layer 7361) of late Saxon date at a level of 32.85m OD in the palaeochannel implies that the water table was much higher for a large part of each year. Therefore, although the Saxon ploughsoil was well-drained, even then the site would have been vulnerable to a relatively slight rise in river level.

The leat system

A series of late Saxon leats along the western side of the site successively carried the diverted flow of the Cotton Brook to feed the watermills. Samples were analysed from each of the first three leats (6940, 6937 and 6933). All contained molluscs of well oxygenated flowing water, with at least two species out of *Valvata piscinalis*, *Bithynia tentaculata* and *Sphaerium corneum* in each.

The late Saxon boundary ditches

Samples were examined from the ditch system running alongside the leats (ditch system 7) and from the large ditch around the late Saxon manor (ditch system 8). In addition to containing aquatic molluscs which can tolerate relatively stagnant conditions such as *Planorbis carinatus*, there were also shells of *Valvata piscinalis*, a flowing water species which occurred in the leats. This suggests that either the leats sometimes overflowed into the settlement or that sediment from clearing them out was scattered over the site.

The flood embankments

By the mid-twelfth century, a clay embankment had been raised along the northern side of the site, overlying the watermill complex. Similar embankments protected the site on the western and southern sides. Excavation and interpretation of these structures proved difficult and some problems remain unresolved. It is now regretted that they were not sampled more extensively.

The western embankment was particularly substantial and of more than one phase. In its final form, it carried the Cotton Brook around 1m above the late Saxon and twelfth-century ground level. A sample of buff clay loam from the early phase of the embankment contained shells of aquatic molluscs, *Planorbis corneus* being particularly conspicuous. Very few aquatic molluscs indeed were noted in the overbank alluvium but inorganic clay in the palaeochannel (not sampled due to a trench collapse), which was rich in aquatic molluscs, had a band of shells of *P. corneus*. The palaeochannel sediments are also plausible as a source of material for the flood defences because no *in situ* alluvium was found beneath the embankments, suggesting that their construction pre-dated most if not all of the overbank alluviation.

There are problems over the interpretation of the extent of the western embankment, which was examined in a single section (Fig 6.5a). Undoubted clay bank material (5560) sealed the leats and stood to a height of 34.76m OD. The leats were replaced by a series of watercourses to the west of 5560. Analysis of a sample from one of these ditches (5399) showed a flowing water molluscan fauna similar to that from the leats, with *Bithynia tentaculata* and *Sphaerium corneum* present.

To the west of these watercourses was another body of clay (5396/5397) which stood to a height of 34.93m

OD, 0.17m higher than the inner bank. During excavation this material was regarded by Robinson, and possibly by Windell, as an outer embankment which would have served to raise the level of water in the ditch. Chapman has pointed out that in the site records, given the homogeneity within this body of the alluvium, it was not possible to define the presence or the limits of this postulated outer bank, and he regards at least the bulk of the material as *in situ* alluvium. He points out that if this was accepted as a full outer embankment it would imply the presence of a constructed bank at least 16m wide. Certainly, the inner bank contained limestone fragments whereas they were absent from the possible outer bank. This issue cannot now be resolved, and is a particular point that would have required further examination and sampling at the time.

The only sample available for analysis was from the eastern edge of 5560. It probably represented a later addition to the bank rather than belonging to the primary phase of construction and comprised pale grey sandy clay with a little gravel. It contained numerous shells of aquatic molluscs, particularly *Valvata piscinalis* and *Pisidium* spp. and had perhaps been derived from the cleaning out of one of the ditches. Of special interest was the occurrence of a single shell of *viviparis contectus*. It is possible that this freshwater gastropod was not introduced to Britain until the later medieval period (Robinson 1985, 197) and it was not recorded from the palaeochannel.

The northern stream channel or leat

At the north-east corner of the settlement there was an earthwork which was assumed to represent an early course of the Cotton Brook running north-west to the palaeochannel. Excavations along the line of the new road showed that waterlain sediments in the stream channel or leat, which contained numerous shells of the aquatic molluscs *Planorbis* sp. and *Lymnaea* sp., overlay late Saxon ditch systems (17). These late Saxon features were filled with non-waterlogged gravelly loam apparently of colluvial origin similar to the Saxon ploughsoil. Shells were absent. This suggests that the watercourse was not the original course of the Cotton Brook but that it had been diverted along this route, possibly as a post-late Saxon drainage ditch. Evidence that the original course of the Cotton Brook ran to the south of the settlement, continuing westwards from the southern embankment came from trenching along the route of the new road, which encountered deep organic deposits, unfortunately neither recorded nor sampled. It is argued by Chapman that only the upper levels of these deposits at the northern end of the site were sampled, and that evidence from the area of the watermills indicates that earlier watercourses lay beneath that might be related to an earlier course of the Cotton Brook.

Alluvium

A sedimentary regime prevailed in the palaeochannel from the middle Saxon period onwards, with the deposition initially of organic sediments and subsequently inorganic clays. A series of samples was examined from the edge of the palaeochannel and spanned the transition from channel to overbank alluvial sediments which serve to continue the sequence of organic samples from the deeper part of the channel (Fig 6.5c).

The molluscs from middle and late Saxon organic sediments were predominantly aquatic species, with very rich assemblages dominated by *Theodoxus fluviatilis*, *Valvata piscinalis*, *Bithynia* spp., *Gyraulus albus* and *Pisidium* spp. The concentration of shells was of the order of 2000 individuals per kg. Shells were absent from the inorganic clays which comprised the lower part of the sample sequence from the edge of the channel (Fig 6.5: layer 7361, blue grey clay, 32.75m OD; layer 7360, dark grey clay, 32.90m OD). However, shells survived in Layer 7359 (Table 12.23), pale grey/buff clay loam with some grit, 33.05m OD, which was possibly deposited in the channel by the final leat prior to the construction of the flood embankment in the early twelfth century. Somewhat over half the shells were from aquatic species, *Bithynia* sp. still being much in evidence, but the concentration of molluscs was only 24 individuals per kg. Thereafter, the alluvial sediments contained assemblages that were fully overbank in character (Fig 6.5: layer 7355–7358, buff clay, bottom of sequence 33.11m OD and top of sequence 33.93m OD). Terrestrial species, particularly *Vallonia pulchella*, *Trichia hispida* gp. and slugs predominated, but there was also a significant presence of amphibious species, mostly *Lymnaea truncatula* (Table 12.23). Such a fauna is well known from the alluvium on the floodplain of the upper Thames basin, where it is characteristic of seasonally grazed hay meadows (Robinson 1988). Only the amphibious species occur on permanent pasture on the Thames floodplain.

On the basis of modern ground level, alluvium was deposited up to a height of about 34.50m OD against the northern flood embankments alongside the palaeochannel (Fig 6.5b). It is uncertain when the palaeochannel ceased to flow as a parallel channel of the River Nene. All the time it remained a hollow on the floodplain it would have served to carry floodwaters, and it carried the diverted flow of the Cotton Brook to the extant channel of the Nene. The final phase of the diversion of the stream along the western embankment turned the flow westwards along the silted palaeochannel to the Nene, which was the reverse of the direction in which the palaeochannel had flowed when it was active. The palaeochannel was clearly still active in the late Saxon period but the alluvial clays of overbank character lapping against the twelfth-century flood embankment extended across the full width of the channel. It is possible that sedimentation was so rapid that the channel became cut off from the general flow of the Nene before the end of the twelfth century.

The alluvium over most of the Nene floodplain in the Stanwick and West Cotton area is not sufficiently calcareous for the survival of mollusc shells. There was only one other exception to the palaeochannel section where useful quantities of shells were recovered from overbank sediments. This was buff alluvial clay (sample 80) in the gravel quarry south-west of West Cotton. *Trichia hispida* group was again abundant, but in company with *Vallonia excentrica* rather than *V. pulchella* and the amphibious species were absent (Table 12.23). *Pupilla muscorum* was also present. Whereas the palaeochannel sequence was from a low-lying area of the floodplain, the quarry sample was probably more typical of drainage conditions on the floodplain. The occurrence of xerophile species such as *V. excentrica* and *P. muscorum* suggests that the floodplain was relatively dry for much of the year. Further evidence that the episodes of flooding were short-lived comes from the unglyed state of much of the alluvium. Even in the palaeochannel, the top 1.6m of clay was unglyed.

The medieval ridge and furrow at the corner of the Neolithic long enclosure was sealed by almost 2.0m of buff alluvial clay bringing the ground level up to 35.55m OD. This was some 0.79m above the height of the flood embankment. While it is possible that the flood defences originally stood somewhat higher, it is clear that they eventually failed as alluvial clay extended over the top of the embankment, raising the ground level to 35.33m OD, and overlay the tail of the western embankment.

There was not an obvious covering of alluvium over

most of the remains of the medieval settlement, although it is possible that the Ag horizon (turf and topsoil) contained alluvial sediments. However, about 0.5m of buff clay loam accumulated to a ground level of 34.45m OD over metalled surfaces on the central yard. Shells were almost absent apart from a few eroded specimens of *Trichia hispida* gp. but this clay can only have had an alluvial origin. It overlay the demolition rubble of the central medieval buildings which contained pottery of AD 1350–1400. The central yard was finally enclosed by walls on three sides and would have been a likely sediment trap if the Cotton Brook overflowed onto the site, so these deposits do not necessarily belong to the main phase of alluviation on the floodplain. It is also possible that the very high level of the alluvium over the corner of the long enclosure was the result of late localised activity by the Cotton Brook.

Late sedimentation by the western water courses resulted in pale grey loam being deposited over the adjacent embankment (Fig 6.5a, layer 5661).

The Cotton Brook structure

Alluvial sediments extended eastwards from the settlement up the valley of the Cotton Brook. A sandy clay and gravel platform which supported a stone structure was found sandwiched between layers of alluvial clay loam about 0.5km upstream from the site. The material of the platform contained shells of flowing water molluscs.

Table 12.23: Mollusca from soils and alluvium (minimum number of shells)

Context type	buried soil 4949	Alluvial clay in quarry (80)	Alluvium over the excavated river palaeochannel				
			7359	7358	7357/ 58	7356	7355
Mollusca							
<i>Bithynia</i> sp.	–	–	9	–	–	–	–
<i>Lymnaea truncatula</i> (Müll.)	–	–	–	1	3	–	11
<i>Planorbis planorbis</i> L.	–	–	1	–	–	–	–
<i>P. carinatus</i> (Müll.)	–	–	–	–	–	1	–
<i>Anisus leucostoma</i> (L.)	–	–	–	–	–	–	3
<i>Succinea</i> or <i>Oxyloma</i> (L.)	–	–	–	1	–	–	4
<i>Cochlicopa</i> sp.	1	–	1	–	–	–	1
<i>Pupilla muscorum</i> (L.)	–	1	–	–	–	–	–
<i>Vallonia pulchella</i> (Müll.)	–	–	–	–	1	–	3
<i>V. excentrica</i> Sterki	1	3	–	–	–	–	–
<i>Vallonia</i> sp.	2	5	4	–	6	1	17
<i>Arion</i> sp.	+	+	+	+	+	+	+
<i>Limax</i> or <i>Derocerus</i> sp.	–	3	2	3	5	3	2
<i>Cecilioides acicula</i> (Müll.)	3	–	–	–	–	–	–
<i>Trichia hispida</i> gp.	4	18	2	–	2	10	24
<i>Sphaerium</i> sp.	–	–	2	–	–	–	–
<i>Pisidium amnicum</i> (Müll.)	–	–	1	–	–	–	–
<i>Pisidium</i> spp.	–	–	2	–	–	–	–
Total	11	30	24	5	17	15	65

Insect assemblages from the palaeochannel and millpond

by Mark Robinson

The insect fragments were identified with reference to the Hope Entomological Collections of the University Museum, Oxford. The nomenclature follows the Royal Entomological Society's revised check list of British Insects (Kloett and Hincks 1964, 1976, 1977 and 1978). The results for the Coleoptera have been expressed in summary form (Table 12.24) using habitat-related species groups as described in Robinson 1991 (278–81). They are given as a percentage of the minimum number of terrestrial Coleoptera in each assemblage, excluding those with aquatic adults because the deposits accumulated under water. The full tabulation of the results is in archive.

The origin of the insect assemblages

The insect assemblages from the West Cotton palaeochannel accumulated under water in fine riverine sediments and their preservation is generally good. They showed no evidence of water sorting. They appear to be representative of the insects which lived in the river and those which entered it from various terrestrial habitats. The catchments from which the majority of terrestrial insects were derived would have extended some distance upstream but a much smaller distance away from the bank. There is no reason to suspect that a significant proportion of the insects experienced human transport to the channel.

The insects from the millpond also accumulated in fine waterlain sediments but their preservation was not so good. Although some of the insects would have been derived from the leat, a greater proportion of the terrestrial insects is likely to have come from the surrounds of the millpond. Thus the insects from the millpond reflect more local conditions than those from the palaeochannel. Again, there was no firm evidence for human dumping of debris containing insects in the pond.

