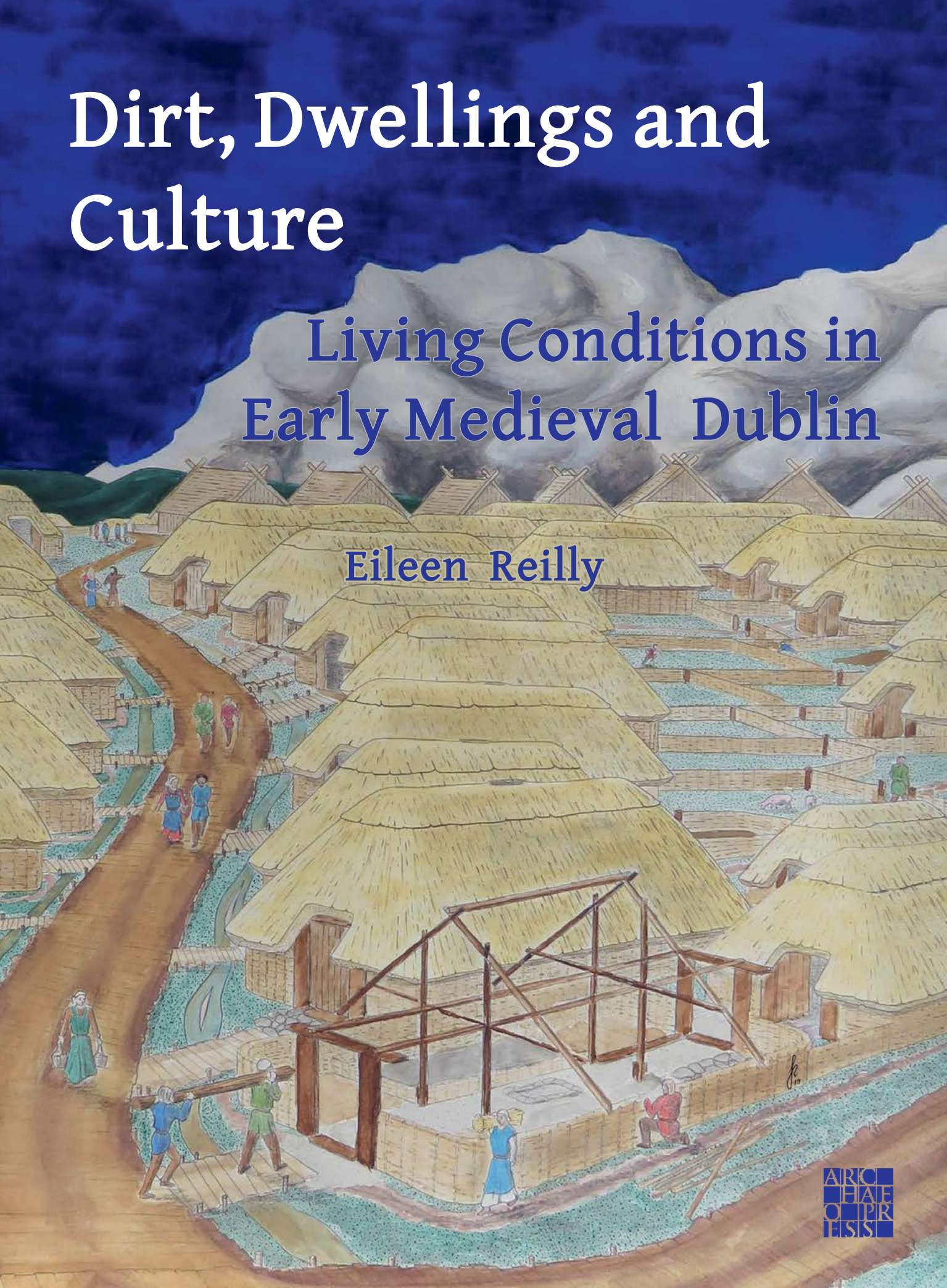
Dirt, Dwellings and Culture

Living Conditions in Early Medieval Dublin

Eileen Reilly



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Dirt, Dwellings and Culture

Living conditions in Early Medieval Dublin: A case-study from Fishamble Street

Eileen Reilly

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Preface

My wife, Eileen, passed away in July 2018. She left behind the bulk of this monograph and it has been completed through the good offices of her colleagues Dr. Lorna O'Donell and Professor Aidan O'Sullivan.

It is an epitaph to a scientist and a scholar, and to her love for her native city.

Eileen was an archaeologist to her fingertips. And she was also a Dub. Working on the Fishamble Street samples was a thrill for her. A marriage of interests.

Her scientific interest in coleoptera was driven primarily by what they could tell us about the human experience. But she thought they were beautiful too. Her beetle specialism – I used to enjoy the reaction of people when asked what she did - was not an alternative to archaeology, it complemented it.

While this volume is almost entirely Eileen's work – it was described to me as 95% finished when I retrieved it from her computer's systems – others have worked to get it over the line.

I am grateful to them.

Eileen was grateful too to the Irish Research Council who funded this research by way of a Government of Ireland Post-Doctoral Research Fellowship, 2013-2015.

One of the most difficult things to reconcile about her passing is the loss of her potential and the contribution to the profession she would have made. As an environmental archaeologist she broke new ground and I know she was looking forward to going further.

Eileen, of course, was more than an archaeologist even though the subject consumed her. She was a mother, a wife, a sister, and a daughter. She was a caring and warm human being, a loyal friend with a beautiful personality. Everyone liked her.

I am pleased we have been able to get this book published for her and I hope she won't be too cross about some of the assumptions we have made to help complete it.

She is hugely missed by her friends and family.

But most of all by myself and her beautiful daughter Áine.

Rónán O'Brien
October 2023

Preface

I will always remember when I first visited Pat Wallace's excavations on the Fishamble Street site, Dublin 37 years ago. I was staggered by the level of organic preservation. I hadn't seen anything like it. It was a treasure trove of archaeology and not least for an environmental archaeologist. I had seen waterlogged organic preservation before on early urban sites in Britain but nothing on that scale.

Pat and his crew had a great responsibility on their shoulders, as they knew full well, and incredible pressure was placed on them for the duration of the excavation. Pat was very much inclined to environmental sampling, not least because of Frank Mitchell's regular visits. Finbar McCormick had also worked on the site and was instrumental in encouraging the collection and sampling of several tons of animal bones for his study and for further research. Also the structural wood of the houses was identified as it was excavated. It did not therefore take much persuasion to set up a sampling programme for the non-wood macro plant remains which an enthusiastic student of mine with a love of plants – Siobhan Geraghty – began for her Master's research. The National Museum facilitated the work with equipment for processing the samples and a place for Siobhan to work.

Siobhan and I noted the presence of insect remains in the samples back then in the early 1980s, and realised the potential for their study from the ongoing work of Paul Buckland and Harry Kenward in York. However, as it happened, some of the pioneering work on insects from archaeological sites was carried out by G. Russell Coope from Birmingham University on samples from Brendan O'Riordain's excavations at Christchurch Place and Winetavern Street.

Unfortunately no one was available at that stage to carry out an archaeoentomological study on the Fishamble Street samples.

Fortunately the sampling strategy we put in place was an optimistic one and involved taking more samples than Siobhan's project could deal with. The realisation that their content would hold potential for future research was accepted by Pat and the National Museum, and hence with storage advice from us, has meant that over 30 years later they were available for Eileen's work.

This study was always waiting to happen, but it needed the right person to take it forward and that person has been Eileen Reilly, whom I have known for over 20 years. Her interest and enthusiasm for environmental archaeology found a focus in archaeoentomology when she was studying for an MSc with Paul Buckland in Sheffield. She came back to Ireland energised by the possibilities of insect studies and first realised the potential for Viking Age samples from the Waterford excavations. We spoke about the Fishamble Street material back then and the possibility that the samples may still be present and viable (as they were for those from Waterford).

With Lorna O'Donnell this possibility became a reality when they successfully obtained funding to prospect the Dublin samples.

There was a huge amount of work involved in going through the samples and checking their viability before the extraction and analysis could be undertaken. This was done with maximum efficiency and this tremendous volume of information and interpretation has been the outcome. The new insights that Eileen has gained from the study both enhances but also considerably 'fine tunes' our understanding of the variation in living conditions of this internationally important site – fully justifying the curation and storage of the samples for over 30 years.

I am delighted that this work has been published. It reflects well on all concerned – Pat Wallace and his excavation team, the National Museum for having curated the samples for over three decades, and especially the work of my friend and colleague Eileen Reilly, who saw the value of the samples and carried out this exemplary study.

Postscript to preface

Mick Monk: I wrote the above a couple of years ago, shortly after Eileen asked would I do so.

I didn't think I would need to write a postscript. To be honest I find it difficult to do this because I still cannot believe Eileen is no longer with us.

She had so much more to give to life, to her family, her friends, and her profession. She was supportive to everyone in all areas of her life and not least her friends and colleagues.

Every one of us in our small group of environmental archaeologists in Ireland have cause to thank her for her friendship and the support she has given us in our work. She gave freely of her time to help and advise.

Her enthusiasm for her work was contagious. She loved nothing more than discussing this with others and interacting with colleagues about their work. Although a specialist, she was always able to see the wider relevance of the results of her research and the implications it had for cognitive environmental and cultural archaeological interpretations.

This was particularly the case for the research into the early medieval and Viking age urban environments not only in Ireland but across Europe, to which she has made a major contribution. It is a travesty that she was on the threshold of taking this research to another level when she was taken ill.

Eileen's contribution and passion for archaeoentomology is to be seen in many scholarly publications that she published in her own name or contributed to. However, I know the work she carried out on the Fishamble Street samples, and the bringing this together for publication, was of key importance to her because it was work showcasing the international importance of the archaeology of her home city.

November is a time to remember, and a time to be thankful. I will always remember you Eileen and be thankful that I knew you as both a good friend and a colleague. I, along with the others in our group of Irish environmental archaeologists, will continue to miss your friendship, your scholarship, and your encouragement of our own work. This volume, along with your other publications, will serve to remind us of your pioneering scholarship and presence in our lives.

Mick Monk
November 2018

Preface

This is the second set of comments that I have written on Dr. Eileen Reilly, following her death in 2018, in the space of the last two months in the Summer of 2022. It is not a surprise, given the normal half decadal pace of academic publishing that I am being asked to do this at this date. What remains a surprise that I find myself having to writing them at all. The tragedy is, of course, that Eileen was taken from us all much to young.

Eileen was educated in archaeology at University College Dublin, graduating in 1992. She undertook an MSc in Environmental Archaeology at Sheffield in 1995 which was followed by a PhD on insect biodiversity in modern woodlands at Trinity College Dublin which was awarded in 2008. Eileen also worked as a consultant on archaeoentomology of a number of important archaeological sites particularly the Iron age Corlea Bog Trackway and a range of Late Bronze, Iron and Viking age deposits from the waterfront at Dublin; such as, Temple Bar and, most importantly, Fishamble Street. Eileen was on of the few archaeoentomologists to work deliberately on urban and settlement deposits, with their rich insights into human life and behaviour, rather than concentrating the 'paleoecological' role of the discipline. This probably speak to her love of the archaeological and her appreciation of what this work can bring to the archaeologists and the sites on which they work. Towards the end of time with us Eileen had started work on the insect faunas from the Drumclay crannog site. I have been privileged to see the draft of some of this work and it is highly innovative and analytical. Perhaps Eileen largest impact is that she promoted the discipline of Environmental Archaeology, and archaeoentomology in Ireland with such dedication and charm that its futures seemsed assured.

My initial contact with Eileen was the result of supporting her early work, particularly confirming her identifications, when she started to work as an independent consultant back in the 1990s. For several years she was a constant visitor to the lab at Birmingham, an event I always looked forward to. As the years went by, and life and family intervened for both of us, this happened less often. We did continue to have 'nerdy' conversations about long dead beetles and when we met at conferences we would great as old friends. Mainly, this was due to Eileen being one of those people who had the gift of just picking up the conversation from the last time we spoke often years previously.

I also hoped, or dreamed, that, as I headed towards the last 10 years of my working life, Eillen would start to take over my UK work from me. After all she was a decade younger than me, was the safest pair of hands around, and would be a good 'inheritor'. Amongst the least important implications of her early death, is that, perversely, I have started to inherit projects from her. This passage of events is clearly the wrong way around and, in its own minor way, is deeply sad.

David Smith

January 2023

Editors' Note

Dr. Eileen Reilly would have written a better book than this, but she just didn't get the time to do it. As editors, we have taken her early drafts, her texts and illustrations, and, with the addition of a paper as a concluding chapter that she was then co-authoring with one of us (Aidan O'Sullivan), we have sought to complete the draft text, as we think she may have finished it. We know that Eileen would have done much more work if she had the chance and can imagine her going back and forth over the text, checking details, conferring with colleagues, and honing her analysis. However, as the Irish Quaternary scholar Prof. Frank Mitchell once said at a conference in TCD many years ago, 'The best is the enemy of the good'. This book is not the best that Eileen would have done; she would have done it far better than us, but we hope that the scholarly community will agree, it is still very good, and a vital contribution to the archaeology of her native city.

Lorna O'Donnell,
Aidan O'Sullivan,
and Stephen Davis
December 2020

Acknowledgements, by Eileen Reilly

This book began as the result of a project undertaken under the auspices of The National Museum of Ireland and co-funded by them and the Environment Fund of the Department of Arts, Heritage and the Gaeltacht in 2011–12. However, it was clear that many of the findings, especially those related to living conditions, needed to be explored and discussed in a wider European context. A subsequent application to the Irish Research Council resulted in a successful Postdoctoral Fellowship at UCD School of Archaeology (2013–15), under the eponymous title of this book, which allowed for many of these wider themes to be examined. There are, therefore, many people to thank for helping to bring this work to fruition.

I would like to thank Dr Patrick Wallace, retired Director of the National Museum, and Dr Raghnall Ó Floinn, current Director, who supported the application to the Environment Fund and were instrumental in shepherding the project in its infancy; Eamonn Kelly and Maeve Sikora who steered things in-house, and Tara Jennings and Eamonn McLoughlin for financial management.

Thanks to all the staff of Collins Barracks who facilitated the sample inventory project. Thanks to Brenda Malone and the staff of Treacy's for help in transporting the samples from Daingean to Collins Barracks and to volunteer Tommy Leonard for help in moving samples within the Quartermaster's Store in Collins Barracks.

To the numerous archaeologists and labourers who worked on the excavations at Fishamble Street we all owe a particular debt of thanks. Without their meticulous excavation, recording and sampling of the deposits and features, none of this work would be possible.

Heartfelt thanks must go to Adrienne Corless, former post-excavation manager of the Dublin Excavations Project, for supporting the project in every way possible; to Mark Gallagher, whose encyclopedic knowledge of the stratigraphy of Fishamble Street was invaluable in trying to identify the origins of each and every sample inventoried, and to Johnny Ryan, whose stunning digital rendition of the original site plans was critical to visualizing the sample locations.

Thank you to Darren Mann, Head of Life Collections at the Oxford University Museum of Natural History, for access to the entomology collections and for his generous assistance on many of the more difficult identifications.

To a great number of people who have provided useful criticisms, comments, discussions on aspects of this work over the last two years: Rebecca Boyd, Steve Davis, Susan Lyons, Mick Monk, Ellen O'Carroll, Lorna O'Donnell, Jean O'Dowd, Aidan O'Sullivan, Bettina Stefanini, Ingelise Stuijts, and David Smith.

Finally, and most importantly, to Lorna, who undertook the inventory with me and whose professionalism, thoroughness, and dedication to the task in hand were extraordinary and always a source of inspiration; to Bettina, without whom this project would never have happened; to Rónán and Áine, who make everything worthwhile, and to my family and in-laws, who have always been proud of my achievements, as I have been of theirs.

I dedicate this book to all of them but especially to my late mother, Jo Reilly (1946–2009).

Eileen Reilly
Dublin 2016

Chapter 1

Introduction

'HOUSE, *n.* A hollow edifice erected for the habitation of man, rat, mouse, beetle, cockroach, fly, mosquito, flea, bacillus and microbe.'

The Devil's Dictionary, Ambrose Bierce (1911)

The Vikings have left an indelible mark on the Irish imagination – from the vivid contemporary accounts of their violence and barbarism in the *Annals*, to archaeological sites like Wood Quay, and the political controversy that surrounded it in the 1980s, to the perception of Dublin as a 'Viking town' by both Irish people and visiting tourists today. Many of Ireland's towns and cities – such as Dublin, Wexford, Waterford, Cork and Limerick – owe their origins in part to the original Viking Age settlements of the 9th and 10th centuries AD. Archaeology has contributed hugely to our understanding of the Viking Age in Ireland, through meticulous excavations of urban and some rural sites, and subsequent public display of Viking Age artefacts and house reconstructions in our museums. But how much do we really understand about what daily life was like in a 10th- or 11th-century town? What were Viking Dublin's houses like to live in, what were their interiors like, what about their backyards, the streets of the town, and the surrounding landscape? Can we reconstruct that everyday human experience, or is this still somewhat out of reach?

In Dublin, we are fortunate to have the extraordinary legacy of the archaeological excavations undertaken by the National Museum of Ireland, the Office of Public Works, and the several Irish commercial archaeological sectors – archaeological excavations set in the Viking town at the heart of the modern city – on which to build our understanding of past living conditions (Fig. 1). In total, more than 383 Viking-age buildings have been excavated in the city, the largest proportion of which were uncovered in Fishamble Street (1977–81), in works under the direction of Dr Patrick Wallace (e.g. Wallace 1992; 2016; Boyd 2012). At Fishamble Street, the preservation of archaeological and environment deposits was extraordinary due to waterlogging, as the anerobic quality of the soils enabled the survival of organic remains. Particularly significant for this study were the excavations named Fishamble Street II (Licence No. E172) and Fishamble Street III (Licence No. E190), with the latter having more plentiful and better preserved occupation levels. Examining the plant macrofossils, animal bone, shell, insects and internal parasites contained in these urban settlement deposits can give us insights into the diet, living conditions and health of past peoples, as well as hinting at the types of the wider rural landscape that surrounded the urban settlement.

This study began as a project entitled the 'Fishamble Street Inventory Project', undertaken under the auspices of The National Museum of Ireland and co-funded by them and the Environment Fund of the Department of Arts, Heritage and the Gaeltacht in 2011–12 (O'Donnell and Reilly 2012). A subsequent Irish Research Council Postdoctoral Fellowship at UCD School of Archaeology (2013–15), entitled 'Dirt, Dwellings and Culture: Living conditions in Early Medieval Europe, a case-study from Dublin, Ireland' investigated living conditions in early medieval settlements in more depth, time and space, and in particular explored the implications of dirt and hygiene in early medieval settlements in Ireland and Europe.

This current book then originates from the examination of insect remains from over 100 of the original soil samples taken during the excavation of Fishamble Street. The samples were taken from within

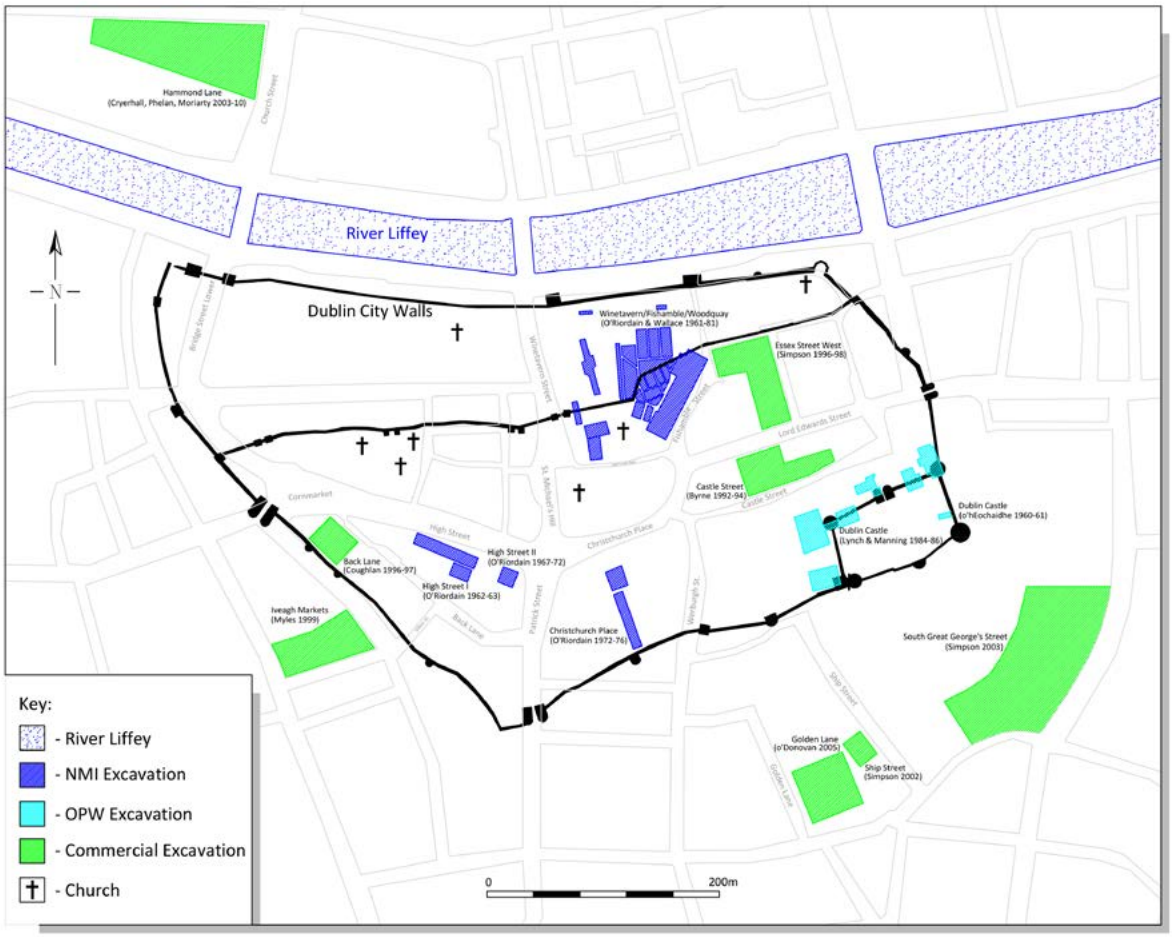


Figure 1: Location map showing sites of major NMI, OPW and commercial archaeological excavations in Dublin, 1962–2010 (© Johnny Ryan).

houses, from animal pens, pits, drains and yards, and it is hoped that this work will complement the study of plant macrofossils published by Siobhán Geraghty (1996).

Insect analysis

Insect remains have been utilised in archaeological and palaeoecological research since the late 1950s – an approach usually termed as *palaeoentomology* or *archaeoentomology*. The method developed at the University of Birmingham, UK, where Fred Shotton, Peter Osborne and especially G. Russell Coope undertook numerous studies of Pleistocene faunas (e.g. Shotton 1959; 1965; Coope *et al.* 1961; Osporne and Shotton 1968). Through careful examination of fossil specimens with comparative collections in Britain and other parts of the world, Coope and others proved that while these species might now be extinct in Britain, they were in fact still present around the globe. This hugely important discovery led to the development of a powerful climatic model, known as the *Mutual Climatic Range* method, which utilized the temperature preference of individual species of beetles to reconstruction temperature changes at the end of the last Ice Age (Coope *et al.* 1971).

It has also been recognised since the 1950s that fossil insects could provide very precise and important data on past environmental conditions, from the local site to landscape scale, for archaeologists and palaeoecologists alike. Beetles, in particular, have proved especially useful due the fact that they survive well in waterlogged archaeological deposits, are relatively abundant, have generally narrow habitat preferences, and, in some cases, have a sensitivity to climate. Through analyzing these habitat preferences and grouping insects into ecologically related habitat groups a picture of changes in local environmental conditions through time and across a site emerges.

While exceptional and groundbreaking work was undertaken across a range of sites by the likes of Peter Osborne and Maureen Girling (e.g. Osborne 1969; Girling 1976; 1977; 1978; 1979a; 1979b etc.), arguably the most important contributor to the field of urban archaeoentomology was Harry Kenward, who, since the 1970s, developed the science to particularly address the complex archaeology found on deeply stratified, waterlogged sites of this nature. He, along with other scientific colleagues, analyzed huge volumes of organic material excavated from sites all over York during major redevelopment of the city centre in the 1970s and 1980s (for a review see Kenward 2009). Kenward, and more recently David Smith, have worked to establish 'indicator packages' of ecofacts which indicate particular on-site activities: these include stable manure (Kenward and Hall 1997); smoke-blackened thatch (Smith *et al.* 1999); cess (Smith 2013; 2020); and leather production (Hall and Kenward 2011).

Kenward and colleagues have also identified the 'rural' origins of many of the insect communities observed on urban sites, suggesting that many species end up in towns by occupying artificially created niches that in effect mimic their natural habitats (Kenward and Allison 1994; King 2014). Some have even become dependent on humans for their survival (*synanthropic*) and are now very rare, or possibly extinct in nature. All of the above make insect analysis a particularly powerful tool when attempting to reconstruct or re-imagine living conditions in Viking-age Dublin.

Chapter 2

Viking Dublin and the Fishamble Street Excavations in context

The establishment of a Viking presence at Dublin – the first raiding settlements

A detailed history of Viking-age Dublin is beyond the scope of this book, however, it is important to outline some of the important dates, events and 'players' in its early history to understand the ebb and flow of settlement activity on Fishamble Street.

Prior to the Scandinavian presence, there were certainly native Irish settlements in the vicinity of the River Liffey, including both secular and church sites. The earliest sustained Viking presence – as opposed to one-off raiding events – comes with the establishment of a defended ship camp or *longphort* somewhere along the Liffey, in probably AD 841. Viking hit-and-run raids had previously begun around the coast of Ireland – the first recorded one being in AD 795 – and these carried on into the first few decades of the 9th century. Fatefully, in the AD 830s and 840s, Viking raiders began to over-winter in defended encampments known as *longphoirt* (plural), instead of returning home after a summer raiding season. In AD 842, the *Annals of Ulster* states 'the heathens still at Dublin' (*Geinnti for Duiblinn*), implying of course that they had been there the previous year. The location of Dublin's first *longphort* or 'ship-camp' or 'ship-landing' has long been sought, and various suggestions as to its whereabouts have been made. O'Brien (1998) made a strong argument for its location at Kilmainham/Islandbridge, close to the location of a known Viking cemetery. Archaeological evidence suggests that it may have been located by a large pool on near the confluence of the River Poddle and the Liffey, southeast of Fishamble Street (Simpson 2010). Excavations on South Great Georges Street and Ship Street, the locations of which were in the past situated on the 'shoreline' of the pool of Dublin ('*Duib linn*') at the mouth of the Poddle, have revealed the remains of a number of early 9th-century Viking warrior burials, occupation evidence, and rivets related to clinker built ships (Simpson 2010: 426). Isotopic analysis of their skeletons indicates that two of the buried men were born and raised in Scandinavia, while the other two were from somewhere else in Britain or Ireland, possibly Scotland (Knudson et al. 2012).

Thus, the Viking settlement may have begun shortly thereafter in the mid 9th century, on the ridge about this settlement in the area bounded by Essex Street West, Exchange Street and Fishamble Street (collectively known as 'Temple Bar West'). There is archaeological evidence for small, sunken structures and two later 9th-century phases of post-and-wattle houses and animal pens. The 'homeland' of the Vikings who came to Dublin first may have been southern Norway, and many of the excavated Viking graves in the south and southwest of Norway contain artefacts of Irish origin (Valante 2008). Kaupang – the first and only 9th-century trading port set up in Norway – may have served as a catalyst or inspiration for the early foundation of *longphoirt* at Dublin, Limerick and Annagassan (cf. Kelly 2015), with goods, both raided and traded, being channeled back to lords and chieftains in southern Norway. The region of Vestfold, where Kaupang is situated, was possibly under the control of the Danish kingdom at this time, although this is not certain (Valante 2008).

Dublin developed before long into one of the most important trading 'gateway' centres of the era, alongside Kaupang, Birka, Hedeby and Staraya Ladoga (Figure 2). An important connection between Dublin and Kaupang is the presence of houses similar to the 'Type 1' house at Kaupang (Skre 2007). The layout of Kaupang and the format of the plots may have provided a model for the early trading centre at Dublin (Valante 2008). Whether these houses at Kaupang were the 'origin' of the Dublin Type 1 house is more complicated, however. These houses were not typical for Norway either, thus there was clearly



Figure 2: Important Viking settlements in northern Europe, AD 800 – 960 (© Johnny Ryan).

interaction and influence in both directions (see Boyd 2009), and Wallace (1992a) ascribed a pre-Viking, part-native Irish, part-northern European lineage to the Type 1 house with Viking influences (Wallace 1992a).

The precise historical personalities involved in these early raids and settlements are not known. However, the success of the *longphoirt* at Dublin and Annagassan led to attacks from other Scandinavian groups, the so-called 'Dark Foreigners', thought to be Danes seeking to recoup losses from political turbulence within the Danish kingdom. Various annalistic references note that Dublin, Annagassan, and, further afield, Anglesey and York were all attacked during the period AD 840–870 by 'Dark Foreigners' (Valante

2008: 67). In the mid 9th century two brothers, Olaf and Ivar, almost certainly from Vestfold, in Norway, now independent from Danish overlordship, arrived in Dublin to 'receive tribute' from the settled 'Fair Foreigners' there (Valante 2008: 178). It is clear they had personal ambitions of their own, as they were soon described as 'kings', rather than emissaries from other Norwegian kings. They attempted to assert control over the lucrative Irish Sea zone, including Scotland. The brothers possibly received tribute from the Scottish Isles during the AD 850s and 860s; however, Olaf was apparently killed receiving tribute from the Picts sometime around AD 870 (Valante 2008: 74). The late 9th century witnessed war and raiding between the petty Norwegian kingdoms, Vestfold, and the more powerful Danish kingdom. Harald Finehair, who started out as a petty ruler in southern Norway, emerged as the most important ruler in Norway in the late 9th century, and probably controlled Kaupang from this point forward, severing any direct Norwegian or Scandinavian link back to Dublin. The 'kings' of Dublin (Ivar and his descendants) were effectively independent from this point.

By the early AD 890s, however, alliances of native Irish kings claimed victories against the Viking settlement at Dublin. This culminated, in AD 902, with 'the foreigners' being 'expelled' from Ireland, specifically from Dublin, by, as the *Annals of Ulster* claim, '...Mael Finnia son of Flannacan, with the men of Brega, and by Cearbhall son of Muirecan, with the Leinstermen...' (Valante 2008: 78, from *Annals of Ulster, Annals of the Four Masters, Chronicum Scottorum*). However, it may have been that only the elite rulers were expelled, and some settlers remained, as there is archaeological evidence that some people remained living in Dublin. Some Viking graves at Kilmainham and Islandbridge were dated to the early 10th century. Importantly, settlement evidence at Temple Bar West showed no break in occupation from the late 9th to early 10th century (Simpson 2010: 421). It would appear, indeed, that only the rulers and their retinue were forced to flee. Historical sources then suggest that the Dublin Vikings went to Anglesey, the Isle of Man, and northern England, where their fortunes varied. There is no suggestion anywhere that they returned to their 'homeland' in Norway.

The return of the grandsons of Ivar to Dublin in AD 917 (and, around the same time, Waterford and Limerick) marks the real beginning of the expansion and development of Irish towns. Wallace (2005) argues for a strong influence from northern England on the subsequent layout of Dublin, where returning Viking leaders 'imported' notions of urbanization after witnessing the building of new towns there. This influence may have continued through political connections between York and Dublin in the first half of the 10th century (Clarke 1998: 331–380).

The founding (and re-founding) of Dublin and other new settlements, of course, did not take place in a vacuum. Early medieval Irish society was politically complex and hierarchical, with constant struggles for power between dynasties, and within a very short time the Vikings of both Norwegian and Danish descent were brought into political alliances with local Irish kings, including through marriage, and were fighting alongside each other, or against each other, for control of both territory and trade (Valante 2008: 102-117). These struggles for power would have impacted at different times on the population of Dublin, although undoubtedly there were also long periods of calm and prosperity. In practical terms, this meant there were periods when the population expanded, new houses were built, and crafts and trade prospered. There were also periods when attacks on the town resulted in the destruction of houses and deaths of the town's peoples. Equally, individual tragedies involving the losses of warriors in battles away from the town, possibly male heads of households and older sons, must have impacted on the fortunes of their families back in the town. While it might not always be possible to link a specific historical event to archaeological evidence, it is likely that the general period of unrest or strife can be identified. The early part of the 10th century was marked by much social and political unrest, as the returning Viking rulers re-established themselves. The later part of the 10th and early 11th century was also a turbulent time, culminating, of course, in the Battle of Clontarf in AD 1014.

What was the Viking town like in the late 9th, 10th, and 11th centuries?

We can imagine Viking Dublin in the 10th century as a densely packed, urban riverside settlement, defined by a bank and ditch enclosure, with the interior comprising of hundreds of wooden, thatched buildings, all closely grouped together along a few narrow streets and lanes, but with some open spaces as well. From above, it would have looked like a busy place, with people moving around the town or working near ships at the waterfronts. At street level, there would have been the pervasive smells of human waste and drains, the breeze off the estuary's mudflats, and the smoke of wood fires in domestic hearths. The sounds would have included the call of seagulls, the barking of dogs, the noises of craft workers in their workshops, and the voices of different languages being spoken.

This character of Viking Dublin can be reconstructed from a range of evidence, including historical and cartographic sources, but mostly from archaeological excavations carried out in the city by the National Museum of Ireland and by archaeologists working for commercial archaeological companies since the 1990s (Murray1983; Simpson 2000; Wallace 1992a; 1992b; 2017). It is from this archaeological evidence that we can best understand Viking Dublin's defences, streets, property boundaries, houses and buildings, fences, and, indeed, daily life, craft and industry. The most significant archaeological excavations at Dublin were the National Museum of Ireland's excavations at Fishamble Street, directed by Pat Wallace in the late 1970s and early 1980s, which by virtue of being extensive, revealed a streetscape, and the organisation of it through closely packed houses and plot boundaries (Wallace 1984; 1985; 1992a; 1992b). At Fishamble Street, twelve tenement plots can be traced more or less continuously across time, indicating the occupation of at least 150 different houses over 150 years (Wallace 1992a: 7). These houses faced onto the street, and behind it were long, narrow bounded property plots, which could be used for animals, gardens, and occasionally other buildings. Wallace's Fishamble Street excavations also revealed the wide range of craft production in the town, exploiting such resources as wood, leather, bone, antler, amber, and metals used for making domestic equipment, as well as items for trade and exchange (Wallace 1987; 1998; 2008). Indeed, the recovery of things that had to be brought into Ireland confirmed the scale and extent of trade contacts the town had along the North Atlantic trade routes, into north-west Europe and as far away as the Mediterranean. The presence of silk indicates trade contacts well beyond Europe's borders into Asia (Wallace 1987). More recent archaeological excavations at several locations around Dublin, such as High Street, Temple Bar West, Werburgh Street, and Exchange Street/ Parliament Street, have also revealed much about the town.

Viking Dublin's streets and pathways

As Viking Dublin's settlement grew and expanded from the late 9th century, it spread up along the contours of the slopes on the hill overlooking the River Liffey, and across time, a network of streets and lanes would have developed, with probably a sense of districts within the town. To some extent, those Viking streets are the origins of the modern city's streets today, and consequently they have only rarely been seen, and they remain untouched under metres of the modern urban streetscape (Wallace 1992b: 39). One of the earliest known Viking roads in Dublin – dating between the mid and late 9th century – was identified at Essex Street West, leading down to the river (Simpson 1999: 25). Two potentially early 10th-century roads were identified at Werburgh Street in the southern part of the town, the first being metalled and running eastwards around a mound. This was replaced by a larger road, which contained a heavier layer of metalling (Hayden 2002: 47). Thus we can see that the streets' surfaces and the pathways of the town were constructed of a range of materials, from clay, to timber, and occasionally stone. In the mid 11th century, some of the Winetavern Street pathways were built of timber (Wallace 1992b: 42).

Ordinary paths were also used, leading from the streets directly into property plots, houses and outbuildings, and a variety of these have been excavated in Dublin. A wood-lined pathway was excavated

at Exchange Street Upper/Parliament Street, with a woven wattle path on the north and brushwood on the south (Gowen and Scully 1996: 16). At Werburgh Street in the southern area of the town, numerous pathways led to the entrances of houses or were positioned alongside or to the front of the houses (Hayden 2002). These were constantly being mended and replaced. For example, a pathway leading to House E1 was initially floored by a layer of sod, then covered with grass and straw, before finally being laid with wattle screens (Hayden 2002: 47–49). At Fishamble Street, in the 10th and 11th centuries, pathways led from the street to the houses, which were set back several metres from the streets. The Fishamble Street paths were typically 1.5 m wide and were made of elongated woven mats laid on top of each other. Other paths consisted of trunks of wood laid on longitudinal runners. In some cases, they were constructed of gravel and paving stones (Wallace 1992b: 42).

Houses and other buildings

Dublin's Viking houses are amongst the best-known early medieval domestic buildings in Europe, and their technology, architecture and organisation has been broadly established (Wallace 1992a; 1992b; 2001). The houses excavated from Viking Dublin date primarily to the 10th and early 11th centuries (Murray 1983; Wallace 1992a). There is a small group of earlier buildings excavated at Temple Bar West which dates to the late 9th century (Gowen and Scally 1996; Scally 2002; Simpson 1999; 2010). Viking Dublin's buildings can also be compared with the Viking-period houses from Waterford (Hurley and Scully 1997), Wexford (Bourke 1990) and Cork (Hurley 2010), which generally date to the 11th and 12th centuries. Wallace's (1982a; 1992a: 19) architectural and house plan analyses led him to suggest that Viking Dublin's buildings could be divided into five principal types (1 to 5), to which two other types (6 and 7), could be added, these being predominantly found in Waterford (Wallace 2001: 48–49).

Type 1 structures were the most common building in Dublin (Wallace 1992a: 17), with Wallace (2005: 828) suggesting that they comprise 75% of all known Dublin houses. In terms of dating, they have been found from the mid 9th to the 12th-century levels of the town. These Type 1 structures were long, rectangular buildings with rounded corners. Their low walls were of post-and-wattle with a roof supported by four large internal posts. A hearth, usually stone-lined was placed in the centre of the floor, and the doors were usually located at each narrow end of the building. The buildings were divided internally into three aisles, a long, central floor space being flanked on both sides by built-up bedding areas, which also served as benches, which ran closely parallel to the side walls. The entrance and exit areas of the doorways were often paved with wattle, timber, and stone, sometimes with these spaces paved differently, even within one house. The impression gained is of a large, open rectangular building, but it is possible that the paving of the end areas suggests that there were in fact compartments or 'rooms' within the buildings, demarcated by wattle, textiles or hides. This would certainly make sense in terms of inefficiently and wastefully heating an entire, large, open building with one central fire. The average floor area of the complete building was 40 m^2 (Wallace 1992a: 9–14; 2005: 828). The roofing of the buildings has to be hypothesised, but they were possibly hip-roofed, with a steeply pitched thatch of oaten straw or reeds on a turf or scraw base. Enigmatically, there is not clear evidence how these wattled walls were sealed (a vital necessity in Irish winter conditions), as there is no clear survival of daub. Nevertheless, some form of insulation would have been required, and it is possible they were sealed with horse dung (Wallace 2005: 831). It could be pointed out that Viking Dublin houses were closely spaced, so there is a sense that huddled together on an urban street they provided some common heat insulation.

Viking Dublin's – and Ireland's – Type 1 houses appear to be an insular innovation, echoing the cellular arrangements of Norse long-houses in the north Atlantic, but built of Irish materials and in an Irish fashion to an extent (they are paralleled at few other Scandinavian settlements, other than perhaps

Kaupang, in Norway). Wallace (1992a: 94) suggested that the rectangular, aisled house was an Irish development adopted and adapted by the Scandinavians.

Viking Dublin's Type 2 buildings were smaller (an average floor area of 16 m^2), sub-rectangular in plan, with pronounced rounded corners (Wallace 1992a: 14–16). They were not aisled, were often floored with wattled mats, and rarely had formal fireplaces (Wallace 2005: 829). The Type 2 building's door was set in the sidewall, and the walls were generally built of a double line of post-and-wattle (much like earlier native Irish roundhouses). Only a small percentage of the Dublin buildings were of this type. Wallace's Type 3 and Type 5 buildings were found principally in Dublin, Waterford, and Cork. The Type 3 building is a shortened and slimmed down version of Type 1, with occasionally doors at either end, but it does not have evidence of threefold division (Wallace 1992a: 16). Type 4 buildings are sunken structures, in which the floor is situated below ground level (Wallace 1992a: 17, Fig. 130). Type 5 structures are small huts without roof supports, which probably functioned as animal pens or were utilised for other outdoor activities (Wallace 1992a: 17–18). Type 6 buildings refer to sill-beam structures with load-bearing walls, which appear to have been constructed from the early 12th century onwards, particularly in Waterford. Type 7 structures are rectangular stone buildings found within Hiberno-Scandinavian towns; they have only been found at Waterford and date to the mid 12th century.

Property plots and their boundaries

At Viking Dublin, it is evident that the space enclosed within the town's defences was managed by the townspeople through the use of individual property boundaries – using narrow plots defined by post-and-wattle fences. At Dublin, as Wallace (2017) has long argued, these property plots remained largely intact in terms of their location and alignment up through the subsequent generations. When plot fences were repaired and rebuilt, they took the line of the existing property boundary. This could be taken to indicate that there existed a centralised system of managing property boundaries (i.e. an authority), or that people were guided by traditions and norms of behaviour, as well as the physicality of the existing fences, and so respected their neighbours' boundaries. At Temple Bar West, property boundaries remained the same from the late 9th until the 11th centuries, and, in one case (Property 2), into the early 12th century (Simpson 1999: 25, 30). Plots were present on Fishamble Street in the 10th century, and they remained largely unchanged for over 200 years. Houses, outbuildings and pathways, in contrast, were built in different parts of the plots and could move around in space across time (Wallace 2005: 824), and regularly changed in location as successive building phases utilised different areas within the plots (Wallace 1992b: 40; Wallace 2005: 824). Plots varied in shape, from rectangular to trapezoidal, and from narrow to wide. At Werburgh Street, to the south of the town (Hayden 2002), the plots were small and were filled mainly by houses. In some cases, for example Level 3 at Werburgh Street, which has been dated to the mid 10th century, the plot boundaries remained the same as the structures were built and replaced. By the end of the century, however, the Level 6 plots were laid out in different lines and the layout of the area had changed (Hayden 2002: 56).

Previous environmental evidence from Viking-age Dublin

From an environmental perspective the expansion of the town settlement and constant building and re-building of houses within the plots required huge volumes of organic material to be sourced from its hinterland on an ongoing basis. This included hazel and ash poles, and rods for wattles, grass sods, bracken, grasses, rushes, leaf litter, mosses, dung, water, clay not to mention the fuelwood for fires, and the foodstuffs and animal products being eaten and processed within the plots. All of this material had, of course, insects associated with it. All of the plots at every level were carefully sampled during excavation (Geraghty 1996), although not all of these samples were retained or survived to the present day (O'Donnell and Reilly 2012). Environmental studies to-date from this site and neighbouring areas

give important insights into the activities of the town residents, as well as some of the conditions within their houses and plots (e.g. Geraghty 1996; McCormick 1987; McCormick and Murray 2007; O'Sullivan 1990; Reilly 2003). This information also provides the background into which this new study of insect remains will fit.

The earliest environmental studies were those of Frank Mitchell and Russell Coope, both Quaternary scientists, who sampled and examined organic material from Christchurch Place, Winetavern Street, and Wood Quay (Mitchell 1987; Coope 1981). The emphasis of Mitchell's studies, in particular, was on the natural history of Dublin, using the plant remains preserved in the waterlogged layers at Wood Quay to reconstruct the prevailing environment of the time. These findings were not 'context specific', however, and were less concerned with domestic structures or human experience. Mitchell did sample from a large cesspit on Winetavern Street and looked at plant remains from the same structures at Christchurch Place as sampled by Coope.

Coope's (1981) work at Christchurch Place highlighted the potential of insect remains to contribute to an understanding of past urban living conditions. One sample was taken from the benched north aisle area of an unusual Type 1 house of sill beam construction, and another from a pit outside (Murray 1981). Both produced rich assemblages, the indoor assemblage dominated by mould-feeding beetles and beetles that were indicative to Coope of damp, decaying plant matter. The pit fill assemblage appeared to be a sub-set of the house floor deposit assemblage, suggesting that it was not dominated by human waste but primarily by house sweepings. The assemblages mirrored findings from the work of Harry Kenward on the Viking town of York, who had identified a cohort of beetles there as belonging to a habitat group now colloquially known as the 'house fauna' (Kenward 1975; Kenward and Hall 1995). Other important species, not known from Ireland at that time, and related to both the wood species used in house construction and to indoor habitats, were also recorded by Coope at Christchurch Place. The most important aspect of his work was to suggest that living conditions within urban houses were similar between major towns in Ireland and Britain at this time; however, with only two samples examined there was no attempt to examine spatial partitioning within the house, and apparently no ectoparasites (fleas; lice) were recovered.

Excavations of the earliest settlement evidence within the 'promontory' area at Temple Bar West revealed a series of small sunken houses, followed by two phases of post-and-wattle houses and animal pens of varying morphology (Simpson 2010). Insect and plant remains evidence suggested the presence of animal dung within yard areas and buildings and appeared to confirm that animals were kept within house plots at this time (Reilly 2003). Animal bone evidence from both Temple Bar West and Fishamble Street from this early phase of settlement suggests that cattle were the dominant meat source, followed very closely by pigs and then sheep (Cremin 2001; McCormick and Murray 2007). However, at Fishamble Street, pigs dominate during the later 10th century from Building Levels 5 to 10, possibly because pigs were being kept within the plots during this time (McCormick and Murray 2007). The age profile of cattle at Fishamble Street suggested that the town was being supplied with older animals, possibly milk cows at the end of their breeding life, in place of younger meat. To date, no published comprehensive studies of fish bone or mollusca, both ubiquitous in samples from Temple Bar West and Fishamble Street, have been undertaken.

Plant macrofossil evidence from Fishamble Street, and a mix of plant and insect evidence from Temple Bar West, characteristic of thatch, sod and turf, demonstrate that houses were most likely roofed with a combination of these materials (Geraghty 1996; Reilly 2003). Inside houses the initial sand/gravel and sod floors were covered with plant matter that eventually decomposed and was replaced with fresh material, similar to the situation observed by Coope at Christchurch Place. Bedding aisles were built up with layers of wood chip and other plant material (Geraghty 1996). The familiar suite of beetles, which

feed on a variety of moulds on decaying plant matter (i.e. the 'house fauna') 'house fauna', were recorded from the house floors at Temple Bar West, similar to Christchurch Place (Coope 1981; Reilly 2003). External (on, rather than inside, the body) parasites recorded were primarily fleas, with surprisingly little evidence of lice. Where occasionally high numbers of foul-indicating species occurred in house floors, especially dung beetles or fly puparia, they appeared to relate either to periods of abandonment or change of use of a building to a temporary byre or animal pen, as observed in some buildings at Temple Bar West and Back Lane (Reilly 2003).