The palaeochannel sequence

The aquatic and waterside environment

Around 25% of the Coleoptera from the palaeochannel samples were water beetles (ie they were at values of 30–40% of the total terrestrial Coleoptera (Table 12.24). Larvae and cases of Trichoptera (caddis flies) were very abundant, tending to equal the number of Coleoptera in each sample.

The aquatic insects comprised a balanced fauna of well-oxygenated water. The flowing water element included beetles of the family Elmidae, which cling to stones or aquatic plants and are so fastidious in their requirements for unpolluted well-oxygenated water that in most of the major English lowland river systems, if they now occur at all, they are restricted to weir outflows and fast-flowing tributary

streams. Species of *Oulimnius* were the most abundant, but there was a single example of *Stenelmis canaliculata* which was only added to the British list recently when it was discovered to live in Lake Windermere (Claridge and Staddon 1960). The caddis remains included cases of *Ithytrichia* sp., a flowing water genus which still maintains a wide distribution (Marshall 1978, 21).

There was also a strong element of aquatic insects characteristic of almost still water, with cases of the caddis *Orthotrichia* sp. and beetles such as *Colymbetes fuscus* and *Hydrobius fuscipes*. The two contrasting elements to the aquatic insect fauna no more than reflect that the river would have had lengths of rapid flow and also reaches or margins of slower water, especially where there was much emergent vegetation. These results are significant because although clay sedimentation was occurring across the bed of the channel, they show that it had not become cut-off at this stage. The fauna also shows that there was a sufficient flow of clean water over the flax being retted in the river bed to prevent an oxygen deficit from developing despite the decay of organic material.

A comparison between the Neolithic and Saxon insect assemblages from the palaeochannel suggests that by the Saxon period, the flow of water had decreased. The proportion of Elmidae amongst the water beetles had declined from 38% in the Neolithic to 13% in the Saxon samples. Cases of *Ithytrichia* sp. outnumbered cases of *Orthotrichia* sp. in the Neolithic samples whereas the converse was true of the Saxon samples. This would be consistent with the sedimentary evidence, because the Neolithic sediments were in general coarser than the Saxon sediments and only in the Saxon period was there deposition of material in the centre of the channel bed.

The Saxon insect fauna contained many phytophagous species of floating-leaved and emergent aquatic vegetation, more than 9% of the non-aquatic Coleoptera falling into this category. The most abundant was *Donacia impressa*, a chrysomelid beetle that feeds on *Schoenoplectus lacustris* (true bulrush), a plant which was probably a major component of tall reedswamp fringing the channel. Other plants of this community suggested by the Coleoptera include *Oenanthe aquatica* gp. (water dropwort) or other aquatic Umbelliferae, the host plants of *Prasocuris phellandrii* and *Iris pseudacorus* (yellow flag), the host of *Lixus paraplecticus* and *Aphthona nonstriata*. The deeper water was apparently sufficiently slowly moving for *Nymphaea* or *Nuphar* spp. (white or yellow water lily) to flourish, as indicated by *Donacia crassipes*.

The majority of the beetles which feed on marsh and aquatic plants were appropriate to marginal and emergent aquatic vegetation. The Carabidae (ground beetles) included many species of wet ground and they too comprised a marginal rather than a full marshland fauna. This suggests that there were not extensive fringing marshes alongside the river, but that there was a relatively abrupt transition from marginal to fully terrestrial vegetation.

Woodland and scrub

The wood and tree-feeding Coleoptera of Species Group 4 only comprised 0.5% of the total terrestrial individuals from the palaeochannel. This suggests that there was little, if any, woodland or scrub in the catchment. Neither do the banks of the channel seem to have been tree-lined, although there was a single specimen of *Curculio salicivorus*, which feeds on galls on *Salix* spp. (willow) leaves (Koch 1992, 282). The number of insects associated with trees and shrubs was too small for any hedgerow element to be detected. However, there was a single example of the weevil *Rhynchaenus cf. alni*, which feeds on leaves of *Ulmus* spp. (elm) (Koch 1992, 348), a possible hedgerow tree.

Grassland

The insects suggest the landscape at West Cotton to have been very open and they included a major component of grassland species. Scarabaeidae and Geotrupidae that feed on the droppings of domestic animals on grassland (Species Group 2) were, at 3.6% of the terrestrial Coleoptera, rather poorly represented. However, weevils of the genera *Apion* and *Sitona* that feed on *Lotus* and *Tnfolium* spp. (trefoils and clovers) and *Vicia* and *Lathyrus* (vetches and vetchlings) (Species Group 3) were much better represented, comprising 7.5% of the terrestrial Coleoptera. Under conditions of permanent pasture, the scarabaeoid dung beetles usually outnumber these weevils by a factor of at least two and pastoral landscapes usually give values of about 10% or more for the scarabs (Robinson 1991, 278–80). The clover and vetch-feeding weevils are very much favoured by hay meadow conditions, reaching values of 8–12% (Robinson 1991, 280). Such results suggest that it is likely the grassland alongside the palaeochannel was managed as hay meadow.

The more host-specific of the phytophagous Coleoptera included various species which feed on grassland herbs, for example *Gymnetron labile* and *G. pascuorum* on *Plantago lanceolata* (ribwort plantain). Some of the other beetles from the palaeochannel samples that tend to be abundant in meadowland included *Pterostichus cupreus*, *Stenus* spp. and *Longitarsus* spp. However, although three species of *Agriotes* were identified, the various other members of the Elateridae and Scarabaeidae which have larvae that feed on roots in grassland (Species Group 11) were poorly represented. Amongst the other insect orders, grass-feeding members of the genus *Aphrodes* (Le Quesne 1965, 55–60) were the most abundant Homoptera.

Disturbed ground and arable

Many of the Carabidae and Staphylinidae from the samples that occur in grassland will also live in various sorts of weedy habitats on disturbed ground including arable land. Some of the more abundant phytophagous Coleoptera can be numerous on weeds of disturbed ground, for example *Phyllotreta vittula* which feeds on Cruciferae

(cresses, cabbages etc.) and *Chaetocnema concinna* on Polygonaceae (knotgrass, docks etc), but some of their host plants also grow in other habitats. There was only a very slight presence of the Carabidae which comprise Species Groups 6a and 6b, beetles which are favoured by arable conditions. However, neither group is particularly abundant even when their favoured habitat is well represented and they do not have such good dispersive powers as the members of the grassland groups (Robinson 1983, 35). The insect evidence therefore cannot be used either to confirm or disprove the proximity of arable land to the palaeochannel, although the phytophagous species at least hint at some sort of weedy ground.

One species, *Aphthona cf. atrovirens*, represented by two individuals is of particular interest. It can feed on *Linum usitatissimum* (flax) as well as *Helianthemum* spp. (rockrose) (Koch 1992, 105). It is possible that it had been introduced to the deposit amongst the flax being retted in the channel.

Other habitats and activities

The insect remains from the palaeochannel do not provide any firm evidence of human habitation at West Cotton even though the upper part of the sequence would have been contemporaneous with the late Saxon occupation of the site. Numbers of the Lathridiidae (Species Group 8) were no higher than might be expected away from settlement. A single specimen from the synanthropic group (Species Group 9) *Typhaea stercorea* and a woodworm beetle (*Anobium punctatum*, Species Group 10) need not imply indoor habitats. The various beetles of foul organic material (Species Group 7) were not, at 6.3% of the terrestrial Coleoptera, particularly abundant and are more likely to have been living in plant debris alongside the channel than in settlement refuse.

The reasons why the insects did not reflect the proximity of the settlement are probably twofold. The flow of water along the channel would have resulted in the catchment for the insect remains being large and so only a small proportion of them would have been derived from the bank alongside the settlement. Also, the settlement was separated from the channel by the mill and leat. Rubbish from the settlement does not seem to have reached the channel in any significant quantity.

A total of 13 puparia of *Melophagus ovinus*, the sheep ked, was recovered from four of the five Saxon waterlogged samples from the section adjacent to the settlement. The ked is a highly specialised wingless fly which is a bloodsucking permanent ectoparasite of sheep and will not survive for long if removed from its host (Edwards *et al* 1939, 123–4). It does not have an independent larval stage, females produce fully grown larvae which attach themselves to the wool of their host and immediately pupate. The ked is not regarded as a serious pest although its attacks can sometimes lead to secondary infestations of *Lucilia sericata* (blow fly) (Evans 1949–50).

While the find of a single sheep ked puparium need have implied no more than that sheep were kept in a field adjacent to the channel, the high concentration of puparia suggests that some specialised activity involving sheep or wool was taking place in or alongside the channel. Perhaps sheep were washed in the channel prior to being sent to market or wool was carded and washed using water from the channel.

Two samples each contained the head of a worker honey bee (*Apis mellifera*). Clearly the channel was within the foraging range of a colony of bees and the riverside hay meadow would have been provided a good supply of nectar in the early summer. A couple of bees does not prove bee-keeping at West Cotton, and indeed one sample pre-dated the excavated settlement, but apiculture was practised in the Saxon period. Hive bees are likely to have greatly outnumbered bees from any feral colonies in the region.

Temporal change

The period of deposition of the Saxon organic sediments in the palaeochannel was perhaps of the order of 300 to 400 years and spanned the foundation of the late Saxon settlement. However, the insects from them give little indication of environmental change. The only possible evidence is for changing conditions in the channel itself. The earliest sample in the sequence, Sample 3, was from the bank of the channel and contained a single larval use of *Orthotrichia* sp., the caddis which favours stagnant or slowly moving water. The three samples from the silts in the centre of the channel all contained much higher numbers of *Orthotrichia* sp. It is possible that this reflects a decreasing flow of water along the channel, with sedimentation initially only able to occur along the channel margins but then occurring throughout the full width of the channel.

The millpond samples

The aquatic and waterside environment

The proportion of water beetles in the millpond samples was lower than in the palaeochannel deposits, with 16% of the total Coleoptera being aquatic species (ie they were at a value of 19% of the total terrestrial Coleoptera, Table 12.24). Although conditions in the millpond were by no means stagnant, there was only a single specimen of an elmid beetle, *Oulimnius* sp. and the flowing water caddis *Ithytrichia* sp. had been entirely replaced by its relative *Orthotrichia* sp., which favours almost still water (Marshall 1978, 16, 21).

The phytophagous insects of floating-leaved and emergent aquatic vegetation also showed some differences from the Saxon channel fauna. There were few species which feed on tall reedswamp plants, for example *Donacia impressa*, which feeds on *Schoenoplectus lacustris* (true bulrush), was absent from the millpond samples. However, there were still the species of lower grazing marsh or marginal vegetation such as *Notaris acridulus*.

The terrestrial landscape

The results from the millpond mostly give a similar impression to those from the palaeochannel for the surrounding landscape. There was only a single wood or tree feeding beetle, *Chalcoides* sp. which feeds on the leaves of *Salix* (willow) and *Populus* sp. (poplar). There was similar evidence for open conditions, with species of both grassland and disturbed ground habitats present. Unfortunately, the assemblages from the millpond were not large enough to determine the relative importance of grassland and disturbed ground or whether the disturbed ground included arable.

Table 12.24: Species Groups of Saxon Coleoptera as percentage of terrestrial individuals

Species groups	Palaeochannel samples %	Millpond samples %
1 Aquatic	33.8	19.0
2 Pasture / dung	3.6	6.0
3 Meadowland	7.5	4.0
4 Wood and trees	0.5	1.0
5 Marsh / aquatic plants	9.2	11.0
6a General disturbed ground / arable	0	1.0
6b Sandy / dry disturbed ground / arable	0.3	1.0
7 Dung / foul organic material	6.3	11.0
8 Lathridiidae	1.7	3.0
9 Synanthropic	0.1	1.0
10 Especially structural timbers	0.1	3.0
11 On roots in grassland	1.7	3.0
Total number of terrestrial individuals	(743)	(99)

Other habitats and activities

The insects from the millpond contrast with those from the palaeochannel in giving a slight hint that there was a settlement at West Cotton. The Lathridiidae (Species Group 8), at 3% of the terrestrial Coleoptera were slightly better represented than from the palaeochannel deposits, but this value is still very low for an occupation site. The proportion of woodworm beetles (*Anobium punctatum*, Species Group 10), also at 3% of the terrestrial Coleoptera at least gives a hint as to the presence of timber buildings. Synanthropic beetles, including grain beetles, (Species Group 9) were entirely absent. An increase in the Hydrophilidae and Oxytelinae Staphylinidae of foul organic refuse (Species Group 7) to 11% of the terrestrial Coleoptera possibly reflected settlement activities, but they would still have largely been derived from plant debris alongside the millpond.

The paucity of insect evidence for the settlement was possibly because the input of the mill leat into the millpond increased the catchment area from which the insect remains had been derived and because the organic sediments did not contain much occupation refuse. However, if any granaries associated with the mill had experienced severe infestations of grain beetles, as for example was found in a Roman granary at York (Kenward and Williams 1979), it would still be expected that this would have been reflected by the insects from the millpond.