Plant macrofossil, bone and mollusca evidence from house floors and cesspits suggested that a mixed diet of meat, fish, shellfish, cultivated cereals and gathered fruits, such as apples, sloes, hazelnuts, bilberries and blackberries were eaten by town residents (Geraghty 1996; Johnston 2001). There is very little evidence for wild animal species (other than fish and shellfish) forming part of the diet. There is also surprisingly little evidence for exotic foodstuffs, with the exception of walnuts and bean epidermis found in single samples from late 10th-/early 11th-century contexts (Geraghty 1996: 33). Non-native grain and bean/pea pests were recorded from 12th-century pit fills in Temple Bar West (Reilly 2003). These species were also found in 12th-century Waterford, but are not known from Ireland prior to this date. This suggests that cereals and other foodstuffs were sourced locally up to this point (King *et al.* 2014).

Evidence from wood species analysis at Temple Bar West and Fishamble Street suggest that hazel was by far the most important tree species exploited (Reilly *et al.* 2014). It was used to build wattle walls, screens and paths, indicating that extensive hazel woodlands must have been available to town residents throughout its history. Other important wood species at both sites include ash, for major structural elements like door-posts and jambs, alder for minor structural elements, and a great variety of other species used for different purposes. Surprisingly, at both sites, oak does not feature as a primary construction wood until much later, although oak is used for a great many artefacts at Temple Bar West (Reilly *et al.* 2014). This sets Dublin apart from most of the contemporary Viking settlements across Europe and has been noted as a gap in the oak tree-ring chronology for Dublin.

Bringing a focus on Fishamble Street

As stated above, the Fishamble Street archaeological excavations are amongst the best-known and most important Viking-age sites in Northwestern Europe. They owe this status to the knowledge gained from the extensive, meticulous investigations carried out there, and at the neighbouring sites of Wood Quay, John's Lane and Winetavern Street, from 1969 to 1981 (Ó Ríordáin 1971; Wallace 1992; 2016). The deeply stratified organic deposits, over 3 m deep, which preserved fifteen successive levels of houses and ancillary buildings in twelve or thirteen plots fronting onto Fishamble Street, have few parallels, with the possible exception of Novgorod in Russia (Figure 2). Even in Viking-age York, few sites yielded both the depth of deposits or the extensive street frontage and plot areas that were revealed at Fishamble Street (Kenward and Hall 1995: 449–50). The Fishamble Street site ran up from the Liffey to the top of the ridge on which Christchurch Cathedral is situated today, in an almost north–south direction, and the plots were mainly east–west in orientation.

Not all the Fishamble Street plots contained house structures at every level, with the most intensively occupied being Levels 8 to 12, dating from approximately the late 10th to mid 11th century AD. Chronological dating has mostly come from the many coins found within the plots, most notably Plots 3, 4 and 5, which reveal evidence of occupation from pre AD 935 to post AD 1030–5 (Wallace 1992). Comprehensive radiocarbon dating has yet to be carried out on material from Fishamble Street. An experimental ash dendrochronology was compiled by Aoife Daly in the early 1990s, which overlapped with the coin chronology and also extended the timeframe into the late 11th century (Daly 1998).

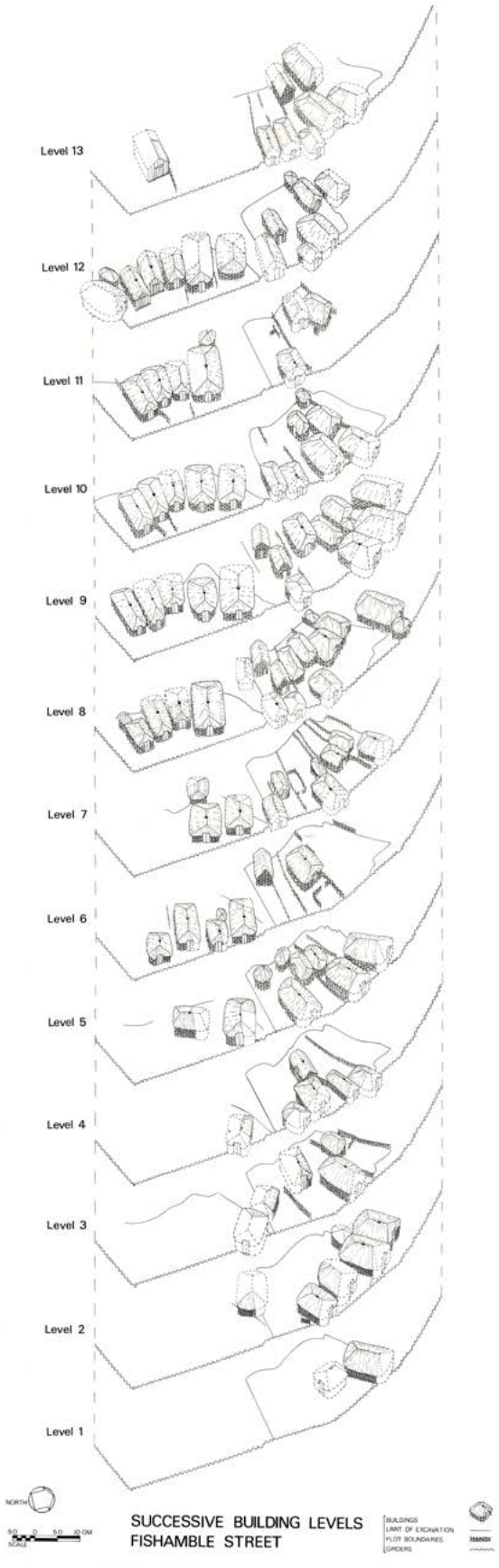


Figure 3: Revised version of building plan (Wallace 1992a: 44) (© National Museum of Ireland; image: Michael Heffernan).

The sheer number of buildings revealed on Fishamble Street allowed for a detailed typology of house-building styles to be proposed for this period, including, most notably, the Type 1 house as we have described above (see Wallace 1992a 2016). Wallace (1992: 9) described this as the 'Dublin house *par excellence* throughout the tenth and eleventh centuries', which probably continued in use until the coming of the Anglo-Normans in the latter part of the 12th century. As elsewhere, the Type 1 houses at Fishamble Street were generally rectangular in plan, with four internal roof supports, with single or double wattle walls. They often had a doorway at each end, front and back of the house, and the floor space inside was divided into three strips or 'aisles' – being a central area flanked by two raised areas, used as benches during the day and beds at night. The corners of the houses were often compartmentalized and floored with wattle mats, stone, planking, or even broken up barrel staves or other reused wood. The central aisle invariably had a rectangular fireplace or hearth, which was often stone-lined or kerbed (Wallace 1992a: 9). Wallace estimated that up to 75% of all buildings from Viking-age Dublin were of this type, with 73% of houses in Fishamble Street being of this type. Other building forms from Fishamble Street included Type 2 houses – the smaller sub-rectangular building, generally not divided into three aisles and rarely with hearths. The Type 2 house's single doorway was often in the sidewall and the floors were often completely covered with wattle mats (Wallace 1992a: 14). Type 3 houses appeared to be smaller versions of Type 1, but without the three aisles and paired roof supports. They do appear to have had a doorway at either end and were found almost exclusively in Plots 5 and 6. Wallace (1992a: 16) suggests that this may have been to fit the unusually narrow layout of these particular plots at their eastern ends. Type 4 houses were sunken-floored buildings and were very rare in Fishamble Street, with only one possible example at an early level (Wallace 1992a: 17). They were small in comparison to Type 2 and 3 buildings, dug straight into the ground with vertical planks or wattle fixed to the earthen walls and internal roof supports. Other sunken-floored buildings excavated in Dublin are found in Temple Bar West, at 9th-century levels (Simpson 1999), and Winetavern Street, while more substantial buildings of this type were excavated in Waterford (Hurley *et al.* 1997). These are not all thought to be from the same building tradition, however, with the earlier house type now referred to as '4a' and the later Waterford examples as '4b' (Boyd 2012). The later type were of much more substantial construction, dug to a depth of 1.5 m with stone-lined passageways, and suggestions that the 'pit' part served as a storage area, and the living quarters were on a 'second' floor above this. Again, as stated above, the final house type in Dublin, Type 5, appeared to be small huts or lean-tos, built as stand-alone buildings or annexes to pre-existing houses. They were generally very small, sub-rectangular, post-and-wattle built, with no, or free-standing, internal roof supports and often no formal doorway but simply a gap left in the wall (Wallace 1992a; Boyd 2012). Some may have been unroofed and served as animal pens; others roofed and used as workshops, privies, chicken sheds, or other animal shelter.

The Fishamble Street excavations also produced an extraordinary range of artefacts, revealing evidence for comb- and cloth-making, amber-working, bronze-working and leather-working, as well as woodcraft of all types (Geraghty 1996; Wallace 2005; 2016). Analyses of artefacts indicated trading links and art influences from other parts of Ireland, Britain and the Northern Isles, Scandinavia, as well as continental Europe (Laing 1988; Wallace 2005). The early Irish *Annals* and other contemporary historical documents refer to Dublin as being hub to a lucrative slave trade that flourished both within Ireland and across much of Europe, and as far as the Near East, at this time (Valante 2008). Evidence has also emerged that ship-building was carried out in Dublin, with residents of both Fishamble Street and Temple Bar West perhaps involved in this craft (McGrail 1993; Simpson 1999).

Chapter 3

Methods of this study

Introduction

This chapter outlines the methods used for analysis from Fishamble Street. The contexts analyzed are listed, as well as houses, building levels, and plots. The productivity of samples is briefly described. Sample processing and methods of analysis are outlined. A sense of the different eco codes potentially represented are also briefly introduced. Full details of the analysis can be found in Appendix 1, Technical report, page 103.

Contexts analyzed

In total, 104 samples were analyzed for insect remains. The samples were carefully selected from amongst the *c.* 850 samples inventoried in 2011 as part of the Fishamble Street Inventory Project (O'Donnell and Reilly 2012). Initially, it was hoped to examine just two or three plots from boulder clay level through to the final identified building level (15) but this proved difficult. No plot was equally well represented throughout time. In the end, samples were chosen primarily to ensure that every level was represented in some way and that within each level as many different context types were analyzed. In an attempt to compare some of the insect results directly with Geraghty's plant macrofossil results, samples from Plots 10, 11 and 12 were frequently chosen. Indeed, generally, samples from Fishamble Street III (Licence No. E190) were better preserved and more plentiful than from Fishamble Street II (Licence No. E172). This is not surprising given that Fishamble Street III was later than Fishamble Street II and sampling methodologies had improved over the course of the entire excavation. Some of the earlier samples also appeared to have suffered more degradation than the later material.

Table I shows the entire list of samples grouped into context types. Much of the subsequent analysis discussion in this book is based on these context groups. Table II and Figures 4 and 5 summarise this information, and also show the total number of beetles identified from each context type and the average Minimum Number of Individuals (MNI) per group. The 'richest' context types were those described as corners, 'wall packing' or 'collapsed wall', and side aisles (or bedding aisles), with MNIs of over 200 beetles per sample. The lowest, perhaps unsurprisingly, was the boulder clay layer. Pits and outdoor yard areas had similar lower MNIs but curiously so did the central floor areas within houses. This interesting outcome will be discussed in detail in following chapters.

All context and building descriptions in the following chapters are taken from the most recent versions of the stratigraphic reports for E172 FS II and E190 FS III, compiled during the period 2004–2011 by Patrick Wallace, Andrew Halpin and Adrienne Corless, being prepared from the original site notebooks and diaries.

Table I: List of samples analyzed, grouped according to contexts.

SAMPLE NO/CONTEXT GROUP	HOUSE	BUILDING LEVEL	PLOT NUMBER
BOULDER CLAY (BC)			
FS III E190: 1		Boulder clay	9
YARD (Y)			
FS II E190: 50	FS 5	2	2
FS III E190: 43	Building 1572	2	8
FS III E190: 63	FS 19	4	8
FS III E190: 102	FS 32	5, 6	8
FS III E190: 142	FS 45	7	8
FS II E172: 136	FS 51	8	3
FS II E172: 137	FS 51	8	3
FS III E190: 254	FS 77	9	10
FS III E190: 333	FS 89	10	10
FS II E172: 206	FS 92	11	3
FS III E190: 455	FS 99	11	11
FS III E190: 456	FS 99	11	11
FS III E190: 458	FS 99	11	11
FS II E172: 243	FS 104	13	4
PITS/TROUGHS/DRAIN FILLS (PF/TF/DF)			
FS II E172: 16		Boulder clay	4
FS II E172: 41	FS 3	2	1
FS II E172: 43	FS 3	2	1
FS II E172: 44	FS 3	2	1
FS III E190: 44		2	8
FS III E190: 45		2	8
FS III E190: 47		2	8
FS III E190: 48		2	8
FS III E190: 230	FS 63	8	12
FS II E172: 199	House 227	10	4
FS III E190: 323		10	9
FS III E190: 334		10	10
FS III E190: 360		10	12
FS III E190: 364		10	12
FS III E190: 365		10	12
FS II E172: 251	Building 106/107	13	4
FS II E172: 273	FS 118	14	4
OUTDOOR WATTLE SCREEN/PATH (OS/PA)			
FS III E190: 167	FS 46	7	9
FS III E190: 168	FS 46	7	9
FS II E172: 139		8	4
FS III E190: 497		13	10
FS II E172: 269	FS 102	14	3
DESTRUCTION/FOUNDATION DEPOSIT (D/FD)			
FS II E172: 46	FS 3	2	1
FS II E172: 49	FS 4	2	2
FS II E172: 80	FS 7	3	4
FS II E172: 102	FS 17	4	4
FS III E190: 58	FS 19	4	8
FS III E190: 169	FS 46	7	9

SAMPLE NO/CONTEXT GROUP	HOUSE	BUILDING LEVEL	PLOT NUMBER
FS III E190: 177	FS 46	7	9
FS III E190: 203	FS 60	8	9
FS II E172: 163	FS 69	9	3
FS III E190: 381		10-11	9
FS III E190: 342	FS 90	10	11
FS II E172: 221	FS 93	11	4
FS III E190: 422	Building 532/533	11	9
FS II E172: 249	FS 104	13	4
FS II E172: 247		13	4
FS II E172: 253		13	5
FLOOR – CENTRAL AISLE (FC)			
FS II E172: 33	FS 1	1	2
FS II E172: 56	FS 10	3	3
FS III E190: 84	FS 28	5	10
FS III E190: 85	FS 28	5	10
FS III E190: 86	FS 28	5	10
FS III E190: 106	FS 35	6	10
FS III E190: 137	FS 45	7	8
FS III E190: 207	FS 61	8	10
FS III E190: 259	FS 77	9	10
FS II E172: 203	FS 84	10	4
FS III E190: 313	FS 88	10	9
FS III E190: 319	FS 88	10	9
FS III E190: 344	FS 90	10	11
FS III E190: 370	FS 91	10	12
FS II E172: 205	FS 92	11	3
FS III E190: 441	FS 99	11	11
FS III E190: 446	FS 99	11	11
FS II E172: 235	FS 94	13	3
FS II E172: 265	FS 102	14	3
FS II E172: 266	FS 102	14	3
FLOOR – CORNERS (C)			
FS II E172: 70	FS 10	3	3
FS III E190: 143	FS 46	7	9
FS III E190: 165	FS 46	7	9
FS III E190: 331	FS 89	10	10
FS III E190: 349	FS 90	10	11
FS III E190: 350	FS 90	10	11
FLOOR – NORTH AISLE (FN)			
FS II E172: 65	FS 10	3	3
FS III E190: 65	FS 19	4	8
FS III E190: 135	FS 45	7	8
FS III E190: 147	FS 46	7	9
FS III E190: 418	FS 97	11	9
FS III E190: 444	FS 99	11	11
FS III E190: 445	FS 99	11	11
FS III E190: 459	FS 99	11	11
FS II E172: 245	FS 104	13	4

SAMPLE NO/CONTEXT GROUP	HOUSE	BUILDING LEVEL	PLOT NUMBER
FLOOR – SOUTH AISLE (FS)			
FS II E172: 64	FS 10	3	3
FS II E190: 64	FS 19	4	8
FS III E190: 109	FS 35	6	10
FS III E190: 136	FS 45	7	8
FS III E190: 192	F1302/1303	7	10
FS III E190: 220	FS 62	8	11
FS III E190: 367	FS 91	10	12
FS III E190: 419	FS 97	11	9
FS II E172: 261	FS 102	14	3
FLOOR – UNSPECIFIED LOCATION (F or F?)			
FS II E172: 101	Building 1193	4	3
FS II E172: 257	FS 101 (150)	14	2
FS II E172: 259	FS 102 (AQ)	14	3
FS II E172: 268	FS 103 (AT)	14	3
COLLAPSED WALL/WALL PACKING (CW/CP)			
FS II E172: 36	FS 1 (163)	1	2
FS II E172: 103	FS 17 (1213)	4	4
FS II E190: 457	FS 99 (412)	11	11

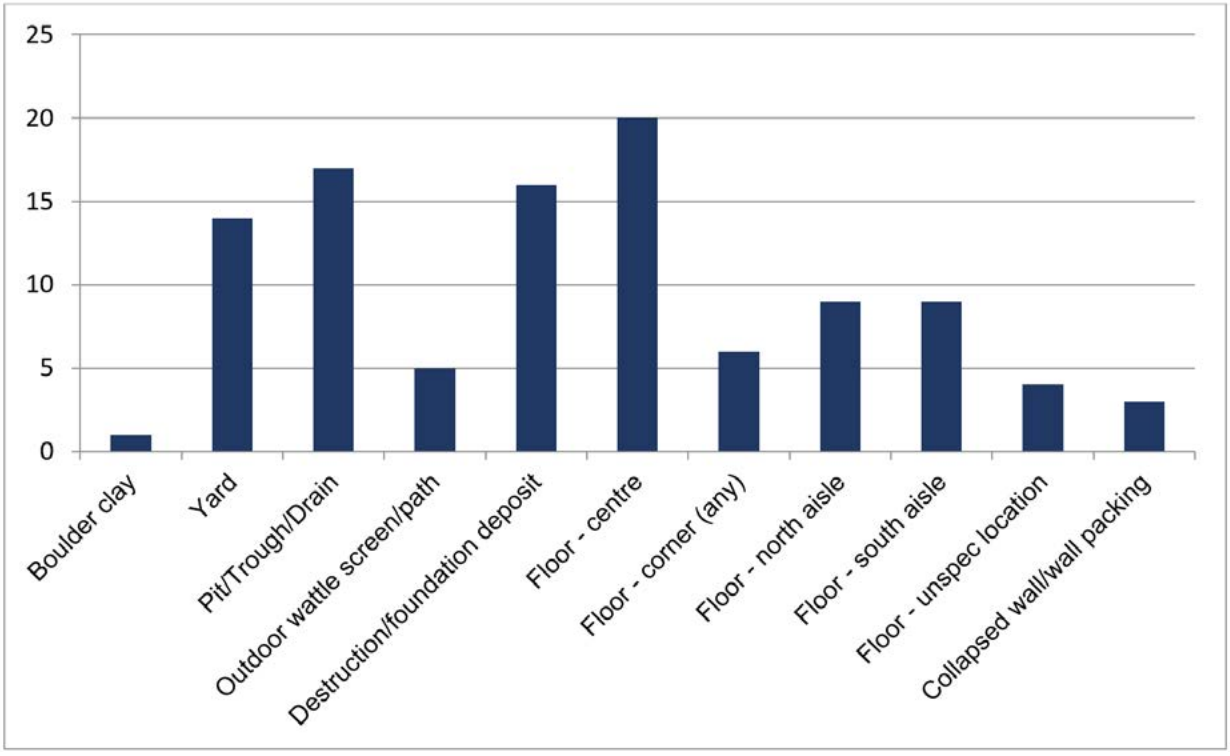


Figure 4: Number of samples per context group analyzed from Fishamble Street.

Table II: Summary of sample productivity – total number of beetles per context group and average MNI.

Context Types	No. of samples	No. of beetles (total)	Average MNI per sample (rounded)
Boulder clay	1	5	5
Yard	14	1208	86
Pit/Trough/Drain	17	1250	74
Outdoor wattle screen/path	5	398	80
Destruction/foundation deposit	16	1534	96
Floor – centre	20	1691	85
Floor – corner (any)	6	1759	293
Floor – north aisle	9	1998	222
Floor – south aisle	9	1982	220
Floor – unspecified location	4	199	50
Collapsed wall/wall packing	3	871	290
Total	**104**	**12,895***	**124**

*excludes flies, external parasites, and other insects.

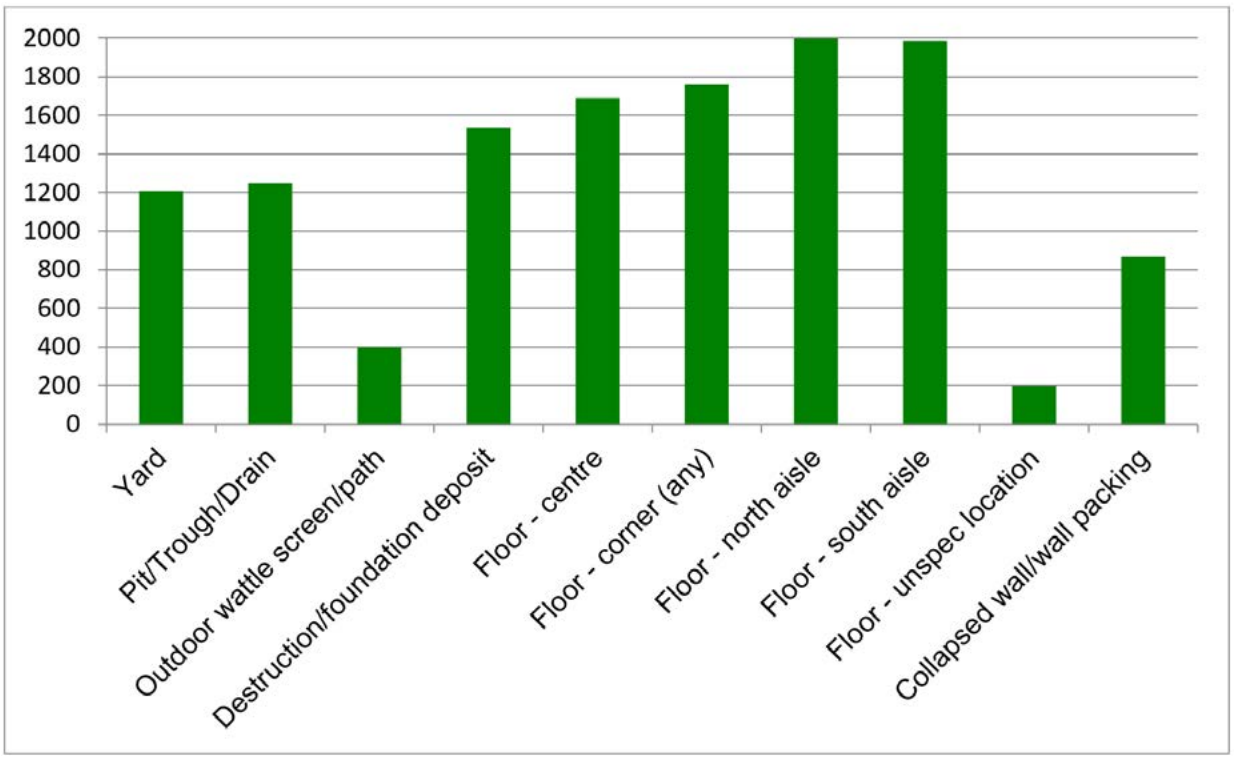


Figure 5: Total MNI (minimum number of individuals) for beetles per context group, Fishamble Street.

Sample processing and data analysis

All of the samples were subjected to paraffin flotation, the standard method used by archaeo/palaeoentomologists for the extraction of insect remains from soil samples, as devised by Coope and Osborne (1968) and further refined by Kenward (1980) and Kenward *et al.* (1986). The samples were disaggregated using water and washed over a 300-micron sieve. The retent in the sieve was then treated with paraffin and cold water added. The paraffin concentrates the insects by adhering to the waxy cuticle of the insect exoskeleton. The flot was then poured through a 300-micron sieve, washed with detergent in hot water to remove the excess paraffin and stored in 70% ethanol. All residues were kept.

All flots were then sorted under a microscope and insect fragments extracted onto wet filter paper. All fragments were identified as far as possible using a set of published keys, the writer's own comparative specimens and collections of British Coleoptera housed in the Oxford University Museum of Natural History. Habitat data were gleaned from various published sources and the BUGS database, the coleopteran ecology package, designed and updated by Phillip Buckland and Paul Buckland (Buckland 2007; Buckland and Buckland 2006). Full species lists are presented with taxonomy following Lucht (1987), with modifications by Böhme (2005). The tables include habitat and distribution data for Ireland, where known, relevant fossil locations from BUGS and from the author's catalogue of sites in Ireland and elsewhere (Tables III and VII–XII).

Analyses of each sample involved summing individual insect taxa into ecologically related habitat groups and assigning each group an 'Eco Code' (Tables IV–V and graphs). The purpose of analyzing the data in this way is to generate a picture of change in the relative proportion of each habitat group within each deposit, group of deposits, and site as a whole, in order to understand the local site environment. Changes in the relative proportion of these groups may be as a result of direct human action or, in some cases, natural events. It is the analysis of these habitat changes that forms the basis of all interpretation presented in this book. A short explanation of each 'Eco Code' is given below, including key species, as these groups will be referred to throughout the text.

Other analyses of the assemblages included calculating *diversity indices* (i.e. a measure of the species diversity in each assemblage, see Table V) and *ordination*, a statistical examination of the relationships (similarities/dissimilarities) between assemblages across the site as a whole, between 'indoor' assemblages and 'outdoor' ones, and to compare Fishamble Street with other sites. Nonmetric Multidimensional Scaling (NMS) was used for this purpose using the PC-ORD programme (McCune and Mefford 1999; Peck 2010). The results of these analyses will be referred to in the text, with accompanying graphs, but technical data will not be presented here.

Eco Codes

Outdoor (oa)

This large diverse group of beetles occurs in garden soils, arable and cultivated ground, carr woodland and open riverbanks. They are unlikely to occur within homes or other structures and instead reflect the natural or non-urban environment. Some are subterranean in habit, occurring under stones or in burrows. Key species include *Trechus quadristriatus/obtusus*, *Pterostichus* and *Meligethes* species generally.

Damp Ground (d)

This is a diverse group of beetles that generally occupy wet or damp places but do not live directly in water. Niches in this group can include muddy riverbanks, marshes, wetlands, wet moss/litter/humus



Plate 1: Neobisnius villosulus (image : Marc Tonquet).



Plate 2: Pomatinus substriatus (image: Kirrill Makarov).

layer. A key member of this group at Fishamble Street is *Neobisnius*, especially *N. villosulus*, a species that clearly reflects the riverine environment of Dublin (Plate 1).

Water (w)

Species that spend much of their lifecycle in water or wet habitats are included in this group. This can range from temporary water bodies (i.e. water in ditches, pools) to larger permanent bodies of water (i.e. lakes, rivers, and marshes). They include a small but important group of species that live in fast-flowing rivers or streams. The key members of this group at Fishamble Street are *Helophorus* spp., particularly indicative of temporary water bodies, shallow water, and pools. This group includes the now locally extirpated fast-flowing water species, *Pomatinus substriatus* (Plate 2).

Saline Habitats (c, sw)

Surprisingly, given Viking Dublin's location on an estuary, this is a very small group of beetles at Fishamble Street. These species occur in decaying seaweed, brackish water, on tidal mudflats, in salt marshes and estuaries. The most frequently occurring species in this group is *Cercyon depressus*, however there is some evidence to suggest that this beetle might also have occupied cesspits during the medieval period (Reilly 2003) (Plate 3).

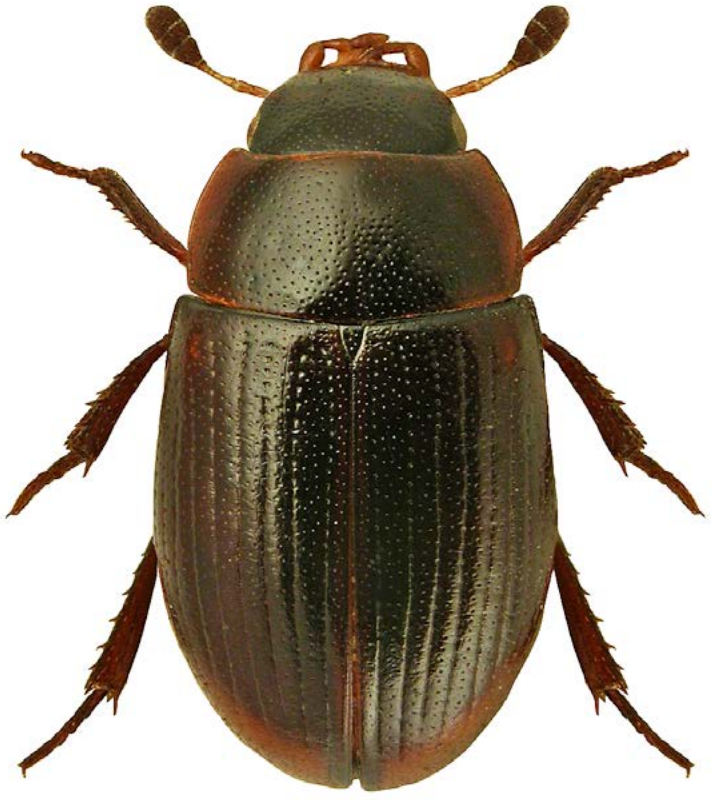


Plate 3: Cercyon depressus (image: Lech Borowiec).



Plate 4: Bruchus rufimanus (image: Jean-Bernard Huchet).

Plant feeders (p)

A large and diverse range of phytophagous (i.e. plant feeding) beetles occurs in these deposits. Some undoubtedly were living on urban weeds within the plots themselves, while others are likely to have come to the site directly in plant and animal matter, i.e. in hay, animal manure, thatch, and bedding. A small number are indicative of cultivated plants such as beet, turnips, beans, and peas, which may have been for consumption by people or animals. Key species in this group include *Longitarsus* spp. (bindweed, ragwort, mint, plantain), *Chaetocnema concinna* (knotgrass, sometimes on cultivated beet), *Phyllotreta* spp. especially *P. nemorum* (various crucifer/*Brassica* species, both cultivated and wild), and *Sitona* spp., especially *S. lepidus* (on various clover species). The non-native bean weevil, *Bruchus rufimanus*, also occurs, albeit only in Fishamble Street Levels 10 and 11 (Plate 4).

Woodland and wood, other than synanthropic species (l)

This group of species is usually found living *in* woodland of various sorts and are perhaps less likely to occur naturally within the urban zone. Some live in dead wood or under bark, others are leaf miners of various tree species. The main structural wood pest, *Anobium punctatum*, is not included in this group and is instead included in the 'house fauna and associated taxa' group below. This distinction is made to illustrate the difference between wood pests as casualties of woodworking/gathering of firewood and those that might have lived within the wooden structures of the Viking town settlement. Numbers are surprisingly small, given the amount of wood and wood chip used in the settlement. The most frequently



Plate 5: Euplectus spp. (image: Kirrill Makarov), and Ptelobius vittatus (image: Christoph Benisch).



Plate 6: Aphodius granarius (image: Jean-Bernard Huchet), A. contaminatus (image: Jean-Bernard Huchet), and Platystethus arenarius (image: Marc Tronquet).



Plate 7: Cercyon unipunctatus (image: Jean Hevre), C. haemorrhoidalis (image: Jean-Bernard Huchet), and Trox scaber (image: Jean-Bernard Huchet).







Plate 8: Carpelimus bilineatus (image: Christoph Benisch), Cerycon analis (image: Kirrill Makarov) and Dendrophilus punctatus (image: Christoph Benisch).



Plate 9: Oxytelus sculpus (image: Kirrill Makarov), Omosita cf. colon (image: Christoph Benisch).

occurring species are *Euplectus* spp. (found under bark in decaying wood) and *Ptelobius vittatus* (bark beetle, which occurs in ash and elm (Plate 5).

Dung – 'outdoor' species (oa-rf)

This diverse group is well represented in most of the samples, especially in yard areas. It is made up primarily of 'true' dung beetles, i.e. species directly associated with animal dung, although some can also occur in rotting vegetation. A distinction is being made here between species largely associated with fresh animal dung and the group (below), which is more closely associated with human-derived waste. Key species in this group include *Aphodius granarius*, *A. contaminatus* and *Platystethus arenarius* (Plate 6).

Foul, including species associated with human habitation (rf)

This small but frequently well-represented group of beetles occurs in decaying or putrefying plant and animal matter, including human faeces, and regularly occurs together in cesspits. Some in this group are also known from dry carrion and other animal detritus. Key members of this group include *Cercyon unipunctatus*, *C. haemorrhoidalis* and *Trox scaber* (Plate 7).

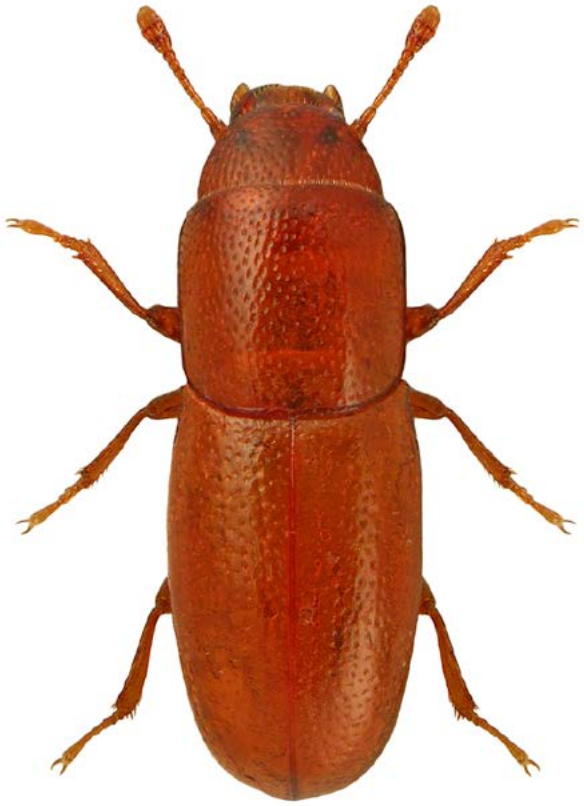


Plate 10: Aglenus brunneus (image: Lech Borowiec).

Generalist decomposers (rt)

This is a very large group and includes a diverse range of beetles that live in all kinds of decaying plant and animal matter. In general, these species are indicative of mouldy hay/straw, leaf litter, moss, moulds, compost heaps, occasionally dung, carrion, animal hides, or old bones. Many of these beetles are not particularly fussy in their choice of habitat and are not necessarily indicative of human habitation. A small number of these beetles occur in bird nests in nature and may have lived in similar environments within houses, but are not specifically synanthropic. Key members of this group include *Carpelimus bilineatus/erichsoni*, *Cercyon analis*, *Dendrophilus punctatus* (not currently known from Ireland) (Plate 8), and *Oxytelus sculptus*, *Omosita cf. colon* (Plate 9), *Leptacinus spp.*, *Anotylus rugosus*, and *Ptenidium* spp.

'House' fauna and associated taxa (rd-h, rt-h, g and some l)

This diverse group, primarily made up of decomposers, contains species known to have a particularly close relationship with human occupation sites throughout time. In general, they occur in drier decaying vegetation feeding on moulds and fungi, but some can occur in more foul niches. Some are highly synanthropic – a term which refers to undomesticated species (plant or animal) living closely alongside and benefiting from human beings, and rarely found in nature today. Others favour human habitations but do not necessarily depend on humans for survival. A small number of species within this group are indicative of dry, stored foodstuffs, e.g. grain and flour. Others are found in structural wood. Key species in this group include *Aglenus brunneus* (Plate 10), *Xylodromus concinnus, Anobium punctatum*, *Cryptophagus* and *Atomaria* species, *Mycetaea subterranea*, *Latridius-Corticaria* species and *Tenebrio obscurus*



Plate 11: Xylodromus concinnus (image: Marc Tronquet), Anobium punctatum (image: Kirrill Makarov, Cryptophagus (image: Jean-Bernard Huchet) and Atomoria (image Svetlana Kuzmina).



Plate 12: Blaps lethifera (image: Jean-Bernard Huchet).



Plate 13: Gracilia minuta (image: Christoph Benisch).

(Plate 11). This group also includes four species possibly 'new' to Ireland from this time: *Blaps lethifera* (see O'Connor 1979), *Gracilia minuta*, *Hylotrupes bajulus* and *Sitophilus granarius* (Plates 12–15).

Multiple habitats (u)

This group includes all species not assigned to specific habitats because (a) they have not been identified to species and the genus has wide and varied habitat preferences, or (b) they occupy such a wide range of habitat niches so that they are difficult to assign to just one. The most frequently occurring genera in this group are *Quedius/Philonthus* spp. and Aleocharinae indet.



Plate 14: Hylotrupes bajulus (image: Jean-Bernard Huchet).



Plate 15: Sitophilus granarius (image Jean-Bernard Huchet).

Chapter 4

Insect analyses through time

Introduction

A general description of what Viking Dublin was like – in terms of its streets, houses, plot boundaries – has already been given, as well as a brief summary of previous general environmental archaeological results (see Chapter 2). At this point, we can now focus on the specific results from the analyses of insect remains from Fishamble Street, and do this methodically level by level. Discussion of the key points and important findings will then follow in the next chapter.

Boulder clay level

The boulder clay level, being the natural subsoil that lay under the subsequent town, has an extraordinary range of activity, including human burials, possible industrial activity, and a number of houses, and this characterizes the boulder clay level of Fishamble Street (Corless *et al.*, in preparation). As most of it is in the form of 'negative' features (i.e. post holes, pits, troughs, trenches, and a possible ditch) it is more difficult to visualize than the wonderfully preserved houses of later levels. Some burnt houses and ephemeral post-and-wattle walls were noted in the areas of what would later become Plots 2 and 3 (we will term them hereafter as 'future plots'), while a possible 'pit dwelling' or Type 4 house was located in the future Plots 6 and 8. It is clear that occupation in this part of Dublin, i.e. the west side of Fishamble Street, had begun from at least the earliest part of the 10th century, with activity on the east side of Fishamble Street and Essex Street West beginning in the late 9th (Simpson 2010). It is possible that late 9th-century occupation is also represented among these features in Fishamble Street. Radiocarbon dates from bone recovered in ditch features at this level, for example, give fairly consistent dates ranging between 770–980 cal AD (95% probability) (Adrienne Corless, *pers. comm.*).

Very few samples exist from this boulder clay level and most were too sterile to consider for insect analysis. Two samples were selected but only one produced a rich insect assemblage, primarily because it came from a pit in the area of future Plot 4. The assemblage was dominated by two generalist decaying vegetation species and lots of fly puparia, suggesting the presence of foul waste. In addition, a high number of damp ground riparian indicators, *Neobisnius* spp., were also recorded. While the pit clearly contained dumped organic matter, it is possible that the pit also held water, perhaps filling naturally at high tide, or deliberately filled with river water for retting flax fibres (Geraghty 1996). Geraghty suggests that flax retting and possibly flax cultivation may have taken place in the open areas along Fishamble Street throughout the 10th and 11th centuries.

Building Level 1

The first recognizable buildings at Fishamble Street were recorded at Level 1 in Plots 2 and 3, closest to the river (Figure 3). No buildings were recorded in Plots 4-13, but other activities were clearly carried out here. Cultivation ridges were noted, as well as a large ditch, which was cut into the boulder clay. Evidence for metalworking was widespread in the form of hearths and metalworking waste. Samples were examined from one building, FS 1, in Plot 2.

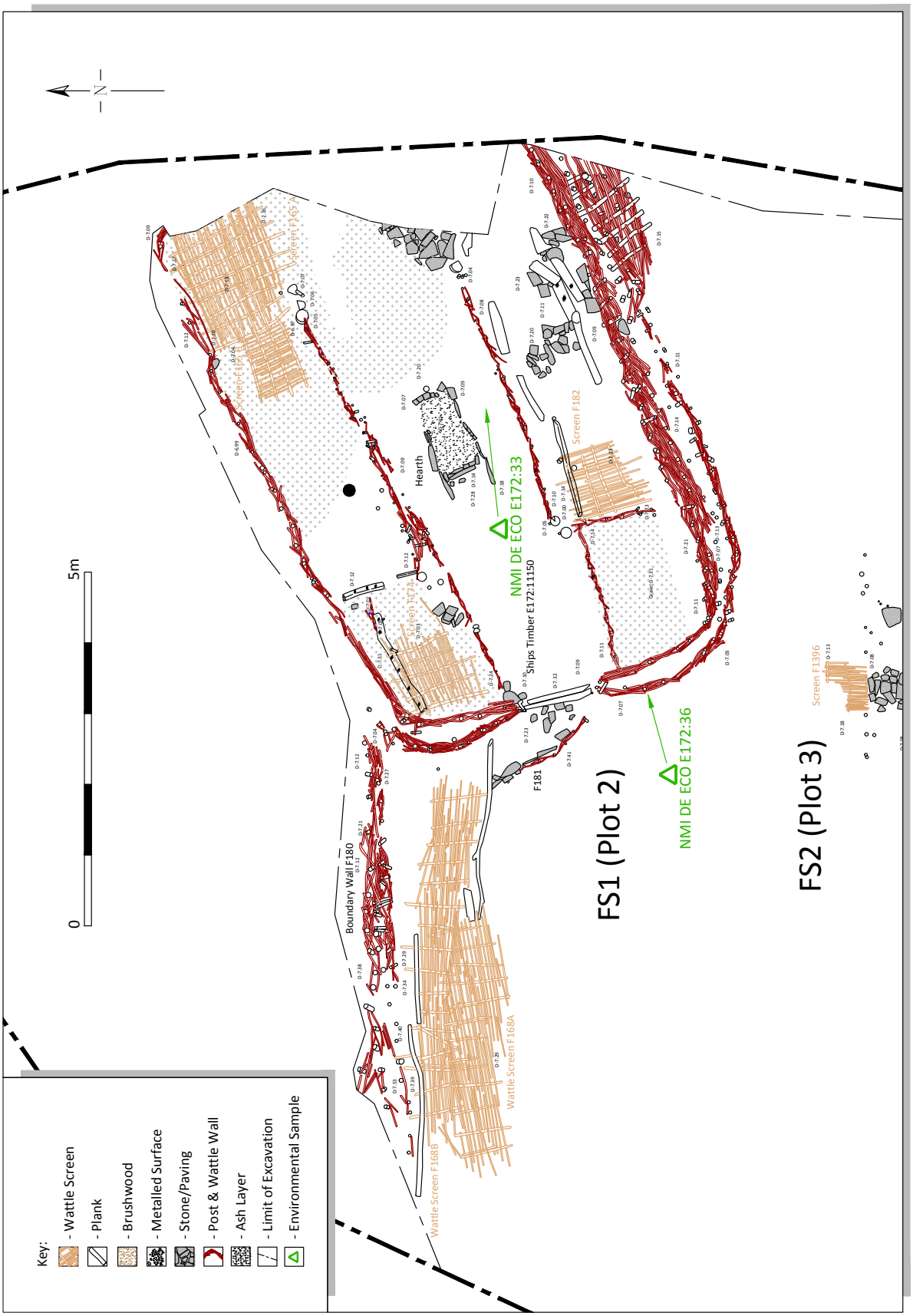


Figure 6: Plan of FS 1 showing sample locations (green triangles, Table 1).

FS 1, Plot 2

Samples at Level 1 were analyzed from FS 1, a large Type 1 three-aisled house (Figure 6). The building had a central hearth and wattle screens in the north-west and north-east corners and in the south aisle. Underlying the building in the north-west corner was a group of timbers, including a ship's timber (McGrail 1993). A wooden weaver's sword was also recovered from this house (Laing 1988).

From the central floor deposit, made up of matted grass, visible straws and leaves, the small insect assemblage was dominated by 'house fauna' species, particularly *Cryptophagus* spp. These beetles, along with species like *Aglenus brunneus*, are among the most frequently occurring species in Viking and medieval house floors (Kenward 1997; Kenward and Hall 1995). *Anobium punctatum*, the 'woodworm' beetle, also occurs in FS 1, albeit in small numbers, but as we will see, it soon becomes firmly established in the houses of Fishamble Street.

From the wall packing between the wattle walls of FS 1 a rich 'house' fauna was recovered, particularly species indicative of straw or mouldy hay. A number of beetles suggestive of fouler conditions e.g. *Cercyon unipunctatus*, *Cercyon analis* and *Cryptopleurum minutum*, also occur in this material, although no true dung beetles. It is therefore not clear from this wall whether dung was mixed with damp decaying hay or straw to fill the wall cavity.

Building Level 2

This level sees an expansion of settlement along Fishamble Street, with houses and ancillary buildings constructed in Plots 1, 2, 3 and 8. Parts of Plot 8 and the area further south (future Plots 9–13 going uphill from the river) were covered in pits and dumps of material, suggesting an open working zone but no habitation at this time. Samples were examined from Plots 1, 2 and 8, representing indoor, outdoor and destruction phase contexts.

FS 3, Plot 1

FS 3 in Plot 1 was a large Type 1 three-aisled house (Figure 7). However, most of the material analyzed here came from a small depression outside the western doorway, which may have been a pit or trough. The fill contained lots of cloth and wood fragments.

The insects were dominated by house fauna but relatively high numbers of water beetles, dead wood/woodland indicators and dung beetles suggest the presence of all these elements in the trough. Large numbers of the fly *Coproica vagans/Limosina silvatica* also confirm the presence of animal dung. Two of the water beetles present, the elmids *Oulimnius tuberculatus* and *Limnius volckmari*, are usually considered strongly indicative of running water (Friday 1988). *Tenebrio obscurus* is first recorded in Fishamble Street here. This beetle is very closely associated with human housing and buildings, found especially in flourmills, grains stores and stables (Koch 1989). The combination of 'indoor' and 'outdoor' elements – household rubbish, wood, water, dung and cloth fragments – suggests a refuse pit, not a cesspit *per se*. It could represent a feature in which were left the waste products of some industrial process, perhaps the dyeing of cloth, and may well include an element of 'flood trash', as suggested by the two elmid species recorded.