Taxa in these groups from West Cotton:

- 1 Haliplidae, Dytiscidae, Gyrinidae, aquatic Hydrophilidae, Hydraenidae, Dryopidae, Elmidae, *Macrolea* sp.
- 2 *Geotrupes* sp., *Colobopterus* sp., *Aphodius* spp., *Onthophagus* sp.
- 3 *Apion* spp., *Sitona* spp.
- 4 *Chalcoides* sp., *Acalles* sp., *Curculio* sp., *Rhynchaenus* sp., *Ramphus* sp.
- 5 *Macrolea* sp., *Donacia* sp., *Plateumarium* sp., *Prasocuris* sp., *Aphthona nonstriata*, *Lixus* sp., *Bagous* sp., *Notaris* sp., *Thryogenes* sp., *Limnobaris* sp.
- 6a *Agonum* sp.

- 6b *Amara bifrons*
- 7 *Cercyon* spp., *Megasternum* sp., *Cryptopleurum* sp., *Anotylus rugosus*, *A. sculpturatus* sp.
- 8 Lathridiidae
- 9 *Typhaea* sp.
- 10 *Anobium* sp.
- 11 *Phyllopertha* sp., *Agypnus* sp., *Athous* sp., *Agriotes* spp.

Not all species have been classified into groups.

Marine shell and Unionidae

by Mark Robinson

Marine shell and large freshwater shells of the Family Unionidae were recovered both by hand, and from sieving, during the excavation. However, the recovery of this material was not systematic throughout the excavation, so the number of shells recovered is unlikely to be a true reflection of their frequency on the site. The material recovered by hand was catalogued and the full results are available in archive. A summary is given in Table 12.25. The material from sieving was not quantified, but was scanned for additional species. None were present.

Both mussel (*Mytilus edulis*) and oyster (*Ostrea edulis*) were numerous in the late Saxon and twelfth-century deposits. Oyster continued to be present in the later medieval deposits but mussel was only represented as a single specimen recovered from the external yard of Tenement E. A single fragment of cockle (Cardiacea) was recovered from a late Saxon ditch fill and a fragment of great scallop (*Pecten maximus*) was recovered from a twelfth-century deposit in LSE10.

Most, but by no means all the large fresh-water shells were recovered from mill leats. Members of this family of fresh-water molluscs were eaten in the Fens and in Ireland (Ellis 1962, 11) and although they are rather unpalatable (Robinson pers comm) this may have been the case at West Cotton.

The results would tend to indicate that shell-fish were

Table 12.25: Numbers of marine molluscs and Unionidae

Taxa	Common name	AD 950– 1100	AD 1100– 1250	AD 1250– 1400	AD 1350– 1400
<i>Mytilus edulis</i> L.	Common mussel	13	21	1	–
<i>Ostrea edulis</i> L.	Common European oyster	32	43	23	5
<i>Pecten maximus</i> L.	Great scallop	–	1	–	–
Cardiacea		1	–	–	–
<i>Unio pictorum</i> L.		2	1	1	–
<i>Unio timidus</i> Phillipsson		2	–	1	–
<i>Unio</i> sp.		–	1	–	3
<i>Anodonta</i> sp.		2	29	1	–

more important during the late Saxon and twelfth-century phases of the site than in the later medieval tenements. This apparent change may be due to differential recovery of material during the earlier part of the excavation, but may be connected with the demise of the manor.

Oyster is common on other sites of this period in the

region, though as yet most of the evidence is derived from urban deposits (Robinson and Wilson 1987). Mussel (*Mytilus edulis*) and common edible cockle (*Cerastoderma edule*) were recorded in both the late Saxon and medieval deposits at St Peter's Street, Northampton (Oakley 1979).

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13 The animal bone

by Umberto Albarella and Simon JM Davis

Introduction

The late Saxon to medieval deserted hamlet of West Cotton, Raunds Northamptonshire (SP 976725), lay in the Nene valley on a slightly raised gravel peninsula at the edge of the floodplain. Excavation between 1985 and 1989 revealed the complex sequence of its development. In the mid-tenth century a late Saxon timber building complex, with an associated watermill, was set within a planned settlement of regular plots. This building complex was directly replaced in the early part of the twelfth century by a small manor or manorial holding comprising a two-storey hall, dovecote, detached kitchen/bakehouse and garderobe, but by the end of the century severe alluviation across the valley floor had resulted in the abandonment of the watermill and the creation of protective flood banks. By the mid-thirteenth century there was a new manor to the east and peasant tenements replaced the old manor house. By the end of that century the manor buildings had also been converted to peasant tenements, marking the end of direct farming of the manorial demesne. The tenements were progressively deserted through the fourteenth century, and by mid-fifteenth century the settlement was abandoned and given over to pasture closes.

Material from West Cotton derives from the following periods:

Early-middle Saxon	
Late Saxon settlement	(AD 950–1100)
The medieval manor	(AD 1100–1250)
The medieval manor and hamlet	(AD 1250–1400)
Demolition rubble and robber trenches	(AD 1300–1450)

The early-middle Saxon animal remains have not been dealt with in detail.

Only the medieval assemblages were sufficiently large to allow a full zoo-archaeological study. The chronological overlap between the hamlet and demolition phases arises from the process of progressive tenement desertion, which began in one tenement as early as 1300. Therefore the two periods have generally been grouped together to form a single mid-late medieval period of the manor and hamlet, dated AD 1250–1450. An exception is the calculation of the frequencies of species, where, in order to discern the

existence of a possible chronological trend, these periods were kept separate. For most studies quantification is only possible at the basic division into two periods:

The medieval manor	(AD 1100–1250)
The medieval manor and hamlet	(AD 1250–1450)

In addition, there are two small groups of later material:

Early post-medieval ditches and banks	(AD 1450–1550)
Late post-medieval activity	(AD 1550–1800)

Residuality was generally considered to be minimal. According to Chapman (*pers comm*) studies of the pottery indicate that this was probably never more than about 5%. However, in the boundary ditches in which 80% of the earlier material was found, the amount of residual Saxon bones may be slightly higher.

The nature of the deposit differed with respect to period, and the main differences can be summarised as follows (*Chapman pers comm*):

Late Saxon and medieval manor: largely boundary ditch fills and some occupation levels.

Medieval manor and hamlet: largely yard deposits and floor levels

Late medieval: demolition rubble and robber trench fills

The scarcity of collections of large animal bones from rural sites makes the West Cotton assemblage particularly important. The main aims of our study were:

- to examine what people were eating at West Cotton
- to try and ascertain what animal products besides meat were being produced
- to understand animal husbandry practises at West Cotton
- to study butchery techniques, methods of food preparation and rubbish disposal on the settlement
- to examine changes with time (mainly early versus late Middle Ages)
- to see how West Cotton differs from other contemporary sites in England and to see whether the West Cotton faunal assemblage reflects countrywide developments in animal husbandry as well as national economic trends

Table 13.1: Number of mammal, bird and amphibian bones (NISP) (not including sieved samples)

Period	Late Saxon	Medieval manor (1100–1250)		Medieval manor and hamlet (1250–1400)		Medieval desertion (1300–1450)		Post-medieval (1450–1550)		Post-medieval (1550 –)
	n	n	%	n	%	n	%	n	%	n
Cattle	46	760	35	290.5	21	116	14	56	11	11
Sheep/Goat	31	531	24	499.5	36	325.5	39	309	58	75
<i>Sheep</i>	4	121	–	82	–	51	–	66	–	14
? <i>Sheep</i>	–	6	–	1	–	2	–	3	–	–
<i>Goat</i>	–	–	–	–	–	–	–	–	–	–
? <i>Goat</i>	–	–	–	–	–	–	–	+	–	–
Pig	28	318	15	174	12	56	7	35	7	3
Equid	11.5	176.5	8	159.5	11	101	12	64	12	7
Red deer	–	1	<0.5	+	–	–	–	–	–	–
Fallow deer	–	–	–	–	–	+	–	–	–	–
Roe deer	–	1	<0.5	1	<0.5	–	–	–	–	–
Dog	3	42	2	38	3	16.5	2	10	2	1
Fox	–	–	–	1	<0.5	–	–	–	–	–
<i>Dog/Fox</i>	–	1	<0.5	–	–	–	–	–	–	–
Cat	1	52	2	17	1	11	1	2	<0.5	–
Polecat/Ferret	–	6	<0.5	3	<0.5	–	–	1	<0.5	–
Weasel	–	+	–	–	–	–	–	–	–	–
Stoat/Weasel	–	2	<0.5	+	–	–	–	–	–	–
Hare	–	3.5	<0.5	7.5	1	14.5	2	1	<0.5	–
Rabbit	–	–	–	–	–	1	<0.5	–	–	–
Beaver	–	–	–	–	–	–	–	–	–	–
Rat	–	5	<0.5	1	<0.5	–	–	1	<0.5	–
Water vole	–	1	<0.5	7	1	11	1	–	–	–
<i>Rat/Water vole</i>	–	5	<0.5	2	<0.5	4	<0.5	2	<0.5	1
Wood/Yellow necked mouse	–	–	–	–	–	–	–	–	–	–
?Bank vole	–	–	–	–	–	1	<0.5	–	–	–
Hedgehog	–	–	–	1	<0.5	4	<0.5	5	1	1
Mole	1	2	<0.5	14	1	16	2	4	1	1
Domestic fowl	5	68	3	38	3	10	1	4	1	1
Goose	4	40	2	10	1	3	<0.5	–	–	–
Duck	1	21	1	3	<0.5	10	1	6	1	–
Grey/Golden Plover	–	–	–	+	–	–	–	–	–	–
Lapwing	–	+	–	–	–	–	–	–	–	–
Pigeon	2	23	1	41	3	15	2	3	1	1
Cormorant	–	1	<0.5	–	–	–	–	–	–	–
Red Kite	–	3	<0.5	–	–	1	<0.5	–	–	–
Buzzard	–	1	<0.5	–	–	–	–	–	–	–
Sparrowhawk	–	–	–	1	<0.5	–	–	–	–	–
?Kestrel	–	–	–	–	–	–	–	1	<0.5	–
Crow/Rook	2	12	1	5	<0.5	17	2	10	2	–
Turdid	–	–	–	1	<0.5	11	1	2	<0.5	–
Passeriform	–	3	<0.5	1	<0.5	2	<0.5	–	–	–
Bird	–	4	<0.5	3	<0.5	–	–	–	–	–
Amphibian	7	93	4	79	6	88	11	17	3	9
<i>Frog</i>	–	7	–	4	–	4	–	2	–	1
<i>Toad</i>	1	8	–	3	–	1	–	1	–	–
Eel	–	1	<0.5	1	<0.5	1	<0.5	–	–	–
Perch	–	1	<0.5	–	–	–	–	–	–	–
Ling	–	–	–	–	–	1	<0.5	–	–	–
Totals	142.5	2178	–	1399	–	825.5	–	533	–	112

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Methodology

Full details of methods used can be found in Albarella and Davis (1994b). [Editors note: This report was originally prepared in the mid-1990s and the full version, including the detailed methodology and all of the tabulated and diagrammatic data, was made available to fellow researchers at the time as an Ancient Monuments Laboratory Report: Albarella, U, and Davis, S J M, 1994 *The Saxon and Medieval animal bones excavated 1985–1989 from West Cotton, Northamptonshire*, HBMC Ancient Monuments Laboratory report, 17/94, London. As this supplementary data is already available to those who require reference to it, only the principal tabulated data is reproduced here.]

Recovery

Most of the West Cotton animal remains were recovered during hand excavation (Table 13.1). However, a programme of wet and dry sieving was carried out on. Most of the soil samples were of 10 litres and were wet sieved through three sieves respectively 5mm, 1mm and 0.5mm mesh (see Campbell in this volume for more details about sampling and recovery methods).

The sieved samples include very small specimens, such as isolated teeth of small mammals (Table 13.2). Unfortunately these samples did not provide useful quantitative information because they were too small and derive from an unknown proportion of the complete deposit. However, three “whole earth” samples (Payne 1992), each of 100 litres, were also sieved. Each is from a different period: late Saxon, the medieval manor and the medieval tenements. Unfortunately, they too produced such a small number of identified animal bones (7, 2 and 5 respectively) that quantitative inferences could not be drawn.

Many small specimens, such as amphibian bones, were collected by hand, which suggests good recovery (Table 13.1). However, a bias against smaller specimens is to be expected. Indeed, an under-representation of smaller parts of the skeleton and smaller species is quite evident.

In order to check whether recovery biases varied in different periods we have calculated the relative frequency

of isolated permanent incisors (ie small teeth which are easily overlooked) for the three main taxa in the two main periods. Although a slightly higher degree of recovery in the later period is apparent, the difference between the two periods is probably too slight to seriously affect the characteristics of the different assemblages. However, this difference must be borne in mind when the two samples are compared. The higher frequency of pig incisors (relative to the other species) is due to the larger size of these teeth compared to the molars, whereas the lower frequency of the sheep incisors is almost certainly due to their smaller size relative to the molars.

Although we have been unable to calculate the general loss of smaller specimens, the list of bones from sieving (Table 13.2) shows more taxa than listed in Table 13.1, and the relative frequency of the species would probably have been very different if all bones present in the soil had been recovered.

Identifications

Some closely related taxa were difficult to distinguish. Rather than try to identify all possibly identifiable elements, we decided to record only a selected suite of elements which, we believe, preserves all the quantitative aspects and is more reliable and less time consuming.

We were generally able to identify the following parts of the skeleton as either sheep or goat: dP₃, dP₄, distal humerus, distal metapodials (both fused and unfused epiphyses), distal tibia, astragalus, and calcaneum using the criteria described in Boessneck (1969), Kratochvil (1969) and Payne (1969 and 1985). Since horncores are not necessarily present in both sexes and can be subject to different patterns of preservation, they were distinguished but not used to calculate the sheep:goat ratio.

For the identification criteria of other taxa see Albarella and Davis (1994b).

Quantification

For a full description of the methods used for mammal bones see Davis (1992a). In brief, all mandibular teeth and a restricted suite of ‘parts of the skeleton always recorded’ (ie a predetermined set of articular ends/epiphyses and metaphyses of girdle, limb and foot bones), were recorded and used in counts.

Number of Identified Species (NISp) and Minimum Number of Individuals (MNI) were both calculated for the most common taxa. Since the side of the element was not recorded, the MNI was simply calculated by dividing each element by its number in the body. The MNI was calculated at the ‘higher level of aggregation’ (Grayson 1984), which means that it was calculated considering each period as a single group, rather than calculating the MNI for smaller groups, such as units, and then summing them up in order to get the total for the period.

Table 13.2: Number of mammal, bird and amphibian bones (NISP) from sieved samples

Period	Late Saxon	Medieval manor (1100–1250)	Medieval occupation (1250–1400)	Medieval desertion (1300–1450)	Post-medieval (1550+)
	n	n	n	n	n
Cattle	–	4	1	–	–
Sheep/goat	1(1)	14	2	2	–
Pig	–	7	2(1)	–	–
Equid	–	2	–	–	–
Dog	–	2	1(1)	–	–
Cat	–	1	–	1	–
Weasel	–	–	+	–	–
Hare	–	–	9	–	–
Rat	–	3	1	–	–
Water vole	–	2	–	–	–
Rat/Water vole	–	–	1	–	–
Small rodent	3	24	22(1)	–	1
Mouse	–	–	1	1	–
Small vole	–	1	5	1	1
House mouse	–	2	–	–	–
Wood/Yellow necked mouse	–	1	–	–	–
Field vole	–	5	4	1	–
Bank vole	–	1	1	–	–
Mole	–	2	1	–	–
Common shrew	1(1)	2	1	–	–
Duck	–	2	–	–	–
?Snipe	–	1	–	–	–
Pigeon	1	1	1	–	–
Crow/Rook	–	2	–	–	–
Turdid	–	1	–	–	–
Passeriform	1	–	2	–	–
Bird	–	1	–	–	–
Amphibian	10(5)	80(2)	36(2)	–	2
<i>Frog</i>	–	9	3	–	–
<i>Toad</i>	1	4	–	–	–
Herring	2	26	5	–	–
Eel	1	1	1	–	–
Cyprinid	–	–	1	–	–
Fish	–	3	1	–	–
Totals	20	191	99	6	5

Ageing and sexing

The wear stage was recorded for all P₄s, dP₄s and molars of cattle, caprines and pig, both isolated and in mandibles. Tooth wear stages follow Grant (1982) for cattle and pig, and Payne (1973 and 1987) for sheep/goat. Mandibles with at least two teeth, with recordable wear stage, in the dp₄/P₄–M₃ row were also assigned to the mandibular wear stages of O'Connor (1988) for cattle and pig, and of Payne (1973) for caprines.

The fusion stage of post-cranial bones was recorded for all species.

Measurements

For a complete list of the measurements taken see Albarella and Davis (1994b). The measurements are generally taken following the criteria suggested by von den Driesch (1976).

Ruminant molar lengths and widths are the maximum measurements of the crown. Measurements taken on equid cheek teeth follow Davis (1987a). All pig measurements follow Payne and Bull (1988). In addition, the width of the central (i.e. second) pillar of M₃ was also measured.

Humerus HTC and Tibia Bd are, for all species, taken following the criteria described by Payne and Bull (1988) for pigs, while humerus BT is, in all other species, taken

as in Davis (1992a). Measurements of cattle and caprine metapodials also follow Davis (1992a).

Wmax and Wmin are the largest and smallest diameters of the base of horncores and antlers. L is the dorsal distance between the base and the top of the horncore.

Preservation

Fragmentation

One outstanding characteristic of the West Cotton animal bones is the high incidence of gnawing marks. Almost all these marks were probably caused by carnivores, only two bones both from the mid-late medieval period were gnawed by rodents. The percentage of recorded gnawed post-cranial bones is only about 15%, but this figure is clearly a considerable underestimate of the real frequency of gnawed bones. Indeed some of the bones were not recordable *because* they were gnawed: carnivores had completely removed the ends. For instance, numerous badly chewed pig humerus shafts were observed, but the actual number recorded (ie with the medial part of the distal trochlea preserved) was very low. Furthermore we recorded the presence of gnawing marks only when we felt confident about their identification. It is likely that many other breakages were caused by carnivores.

A very high percentage of gnawed bones was also noticed at the nearby Burystead and Langham Road sites within north Raunds (Davis 1992b and Davis 2009), and we suggest that this may be characteristic of rural sites.

In many instances bone surfaces showing the typical pattern of partial-digestion (as described by Payne and Munson 1985) were also noticed. Most of them (23 out of a total of 34) were from the mid-late medieval period, which corroborates our finding of greater scavenger activity in the later part of the Middle Ages (see below). Only four bones from the medieval manor period were 'part-digested'.

However, a major cause of fragmentation was clearly human activity, many of the bones being chopped or cut, although these signs had often become completely obliterated by the subsequent activities of dogs and erosion in the soil.

Preservation of the surface

While fragmentation was high, the preservation of the bone surface was generally quite good, and occasionally excellent, which suggests that the conditions in the soil had not severely affected the bones. Most of the bones from all periods and areas seemed to be well preserved.

Chronological variation

In order to check whether there were differences in the preservation patterns between the two main periods (medieval manor and medieval manor and hamlet) some factors which should be indicative of the level of fragmentation were compared.

The generally high percentage of teeth, many isolated, is to be noted which almost certainly indicates high fragmentation; teeth are generally harder and relatively unpalatable to dogs. However, the pattern seems to be different in the two periods, the number of teeth versus bones and of loose teeth versus teeth in mandibles being higher in the later period. Therefore it seems that fragmentation is higher in the later medieval assemblage, and this must be taken into account when the results from the two periods are compared.

The difference in the nature of the deposits from which the bones are derived is probably the main cause of the different degree of fragmentation in the two periods. Whereas the earlier period bones are largely derived from boundary ditch fills, the later material is mainly from occupation levels in and around the buildings. Despite the evident recutting of the boundary ditches (Chapman pers comm), the earlier bone assemblage is therefore likely to have suffered less post-depositional disturbance.

Despite the suggested difference in the fragmentation pattern between the two periods, no significant difference in the percentage of gnawed bones has been noticed. This is not surprising because, as stated above, dog activity was probably so intense that many of the post-cranial bones, especially of sheep and pig, would have disappeared from the archaeological record. This is also confirmed by the generally higher percentage of gnawed bones for the larger species; 25–30% of cattle bones as opposed to 13–20% of sheep bones. This is an unrealistic figure because dogs tend to prefer smaller bones which can easily enter their mouth and be chewed until the epiphyses are completely abraded. In the Bronze Age site of La Starza (Southern Italy), where the degree of gnawing was equally high but also shafts were counted, an opposite result was obtained, pig and sheep bones being far more frequently gnawed than cattle bones (Albarella 1995).

It is therefore clear that at West Cotton the percentage of gnawing marks do not represent a direct index of fragmentation and that post-cranial bones of caprines and pigs are almost certainly very under-represented. As the assumed different level of fragmentation suggests, this bias is probably stronger in the later period.

Spatial variation

Given the high degree of dog activity we did not expect to find significant differences in the preservation patterns between different areas. Although in a few contexts articulated bones, which suggest primary deposition, were found, it is probable that most of the bones had been moved around the site by scavengers.

An attempt to compare the degree of fragmentation in the medieval manor period between ditch deposits and building deposits has not shown any consistent variation. The two considered indexes of fragmentation, the percentage of teeth and that of isolated teeth, gave inconsistent results. The comparison is also made problematic by the smallness of the samples of bones derived from buildings and their yards.

Frequency of species in different periods

Cattle, caprines, pig and equids represent more than 75% of the vertebrates and 90% of the mammals in all periods.

The relative frequencies of the main taxa were compared using both estimates of the number of fragments (NISP) and Minimum Number of Individuals (MNI). We have little doubt that the MNI gives a more realistic figure, as the NISP count is seriously affected by recovery and taphonomic factors (see above) so that the smaller species are under-represented.

According to the MNI, caprines are the most common taxon in all periods (Table 13.3). However, this does not mean very much until the patterns of exploitation of each taxon are fully understood, and, of course, mutton was not necessarily the most favoured meat.

The rather high percentage of equid bones in all periods appears to be a character of this site. However, it is not as outstanding as at Burystead/Langham Road where, in the medieval period, equids were the most common taxon (Davis 1992b and Davis 2009). Grant (1988) suggests that, although exceptions exist, a high percentage of equid bones may be related to the presence of light soils where horse-power was more efficient than ox-power. At West Cotton it is probable that both heavy and light soils were exploited (Campbell pers comm), thus the high presence of equids is not entirely inconsistent with this hypothesis.

Table 13.3 Frequencies of the main domestic taxa by percentage and (MNI)

Period of occupation	Cattle	Sheep	Pig	Equid
Medieval manor (1100–1250)	26% (37)	48% (69)	22% (31)	5% (7)
Manor and hamlet (1250–1400)	20% (20)	62% (63)	12% (12)	7% (7)
Late medieval demolition (1300–1450)	13% (7)	66% (37)	12% (7)	9% (5)

The relative frequency of the main species did not remain constant with time. Although the two later medieval periods are not clearly chronologically distinct, an interesting trend can be noticed: caprines and equids gradually *increase*, whereas cattle and pig gradually *decrease*. However, it is important to remember that we are dealing with a ‘closed’ system – a fall in the frequency of one species will lead automatically to a rise in the others.

A χ^2 test applied to the MNI count shows that there is a substantial difference in the composition of the faunal assemblage between the medieval manor and the manor and hamlet ($\chi^2 = 6.7$, with less than a 1% probability that the difference is due to chance), and that no difference exists between the manor and hamlet and the chronologically overlapping demolition deposits ($\chi^2 = 1.3$, which means that there is a 25% probability that this difference is due

to chance). When applied to NISP the test showed in both cases a very substantial difference (with much less than 0.5% probability that it is due to chance). We are inclined to believe that the difference in the frequency of species is real also in the later medieval and that the χ^2 test failed to show any significant difference when applied to MNI due to the reduced sample size.

It is interesting to notice that the increase in caprines seems even more striking in the post-medieval period (Table 1), when they largely dominate the assemblage.

The difference within the Middle Ages should, we suggest, be interpreted in the context of regional as well as local changes. The countrywide phenomena to bear in mind are: a) the increasing importance of wool production in medieval England, and b) the increasing use of horses for traction. The most important local change was the transformation of the site from a manor house to a hamlet, with the consequent probable decline in status.

However, in order to try to explain this change in the faunal composition we will have to examine other questions in detail, such as the kill-off pattern and the size of the West Cotton animals.

Frequency of species in different areas

In order to examine any possible lateral variation, different areas had to be considered in different periods, because of the massive change in the topography of the site between the manor and the manor and hamlet periods.

For the earlier period the frequencies of the main taxa from the system of ditches and plots and from the buildings and their yards were compared. A slightly higher number of larger species was found in the ditch deposits. Whether this is due to differential recovery or differential taphonomic effects or to a real difference in the disposal patterns is uncertain. However, there are two main problems in interpreting these data: one is the probable mixing of bones by scavengers, and the other is the small size of the sample from the buildings, which makes comparison between the two assemblages rather difficult.

For the later period, the assemblages from the different tenements were compared. Apart from minor differences, the four assemblages appear to have a similar composition. It is interesting that the increase in caprines is confirmed for each tenement, which supports our finding of a gradual increase of caprines over the site as a whole.

Major domesticates

Cattle (*Bos taurus*)

Body parts

Differences in the frequency of different elements of the cattle skeleton are probably due to recovery and preservation biases. The smallest elements, such as isolated incisors, and the least dense and most fragile elements,

such as distal femur and phalanges (Brain 1967), are, not surprisingly, under-represented.

No major differences can be noticed between the two main periods, apart from a slightly more marked scarcity of post-cranial bones in the manor and hamlet phase, which is consistent with our assumption (see above) of poorer preservation in the later period.

The presence of all parts of the skeleton, including heads and feet, supports the assumption that animals were slaughtered locally.

Age

Age profiles, calculated using mandibular age stages of O'Connor (1988), show that in both periods most of the animals were killed when adult or older, although some younger specimens are also present (Table 13.4).

This kill-off pattern is quite typical of medieval sites (Grant 1988), and it is also consistent with the age of the animals in the nearby sites of Burystead and Langham Road (Davis 1992b). Cattle were used mainly for traction, with their milk and meat being of secondary importance (Grand and Delatouche 1950; Grant 1988). The West Cotton age profile is consistent with this kind of exploitation, with most of the animals kept to maturity, and exploited for power and milk, with a few animals killed when younger for meat.