A sample from the central floor area of FS 3 was related to the *destruction* of the house, not occupation. A great deal of ash and charcoal was present here suggesting the house burnt down – whether deliberately or accidentally is unclear. Although small, the insect assemblage reflects the fact that the house was abandoned for a while, probably open to the elements. Damp ground beetles formed a high proportion

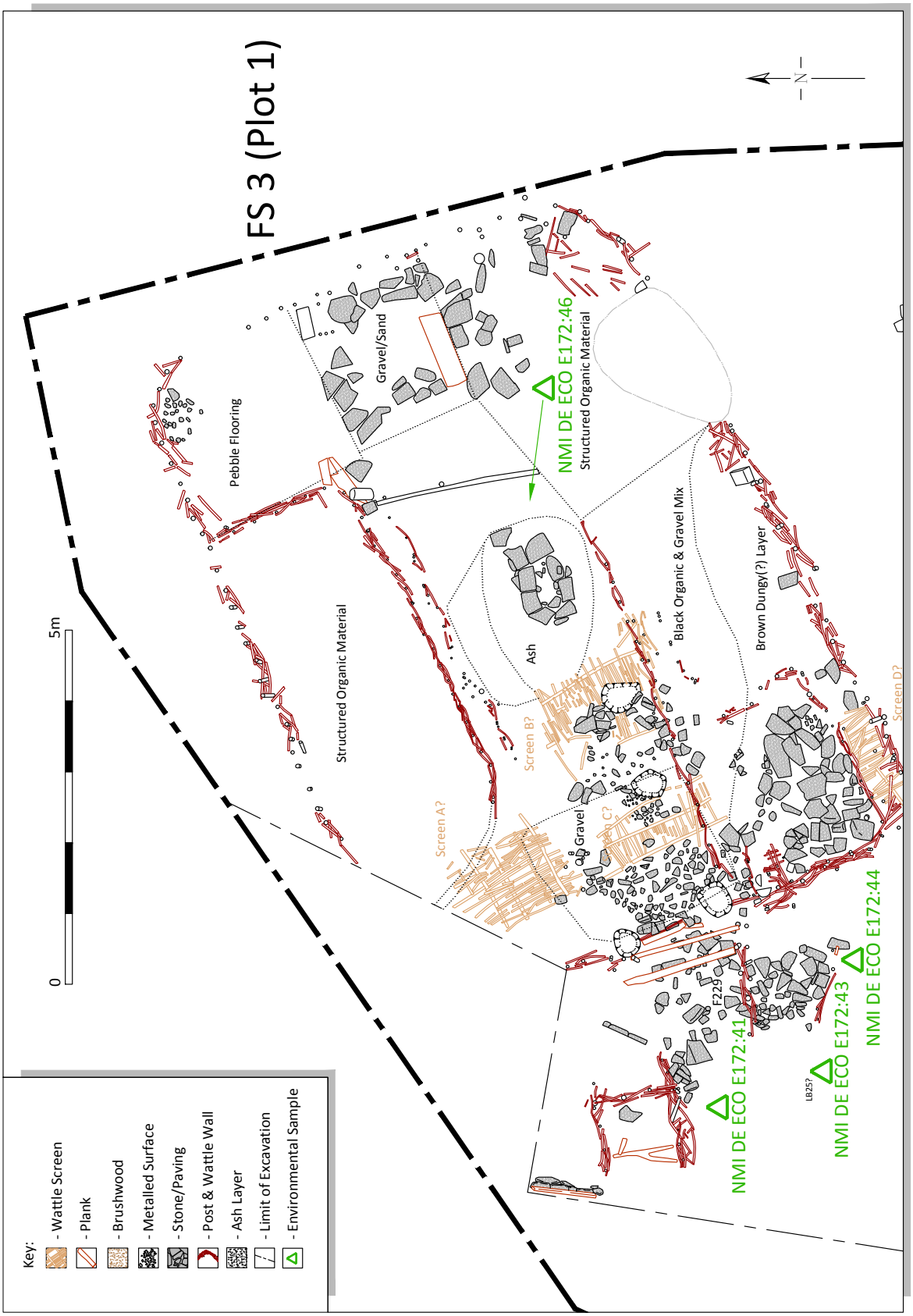


Figure 7: FS 3, Plot 1, showing sample locations.

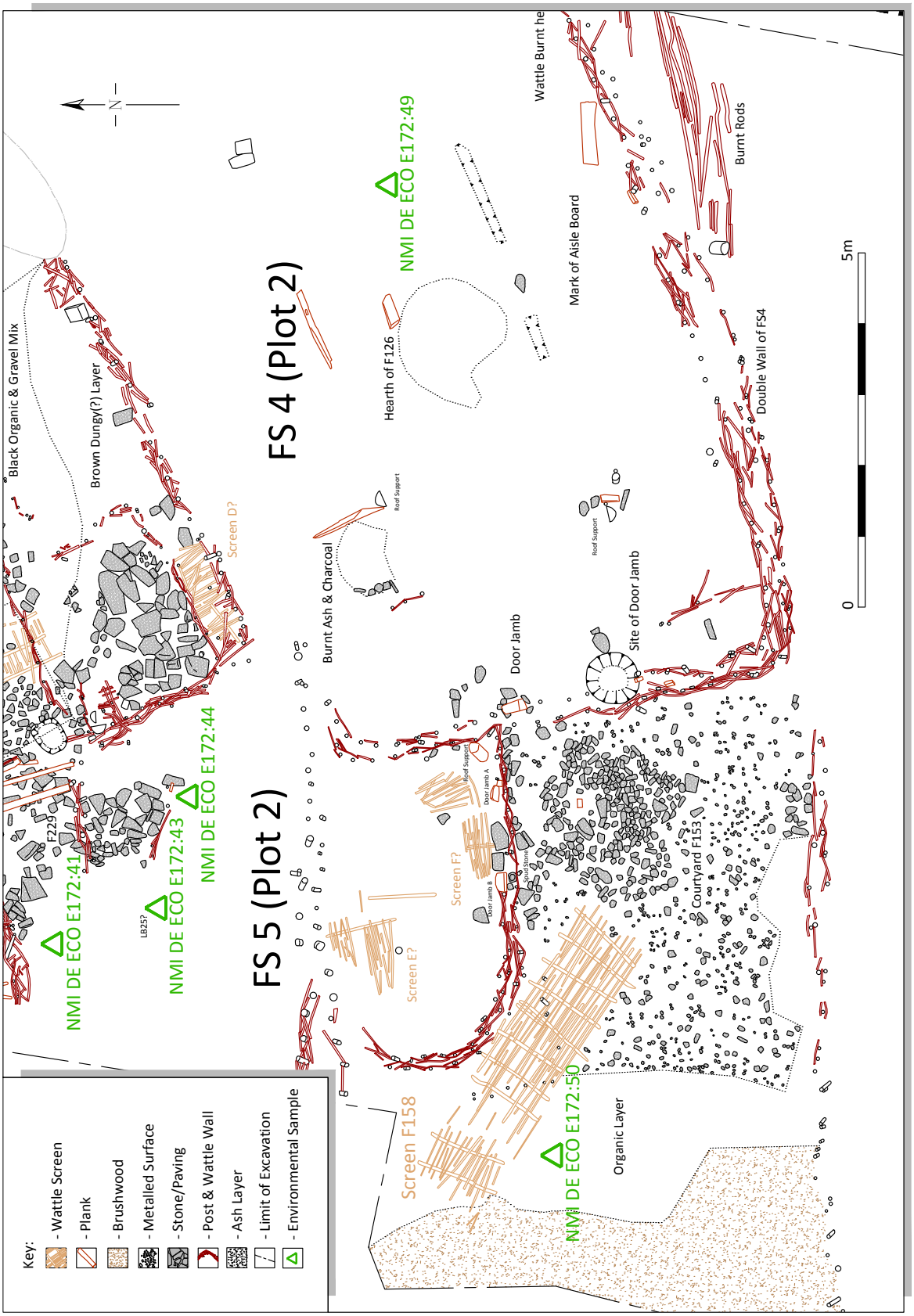


Figure 8: FS 4 and 5, Plot 2, showing sample locations.

of the assemblage. A high proportion of beetles that could not be identified to species also suggest that this deposit was trampled and degraded.

FS 4, Plot 2

Plot 2 contained a large Type 1 three-aisled house, FS 4, with a small Type 5 annex, FS 5 (Figure 8). The main building had also been burnt, producing an ash layer that contained a coin of Eadred (AD 946–955).

Beneath this was a thick organic layer, probably representing the foundation deposit for FS 4. It was highly organic and included small fragments of wood and gritty sand. A very small insect assemblage was recorded from this material, dominated by house fauna. One interesting beetle found here was *Sphaeriestes stockmanni/reyi*, which is generally found in burnt twigs (Alexander 2002). Its presence is possible due to the burning down of houses, as it may have been attracted to burnt wattle. This is the first record for this species from an early medieval settlement site in either Ireland or Britain.

Immediately outside the west doorway of FS 4 and south of FS 5 was a small cobbled yard, with a wattle screen forming a pathway extending to the west. The yard surface was covered in black organic material with animal bones, hazelnut shells and visible fly puparia. A sample from this produced a large assemblage dominated by generalist decomposers and dung/foul indicators. Indeed, many of the generalist species recorded would be entirely at home in fouler material, such as stable manure and wet compost. There were few 'true' dung beetles such as one might expect with cow or horse dung. Large numbers of blow fly larvae were also recorded from this deposit, suggesting the presence of fresh butchery waste in the yard. This all appears to tie in with the large number of neonatal pig bones recorded within FS 5, which suggests that this was farrowing pen, probably unroofed (McCormick and Murray 2007; Wallace 1992a: 124).

Building 1572, Plot 8

Plot 8 contained a possible post-and-wattle wall, Building 1572, which was poorly preserved and only survived for a small area in the southeast corner of the plot. This building may have been contemporary with, or even pre-dated FS 8, which also lay in this plot and was quite poorly preserved. Contemporary with Building 1572, lying 2 m to the southwest, was an area of paving, which may have served as the base of a fire. The entire plot footprint was covered in a thick green organic layer, with visible grasses, shells, clay and ash. Samples were examined from this deposit and from two pits, one southeast of Building 1572 and one in the northern part of the plot. The view of the excavators was that much of this material represented animal dung or manure.

The main yard deposit produced a small assemblage dominated by dung/foul indicators. A number of 'true' dung beetles species were recorded. *Omosita cf. colon* was also recorded and is generally found on old bones, carrion and other foul matter (Hinton 1945). Animal bone was frequently encountered in this deposit. House fauna numbers were very low, their low numbers or complete absence often a key characteristic of 'outdoor' yard deposits.

The three fills from the large shallow pit southeast of the building produced rich diverse dung beetle faunas, suggesting the presence of fresh animal manure in the pit or in the surrounding yard. They included a diverse generalist decomposer fauna dominated by species that occupy fouler habitats, especially wet rotting vegetation and carrion. Muddy ground and water beetles also suggested the pit contained standing water. A variety of beetles indicating both grassland and urban weed plants were present in the pit fill. These were probably both casualties from within the urban zone and from animal manure, reflecting the areas grazed by animals.

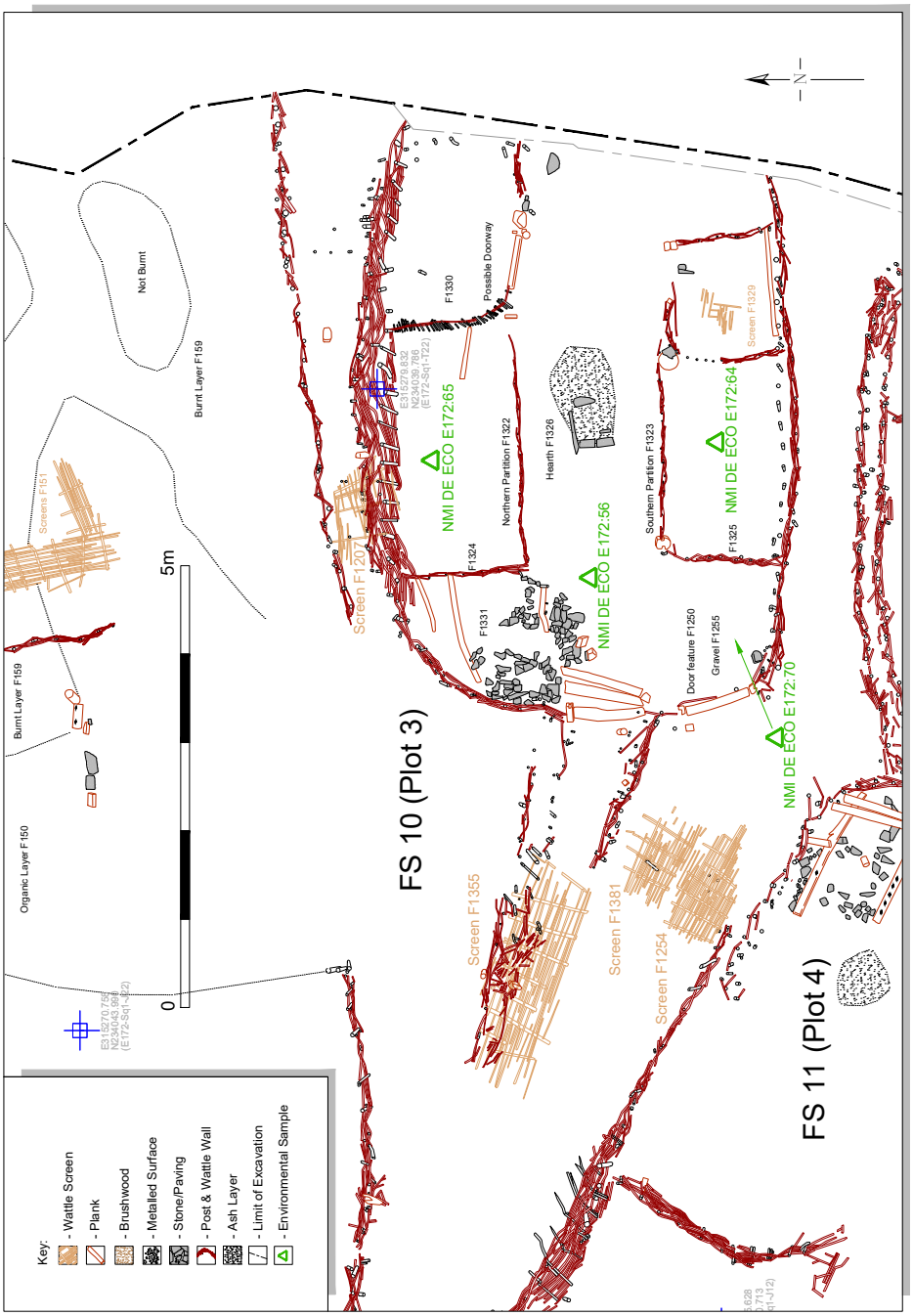


Figure 9: FS 10, Plot 3, showing sample locations.

Neogalerucella lineola was a notable find in this pit fill. It occurs on the leaves of willow, alder and hazel along riverbanks, in fens and wet woodland (Cox 2007: 158). Alder, willow and hazel were common tree species used in house construction in Fishamble Street. It is also likely that the banks of the Liffey were clothed in these trees. As for the waterside taxa mentioned above, it is also possible that this species arrived as a result of being accidentally grazed by large herbivores. .

The fill of the large pit at the northern end of this plot produced a high proportion of generalist decomposer and dung/foul indicating beetles and flies, but also high proportion of 'house fauna' species. This suggests the pit was also a receptacle for household waste. However, 'house fauna' in pits can also indicate straw or hay was used to 'cap' pits at certain times of the year to dampen down smell (Reilly 2003). In the context of this plot, these species may also have occurred in old hay used as fodder for animals. One notable beetle from this sample was *Necrobia violacea*, found in carrion, dried fish, dried skins and processed meats, such as cured hams (Dillon and Dillon 1972; Fogliazza and Pagani 1993). While other members of this genus are known from Ireland, this one is not known. Its presence in Fishamble Street may relate to imported meat products during the Viking era. It has also been recorded from Viking-age Kaupang (Norway), Viborg (Denmark) and Coppergate, York (England) (Barrett *et al.* 2007; Kenward 2005; Kenward and Hall 1995).

Building Level 3

At this level houses and other structures existed in Plots 3, 4, 5, 8, 10 and 11, which represents a considerable expansion in settlement up the street away from the river. However, houses and other buildings in Plots 8, 10 and 11 appeared to have burnt down during this time. One building in Plot 8 was described as a 'chicken coop' (Wallace 1992). From the area of Plot 11 and further south a huge amount of activity associated with metalworking was uncovered, including crucibles, slag, kiln waste, nails, iron bolts and a gilded bronze (Corless *et al.*, in preparation). Human skeletal remains were found in the area of future Plot 13. Coins of the reign of Athelstan *c.* AD 930–935 were found in Plots 4 and 5, although coins of a later period were found in the previous building level. Dating, therefore, remains slightly confused between these levels. Samples representing indoor and foundation deposits were examined from Plots 3 and 4.

FS 10, Plot 3

FS 10 was a large Type 1 house situated towards the eastern end of Plot 3 (Figure 9). It had a typical three-aisled structure, with additional partitioned areas in the northeastern and southeastern corners during its lifetime. A small carved wooden toy ship was found in this house (Laing 1988). Samples looked at came from the north and south aisled bedding areas, the central floor and the southwest corner.

The central floor deposit produced a smallish assemblage dominated by generalist decomposer and house fauna species. Many of the beetles recorded, however, suggested that the floor was damper and perhaps fouler than might be expected for inside a house. The southern aisle had a high representation of house fauna but was also dominated by damp-indicating insects, especially *Carpelimus bilineatus/ erichsoni*. Large numbers of house fly (*Musca domestica*) and blow fly (*Calliphora cf. vicina*) puparia were recorded, which also suggests foul conditions, rather unexpected for an area assumed to be used for sleeping. The sample from the northern aisle, meanwhile, produced an extraordinarily rich fauna dominated by *A. brunneus* (328 individuals), a key member of the 'house fauna'. In general, deposits where it dominates tend to be cleaner or drier than those were it forms only a minor component. Nevertheless, this deposit also produced relatively high numbers of foul indicators. A surprising find was high numbers of the parasitic wasp, *Spalangia* sp. These wasps are parasitic on certain fly species, especially *M. domestica,* and while they may have kept the actual number of flies in check (e.g. Skovgard

and Nachman 2004: 555–567), they do attest to the presence of this fly within the house. All three samples also produced small numbers of the human flea, *Pulex irritans*.

FS 10 appeared to have been remodeled three times during its use. The final remodeling included the possible insertion of an additional door feature towards the southwestern corner of the house and the associated laying down of a gravelly organic deposit in this area. This deposit produced a large assemblage dominated by generalist decomposer species, dung and carrion-indicating fly species, suggestive again of somewhat damp and foul conditions. There was a lower percentage presence of house fauna in this deposit.

The evidence suggests either that the residents of this house were involved in activities that generated foul waste, perhaps butchery, and that ground conditions were damp and perhaps more attractive to fouler insects. Alternatively, all these assemblages may reflect abandonment of the house, which then lay open to the elements, possibly accessed by foraging pigs or domestic animals for some time prior to dismantling.

FS 7, Plot 4

FS 7 was a large Type 1 house situated at the eastern end of Plot 4, contemporary with FS 10. A weaver's sword, wooden lid, cube and stem were found in association with FS 7 and FS 11, in this plot. A widespread sod layer, bounded by the wattle walls that formed the outline of FS 7, was interpreted as a foundation layer for this house. Patches of chewed grass or possibly manure were incorporated into this layer. One of these deposits was sampled but yielded only 16 beetles, five fleas and a small number of fly puparia. The fauna was very mixed with no clear signature.

Building Level 4

During this level, houses and other structures existed in Plots 2, 3, 4, 5 and 8. The area south of Plot 8, uphill, appears to have been open ground during this period. Many important and beautiful wooden artefacts were identified from this occupation phase, including a ship's prow (or 'stem') serving as a threshold in house FS 9, Plot 2 (although see McGrail 1993 for caution). From FS 17, Plot 4 (see below), came a beautiful roof-shaped box lid, while in FS 18, Plot 5, a small carved human head, writing tablet and coin of Eadred's reign (*c.* AD 946–955) was recorded (Laing 1988; Wallace 1992). From FS 19, Plot 8, a possible saddle-bow was recovered (Laing 1988). In FS 20, Plot 2, amber finds suggested that this might have been the house of an amber worker (Wallace 1992a); a carved chair terminal was also recorded from here (Laing 1988). Samples were examined from indoor, outdoor and foundation deposits of Plots 3, 4 and 8.

Building 1193, Plot 3

Three buildings lay within Plot 3 at this level. Building 1193 and FS 15 occurred in the same area, although Building 1193 extended further to the west, its eastern end apparently removed during construction of FS 15. There is some evidence for internal divisions and roof supports suggesting that it may have been a Type 1 house. A sample from a general floor deposit in the centre of this building produced a small assemblage dominated by house fauna. *Acritus nigricornis* and *Dendrophilus puncatus*, two small histerid beetles, also occur in this floor deposit. The former is found in rotting vegetation and wood piles, while the latter is known from animal burrows, bird and ant nests, and rotting wood in tree hollows (Alexander 2002). Although not members of the house fauna *per se*, both species commonly occurred in indoor contexts in Fishamble Street. While the former can be explained in the context of the many layers of wood chips used to build up floor layers, the latter is a little more enigmatic, particularly the

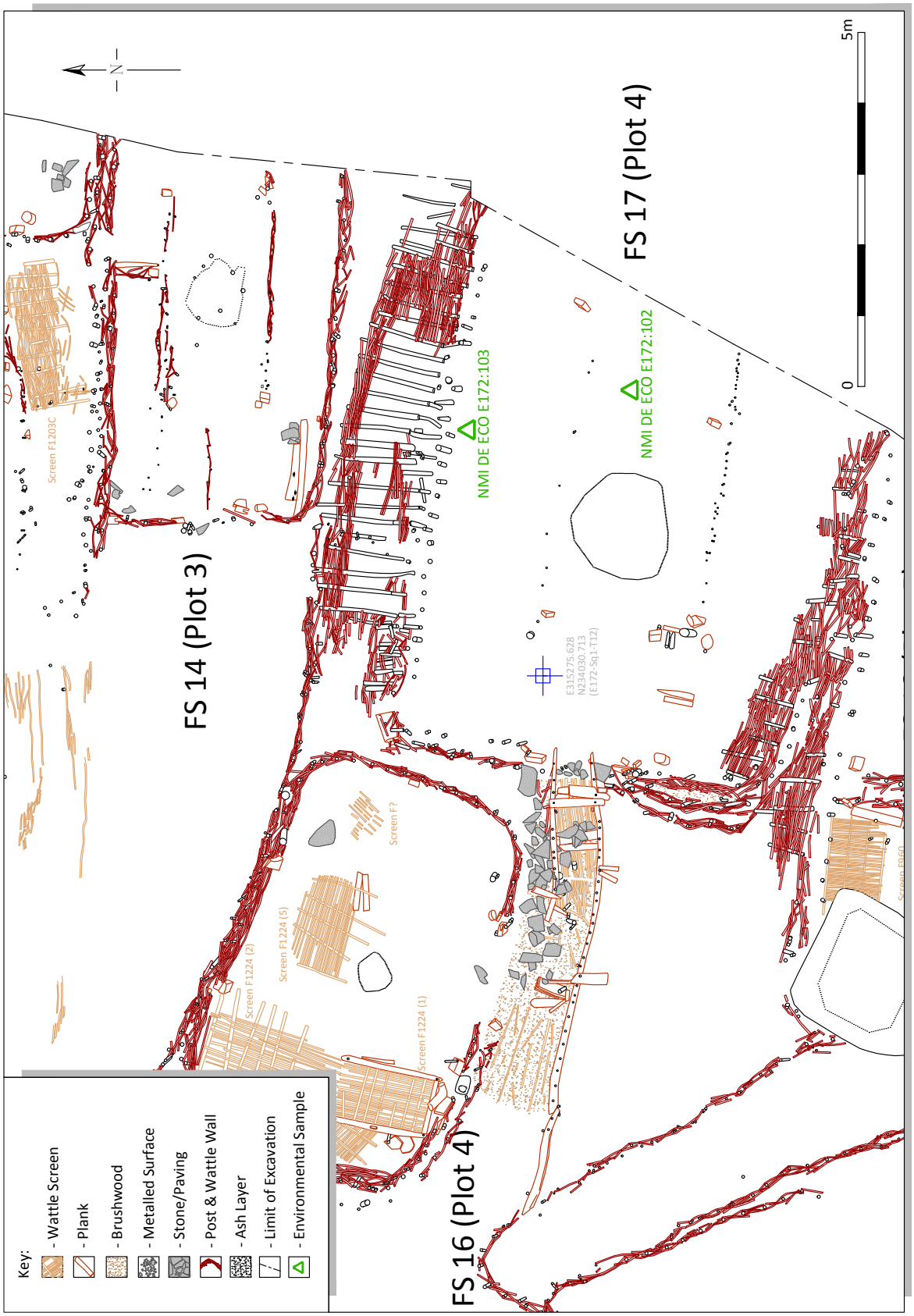


Figure 10: FS 17, Plot 4, showing sample locations.

high numbers that occur in later levels. Bird nests may have been present in the roof spaces of many of the houses, however, another possibility is that this beetle came from skins or other coverings used to partition the buildings or cover bedding and seating areas. This will be discussed again in more detail.

FS 17, Plot 4

A large Type 1 building, FS 17, was erected in the eastern end of Plot 4 (Figure 10). Although the exterior walls were well preserved, internal features were not, making it difficult to determine the internal layout of the house. A sample from the sod foundation layer in the centre of the house produced a rich fauna dominated by house fauna species, but especially *Ptinus fur* and *Xylodromus concinnus*. Both of these beetles are particularly common in fungoid wood, haystack refuse and stored foodstuffs (Alexander 2002; Koch 1989), which probably reflects surface material stamped into the sod layer, instead of the sod itself. A small mixed 'outdoor' element of the fauna, including grassland plant indicators and dung beetles, were probably more indicative of where the sod originated. *T. obscurus* also indicated that stored products, perhaps flour or other foodstuffs, were present in the house.

The most surprising find in this deposit was *Hylotrupes bajulus*, a long-horn beetle known to bore into wood used in construction of houses and other buildings. While today it is primarily found in pine, spruce and fir, on the continent it is also known from alder, hazel, poplar and occasionally oak (Hickin 1968). Its presence in Fishamble Street is fascinating, as it is highly likely to have been imported into Dublin at this time in timber, emerging as adults at a later point. The relatively immature coloration of the individuals encountered here suggests they were newly emerged adults. What was the source of this beetle in Dublin? The re-use of ship's timbers in house construction and furniture making in Dublin is one possible explanation. Indeed, a possible ship's prow was recovered in nearby Plot 2 in FS 9. One other context from FS 17, the material from a collapsed wall, produced a rich assemblage entirely dominated by house fauna and decaying straw/hay species. Broken fragments of *H. bajulus* wing-cases were recorded here also. There was a negligible 'outdoor' element in the fauna, confirming the protected interior origin of this material.

FS 19, Plot 8

FS 19 was a poorly preserved building located in the northern part of Plot 8 (Figure 11). Although the outer walls were largely removed, the internal three-aisle division features, including a hearth and paving in the central-aisle area and towards the western end, were recorded. A brown organic layer lay within the northern aisle division contained a very mixed fauna, suggesting that FS 19 was not a typical house or at least not by the time this particular organic layer built up. The deposit contained moderately high number of outdoor, water- and dung beetles, more commonly seen in pit or yard deposits. The water beetles might suggest that the house was unroofed. This suggests that the house may have been used for animal housing at this point. The number of water beetles might suggest that the house was unroofed by this time although the presence of the rare water beetle, *Pomatinus substriatus*, may simply indicate the presence of imported river water in a trough or other receptacle for the use of animals. *Dicheirotrichus gustavii*, a ground beetle characteristic of coastal salt-marshes and estuaries, is also recorded here. The primary deposit in the southern aisled area was also poor in terms of insect numbers. Proportionally, house fauna were high, but the deposit also contains a similar mixture of foul/water/outdoor beetles as the north aisle. In addition, this deposit contained a large number of fly puparia, including the biting stable/house fly, *Stomoxys calcitrans*. The plant-feeding beetle *Nedyus quadrimaculatus* is indicative of nettles, and *Notaris acridulus* is indicative of waterside vegetation. These may have come from bedding or fodder, or were incorporated into the deposit in stable manure.

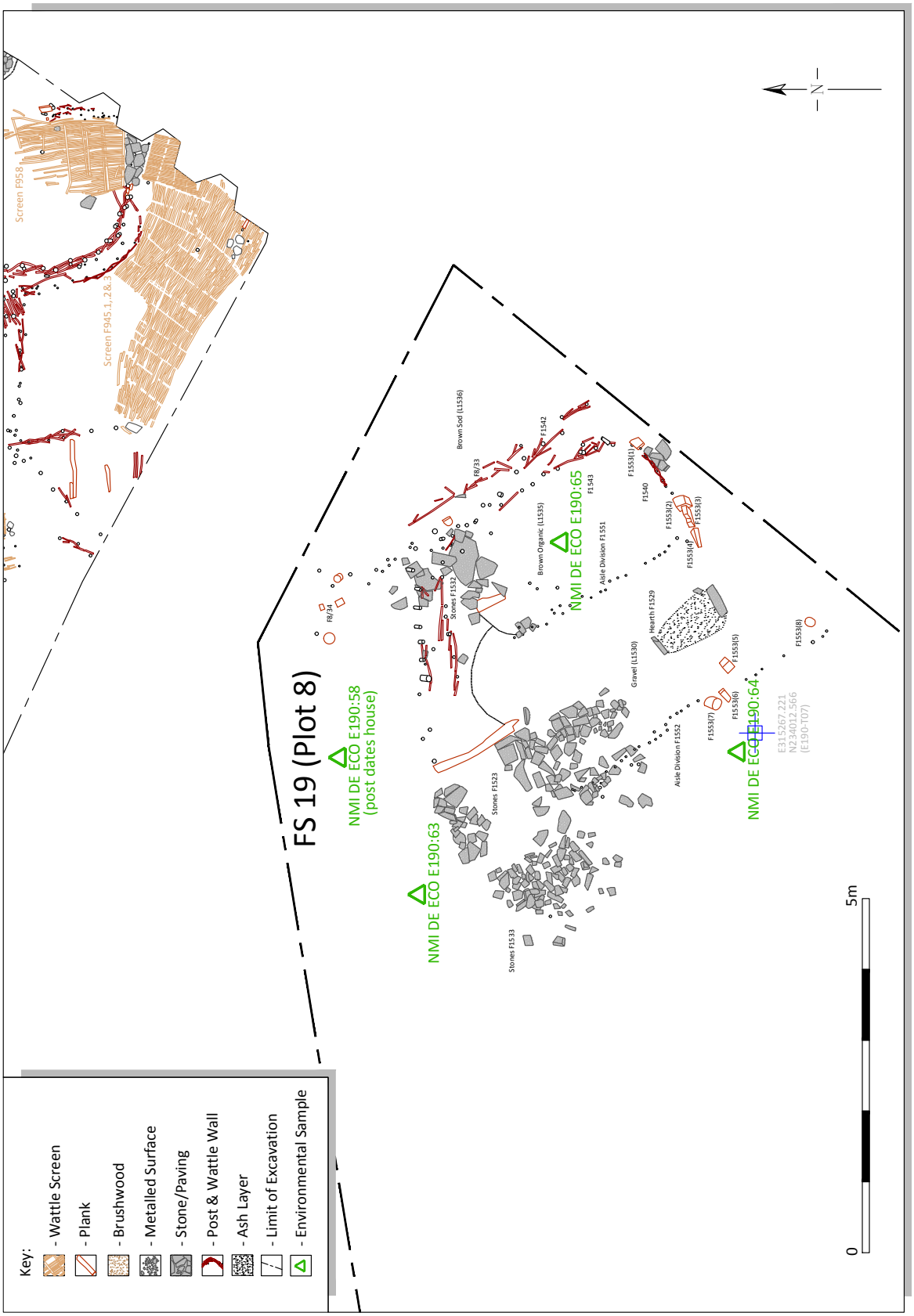


Figure 11: FS 19, Plot 8, showing sample locations.

Outside the house, and stretching to the western end of the plot, were various gritty organic clay layers with lots of discarded bone. A sample from this deposit had a typical outdoor profile totally dominated by dung/foul indicators. Among the frequent fly puparia encountered were *Helcomyza ustulata* and *Thoracochaeta zosterae*, both of which are most commonly known from decaying seaweed (Smith 1989). During Viking-age medieval times, however, these flies appear to have been attracted to urine-soaked rotting plant matter and became among the commonest components of yard and cesspit faunas (Belshaw 1989; Smith 2012; 2013). Evidence, therefore, from within and outside FS 19, suggests that by the end of its life it was functioning either as an open pen or stable.

An extensive sod layer 'sealed' feature FS 19, and also provided the foundation layer for construction of FS 27/32 at building level 5. It produced an entirely different insect 'signature' to others from this plot. While it was not a particularly large assemblage, it was totally dominated by house fauna species, suggesting some of the material used to build up the foundations came from indoor deposits, roofing material, or thatch. The presence of some dung beetles and flies, however, also reflects the foul and dungy nature of this plot in its final stage.

Building Level 5

During Building Level 5, houses and other structures existed in Plots 2, 3, 4, 5, 6, 8, 9 and 10, a further expansion on previous building levels. Buildings in Plots 2, 3 and 4, however, were burnt or partially burnt, which may have been due to accidental burning or a period of violent upheaval in the town (see Chapter 2). Nevertheless, some fine, carved wooden objects were found associated with buildings in Plot 3 at this time (Laing 1988), while possible metal-working activity was identified in Plots 5 and 10 (Corless *et al.*, in preparation). Finds from a pit in Plot 10 included amber, fabric, an iron punch, bone beads, three 'net sinkers', and a possible hone stone, while human skeletal material was also excavated in this area (Corless *et al.*, in preparation). A coin of Aethelred, *c.* AD 980, was found in Plot 6 (Wallace 1992a).

This level also saw the first comprehensive plant macrofossil analyses (Geraghty 1996) in the area of future Plots 11 to 13. The top end of Fishamble Street does not appear to have been built on for 50–60 years after settlement started at the bottom end. Three early burials, all crouched and casually aligned, along with two human skulls, were uncovered in this 'fallow' area. There was also evidence for a considerable amount of activity, with the digging of pits and gullies. Samples from two pits contained substantial deposits of cleaned barley and oat grain, ready for storage or use (Geraghty 1996). Another pit produced a large quantity of charred flax seeds.

Only a small number of samples were available or suitable from Level 5. Outdoor and indoor deposits from Plots 8 and 10 were examined here.

FS 32, Plot 8

FS 32 was a fairly poorly preserved Type 1 house in the eastern part of Plot 8. An extensive area of dark-green woody organic material covered the yard area outside the house, and also contained animal bone and shell. It was dominated by house fauna, even though it came from the yard. However, high numbers of dung and plant-feeding beetles and a range of foul-indicating fly puparia were typical of yard and pit deposits. The house fauna element may have come from floor sweepings, dumped bedding, or roof thatch left out as fodder for animals.

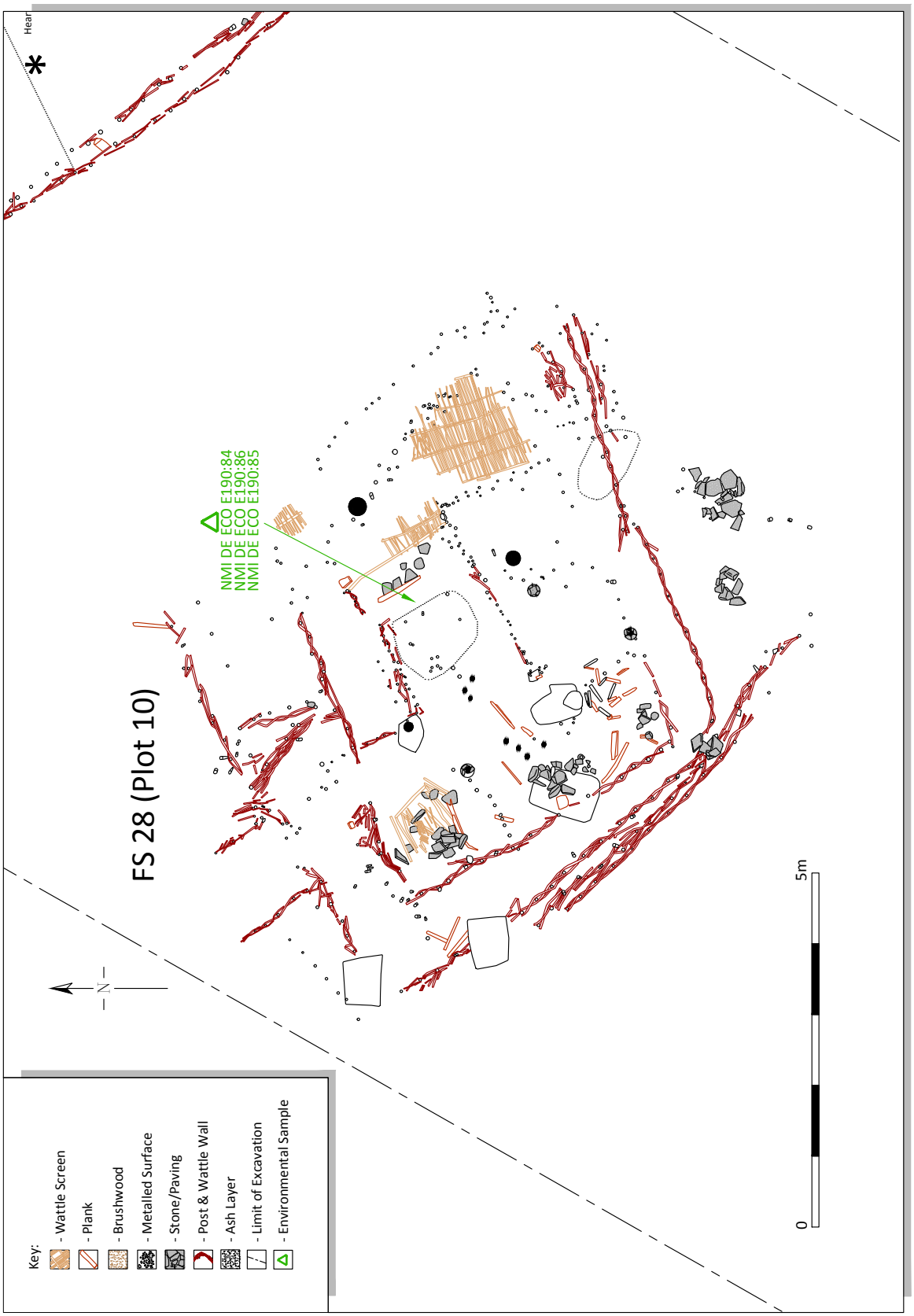


Figure 12: FS 28, Plot 10, showing sample locations.

FS 28, Plot 10

FS 28 was a three-aisled Type 1 house, with the northeastern end largely missing (Figure 12). It was oriented somewhat differently, i.e. NE/SW, to the general EW orientation of many of the houses on Fishamble Street and all subsequent buildings in Plot 10. It was surrounded on three sides by a boundary wall with a sort of 'passageway' leading off from the northwestern corner. Three superimposed 'floor' layers were recorded in the central-aisle area and one sample was examined from each. Notably, during excavation the deposits were colourfully described as 'brown humus gunge', suggesting they were dungy nature.

All three floor deposits were dominated by dung/foul indicators. Two species were particularly frequently recorded – *Oxytelus laqueatus* and *Aphodius granarius* – both indicative of dung, fermenting vegetation and manure heaps. The number and variety of plant-feeding beetles recorded also suggest the presence of manure, as most were

indicative of grassland plants. The final 'floor' deposit produced some house fauna beetles but notably very few *A. brunneus*. Clearly the floor was inimical to successful breeding for this beetle. The floor deposits also had a mixed foul-indicating fly population.

Combined, the insects suggest that FS 28 was not functioning as a domestic house when these deposits were formed. Similar to FS 19, at the previous level, the building appears to have been an animal stable or byre for part of its existence. It may simply have lain abandoned for a period of time, used casually by neighbours for corralling or feeding animals prior to butchery, market or export. The depth of deposits and the similarity of their faunas would suggest a relatively long 'abandonment' phase, if so.

Building Level 6

Unfortunately, this level is very poorly represented here as samples either did not survive from this level, or the existing samples were not suitable. Level 6 was somewhat ephemeral compared to the previous and following levels and some houses showed signs of burning. Buildings existed in Plots 4, 6, 8, 9, 10 and 11. Fine wooden objects were found in Plot 4, with some suggestion that a wood-worker lived in FS 29 (Wallace 1992). In Plot 9, a deposit west of the doorway of FS 33 contained hair, textile and leather, suggesting cloth making and leatherworking occurred in this house. Finds associated with FS 36 in Plot 11 suggested the presence of a metal worker (Adrienne Corless, pers. comm.). Samples were examined from inside one house in Plot 10 only.

FS 35, Plot 10

FS 35 was a poorly preserved Type 1 house that succeeded FS 28 (Figure 13). The building was founded on a layer of estuarine mud, which appears to have been deliberately laid down and which may account for its poor preservation. The central area of the house was covered in a succession of layers, one of which consisted of grey-brown clay with slag, bone, charcoal and shell inclusions with a wattle matt above it. This produced a poor assemblage of only eighteen beetles, most of which were house fauna species or generalist decomposers. In the southern aisle, floor layers were dominated by ash and clay, with visible plant remains, bone and shell. This material also produced a small mixed assemblage with dung, water, outdoor and plant feeding species occurring most frequently. The flies *M. domestica* and *S. calcitrans* were also present, attesting to the foul nature of the floor deposits in this area. The assemblages strongly suggest that the house lay abandoned and probably unroofed for a time towards the end of its life. The poor preservation may also indicate the house was completely dismantled, or perhaps partially burned, which may, of course, have precipitated abandonment.

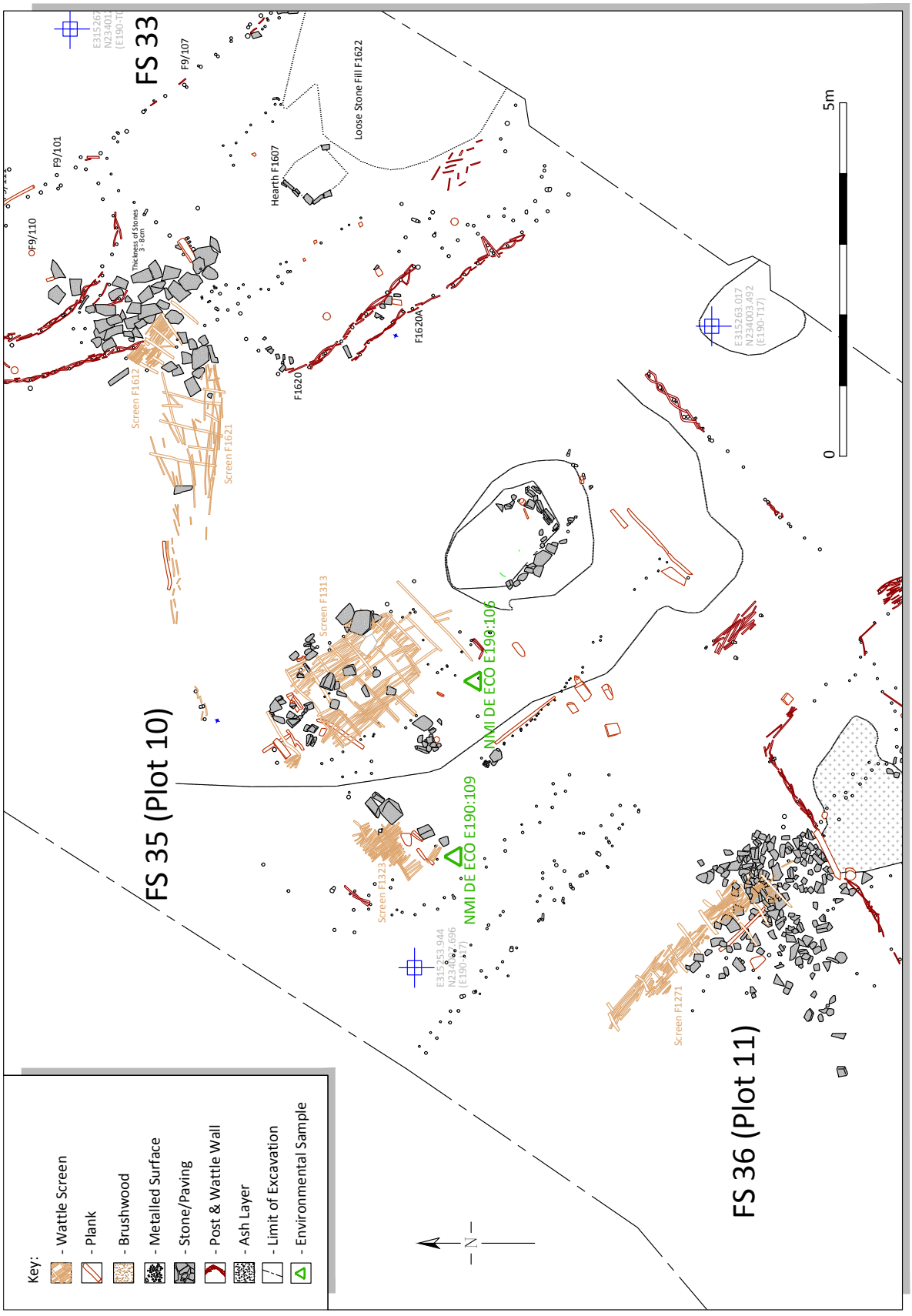


Figure 13: FS 35, Plot 10, showing sample locations.

Building Level 7

Level 7 sees expansion of the settlement on Fishamble Street once again, with at least one and sometimes multiple buildings present in Plots 2, 3, 4, 5, 6, 8 and 9, as well as lots of evidence for industrial activity in the area of Plots 10–13 (Adrienne Corless, pers. comm.). Carved wooden objects, a gaming piece, amber pieces and beads, as well as much evidence for metal working, are present throughout this building level across the plots. Clearly Fishamble Street is once again thriving. Samples were examined from indoor, outdoor and foundation deposits in Plots 8 and 9, as well as a curious deposit from a possible building in the area of Plots 10–13.

FS 45, Plot 8

FS 45 was a classic Type 1 house (Figure 14). It was founded on an extensive ash layer, the remains of burnt houses at Level 6. A large hearth and a mixed organic deposit, with matted plant remains, bone, shell and small stones, occupied the central aisle. A sample from here produced an insect assemblage with high-percentage presence of house fauna, as might be expected from an indoor location. However, the high number of true dung beetles and other foul indicators suggest that the central floor area was also dirty and trampled. This deposit appeared to be from a true 'occupation' deposit, rather than an abandonment phase. This will be discussed in more detail in Chapter 5. The main occupation layers in the northern and southern aisles consisted of matted plant remains, mosses, brushwood fragment, charred hazelnuts, textile fragments and some clay inclusions. Insect assemblages from the two aisle floor deposits were extremely rich, dominated by *A. brunneus* and other house fauna. However, *D. punctatus*, first mentioned in Building 1193, Level 4, was the second most frequently occurring species in both deposits. Wood debris, bird nests, or, possibly, the use of dried animal skins in the bedding areas, might explain the high numbers. There were negligible numbers of outdoor, damp ground, water or dung beetles suggesting that the side-aisle areas of this house were kept warm and dry. The bedding areas most likely did not see the same footfall as the central aisle or hearth area for example; this means one might expect outdoor species to be more concentrated in these more frequently accessed areas than elsewhere in the house. Outside the back wall of the house, a thick clayey sod layer, which included animal bone, shell, fragments of wood and gritty gravel, had built up. The assemblage here provided a stark contrast to the two side aisles, but overlapped with the central aisle. While there was a surprisingly high presence of house fauna, probably incorporated into yard deposits through sweeping out of interior floors, many characteristic species of 'outdoor' contexts were well represented, including dung, water, ground and plant-feeding insects, the latter indicators of both urban weed and grassland plants.

FS 46, Plot 9

FS 46, also a Type 1 house, lay in the neighbouring plot to FS 45 and did not appear to be separated from it by a boundary fence (although see the reference to wattle matting below) (Figure 14). It was built on a thick layer of organic material which appears to represent a fallow period in this plot more than simply a foundation deposit for the house. Samples of this material were examined in two different locations, one from the western end of the plot, near where FS 47 was subsequently built, and one from under the footprint of FS 46 itself. Possibly due to mixing of layers, or trampling from above, the foundation material within the footprint of FS 46 had a high presence of house fauna. However it also contained high numbers of foul indicators. Dung, cess and carrion related fly puparia were also recorded in high numbers. The assemblage from the western end of the plot had fewer house fauna and a slightly higher presence of foul-indicating beetles and flies. It certainly suggests that this plot lay fallow for a period of time, allowing waste material to build up, before construction of FS 46 and 47 commenced.