The use of cow's milk should be associated, not only with elderly animals, but also with the presence of some very juvenile calves. This is not evident in the calculated figures for mandibles, however, the more fragile juvenile mandibles were perhaps more easily fragmented and when loose teeth are also considered a number of deciduous premolars, some relatively unworn, are present.

Grant (1988) suggests that in the later part of the Middle Ages beef became more important, as the increase of more juvenile animals in some sites, such as Exeter (Maltby 1979) and St. Andrew's Priory, York (O'Connor 1993), seems to demonstrate. At Sandal Castle, Yorkshire (Griffith *et al* 1983) and Launceston Castle, Cornwall (Albarella and Davis 1994a), no change was noticed within medieval times, but an increase of calves was quite obvious by the sixteenth century.

The apparently higher number of young cattle at West Cotton in the manor and hamlet period (Table 13.4) is significant when a χ^2 test is applied, although the Kolmogorov-Smirnov test failed to show any significance. This inconsistency is probably due to the small size of the

sample, and the result of the Kolmogorov-Smirnov test cannot be taken as a demonstration of continuity in the kill-off pattern between the two periods. When the ratio between deciduous and permanent premolars is taken into account only a very slight change between the two periods becomes apparent. Therefore we can suggest only tentatively at this stage that an increase in beef production occurred in the later period at West Cotton.

The epiphysal fusion data also show that most of the animals were mature, although a number of juvenile cattle (unfused epiphyses) are also present. However, the intensive scavenging by carnivores is without doubt the cause of the under-representation of unfused bones. The absence of any apparent change between the two periods is not of much significance, because of the small size of the sample in the later period and the difference in preservation pattern between the two periods (see above).

Size

A comparison was made of the width of the lower third molar tooth and the distal width of the astragalus between the two periods at West Cotton; with late Saxon specimens from Burystead/Langham Road, Raunds (Davis 1992b and Davis 2009); with middle medieval, late medieval and early post-medieval periods at Launceston Castle, Cornwall (Albarella and Davis, 1994a); with mid-late medieval at Leicester, The Shires (Gidney 1991a and 1991b); and early medieval, Coppergate, York (O'Connor 1986). This comparison gives consistent results as follows:

- No size change occurred at West Cotton during the Middle Ages (confirmed by a statistical test)
- No size difference was noticed between the late Saxon cattle from Burystead/Langham Road and those from West Cotton
- The cattle from the Northamptonshire sites appear to be larger than those from any medieval periods at Launceston Castle. The difference between the West Cotton and the Launceston animals is significant.

Furthermore the astragalus plot shows that:

- There is no size difference between the medieval manor cattle at West Cotton and York
- Leicester cattle are intermediate in size between the West Cotton and the Launceston ones. They are significantly smaller than the West Cotton animals.

Table 13.4: Frequency of cattle mandibles by age stage, percentage and (MNI)

Period of occupation	Juvenile	Immature	Sub-adult	adult	elderly
Medieval manor (1100–1250)	5% (3)	15.5% (10)	8% (4.5)	32% (18.5)	42% (24)
Manor and hamlet (1250–1450)	0% (0)	22% (5)	17% (4)	35% (8)	26% (6)

It also appears that the size of the late Saxon and medieval cattle from Northamptonshire and Yorkshire is more similar to that of the post-medieval than the medieval cattle at Launceston. The evidence then seems to indicate *regional* as well as *chronological* variation in cattle size in medieval England.

It should also be noted that the small size of the Launceston animals is similar to that of the contemporary sites of Exeter, Devon and Prudhoe Castle, Northumberland (Albarella and Davis 1994a). It is thus tempting to suggest that the animals from the heart of the country (ie Northamptonshire) might have been larger (were they 'improved' animals?) than those from more outlying and possibly more marginal areas in the west and north of the country. This hypothesis needs to be tested when more data from different sites and areas become available.

Sex

Since no morphological characters provide a means of distinguishing the sexes of cattle, measurements have to be used in order to investigate the question of sex ratio.

No separate groups were noticed in the plots of different measurements. Furthermore, the coefficient of variation of the supposedly highly dimorphic metacarpal indexes (smallest shaft width/greatest length and distal width/greatest length), are not very high (8.5 and 8.6). This may indicate either that the morphological differences between sexes has been over-emphasized, or that the sample is comprised predominantly of one sex (females, or more probably, females and castrates).

The absence of bulls is quite likely. In some villages the general ratio between females and males was 10/12 :

1 (Grand and Delatouche 1950) while in other villages or manorial systems it was considered too expensive to keep a bull, therefore the herd had to rely upon communal sires (Thornton 1992).

Shape and breed

When the West Cotton metatarsals are compared with those from medieval and post-medieval levels at Launceston Castle, it was noted that not only in terms of their *size*, but also *shape*, the West Cotton cattle appear to be more like the post-medieval than the medieval Launceston cattle.

The evidence for both shape and size therefore show that different kinds of cattle were present at West Cotton and Launceston.

Butchery and bone working

There is little doubt that cattle bones at West Cotton represent butchery and food refuse. Almost 30% of the bones bore clear butchery marks and the fragmentation of many of the others is probably also due to human activity (Tables 13.5 and 13.6).

Cut marks, especially those observed on the astragalus, were almost as frequent as chopping marks. Most are probably connected with the severing of tendons. Two metapodials were smashed and burnt near the mid-shaft, which suggests the extraction of marrow. A tibia from the mid-late medieval period of the manor and hamlet is the only sawn bone found on the site.

Cut marks on phalanges, distal metapodials and in one case also on the skull (frontal bone) almost certainly attest to skinning (Table 13.7). In medieval times, hides were

Table 13.5: Medieval manor (1100–1250): Percentages of butchered and gnawed postcranial bones

Species	Chopping		Cuts		Total Butchery		Gnawing	
	n	%	n	%	n	%	n	%
Cattle	85	16	56	11	137	26	130	25
Sheep	49	19	16	6	59	23	34	13
Pig	8	11	6	8	11	15	18	24
Equid	9	8	9	8	18	15	26	22
Dog	–	0	–	0	–	0	–	0
Total	151	15	87	9	225	22	208	21

Table 13.6: Medieval manor and hamlet (1250–1450): Percentages of butchered and gnawed postcranial bones

Species	Chopping		Cuts		Total Butchery		Gnawing	
	n	%	n	%	n	%	n	%
Cattle	29	16	25	13	51	27	57	30
Sheep	36	14	11	4	43	17	51	20
Pig	3	7	2	5	5	11	12	27
Equid	25	21	23	15	45	30	48	32
Dog	–	0	–	0	–	0	1	4
Total	93	14	61	9	144	22	169	26

Table 13.7: Number of cut marks due to skinning on cranial and foot extremities

Species	Late Saxon	Medieval manor	Manor and hamlet	Post-medieval	Total
Cattle	1	23	7	0	31
Sheep	0	2	0	0	2
Pig	0	1	0	0	1
Equid	0	6	20	2	28
Dog	0	1	3	0	4
Cat	0	4	1	0	5

a secondary, but important, product of the cattle carcass (Grand and Delatouche 1950). One chopped horncore indicates that horn working may also have been practised on the site.

We suggest that all slaughter and butchery activities took place on the site, and that all parts of the body were used locally and/or for sale at market.

Caprines (*Ovis/Capra*)

Identification

All the countable bones that we identified to species proved to belong to sheep (*Ovis aries*; Table 13.1). This animal, in terms of numbers of individuals, was the most common of the food species at West Cotton – hardly surprising in view of its great importance. “Shepe...” in the opinion of Fitzherbert (1534) “... is the mooste profytablest cattell that any man can have...”. Only one horncore of goat (*Capra hircus*) was present in the early-middle Saxon period and one proximal radius identified as “possible goat” was found in a post-medieval level.

The scarcity of goat is a general phenomenon in medieval England. At Burystead/Langham Road no trace of goat was found (Davis 1992b and Davis 2009). Historical evidence suggests that flocks of goats were kept mainly in the *hilly* districts of England and Wales (Burke 1834), so the absence of this animal from Northamptonshire sites is not surprising.

Since goat was so rare, or even absent, from medieval West Cotton, in the rest of this report ‘caprines’ will be simply referred to as ‘sheep’.

Body parts

Even more than for cattle, the distribution of parts of the skeleton of sheep is strongly determined by recovery and taphonomic factors. Incisors (generally isolated) and post-cranial bones are hugely under-represented relative to cheek-teeth: incisors being more under-represented in the earlier period and post-cranial bones being more under-represented in the later period. It is probable that, as in cattle, all parts of the skeleton were originally present in equal numbers, and therefore the sheep may have been slaughtered on the site.

Age

The pattern of sheep mortality at West Cotton is of crucial importance to our interpretation of the development of the economy at this site.

Age profiles, as calculated by mandibular age stages (Payne 1973), show that the kill-off pattern of sheep at West Cotton varies between the two medieval periods. A statistical test confirms that in the earlier period a higher proportion of the sheep were killed at a *younger age* than in the mid-late medieval. In the earlier period more sheep were slaughtered in tooth wear stages C and D (6 months–2 years old) whereas, in the mid-late medieval period more were slaughtered in wear stage F (3–4 years old). This result is confirmed by considering loose teeth and teeth in mandibles together (Tables 13.8 and 13.9), where in the earlier period 15% more animals were slaughtered within the second year.

This difference, although not striking, is important, because it suggests a change in the pattern of exploitation of the sheep. In both periods quite a wide range of ages are represented, which suggests a mixed economy, i.e. one in which meat, milk *and* wool were all important. Whereas in the earlier period the major emphasis was upon the production of meat, in the later period wool became more important. This does not mean that the economy shifted to specialized wool production, but merely that a higher proportion of sheep were shorn of two or more fleeces before being slaughtered. The fact that the killing peak is in the fourth year and not later, indicates perhaps that the production of mutton was still important. Indeed Muffett (1655) suggests that the best mutton is not above four years old.

The increased importance of wool production probably also explains the increasing frequency of sheep with time (see above) and may also be correlated with the possible decrease in cattle age – a non-intensive production of mutton being compensated by an increase of beef from cattle slaughtered at a younger age.

When the age profiles of the West Cotton sheep are compared with those from Launceston and Burystead/Langham Road, it is interesting that the earlier period at West Cotton (with its emphasis on meat) is similar to late Saxon Burystead, while the later period (with its emphasis on wool) is more similar to the late medieval at Launceston.

Table 13.8: The medieval manor: sheep kill-off pattern from tooth wear (mandibles and loose teeth)

Age ranges	wear stage	% killed within range	Cumulative % killed	Age
0–2 years	–	44%	44%	c 2 years
>2 years	–	56%	–	–
2–3 years	2–4	6%	50%	c 3 years
3–5 years	5–10	25%	75%	c 5 years
6–10 years	11G	24%	99%	c 10 years
>10 years	>11G	1%	100%	–

Table 13.9: The medieval manor and hamlet: sheep kill-off pattern from tooth wear (mandibles and loose teeth)

Age ranges	wear stage	% killed within range	Cumulative % killed	Age
0–2 years	–	30%	30%	c 2 years
>2 years	–	70%	–	–
2–3 years	2–4	5%	35%	c 3 years
3–5 years	5–10	36%	71%	c 5 years
6–10 years	11G	28%	99%	c 10 years
>10 years	>11G	1%	100%	–

It is possible that, unlike size, we are here dealing with a countrywide *chronological development*.

The growing importance of wool production is certainly a regional rather than local phenomenon. The increase in the frequency of sheep has been attested in several other sites such as Exeter (Maltby 1979), Lincoln (O'Connor 1982b) and Barnard Castle (Jones *et al* 1985). There is also historical evidence that from the beginning of the thirteenth century, British wool was considered the finest in Europe and that it was more frequently exported to areas such as Flanders and the Artois (Grand and Delatouche 1950 and Trow-Smith 1957).

Bone fusion data are unfortunately of little help because of the poor preservation. They do not appear to confirm the age shift indicated by the teeth, but their interpretation is complicated by the differential preservation in the two periods and by the probable increase in wool production in the later period which may have entailed a greater proportion of wethers with their later fusing epiphyses (Hatting 1983).

From our finding of an increase in numbers of sheep and an increase in the age of their slaughter we may infer that an even greater area of land was used for sheep pasturage in the later thirteenth to mid-fifteenth centuries than sheep numbers alone would indicate. This is because both numbers and age have an 'add-on' effect (we are grateful to Mark Robinson for this observation).

Size

An attempt to metrically distinguish between first and second molars by measuring the maximum width of the crown, failed due to the large amount of overlap between these two teeth sizes, although it was possible to observe

that, as with cattle, no size change occurred between the two medieval periods. This result was also confirmed in plotting of the width of the distal tibia.

A comparison of sheep size at different sites gives roughly the same results as for cattle: the West Cotton animals are definitely larger than the medieval sheep at Launceston (the difference being statistically 'very significant'), but are the same size as animals from York (O'Connor 1986). Unlike cattle, the West Cotton sheep are also the same size as animals from Leicester (Gidney 1991 and 1991b). Other sites in the west country, namely Exeter (Maltby 1979) and Okehampton Castle (Maltby 1982), like Launceston, had sheep which were smaller than those from West Cotton. Again, it would appear that since the beginning of the Middle Ages a larger and possibly more 'improved' type was present in the central part of the country. The small size of sheep from south-western sites (Exeter and Taunton) was also noticed by O'Connor (1982a).

Sex

Although no morphological criteria could be used to distinguish the sexes in sheep, a plot of the size of a very sexually dimorphic element, the horncore, was of interest as it comprised two distinct groups: one with four very large horncores and another with a higher number of smaller specimens. Despite the reduced size of horncores in wethers (Hatting 1983) the size difference between females and castrate horn cores is still probably sufficient for measurements to form separate plots. We therefore suggest that the two clusters belong to females and a smaller group of either castrates or entire males.

The possible presence of rams is of some interest. In the

manor of Rimpton, Somerset, rams (as well as bulls, see above) were not kept during the first period of occupation of this settlement. Then rams were introduced, in a ratio of one ram to forty ewes, a proportion considered ideal in medieval times (Thornton 1992). In case the large horncores belong to rams, their presence in both periods at West Cotton probably suggests either a high standard of husbandry or that the sheep flock was large enough to justify the keeping of sires. If they are wethers this may be taken as a further indication of wool production.

Butchery and working

As for cattle and pig, approximately 20% of the sheep bones showed signs of butchery, but, unlike cattle, many more chopping than cut marks were noticed (Tables 13.5 and 13.6). Clearly bones of this animal are derived from food refuse.

Only one horncore, a probable ram or wether, from the earlier period, was definitely chopped at the base. No saw marks were noticed. It is possible that the working of sheep horns was not particularly popular, and other materials, such as bone and antler, were preferred.

Pig (*Sus scrofa*)

Body parts

Due mainly to the extensive damage by scavengers, very few post-cranial bones of pig were preserved, and the assemblage is dominated by the much more durable teeth. Pig bones are very porous and generally very greasy, and being mostly juvenile, must have been much preferred by dogs. The huge over-representation of pig teeth in archaeological faunal assemblages is often noted (see for instance Davis 1987b; Davis 1992b and Davis 2009; and Albarella and Davis 1994a).

Skull fragments are also very infrequent, which supports our suggestion that the difference is due to taphonomic factors rather than a preference in antiquity for heads.

Age

Age profiles are calculated by mandibular age stages (O'Connor 1988).

Despite the small sample size, especially in the later period, the ages of pig slaughter appear to have remained

the same in both periods at West Cotton, with the age curve dominated by immature and sub-adult animals (Table 13.10), with only a few animals kept to older age, presumably for reproduction. This is a predictable pattern and is widespread. Pig husbandry has only one basic aim: the production of meat and lard.

The surprisingly low ratio of milk to permanent premolars probably reflects the higher fragility of the anterior part of the mandible in juvenile animals, as well as the greater tendency for milk teeth to drop out of the mandibular ramus. (Isolated teeth are more likely to be missed in excavation.) The same phenomenon was noticed at Launceston Castle (Albarella and Davis 1994a).

Size

Tooth measurements have been compared with a 'standard' value calculated from the Neolithic pig sample from Durrington Walls (Albarella and Payne 2005). This method not only allows a comparison of measurements from the two periods, but also the simultaneous consideration of different measurements and different elements, highlighting possible differences in proportions. There is no evidence for any change between the two periods at West Cotton. However, there is an interesting difference in the proportion of the medieval measurements relative to the Neolithic ones: in both periods at West Cotton, relative tooth size decreases towards the back of the jaw. Whether this is due to genetic, allometric or nutritional factors remains an open question. It will be interesting to explore this further.

The coefficient of variation of measurements is generally low and this probably attests the presence of a single domestic population.

Unlike cattle and sheep, no size variation was noticed between the West Cotton and the Launceston pigs. It seems that in medieval England, pig-size was fairly uniform (at least as far as the teeth are concerned).

Sex

When the shape and size of all canines are considered, males appear to have been more common. However, this figure is likely to be biased by recovery, because male canines are larger and therefore less likely to be overlooked. When only canines in mandibles (therefore not affected by recovery bias) are taken into account the ratio is reversed, and females appear to be more frequent (Table 13.11).

Table 13.10: Frequency of pig mandibles by age stage, percentage and (MNI)

Period of occupation	Juvenile	Immature	Sub-adult	adult	elderly
Medieval manor (1100–1250)	8% (3)	32% (13)	45% (18)	15% (6)	0 (0)
Manor and hamlet (1250–1450)	0 (0)	36% (5)	50% (7)	14% (2)	0 (0)

Table 13.11: Pig sex ratio for isolated canines and canines in (mandibles)

Period of occupation	Females	Males
Medieval manor (1100–1250)	14 (2)	24 (1)
Manor and hamlet (1250–1450)	21 (10)	40 (5)
Total	35 (12)	64 (6)

This predominance of sows is unusual in archaeological sites, especially from ‘consumer’ sites (see for instance Launceston Castle). However, documentary evidence suggests that only one boar was kept per three sows on manorial sites (Thornton 1992): a proportion which could be consistent with the West Cotton results.

Although caution is necessary because of the small sample, we suspect that the pig sex ratio shows that West Cotton was a ‘producer’ as well as a ‘consumer’ site, and that not all pigs were slaughtered for household consumption, but some young males were grown for sale at market.

Butchery and working

Because of the very small size of the post-cranial assemblage very little butchery evidence was available for pigs. However, some butchery marks were recorded (Tables 13.5 and 13.6), which indicate that pig bones too derive from butchery and kitchen waste.

Some pig bones, such as metapodials, seem to have been regularly worked (see Hylton this volume).

Equids (Equus sp)

Identification

There were 29 specimens of equid (mandibles or loose teeth) which could be securely identified as horse (*Equus caballus*). Seven come from the medieval manor, 20 from the manor and hamlet and two from post-medieval levels. Despite frequent references to donkeys (*Equus asinus*) in early English books on agriculture, no trace of this animal could be found at West Cotton. It is interesting to quote Loudon (1844, 40) who, in his section on the history of English agriculture from the time of Henry VIII to 1688 states that asses were not “... propagated in England till a subsequent period.” All metapodials and third phalanges at West Cotton were more similar to those of the horse rather than donkey.

Although the majority of the West Cotton equids are certainly horses, we still prefer to use the term equid for this taxon, as our sample of identified elements is small and our confidence in being able to identify post-cranial bones only fair (not as high as for sheep and goat).

Body parts

Unlike the other common species, equid post-cranial bones are somewhat better represented than teeth. We think this is mainly due to their larger size, and generally older age. Hence they are less prone to post-mortem destruction. It is also possible that equid carcasses/bones were disposed in a different manner.

Very few equid bones were in articulation, and no trace of burials was found. In terms of their general appearance, degree of damage and scavenging, and scattering around the site, there appears to be little to distinguish between equid bones and bones of sheep, cattle and pig. Therefore, as for cattle, sheep and pig, equid bones probably derive from many different individuals, rather than from a few buried skeletons.

Age

For ascertaining the age-at-death of the equids we have to rely on the ratio of milk to permanent premolar teeth and on the fusion of limb-bone epiphyses. Both methods indicate (tenuously for the few teeth found) an age increase in the later period of occupation.

As far as the fusion of the epiphyses are concerned, it is possible that the poorer preservation in the later period has biased against the unfused bones. It is also possible to argue that the smaller number of milk premolars in the later period is simply due to chance.

Two other explanations are a) that the change is real, and that it reflects improved horse-management (ie fewer deaths of foals), or simply b) instead of breeding horses themselves, the inhabitants of West Cotton in the later period preferred to buy horses elsewhere.

Size

The calculation of withers heights shows that all equids were shorter than 14 hands and 2 inches. This means that they represent ponies rather than horses. However, it must be remembered that we cannot rule out the possible presence of donkey.

There is no apparent change in the heights of the animals between the two periods. The astragalus measurements also show that, apart from two larger late Saxon specimens, the size of the equids from Burystead/Langham Road (Davis 1992b and Davis 2009) and West Cotton were similar.

Butchery

The frequency of chop and cut marks (as well as gnawing marks) on equid bones, although slightly lower in the earlier period, is comparable to that in cattle. However, whereas in cattle most of the cut marks are definite ‘butchery’ marks in that they can be related to the severing of tendons, in the West Cotton equids most of the cut marks were probably a consequence of skinning (Table 13.7). The skinning of

equids seems to have become particularly common in the later period. The use of equid hides is well known from medieval times (Grand and Delatouche 1950; Langdon 1989), but we are not aware of any other medieval site in which such a high number of skinning marks has been found on equid bones.

A high number of butchery marks, chop as well as cut marks, was also found on the West Cotton equid bones (Tables 13.5 and 13.6). Many of the ‘non-countable’ elements were also butchered. In the earlier period butchery marks are not as common as for cattle, but in the later period equid becomes the taxon with the highest frequency of identified butchery. Chopping marks are particularly common on metapodials, but were also noticed on all other bones in the skeleton (scapula, humerus, radius, pelvis, femur, tibia, calcaneum) and in any period, including late Saxon (only metapodials) and post-medieval.

Butchered equid bones are often found on medieval archaeological sites, and also on some rural sites, such as Gorhambury (Locker 1990) and Langham Road, Raunds (Davis 1992b and Davis 2009, and see Albarella and Davis 1994a for a more comprehensive list). However, in all these sites butchered bones represent only occasional finds, while at West Cotton they seem to be fairly frequent. Wilson and Edwards (1993) have found dense aggregations of butchered horse and dog bones in eighteenth-century levels at Witney Palace, Oxfordshire. They suggest that horse meat was fed to hunting dogs at kennels kept by wealthy landowners.

Despite the high percentage of butchery marks, unlike the other common species, we cannot take for granted that equid bones represent butchery and food refuse. Since the proscription by Pope Gregory III (AD 732) the consumption of horse meat is generally considered to have been widely avoided and the only exploited part of the horse carcass was its hide. Nevertheless the butchery marks on the West Cotton equid bones provide clear evidence that horse flesh, although not necessarily regularly, was exploited. A more difficult question to answer is: by whom? There is some historical evidence that horse meat was used for feeding dogs. Markham (1633) recommends feeding “horse-flesh newly slaine, and warm at the feeding” to hunting hounds on their rest days, this being “... the strongest and lustiest meat you can give them”. The possibility that equid meat was eaten by the numerous dogs which lived on the site must therefore be considered likely, and the high percentage of gnawing marks is to be noted in this respect.

However, the similarity between the butchery pattern for the equids and the other food species is intriguing. The prohibition of hippophagy is undoubtedly a well entrenched aspect of English and even European life (but see Larousse 1873 under *Hippophagie*). As long as horses were scarce and highly prized work animals it is easy to understand why there was such a taboo (see Harris 1985). However, as these animals became more common as work beasts, we wonder whether the severity of the taboo did not decrease and besides being used to feed dogs, horse

flesh was occasionally consumed. For example during a sequence of wet seasons, poor harvests, and disease among stock between 1314 and 1321, Stows Annals record the suffering of lords of the manor and their retainers: “horse-flesh was counted great delicates” (Hollis 1946). An equid tibia from the medieval manor period was smashed and burnt near its mid-shaft, probably in order to extract the marrow, and a similar pattern of butchery was also noticed on two cattle metapodials. Was this marrow really used to feed the dogs?

It is interesting in this respect that one of the criteria used by Wilson and Edwards (1993) for suggesting the horses at Witney Palace were not butchered for human consumption is the absence of any evidence of marrow extraction.

Other mammals

Deer

All three European species of deer are present (Table 13.1) but in very small quantity. This is typical of both rural and urban sites (Albarella and Davis 1994a) and is not surprising since deer hunting was a privilege strictly restricted to the aristocracy (Clutton-Brock 1984 and Grant 1988).

A small number of red deer (*Cervus elaphus*) and roe deer (*Capreolus*) bones from both periods are clearly butchery/food refuse, indicating that occasionally the prohibition on deer-hunting was ignored. Fallow deer (*Dama dama*) is only represented in the later period, by a chopped proximal metatarsal.

A few antlers of both red and roe deer were also found. All show signs of working. Some are shed, which suggests that they were collected for craft purposes. One deer bone (probably the shaft of a metatarsal) was also used for making a pipe or flute (Lawson in this volume).

Canids

Dog (*Canis familiaris*) bones are quite common (Table 13.1), although this animal is rather more conspicuous by its destructive influence upon the bones in general. Few measurements could be taken, though most of the dogs seem to have been of ordinary size. Very small and very large specimens are absent. Two almost complete skulls were found, one from late Saxon deposits and another from the medieval manor. They are both from fairly large dogs, and the Saxon one resembles, in shape, an Alsatian.

Cut marks can be seen on the nasal-bone of the medieval skull and there can be little doubt that these were caused by skinning. The same interpretation has been given for some skulls from a Roman well in Eastbourne (Serjeantson 1989). Other evidence for skinning has been found on dog bones: three mandibles from the later medieval period have clear cut marks on their anterior-buccal surfaces.