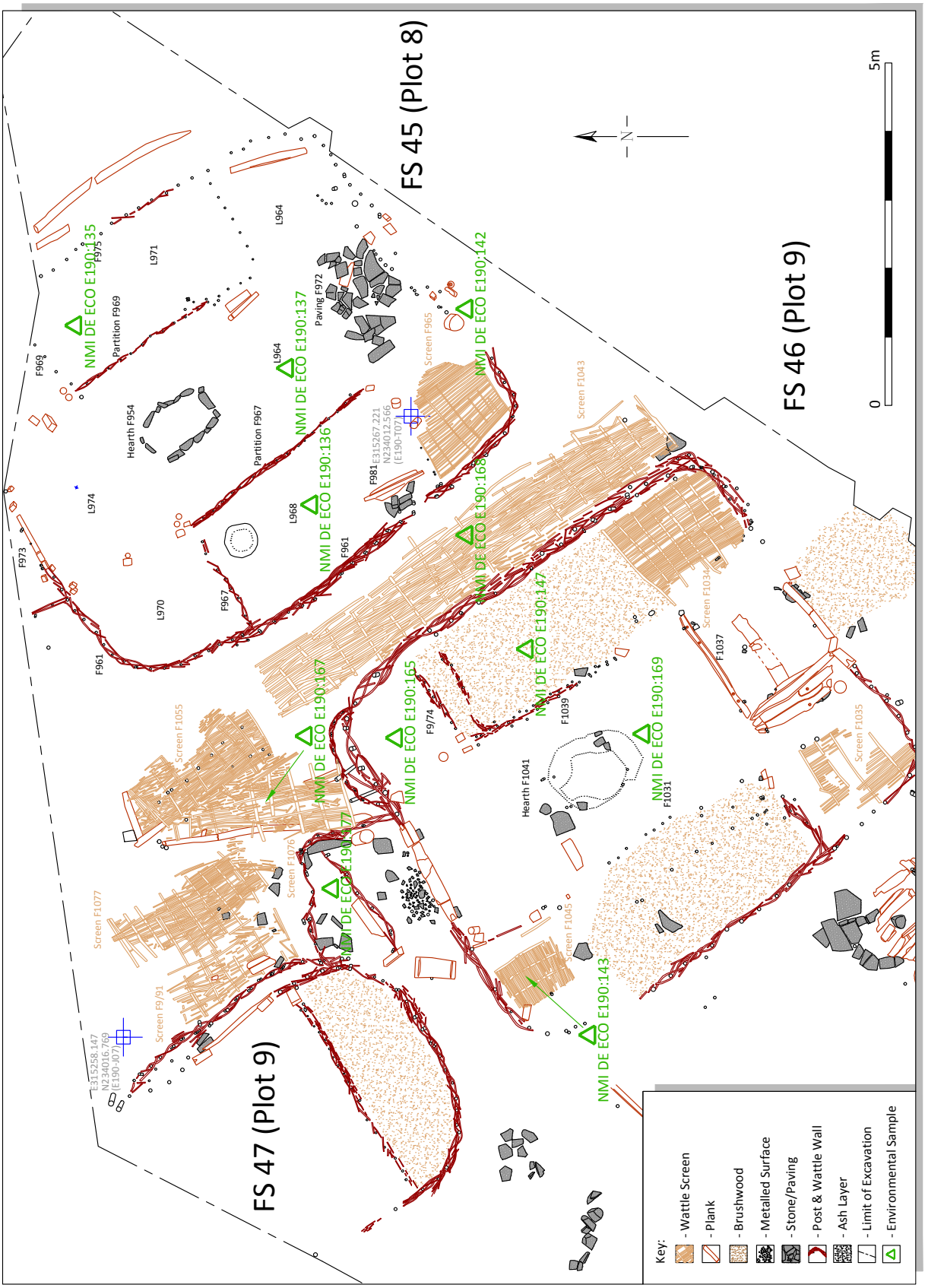


Figure 14: FS 45 and 46, Plots 8 and 9, showing sample locations.

Inside, the house had a typical three-aisle structure but with a number of additional partition features in each corner and a possible lobby inside the east doorway. Wattle mats were recorded in three of the four corners. Samples were examined from the southwestern corner; a sod layer beneath the brushwood layer in the northern aisle and a dark organic floor deposit in the northwestern corner of the house.

The north aisle sod layer produced a familiar assemblage for a side aisle, dominated by house fauna species. The northwest corner had a similarly high presence of house fauna but lower numbers of *A. brunneus*. Among the generalist decomposer species, many were suggestive of somewhat damper conditions in this location. It also contained surprisingly high numbers of foul-indicating fly puparia, which suggests contamination; either during occupation of the house, or initially when the sod was laid down over the pre-existing 'fallow period' deposits. It may indicate that products were being stored or prepared here that attracted these flies, for example, fresh meat, butchered bone, or fresh skins. The deposit from the southwestern corner was very rich in house fauna but also contained high numbers of *D. punctatus* and *O. colon*, and smaller numbers of *Trox scaber*. Combined, these species are indicative of either birds nesting above or dried animal matter. Dried meats may have hung here or, perhaps, animal skins hung after cleaning or used as screens/wall coverings. Does this link to a possible 'preparation area' across the way in the northwest corner?

Outside the house, two samples came from the extensive wattle mats or pathways that lay to the north and northeast of the house (Figure 14). One extended from the northwestern corner of FS 46 in a NS direction, the other extended along the whole northern wall of FS 46, between FS 46 and FS 45. This mat has variously been designated a 'collapsed' boundary wall or a 'main pathway' through the plots. It may have served both purposes during its lifetime. Surprisingly, house fauna dominated the assemblage from the NS wattle mat. The foul element among the beetles was relatively small. The assemblage from the mat running between FS 45 and 46 was much more mixed. A range of beetles suggested that ground conditions were wetter here. Foul indicating fly species suggested that animal dung and possibly human excrement were trampled into the surface of the path. The difference may be accounted for by the proximity of the NS mat to the back door of FS 46, where house sweeping may have been spread across the surface, while the path between the houses was more heavily trampled. *Hylotrupes bajulus* was recorded in various deposits throughout FS 45 and 46, its first appearance since building Level 4. It may have become established in the town by this time, or this may represent another temporary appearance in imported wood.

'Building' 1302=1303, Plots 10–12

At this level, as mentioned before, there is no evidence for house structures in Plots 10–13. However, eighteen stone-packed postholes in a vaguely circular shape suggested the presence of a large 'barn-like' structure in this area (Corless *et al.*, in preparation). Within the area demarcated by the posts, areas of paving were noted, a number of wooden-lined troughs and a hearth. Clay and sod layers sealed a variety of ash spreads associated with these hearths and a sample was taken from one of these deposits; this comprised matted plant remains, animal bone, clay, decayed shell, and charcoal. It was described in the original sample register as 'clay, south aisle'. It is possible that another building could have been built within the footprint of 1302=1303, of which only the clay floors survived

The sample produced a very rich assemblage, which bore all the hallmarks of a side-aisle deposit. House fauna dominated, alongside many generalist decomposers and plant feeding, moss and decayed wood species. Therefore, the possibility exists that this deposit relates to a later 'aisled' structure, previously unrecognized, lying with the footprint of this larger 'industrial' structure.

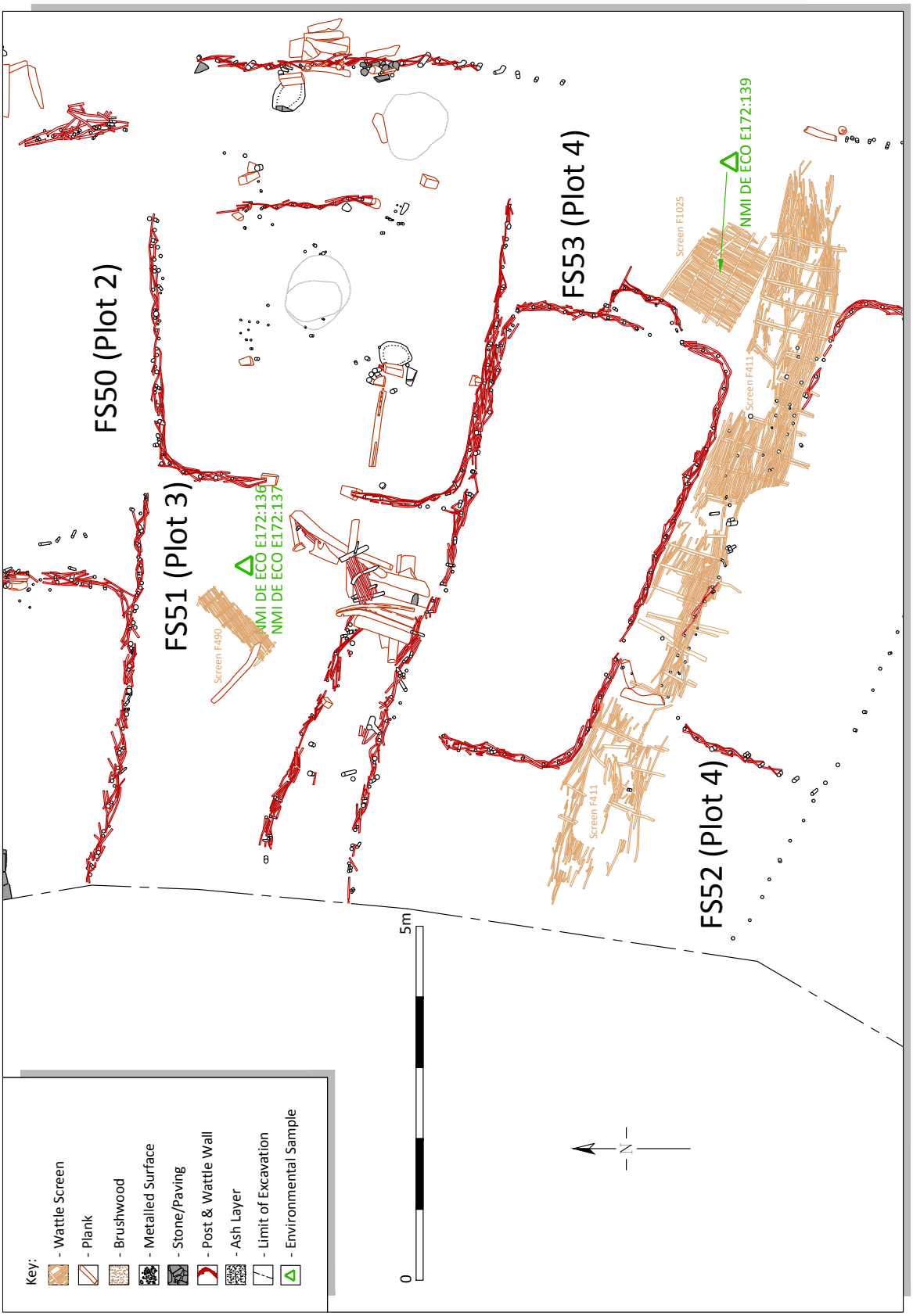


Figure 15: FS 51 and 53, Plots 3 and 4, showing sample locations.

Building Level 8

While settlement in Fishamble Street continued to expand southward up the hill, this level also represented a period of dramatic upheaval, as many of the houses were burnt down. The extensive nature of this burning would suggest something more than accidental fire and may relate to a period of political unrest in the late 10th century AD. Preservation and selection of samples was difficult, as no one house was presented by a comprehensive number of samples. Finds from this street level include large amounts of burnt slag, furnace ash, and other evidence of metalworking in Plots 9 to 11. Ships timbers were also found in Plot 2 (FS 50) and outside FS63 in Plot 12. Samples from yard, indoors, and pit fill deposits were examined from Plots 3, 4, 9, 10, 11 and 12.

FS 52, Plot 3

FS 51 was a small Type 1 house spanning the width of Plot 3 (Figure 15). Its internal subdivision features were poorly preserved. Two samples came from the yard area outside the house to the west. This material consisted of matted plant remains, shell,

charcoal, and a large quantity of dumped feathers, most likely the result of plucking chickens. The yard also contained a wattle mat, a wattle wall, and a spread of timbers, which may have served as a pathway.

The deposit produced a large, rich assemblage, with a very high presence of house fauna. This suggests that the deposit actually came from an 'indoor' context. Given the presence of the wattle wall, mat and spread of timbers, this area may have been some sort of building. The high number of feathers may suggest something like a chicken coop, but it may simply have been an outbuilding or annex that served multiple purposes (or even the use of feathers in bedding – Scott Timpany, pers. comm). A total of 104 puparia of the seaweed/cess fly, *T. zosterae*, were also recorded in this material, along with many foul-indicating beetles. Combined, this suggests that the deposit was not a typical 'indoor' deposit and was heavily contaminated by material that attracted these sorts of beetles and flies. Accumulating chicken faeces and urine inside a chicken coop might explain this strange mix of 'house' fauna and foul indicators. A chicken coop was noted at previous levels also (Wallace 1992a).

Between FS 53 and 54, Plot 4

Next door (Plot 4, FS 54) was presumably the main structure but this did not survive in any substantial form. West of this, a small structure, FS 53, was built (Figure 15). It had no internal features and no hearth and may have functioned as an enclosure or stable. Between FS 54 and FS 53 a wattle screen was laid down, partly overlying the main wattle path in this plot. This was overlain by various peaty organic layers, one of which was sampled. This produced a small, mixed assemblage of dung and house fauna, probably a combination of trampling dung from the yard and sweepings from the surrounding houses. Like the wattle mats at Level 7, the surface was not as foul as the general yard mud that must have surrounded it, fulfilling their assumed purpose of providing residents with a cleaner and drier route both across and through the plots.

FS 60 and FS 61, Plots 9 and 10

Further up the street in Plot 9, FS 60 was a substantial Type 1 building (Figure 16). While the internal features were discernable, the house appears to have suffered much damage from fire. The only sample from this house came from a burnt clay layer in the central-aisle area, which also contained charcoal, wood chips, bone, hide, slag, and substantial numbers of blow fly puparia, primarily *Calliphora vicina* (the 'blue bottle'). This fly is attracted to freshly dead bodies of both animals and humans, as well as freshly

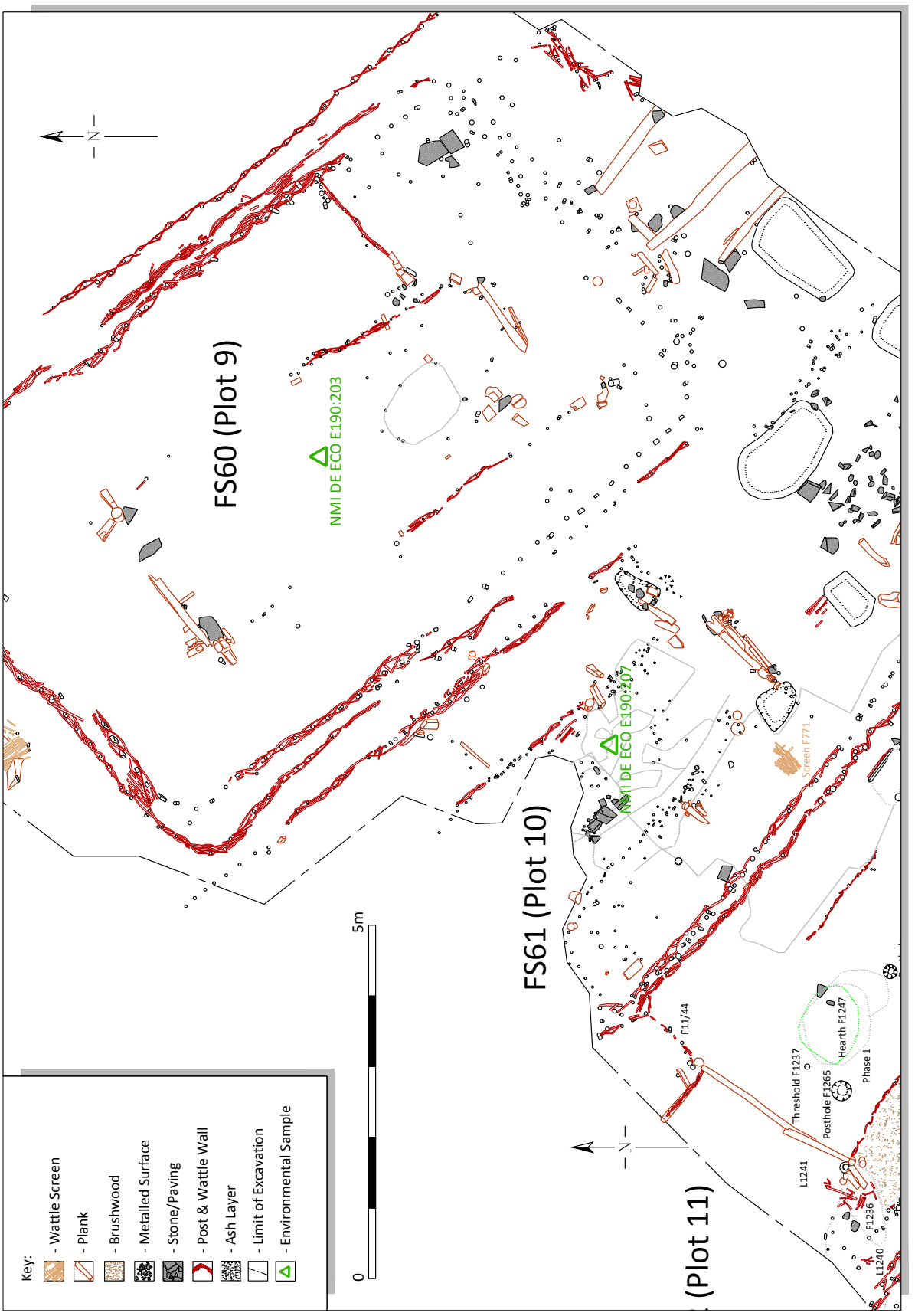


Figure 16: FS 60 and 61, Plots 9 and 10, showing sample locations.

butchered bones with flesh still attached (Smith 1989). The fact that this deposit contained so many of them suggests that its preferred food source was available in the centre of this house. Post-burning, the abandoned space may have been used for dumping butchery waste or animal carcasses. It is also entirely possible that human remains lay in this location. The body may have been removed eventually, but the puparia remained *in situ*. The very low number of generalist and house fauna beetles in the deposit is probably due to the burning away of most of the floor layers.

FS 61 was located southwest of FS 60, in Plot 10, separated from it by a thin boundary wall. It was also a Type 1 house, but the western end of the house extended beyond the limits of the excavation. The eastern wall also did not survive and evidence of burning is also present in this structure. The central floor deposit here again produced a very small assemblage, presumably due to burning or post-burning degradation of the floor layers. The assemblage was similarly dominated by house fauna beetles but had a higher proportional presence of outdoor ground-living beetles, including the weevil *Otiorhynchus rugifrons*. This beetle prefers bare dry ground with sparse vegetation and may have been attracted to open exposed areas after the houses were burned.

FS 62 and FS 63, Plots 11 and 12

FS 62 was a Type 1 house, the first in Plot 11 since Level 6, but also destroyed by fire (Figure 17). The northwest and southwest corners of the house were partitioned off. Geraghty sampled a number of contexts from this house for plant macrofossils (Geraghty 1996: 19–29). Yard deposits suggested that there was a rich covering of weeds, with paths fringed by buttercups, sedges, chickweed, and stinking chamomile. The south aisle floor, however, appeared to have been protected from burning, as a sample from here produced a rich assemblage of beetles totally dominated by house fauna species. Other generalist decomposers suggested a relatively dry and clean floor. Overall, the assemblage is similar to other aisle samples and is one of the few glimpses of an actual occupation floor from Building Levels 8 or 9.

FS 63 was the first building in the new Plot 12 (Figure 17). This house, like its neighbours, was burnt to the ground and many of its features were barely discernable. No samples from inside the house were available for analysis. Outside, to the north, a path and large pit (F1121) were recorded. Geraghty (1996: 29–30) discussed this pit in detail. It appears not to have been dug for contemporaneous use with FS 63, but more likely pre-dated it by some time. The large number of flax seeds in the basal layer and its unusual square shape suggest it may have been originally dug as a retting pond (Geraghty 1996: 30). One fill, from close to the top of the pit, was examined for insects. It consisted of loose, black organic material, with burnt wood/twigs, possibly burnt straw/sod, shell, and bone. Geraghty suggests that when FS 63 was being built there was an attempt to fill in the pit, but this was only partially successful. It was not until the house was burnt down that discarded burnt roof and wall material was added to finally seal off pit F1121.

The insect assemblage was not very large and, unlike other pit fills in Fishamble Street, foul-indicating beetles did not dominate. One fly species, *Coproica vagans/Limosina silvatica*, was reasonably numerous and is suggestive of either animal dung or human excrement. However, house fauna were the dominant habitat group, followed by more generalist decomposers. This would appear to concur with the archaeological evidence, which suggested that this pit was primarily filled with dumped roofing material and perhaps other debris from the nearby burnt house. *Brachysomus echinatus* and *Otiorhynchus rugifrons* may have come from turf cut from coastal grassland areas, used either as roofing material or for sod flooring, although the latter may also have been attracted by the bare dry ground created by the burning down of most of the houses on the street. Both have a coastal distribution in Ireland (Morris 1997).

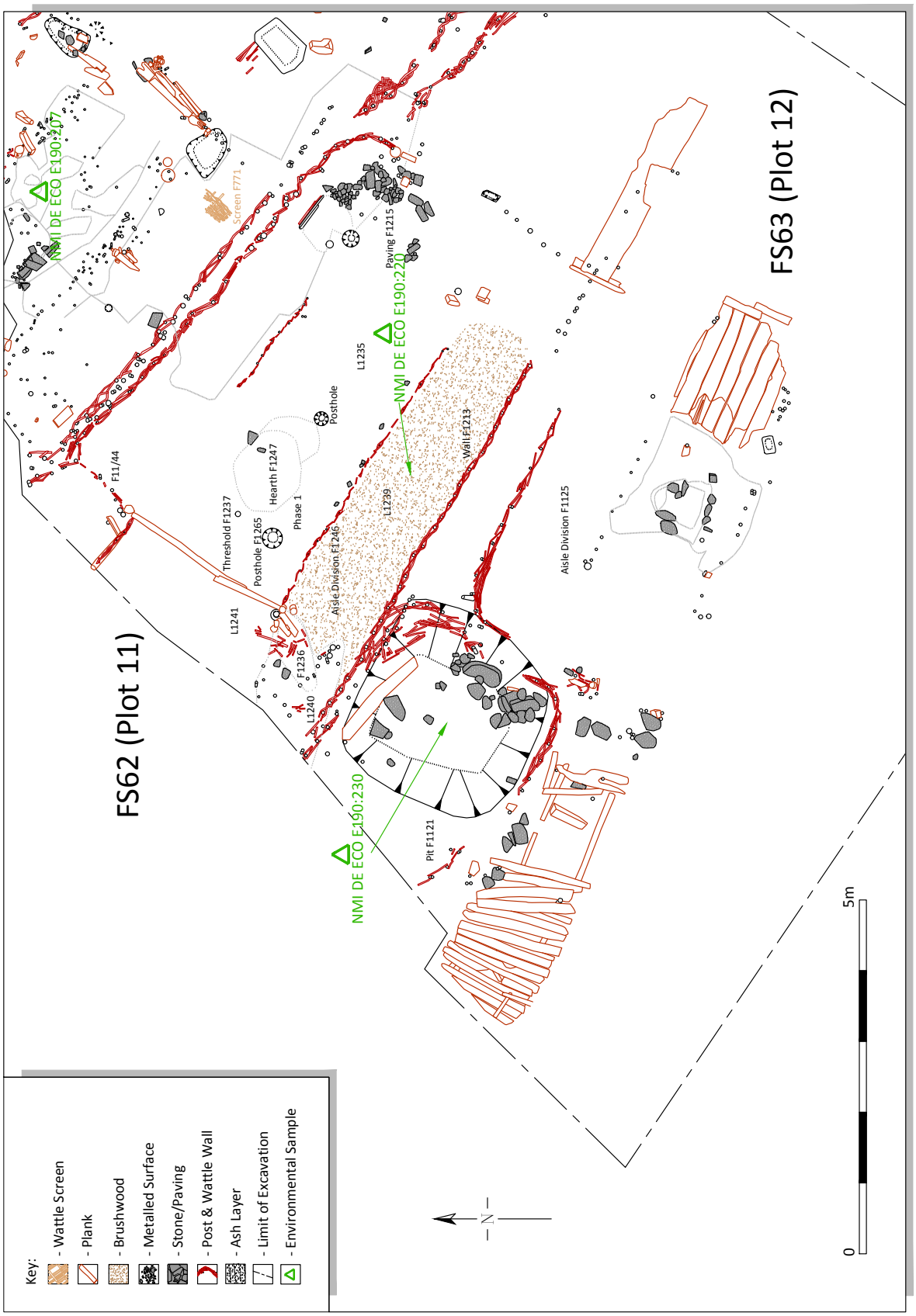


Figure 17: FS 62 and 63, Plots 11 and 12, showing sample locations.

Building Level 9

While there was at least one, and in some cases up to three houses built in every plot at this level, the majority again suffered complete or partial burning. Once again this had a detrimental effect on the availability of samples for analysis. Several coins were found at this level, including two Aethelred (*c.* AD 980 and *c.* AD 991–7 respectively) and one Edgar (*c.* AD 959–973). The devastation at this and the previous level may relate to the particularly turbulent period towards the end of the 10th and start of the 11th century. Only three samples were examined from this level, one from Plot 3 and two from Plot 10.

FS 69, Plot 3

Two buildings were erected in Plot 3 at this level, FS 70 and FS 69. FS 70 was a large Type 1 house with an unusual stone footing or drainage channel along it southern wall. FS 69 was a small building built towards the western end of the plot. It appeared to be a Type 1 house in layout, although very small in comparison to others. This building was destroyed by fire, giving rise to a large thick 'ash' layer comprising burnt plant matter or burnt sod, either a burnt foundation floor or fallen burnt roof material. This was examined for insect remains, but, perhaps predictably, produced a very small fauna with no clear insights into its origin and conditions within the building. Clearly the burning of the house had a detrimental effect on the preservation of insect remains.

FS 77, Plot 10

FS 77 was a poorly preserved Type 1 house that also suffered extensive fire damage (Figure 18). Indeed, the external walls only survived as linear deposits of ashes and some charred posts. The central floor area had a number of spreads or deposits, one of which comprised compressed plant remains, wood chips, hazelnut shells, and bone. This produced a small, impoverished assemblage of house fauna, generalist decomposer and outdoor plant-feeding beetles. The plant-feeding insects were a mixture of urban weed and grassland herb species, and could have come from the immediate plot area or from burnt sod/roofing material. Plant macrofossil analysis from floor layers in neighbouring FS 78 would suggest that the latter was most likely (Geraghty 1996: 27).

Outside the house, a large wattle mat extended in a NW–SE direction from the eastern end of FS 77 towards the eastern end of the plot and along the boundary between Plots 10 and 11. As with previous examples, it may have been a collapsed fence, or path, or served both purposes during its lifetime. It was heavily scorched in places. A sample from the organic material beneath this mat produced a mixed assemblage. There were indications here of damp ground underfoot with ground beetles *Pterostichus minor* and *Bembidion cf. tetracolum* present, species that prefer damper ground near water (Luff 2007). Neither sample was particularly helpful in terms of understanding living conditions at this level. There is no doubt that, with very few exceptions, the burning of houses at Levels 8 and 9 has left these phases of occupation somewhat 'invisible' on this issue.

Building Level 10

After the devastation of Levels 8 and 9, Building Level 10 represents a return to a lively and thriving Fishamble Street. At least one structure was built in every plot from Plot 3 to Plot 12, many of them closely packed together with no paths between. Finds at this level include an Aethelred coin *c.* AD 1005 from Plot 3. Slag rich layers in Plot 4 and a set of blacksmith's tongs in Plot 5 suggest that metalworkers or other craftspeople occupied these plots. A spectacular carved crook was found in Plot 6, along with a carved stave or box lid (Laing 1988). Other evidence from Plot 6 led Wallace to suggest that this was the home of an ironworker (Wallace 1992). Finds from Plots 8 to 11 include items of an intimate and

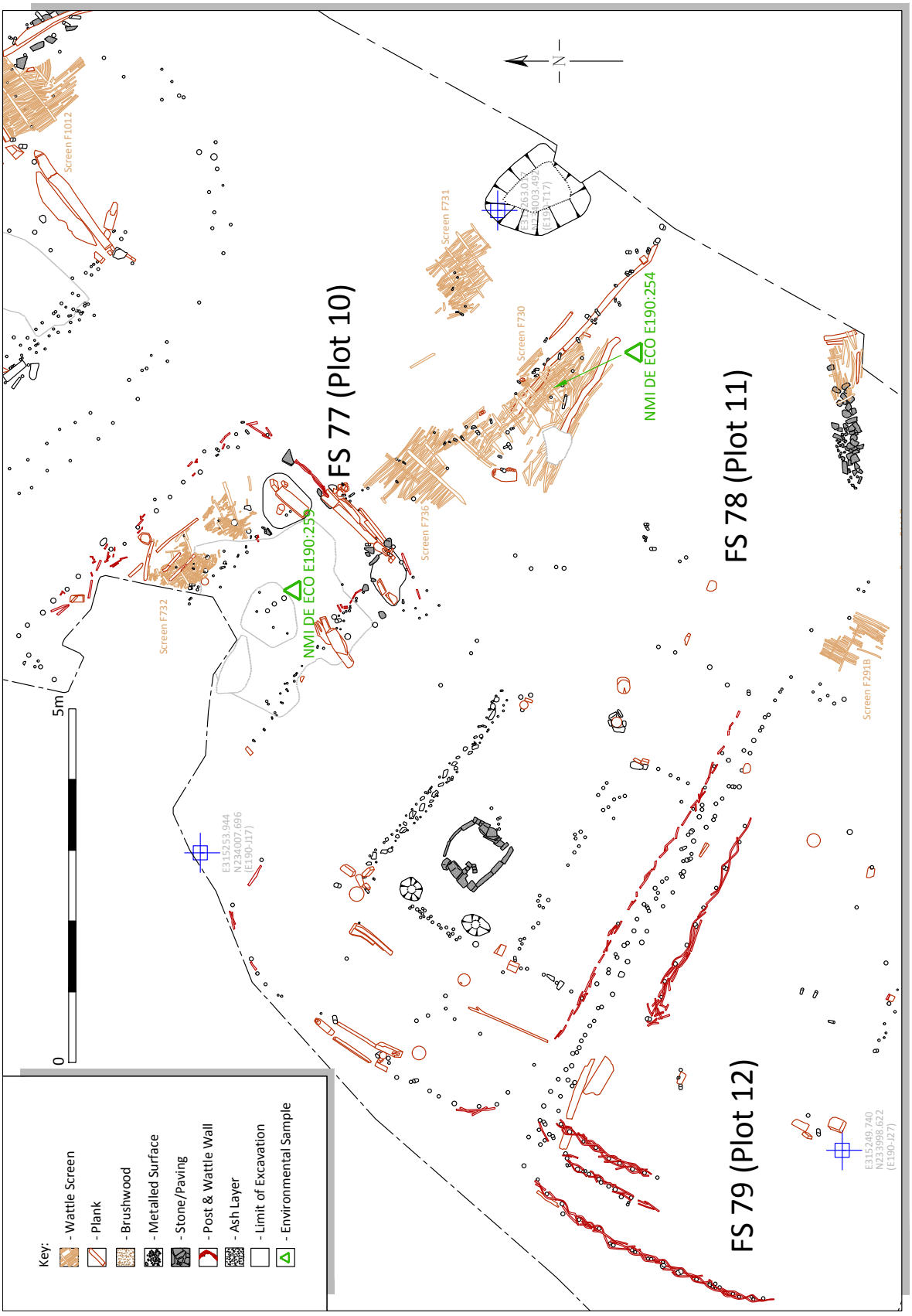


Figure 18: FS 77, Plot 10, showing sample locations.

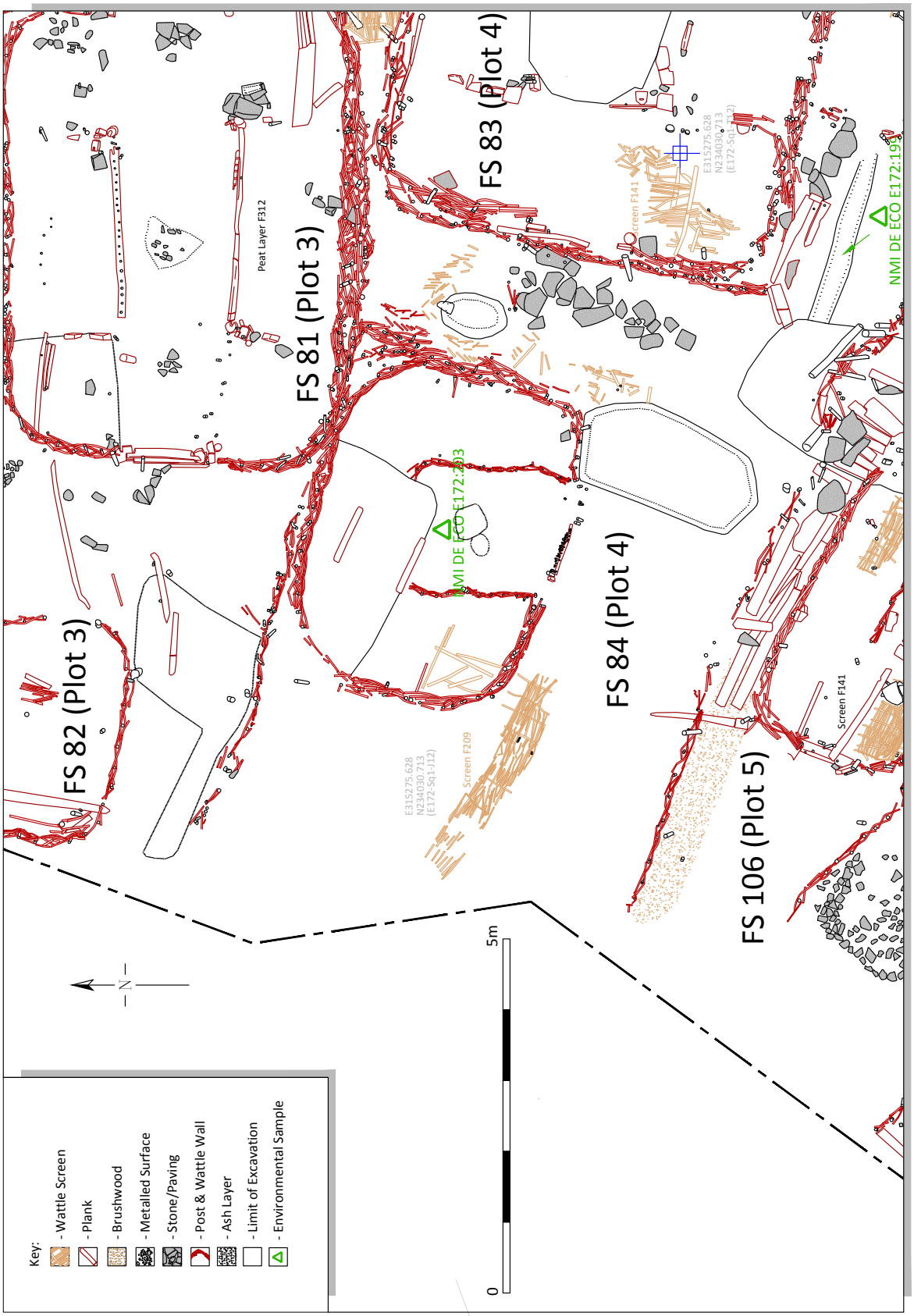


Figure 19: FS 84 and the drain in lean-to structure 227, Plot 4, showing sample locations.

domestic nature, including fragments of a silk scarf, a stylus or pricker, and a spoon (FS 87, Plot 8), a wooden box and scoop handle (FS 88, Plot 9), a wooden bucket stave and a lugged timber with iron clasp, possibly part of a box-like container or bed (FS 90, Plot 11) (Boyd 2012; Wallace 1992a). An interesting find in Plot 9 was a cache of cow bones, which is suggestive of a bone-working area (FS 88) (Boyd 2012). Samples from indoor, outdoor, pit fill and destruction/foundation deposits were examined for insects from Plots 4, 9, 10, 11, and 12

Outside building 227 and inside FS 84, Plot 4

Building 227 was a small, poorly preserved building adjoining the south wall of FS 83, the main house in Plot 4 (Figure 19). FS 84 lay 2 m west of FS 83, and was divided roughly into three compartments; this, however, was not a classic three-aisled house due to its unusual orientation and size. Two samples were examined from this area: one from the fill of a drain that ran from the western end of Building 227 towards a large pit on the boundary between Plots 4 and 5, and the second from a central floor deposit in FS 84. The smelly dark brown drain fill produced a mixed assemblage of generalist decomposers and foul indicators. House fauna were also represented but few direct indicators of human faeces or animal dung were recovered. Nothing was recovered that could shed light on the use of Building 227. It is likely that this fill represented a natural infilling of the drain after it went out of use, rather than material related to its use phase.

FS 84 appeared to have two phases of use, with the original floors primarily made up of sod and brushwood in the 'aisles', while the central area was covered in gravel and sandy loam. Later, the central area was covered by an extensive ash layer, followed by a gravel/charcoal layer rich in slag. Probably due to the presence of ash, this deposit produced a very small, impoverished insect assemblage dominated by 'indoor' species. This suggests that the deposit still represented an active occupation floor in a roofed structure, instead of some post-use or abandonment phase.

FS 88, Plot 9

FS 88 was a classic Type 1 house, built on the layer of ashes created by the burning of FS 76 from the previous level (Figure 20). It had single wattle walls with doorways located in the western and eastern walls. Areas of wattle matting and stone cobbling were recorded in the western part of the building and the southeastern corner. Reused planks/split logs covered the eastern floor area of the central aisle, presumably serving as a floor or lobby inside the eastern door. Boyd (2012) noted a thick layer of periwinkles, mussels, oysters, and cockle shells in this plot, which may have been used to improve drainage but also indicates the importance of marine resources at this time. Samples were examined from the central floor, a pit outside the eastern doorway and a deposit that sealed the house, representing the destruction phase. One sample from the main floor deposit, between the central hearth and the cobbling inside the western doorway, produced a rich assemblage dominated by house fauna. *Anobium punctatum* (woodworm) and *Ptelobius vittatus* came from the wood that was presumably used in the floor planking and roof beams, the latter suggesting the presence of ash and/or elm. For the most part, the assemblage suggests the floor was quite warm and dry; however, the assemblage also produced high numbers of the human flea, *Pulex irritans*. This is more commonly a feature of side-aisle deposits, where people slept. A sample from a hazelnut-rich layer under the cobbling at the western end of the house, was poorer in numbers but had a similar habitat profile, including high numbers of fleas. Pests of stored foodstuffs were also recorded in this deposit.

The pit fill produced an assemblage typical of cesspits, particularly those associated with human faeces and urine in medieval contexts, including over 250 puparia of *T. zosterae*. The bean weevil, *Bruchus rufimanus*, a non-native pest of stored legumes, was recorded for the first time in Fishamble Street in

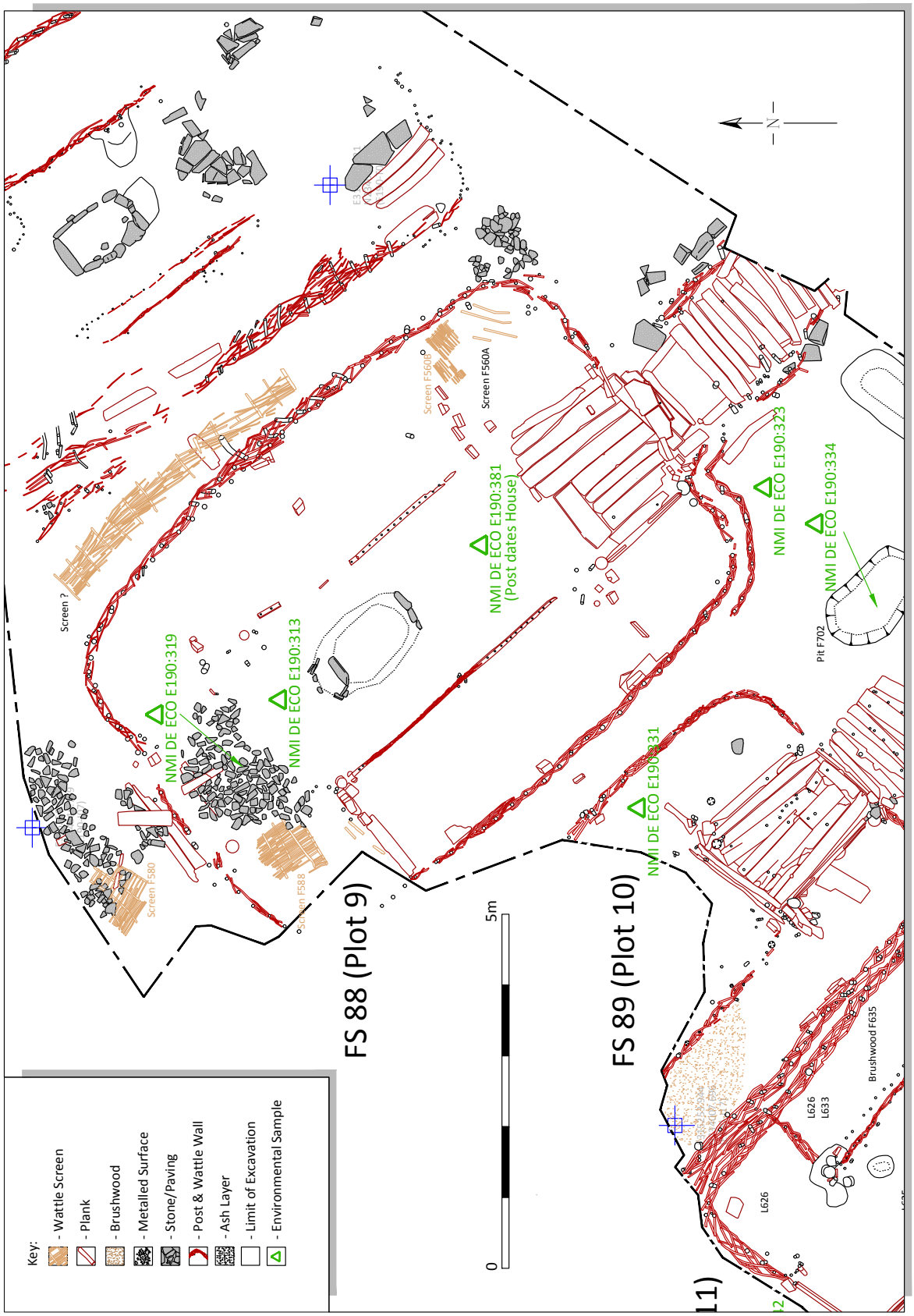


Figure 20: FS 88 and 89, Plots 9 and 10, showing sample locations.

this fill. It was probably ingested in spoilt peas or beans. Geraghty (1996) recorded a thick layer of sloe berries, walnut fragments, moss, hair, wool and cloth in this pit fill, again probably derived from a mix of household waste and human excreta. Scrap wood and wattle also ended up in the pit. Another species new to Fishamble Street, the longhorn beetle *Gracilia minuta*, was recorded from this fill and is associated with willow, hazel, and wickerwork generally (Hyman 1992). Coope first found this beetle at Christchurch Place, although it was not recorded from Temple Bar West (Coope 1981; Reilly 2003). It is possible that it arrived in imported basketry at this time and became established in the wattle of Fishamble Street and elsewhere in Dublin after this point.

Finally, the destruction or sealing layer over FS 88 probably provided the foundation layer for houses in this plot at Building Level 11. The insect assemblage from this deposit was dominated by generalist decomposers, many of which would be common in haystack refuse, straw, manure, and compost. The range of fly puparia present also reflected both foul and domestic waste material. Waste wood, wood chips or bark also formed part of this deposit, indicated by a variety of wood dependent beetles. Another possible new arrival recorded in this deposit is *Phacophallus parumpunctatus*, a beetle thought not to have arrived in Ireland or Britain until relatively recent times (Lott and Anderson 2011). Its frequent records from settlement sites dating from the Iron Age onwards in Britain, however, suggests that it arrived in these islands at a much earlier date (Buckland and Buckland 2006). Its presence here in Plot 9, alongside other potentially 'non-native' insect species and exotic foodstuffs, such as walnuts, suggests a link between the residents to people, or traded goods, from outside Ireland.

FS 89, Plot 10

FS 89 was another Type 1 house (Figures 20 and 21). The northwestern part of the house, including most of the northern aisle, was badly damaged by subsequent features. There is some suggestion that a previous building, 720, representing an 'interim' Building Level 9/10, was present within the footprint of this house (A. Corless, pers. comm.) However, this does not materially affect the samples examined, which came from the floor in the northeast corner of the house, the main yard deposit underneath a plank pathway, and from the basal layer of a pit (702) associated with the house.

The corner floor deposit, which contained matted plant remains, charred wood, hazelnut shells and clay, produced a rich assemblage of house fauna. In addition, the mix of *O. colon*, *T. scaber* and *D. punctatus*, indicative perhaps of animal products either stored or hanging up in this corner, was present. The yard deposit from under the plank pathway produced a typical mixed assemblage of foul-indicating and generalist decomposers, but also a reasonably high representation of house fauna, presumably from house sweepings. The high representation of plant-feeding beetles was a mix of urban weed, wetland plant and cultivated plant indicators. The basal layer of Pit 702, a black organic mix of straw, fruit stones, shell and bone, produced a disappointingly small beetle fauna but very high numbers of the seaweed fly, *T. zosterae*. The poor numbers suggested the cess was 'diluted' with plant matter, bone and shell, presumably household waste.

FS 90, Plot 11

FS 90 was a large, well-built Type 1 house in Plot 11 that appeared to also to have had two phases of occupation (Figure 21). One relates to a possible 'interim' Building Level 9/10 (see Corless *et al.*, in preparation). The second phase of construction fits firmly into Building Level 10 and it is this phase that most of these samples relate to. In Phase 2, the building was extended westward, a drain was introduced through the central aisle and various wattle mats were added to the floors. A wattle mat covered the eastern part of the drain in the central aisle and a sample was examined from the mat surface. This black, slightly humified organic material produced a moderate sized assemblage dominated by house

fauna, as well as human fleas. The northeastern and southeastern corners of the north and south aisles were partitioned off with grooved timber frame bases, between which was laid plank flooring to form a sort of lobby. Both compartments were floored with wattle mats. Two samples were taken in the northeastern corner, one from immediately below the wattle mat and another from a floor layer below this. This may represent the earlier floor of Phase 1 of FS 90. If this is the case, then this is the earliest layer represented in this collection of samples.