Dog skins were commonly used in medieval times, for

instance for producing gloves (Shepherd 1979, quoted by Serjeantson 1989).

Since most of the dog bones were not butchered (Tables 13.5 and 13.6), dogs were probably not generally eaten. One possible exception is a canid (small dog?) pelvis with cut marks on the acetabulum, possibly the result of dismemberment. Gnawing marks were also uncommon and in general bones were less fragmented than those of food animals.

Only one definite fox (*Vulpes vulpes*) bone, a metatarsal, was found (Table 13.1). This animal was probably occasionally hunted for its fur.

Cat

Cat (*Felis catus*) bones were found in all periods, and are especially common in the earlier period (Table 13.1).

Most of the cats were not only small but also gracile. Dental measurements show that they were definitely smaller than the specimens from Launceston Castle (Albarella and Davis 1994a). Post-cranial bones plot in the very low part of the size range of Irish medieval cats (McCormick 1988).

A fairly large number of bones were unfused, ie from young cats, a pattern also found at Exeter (Maltby 1979) and in a few urban medieval sites in Ireland (McCormick 1988). It must be noted that far fewer unfused bones were found on the early Christian site of Lagore in Ireland. High numbers of juvenile cat bones were also found at Lincoln (O'Connor 1982b) and at King's Lynn (Noddle 1977).

McCormick (1988) interprets the difference in the age pattern between early Christian and medieval sites in Ireland as a consequence of a different use of the animals. He suggests that whereas in pre-medieval times cats were kept mainly as pets, in medieval times they were exploited for their pelts. His idea is also supported by the larger size of the animals in the early Christian period, which, together with the fusion evidence, seems to suggest the presence of a 'well cared-for' cat population. The association between immature bones and skin production has also been suggested by Serjeantson (1989).

Unlike Exeter, King's Lynn, Lincoln, Waterford and Dublin, at West Cotton two kinds of evidence point to the production of cat skins: juvenile age *and* skinning marks (Table 13.7). Two mandibles from the medieval manor, one mandible from the medieval tenements, and two distal humeri from the medieval manor have clear cut marks, presumably caused by skinning.

Despite the common interpretation of cats kept for their pelts, there is little direct evidence from medieval British sites: cut marks on cat bones are not frequently reported. Sadler (1990) mentions the presence of cut marks on a pelvis from the manor house of Faccombe Netherton.

In conclusion, we think that there is clear evidence that at West Cotton cats were used for their pelts, rather than being just pets (however, the two are not incompatible). Their role as rodent predators, well known from historical

sources, must also be considered as should the fact that the Middle Ages were unhappy times for cats – they were looked upon as “familiar of the devil, companions of witches and even witches themselves” (Pond and Raleigh 1979). Furthermore, we think that the West Cotton cat bones support McCormick (1988) and Serjeantson's (1989) assumption that juvenile age may be related to skin exploitation.

Mustelids

Several bones, both mandibles and post-cranial bones, of polecats (*Mustela putorius*) were found in medieval and post-medieval contexts (Table 13.1). They come from different parts of the site and therefore probably belonged to different animals.

When compared to modern specimens in the AML reference collection, it is clear that most of the West Cotton polecats were smaller than modern ones and that they are closer in size to ferret (ie domestic polecat) bones.

No cut or chop marks were found on any of the polecat bones. Nevertheless, despite their disagreeable smell, the possibility that we are dealing with wild animals caught for their pelts has to be considered. The interest of the inhabitants of West Cotton in furs, skins and hides seems quite evident.

Their small size may of course indicate that these bones belong to ferrets – an animal known to have lived in Britain at least from the thirteenth century, when it was reared mainly for catching rabbits (Owen 1969). Consequently the scarcity of rabbits at West Cotton (Table 13.1) does not support (though, of course, it does not exclude) this hypothesis.

The polecat-ferret question has, unfortunately, to be left open. If indeed a ferret, then it would represent the first archaeological evidence for this animal in Britain.

Van Damme and Ervynk (1988) identified two partial mustelid skeletons as ferrets from a fourteenth-century pit at the Castle of Laarne in East Flanders. They made their identification on the basis of skull shape and observed that both upper and lower canines had been filed down, a technique known to have been used to prevent ferrets from killing their prey. Rabbit bones were also found on this site.

Weasel (*Mustela nivalis*) bones were found (Tables 13.1 and 13.2) as were bones from a mustelid intermediate in size between the weasels and stoats (*Mustela erminea*) in the AML reference collection. The presence of weasels of normal size at West Cotton suggests that we are more probably dealing with a population of very small stoats rather than large weasels.

Polecats, stoats and weasels are all listed by Veale (1966, quoted by Serjeantson 1989) as being among the animals exploited for fur in the Middle Ages. Baxter (1834) lists polecats, stoats and weasels under “vermin”, mentioning that both weasels and polecats steal poultry etc and suggests various ways of getting rid of them. However, he does

mention that the weasel "... is beneficial in some respects in destroying rats, mice, and other noxious vermin..."

Lagomorphs

Lagomorph bones are not particularly common, especially in the medieval manor period (Tables 13.1 and 13.2). Rabbit (*Oryctolagus cuniculus*) is very rare, whereas several bones of hare (*Lepus* sp) were found. Two humeri from the medieval manor and one from the medieval tenements are securely identified as 'brown hare' (*Lepus europaeus*).

Although not abundant, hare is the most common wild animal on the site, and it shows that hunting of small animals was undertaken, if on a small scale.

Beaver

A beaver (*Castor fiber*) femur was found in a 'river silt' deposit from the early-mid Saxon period. However, a radiocarbon date has demonstrated that the bone is from the late Bronze Age, 1310–920 cal BC (95% confidence; 2900+/-60BP, OxA-4740).

Historical records suggest that beaver survived in Wales as late as the end of the twelfth century AD (Corbet and Southern 1977). Beaver bones were found in an eighth-century level at Fishergate in York (O'Connor 1991) and in a ninth-century context at St Peter's Street, Northampton (Harman 1979). From historical sources we know that beavers were hunted for their pelts, and especially for their sexual glands, which were supposed to have therapeutic power (Grand and Delatouche 1950).

Other rodents

Several other rodent species were identified (Tables 13.1 and 13.2). They are all obviously under-represented because of their small size.

Water voles (*Arvicola terrestris*) are common and their presence may be associated with the wet environment. It is not impossible that they were exploited, but no cut marks were noticed.

Rats (*Rattus* sp) do not seem to have been particularly numerous, their numbers were perhaps kept in check by the cats and dogs present on the site.

Rats and mice are typical commensal species, and they may be associated with the presence of grain deposits on the site.

Insectivores

Hedgehog (*Erinaceus europaeus*) may have had some value as a source of meat, but shrew (*Sorex araneus*) and mole (*Talpa europaea*) certainly represent animals which died by chance on the site. Most of the mole bones look very white and translucent, and are therefore probably intrusive.

Birds

As at Burystead/Langham Road, Raunds (Davis 1992b and Davis 2009), birds are not very common at West Cotton. It is difficult to compare the frequency of birds relative to mammals, since this is strongly related to the efficiency of recovery. However, it must be noted that at Launceston Castle a decline in status of the site was clearly associated with a dramatic decrease in the number of bird bones (Albarella and Davis 1994a).

Galliforms

Since no clear trace of pheasant (*Phasianus colchicus*) or guinea fowl (*Numida meleagris*) was found and despite the fact that only two bones were definitely identified as domestic fowl (*Gallus gallus*), we assume that all galliform bones belonged to domestic fowl.

Domestic fowl was slightly more common in the earlier period. All parts of the skeleton are more or less represented. In both periods, between 10% and 20% of the bones are juvenile, but this number is probably an underestimate in view of recovery, fragmentation and identification problems. Eleven tarsometatarsi from the earlier period are unspurred (ie from females) and only one has a clear spur (ie it belonged to a male); three of them have spur scars and are probably also from males or capons (West 1985). Only two tarsometatarsi come from the later period and they are both unspurred. Several bones, from both main periods, had chop and especially cut marks.

It is reasonable to suggest that domestic fowl were exploited for meat, eggs and feathers, but they were not among the chief food resources on the site.

Goose (*Anser* sp)

This species is almost as common as domestic fowl and also decreases in the later period (Table 13.1). Due to their rather large size they probably belonged to domestic goose. No clear bias was found in the distribution of its body parts, and fewer juvenile bones were found than for domestic fowl, a pattern known also on other sites – see for instance Exeter (Maltby 1979) and Launceston Castle (Albarella and Davis 1994a). Chop and especially cut marks were noticed on several bones.

One specimen from the earlier period and two from the later are slender and quite small, and could therefore belong to one of the wild species.

Geese are common on British medieval sites and are known, from historical sources, to have been valued for their meat. Goose fat and feathers were also exploited. Geese were sometimes kept by mills and malting houses, where they would be fed various by-products (Grand and Delatouche 1950). This is interesting given the presence of a mill and malting activities at West Cotton.

Duck (*Anas sp*)

Duck bones are only slightly less common than goose bones, and also tend to decrease in the later period. They probably belonged to domestic duck, again due to their rather large size. They are mostly adult. Cut marks on their bones were also noticed.

One very small duck bone from the earlier period belongs to a garganey (*Anas querquedula*) or, more probably, to a teal (*A. crecca*). A somewhat larger (but still small) bone comes from the later period and may also derive from a wild duck.

Ducks are found much more rarely than geese both in archaeological sites and in historical sources. Their meat was not very valuable and ducks were sometimes considered to be dirty and unpleasant animals (Grand and Delatouche 1950). It is therefore possible that they are more closely associated with sites of low status.

Pigeon/dove (*Columba sp*/*Streptopelia sp*)

This taxon represents the most common bird in the later medieval period (Table 13.1). It is, however, quite common in the earlier period, and its frequency supports the identification of the circular foundation as a dovecote belonging to the twelfth-century manor. Nine of the 23 pigeon bones from the earlier period come from this building.

Approximately 75% of the later medieval pigeon bones also come from the area around the dovecote, which is thought to have survived into the earliest part of this period (AD 1250–1300; Chapman pers comm).

Almost 30% of the pigeon bones were juvenile and all parts of the skeleton were more or less equally represented. Only one bone, from the earlier period, bears cut marks.

Since the size of the domestic pigeon is very variable we could not use metric criteria to distinguish between the different species. However, the presence of the dovecote could indicate that most of the bones come from domestic animals kept on the site.

The pigeons were perhaps mainly used for their meat, and this is supported by the high number of juvenile animals. Pigeons were supposedly an important standby in medieval times during winter when fresh meat was scarce, and they also provided valuable manure (Drummond and Wilbraham 1939).

Other birds

Among other birds, several species of little economic value were found. Among these corvids are the most common (Table 13.1). Neither small, eg jackdaw (*Corvus monedula*) size, nor large corvids such as raven (*Corvus corax*) size were found, hence we assume all the specimens belong to the rook/crow (*Corvus frugilegus/corone*) group. Very few juvenile bones were found.

Whether or not they constituted part of the traditional

English dish containing young rooks cannot be determined.

The presence of several birds of prey (Table 13.1) is interesting. Birds of prey are more commonly associated with castle sites, where they are known to have been used by the aristocracy for hunting. This is clearly not the case for West Cotton, where they might have been killed for amusement. The most common bird of prey is the red kite (*Milvus milvus*; several ‘non countable’ bones were also found) which is supposed to be a scavenger. Perhaps these birds used to be commensal too, scavenging the village refuse, and hence becoming an easy target. Baxter (1834, 627) lists kite under vermin and considers it “...an insidious thief attacking young poultry, pheasants, partridges, etc” and recommends a method for ensnaring this “...by no means common” bird.

In the late twentieth century the breeding area of the red kite was limited to central Wales (Sharrock 1976), though it was apparently more widespread in former times. [Editors note: and in the early twenty-first century has been successfully re-introduced in England and Scotland]. Red kite bones have also been found on other medieval sites in different regions, such as Fishergate, York (O’Connor 1991) and Launceston Castle, Cornwall (Albarella and Davis 1994a) as well as in Northampton (Bramwell 1979).

Other vertebrates

Amphibians

Large numbers of amphibian bones were found both in the hand collected assemblages and the sieved ones (Tables 13.1 and 13.2). They probably all belong to the frog/toad (*Anura*) group.

The presence of amphibian bones in such large quantity indicates a wet environment – hardly surprising in view of the nearby location of the river. The presence of large numbers of water voles also probably reflects the closeness of the river.

Fishes

These were kindly identified by Andrew Jones. Fish bones are uncommon in any period, which is strange given the closeness of the river. Only four fish bones were found from the hand collected assemblage and 41 from sieved samples (Tables 13.1 and 13.2). Most belong to relatively small fish, hence their scarcity in the hand collected assemblages. However, compared to the number of amphibian bones of similar small size, they still appear to have been quite uncommon. It really seems that at West Cotton people were not keen on fish and/or fishing.

Most of fish bones come from contexts within buildings. Since they are presumably better preserved in these contexts it is possible that the poor representation of fish bones

can be explained, at least in part, by their poor survival in external features.

Both freshwater fishes (eel, perch and cyprinid) and sea fishes (herring and ling) were identified.