This 'early' floor produced a very rich assemblage dominated by house fauna and, similar to other corner samples previously examined, high numbers of *O. colon* and *D. punctatus*, alongside *T. scaber*, *T. obscurus* and the 'larder beetle' *Dermestes lardarius*, a pest of stored foodstuffs (Hinton 1945). *Sitophilus granarius*, the grain weevil, was also recorded here, the first such record for Fishamble Street. Among the plant-feeding beetles, *Atomaria ?linearis*, *Phyllotreta nemorum*, *Chaetocnema hortensis* and *Sitona ambiguus* may suggest the presence of processed or gathered cereals and legumes or perhaps the presence of herbivore dung. This broad range of indoor 'cellar' type fauna and cultivated ground indicators would strongly suggest that this corner of the house was used for storage of foodstuffs, dry goods, possibly skins or hides, and, potentially, cereal grain. The floor deposit above this contained a very similar range of house fauna, storage indicators, plant feeding-beetles indicative of legumes/clover and indicators of hides, skins, or old bones. Geraghty (1996) examined a great many contexts from this house for plant macrofossils. One notable sample, between the hearth and south aisle, produced concentrations of flax bolls, suggestive of a stage of flax fibre production known as 'rippling', where the seed heads (or bolls) are forcibly removed from the plant stems prior to retting. A sample from between the roof support post and the bedding bench in the south aisle also contained concentrations of half hazelnut shells. These deposits provide a good representation of the different zones of activity within FS 90.

Finally, a layer of clayey sod containing numerous wooden pegs, large amounts of scrap wattle, furnace ash, charred wood, bone, and slag sealed the whole building. The insect assemblage from this deposit was dominated by house fauna, with outdoor species, including plant-feeding and dung beetles, well represented also, suggesting that this deposit had multiple origins.

FS 91, Plot 12

FS 91 was the last house on the street as revealed through excavations (Figure 21). The northern and central parts of the house were better preserved than the southern aisle area. The northwestern corner of the house was evidently partitioned off. A cobbled path led up to the western doorway and kerbing was evident around the hearth area. The final floor layer, close to the hearth, produced a very small assemblage of only 30 beetles, dominated by *Aglenus brunneus*, which accounted for 14 of the 30 (Figure 25).. The partially burnt and ashy nature of this deposit probably accounts for the low numbers of beetles and complete absence of flies. A layer of black, decayed straw-like material in the southern aisle, which sealed a wood chip layer, produced a typical 'aisle' assemblage totally dominated by house fauna. A large number of human fleas (25) were also recorded in this deposit. *D. punctatus* was the second most numerous species present, similar to other corner and aisle deposits previously discussed.

The other three samples from this plot came from two large intercutting pits (F268A and 268B) located southeast of FS 91. The boundary wall between Plots 11 and 12 respected the outline of these pits, suggesting it belonged to the residents of FS 91. It can be assumed that 268B simply represented a deepening and widening of the original Pit 268A. The three pit fills produced relatively small assemblages, something that will be discussed further in Chapter 5. The earliest of the three contained over 50% house fauna, while dung/foul beetles make up a relatively small proportion overall. However, the range of fly species recorded would point to the presence of human faeces and urine. It is likely that the pit fills were 'diluted' with household waste, in some cases possibly deliberately dumped to cap smells



Figure 21: FS 90 and 91, Plots 11 and 12, showing sample locations.

emanating from the pit. *G. minuta* was found in this fill (and in one other fill from this pit) and may have been in discarded wattle. This deposit also sees the first record for *Blaps lethifera* at Fishamble Street, a beetle that is regarded as strongly synanthropic and found primarily in indoor locations in cellars, stores and barns (see Chapters 2 and 5 for further discussion on the significance of this species). The middle fill was very similar to the lowest fill, but one Mallophaga louse, which could not be identified to species, was also recorded. Mallophaga (chewing or biting) lice are found on a wide variety of animals and birds. Finally, the upper fill produced a small assemblage of beetles but a very large assemblage of flies, in particular large numbers of *T. zosterae*. The presence of a single *S. granarius* (a link to FS 90 next door) is most likely due to ingestion of spoilt grain and suggests that this final fill was more true 'cess' than the earlier fills.

Building Level 11

While some plots are intensively occupied at this level, it is clear that there is also some reduction in settlement, with no building in Plots 1, 2 and 6, and a very ephemeral building in Plot 8. Other buildings were less well preserved then those in the previous Level 10. The limits of excavation at this level also diminished somewhat the extent of exposure of some buildings. A number of coins were recorded from Plot 3, including Aethelred AD 1003–9, Sihtric pre-AD 1003, and Sihtric AD 1025. This mix of dates suggests an early 11th-century date for Level 11. Some fragments of later pottery were recorded from Plot 9, which imply a possible 12th-century date for this level. However, taphonomic processes might explain their presence, including the possibility that later material fell from exposed baulks above the open excavation zone. Other finds include a small wooden toy horse from Plot 3, a carding comb from Plot 9, leather fragments, wooden bowls, and spoons from Plot 10, all related to domestic activities within the houses. Samples from indoor, outdoor and foundation deposits were examined in Plots 3, 4, 9 and 11. FS 99 in Plot 11 was particularly well sampled.

FS 92, Plot 3

FS 92 was the only house built in Plot 3 during this period (Figure 22). It was a typical Type 1 house, albeit small, erected on a sod foundation, but with internal sub-division features poorly preserved. The primary floor layer in the centre of the house was a matted organic layer of plant remains, reeds, leaf litter, wood fragments, and shell. To the east of FS 92 was an open area. The earliest deposit in the yard comprised well-humified organic material, made up of finely broken down plant remains.

These two deposits produced unusual assemblages given their locations. The 'indoor' deposit produced a very mixed assemblage of house fauna, dung and foul indicating beetles and flies, human fleas, generalist decomposers and some outdoor ground beetles, typical of cultivated ground and gardens. It suggests that this building was either abandoned when this deposit accumulated or had changed use to an open byre or stable. Strangely, the deposit from outside the house produced a more typical 'indoor' assemblage (except that it was very small), dominated by house fauna and human fleas. One human louse, *Pediculus humanus*, was also recorded here. A higher number of water and damp ground beetles than might be typical for indoor locations is one of the only indicators of its outdoor origin. It is likely that this deposit was almost entirely derived from floor or roof material, possibly sweepings from houses, mixed with trampled mud from the yard.

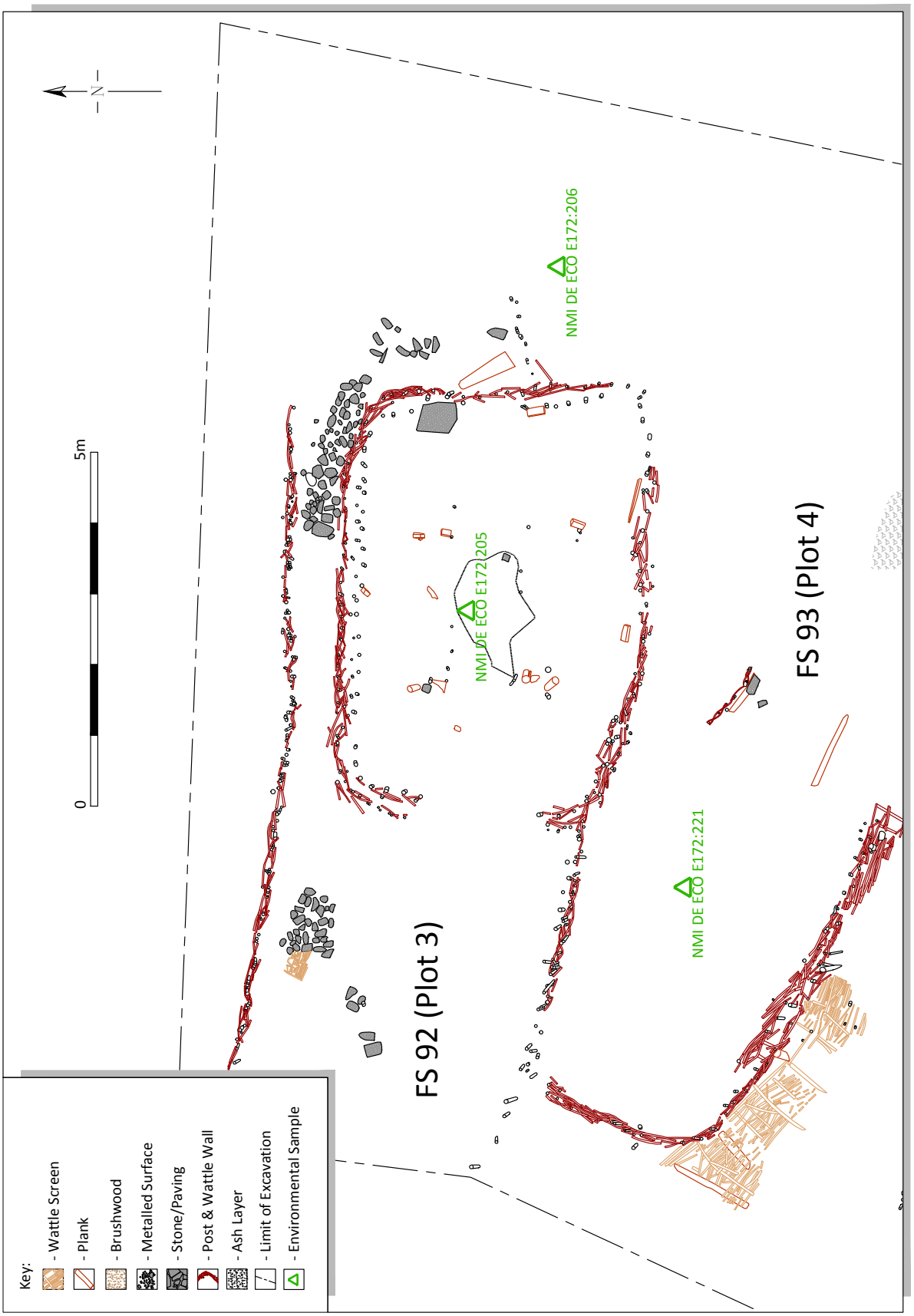


Figure 22: FS 92 and 93, Plots 3 and 4, showing sample locations.

FS 93, Plot 4

Plot 4 showed a paucity of building activity at this level. However, a partially surviving arc of double wattle walling and a foundation of sod material suggest that a building stood here, named FS 93 (Figure 22). Two timbers within the house may have been associated with internal divisions but most of the other internal features did not survive. A sample from the foundation sod layer produced quite a mixed signal, largely dominated by house fauna. High numbers of foul-indicating fly species suggested mixing of both sod and foul trampled material in building up the footprint of the new building. However, the fact that the house was completely dismantled/destroyed may also be a factor in the high number of flies recorded, as this deposit was probably exposed for some time prior to building resuming in this plot at Building Level 13.

FS 97, Plot 9

FS 97 in Plot 9, the successor to FS 88, was founded on a layer of estuarine clay, which may have been deliberately laid to level the ground before construction and to provide additional drainage (Figure 23). Later features largely removed the southwestern corner of the house; however, the rest of the building was very well preserved. The outer double wattle walls still had their packing between them. There was an entrance to the west and to the east, with elaborate door-jambs. The house was divided into three aisles, as usual, and the three surviving corners were also subdivided and partitioned, with possible doors. Some of these corners had wattle mats on the floors.

Samples from the main floor deposits in the north and south aisles were examined. The floor deposits were similar and contained black, matted organic material with wood fragments, straw and other plant remains. They produced rich, similar assemblages, although the north aisle material was richer in terms of house fauna, most notably *A. brunneus. B. lethifera* and *Hylotrupes bajulus*, both present in this house. The south aisle floor produced moderately high numbers of house fly puparia and one possible individual of *Bovicola* cf. *caprae*, a louse which is primarily a parasite of goats but also cattle, horses, pigs, and sheep. The north aisle floor revealed a large number of *Formica* ants, a nest-building species of leaf litter, twig mounds and tree stumps; presumably these may have found suitable habitats among the floors of Fishamble Street houses.

Outside FS 97, towards the eastern end of the plot, two wattle walls and a series of upright planks may have formed part of an outhouse, designated Building F532/533 (Figure 23). It appears to have been built on top of a widespread organic layer, most likely yard mud rather than sod, but which constituted the foundation level for the building; this consisted of brown-black organic clay with visible stones, bone, and shell. A sample from this material yielded an assemblage of mixed house fauna and dung/foul beetles, with a higher than usual representation of damp, muddy ground indicators. While the sample came from within the footprint of the outbuilding, it is clear that the widespread 'yard' deposit on which the structure was built had an influence on the composition of the fauna. A mix of fly species was suggestive of foul ground conditions, including urine-soaked plant matter. A single example of a sheep ked, *Melophagus ovinus*, may hint at use of the outbuilding as a byre. Sheep keds normally stay with their hosts, and their presence in deposits may be as a result of the processing of wool, or temporary housing of sheep in byres or outbuildings prior to market or export.

FS 99, Plot 11

FS 99, the successor to FS 90, appears to have been constructed in Plot 11 after a fallow period, during which various accumulations of dumped rubbish built up. One deposit of mixed blackish-green organic material, straw, nutshells, slag, and bone produced an insect assemblage with high numbers of dung and

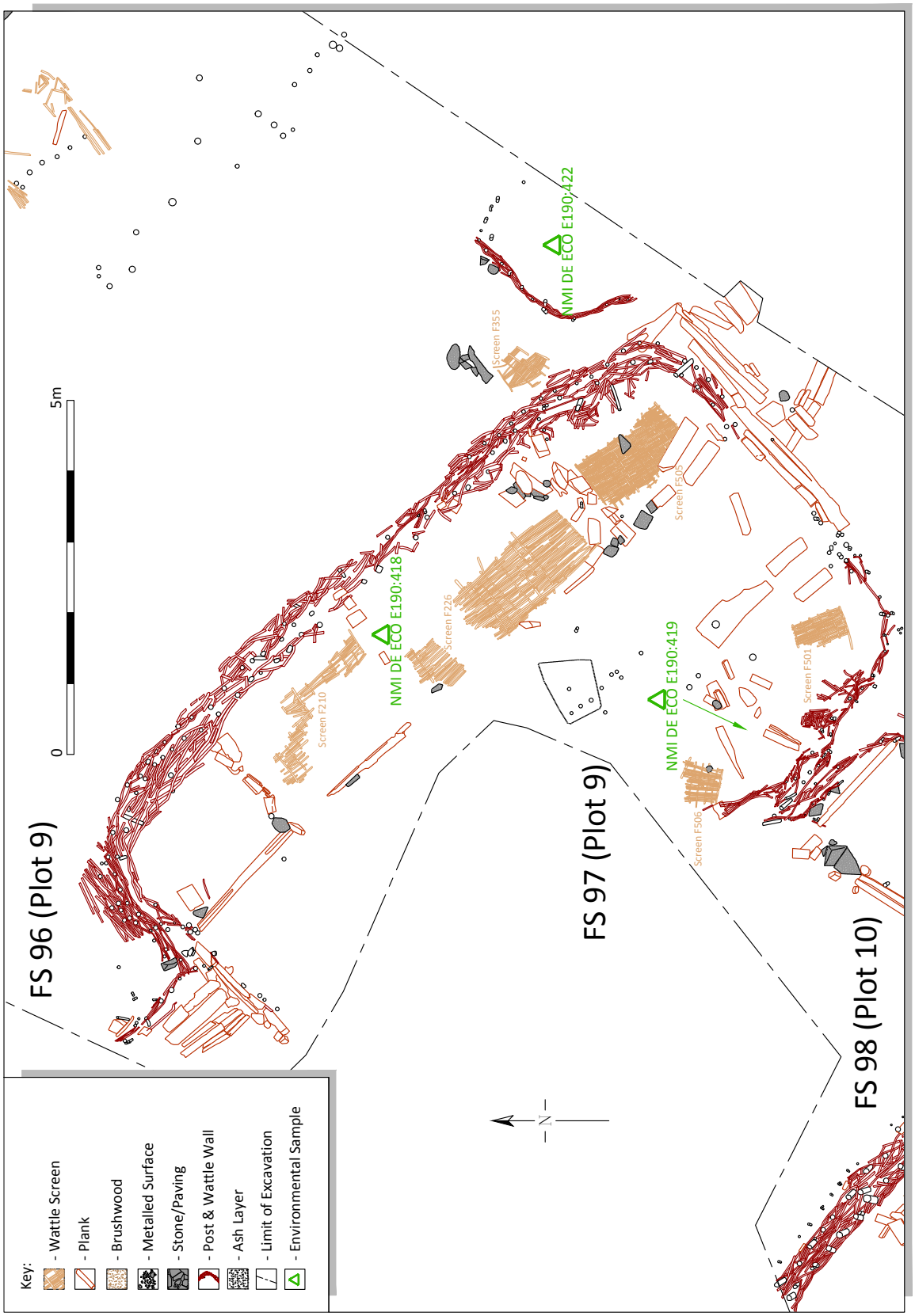


Figure 23: FS 97, Plot 9, showing sample locations.

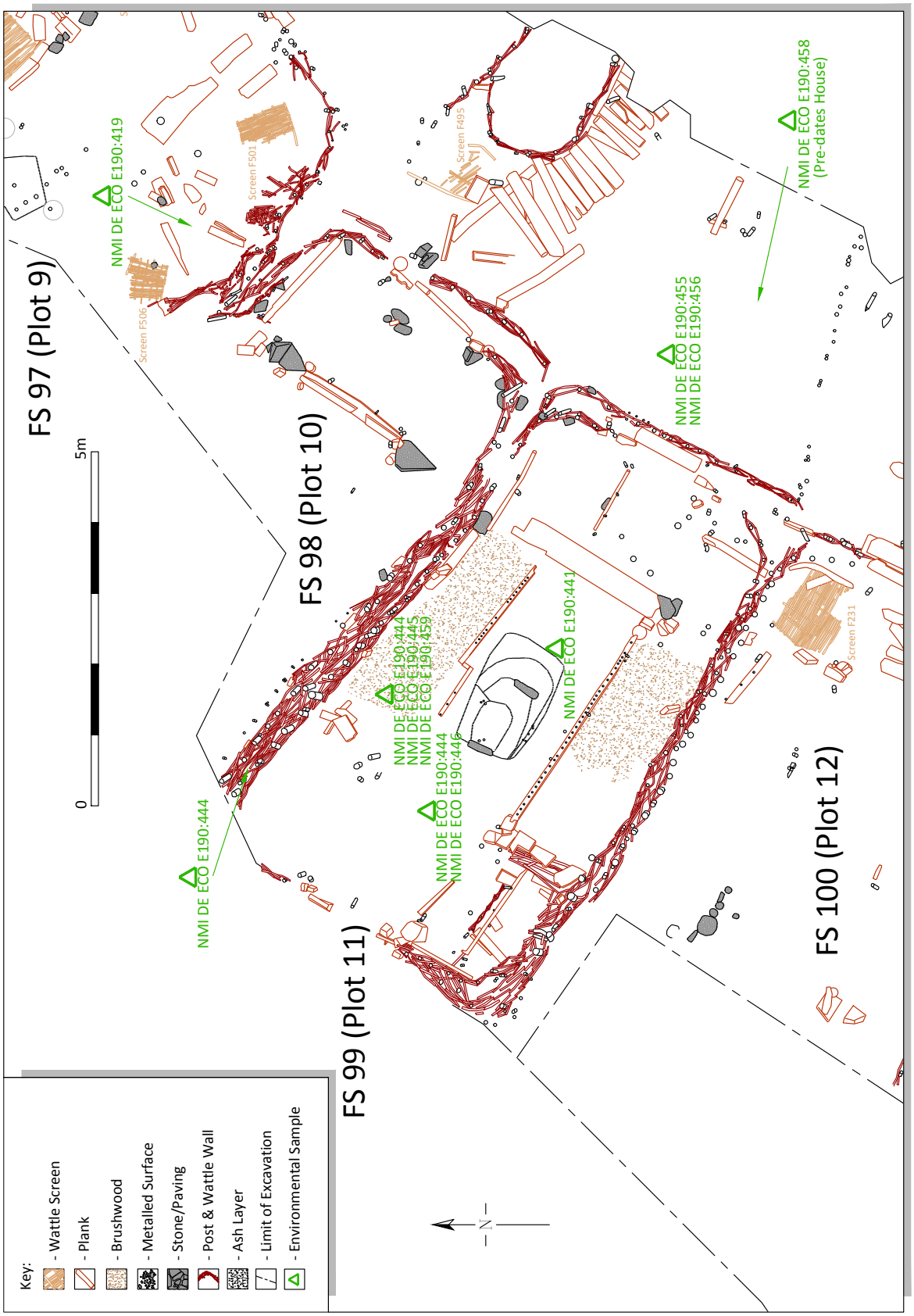


Figure 24: FS99, Plot 11.

stable manure associates. Moderately high numbers of fly puparia, including blowflies (Calliphoridae), attest to generally foul conditions within the plot prior to construction of FS 99.

FS 99 was a Type 1 house with partitioned corners and entrances west and east. It was intensively sampled for plant macrofossils by Geraghty (1996). An outer wattle wall existed to the east, which may have functioned as a revetment for the foundation layer of the house. It was filled with a shelly, clayey deposit. A similar feature was recorded in the southwestern corner. This material was very organic and contained many wattle fragments. This produced a very large, rich assemblage, dominated by house fauna but not overwhelmed by *A. brunneus*. Instead, other house fauna species more indicative of the super-structure of the house are present in high numbers, in particular species that came from straw or old thatch, possibly used as packing between the walls or that accumulated from the roof thatch above. Large numbers of certain decomposers indicative of damp, foul conditions, including dung, may lend credence to the suggestion that dung was used in the fill of the walls and/or to provide insulation. Once again, moderately high numbers of beetles indicative of animal hides, skins or bird nests, are recorded, including one only found in this deposit, *Nitidula rufipes*. This beetle is also known from dried and cured meats (Hinton 1945). However, few fly puparia are recorded from this deposit, suggesting it may have been protected in some way from access by breeding flies.

Wattle walls erected on drilled frame bases demarcated the aisles inside the house. The primary surface in the central aisle was a compact organic layer, charred in places and containing many hazelnuts. An entire deposit of hazelnuts was found in a small hole dug into the floor near the hearth (Geraghty 1996: 21). Eventually, the central floor area was covered by a gritty organic mixed layer, with sand, ash, shell, stones, and hazelnut shells. This may represent the final activity phase of this house. A sample was examined from each floor deposit. While there was no marked difference in the range of habitats represented in the two samples, there is a dramatic difference in the productivity of the two, with the original floor layer producing a large assemblage and the later floor a very small one. This may be due to hearth material becoming incorporated into the floor, and not the abandonment of the house *per se*. Proportionally, house fauna dominate both samples. However, the primary floor layer mirrored aspects of the rich 'hay' and structural wood fauna found in the wall packing. Along with very high numbers of *Formica* ants, it suggests longevity or stability of this deposit, exposed for a long time and incorporating beetles falling from the roof, as well as those living within the floor itself. Interestingly, the potential 'bird nest' or 'skin/hide' element of the wall packing and house corner/side-aisle assemblages is not apparent here.

In the northern aisle, three superimposed deposits, representing the 'building up' of the bedding area, were sampled. Geraghty (1996) examined the same three deposits. The primary deposit of mixed organic clay and sand was poor in terms of numbers, producing an assemblage more characteristic of outdoors than indoors. The pre-house foundation layer on which the house was built may have influenced this assemblage with foul-indicating fly puparia just as numerous as beetles. However, the clay and sand in the deposit may simply have been inimical to good preservation. The next layer, of clay and wood fragments, produced a more typical side-aisle assemblage, with high numbers of house fauna and stored product species including *B. lethifera*. *Sitona striatellus* recorded in this deposit is generally found on gorse, which is perhaps unlikely to have been used as bedding material for people. However, the presence of a small number of dung beetles may indicate that this is part of a stable manure signature, as gorse was regularly fed to cattle as a winter feed in the early medieval period (Lucas 1960). The final deposit in the north aisle, the brushwood layer, produced a similar sized fauna to the previous deposit, but with a more diverse range of house fauna. The high numbers of woodworm were a recurring feature of this house, again suggesting it was long-lived. High numbers of *D. punctatus* were once again a feature of this side aisle.

Outside the building, to the west, a woven wattle pathway was laid down, over which a later plank pathway was laid (not shown in Figure 24, but given in Geraghty 1996: 14). Samples were examined from yard deposits between the southern boundary wall and the wattle screen, and to the north of this screen. They produced similar large, foul-indicating assemblages, with numerous beetles associated with damp wet stable manure, rotting vegetation, grassland plants and urban weeds. The necessity for the wattle and plank pathways is clear, as underlying ground conditions in the yard were clearly very mucky. The sheer number of stable manure/dung indicators would strongly suggest that animals were kept within this plot and perhaps explains the slightly 'dungy' signature of some of the indoor deposits, with material being brought into the house on people's shoes.

Building level 12

Unfortunately, no suitable samples from Building Level 12 were available to shed light on living conditions and environment in the street at this time. There appears to have been a significant contraction in settlement during this phase, with nothing built in Plots 1 – 5 and only one Type 1 house in Plot 6. The preservation quality of buildings in Plots 7 – 12 was also relatively poor. This new interpretation differs from images presented in Wallace (1992: 43, 44). Revisions of the stratigraphy suggest that buildings FS 101–106 belong to Levels 13 and 14, while some original Level 13 buildings are now assigned to Level 14. The small amount of pottery from Plot 9 again suggests a possible 'later' date for this building level although the security of contexts in which the pottery was found needs to be confirmed.

Building Level 13

Building Level 13 sees intermittent settlement, with a small cluster of buildings in Plots 3 – 6, and a single building in Plot 11. A complex of timber pathways was recorded in Plots 9 and 10 but no associated buildings. Beyond Plot 11, Plots 12 and 13 appear to have lain fallow. A weaver's sword, ship's timber, and a human skull came from the area of Plot 13. A coin of King Cnut's reign, *c.* AD 1025, was found in Plot 9 at this level. No animal bone or plant macrofossils were analyzed here. Indoor, outdoor, and pit fill deposits were examined from Plots 3, 4, 5 and 10.

FS 94, Plot 3

Within Plot 3 was a Type 1 house FS 116. Towards the western end of the plot lay FS 94, which may have been a small Type 5 'outbuilding' or pen. The walls were erected on the general deposits recorded across the whole plot in this area. The upper layer was a mixed stony organic deposit with visible shell, wood, bone, and plant remains. While this was the 'floor' of FS 94, it could also be regarded as an outdoor yard deposit if FS 94 was a pen and unroofed. The insect assemblage was small and mixed, with moderately high representation of house fauna taxa, but dung, foul, outdoor and waterside beetles were also present. The mixed, largely 'outdoor' nature of the deposit may suggest the structure was unroofed and made do as an animal pen, but the number of true dung beetles was relatively small. Therefore, the exact use of this building is not clear from the insects found.

FS 104 and Building 106/7, Plot 4

The main building in Plot 4 was the Type 1 house FS 104. It was located at the eastern end of the plot and the interior was much damaged by a later pit (Pit G). A wattle-lined drain ran out of the west doorway. A gravel layer and some cobbling were laid down in the southwest corner. The house was built on a sod foundation layer, which produced a large assemblage dominated by house fauna, but with a high number of plant-feeding beetles. *S. lepidus* and *S. hispidulus* are both found on clover and other ground herbs and may reflect where the sod came from. However, dung beetles, especially *Aphodius contaminatus*,

might also indicate stable manure, something that was not uncommon in foundation level deposits through mixing with fouler yard material. The most frequently occurring species (after *A. brunneus*) was *Xantholinus linearis*, a beetle found in all sorts of dry decomposing matter, both indoors and outdoors, during this period (Lott and Anderson 2011). Much of the interior was then covered in various mixed organic layers, one of which, in the north aisle, produced a large, rich assemblage dominated by house fauna, although lower numbers of *A. brunneus* suggested this floor was not as clean or dry as north aisle floors elsewhere. This may be as a result of disturbance by Pit G, or may simply be a reflection of a very late or post-occupation phase of the building, or of variation between houses. One example of *M. ovinus* (sheep ked), linked with buildings at Level 11, suggested the presence of unprocessed wool from sheep. Wood-dependent beetles included *P. vittatus* (ash/elm), *G. minuta* and *H. bajulus*. The identification of *Bruchus* sp. also suggests the presence of contaminated beans or other pulses. A very high number of *Formica* ants, similar to houses at Level 11, suggested a relatively stable or long-lived deposit, an indication that the house itself may have stood for a long time.

Outside the west doorway was a badly preserved timber pathway, a small area of brushwood and cobbling. Just west of the northwest corner of the house was an arc of post-and-wattle walling. From an accumulation of organic 'straw-like' material within this yard area came a moderate-sized assemblage with an 'indoor' profile, dominated by house fauna and with a very small percentage presence of dung/outdoor beetles. A proportionally high number of plant-feeding beetles may have come from straw or other gathered plant material, or from urban weeds, within the plot. It is possible this arc of wattling represented the remains of a byre or stable but the relatively low level of foul indicators may suggest a domestic use instead.

Building 106/7 (Q) was located in the southwestern corner of the plot. The building only partially survived, primarily the fairly substantial northern wall, the curving western wall, a possible northern aisle internal division, and a series of wattle mats. It was not entirely clear if the building was a three-aisled Type 1 building or a smaller Type 3 building ('106' is listed as Type 3 in Wallace 1992a, '107' as Type 1). The whole building was founded on a sod deposit, which produced a rich but highly mixed assemblage, certainly suggesting that this was not a typical 'indoor' deposit. It had a very high representation of damp/muddy ground, brackish water, freshwater and stagnant water beetles. This suggests that either water was stored in this building, perhaps for watering animals, or, possibly, that the clay that formed this foundation deposit came directly from the riverbank.

Outside this building, to the north, was a cobbled east-west path which partially overlayed a wide, shallow pit filled with a variety of silty/gritty loam layers. One of these layers, close to the base, produced a relatively small assemblage with a strong cesspit signature. There was a moderately high representation of house fauna, implying that household sweepings or straw were added to the fill. Overall, the small assemblage and relatively inorganic fills suggest the pit had being emptied out at some point, or was in use for a very short time.

FS 120, Plot 5

The fairly ephemeral remains of a Type 1 house, FS 120, were located in Plot 5. Small amounts of the northern and southern wall survived, as well as a partial wattle screen and ash spread, possibly associated with a hearth. The foundation sod layer was a compact clayey organic layer. The assemblage from this layer was not large and was quite mixed. House fauna were proportionally high but other habitat groups were also well represented, especially generalist decomposers, foul and outdoor beetles. *T. zosterae* albeit in low numbers, suggested the presence of human cess/urine. The mixed nature of the fauna probably reflected abandonment of the building, which then lay open for some time, accumulating general rubbish.

Pathway complex, Plot 10

Unfortunately, as noted above, very few structures existed in Plots 8 – 12. The only useful sample that could be examined was from a timber pathway, F29, part of a complex pathway feature F8B in Plot 10. F29 comprised some eight planks or so, laid east–west and covering an area of 1.8 m by 0.8 m. This may have been a path in its own right or simply as a foundation level for the F8B pathway, a combination plank, brushwood, and stone feature. A sample from the organic build up around and between produced a very small beetle assemblage, mainly house and dry decomposer fauna, but a large number of *T. zosterae* puparia was also recorded. This suggests that urine-soaked plant matter was present in the organic build up between the planks, perhaps reflecting the presence of animals in the yard or street area across which the path was laid.

Building Level 14

Building Levels 14 and 15 were represented by no more than a handful of buildings. No suitable samples were available from Level 15 or from Plots 8 – 12 at Level 14. Therefore, all samples discussed below come from the small number of buildings represented in Plots 2, 3 and 4. Interestingly, Plot 3 was quite intensively occupied compared to most of its neighbouring plots. Coins of King Sihtric's reign, *c.* AD 1025–30 and AD 1030–35 were found in Plots 3 and 4. However, possible 12th-century pottery was found at this level further uphill in Plot 12 (Adrienne Corless, pers. comm.).

FS 101, Plot 2

A very small section of a building of unknown type, FS 101, survived at the centre of Plot 2 (Figure 25). Within the house a clay floor was identified, underneath which a thin organic layer was also recorded; another clay floor was found beneath this layer. A sample from the thin organic layer between these two clay floors produced a small mixed assemblage, with house fauna proportionally the most frequently occurring group. *Rhizophagus bipustulatus*, found under the bark of many broadleaved trees, but not currently known from Ireland (Alexander 2002), and *Ptilinus pectinicornis*, in dead wood of many tree species and sometimes known as a furniture pest (Koch 1989), were recorded here and nowhere else in Fishamble Street. These may have come from waste wood brought in from outside Ireland or perhaps be imported from areas of ancient woodland remaining in the hinterland of Dublin at this time. The number of puparia from foul-indicating fly species would suggest that the deposit was trampled and mixed, and perhaps represented an old floor surface within this house.

FS 102 and 103, Plot 2

In contrast to Plot 2, a number of reasonably well-preserved buildings were found in Plot 3. These extended along the full length of the plot. FS 122 was a probable Type 1 house and was built at the eastern end of the plot. In the middle of the plot was FS 102 (Figure 25). This was also a Type 1 house of fairly small size with some of its internal features disturbed by a later pit. Wooden base plates, rather than wattle, marked out the aisles. A complex stratigraphy was recorded within the house.

A sample described as 'stomach contents' from outside FS 102 produced a small beetle and fly assemblage, mostly indicative of decomposing plant matter and foul material. The most frequently occurring species was *T. zosterae* and it is likely that this was a small, isolated deposit of excrement.

Two samples were examined from primary floor layers, one in the northwest corner and one in the centre of the house. These layers appear to have been spread across the whole house at an early stage and may pre-date the subdivisions. In both cases they appeared as black, matted organic material

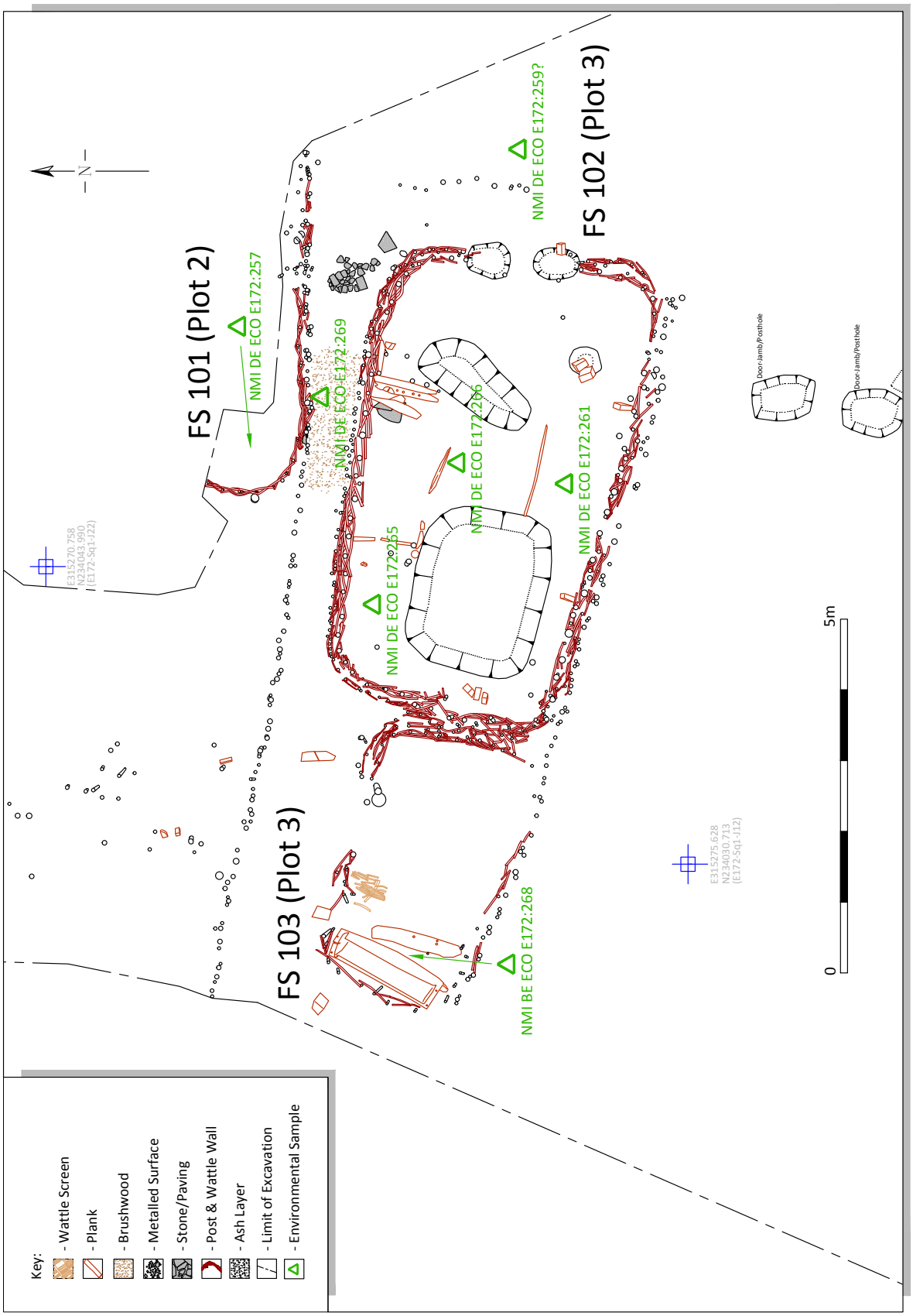


Figure 25: FS 101, 102 and 103, Plots 2 and 3, showing sample locations.



Figure 26: FS 118, Plot 4, showing sample locations.

with visible charred hazelnut shells, wood chip and waste wattle pieces. While house fauna are well represented in both deposits, generalist decomposers dominate, particularly those indicating fouler conditions. While true dung beetles are not common, other dung beetles that live in putrefying plant matter and both human and animal excreta are present. Alongside fairly high numbers of foul-indicating fly puparia, it appears that the early phase of this building was not for human occupation. It may have worked as a temporary byre, or was abandoned for a while after being initially constructed before being subsequently re-occupied and sub-divided, as the archaeological interpretation suggests.

The later southern aisle area floor was covered by dark-brown matted plant remains, wood chips, waste wattle and hazelnut shells. This produced a more typical 'side-aisle' assemblage with high overall percentage presence of house fauna. However, there is a notable mix of fly puparia present, particularly those indicative of dung, while two sheep keds were also recorded. While the assemblage was more typical of 'human occupation' side aisles, the fouler elements in the fly puparia and the sheep keds would suggest that the previous deposits from the house's earlier use phase may have become mixed with later deposits. It is also possible that animal husbandry of some sort continued in this plot, thus influencing the interior cleanliness of the house.

Outside FS 102, on the north side of the plot, was pathway AY, comprised a wattle layer, stone paving and a wattle screen (Figure 25). A sample from this deposit produced a large mixed assemblage of house fauna, generalist decomposers, damp-ground indicators and dung beetles, suggesting typical mucky ground conditions around and along the pathway. Large numbers of ants were also recorded in this deposit and clearly the wattle layer provided an ideal habitat for nest building.The high concentration of house fauna within this material suggests that at least in part this comprises spent bedding/floor material which is being re-used as foundational material.

FS 103 was a small Type 5 building at the west end of Plot 3 (Figure 25). A doorway in the north wall led out into a small yard area between the boundary fence and FS 102. A later pit disturbed most of the interior. The western end was partly divided from the rest of the building by a large timber. A wood chip floor lay in the western end of the building. It produced a mixed assemblage of house fauna and generalist decomposers – commonly those indicating fouler habitats. *A. brunneus* does not occur in high numbers, and the most frequently occurring species in the assemblage is the fly *Heleomyza serrata*, which is found in the humus layer of soils and in bird nests. The assemblage would appear to reflect the abandonment of the building more than it being an active occupation phase, although there is no indication that the building was unroofed when the deposit accumulated.

FS 118, Plot 4

Two buildings were constructed side by side at the eastern end of Plot 4, although FS 117 is actually later than FS 118. FS 117 was a Type 1 house and FS 118 a smaller Type 3 – and much less well preserved (Figure 26). No suitable samples existed for the interiors of either. Instead, a sample from a wattle-lined drain feature, which ran out through the centre of the west doorway to pit AC, was examined. The assemblage from this drain fill was rich and mixed, with an equally high proportion of house fauna and *Quedius/Philonthus* spp. Members of both these large genera occur in a wide variety of habitats, from grassland to river shingle, from carrion to rotting plant matter and dung. This suggests that the drain may have been acting as a 'pitfall trap' for surface fauna normally ubiquitous in the urban environment. Also present were moderately high numbers of 'outdoor', foul, damp ground indicators and beetles found in decaying wood. Of the latter group, the 'Elm Bark Beetle' (*Scolytus scolytus*) was an interesting addition to the wood-dependent fauna from Fishamble Street. Elm played a role in house construction here and the presence of the elm bark beetle, alongside other indicators of elm and ash (*P. vittatus*), clearly demonstrates its use in this plot. However, the most numerous taxon recovered in this deposit

was *T. zosterae*. This would seem to indicate that the primary fill of the drain was human waste, possible urine-soaked plant matter or faeces. It is also possible that some other combination of factors provided attractive breeding conditions for this fly, perhaps waste from the manufacture of plant or animal products. The fact that FS 118 was a smaller Type 3 house certainly allows for the possibility that this was not a domestic structure but rather a workshop or outbuilding of some sort.

Chapter 5

Reconstructing living conditions in the houses, plots, streets, and surrounds of Viking Dublin

House interiors, division of space

The layouts of houses in Dublin, and indeed in other Viking settlements in Ireland and beyond, have been described in detail by Wallace (1992) and Boyd (2012). The origins of the Type 1 'Hiberno-Norse' house have been discussed in Chapter 2. While rectangular houses were certainly not unknown in pre-Viking Ireland (O'Sullivan and Nicholl: 2011; O'Sullivan *et al.* 2014, 93), there is no doubt that the shape and design of this house particularly suited the narrow plots of urban settlements. The materials required to construct them (wood, sod, straw, wood chip, sand/gravel, ferns/bracken, reeds) and, importantly, the way these materials were put together by people produced unique micro-habitats and new associations of insects that might not necessarily be found together in nature. It also encouraged the proliferation of certain species specifically within houses, which might otherwise be relatively rare or restricted in their distribution. No doubt there were certain activities, cultural and geographical influences, which produced aspects unique to the Irish urban indoor fauna compared to Britain and elsewhere, but also similarities, some of which will be discussed below.

From the 30 Type 1 houses examined here 48 floor deposits are represented (Table II); 20 central-aisle floors produced generally small mixed assemblages compared to the side aisles and corners. All bar four central floor deposits produced less than 100 beetles, suggesting that these floors were less organic or that conditions were not as conducive to good preservation. For the most part, the insect communities of the central floor areas could be seen as a sub-set of the aisle/corner floors, with human behavioural factors determining the differences observed. Floors may have been swept regularly, and ash, from the hearth, may have been spread across the floor and stamped in to maintain a dry 'clean' surface. There is little to suggest from the insects that the main floor space was a sodden mass of rotting plant matter. The puparia of nuisance fly species (house flies, blow flies and biting stable flies) were infrequent for the most part, with the exception of two houses, FS 28 (L5) and FS 102 (L14) (Chapter 4). In both cases, the insects from the central floors suggest that these buildings were not used for human occupation despite having the morphological characteristics of Type 1 houses. In the case of FS 102, it appears to have been a byre or stable first and then subsequently subdivided and occupied (Chapter 4).

The 18 side-aisle samples for the most part produced large, rich assemblages dominated by 'house' fauna, most notably *A. brunneus*. The dominant picture was of generally dry warm conditions in these areas of the houses. Very few side-aisle deposits contained a strong 'foul' element, with the exception of FS 10 (L3), FS 19 (L4) and FS 102 (L14). In the case of FS 10, the two side aisles had unusually high numbers of nuisance fly species, and the low numbers of *A. brunneus* in the south aisle, in particular, would suggest that conditions here were less dry and comfortable. FS 19 was almost certainly unroofed and used as a byre in the last stages of its existence, and FS 102, as noted earlier, had an interesting two-phase use. The south aisle deposit here contained many of the typical house fauna species but was also possibly contaminated by layers below from its earlier use as a byre or workshop. FS 35 (L6) also had atypical side-aisle fauna but this was due to burning and the lowermost north aisle floor in FS 99 (L11) was probably part of the foundation deposit in this area and partly inorganic.

Much has been written about *A. brunneus* and its importance as an indicator of 'indoor' contexts (Kenward and Hall 1995). At Deer Park Farms, Kenward *et al.* (2011) suggested that this beetle could also have

burrowed into thick deposits and continued breeding long after a house went out of use, which might explain the superabundant numbers in some bedding area deposits there. This was because, despite this beetle being first identified as a key component of the house fauna at Coppergate, it never reached the superabundant numbers there that are seen at Deer Park Farms (Kenward 1997) or Christchurch Place (Coope 1981). However, 'bedding' aisles *per se* were not excavated at Coppergate in the comparable 4B houses (Kenward and Hall 1995: 726-31). In addition, the Level 5B houses may have been two-storey structures, with the main living floor space raised and made of floor boards, thus limiting the build-up of certain house fauna species. Here, numbers of *A. brunneus* were relatively low (Kenward and Hall 1995: 734). It suggests that the bedding aisles of Deer Park Farms and Fishamble Street were built up in a similar way, with layers of brushwood and especially straw-like plant material, which provided a warm, protected, relatively dry space for sleeping compared to the more exposed central floor zones. These thick layers of brushwood provided ideal breeding conditions for *A. brunneus*.

The corners and wall fills of the houses, for the most part, overlapped with the side aisles in terms of their insect faunas. They were generally dominated by house fauna, suggesting they were also 'protected' spaces. In many cases examined here, the corner floors were covered in wattle mats, which would ensure that whatever was being stored here was 'raised' off the foundation floor deposit. This is perhaps why *A. brunneus* did not reach superabundant numbers in these locations – as the deep woodchip layers were thinner or missing completely. Only in FS 99 (L11) did the insects produce evidence of stored grain or flour in the corners (Chapter 4). Wall fill deposits were dominated by dry house fauna species and there were negligible foul or dung indicators, with the exception of a wall fill from FS 99. Here a significant number of species were indicative of wet, decaying plant material, possibly including manure. It is not possible to say on the basis of these three deposits if dung was used to insulate the walls, as some writers have suggested (Geraghty 1996; Kenward and Hall 1995; Wallace 2005). The most interesting aspect of the corner areas was a notable presence of bird nests, animal hide, and dry carrion species – *D. punctatus*, *O. colon*, *T. scaber*, *D. lardarius*. This combination of species also occurred in some of the wall fill deposits, most notably from FS 99 (L11), and some side aisles. *D. punctatus* was frequently very numerous in the side aisles. None of these species occurred in large numbers in central floor or yard/pit deposits. Therefore, their temporary proliferations appeared to relate to conditions/activities or materials specifically within the side aisles, corners and walls. One obvious possibility is that these were fauna associated with birds nesting in the roof spaces, the nests dropping down over time to become incorporated into the bedding material and floors. However, if this were the case would this not also apply to the central floor? This might explain occasional inclusions but not the large numbers of *O. colon*, in particular, present in some corners. Another definite possibility is that they were part of the decomposer fauna of dried meats, hides or skins being used as wall covering, bed coverings or partitions, perhaps also rolled up and stored in corners, hence their concentrations in these areas. Experimental analysis by Rebecca Boyd in reconstructed Viking houses in Denmark would suggest that wall hangings were essential to keep the interior of the house warm and to provide some level of privacy. Undoubtedly, wooden panels or wattle screens were also used (Boyd 2012). Surprisingly, *D. punctatus* is not recorded in Ireland today (Anderson *et al.* 1997), nor recorded at Deer Park Farms (Kenward *et al.* 2011), and was infrequently encountered at Coppergate (Kenward and Hall 1995). However, it was encountered at Temple Bar West and Back Lane, Dublin, and Barronstrand Street, Waterford (Reilly 1996; 1999; 2010). It has been recorded from Roman sites in London and York, but otherwise its main fossil find locations outside Britain and Ireland are 11th- and 12th-century Oslo, and 13th-century Novgorod (Kenward 1988; Hellqvist 1999).