The eel (*Anguilla anguilla*) bones all belong to medium-sized individuals, 400–700mm in total length. They were probably fished in the river, following an old and still common British tradition. The early fourteenth-century *Luttrell Psalter* depicts eel traps positioned in the leaf of a watermill (Backhouse 1989). This represents a scene from everyday life which could even typify West Cotton in earlier times. However, since large scale netting on the tidal reaches of the main estuaries was already practised in this period, eels may simply have been imported along with the herrings.

A perch (*Perca fluviatilis*) preopercular (from a 300–400mm long fish) and a cyprinid pharyngeal tooth plate (from a fish less than 150mm long) also testify to some interest in riverine resources.

Herrings (*Clupea harengus*) and ling (*Molva molva*) had necessarily to come from the sea, and represent the only direct evidence for a resource which does not derive from the site or its immediate catchment area. Perhaps they were brought in smoked or salted. It is interesting that not only small fish (the herrings were 250–300mm long) but also large fish (a ling cleithrum being from an individual at least one-metre long) were brought from the sea.

The site

Animals were, without doubt, extremely important at West Cotton, and served as sources of all kinds of food, such as meat, fat, milk, cheese and probably eggs. Hides, skins, dung and especially wool were certainly also very important, and no doubt animals and their products in excess of local requirements could have been sold or exchanged at market. In this way West Cotton would have been part of a wider economic system. Power from oxen and horses almost certainly aided in the preparation of the soil for crops, and in their subsequent processing.

Food production was almost entirely derived from the domestic animals. Hunting and fishing were quite clearly subsidiary activities. Despite the presence of the river, some of the fish were imported rather than fished locally.

The animal bones fail to show any real variation between different areas of the site. Most of the bones were probably not in their primary location, having been moved by dogs. However, in view of the presumed importance of dairy products and wool, areas specialising in these tasks must have been present on the site as documentary evidence indicates (Basing 1990).

The mid-thirteenth century change in the site does not seem to be reflected by any substantial change in the nature of the animal economy. Changes of course occurred between the two periods, but they seem to be a consequence

of regional economic trends, rather than the transformation of West Cotton from manor to hamlet.

There is little evidence for any possible decline in status of the settlement. Pigs, known to be more common on high status sites (Grant 1988; Albarella and Davis 1994a), are slightly less frequent on the site when it became a hamlet, but this is more probably related to a general countrywide development, perhaps in some way connected with the increasing importance of wool sheep.

Birds, which may signify higher status, appear to have become less common with time at West Cotton. But the change is small and may simply reflect increasingly poor preservation. Furthermore pigeons, whose meat was much valued in the Middle Ages, actually increased in number.

We have no evidence that less meat was consumed. Non edible species, such as dogs and cats, which would have become relatively more common in times of low meat consumption, were more or less equally frequent in the two periods.

Real economic changes which occurred on the site, such as the increased importance of wool production and the possible replacement of some oxen by horses for ploughing, do not seem to bear any relation to the changes which occurred to the status of the site.

In conclusion, the development from manor to hamlet was not paralleled by any dramatic change for better or worse in the economic life of the inhabitants of West Cotton. Time passed, buildings metamorphosed, but the life of the inhabitants remained basically the same.

West Cotton in a more general context

West Cotton and Burystead/Langham Road

The most obvious sites to compare with West Cotton are Burystead and Langham Road, also rural sites, located two miles away in Raunds (Audouy and Chapman 2009). Animal bones from these two sites have been studied as a single assemblage (Davis 1992b and Davis 2009). The comparison is unfortunately somewhat handicapped as at Burystead/Langham Road the largest sample is of late Saxon date, a period for which we only have a small sample of bones at West Cotton. Moreover, no division in the medieval period was feasible at Burystead, so none of the medieval economic changes at West Cotton could be discerned at Burystead/Langham Road.

However, we can observe many similarities between these two sites, such as the extensive destruction of bones by scavengers, the prevalence of sheep in all periods, the importance of equids, and the kill-off patterns of the cattle and sheep suggesting a mixed economy.

It is also interesting that, as mentioned above, the sheep kill-off pattern in the late Saxon at Burystead resembles the earlier rather than the later period at West Cotton. This could indicate a gradual trend towards increasing wool production with time.

The late Saxon cattle from Burystead/Langham Road

are comparable in size with the medieval animals from West Cotton. Thus no size change appears to have occurred in the cattle of Northamptonshire during the period late Saxon to late medieval. What is apparent, however, is a contemporary regional variation, with larger cattle in Northamptonshire, Yorkshire (O'Connor 1986) and Leicestershire (Gidney 1991a and 1991b) and smaller cattle in Cornwall (Albarella and Davis 1994a), Devon (Maltby 1979) and Northumberland (Davis 1987b). Unfortunately too few measurements of sheep were taken at Burystead/Langham Road to enable confirmation of our suggestion derived from the West Cotton data, that sheep showed a pattern similar to that of cattle.

In brief, it seems that the two sites, West Cotton and Burystead/Langham Road, had a very similar animal economy. Minor differences, such as the much longer list of identified taxa at West Cotton, probably simply reflect the larger size of the assemblage from this site.

Villages, towns, castles

Having compared the West Cotton faunal assemblage with another local one, it can be compared with assemblages from other medieval and post-medieval villages, towns and castles countrywide. For the sake of consistency, we have had to use NISP data, which are probably poorer estimates of the actual numbers of livestock, rather than MNI.

With its relatively high percentage of sheep and low percentage of pig, the West Cotton faunal assemblage confirms our predicted village faunal composition, as the West Cotton plot sits well within the distribution of plots of other rural sites. In the medieval manor and hamlet period (1250–1450), West Cotton appears among the sites with the highest frequency of sheep. This could indicate that wool production was particularly important at West Cotton, though we have to admit that it may merely reflect better recovery of smaller (ie sheep) bones and teeth, and perhaps a combination of these two factors is the correct explanation.

The scarcity of wild-animal remains is another factor that seems to characterize rural sites and to differentiate them from castles.

Any further attempt to view West Cotton in a general rural context is handicapped by the general smallness of faunal assemblages from villages.

Medieval and post-medieval sites

The two West Cotton periods also still fit quite well in the chronological pattern, as the change in frequencies of species at West Cotton seems also to represent a countrywide phenomenon, ie the increase of sheep and decrease of pig (see also Grant 1988).

The increasing importance of equids, and a tendency to slaughter sheep at an older age and cattle at a younger age, have also been noticed on other sites, and may reflect general trends.

A new economic system

As we have seen, the transformation from manor to hamlet did not dramatically change the West Cotton economy. Nevertheless, several changes did occur which can reasonably be explained in terms of countrywide rather than local trends.

The absence of any size change of the West Cotton animals reflects the well attested stability of livestock in the Middle Ages (see Armitage 1982). A substantial size increase, apparently gradual in sheep and sudden in cattle, appears to have occurred somewhat later – during the sixteenth to seventeenth centuries (see Kerridge 1967 for the historical evidence and Albarella and Davis 1994a for the archaeological evidence). Nevertheless, we cannot assume that the absence of any size increase necessarily reflects the lack of any improvement in husbandry techniques. Thornton (1992) has demonstrated that at Rimpleton manor, Somerset, improvement in livestock productivity in the thirteenth and fourteenth centuries was not manifest as animal-size increase, but as improved fertility and reduced mortality. These are extremely difficult to detect archaeologically.

However, other changes which occurred between the two medieval periods were archaeologically detectable, and we suggest that they could be linked. The increased importance of wool in the later period may to some extent have occurred at the expense of mutton production. At the same time a small decrease of pig numbers occurred, perhaps due to a decline of woodlands.

We suggest the possibility that a reduced pork supply and a non-intensive strategy of mutton production were the causes of the increased extent to which cattle became a source of meat rather than power. If correct, we would be able to understand why we find an increase in the numbers of younger cattle in the later period and we would be able to relate this altered strategy in cattle management with the increasing degree to which horses were used for power. Therefore it appears that the later period saw the introduction of a new economic system, in which wool, beef and horse-power had become more important, and mutton, pork and cattle power less important. This change was not at all revolutionary, but gradual. In general terms, however, a contemporary observer would have seen these changes, but the similarities between the two periods would have seemed greater than the differences.

Summary

Over 5,000 hand-recovered animal bones and teeth were identified and recorded from West Cotton. Like many other medieval sites most of the bones belong to cattle, sheep and pig.

Sheep were the most common taxon and their numbers increased with time, with a shift towards older sheep probably reflecting a countrywide trend towards increased

wool production, but meat and milk were also used.

Cattle were probably used mainly for traction, as well as meat and dairy products. This animal decreased in number, probably as a consequence of the increased importance of sheep, and perhaps also because some of the work oxen were replaced by horses which became slightly more frequent. The study of the kill-off pattern of cattle is handicapped by the small size of the later period sample, although it can be tentatively suggested that a higher number of juveniles were killed in the later period. This may indicate an increase of beef production and decreased use of cattle as work beasts.

Pig numbers also decreased, perhaps also due to the increased number of sheep. However, a general contraction of woodland must also be considered as a possible factor. Pigs were clearly exploited for meat and lard, as indicated by the high number of immature animals.

Equids, probably all horses of pony size, are quite common in all periods and must be added to the list of the most important animals in the economy of the site. They were clearly used for traction and, as the high number of butchered bones shows, also for feeding dogs and probably for human consumption, despite the well known taboo against horse flesh.

Other domestic animals such as dogs and cats were common, while wild mammals, in particular deer, were very rare. Among taxa of great interest is the polecat. Unfortunately we do not know whether it was the domestic form (ie ferret) or the wild animal.

Birds are not abundant, but their scarcity may to some

extent be the result of recovery bias. The most common birds are domestic fowl, goose, duck and pigeon, which probably served as a subsidiary source of meat, fat, and dung as well as eggs and feathers. While a few wild geese and ducks were probably present, the pigeons, in view of the presence of a dovecote, were more probably all domestic.

Amphibians were very common, undoubtedly a reflection of the wet environment and the nearby river. However, very few fish have been found. Eels, probably fished from the river, and herring purchased at market were the most common species.

The representation of different parts of the skeleton of all species has largely been influenced by scavenger action, preservation and recovery. No bias caused by human activity can be observed, and it is therefore possible that all animals were reared, slaughtered and butchered on the site.

The bones had been severely fragmented by scavengers, which seems to characterise assemblages of animal bones from rural sites. Cut marks on horse, cat and dog bones as well as on the main food-animal bones probably reflect the importance of animal skins, and the use of cat pelts is supported by the young age at which they were killed.

No size change occurred between the two medieval periods at West Cotton, and both cattle and sheep were comparable in size to contemporary animals from Yorkshire and Leicestershire, but were larger than those animals from Cornwall and Northumberland. It is possible that this regional variation in the size of farm animals may reflect the presence of 'improved' animals in the central counties of England.

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14 The human bone

by Simon Mays

Medieval infant burials

Three medieval infant burials were recovered, two from beneath the floors of buildings and one from a yard.

Burial 1648, in external open yard, BY3/4, tenement B

The skeleton is about one-third complete, parts of the trunk, arms and upper legs are present. Bones well preserved. The long-bone lengths suggest an age of about 30–31 weeks in-utero (Scheuer *et al* 1980).

Burial 3065 under the floor of barn, C8, tenement C/D

The skeleton is virtually complete, bones very well preserved. Dental development indicates it is neonatal (Ubelaker 1978, fig 62), and the long-bone length (Scheuer *et al* 1980) suggests it is perhaps slightly premature, about 37 weeks in-utero.

Burial 4329 within medieval manor range, barn and malt house, S19

Skeleton is about two-thirds complete, bones well preserved. Dental development indicates that it is neonatal (Ubelaker 1978, fig 62), and long-bone length (Scheuer *et al* 1980) suggests 40–44 weeks in-utero; full term.

Discussion

Three burials of infants whose ages range from about 30–44 weeks in-utero were studied. The normal gestation period for a human foetus is 40–42 weeks, but after 28 weeks it is potentially viable and, given care, may survive (discussion in Molleson 1989). Hence all three inhumations studied were potentially viable. The locations of these burials in the corner and against the wall of two agricultural ranges, and in a pit cut through accumulated midden debris is suggestive of still births or unbaptised infants dying shortly after birth.

The skeletal evidence is consistent with this, however, it is not possible to determine in each individual case whether the infant was still born or died in the immediate post-natal period.

It may be noted that the two barns were attached to the twelfth-century and later thirteenth-century manors, while the yard was part of tenement B, and it has been suggested that this was also a complex of high status origin (A Chapman *pers comm*). They are therefore not within peasant tenements, as might have been assumed, although in two cases they may have been buried following conversion of the properties to peasant tenements.

Table 14.1: Metric data for medieval inhumations (mm)

Burial		1648	3065	4329
Femur length	left	57mm	72mm	80mm
	right	–	72	–
Tibia length	left	–	61	–
	right	–	61	74
Fibula length	left	–	58	–
	right	–	58	70
Humerus length	left	–	62	73
	right	–	62	–
Radius length	left	–	49	59
	right	40	49	–
Ulna length	left	–	58	67
	right	46	58	–
Clavicle	left	–	42	49
	right	–	42	48

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