Finally, the 'foundation' floors and 'destruction' layers from Fishamble Street provide interesting contrasts and overlaps with the occupation floors. Geraghty noted that, in general, the layers that sealed houses were derived from mixed sources, notably the sod used to roof houses, which contained seeds of grassland plants and sometimes flooded or wet meadow plants. These deposits also had higher

quantities of mineral soil (Geraghty 1996: 28). These sealing or destruction deposits often formed part of the foundation deposit for the next house. Many of the insects from these deposits reflected both house faunas, including species that may have lived in thatch and species that lived in grasslands and other 'outdoor' habitats. In some cases, a definite 'fallow' period was observed, e.g. before FS 46 (L4) or FS 99 (L11) were built, meaning that the foundation deposits in these areas had foul 'outdoor' elements in their insect fauna, with especially high numbers of dung indicators (Chapter 4). At other times, the complete destruction of houses resulted in burnt layers of sod and ash, which would have obstructed good preservation of insects, such as was the case in FS 4 (L2), FS 60 (L8), and FS 69 (L9).

The yards and outbuildings

Outside the houses, 19 samples from yard deposits or external wattle mats/paths were examined. The yard areas of the plots presumably fulfilled multiple functions. Other smaller buildings stood behind the main house or, in some cases, attached to it. Some of these buildings may have served as additional sleeping spaces, such as appeared to be the case with FS 84 (L10), which subsequently changed use to a workshop (Chapter 4). A great number appeared to be workshops, and possibly byres/stables or pens for animals. From the earliest levels the thing that distinguishes the insect assemblages from yard deposits is their damp, dungy signatures. In Plot 8 (L2) both the yard and pit fills suggested trampled straw, dung and butchery waste, even possibly the stockpiling of dung (Chapter 2). High numbers of blowfly puparia in the yard of FS 4 (L2) appeared to relate to a fallowing pen, FS 5 (Wallace 1992a; McCormick and Murray 2007). The yard around the much later FS 99 (L11) was also notably filthy.

Wattle mats and paths clearly became important for keeping the feet above the muck and morass of the yards, much as we might use duck boards today. At earlier levels they clearly encourage movement around the house, however, by the intensely occupied early 11th century (Level 10/11), mats and paths led up to houses but not around. They may be evidence of the importance of keeping the interiors of homes as clean as possible. Assemblages from the surface of wattle mats in Plot 4 (L7) indicate they were not as filthy as the yards that surrounded them, with a mixed house fauna/outdoor signature, suggesting they partly fulfilled their purpose. House sweepings may have been spread across their surface, or other dry indoor material, to maintain them.

The question remains, though, whether the dungy conditions underfoot were simply due to trampling of mud and other material, with occasional inclusions of actual dung from domestic animals, or whether animals were kept within every, or even the majority, of plots. While the less crowded conditions of 9th-century levels at Temple Bar West appear to suggest this (e.g. Reilly 2003), the narrow, more confined, spaces within plots in late 10th-/early 11th-century Fishamble Street make this more problematic. At most, it could only have been a few pigs or perhaps goats. Evidence for animal ectoparasites is limited, with only one possible *Bovicola caprae* and occasional sheep keds. The latter were probably present in wool, and are not necessarily evidence for the presence of sheep. The biting stable fly, *Stomoxys calcitrans*, was particularly common from Levels 6 to 10, but seldom seen after that time. *Pulex irritans*, the human flea, can be an indicator of pigs, but at Fishamble Street they are most frequently occurring in side aisles and some central floor layers. This would suggest that humans were its primary host. The presence of larger animals within the plots is almost certainly out of the question. Temporarily unoccupied houses or plots lying 'fallow' may have been used as stables or foraging places for pigs, which may partly explain the 'dungy' signature of certain house floors and foundation deposits described earlier.

One anomalous yard deposit came from outside FS 51 (L8). The high numbers of *A. brunneus* were suggestive of an indoor location but the equally high numbers of *T. zosterae*, the seaweed/cess fly, suggested an altogether different source. The huge number of feathers in the deposits suggests a chicken coop stood here, even though the structural evidence was all but removed.

The pits

17 pit, drain and trough fills were examined from Fishamble Street. Most had relatively poor assemblages of beetles but high numbers of fly puparia. This is not uncommon in pit fills, especially those primarily used as cesspits. In a study of medieval to late medieval cesspit fills from eleven sites across England, *T. zosterae* was the most frequently occurring insect at seven of them (Smith 2013). In Fishamble Street, it occurred in particularly large numbers from pit fills associated with FS 88, FS 89 and FS 91 (L10), and a drain fill from outside FS 118 (L14). The ecology of this fly has already been touched upon. While decaying seaweed is its primary habitat today, it is likely that the salts in human and animal urine may have attracted it to open cesspits and mucky yards in medieval times (Belshaw 1989; Webb *et al.* 1998; Smith 2013).

Other fly and beetle species, including indicators of dung and human faeces, were well-represented in pit and trough fills from earlier levels. Many fills contained relatively high numbers of 'indoor' species, which, apart from indicating dumping of old bedding or floor sweepings, could have been a deliberate attempt to dampen down foul smells (Reilly 2003; Smith 2013). The unusual fill towards the top of F1121 (L8), outside FS 63, was made up of burnt roofing material, indicated by both the plant remains (Geraghty 1996) and the insects described in Chapter 4. Here, this material appeared to have been used to close off the pit and level up the ground before new house construction began at Level 9.

These (relatively) poor insect assemblages may also indicate that pits were cleaned out regularly and backfilled toward the end of their use with a mixture of inorganic and organic material, such as those at Levels 2, 8, 10 and 13. Mick Monk (pers. Comm.) remembers that a great many of the pit fills from Fishamble Street appeared 'inorganic' compared to pit fills observed in medieval Southampton, Worcester and elsewhere (Buckland *et al.* 1974). Pits with much of their original contents intact certainly survived in some locations in Dublin, e.g. Winetavern Street (Mitchell 1987: 28) and Castle Street (Byrne 2014). Overall, however, it would appear that active waste management was taking place at Fishamble Street, with the contents of cesspits perhaps being used as manure for plots or on open commonage areas for the growing of crops or flax, as suggested by Geraghty (1996).

Living conditions

Taken together, evidence from within the houses suggested that there was an effort to keep the floors generally clean and the bedding and storage areas relatively warm and dry. External circumstances, including flooding or a rising water table, may have interfered at times, especially in houses closer to the river. Undoubtedly, also, the more intense periods of occupation towards the end of the 10th and start of the 11th century took its toll on the general conditions of roads, paths and yards, making plank and wattle paths essential to pick one's way over mucky ground. Overall, central-aisle floors had more in common with yards and pit fills, as an ordination graph of all the assemblages illustrates in Figure 27, suggesting that the 'traffic' through the house and around the central zone led to 'dirtier' or perhaps 'less dry' conditions underfoot.

It is interesting that the only central floor deposits that even vaguely mimicked side-aisle deposits, especially in terms of numbers of *A. brunneus*, were from FS 88, FS 90 (L10) and FS 99 (L11), all of which appeared to have particularly elaborate partitioning. The addition of lobbies, floored with boards, within the houses, may have checked the movement of people straight through the houses from outside, although it might be too far-fetched to say that mucky shoes had to be removed!

The population was certainly afflicted by abundant fleas, but lice are strangely absent from all bar two deposits. This is in complete contrast to the abundant lice recorded from deposits at Deer Park Farms,

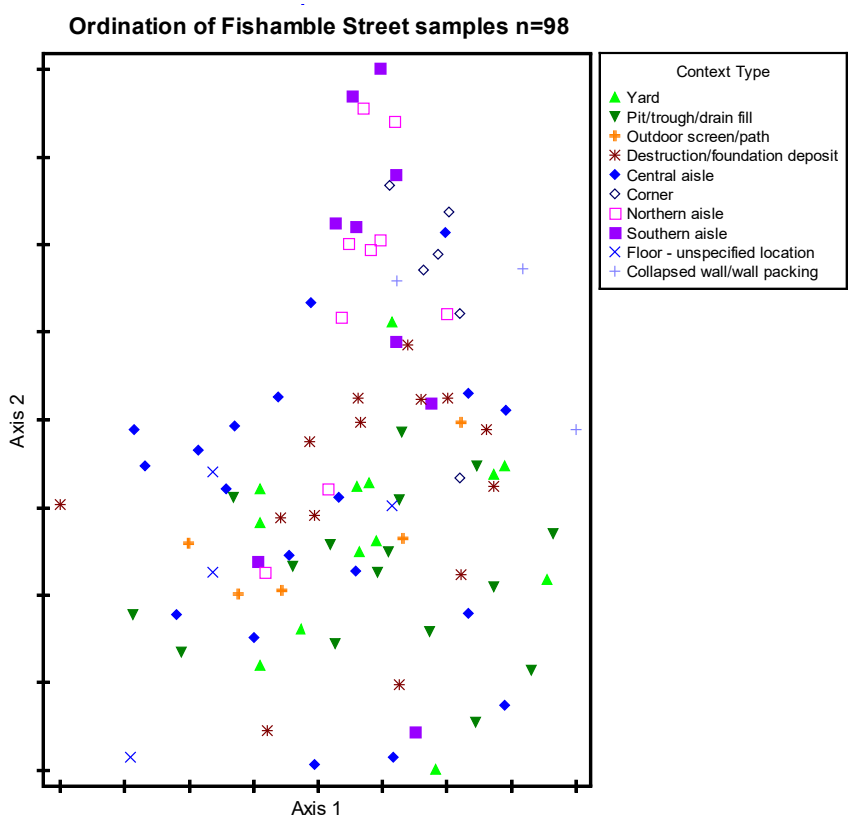


Figure 27: Ordination of Fishamble Street samples (n = 98) by context; note the clustering towards the top of side aisle, corner wall packing deposits.

and the fairly regular numbers encountered at Coppergate (Kenward *et al.* 2011; Kenward and Hall 1995). Lice were not recorded from inside Temple Bar West houses and were very rare at Barronstrand Street (Reilly 2010). At Deer Park Farms, deposits with large numbers of lice came from within, but also from yard deposits outside, and not necessarily associated with discarded household waste. This suggested to the writers that active de-lousing may have taken place out of doors or that clothes were cleaned in the yard (Kenward *et al.* 2011: 517). It is possible that similar activities took place at Fishamble Street but that the results of these activities are simply not represented in the samples here. Bone combs were found in abundance throughout Viking Dublin and bone comb-making was a thriving industry in early medieval Ireland generally (O'Sullivan *et al.* 2010: 134; O'Sullivan *et al* 236-38), certainly suggesting that ridding oneself of lice was an important part of grooming. Differential decay, however, may also be a factor here. Flea heads are extremely robust while lice are more delicate. If lice from de-lousing or clothes washing ended up in pit fills or middens, given the slightly inorganic nature of many of these deposits they may not have survived.

Intestinal parasites were not examined as part of this study but should form part of any future research strategies. The presence of abundant flies throughout all levels of Fishamble Street is worthy of further comment. The house fly (*Musca domestica*) and stable fly (*S. calcitrans*) are possible vectors for a great many diseases, including diarrhoea, dysentery, and various plagues (Smith 1973). The house fly, in particular, was colloquially known in past times as 'the dark destroyer' because of its perceived association with the spread of disease (Smith 2012: 66–67). The presence of these flies, or indeed, high instances of intestinal parasites, cannot be equated to the presence of disease (Smith 2012: 66–67). However, levels of contamination of such parasites in deposits other than pit fills might help to

establish the levels of cleanliness within houses and exposure to potential diseases in the yards and streets outside. The presence of flies within houses certainly points to the fact that foodstuffs were open to contamination. However, it may only be through the study of contemporary populations, the people who lived in these houses, that we can truly demonstrate levels of disease or attempt to tie these various strands of evidence together.

Hinterland connections

It is clear from the animal bones, plant remains, artefacts and houses that Dublin was supplied from the outset with a great variety of food and raw materials from the landscape surrounding it (Geraghty 1996; McCormick and Murray 2007; Murphy and Potterton 2010; Valante 2008). The level of political control over this area may have waxed and waned, depending on the wider political context, but it appears that an area as far west as Leixlip, as far north as Howth, and possibly as far south as northern Wicklow, was under their control (Geraghty 1996: 61; Valante 2008: 140–141). This area was known as the *crích gall* ('territory of the foreigners') or *Dyflinarskiri*. How much of this was actually settled by 'Vikings' is not clear, although some evidence exists for rural settlements with strong Scandinavian links in the greater Dublin area (e.g. Ó Néill 2006). Animal bone evidence suggested that cattle provided the bulk of meat consumed by Dublin residents from its earliest foundation, with pig bones only exceeding cattle bones for a period during the late 10th century (McCormick 1987; McCormick and Murray 2007). This must have been supplied from outside the town, as it is highly unlikely that cattle were reared within it. However, the unusually high levels of pig meat consumption in the late 10th century may have been due to a perceived need for self-sufficiency, particularly during times of political strife (O'Connor 2010). Much of the dung beetle and stable manure fauna recorded in Fishamble Street is no doubt related to animals kept within the town. However, the possibility that dung was gathered from the hinterland for use as daub, or to manure plots within the town, may also explain their constant background presence in the yard deposits. While few ectoparasites of animals were recorded, sheep keds appeared in aisle and yard deposits from Level 7 onwards, probably from wool. The ked, a wingless parasitic fly, spends its whole life cycle within the wool of the sheep and can be removed using various processes, from hand-picking to washing in stale urine (Buckland and Perry 1989; Kenward and Hall 1995: 775–777). Sets of iron shears were found in Fishamble Street, suggesting perhaps direct links to the husbanding of sheep for wool by some of the residents (Monk 2013: 705).

Insects from Fishamble Street give us insights into the construction materials used in house, fence, and path building. Beetles associated with grassland and meadows are constantly present throughout the deposits, some undoubtedly from turf or sod cut for roofs and foundation floors, and also potentially arriving through either stable manure or stomach contents. The evidence for straw, possibly used in thatch, wall packing and bedding/fodder for animals, is well attested by many of the house fauna species, notably *Mycetaea subterranea* and *Xylodromus concinnus*, both of which are typical components of the house fauna.Negligible numbers of insects indicative of reeds or rushes were found among the floor, yard, and pit deposits of Fishamble Street, suggesting these were not used in roof thatch or strewn across floors. There is some suggestion that hay-making, a non-indigenous practice, was introduced by Scandinavians at this time and is perhaps reflected in a suite of plant remains found throughout Fishamble Street (Geraghty 1996: 61), although other writers suggest that the evidence is still far from clear (Monk 2013: 795). Many of the insects indicative of meadows could equally have come from secondary sources, e.g. manure, especially from animals grazed in meadow-like environments.

Woodland species, timber and bark beetles are present throughout the deposits in Fishamble Street, unsurprisingly. However, if we leave *A. punctatum*, the woodworm, aside for the moment, the actual numbers of woodland associates is surprisingly small, given the huge amounts of wood and wood chips used in house construction. Only 15 species of bark and wood-boring beetles are recorded from

Fishamble Street (out of a total of 300) while only three or four leaf defoliating species are present (Table IV). This could indicate that primary wood working, including removal of branches and leaves, took place where the tress were felled, not where the houses were built although these taxa are rarely abundant, even in samples derived from primary woodland deposits. A great many generalist litter/decomposer species do, of course, inhabit wood litter and were probably woodland inhabitants prior to finding suitable niches among the houses of Viking-age Dublin. There is also the possibility that two commonly occurring species in the bedding-aisle areas, *D. punctatus* and *Acritus nigricornis*, originated from wood debris. The beetles recorded are from the main tree species used in house construction in Fishamble Street e.g. hazel, ash, alder, willow and elm, all of which would have been readily accessible in the river valleys and on the gravel ridges around Dublin. There is little doubt that the residents quickly acquired a ready supply of hazel, the primary wood used for the construction of house walls, paths, screens and boundary fences. No specific oak associates were recorded, which is not entirely surprising given the lack of oak in house construction in Fishamble Street, a pattern mirrored 'across the street' in Temple Bar West (Reilly *et al.* 2016). The possibility exists that oak was 'reserved' for very specific activities e.g. ship building, charcoal making, tanning of leather, activities that were probably not taking place in amongst the houses of Fishamble Street – hence the lack of oak associates. Oak off-cuts and dismantled ship timbers did make their way back into the community, however, and were used in houses and for furniture and utensil making (Reilly *et al.* 2016). Evidence from one house in Temple Bar West pointed to it being occupied by a person engaged in the ship-building trade (Simpson 1999). At least two structural wood pests were more than likely imported into Ireland at this time and will be discussed in the next section.

On food resources, the insects are somewhat mute. Some species that occur reasonably frequently, such as *Phyllotreta nemorum* and *Chaetocnema concinna* may have come from beet, carrots and other cultivated members of the *Brassica* family. However, they could equally have occurred on wild members of this family, many of which were present among the plant remains recorded at Fishamble Street (Geraghty 1996). Cereal remains were not frequently recorded from the waterlogged deposits but caches of grain were found at Fishamble Street (Geraghty 1996). The most common pests of stored cereals are not native to Ireland and none have been recorded here from deposits dated earlier than the 12th century (Reilly 2003). Furthermore, the grain weevil is thought to have died out in Britain in the post-Roman era and does not reappear there with any frequency until the post-conquest era, perhaps even the 12th century (King *et al.* 2014). However, both *Bruchus rufimanus* (pest of beans/peas) and *Sitophilus granarius* (grain weevil, pest of cereals) were recorded from Levels 10 and 11 in Fishamble Street, suggesting they may have been present in early 11th century Dublin. Unfortunately, apart from these brief appearances, neither is recorded again in the remaining levels. This leaves open the possibility that these were one-off accidental inclusions and did not become established from this point forward. This reinforces the assumption that the town was largely supplied with grain from the hinterland, which remained uncontaminated by these pests until the Norman period, despite some documentary sources of importation of grain in the 7-8th century from France (Kerr *et al.* 2013, 43-9). On the issue of beans, one might expect that if the Vikings introduced bean cultivation to Ireland that *B. rufimanus*, along with other bean/pea pests, should have been present from the earliest stages of settlement and should have made sporadic appearances in the record from then on, especially in cess-pit deposits. Evidence for beans in the plant macrofossil evidence from Fishamble Street was also slight, with only one bean epidermis recorded (Geraghty 1996). However, once again, it is important to remember the wise archaeological saying 'absence of evidence does not equal evidence of absence'. It may simply be that differential preservation or not hitting on the right samples has resulted in this curious absence.

Estuarine and riverine insects are surprisingly scarce throughout the levels of Fishamble Street. While beetles that live in temporary pool and puddles were common in yards and pits, species related to

riverside plants, running water or salt-water/salt-marsh only occasionally appear. Notable among them is the now locally extinct aquatic beetle *Pomatinus substriatus*. This was first recorded in Ireland at the late Bronze Age/early Iron Age site of Clancy Barracks, 2 km downstream from Fishamble Street (Reilly 2009). *P. substriatus* was also found across the river at Ormond Quay associated with a middle Iron Age wooden revetment (Reilly 2008; Bolger 2010). Many species of riffle beetles have disappeared from the lower reaches of rivers in Britain, generally thought to be caused by alluviation of river beds from surface run-off as farming intensified (Smith 2000). Together with other riffle beetles, the presence of *P. substriatus* at Fishamble Street suggests that the Liffey was still fast-flowing over a shingle substrate (at least in its central channel) in the early medieval period.

Shipping, trade and miniature stowaways

The insects from Fishamble Street have produced additional evidence for connections between Dublin and the wider Viking world. Table XVII lists all of the species that may have arrived into Dublin during the 10th and 11th century. Some are early arrivals, such as *H. bajulus* and *Necrobia violacea*, the latter making only two appearances in Fishamble Street. This beetle was likely imported with dried meat products but did not become established here. Apart from Roman-dated finds in Lincoln, its fossil distribution from Britain to Sweden is primarily from Viking age and medieval sites (e.g. Barrett *et al.* 2007; Kenward 1988:2005; Smith 2012).

H. bajulus is a longhorn beetle known to bore into dry, well-seasoned wood used in construction of houses and other buildings (Alexander 2002). The larvae can take from 3 to 15 years to mature inside the wood, which means it is regularly moved around in shipping, in posts, beams, packing cases and orange boxes, emerging much later as an adult in new locations (Hickin 1968). It is not native to Ireland or Britain but may have become naturalized in both countries since the late 18th century via imported pinewood used for house building (O'Connor and Ashe 2000: 77). Its presence in Dublin at this early date is enigmatic but, in the author's opinion, is probably linked to the construction, dismantling and repairing of ships during the 10th and 11th century (McGrail 1993; Reilly *et al.* 2014). The presence of small amounts of non-native pine species among the structural wood and artefacts identified at Temple Bar West, including possible re-used ship timbers, may be the source of this beetle in the houses of Fishamble Street also (Reilly *et al.* 2014) It first appeared at Level 4, mid-10th century, and then appeared sporadically but consistently right to the last excavated level (see Chapter 4 and Table III). It is interesting to note that it has not been recorded from any other contemporary Viking age settlement to-date for which insect analysis has been carried out. It would, however, be interesting to compare the data here with houses from other well-known ship-building centres of this era elsewhere in Europe, especially in Denmark.

Other possible 'new' arrivals into Dublin from an early stage in the settlement included *Tenebrio obscurus*, *D. lardarius* (stored and dried food products) and, possibly, *D. punctatus* (discussed earlier). None of these species appear to have any presence in Britain prior to the Roman era, where they begin to occur in association with settlements of this period (e.g. Kenward and Williams 1979; Smith 2011). Therefore, it is entirely possible that their arrival into Ireland is also in the context of settlements with outside connections, particular with the importation of dried meat, fish or other food products. None of these species are not known from pre-Viking native Irish settlement sites where good preservation has permitted insect analysis e.g. Deer Park Farms (Kenward *et al.* 2011), Roestown (Reilly 2006) or Skellig Michael (Allen *et al.* 2012) but this is a very small pool of sites.

Levels 10 and 11, dating from the early 11th century, produced another 'wave' of new arrivals with species like *B. lethifera*, *G. minuta*, *Nitidula rufipes*, *P. parumpunctatus*, *B. rufimanus* and *S. granarius* (both discussed in the previous section) making one off appearances at these levels or becoming established from this point forward. Does this represent the arrival of new people or new goods into the town or

is this simply a result of intensification of occupation after a period of turbulence, represented by the extensive burning of Fishamble Street at Levels 8 and 9 *G. minuta* is associated with wickerwork and while native to Britain is not known from Ireland presently. It may have arrived with supplies of wattle from England as the re-building of houses began again in earnest, although more research is required to establish whether this species is in fact native to Ireland. *B. lethifera* may be native to Britain but its fossil find locations again date from the Roman era onwards from settlement sites only (Kenward and Williams 1979). Few of these species became widely established after this point in Ireland. It would appear that the many unique habitats provided by Viking age homes and outbuildings, just like Roman towns 800 years earlier, resulted in the temporary flourishing of some otherwise geographically and ecologically restricted beetles.

Fishamble Street and early medieval Irish settlement – the insect evidence

As discussed briefly in Chapter 2, early medieval Ireland, during which time these first urban communities come into being, was socially and politically complex (Kerr *et al.* 2013). A large body of Old Irish law tracts exist detailing a huge range of information about property and status, and outlining the socio-economic relationships between early medieval lords and their client free commoner farmers. These early Irish laws also provide information on houses, the things within them, and the activities that took place there (O'Sullivan *et al.* 2014). The Early Medieval Archaeological Project (EMAP) has collated the results of excavations of early medieval settlements in Ireland over the last 70 years (O'Sullivan *et al.* 2014). Many new settlement types have emerged, such as settlement cemetery and settlements with large industrial functions, to add to the numerous ringforts, crannóga and ecclesiastical sites previously known (e.g. Fibiger and Seaver 2010; Clarke and Carlin 2008). While early Irish society was tribal, hierarchical, rural and familiar, it was tied closely to developments elsewhere in Europe. There is strong archaeological and historical evidence for long-distance trade and exchange, particularly with western France and beyond to the Mediterranean. Beach trading stations may have been exploited by both maritime merchants, the church and the secular aristocracy, with islands and other coastal locations being places where both Irish and Frankish traders moved such goods as leather shoes, clothes and butter to the continent (Kerr *et al.* 2013, 52-9). Ship-wrights are specifically named in the law tracts (Ibid., 7, 58-9). Slaves were also traded into and out of Ireland and, indeed, Ireland would appear to have been part of the general European trading network of goods and slaves throughout the early medieval period. However, evidence for 'urbanism' prior to the Scandinavian towns of Dublin, Waterford, etc., is scant. Perhaps the best fit may be the larger monastic sites like Clonmacnoise, where archaeological evidence suggests the presence of village-like 'streets', multiple houses and workshops (King 2009). Some of the larger multifunctional settlements like Raystown and Johnstown may have had functions relating to production. However, crucially, unlike the many Anglo-Saxon emporia on the coast of Britain, which eventually developed in towns, none of the purported pre-Viking emporia sites in Ireland became towns (Kerr *et al.* 2013: 47–48). Indeed, it appears that they largely went out of use when Viking trading centres or *longphoirt* came into existence.

In terms of building up a picture of the interiors of houses and living conditions within native Irish settlements at this time, the environmental evidence is extremely limited. Documentary sources have a lot to say on the disposal and management of food waste, animal dung, even dog excrement, at this time (O'Sullivan 2008; O'Sullivan and Nicholl 2011). Middens have been excavated on some early medieval ecclesiastical sites (e.g. Marshall and Walsh 2005), while many pits have been excavated from within early medieval settlement enclosures filled with food debris and industrial waste (O'Sullivan *et al.* 2010, 64; O'Sullivan *et al.* 2014 105-6). However, anaerobic preservation on large dryland sites tends to be confined to the bottoms of ditches or deeply dug pits and wells only, so preservation of many of the key insect taxa, which speak to domestic living conditions, are often missing. Where such evidence does exist, there are interesting overlaps with elements of the urban faunas we've encountered at Fishamble

Street. House fauna species were recovered from fills of the early medieval enclosure at Roestown, Co. Meath, demonstrating that occupation debris was disposed of in the ditch (Reilly 2006). This was mixed with a strong animal dung signature too, possibly from manure and stable bedding mucked out into the ditch from within the enclosure. The use of parts of the enclosing ditch for waste disposal appears to have been a common practice at this time as the same phenomena was observed in insect assemblages from Castlefarm 1 and Dowdstown 2, Co. Meath (Davis 2008a, 2008b).

A remarkable insect fauna was derived from the garden soils of the Monk's Garden area on Skellig Michael (Allen *et al.* 2011). The insects suggested that much of the material was made up of discarded household waste, possibly from the cells, but also imported from the mainland. Some of the species would not have been found on the island and, similar to some of the imported 'urban' elements of the Fishamble Street fauna, could not have made it to Skellig Michael without being transported by people (*sensu* Kenward 1997). The insects also indicate that animal manure was not used as fertilizer but seaweed, human excrement and seabird guano were suggested in the assemblages. The monks presumably gathered waste material (possibly in a midden) and deliberately reused it, undoubtedly partly as a way to manage their living quarters as well as allowing them to grow food on the island.

The best preserved early medieval settlement for which detailed insect analysis exists in Deer Park Farms, Co. Antrim (Lynn and McDowell 2011; Kenward *et al.* 2011). This site has been referred to on numerous occasions already in this book and it provides many remarkable parallels to Fishamble Street, but also noticeable differences. The samples from bedding areas produced very similar 'house' fauna species, although overall floors and interiors here appeared to be somewhat damper, particularly the lower layers. Indeed, it was observed that insects from across the site, both inside and out, suggested conditions were damp, certainly compared to Coppergate and other site in York (Kenward *et al.* 2011, 502-3). Insects suggested that foul, moist and fetid material existed on the yard surfaces at all time, much like the yard areas of Fishamble Street houses. Both insects and plant macrofossils suggested grass sods were used on site, similar to Fishamble Street, possibly in foundation layers or roofs, but were remarkable 'silent' on the plant material that may have covered these sods (Ibid., 511). The high levels of lice infestation at Deer Park Farms compared to Fishamble Street have already been discussed. This difference is either 'real' in terms of differences in cleanliness and personal hygiene between these two populations, or taphonomic. At the moment, in the absence of some experimental tests on differential preservation of ectoparasites and additional insect data from other Irish rural settlement sites, the exact reason for this remarkable difference is not clear.

Other differences between Deer Park Farms and Fishamble Street are in the area of contacts with settlements beyond Ireland. Many important house fauna taxa and other commonly occurring 'indoor' species at Fishamble Street were probably imported from outside Ireland (as discussed earlier). None of these species are present at Deer Park Farms, nor are they present at any of the other Irish sites discussed here. This ultimately sets the urban settlements of this time apart from their rural counterparts – the longevity of occupation, intensity of settlement, constant renewing of building materials and inputs of imported products, built up a unique occupation fauna specific to these complex cosmopolitan settlements.

Even between near-contemporary urban settlements e.g. Temple Bar West in Dublin and Barronstrand St in Waterford, similarities and differences exist. Many of the samples examined from Temple Bar West actually pre-date Fishamble Street, coming from the smaller late 9th century structures and animal pens. The insects here suggested generally foul conditions both within and outside buildings, with buildings possibly even changing use from animal to human occupation (Reilly 2003). Very few bedding-aisle deposits were examined from later 10th-century buildings here, thus the house fauna element, while present, is much diminished compared to Fishamble Street. However, overlaps do occur in terms of the

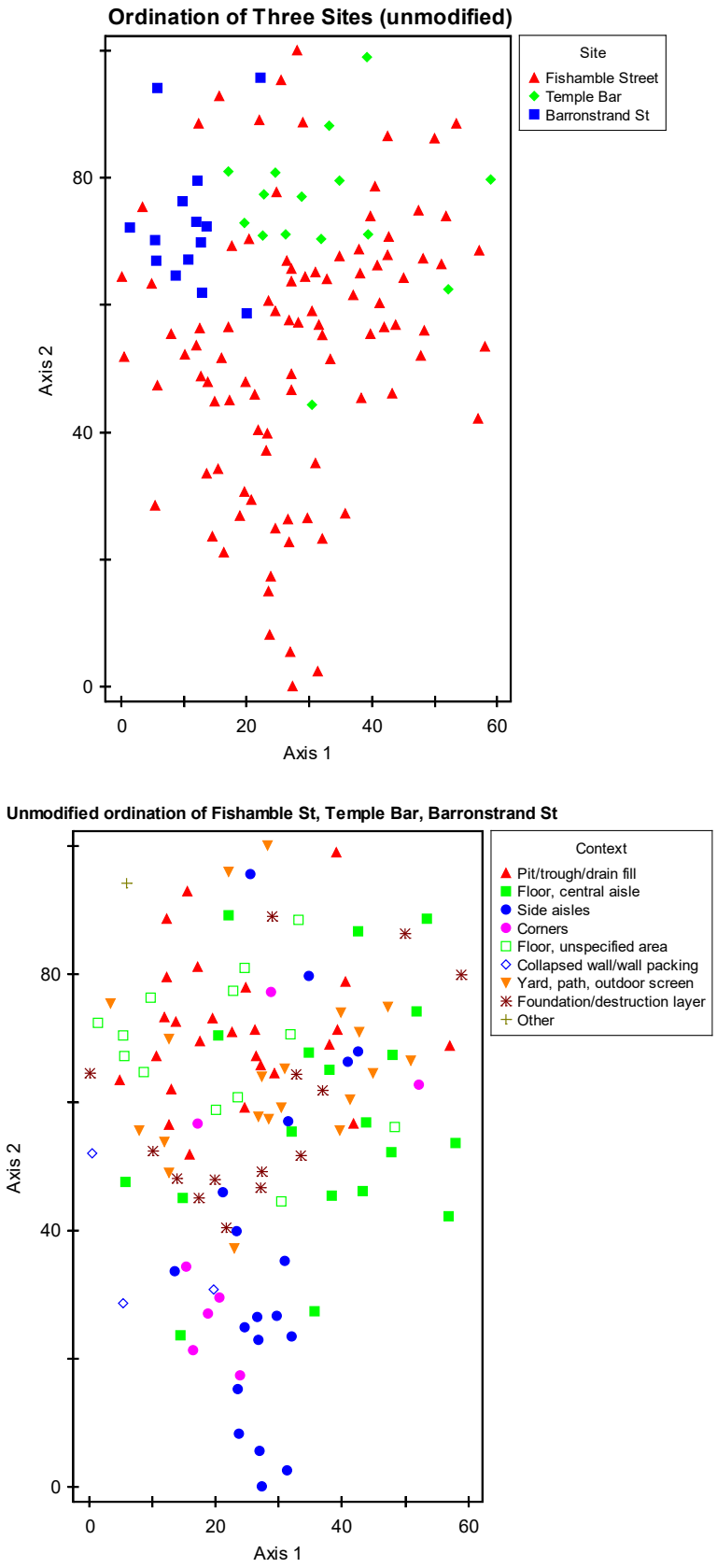


Figure 28: Ordination of insect assemblages from Fishamble Street, Temple Bar West, and Barronstrand Street (left) and by context type (right).

imported elements of the fauna. At Barronstrand Street, the insects from house floor layers in three neighbouring plots indicated that they were considerably fouler than might be expected and suggested either the stabling of animals within plots and/or abandonment, similar to the central floor deposits in FS 19 and FS 28 (Reilly 2010). Some suggestion of butchery activity was also evident in one building, as well as indications of generally damper ground conditions underfoot. These houses lay outside the Viking wall and closer to the river, so flooding or a rising water table in winter might explain this signature. The beetles also produced remarkable evidence of extant semi-natural woodland in close proximity to the town, due to the number and variety of now extirpated woodland beetles recorded. Parallels for the number and variety of such species only exist at the

Late Bronze/Early Iron Age site of Clancy Barracks, Dublin. As noted earlier, numbers of wood-dependent beetles at Fishamble Street were relatively speaking small, although some rare and possibly extirpated species were recorded (Reilly 2014, Table III). Figure 28 is an ordination graph of samples from Fishamble Street, Temple Bar West, and Barronstrand Street, illustrating that while assemblages from both sites overlap with the bulk of pit, yard and central-aisle samples from Fishamble Street, none overlap with the uniquely rich faunas from the side aisles and corners. It also demonstrates the 'separateness' of aspects of the Barronstrand Street assemblages, where both pit and floor deposits had more in common with each other than with similar deposits from contemporary sites.

The European context – insect evidence from settlement sites

In recent times a number of early medieval settlement sites have been examined for insect remains, particularly from northwestern and eastern Europe. The present author has reviewed environmental evidence from Viking-age towns across this region (Reilly 2015) and some key findings from the insect analysis will be discussed here.

Coppergate in York has been mentioned several times already in this book and is something of a 'type-site' for environmental archaeologists attempting to understand urban living conditions (Kenward and Hall 1995). Multi-proxy analysis of biological remains has given remarkable insights into the activities of the town's residents, with many of the occupants of Coppergate, in particular, engaged in craftworking. Many other 'streets' in York have been similarly analysed, e.g. Pavement, Parliament Street, Mickelgate, and, more recently, Hungate (Hall and Kenward 2000; Hall *et al.* 1983; Hall *et al.* 2007; Kenward and Hall 2000).[1] Houses on Coppergate were similar in construction to Dublin at Level 4B (early to late 10th century) but then changed to two-storey 'sunken' buildings at Level 5B (late 10th/mid 11th century) (Kenward and Hall 1995: 440–441). Within the houses, environmental evidence from floor deposits for craft activities included dye-plant waste, sheep keds and lice (presumably from wool cleaning), wood, bone and leather working, and bee keeping. Parasites of humans, especially fleas and lice, were concentrated in floor deposits within houses. In general, the insect evidence from within houses suggests that living conditions were not filthy. Floors with higher numbers of foul-indicating species probably indicated periods of abandonment, similar to Fishamble Street. In contrast to the early phases in Dublin, there was very little evidence from the insect assemblages at Coppergate that animals were routinely kept within these plots. Recent isotopic studies of pig bones from Swinegate and Coppergate suggest that pigs had a largely herbivorous diet, similar to sheep of the same period, and were not yard-fed or yard-kept (Hammond and O'Connor 2013).

At Kaupang in Norway, the early trading settlement with links to Dublin, much of the organic occupation evidence was confined to pits and ditches, as the houses were mostly burnt down (Barrett *et al.* 2007). Although it started as a seasonal trading camp, within a decade of its beginnings in AD 800, permanent

[1] See also, www.dighungate.com (viewed 16 August 2021).

houses were built within the plots, spread out along the original shoreline (Skre 2007: 115). Plant remains analysed from pits, floors, side aisles and midden layers show the presence of cereal grains, but no insect pests of stored grain; this would suggest that cereals were sourced locally. Pig bones dominated the animal bone assemblages, and herring, cod, saithe, hake, and ling were all eaten. With the possible exception of the small amount of cat bones recovered, there was no clear evidence for a fur trade operating from Kaupang. However, surprisingly high numbers of beetles associated with 'old bones' or dried skins were recovered from two pits, in particular *Omosita colon*, familiar to us from Fishamble Street corner and side-aisle deposits. The range of bones identified in the pits did not necessarily support the notion that these beetles were living on the detritus of skinning. It is possible, given the huge numbers of fish bones in the pits, that they were drying fish, or that it simply represented large amounts of discarded butchery waste. Dried fish and other meats may have been exported from places such as Kaupang, or used as snack food on long sea journeys. This is one route by which some of the imported beetles indicative of dried foodstuffs made their way to Fishamble Street. From the pits, the insect and plant macrofossil evidence suggested that they were primarily filled with household waste, not human or animal excrement (Barrett *et al.* 2007). This may simply be a reflection of the final use phase of the pits. A deep cultural layer was noted in the harbour area of the town, similar to the 'Birka Layer' (below) and it may be that dung, excrement and other fouler organic material was dumped off-shore. Analysis of this deposit did not give clear indications of a strong 'cess' element, but intestinal parasites were not looked at. The low number of synanthropic beetles suggests that the settlement at Kaupang was probably not based on an earlier settlement and relatively very short-lived. Certainly, the intensity and longevity of occupation demonstrated through the rich synanthropic fauna of York and Dublin were not evident here.

At Birka, the late 8th- to 10th-century trading centre in Sweden, insects have not been examined from any of the occupation zones. However, biological remains were examined from a 6.5 m-long lake core taken through the Birka context, a deep cultural layer, which also built up in the lake beside a wooden palisade (Risberg *et al.* 2002). It is thought that this was the result of deliberate dumping of waste beyond the palisade, rather than surface run-off, as the layer does not occur in the area between the palisade and the shoreline. The presence of human intestinal parasite eggs, high numbers of lingonberry, bilberry and wild strawberry seeds, moss fragments, and fly puparia, suggest that the area was used for dumping of human and animal excrement, something that may have parallels at other early Viking towns, Irish and Scottish crannógs (Kenward *et al.* 2000; Selby *et al.* 2005), and, indeed, parallels the dumping of waste into enclosure ditches of other early medieval settlements (see above). In addition, some writers have suggested that winter markets took place on the ice west of the palisade, which resulted in large amounts of animal dung falling into the lake waters when the ice melted in the spring (Arrhenius 1994).

Viborg was a later foundation than Kaupang, Birka, York, or Novgorod (below), with its origins dating probably from the start of the 11th century. Recent excavations at the Sondersø settlement, close to the shoreline of Sondersø Lake, have uncovered evidence for a workshop, most likely used for metalworking (possibly a forge), latrine, and waste middens. No residential houses were found, confirmed by the very low levels of insects belonging to the 'house fauna' group in the deposits (Kenward 2005); it is likely that they were located further uphill. Sand and gravel were used to build up floor levels within the workshop area, and presumably within houses also, probably to provide a drier ground surface underfoot, something reflected in river/lakeside settlements throughout the Viking world. Dendrochonological studies showed that oak from generally younger trees was used for major structural elements (Daly 2005), similar to York and Waterford, but not Dublin. Surprisingly, the woodworm, *Anobium punctatum*, was hardly present on this site, which may suggest that these buildings were not particularly long-lived and relatively fresh wood was used. This may also be implied by the presence of *Lyctus linearis*, the 'powder-post beetle', which is thought to be able to attack relatively fresh wood (Kenward 2005).

Evidence from insect remains and plant macrofossils suggest that turf might have been used as a roofing material, although plant growth detected in the floor layers suggested that the building was unroofed in any formal sense. Woven mats, sails, or even hides may have been used instead.

The presence of the hide beetle, *Trox scaber*, and the longhorn beetle, *Phymatodes testaceus*, which lives under bark, cattle phalanges, and bark fragments in one mixed outdoor midden, suggests that tanning of leather was taking place somewhere in the vicinity (Kenward 2005). Clear evidence also exists from the bone analysis for the skinning of animals for fur, especially polecat, fox, hare, and possibly also domestic cat. It would appear that this area of Viborg was the craft production zone, with metalworking, comb making, leather working and fur production all taking place. Other evidence of diet and local food resources came from the latrines and middens. A large amount of food waste was found in the southern and western parts of the excavated zone, suggesting that houses lay just to the south. Bones of chicken, geese, cattle, pigs, sheep, herring, eel, perch, smelt, and oyster shells were all recorded. Other foods identified from the latrine included, onions, various wild fruit seeds, apple pips, hazelnuts, peas, beans, rye, barley and oats, a diet with many similarities to Fishamble Street. Specific insect and plant macrofossil evidence for moss was also indicated here, most probably used as toilet wipes, something that is well demonstrated in Dublin and York (Mitchell 1987; Geraghty 1996).

The town of Novgorod in Russia was founded by Scandinavian traders in the early to mid 10th century as one of a number of settlement posts connecting Sweden with the interior of Russia and eventually to Constantinople (Nosov 2001: 5–9). Cultural layers then built up rapidly over the next five centuries. Insect and plant macrofossil evidence from the 10th- to 12th-century levels suggest that moisture from the nearby river and the underlying impervious clayey soils made it necessary to re-build structures frequently, despite the raised floors of the log-built houses (Monk and Johnston 2012; Reilly 2012). The dominance of pine and spruce as the building material of choice is demonstrated by the insect remains from the 10th-century levels, where pests of pine and spruce were present in deposits spread below the raised floors of the houses (Reilly 2012). The lack of any species associated with leaf litter suggests that all primary wood-working activity took place off-site, with only the finished logs brought onto the plot for house-building. Dung/decomposer insects, including species known to inhabit wet, muddy ground, dominated the beetle assemblages from these early levels, even from beneath the house floors. In general, insect assemblages from house floor, outdoor and byre deposits at Troitsky displayed higher 'foul' signatures then contemporary settlements at Dublin or York, probably due to the higher than usual number of muddy ground species. Characteristic house fauna species, such as *A. brunneus*, were not present in Novgorod, despite clear evidence for intense and rapid urbanisation. It may simply be the case that Novgorod was at the limits of the natural geographical range of *A. brunneus*. However, its absence may also be linked to the dominant house-building style, where raised wooden floors did not result in the deep litter layers evident in side aisles of houses in other parts of the Viking world, leading to the build-up of complex synanthropic faunas.

'From rural landscape to urban streetscape'

Insect analysis enabled a more detailed or nuanced understanding of the lives of Dublin residents in the 10th and 11th centuries, their living conditions, their connections to the greater Dublin region and to the wider Viking world. Certainly, the picture is clearer than ever before.

The insect remains provide many examples of links to the rural landscape beyond the town, especially woodland. However, apart from muddy ground indicators, some of which are riverbank inhabitants, riverine and estuarine species were not numerous, despite clear evidence for marine resources being eaten by residents. Its notable that salt-tolerant plant species were also largely absent from Fishamble

Street, which may indicate that people looked inland and up the river valleys more than towards the sea for much of their raw materials. What certainly did come from the sea, however, were ships – and with ships came many new insects to Dublin. Most of these species were associated with stored products, i.e. wood and hay, and very quickly found niches among the houses of Fishamble Street. The closest parallels for living conditions in Dublin are with York in England, but this is primarily a result of the availability of comparative material from similar contexts. We have seen that other parallels exist with Kaupang and Viborg, and that aspects of 'urban living', as illustrated by insects, are common to all settlements examined here. Clearly regional, social, and cultural differences existed and these need further detailed study.

How aware were Fishamble Street residents of their tiny housemates? Beyond the flies, fleas and larger ground dwelling insects, which occasionally crawled into their homes and hid among cracks and crevices, probably not at all, but their survival gives us a more vivid picture of these people's everyday experiences. The detailed study in this work of house interiors shows that bedding areas, central floors and corners were viewed differently. Surface cleanliness was important in the central aisles, but inevitably trampling and food waste provided niches for beetles and flies – indicative of fouler conditions. Comfort and warmth was particularly important in the bedding areas, and, despite heavy infestations of fleas, which are not indicative of dirt *per se*, for the most part this aim was achieved.

The curious absence of lice requires an explanation and further study, as it seems improbable that Dublin residents did not suffer from this particularly irritating parasite. Why the need for all the bone combs otherwise? Or were they just particularly adept at de-lousing? While the insects do not reveal exactly what was being stored in the corners of houses, except generic 'dried foodstuffs', floor deposits from these areas have added an important 'animal skins/old bones' suite of insects to the picture. Are these beetles simply dropping from bird nests in the eaves? It may explain the presence of some, but, on balance, the presence of dried or cured meats, and/or the use of skins or hides as screens and coverings, are possibly a better fit with current thinking on the cultural biographies of Viking-age homes (Boyd 2012).

There is no doubt that once the householder stepped outside his or her door, the yards and streets were more often than not covered in a layer of trampled wet mud, decaying plant matter and animal dung. As settlement intensified, the need to, quite literally, rise above this resulted in construction of elaborate paths leading up to the front doors, and, in some cases, from the back doors to ancillary buildings. Evidence from pits and yards also suggests that residents were probably permanently discomfited by the presence of nuisance flies. It is clear from the insect remains also that, outside of the evident catastrophic burning of the houses along Fishamble Street, at different points in its history the occupation of the street waxed and waned. Some plots lay idle for periods of time while life went on next door and these empty plots and houses were used as temporary stables for animals.

Chapter 6

Conclusions: Thinking about dirt and hygiene in early medieval societies in Ireland and beyond

Introduction

What did early medieval people think about dirt and cleanliness, and how did they manage their personal hygiene, household dirt and human waste? In this concluding chapter, the cultural and practical perception and management of dirt and cleanliness will be assessed using archaeological, biological, and documentary sources from both urban and rural settlements in early medieval Ireland, set in its wider European context. Utilizing this multi-proxy approach, these conclusions seek to explore living conditions in different rural and urban settlements – in the early medieval buildings and urban streetscape of Viking Dublin, principally at Fishamble Street, Dublin, but also at an early medieval *rath* (an Irish early medieval settlement enclosure) at Deer Park Farms, Co. Antrim (Kenward *et al.* 2011), and at an early medieval crannóg (lake-island dwelling) at Drumclay, Co. Fermanagh (Figure 29; Table XIII).

Anthropological theories on attitudes to dirt and cleanliness are used to enable a deeper understanding of what may have motivated people when it came to personal hygiene and waste management at these sites. Comparisons with other European cultures and other time periods will also be drawn upon (see King and Henderson 2014; Koloski-Ostrow 2015).

As we have seen, there is a range of Irish archaeological and historical evidence that can potentially tell us how early medieval people thought about dirt and cleanliness. In archaeological terms, we can explore the artefactual and structural evidence for how they built, organised, and inhabited their dwellings and settlements (e.g. O'Sullivan *et al.* 2014), as well as how they dressed, washed, and groomed themselves using bone combs. Early Irish documentary sources – i.e. law texts (including medico-legal texts) hagiographies (saints' *Lives*), and narrative literature – are useful for understanding early medieval mentalities and attitudes towards dirt, hygiene and health (e.g. Crawford 2011; Lucas 1965). These sources give insights into what was expected in the home or settlement, what were acceptable and unacceptable behaviour, how illnesses were suffered and dealt with, and also something of the attitudes towards certain crafts/activities associated with intimate acts, such as grooming (e.g. Dunleavy 1988).

Biological proxies, i.e. insect remains, plant remains, animal bone, intestinal parasites, etc., can also point to the physical realties and discomforts of daily life, as well as to what, where, and how 'dirty' material was disposed of. This palaeoenvironmental evidence can suggest the physical conditions experienced within houses and settlements, and potentially the impact of the living environment on the human body (Shin *et al.* 2013; Forbes *et al.* 2010; 2013; Mitchell 2015). Particular focus will be placed in this concluding chapter on results of insect analysis from the three case study sites, the Viking-age dwellings of Dublin in particular, but also a number of generally contemporary early medieval rural settlements.

Defining dirt – what it is, and what it is not

It is important firstly to explore what dirt and cleanliness are in anthropological terms. Dirt can be briefly defined as a substance that soils someone or something, leading to different kinds of dirt-ridding behaviours, from the personal to the domestic (Smith 2011). In another sense, dirt is something that is 'not in the right place' for that culture or time (*sensu* Douglas 1966). However, what is considered dirty

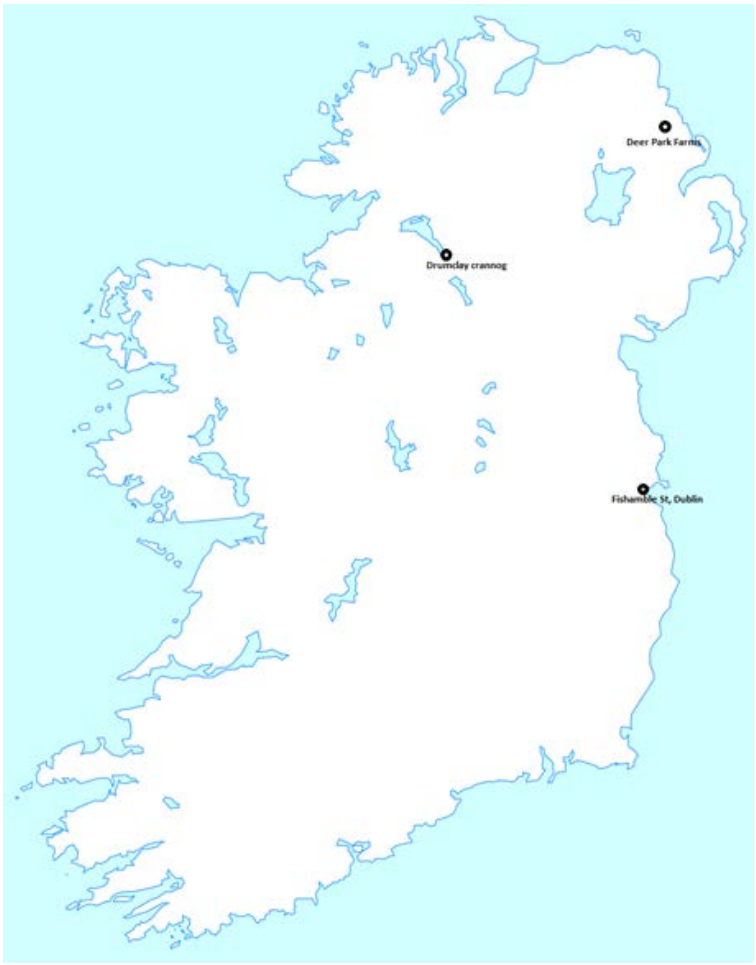


Figure 29: Location map of sites discussed in text (Wikipedia creative commons).

is not necessarily universal across space and time. There are some things that humans generally view as 'dirty' or 'disgusting' and Curtis (2007) has noted the most widespread aversions are to products of the human body. i.e. faeces, urine, sweat, vomit, blood and pus, while certain animals or their products (e.g. pigs, dogs, rats), certain insects (lice, cockroaches, flies, maggots), rotting meat or fish, and decaying substances generally, all generate strong disgust responses.

Some anthropologists have argued that these aversions have come about through a recognition or basic understanding of the strategies of disease avoidance (Kellog 1891; Tylor 1958). However, Mary Douglas (1966) termed this 'medical materialism' and that whether we avoid dirt for 'primitive' reasons, or on the basis of scientific medical knowledge of bacteriology or pathogens, we are still engaging in dirt and defilement avoidance as part of our social order. She has instead argued that past cultural behaviours in relation to cleanliness or food avoidance were part of agreed cosmologies, without which society could not function.

Curtis and Biran (2001) argue that the 'practical' (i.e. dirt avoidance for health reasons) and the symbolic do not have to be mutually exclusive – that evolutionary responses to things that disgust us have become encoded in our dirt-ridding behaviour, but that those things can certainly vary. The key question for archaeologists, who deal with dirt all the time, is whether or not we can identify such tolerances and aversions in the archaeological, documentary, and bioarchaeological records of the past.

Reconstructing early medieval ideas of dirt, personal hygiene and cleanliness: archaeological and documentary evidence

Early Irish laws, hagiographies and narrative literature reveal that people in early medieval Ireland had a range of ideas about personal beauty, attractiveness, and aesthetics. They frequently contain idealized descriptions of heroes and heroines with long lustrous dark hair, fair skin tones, red lips, strong limbs, and so forth (Doyle 2010). There is also evidence of the importance of personal grooming in both archaeological and historical sources. Bone and antler combs are common finds from early medieval settlements, and while it is often assumed these were primarily used for removing lice from the hair, they were undoubtedly used to groom the hair more generally, and a range of highly decorated forms are known – indicating that they were cherished and also very likely were personal possessions (Dunlevy 1988). Lucas (1965: 104–106) notes in a number of early Irish tales the apparent combined use of 'cotton grass' (probably *Eriophorum angustifolium*) and combs, so as to clean the hair more effectively than combing alone. This may have had parallels in the combined use of cotton wool and combs right into 20th century to remove dandruff, excess oil, and, of course, nits were they present (Lucas 1965: 106).

Smith (2011) notes that nit-picking, in particular, is universally regarded as a low or dirty subject and there are very few references to it in literature prior to the 17th century. Although we cannot easily distinguish between head lice (*Pediculus humanus capitis*) and body lice (*P. humanus humanus*) in archaeological deposits, it is clear from their abundant survival in floors, bedding areas, and, indeed, outdoor locations from sites like Deer Park Farms, Co. Antrim, that they were present (Kenward *et al.* 2011). Other possible strategies for removal of head lice and bodily vermin may have included the use of urine mixed with wood ash to create a type of lye, which was then applied to the head and body (Lucas 1965: 103). However, it is also clear that urine was viewed as an 'unclean' substance in contemporary documentary sources (Lucas 1965: 210).

Intriguingly, despite the importance of combs for personal hygiene, it seems that the status of the comb-maker in early Irish society was very low, and he/she is generally presented in very negative or parodic terms in law tracts and other contemporary writings. In the 12th-century *Life of St Colman, Son of Luachan* (Daly 1999) in reference to a king who has offended him, hopes that '...none spring from him but shoemakers and comb-makers, or people of that kind...'. Famously, the 9th-century *Trecheng breth Féne* ('Triads of Ireland') describe the comb-maker thus:

> 'Three things that constitute a comb-maker: racing a hound in contending for a bone; straightening a ram's horn by his breath, without fire; chanting upon a dunghill so that all antlers and bones and horns that are below come to the top.' (Meyer 1906)

The association with the 'dung hill' was clearly meant to symbolise someone who defiled themselves by working with an unclean or unsavoury material taken from a dirty, noisome place. Interestingly enough also, experimental archaeological replication of combs and the working of bone and antler is smelly work, particularly as antler is being sawn into portions and plates.

Other archaeological evidence for washing and bathing is perhaps harder to explicitly demonstrate, and yet documentary evidence suggests that good hospitality within the home in the early medieval period included facilities for washing and bathing. There are numerous references to washing and bathing in early medieval literature, particularly of the hands, feet, and occasionally the whole body (Lucas 1965). According to the *Trecheng breth Féne* the three preparations of a good man's house are 'ale, a bath (*fothrocud*), a large fire' . Equally, a story from the 9th century of a visit by a poet of the Tuatha De Danann to King Bres Mac Eladain relates how '... he was conveyed into a small outlying house which was narrow, dark and dim, and there was neither fire, nor bath, nor bed...', clearly unacceptable conditions

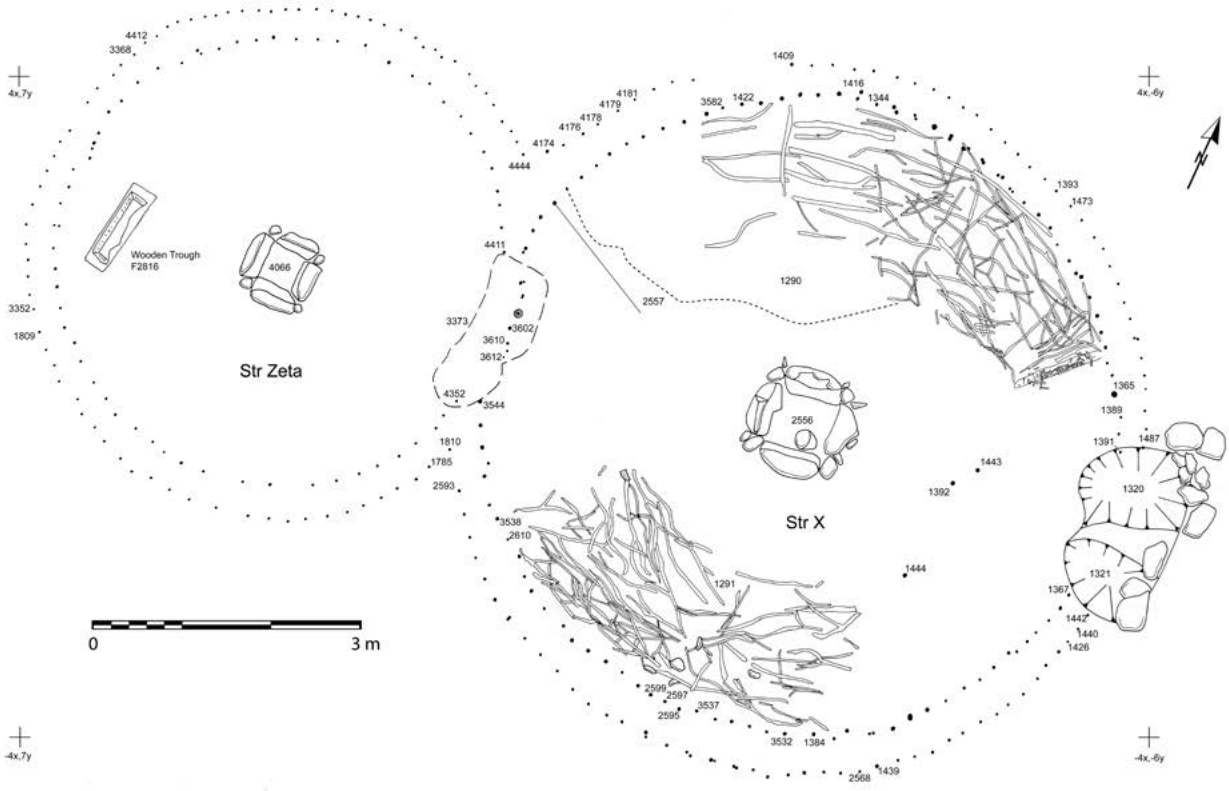


Figure 30: Plan of central house X and Theta, Level 6, Deer Park Farms, N. Ireland (after Lynn and McDowell 2011: 125, Figure 7.3). © Crown DfC Historic Environment Division

for a guest at this time. In the *Aislinge Meic Con Glinne*, the traveller complains that on arrival at a house where he is to spend the night, the blankets were unaired and the stones used to heat the previous night's water for washing were still sitting in the bucket. (Meyer 1892).

Dirt and cleanliness in early medieval settlements: bioarchaeological evidence

This monograph has focused on the evidence for biological evidence for living conditions in houses and dwellings, so we will turn to such evidence now. Excavations of early medieval settlements have tended to concentrate on well-drained 'dryland' locations, where the biological evidence needed to really address the issue of dirt and cleanliness is lacking, although some deep pits and ditch fills do offer fragmentary insights (Reilly 2011). It is only with the publication of detailed environmental data from Deer Park Farms, Co. Antrim, have we had the first real insights into the realities of living in early medieval Ireland in a mid-ranking farmer's home (Lynn and McDowell 2011). In conjunction with preliminary exploratory data from the recently excavated crannóg at Drumclay, Co. Fermanagh, and detailed insect evidence from Fishamble Street, Dublin, we can compare a variety of early medieval settlement types and homes for the first time. Here, we examine these settlement types under three main themes – house interiors, enclosure/yard conditions, and waste management – drawing out contrasts and similarities, as well as insights from contemporary documentary sources.

Early medieval rural settlement

In Ireland, between the 7th and 9th centuries in particular, settlement was largely rural and pastoral, similar to much of northern Europe. There is little evidence for the presence of larger clustered settlements, except possibly at some grander monasteries – e.g. Clonmacnoise, Co. Offaly (King 2009) – with 'urban' settlements proper only really beginning in the 9th and 10th centuries (Valante 2008). Archaeological evidence suggests that the vast majority of houses were round, built with stone or double post-and-wattle walls, and roofed with thatch of either straw, turf, heather, or reeds – essentially an upturned basket structure – with no evidence of internal roof supports (O'Sullivan *et al.* 2014: 88–94). At Deer Park Farms, most structures appeared to have at least two internal bedding/bench areas along the walls and a central hearth.

The 8th-century Irish law tract *Crith Gablach* details all the grades of commoner and nobility in early medieval Irish society, what property they should own, and clientship dues (Binchy 1979; MacNeill 1923). This description of the typical mid-ranking farmer's house conforms well to the excavated evidence at Deer Park Farms and many other early medieval *rath* sites (Figure 30).

Biological evidence in the form of insects, plant macrofossils and intestinal parasites can give insights into the interior cleanliness and management of these living spaces compared to the yards surrounding the homes. Bedding areas were demarcated by either wattle or plank frames and filled with layers of material, beginning with sod and wood chips, or larger wood fragments, then a mixture of heather, bracken, straw and moss, before finally, presumably, being topped with either hides or woven blankets. The *Crith Gablach* gives details of the fines that an intruder or guest must pay for damage to various household items, ranging from vats to pillows (presumably part of the bed coverings) (Kelly 1988).

Biological analysis indicates that these spaces appear for the most part to have been well-maintained, with the ecological signatures of the insect assemblages largely pointing to mouldy plant matter, but very little by way of 'foul' or 'dirty' elements (Kenward *et al.* 2011; Table XIII, Drumclay). Insect and plant assemblages from the rest of the floor spaces in these houses showed more variability. For the most part these assemblages do not suggest 'foul' conditions indoors, merely somewhat damp (or mouldy) trampled spaces, where the primary nuisance elements came in the form of flies attracted to stored food or food waste, as well as ectoparasites living on the residents and within the floors/bedding. Extreme variations from this apparent norm of relatively 'clean' interior spaces comes from some individual structures at Deer Park Farms, where the bedding areas produced very high numbers of animal ectoparasites and dung indicators (Kenward *et al.* 2011), suggesting possible deliberate conversion for use as animal byres or stables.

Intriguingly, at Drumclay crannóg, insect remains from two early house platforms suggest that one structure may have started life as a domestic building, was then either abandoned or used for stabling animals, and then returned to domestic use (Table XIII). In anthropological terms this is somewhat unusual, as typically the biography of a dwelling house usually ends in its ruination or its re-use for some 'dirty' function, and buildings used for animals do not usually later become dwellings for humans (e.g. see Van de Noort and O'Sullivan 2006: 104). This possible switching back and forth between domestic and animal use at Drumclay is not indicated in the documentary sources of the time, indeed, descriptions of a typical farm would suggest that housing for animals e.g. *airchae* (outhouse), *tech ndam* (ox-house), *lías caíreach* (sheep-pen), *lías lóeg* (calf-pen), and *muccfoil* (pigsty), were all separate entities from the *teach* (house) (Kelly 1988). In the absence of full post-excavation analysis of the house structures at Drumclay, it is impossible to say if this is a feature particular to this crannóg, or, indeed, just to the earliest phases of its use. It is clear that in Irish early medieval society, animals lived in close proximity to people, with all of the potential risks inherent in this for health and hygiene (Reilly 2003). However it seems less

likely that animals and humans lived together in the same buildings, something that was relatively common in other parts of northern Europe at this time, albeit in separate parts of those buildings (e.g. Hamerow 2002. One Irish medico-legal text from the 8th century, *Bretha Crólige* ('Judgements of Sick Maintenance'), specifically mentions the exclusion of dogs, sheep, and pigs from the vicinity of a person recuperating from illness, possibly implying that these animals were occasionally inside houses (Binchy 1938: Entry 23). However, a further explanation states that it is the noise of dogs fighting, or sheep bleating, or pigs grunting *outside* the house that is to be restricted (Binchy 1938: Entry 61).

There are several documentary sources suggesting that the maintenance of the cleanliness of the path or entranceway leading up to the house, a feature known as the *airdrochat*, was important (Lucas 1965; O'Sullivan *et al.* 2014, 85-6). Cobbling, paving, and wooden paths are regular features of excavated *raths* and crannógs. Insect evidence from the yard areas of Deer Park Farms and Drumclay suggests that they were somewhat mucky and dungy, different in character from the interior of houses. The expectation in early Irish sources that paths were kept clean may have facilitated the keeping of interior spaces clean, while the yard areas around the houses were somewhat less salubrious. It is notable that indoor floor deposits from Deer Park Farms and Drumclay show little contamination from animal or human intestinal parasite eggs, which, if present, might have indicated that trampled dung or other foul waste was being brought indoors on footwear. It seems then that stopping people from bringing their dirty feet into the house by keeping the entrance clean was a deliberate strategy (Kenward *et al.* 2011).

Important archaeological evidence for waste management for this period comes from rubbish heaps, middens, dumps, and pits of various kinds.[1] Middens appear to have been deliberately built up at a distinct place with the debris and waste from both household activities and yard clearings, for example, at Deer Park Farms; Moynagh Lough crannóg, Co. Westmeath and Illauloughan Island, Co. Kerry (Kenward *et al.* 2011; O'Sullivan *et al.* 2014; Marshall *and Walsh* 2005). While middens were banished to the edge of the settlement, they were still a visible feature within the yard area and were clearly important sources of manuring for fields or garden plots. O'Sullivan and Nicholl (2011) also speculate that particularly large middens, rich in animal bones, may have been an outward expression of household wealth. However, while it was a necessary and important feature of the yard, a dunghill or midden was regarded with disgust by contemporary writers. For example, in the unsavoury description of a dung hill in the 8th century tale *Fled Bricenn* (Briciu's Feast), we have an account of people falling into the unpleasant heap (Lucas 1965).

Pits, by contrast, especially cesspits specifically for the disposal of human faeces/urine, are relatively rare at early medieval rural settlements in Ireland (O'Sullivan *et al.* 2014). This is not simply a product of unfavourable preservation conditions, i.e. dryland sites where organic waste does not preserve well, but seemingly a lack of the features themselves. Possible cesspits were excavated on rural crannógs, such as Moynagh Lough, Ballinderry and Lough Faughan (O'Sullivan *et al.* 2014, 106). No cesspit was identified from Drumclay (Nora Bermingham, pers. comm.); indeed, it seems that at Drumclay human waste was everywhere (Nora Bermingham, pers. comm.). The Moynagh Lough example in particular was filled with interleaved layers of 'dung' and 'straw/leaves', possibly used as wipes, and appeared to have been recut and possibly cleaned out a number of times (Bradley 1993). In the absence of cesspits on crannógs, the likelihood is that most waste, including human waste, was dumped over the palisade and into the surrounding lake waters (Kenward *et al.* 2000; O'Sullivan 2004; Bermingham *et al.* 2009).

Where pits have been excavated at other rural sites, some may have been used for other activities (e.g. for flax retting) rather than human waste disposal, such as at Castlefarm 1 (McClatchie 2014).

[1] See O'Sullivan 2004 for middens on early medieval crannogs

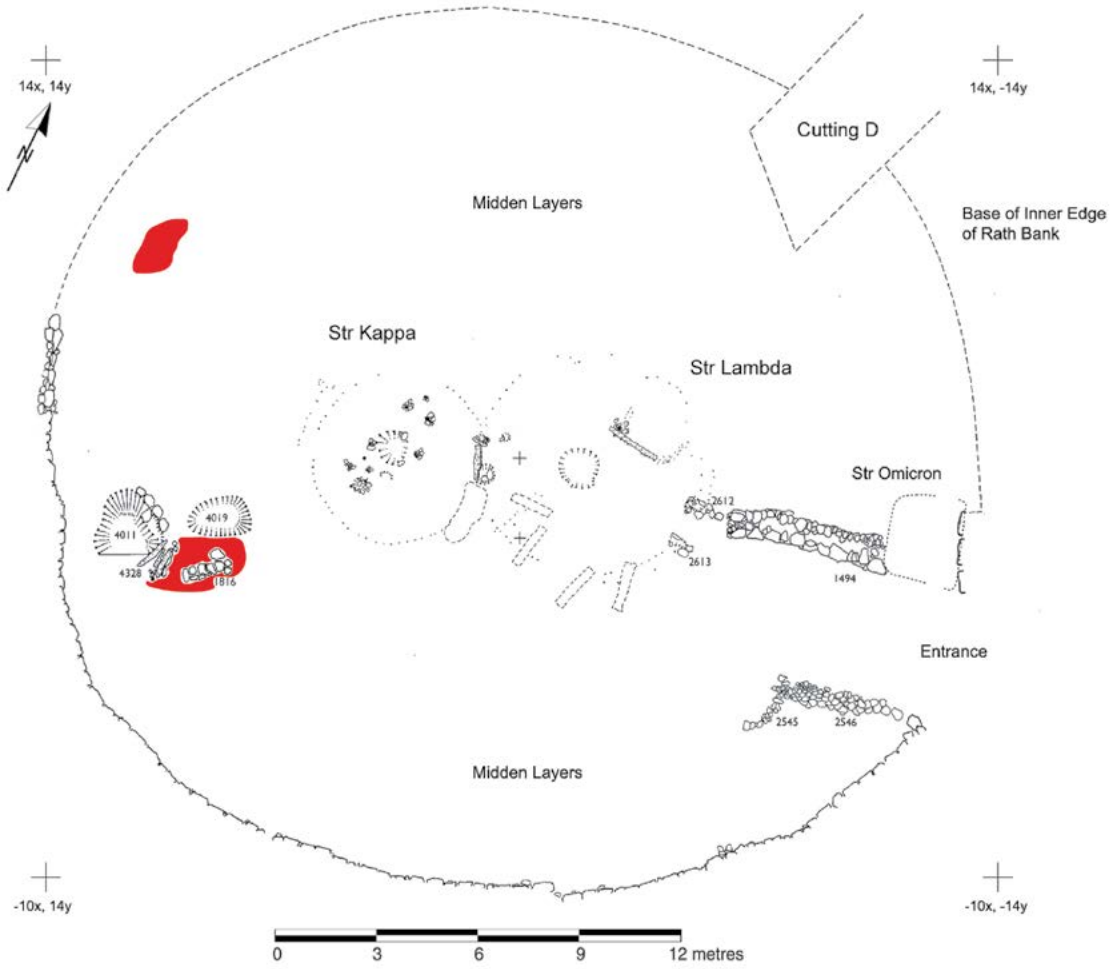


Figure 31: Concentrations of intestinal parasite eggs, primarily Trichuris trichura, in Levels 4a and 6 at Deer Park Farms, Co. Antrim, Ireland (Annotated plan from Lynn and McDowell 2011: 106, figure 6.8). © Crown DfC Historic Environment Division

People have to defecate though, it is a basic, daily human need. So where did people go to dispose of human waste at this time? One possible clue comes from biological evidence from Deer Park Farms, where a number of yard deposits revealed particularly high concentrations of eggs from whipworm (probably *Trichuris trichura*) (Kenward *et al.* 2011) (Figure 31).

One location in particular is associated with a slight depression and possible wooden screen to the left of the main figure-of-eight central house, where an above-ground receptacle of some kind may have been located for the purposes of toileting (Lynn and McDowell 2011:. The contents of this bucket or tub may then have been throw on the dung heap, along with the rest of the foul waste matter, for later use as manure. One notable documentary reference to the concept of toileting in a bucket comes in the 8th-century story *The adventure of Nera*, which states that it is not good to keep a 'tub for washing or bathing' or a 'slop pail' in the house after sleeping (Lucas 1965). The implication of this story is that the content of the slop-pail is human waste and should never be kept in the house at night.

The ditches surrounding these sites may also have been a location for the disposal of human waste. Dung-like material has been identified in ditch fills around early medieval settlement sites, including

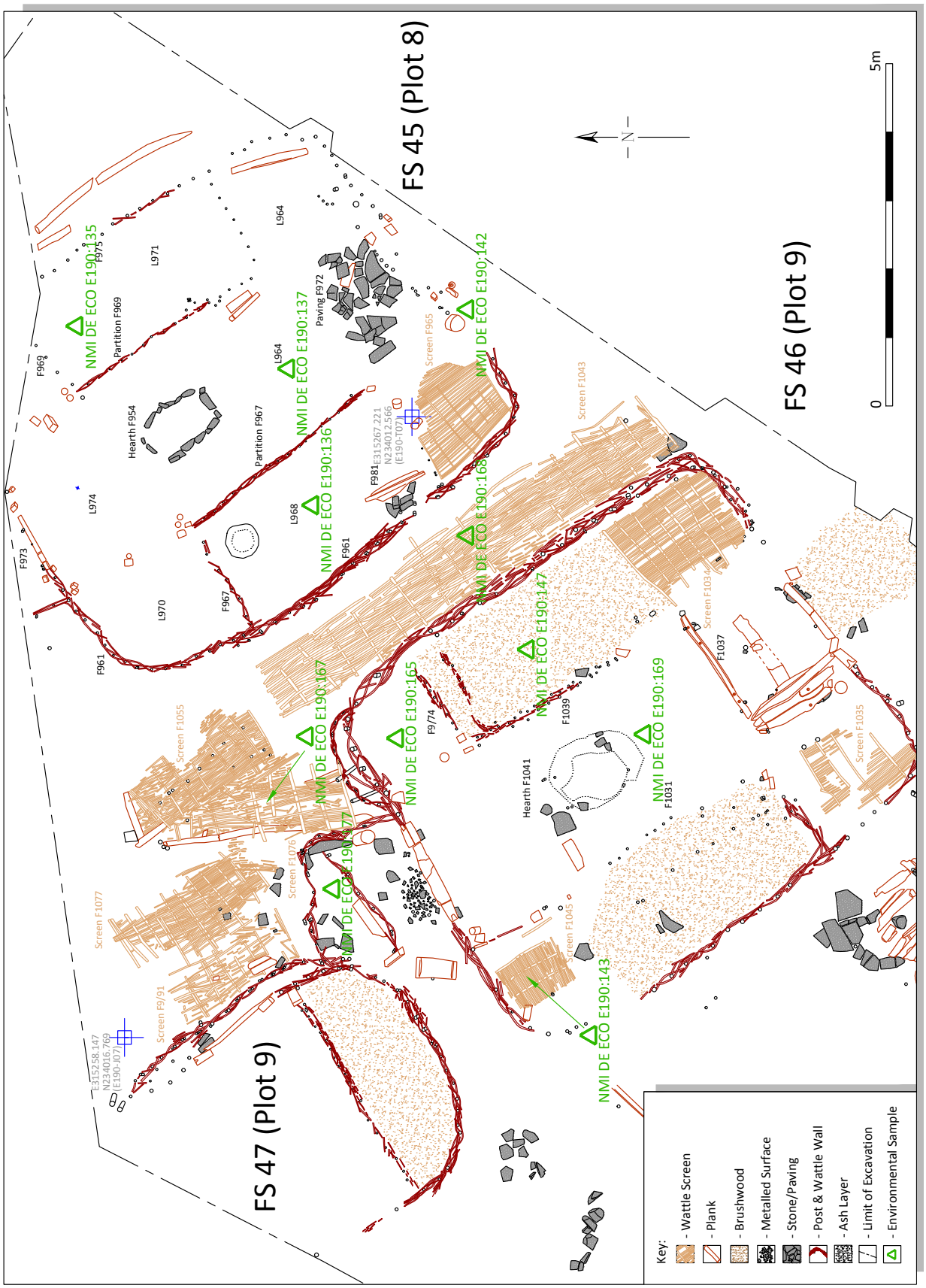


Figure 32: Plan of streetscape and houses, Level 7 (mid 10th century), Fishamble Street, Dublin (© Johnny Ryan/National Museum of Ireland).



Figure 33: Plan of streetscape and houses, Level 10 (late 10th/early 11th century), Fishamble Street Dublin (© Johnny Ryan/National Museum of Ireland).

Roestown, Castlefarms, and Baronstown, all in Co. Meath, although none were tested for intestinal parasites to confirm if human faeces were present (Reilly 2011).

Viking urban settlements

As we know, the first true urban settlements in Ireland appear in the 9th–10th centuries, the most prominent of which coincide with early Viking coastal-trading posts. Most early occupants of these new urban settlements, however, were native Irish and would have lived in rural raths within their own lifetimes, subject to the rules and laws that governed life in Gaelic Ireland at that time. Negotiating the conditions of urban living must have posed many new challenges (Boyd 2013; 2015). Fishamble Street in Dublin, excavated in the late 1970s and early 1980s, represents a typical urban streetscape of the 10th and early 11th centuries (Wallace 1992; 2015).

The housing of the first urban settlements in Ireland was generally rectangular in shape, with evidence for both double and single wattle walls, light internal roof supports, and more formal subdivisions of the internal space in the form of bedding aisles and corners (Wallace 2015; Figure 32).

There are no equivalent documentary sources to the *Crith Gablach* about these houses, who lived in them and what rules they applied to house or yard maintenance, because the first urban settlements were controlled by new Scandinavian arrivals and their mixed Irish-Scandinavian descendants (Valante 2008). However, the overall construction method for the majority of structures was not that dissimilar to the native Irish roundhouse, in that the walls were a more or less a continuous basket-type structure, rather than stand-alone panels of wattle, albeit with internal roof supports (Wallace 1992a). It suggests similarities in the interior layout and treatment to rural roundhouses, but adapted to suit the new long narrow plots of early streetscapes compared to the more open circular spaces of rural *raths* or crannógs.

The detailed biological analysis carried out at Fishamble Street, presented in previous chapters, revealed a remarkably similar picture to early medieval rural sites of relatively clean and dry conditions in the bedding aisles and corners, with the central aisles somewhat damper and more trampled. Again, the primary nuisance elements were flies and ectoparasites, especially fleas. Some internal deposits in houses at Fishamble Street produced high dung signatures, particularly in the central floor area (Wallace 2015.). These buildings may have been unroofed and abandoned for a period of time, perhaps temporarily used as animal byres, or for stockpiling dung. Outside, the situation was different, with both front and back areas of plots generally producing assemblages indicative of foul, dungy conditions.

Similar to the cobbled or paved paths of rural raths, wooden plank or wattle paths were a common feature of house plots in Dublin and elsewhere. These paths led up to front doors and were also a feature at the back of many plots. Analysis of internal floor deposits from Fishamble Street show negligible levels of parasite eggs, similar to Deer Park Farms, suggesting once again little contamination from animal dung or other excreta. Whether paths, or indeed other features, such as porch areas, were deliberately constructed with the specific aim of keeping internal floors free of muck and filth is a matter for speculation, but they do appear to have produced this effect.

In contrast to rural settlements, visible elements of waste management in the form of cesspits associated with individual house plots or groups of house plots is the norm from the very earliest levels at Fishamble Street (Wallace 2015). The narrow plots and more restricted space must have necessitated the development of more permanent toileting facilities. Notably, in many cases these features were on the street front, not at the back of plots (Figure 33).

Not all plots had a cesspit and the positioning of them to the front of the plot may imply shared facilities or even public access, perhaps by a group of residents. This had a precedent in earlier times, with similar evidence emerging from Roman cities in Italy (Koloski-Ostrow 2015). Many cesspits show evidence for cleaning out and re-cutting, implying that they were maintained and managed over long periods of time and that waste was removed to some other location. Evidence from late medieval English and Dutch towns shows that this process was formalised by municipal authorities, with people employed to empty cesspits and cart it to assigned 'dung' hills outside the towns, which could then be accessed by agricultural workers as manure (Jørgensen 2010a: 49–42; Rawcliffe 2013: 136–137; Van Oosten 2016: 2). However, at this early stage in town development, with no contemporary documentary evidence, it is not entirely clear where the contents of pits were deposited. Limited environmental evidence from other contemporary towns across Europe, such as York and Birka, suggest that much of it may have entered local rivers, lakes, and water courses (Reilly 2015), a trend that continued right into the later and post-medieval periods (Jørgensen 2010b; Rawcliffe 2013). However, it is also possible that, like their rural neighbours, some of it was used to manure garden plots or larger communal plots for the growing of vegetables, with all the implications for human health that this might produce, or crops such as flax (Geraghty 1996). Preliminary intestinal parasite egg analysis from cesspits in Fishamble Street certainly confirm that most were receptacles for human faeces (Table XIV).

Dirt and hygiene in early medieval societies

Compared to the rich and varied documentary sources detailing attitudes to sanitation in the later medieval period (e.g. Jørgensen 2010a; 2010b; Rawcliffe 2013), the early medieval period is something of a blank page for much of northern Europe. However, as Koloski-Ostrow (2015) points out in her seminal study of Roman cities, even scant documentary sources, in conjunction with good archaeological evidence, can help to elucidate an understanding of the perceptions and reality of past sanitary history. The same scholar also notes that it is worthwhile to leave behind our modern attitudes and benchmarks of 'good sanitary practices' before embarking on such studies (Koloski-Ostrow 2015:.). This brief review of multi-disciplinary evidence from Ireland has attempted to shed new light on cultural attitudes towards dirt and cleanliness during the early medieval period.

Rich environmental evidence from three settlement sites indicates that interior spaces were relatively clean compared to exterior spaces, and that bedding areas in particular were treated differently from other interior spaces.

Figure 34 shows an ordination graph of many of the insect assemblages from all three sites, and some of the possible explanations for the similarities and dissimilarities encountered. Insect assemblages from interiors of houses in 10th-century York, England, while not separated on the basis of bedding aisle and central floors, also show clear differences between 'interior' and 'exterior' zones (Kenward and Hall 1995). Evidence from other proxies, such as soil micromorphology, have shown similar trends within houses in early trading towns, e.g. Kaupang, Norway (Milek and French 2007; Wouters *et al.* 2016). This suggests some commonality of purpose, or attitude, towards the ordering of personal space in the early medieval period. Descriptions in Irish documentary sources relating to hospitality, treatment of the sick and ill, and the maintenance of paths also suggests, at the very least, a certain aesthetic desire to maintain cleanliness and order.

Understanding of hygiene, however, and any direct causal link between dirt and disease, is a different matter. The possible re-use of cesspit contents in early Dublin as manure and the large, visible middens of early medieval rural sites suggest one of those anthropological contradictions between the human need to separate ourselves from things that disgust us and the practicality of reusing an obviously useful material. In both cases, it can be argued that waste clearly had its designated place, separated from the

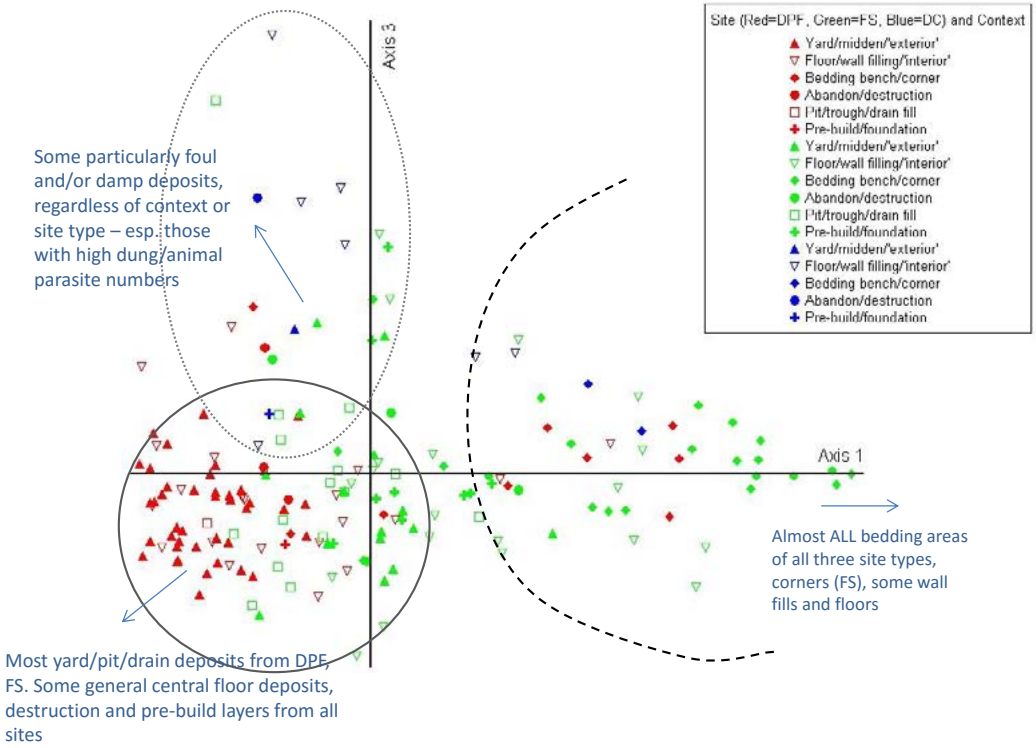


Figure 34: Ordination of insect assemblages from indoor and outdoor contexts, Deer Park Farms, Fishamble Street, and Drumclay crannóg.

domestic sphere, controlled and contained, very much as Mary Douglas defined it. However, within the cultural norms of the time it was also designated useful, despite its clearly repellent nature. Lack of understanding of the possible hazardous nature of reusing waste material as manure, or the dumping of waste in rivers and watercourses does not suggest primitivism on the part of early medieval people, nor, as has sometimes been suggested, regression from more advanced attitudes to dirt and cleanliness during the Roman era (Koloski-Ostrow 2015:). The much-lauded sophistication of Roman latrines, sewers, drains, and fresh water supplies in cities, towns and forts across Europe masks the reality of often disconnected public works (Koloski-Ostrow 2015:). The motivation behind these works was more often the aesthetic of clean public squares and streets rather than human health and hygiene, with cesspits unconnected to any sewer system the norm for the vast majority of town residents. Similarly, it was the uncontrolled dumping of human waste and other noxious material into river courses and streams throughout the medieval period, and right up to 19th century, across Europe, that triggered many municipal ordinances and heavy penalties for transgressors (Jørgensen 2010b; Van Oosten 2016). In truth, the link between human health, hygiene and waste matter is primarily a product of 18th- and 19th-century medical enlightenment and advances in microbe studies (Smith 2011).

Mitchell (2015) notes that throughout human history the two main sources of intestinal parasite infection are from zoonoses (animal parasites) contracted through eating undercooked or infected meat, and those of faecal contamination and poor sanitation. Increased numbers of latrines during the medieval period did not necessarily cut down on levels of contamination. In fact, the opposite seemed to be the case. The practice of composting human faeces for up to six months before spreading on fields as manure is reasonably well understood today, which helps to reduce parasite infection (Mitchell 2015:). The time lag between emptying cesspits, or depositing human waste in middens and subsequent

use in fields, may have been much shorter in the early medieval period, leading to constant re-infection by parasites and the perpetuation of many debilitating illnesses associated with them (Mitchell 2015). Many of the diseases mentioned in hagiographies, annals, and medico-legal texts of this period in Ireland have a direct relationship between poor hygiene and poor water quality and an impaired immune system (Crawford 2011). The recuperation strategies recognised the need for cleanliness and a calm environment for the patient, but the causes of the illnesses were poorly understood.

Conclusion and future research directions

To conclude, multidisciplinary evidence can, as demonstrated here, help the archaeologist understand attitudes towards dirt, cleanliness and personal hygiene in the early medieval period, a topic which has received relatively little research attention to-date. By combining sources, gaps in our understanding can potentially be filled. Notably, bioarcharchaeological evidence can provide insights into the otherwise hidden intimate aspects of the management of internal house space. Studies such as this once again highlight the need for targeted sampling strategies and proper sample management during excavation and post-excavation of waterlogged, deeply-stratified rural and urban settlement sites. The earliest occupation levels of many important early medieval towns are still being uncovered across Europe – e.g. Ribe and Antwerp (Devos *et al.* 2013) – and many further opportunities to examine the living conditions of early urban dwellers will become available. The value of the analysis presented here lies in the ability to compare and contrast different communities and dwelling types during the early medieval period, both rural *and* urban, but also identify commonalities of perception and attitude towards dirt and cleanliness.

Appendix 1

Technical report appendix

Boulder clay level

E172 16: Sample from pit 1632, one of a series of pits cut into the boulder clay in the area that became Plot 4, associated with long linear trench. These pits and trenches did not appear to form any coherent structure. Their function is not known. The fill was black-brown well-humified organic clay with charcoal inclusions.

Rich insect assemblage but dominated by high numbers of two generalist decaying vegetation/compost/manure species, *Anotylus rugosus*, *Gyrohypnus liebei*. Lots of fly puparia also suggest the presence of human faeces/animal dung and possibly butchery waste – *Cailiphora vicina* (blow-fly) and *Coproica/Limosina* (cow dung). In addition, a high number of damp ground indicators, *Neobisnius* spp., were also recorded and the ground beetle, *Trechoblemus micros*, which occurs in small crevices/animal burrows near water. While the pit clearly contains dumped organic matter, the natural riverine environment is evident by the presence of these latter two species.

E190 1: Sample taken from the area of future Plot 9. Here a series of ditches and pits were excavated, which did not form any discernable pattern. The exact location from which the sample was taken is unclear but probably from one of these ditch/pit features. The material was a light grey-brown organic clayey silt with lots of pebbles, charcoal and shell inclusions.

Poor sample – only five beetles, all generalist decomposers.

Building Level 1

Plot 2, FS 1

E172 33 and 36: FS 1 was a large Type 1 three-aisled house. The building had a central hearth and wattle screens in the north-west and north-east corners and in the south aisle. Underlying the building in the north-west corner was a group of timbers, including ships timbers. Context 162 constituted the final floor layer, made up of matted grass and other organic material, from which sample 33 came. Large fragments of reeds and leaves were visible in the sampled material. Sample 36 came from the organic grassy fill between the wattle walls along its western side.

Sample 33 produced a small fauna dominated by 'house fauna' species, particularly *Cryptophagus dentatus* grp. This sample constitutes the first appearance of what will become important 'house fauna' species, *Aglenus brunneus* and *Anobium punctatum*, albeit in tiny numbers. A small number of plant feeding species that are found on crucifers and Brassicas occur here also. Sample 36 was a much richer sample, dominated by 'house fauna' but particularly by those that indicate straw and mouldy hay, like *Mycetaea subterranea*, *Xylodromus concinnus* and *Atomaria* spp. A small number of beetles from the fouler end of the decomposer spectrum, *Cercyon unipunctatus*, *C. analis* and *Cryptopleurum minutum*, also occur in this material though no true dung beetles. The fill between the walls was clearly composed of damp decaying vegetation but probably not animal dung. A very small number of riverine-associates are also present – *Ocypus nitens*, found in river shingle and damp litter, and *Notaris acridulus*, found on waterside plants, especially reeds. They may have been introduced into the wall fill in clay from the riverbank used as a foundation for the house and/or in reeds used for flooring or matting.

Building Level 2

Plot 1, FS 3

E172 41, 43, 44 and 46: FS 3 was a large Type 1 three-aisled house. Three of the samples (41, 43 and 44), however, came from a feature immediately outside the house, a small depression. This may have been a pit or trough. The fill was a green-brown matted organic with lots of cloth and wood fragments (LB 27/5269). The last sample, sample 46, came from a mixed organic wood deposit from the central floor area, which represented the destruction layer of FS 3. The house had clearly been burnt down.

Only one of the trough/pit samples, 41, produced a large assemblage. House fauna, in particular, *Aglenus brunneus*, *Atomaria* spp and *Lathridius minutus* grp, dominated this sample. This was somewhat surprising for an 'outdoor' deposit and perhaps indicates that this material actually came from floor material inside the house. However, it was undoubtedly mixed in origins. Water beetles such as *Helophorus* spp, *Oulimnius tuberculatus* and *Limnius volckmari*, the latter two indicative of running water, were recorded here and dung beetles such as *Aphodius sphacelatus* and *Aphodius fossor*, suggest the presence of animal dung. The presence of large numbers of the fly *Coproica vagans/Limosina silvatica* also confirms the presence of animal dung. One notable species recorded in this sample was *Anthonomus ulmi/pedicularis*, which is found on hawthorn or elm. The larvae breed in the flower buds and the adults often overwinter under the bark. Neither species is particularly common today. This is the first time it has been recorded from an early medieval site in either Ireland or Britain.

Sample 43, although much less rich and diverse, had a similarly high proportion of house fauna but also contained a mix of dung and water beetles. Sample 44 was the only one of the three that had a higher proportion of generalist decomposers than house fauna. The most frequent occurring species in this sample was *Cercyon analis*, found in decaying vegetation, compost and stable manure. In addition, *Cercyon depressus*, found in decaying seaweed, was recorded from this deposit. This beetle is often found in cess-pits during the medieval period also. This is also the first sample where *Tenebrio obscurus* is recorded in Fishamble Street. This beetle is very closely associated with human housing and buildings, found especially in flourmills, grains stores and stables.

Sample 46 came from the central floor area of FS 3 from the 'destruction level' of the house. Evidence that the house was burnt down came from the fact that this layer contained a great deal of ash and charcoal (LH 40/627). Although small, the insect assemblage reflects the fact that the house was abandoned and perhaps open to the elements. Damp ground beetles formed a high proportion of the assemblage, especially *Neobisnius* spp, found in river shingle and damp litter. A high proportion of beetles that couldn't be identified to species and that occur in a great variety of habitats also suggest that this deposit was trampled and degraded.

Plot 2, FS 4 and FS 5

E172 49 and 50: Plot 2 contained a large Type 1 three-aisled house, FS 4, with a small Type 5 annexe, FS 5. The main building had been burnt producing an ash layer, which contained a coin of Eadred (946-55). Beneath this, organic layer F161 may represent the foundation deposit for this new building. Sample 49 came from this layer. It was highly organic with grassy/straw inclusions, small fragments of wood and gritty sandy inorganic inclusions. Immediately outside the west doorway and south of FS 5 was a small cobbled yard, with a wattle screen F158 forming a pathway extending to the west. Sample 50 came from beside this wattle path. This was a pure black organic material with occasional animal bones, hazelnut shells and visible fly puparia.

Sample 49 produced a small assemblage of beetles and flies primarily because only 1 litre of material was available for processing. House fauna, particularly *Cryptophagus dentaus* grp, dominated it. A small number of water beetles, including a running water species *Esolus parallelepipedus*, were also recorded in this deposit. One interesting beetle found in this deposit was *Sphaeriestes stockmanni/reyi*, which is generally found in burnt twigs and small branches. Its presence may have been due to the burning down of houses, as they may have been attracted to burnt wattle. This is the first record for this species from an early medieval settlement site in either Ireland or Britain.

Sample 50 produced a larger assemblage dominated by generalist decomposer beetles and dung/foul indicators. Indeed, many of the generalist species recorded would be entirely at home in fouler material, such as stable manure and wet compost. *Carpelimus bilineatus/erichsoni*, *Oxytelus scupltus*, *Cercyon analis* and *Cercyon atricapillus* were the most numerous species. There were few true dung beetles, however, which might suggest that the yard did not contain fresh animal dung. A large number of blow fly larvae were also recorded from this deposit, suggesting the presence of butchery waste in the yard.

Plot 8, outside possible Building 1572

E190 43, 44, 45, 47 and 48: Plot 8 contained a possible post-and-wattle wall, Building 1572, which was poorly preserved and only survived for a small area in the southeast corner of the plot. This building may have been contemporary with or even pre-dated FS 8, which also lay in this plot and was quite poorly preserved. Contemporary with Building 1572, lying 2m to the southwest, was an area of paving, which may have served as the base of a fire. A thick layer of green gritty organic material (F1573) covered this paved area, from which sample 43 was taken. A possible large shallow pit lay to the southeast of Building 1572 and may have truncated it. A number of layers filled this pit, including F1567, F1568 and F1570. These layers consisted of rich green organic material with visible 'grasses', mussel shells, clay and ash. Samples 44, 45 and 47 came from these layers. In the northern part of the plot lay a large oval pit, F1583, also filled with a green organic material. Sample 48 comes from this deposit. There is some suggestion that much of this material represents animal dung or manure.

Sample 43 produced a small assemblage dominated by dung/foul indicators. A large number of true dung beetles were recorded, including *Aphodius prodomus* and *Aphodius granarius*, although both these species can be found in foul decaying plant matter also. *Omosita cf. colon* was also recorded from this deposit and is generally found on old bones, carrion and other foul matter. Animal bone was frequently encountered in this deposit. House fauna numbers were very low, a key characteristic of 'outdoor' yard deposits.

Samples 44, 45 and 47 came from a large shallow pit. Only sample 44 produced a large assemblage although all three samples produced rich diverse dung beetle faunas, suggesting the presence of fresh animal manure in the pit or in the surrounding yard. All three samples also produced diverse generalist decomposer fauna, dominated by species that occupy the fouler end of the decomposer spectrum, especially wet rotting vegetation and carrion. The presence of *Neobisnius* spp (samples 44 and 45) and *Helophorus aequalis* (samples 44 and 47) suggest the pit was wet, perhaps even contained standing water at certain times of the year. A variety of beetles indicating both grassland and urban weed plants were present in the pit fills. These were probably both casualties from within the urban zone and from animal manure, reflecting the areas grazed by animals. *Neogalerucella lineola* (sample 47) is a notable species in this pit fill. This beetle is found on the leaves of willow, alder and hazel along riverbanks, in fens and wet woodland. Alder, willow and hazel were common tree species used in house construction in Fishamble Street. It is also likely that the banks of the Liffey were clothed in these trees. Its presence here is therefore a reflection of the local woodland. It hasn't been recorded previously from any early medieval settlement sites in Ireland or Britain.

Sample 48 from the large pit at the other end of this plot produced a moderate-sized fauna. While it also contained a high proportion of generalist decomposer and dung/foul indicating beetles and flies, there was also a high presence of house fauna species. This suggests the pit was a receptacle for household waste as well as human cess and/or animal dung. However, it could also be that straw or hay was used to cap the pit at different times and beetles characteristic of this material became incorporated in the fill via this pathway. One notable beetle from this sample was *Necrobia violacea*, found in carrion, dried fish, dried skins and processed meats, such as cured hams. While other members of this genus are known from Ireland, this one is not known. Its presence in Fishamble Street is most likely via imported meat products during the Viking era. It may not have become established here. It has also been recorded from Viking age Kaupang (Norway), Viborg (Denmark) and Coppergate, York (England).

Building Level 3

Plot 3, FS 10

E172 56, 64, 65 and 70: FS 10 was a large Type 1 house situated towards the eastern end of Plot 3. It had a typical 'three aisle' structure, with additional partitioned areas in the northeastern and southeastern corners during its lifetime. Sample 56 came from a mixed deposits situated over the primary or foundation floor west of the hearth in the central aisle. Samples 64 and 65 came from the southern and northern aisled areas respectively. FS 10 appeared to have been remodeled three times during its use. The final remodeling included the possible insertion of an additional door feature towards the southwestern corner of the house and the associated laying down of a gravel deposit in this area. Sample 70 came from this material.

Sample 56 produced a smallish assemblage dominated by generalist decomposer and house fauna species. Many of the beetles recorded suggest that the floor was damper and perhaps fouler than might be expected for inside a house. The southern aisle (sample 64) had a high representation of house fauna but was also dominated by damp-indicating decomposer insects, especially *Carpelimus bilineatus/erichsoni*. A high number of house fly (*Musca domestica*) and blow fly (*Calliphora cf. vicina*) puparia were recorded in this deposit, which also suggest fouler than expected conditions within this house, especially as the aisle are generally thought to be sleeping areas. The sample from the northern aisle (sample 65) produced an extraordinarily rich fauna dominated by the beetle *Aglenus brunneus* (328 individuals). This is the first of many aisle samples that produce very rich faunas dominated by this beetle. Much has been written about *A. brunneus* before, in particular, its importance as an indicator of 'indoor' contexts. It is a key member of the 'house fauna'. Notably, in general, deposits where it dominates tend to be cleaner or drier than those were it forms only a minor component. Nevertheless, this deposit also produced a high number of *Musca domestica* and blow fly puparia again, suggesting foul decaying material was incorporated into the floors of both side aisles. However, very few other true dung/foul indicators are present in the north aisle. A large number of parasitic wasps, *Spalangia* sp, were also recorded in this sample. These wasps are parasitic on certain fly species, especially *M. domestica*. They would have kept the numbers of actual flies in check within the house. All three samples produced small numbers of the human flea, *Pulex irritans*, which becomes a ubiquitous presence within houses from here on in. Sample 70 came from the southwest corner of the house and produced a large assemblage dominated by generalist decomposer species. *Gyrohypnus liebei*, *Cercyon analis* and *Oxytelus sculptus* suggest that conditions were again somewhat damp and foul and a moderately high presence of dung/carrion-indicating fly species confirms this impression. There was a lower percentage presence of house fauna, particularly *A. brunneus*, in this deposit. Given the consistent presence of these particular flies inside this house, there is the possibility that the residents were involved in activities that generated foul waste, perhaps butchery?

Plot 4, FS 7

E172 80: FS 7 was a large Type 1 house situated at the eastern end of Plot 4, contemporary with FS 10 (above). A widespread sod layer, bounded by the wattle walls that formed the outline of FS 7 was interpreted as a foundation layer for FS 7. Sample 80 came from a deposit of plant matter contained within this sod, which appeared to be chewed grass or possibly manure.

This was a very poor deposit, which yielded only 16 beetles, 5 fleas and a small number of fly puparia. The fauna was very mixed with no clear signature.

Building Level 4

Plot 3, Building 1193

E172 101: Three buildings lay within Plot 4 at this level. Building 1193 and FS 15 occurred in the same area, although Building 1193 extended further to the west, its eastern end apparently removed during construction of FS 15. There is some evidence for internal divisions and roof supports suggesting this building may have been a Type 1 house. Organic layer 1143, from which sample 101 is taken, appears to be a general floor deposit associated with the occupation phase of this house. It should be noted, however, that some of the wattle screens and deposits from this area appear to be associated with FS 21, which was built over the footprint of this building at a later stage.

This sample produced a small fauna but only 1 litre of material was available for analysis. It was dominated by house fauna species such as *Cryptophagus* spp, *Aglenus brunneus* and *Corticaria* sp, albeit in small numbers. *Acritus nigricornis* and *Dendrophilus puncatus*, two small Histerid beetles, also occur in this sample (as they did in house FS 10 above). Their natural habitats tend to be animal burrows, bird's nests and rotting wood in tree hollows. Although not strictly speaking members of the house fauna, both species are commonly encountered in indoor contexts in Fishamble Street, where clearly conditions mimic aspects of their natural habitats. A moderate number of plant feeding beetles were also encountered in this deposit. Most occur on common grassland and urban weeds and may have been brought in with flooring material.

Plot 3, FS 17

E172 102 and 103: A large Type 1 building, FS 17 was erected in the eastern end of this plot. Although the exterior walls were well preserved, internal features were not so, making it difficult to determine the internal layout of the house. A uniform sod layer 1219 was laid down as the foundation for this house, from which sample 102 comes. Various other occupation layers were identified as well as two collapsed walls, 1154 and 1156, made up of wood, ferns and other plant matter. Sample 103 came from this material.

Sample 102 from the sod layer produced a rich fauna dominated by house fauna species, especially *Ptinus fur* and *Xylodromus concinnus*. Both of these beetles are particularly common in fungoid wood and haystack refuse, which might reflect surface material stamped into the sod layer, rather than the sod itself. Beetles such as *Stilbus testaceus* and *Omonadus floralis* are also indicative of decaying grass and hay. A small mixed 'outdoor' element of the fauna, including grassland plant indicators and a small number of dung beetles, may be more indicative of the sod itself and where it came from. *Tenebrio obscurus* is recorded here suggestive of stored products, perhaps flour or other foodstuffs. The most surprising find in this deposit is the 'old house' borer, *Hylotrupes bajulus*, a long-horn beetle known to bore into wood used in construction of houses and other buildings. The beetle continues to be intermittently present

in Fishamble Street from this time on. *H. bajulus* is not native to Ireland but has become naturalized probably since the late 18th century via imported pinewood used for house building. The term is a bit misleading, as they seem to prefer the high resin content of younger wood. The larvae can take up to 30 years to mature within the wood, however, 3 to 15 years is more usual. While today it is primarily found in pine, spruce and fir, on the continent it is also known from alder, hazel, poplar and occasionally oak. Its presence in Fishamble Street is curious and fascinating as it is highly likely to have been imported into Dublin at this time in timber, emerging as adults at a later point. The relatively immature colouration of the individuals encountered here suggests they were newly emerged adults. The re-use of ship's timbers in house construction and furniture making in Dublin, while not entirely unique to the city, is a very particular characteristic of the Viking era here. Surely this is a possible source for this beetle in the houses of Fishamble Street? It is interesting to note that this beetle has not been recorded from any other contemporary Viking age settlement to-date for which insect analysis has been carried out. It would, however, be interesting to compare the data here with houses from other well-known ship-building centres of this era elsewhere in Europe.

The collapsed wall-filling material from which sample 103 came was made up of almost pure plant matter, with identifiable ferns, straw and reeds. The rich beetle fauna was entirely dominated by diverse house fauna and decaying straw/hay species, including *Aglenus brunneus*, *Mycetaea subterranea*, *Xylodromus concinnus*, *Crataraea suturalis* and *Omonadus floralis*. Broken fragments of a *Hylotrupes bajulus* elytron was also recorded here. There was a negligible 'outdoor' element in the fauna, confirming the protected interior origin of this material.

Plot 8, FS 19

E190 58, 63, 64 and 65: FS 19 was a poorly preserved building located in the northern part of Plot 8. Although the outer walls were largely removed the internal 3-aisle division features, including a hearth and paving in the central aisle area and towards the western end, were recorded. A brown organic layer 1535 lay within the northern aisle division and appears to have one of the primary occupation layers. A possible 'destruction' layer of ash and charcoal, 1531, sealed this layer. Sample 65 came from 1535. 1528 was the primary deposit in the southern aisled area and was a similar peaty brown organic material to 1535. Sample 64 came from this deposit. Outside the house and stretching to the western end of the plot were various gritty organic clay layers. One of these, 1522, was a gritty black organic material with lots of bones and small stones. Sample 63 came from this material. Finally, sample 58 came from an extensive area of 'brown sod', which appears to have sealed FS 19 and also provided a foundation for the subsequent building of FS 27/32 at building level 5.

Sample 65 from the north aisle contained a very mixed fauna, suggesting that FS 19 was not a typical house or at least not by the time this particular organic layer built up. While a high percentage presence of house fauna was recorded, the deposit also contained a moderately high number of outdoor, water- and dung beetles, more commonly seen in pit or yard-type deposits. This suggests that the house may have been used for animal housing at this point. The number of water beetles might suggest that the house was unroofed at this point although the presence of the relict running water beetle, *Pomatinus substriatus*, no longer found in Ireland, may simply indicated the presence of imported river water in a some sort of receptacle for the use of animals. *Dicheirotrichus gustavii*, a ground beetle characteristic of coastal salt-marshes and estuaries, is also recorded here. This beetle was found in 13th century deposits at Iveagh Markets. Surprisingly though this is the only deposit examined in Fishamble Street where it is found, given the proximity of the site to the river. Sample 64 from the south aisle was a poorer sample in terms of numbers. House fauna are again proportionally high but the deposit also contains a similar mixture of foul/water/outdoor beetles as the north aisle. In addition, this deposit contained a large number of fly puparia, including the biting stable/house fly, *Stomoxys calcitrans*, and *Coproica*

vagans/Limosina silvatica, indicative of cow dung or human excrement. The plant-feeding beetle *Nedyus quadrimaculatus* is indicative of nettles and *Notaris acridulus* is indicative of waterside vegetation. These may have been contained in bedding or fodder or were incorporated into the deposit in stable manure.

Sample 63 came from the yard area outside FS 19. It was a small assemblage with a typical outdoor profile totally dominated by dung/foul indicators. Among the frequent fly puparia encountered in this deposit, *Helcomyza ustulata* and *Thoracochaeta zosterae*, are most commonly found in decaying seaweed today. However, during the early medieval period these beetles may have been attracted to urine-soaked rotting plant matter and therefore may have been common in both muddy yards and cess-pits. Other fly species from the yard deposit reflect those found in the south aisle area. They lend some support to the idea that FS 19 served as a stable perhaps in the final phase of its use.

Sample 58 from the sod layer that sealed FS 19 was different in profile from all of the other deposits examined here. While it was not a particularly large assemblage, it was totally dominated by house fauna species. However, there were some overlaps. *Helcomyza ustulata* was recorded again and a number of dung beetles, *Aphodius contaminatus*, *A. foetidus* and *A. granarius*, were also recorded in this deposit. It reflects the foul and dungy nature of this plot in its final stage. *Hylotrupes bajulus* and *Neogalerucella lineola* were both found in this deposit reflecting both imported and naturally occurring wood used in houses at this level.

Building Level 5

Plot 8, FS 32

E190 102: FS 32 was a fairly poorly preserved Type 1 house in the eastern part of Plot 8. The only sample (102) examined from this area was from an extensive area of dark green woody organic material located outside the house to the north (1501). This yard deposit also contained animal bone shell and matted plant material.

This deposit produced a moderate sized assemblage surprisingly dominated by house fauna, even though it came from the yard area beside FS 32. However, the high number of dung and plant-feeding beetles and the range of foul-indicating fly puparia are more typical of yard and pit deposits. The house fauna element may have come from dumped floor material from the nearby house.

Plot 10, FS 28

E190 84, 85 and 86: FS 28 was a three-aisled Type 1 house, with the northeastern end largely missing. It was oriented somewhat differently, i.e. north-east south-west, to the general east-west orientation of many of the houses on Fishamble Street and all subsequent buildings in Plot 10. It was surrounded on three sides by a boundary wall with a sort of 'passageway' leading off from the northwestern corner. Little information was recorded for deposits in the two side-aisle areas. However, a number of deposits were recorded from the central aisle area. 1348 was the lower of these deposits, simply referred to as 'fill' but presumably representing a floor deposit. Sample 86 came from this material. This was covered by 1347, similarly described as 'fill', from which sample 85 is derived. A more extensive floor deposit 1333 covered both of these layers. It was described as 'brown humus gunge' and was recorded over much of the central area of the house towards the northern end. Sample 84 comes from this deposit.

Sample 86 from the earliest 'floor' level produced a moderate sized fauna totally dominated by dung/foul indicators. Two species were particularly frequently recorded – *Oxytelus laqueatus* and *Aphodius granarius*, both indicative of dung, fermenting vegetation and manure heaps. The number and variety of

plant-feeding beetles recorded also suggest the presence of manure as most are indicative of grassland plants and were probably ingested by animals while grazing. The ground beetle *Amara aenea* is also indicative of dry grassland. This deposit, therefore, may be indicating one of two things: either it is not a 'floor' deposit as such but perhaps material used to fill in the surface area prior to construction of FS 28. Alternatively, similar to FS 19 above, this deposit represents a non-domestic phase of use, perhaps an animal stable also. Outdoor/plant-feeding/foul indicators similarly dominate sample 85, from the layer above the earliest floor, although there are some house fauna beetles present also. The ground beetles present are species typical of cultivated ground, while the rich range of plant-feeding species, including *Gymetron labile*, *Sitona cf. waterhousei*, *Phyllotreta nemorum*, indicate plantain, clover, various mustards and cultivated vegetables. Again, this combination of species together with dung beetles may suggest the presence of animal feed and stable manure in this deposit. The final 'floor' deposit examined, 1333, from which sample 84 was taken, produced a larger assemblage than sample 85, but it was similarly dominated by dung and foul-indicating beetles. Some house fauna beetles were recorded but interestingly very few *Aglenus brunneus*. Clearly the floor was inimical to successful breeding of this species. This deposit also had a mixed foul-indicating fly population also. Combined, these three samples suggest that FS 28 was not a typical house and was perhaps not used for human habitation, certainly not during the phase that these deposits represent.

Building Level 6

Plot 10, FS 35

E190 106 and 109: Two samples were examined from this poorly preserved three-aisled Type 1 house in Plot 10 (succeeds FS 28, above, in this plot). The building was founded on a layer of estuarine mud, which may account for its poor preservation. The central area of the house was covered in a succession of layers, one of which, 1310, consisted of grey brown clay with slag, bone, charcoal and shell inclusions. Sample 106 was taken from this material. A wattle mat, 1313, lay above it. In the southern aisle, a succession of layers included 1324, described primarily as an ash layer, which occurred at the northwestern end of the aisle. However, the deposit actually consisted of ash, light brown clay, visible plant remains, bone and shell. Sample 109 came from this material.

Both samples produced small assemblages, although preservation in the central floor area was worse than the south aisle. Sample 106 contained only eighteen beetles, most of which were house fauna species or generalist decomposers. The south aisle material was far more mixed with dung, water, outdoor and plant feeding species occurring most frequently in the small assemblage from sample 109. The fly species *Musca domestica* and *Stomoxys calcitrans* were also present, attesting to the filthy nature of the floor in this area. The deposits here may very well reflect a period of abandonment after the house went out of use. Building Level 6 was certainly more ephemeral than other levels and many of the houses showed signs of burning. This would have contributed to the poor preservation environment observed in these samples.

Building Level 7

Plot 8, FS 45

E190 135, 136, 137 and 142: FS 45 was a classic three-aisled Type 1 house. It was founded on an extensive ash layer as many of the houses on Level 6 at this end of Fishamble Street were seemingly destroyed by fire. A large hearth and a mixed organic deposit, 964, which consisted of brown-black peaty organic material with matted plant remains, bone, shell and small stones, occupied the central aisle. Sample 137 came from this deposit. The primary layer in the northern aisle was 962, which consisted of matted plant remains, mosses, brushwood fragment, charred hazelnuts, textile fragments and some clay inclusions. Sample 135 came from this deposit. The southern aisle was slightly different, as the primary layer appeared to be a rather sterile stoney grey mud containing charcoal (968). Above this three timbers were recorded (981) and an organic layer sealed these, 963, very similar in composition to 962 in the northern aisle. Layers 968 and 981 may have acted as a 'foundation floor' for the southern aisle. Sample 136 came from layer 962. Outside the back wall of the house, a thick clayey sod layer, 977, which included animal bone, shell, fragments of wood and gritty gravel, had built up. Sample 142 came from this deposit.

The central aisle material (sample 137) produced a moderate size fauna with a high percentage presence of house fauna, as might be expected from an indoor location. However, the number of true dung beetles and other foul indicators would suggest the central floor area was dirty and trampled. This would appear to be a common characteristic of central aisle deposits, specifically those that seem to truly represent occupation level floors, rather than abandonment phases or houses that have changed use. Sample 135 and 136 came from the main floor deposits in the northern and southern aisles and were both extremely rich, dominated by *Aglenus brunneus* and other house fauna. Very few other habitat niches are represented here. *Dendrophilus punctatus*, although not strictly classified as a member of the house fauna, is the second more frequent-occurring species in both deposits. One possible explanation for this is the presence of dried animal skins or other coverings in the bedding areas. However, the presence of nesting birds in the roof space of the house might also explain its presence. There is negligible presence of outdoor, damp ground/water and dung beetles suggesting that the side-aisle areas of this house were kept warm and dry, a contrast to the more exposed and trampled central aisle area. The assemblage from the outdoor deposit 977 provides a stark contrast to the two side aisle samples and shows parallels or overlaps with the central aisle deposit (sample 142). While there is a surprisingly high percentage presence of house fauna species, notably only five examples of *A. brunneus* are recorded. Other house fauna species, such as *Anobium punctatum*, the woodworm beetle, could have become incorporated into yard deposits through sweeping out or trampling i.e. material being walked from inside houses out to yards and vice versa. The characteristic aspects of 'outdoor' contexts are all well represented in this deposit such as true dung beetles, water, ground and plant-feeding insects, the latter representative of both urban weed and grassland plants.

Plot 9, FS 46

E190 143, 147, 165, 167, 168, 169 and 177: This house and its associated features were intensively sampled so various elements of its history can be represented. It occurred in the neighbouring plot to FS 45 and did not appear to be separated from it by a boundary fence (though see reference to wattle mat 1043 below). FS 46 was built on a thick layer of organic material, 1600, which appears to represent a fallow period in this plot rather than simply a foundation deposit for the house. Sample 169 and 177 appear to come from this deposit, although from different locations. Sample 177 was taken from 1600 towards the western end of the plot, near where FS 47 was subsequently built. Sample 169 occurs under the footprint of FS 46 itself.

Inside, the house had a typical three-aisle structure but with a number of additional partition features in each corner. Wattle mats were recorded in three of the four corners. Sample 143 came from 1048, an organic layer with visible animal bone and shell, which covered wattle mat 1045 in the southwestern corner. Sample 145 came from a sod layer, 1059, which lay beneath a brushwood layer in the northern aisle. Sample 165 came from layer 1075 in the northwestern corner of the house, which, like the southwestern corner, appeared to have been partitioned off. This rich black layer consisted of pure matted plant material, reeds, woodchip and scrap wattle.

Outside the house, two samples came from the extensive wattle mats or pathways that lay to the north and northeast of the house. Sample 167 came from the surface of wattle mat 1076, which extended from the northwestern corner of FS 46 in a north-south direction. It consisted of trampled organic matter, wattle, shell, bone and plant remains. Sample 168 came from wattle mat 1043, which extended along the whole northern wall of FS 46, between FS 46 and FS 45. This mat has variously been designated a 'collapsed' boundary wall or a 'main pathway' through the plots. It may have served both purposes during its lifetime. The material samples consisted of dark brown organic with scrap wattle, stones, burnt wood and shell.

Sample 169 and 177 came from the thick deposit that pre-dated construction of FS 46 and 47 albeit from different locations. Their habitat profiles are slightly different as a consequence. Possibly due to mixing of layers or trampling from above, sample 169 within the footprint of FS46 has a high percentage presence of house fauna, including 48 examples of *Aglenus brunneus*. It also has a high representation of dung beetles and foul decomposers, suggesting the presence of foul decomposing matter, possibly manure, in this area of the plot prior to construction of FS 46. A small number of beetles, including *Omosita colon* and *Creophilus maxillosus*, also attest to the presence of old bones, carrion and fly puparia, presumably breeding in the filth. Dung, seaweed (possibly cess) and carrion fly puparia are recorded in high numbers. Sample 177 produced a slightly smaller assemblage with slightly lower overall presence of house fauna and a slightly higher presence of foul-indicating beetles. A similar range but smaller numbers of fly species were present in this deposit, suggesting that this pre-house deposit was fairly uniform across the plot.

Inside the house, sample 147 came from the foundation sod layer in the north aisle and had a familiar habitat profile for a side aisle, dominated by house fauna species, particularly *A. brunneus*. From the northwest corner of the house, sample 165 had a similarly high presence of house fauna but somewhat lower numbers of *A. brunneus*. Among the generalist decomposer species, many are suggestive of somewhat damper conditions under foot in this location. It also contained surprisingly high numbers of foul-indicating fly puparia, which suggests contamination of this layer, either during the time it was being laid down or with trampled material coming in from the yard outside. Despite its close proximity to the bedding area and the suggestion that the corners were partitioned off from the centre aisle, clearly the movement within this zone was different, if the insects are any indication. Two new wood-dependent beetles were recorded here –*Pseudophloeophagus aneopiceus* and *Rhopalomesites tardyi*. Both of these beetles are found in damp rotten timber throughout Ireland, but are especially known from the southwest. Both were previously recorded from Skellig Michael and the latter from the Killarney woods (refs.). However, they were also found at Back Lane, Dublin and *R. tardyi* has been recorded in Clancy Barracks, Dublin and Barronstrand St, Waterford. Clearly both formed part of the local woodland fauna along the valley of the river Liffey and were probably causalities brought into the house in gathered firewood or wood used for construction. *Hylotrupes bajulus* is recorded in this deposit. It is also found in sample 143 from the southwestern corner of the house. This deposit overlay a wattle mat in this compartment. The presence of *H. bajulus* in these deposits (and one in FS 45) is its first appearance since building Level 4. Its impossible to say, without examining lots more deposits from Levels 5 and 6, if it had become established in the town by this time or if this is simply another temporary appearance of

this beetle in imported wood. The deposit from which sample 143 came was very rich in beetles, with very high numbers of *A. brunneus* again dominating the assemblage. House fauna of all types are very well represented but it is the high numbers of two beetles, *Dendrophilus punctatus* and *Omosita colon*, and smaller numbers of *Trox scaber*, which is most interesting. The latter two are often associated with dried skins and hides or dry butchery waste. *D. punctatus*, as noted earlier, is found in many of the side aisle bedding area samples, suggesting some aspect of these environments were suitable for breeding. While their presence may simple be due to birds nesting in the corners of the house, its is possible that this corner compartment was used to store rolled up skins/leather or, perhaps, was hung with such material to form the partition. The hanging of dried meats in this location might also cause a temporary proliferation of some of these beetles.

Outside, and between FS 46 and FS 45, samples 167 and 168 came from the wattle mats or paths that covered much of the ground surface in this area. Sample 167 from screen 1076 produced a smaller assemblage than 168 from 'screen' 1043. House fauna proportionally dominated it, though with few *A. brunneus*, and it had a mixed range of outdoor, foul, damp-ground and generalist decomposers also. It had a number of foul-indicating fly puparia suggestive of animal and human excrement. The foul element among the beetles was relatively small, which may mean the mats succeeded in keeping the ground surface less filthy than other 'outdoor' contexts. Sample 168 had a slightly largely assemblage and a more mixed range of habitat groups. A range of water beetles and damp-loving decomposers suggests ground conditions were wetter on this surface of this wattle path. Dung beetles and other foul indicators were also present though not in great numbers. However, a moderately high number of foul indicating fly species were recorded suggesting many different types of material, including animal dung and possibly human excrement, were trampled into the surface of the path.

Plot 10, Building 1302=1303

E190 192: At this building level there is no evidence for house structures in Plots 10-12, however, stone-packed postholes suggested the presence of a large 'barn-like' structure. Eighteen in total were identified in a vaguely circular shape that may have served some sort of industrial purpose. Within the area demarcated by the posts, areas of paving were noted, a number of wooden-lined troughs and a hearth. Human remains, including a baby's skull, were discovered outside this 'building'. Various hearths and other features were recorded in the area of future plots 11, 12 and 13 south of 1302=1303. A series of hearths and other burnt features appeared to succeed the 'building' in Plot 10 also. Clay and sod layers sealed a variety of ash spreads associated with these hearths. Sample 192 was taken from one of these deposits, described as a 'clay' layer, 1250. The deposit was made up of matted plant remains, animal bone, clay, decayed shell and charcoal. It was described in the original sample register as 'clay, south aisle' but as possible building 1302=1303 did not appear to have aisles its unclear if this location information is correct. Could another building have been built within the footprint of 1302=1303, for which only the clay floors survived?

The sample from this deposit produced a very rich assemblage, which bore all the hallmarks of a side aisle deposit. House fauna dominated it, most notably over 200 examples of *Aglenus brunneus.* At first look, it would appear that the sample register description was accurate in terms of location. However, this is at odds with the description of the building itself. The possibility that it relates to a later or earlier building previously unrecognised lying with the footprint of this building can't be ruled out. A large number of generalist decomposers were also recorded as well as a moderately high number of plant-feeding beetles. Some 'outdoor' woodland-related beetles were also recorded in this deposit, notably, *Abax parallelepipedus* and *Hemicrepidius hirtus.* These may have arrived in woodland mosses or mossy branches/logs gathered for firewood. The presence of ants, *Myrmica* spp., may have a similar origin although it does appear quite frequently in indoor samples from approximately level 4 onwards.

Building Level 8

At this level, a number of plots and houses are featured, however, no house is represented by a comprehensive number of samples. This is partly a function of the preservation condition in which many of the houses were found (i.e. poor, partially or wholly burnt) and the availability of samples from the houses and their associated features.

Plot 3, outside FS 51

E172 136 and 137: FS 51 was a small Type 1 house spanning the width of Plot 3. Its internal subdivision features were poorly preserved. Samples 136 and 137 were taken from the yard area outside the house to the west from layer 488. This layer consisted of matted plant remains, wood charcoal, shell and a large quantity of dumped feathers, clearly the result of preparing chickens for cooking. The yard also contained a wattle mat, a wattle wall and a spread of timbers, which may have served as a pathway.

Sample 136 was made up almost entirely of decaying feathers and produced only one beetle, one flea and a couple of fly puparia. However, sample 137 essentially from the sample deposit but with far fewer feathers, produced a large rich fauna with a very high percentage presence of house fauna. Both *Aglenus brunneus* and *Anobium punctatum*, the woodworm beetle, were well-represented. This suggests that perhaps the deposit actually came from an indoor context. Given the presence of the wattle wall, mat and spread of timbers, this area may have been some sort of building. The high number of feathers may suggest something like a chicken coop but it may simply have been an outbuilding or annex that served multiple purposes. The most frequently occurring beetles other than house fauna species were *Oxytelus sculptus*, *Ptenidium* spp. and *Cercyon depressus*. 104 examples of the puparia of the seaweed fly, *Thoracochaeta zosterae*, were also recorded in this material. The former two species occur in a wide range of decaying material from foul to dry. *Ptenidium* spp. is also known from decaying seaweed. *C. depressus* and *T. zosterae* are generally found in decaying seaweed but, as mentioned previously, may have been attracted to the salts in urine and are frequently encountered in medieval cess-pits. Combined, this suggests that this deposit was not a typical 'indoor' deposit and was clearly heavily contaminated by material that attracted these sorts of beetles and flies. If the space was used as a chicken coop the faeces and urine that might have accumulated on the surface could explain this strange mix of 'house' fauna and foul indicators.

Plot 4, outside FS 53

E172 139: Next door to FS 51, in Plot 4, a number of buildings were erected. FS 54 was presumably the main structure but did not survive in any substantial form. West of this a small structure, FS 53, was built. It had no internal features and no hearth and may have served as an enclosure or stable. Between FS 54 and FS 53 a wattle screen, 1025, was laid down, partly overlying the main wattle path in this plot (411). This was overlain by various peaty organic layers, one of which, 481, was sampled (Sample 139).

This sample produced a small assemblage of beetles of fairly mixed origins, although house fauna were proportionally well-represented. The fact that the sample came from a wattle mat immediately outside a house probably explains why the assemblage is so mixed. Preservation was not great, suggesting that the deposit had dried out in the past. One species of interest was *Sphaeridium scarabaeoides*, which occurs in fresh cow or sheep dung. However, dung indicators overall were low and this may simply have been present on the boot of someone coming from a different part of the town. *S. scarabaeoides* was also recorded in Level 7 in building 1302=3.

Plot 9, FS 60

E190 203: FS 60 was a substantial Type 1 building. While the internal features were discernable, the house appears to have suffered much damage from fire. The only sample from this house, sample 203, came from a burnt clay layer in the central aisle area, which contained charcoal, wood chips, bone, hide, slag and substantial numbers of blow fly puparia (only a small selection were extracted).

The dominant feature of this sample was the high number of blow fly puparia, probably *Calliphora vicina* (the 'blue bottle'). This fly is attracted to freshly dead bodies of both animals and humans and freshly butchered bones with flesh still attached. The fact that this deposit contained so many of them suggests that its preferred food source was available in the centre of this house. This most likely means that the house was abandoned for some time after it was burnt down and was perhaps used for dumping of butchery material or animal carcasses. It is also entirely possible that human remains lay in this location for some time as the larvae move a short distance away from their food source when ready to pupate. The body may have been removed/buried but the puparia remained *in situ.* The sample also produced a very small beetle fauna, with a high proportionate presence of house fauna and generalist decomposer beetles. This aspect of the deposit probably reflects the pre-burned house floor. The low number of beetles is probably due to burning, which can be inimical to good preservation.

Plot 10, FS 61

E190 207: FS 61 was located southwest of FS 60, separated from it by a thin boundary wall. It was also a Type 1 house but the western end of the house extended beyond the limits of the excavation. The eastern wall also did not survive but the reason for this is not clear. Evidence of burning is also present in this structure. Sample 207 came from the primary floor deposit in the central aisle, 783. This consisted of a thin black clayey organic layer, with pebbles, plant remains, shells and occasional bones visible.

Sample 207 produced a very small assemblage also, similar to 203 above. Again, this may be due to the fact that the deposit was burned or degraded. The assemblage was similarly dominated by house fauna beetles but had a higher proportional presence of outdoor ground-living beetles, including *Harpalus affinis*, *Amara* sp., *Byrrhus pilula* and *Otiorhynchus rugifrons*. *O. rugifrons*, in particular, prefers bare dry ground with sparse vegetation and may have been attracted to open exposed areas after the houses were burned.

Plot 11, FS 62

E190 220: FS 62 was the first building in Plot 11 and was of typical three-aisled design. The building was clearly damaged by fire, something it had in common with other buildings at this level. The aisles were initially marked out by stones, then by thin wattle walls. The northwest and southwest corners of the house were also partitioned off. Sample 220 came from the main floor material in the south aisle, 1239 (which was very similar to the material used to floor the north aisle). It consisted of compacted matted straw and other plant matter, with visible wood chips and animal bone.

The south aisle floor layer appears to have been protected from burning as it produced a rich assemblage of beetles totally dominated by house fauna species, most notably *A. brunneus*. Other generalist decomposers suggest a relatively dry and clean floor. However, animal bone was visible in the deposit and blow fly larvae were recorded in small numbers. A small number of dung beetles were also present, although at least three of these species are also at home in decaying vegetation. Overall, the assemblage is similar to other aisle samples and is one of the few glimpses of an actual occupation floor from Building Levels 8 or 9.

Plot 12, FS 63

E190 230: FS 63 represents the first building in the new Plot 12. This house was clearly burnt to the ground and many of its features are barely discernable. No samples from inside the house were chosen for analysis. Outside, to the north, a path (1120) and large pit (1121) were recorded. A ship's timber (1106) was found lying in the yard area of this house. The pit contained a variety of fills, one of which, 1121(4), consisted of a loose layer of black organic material, with burnt wood/twigs, possibly burnt straw/sod, shell and bone. Sample 230 came from this deposit. There is a suggestion that this fill was burnt roofing material from FS 63 and that Pit 1121's primary purpose was as a general refuse pit, even if it was originally cut as a cess-pit.

The assemblage from this deposit was not very large but similar in size to other pit fills from Fishamble Street. Unlike other pit fills, however, foul-indicating beetles did not dominate the assemblage. Indeed, foul-indicators amounted to only 7% of the entire fauna. One fly species, *Coproica vagans/Limosina silvatica*, was reasonably numerous and is suggestive of either animal dung or human excrement. However, house fauna were the dominant habitat group, followed by more generalist decomposers. This would appear to concur with the archaeological evidence, which suggested this pit was primarily filled with dumped roofing material and perhaps other debris from the nearby burnt house. A mixture of outdoor, damp-ground and plant-feeding beetles may have originated in the yard area and fallen into the open pit. However, *Brachysomus echinatus* and *Otiorhynchus rugifrons* may also have come from turf cut from coastal grassland areas and used either as roofing material or for flooring. Both have a pronounced coastal distribution in Ireland, particularly from the east coast. *Anobium punctatum* and *Neogalerucella lineola* probably came from wood used in the house, which was dumped in the pit.

Building Level 9

This was also a poor level in terms of representation of samples. Again, burning of houses at this level appears to have been a factor. A small number of samples were selected, however, to provide some level of representation.

Plot 3, FS 69

E172 163: Two buildings were erected in Plot 3 at this level, FS 70 and FS 69. FS 70 was a large Type 1 house with an unusual stone footing or drainage channel along it southern wall. FS 69 was a small building built towards the western end of the plot. It appeared to be a Type 1 house in layout, although very small in comparison to others. This building was destroyed by fire, giving rise to a large thick 'ash' layer, 442, comprising burnt plant matter or burnt sod. It may represent a burnt floor or fallen burnt roof material. Sample 163 came from this material.

Perhaps predictably, this sample produced a very small fauna of only 12 beetles and 3 fly puparia. Clearly the burning of the house had a detrimental effect on the preservation of insect remains. The range of habitats represented was very wide and does not give any clear insights into the living conditions within this building.

Plot 10, FS 77

E190 254 and 259: FS 77 was a poorly preserved three-aisled house in Plot 10 that also appears to have suffered extensive fire damage. Indeed, the external walls only survived as linear deposits of ashes and some charred posts. The central floor area had a number of spreads or deposits, one of which, 740,

comprised compressed plant remains, wood chips, hazelnut shells and bone. Sample 259 came from this material.

Outside the house, a large wattle 'mat' (730/36) extended in a northwest-southeast direction from the eastern end of FS 77 towards the eastern end of the plot and along the boundary between Plot 10 and 11. There is some suggestion, from the pointy nature of the rod endings, that this was in fact a collapsed fence, rather than a path. However, similar to other building levels/plots, it may have served both purposes during its lifetime. It was heavily scorched in places. Sample 254 came from the sandy organic material beneath this mat.

Probably due to post-depositional charring, both samples produced small assemblages. Sample 259 within the house had a very mixed signature with house fauna, generalist decomposer and outdoor plant-feeding beetles all present. The plant-feeding insects were a mixture of urban weed and grassland herb species and could have come from the immediate plot area or from burnt sod/roofing material. Sample 254 from the deposit outside below the wattle mat was similarly mixed but with less house fauna and more generalist decomposers and species that are relatively ubiquitous in urban environments. There were more indications here, however, of damp ground underfoot with ground beetles *Pterostichus minor* and *Bembidion cf. tetracolum* present, species that prefer damper ground near water. Both samples, however, are not particularly helpful in terms of revealing living conditions at this level. There's no doubt that, with a very few exceptions, the burning of houses at levels 8 and 9 has left these phases of occupation more invisible in the record from an insect point of view.

Building Level 10

After the somewhat ephemeral and badly damaged houses and features in Building levels 8 and 9, Building Level 10 represents a return to really well-preserved substantial Type 1 houses and associated structures. A number are very well represented in terms of samples. There are many very interesting aspects to the insect faunas from this level, including first records of some important species, which may represent their first arrival into Dublin.

Plot 4, outside Building 227

E172 199: Building 227 was a small poorly preserved building adjoining the south wall of FS 83, the main house in Plot 4 (not represented in the samples chosen from this level). Sample 199, however, comes from the fill (276) of a stone/timber-lined drain (196) that ran from the western end of Building 227 towards a large pit, AC, which straddled the boundary between Plots 4 and 5. The sample was chosen to see if this drain could shed light on the function of Building 227 i.e. domestic or industrial. A large amount of slag was noted where the drain met the edge of the pit. The fill consisted of smelly dark brown organic material, with visible bone and shell.

The assemblage from the drain was extremely mixed in origins, with high numbers of both generalist decomposers and species that occupy multiple habitats, including foul conditions, especially in the context of an urban environment. House fauna are also represented but the assemblage contained very few direct indicators of human or animal waste. There were also very few indicators of water. It is likely that the fill sampled represented a natural infilling of the drain after it went out of use, rather than material related to its use phase. Two wood-related beetles were recorded here – *Ptelobius vittatus*, a small bark beetle found primarily in ash and elm, and *Phratora vulgatissima*, found on willow and alder in riverside locations. Ash, elm, alder and willow were frequently used wood species in house construction in Fishamble Street. These beetles were probably part of the natural woodland fauna of the river valley.

Plot 4, FS 84

E172 203: FS 84 lay 2m west of FS 83 and was very small in comparison. It was divided roughly into three compartments, but was not a classic three-aisled house due to its unusual orientation and size. The floors of FS 84 were primarily sod and brushwood in the western and eastern sections, while the central area was primarily covered in gravel and sandy loam. Later in its use, the central area had a large ash layer, which spread over much of the interior, followed by a gravel/charcoal layer rich in slag (182), from which sample 203 was taken. The material also contained 'crumbly' plant remains, bone and shell.

Presumably due to the presence of the ash, this deposit produced a very small, impoverished fauna. However, it was dominated by house fauna and generalist decomposers, especially beetles commonly encountered in indoor contexts in this period e.g. Histerid beetles like *Acritus nigricornis* and *Margarinotus merdarius.* This would suggest that the deposit still represented an active occupation layer, rather than some post-use or abandonment phase.

Plot 9, FS 88

E190 313, 319, 323 and 381: FS 88 was built on the layer of ashes created by the burning down of FS 76 from the previous level. It was a classic type 1 three-aisled house, oriented northwest- southeast. The walls were single wattle walls with interior wall plate supports and a doorway was located in the western and eastern walls. Areas of wattle matting and stone cobbling (581) were recorded in the western part of the building and the southeastern corner. Reused planks/split logs covered the eastern floor area of the central aisle, presumably serving as a floor inside the eastern door. Sample 313 was taken from the main floor deposit, 548, between the central hearth and the cobbling inside the western doorway. This was a black organic material, with clay, bone, hazelnut shell, charcoal and shell inclusions. Sample 319 came from a layer of hazelnut shells and mixed organic material under the cobbles (582). Sample 323 came from the top of a pit, 583, located along the eastern boundary of the excavated area in Plot 4. It lay south of the plank path F576 and wattle wall F577 south of FS 88. The pit fill consisted of a dark brown organic material with abundant plant remains and scrap wattle. Finally, associated with this house was a rich dark organic layer F517, containing clay, animal bone and matted plant remains, overlying a sod layer F518. F518 sealed house FS 88 and both layers probably represent a destruction or abandonment phase prior to the construction of houses in Plot 9 at building level 11. Sample 381 came from the F517 layer.

Sample 313 from the central floor area produced a rich assemblage dominated by house fauna, especially *Aglenus brunneus*. *Anobium punctatum* and *Ptelobius vittatus* came from the wood presumably used in the floor planking and roof beams, the latter suggesting the presence of ash and/or elm. For the most part, the assemblage suggests the floor was quite warm and dry. There were no foul-indicating fly puparia, for instance. However, a small number of true dung beetles, *Aphodius contaminatus* and *A. luridus*, suggest contamination with small amounts of dung, presumably brought in on people's shoes from the yard outside. One very interesting aspect of this assemblage was the very high number of *Pulex irritans*, the human flea. This is a more common feature of side aisle deposits, where people presumably slept. It might suggest that this location was chosen to remove fleas from residents but as fleas are more mobile than lice, which tend to cling to their host, this seems unlikely. In the absence of side-aisle samples from this house it's not possible to confirm if this was simply a house with an unusually high infestation! *P. irritans* is more or less ubiquitous is deposits from Fishamble Street but numbers do fluctuate between deposit type. Sample 319 ostensibly comes from the central floor aisle also, however, its location under the cobbling at the western end of the house, inside the door, has obviously influenced the assemblage. Firstly, its much poorer than 313, with the cobbling and associated inorganic material presumably having a detrimental effect on preservation here. Nevertheless, its habitat profile is very similar to 313, completely dominated by house fauna like *A. brunneus*, *Ptinus fur*, and high numbers of *Pulex irritans*,

and possible stored foodstuff-indicators like *Dermestes lardarius* and *Tenebrio obscurus*. *Hylotrupes bajulus* reappears in this deposit also and becomes a regular feature of assemblages from this point on. It may be that by this time it had become established in the houses of Fishamble Street, emerging every few years.

Sample 323 came from the pit outside the eastern door of FS 88. It had a high representation of foul-indicating beetles, particularly those associated with human faeces and urine in medieval contexts, *Cercyon unipunctatus* and *C. depressus*. In addition, over 250 puparia of the seaweed beetle *Thoracochaeta zosterae* were recorded in this context. This fly appears to be very characteristic of cesspits during this period (Smith 2012). Another interesting finding in this fill is the pea weevil, *Bruchus rufimanus*, a non-native pest of stored legumes. This is the earliest recorded finding of this beetle in Ireland and was probably ingested in spoilt peas or beans. There seems to be no doubt that the pit was intended for use as a cesspit and the fill would appear to confirm this. However, there also appears to have been some household waste mixed into the fill, especially scrap wood and wattle. A number of wood-dependent beetles, *Anobium punctatum* and *Hylotrupes bajulus*, are found in this fill, as well as the small longhorn beetle, *Gracilia minuta*. This is the first record of *G. minuta* in Fishamble Street, a beetle first reported from Dublin in an 11th century house in Christchurch Place by Coope (1981). This beetle may have been native to Ireland and simply became established in the urban fauna from this point onwards. However, it is surprising, giving the volume of wattle used in housing up to this building level, that it had not been encountered before now. It is not recorded from Deer Park Farms, despite the large amount of wattle used there also. Therefore, it is possible that it arrived in imported basketry at this time and became established in the wattle of Fishamble Street and elsewhere in Dublin after this point. *G. minuta* is not currently listed on the Irish list of Coleoptera so presumably did not become naturalized. In Britain its status is regarded as 'vulnerable' (Red Data Book 2), where it is largely confined to localized parts of England and Wales (Hyman 1992). Archaeological records there show, amongst others, that it was present in Romano-British and Anglo-Scandinavian York, which may have been its route into Dublin at this time (Hall et al. 1983; Hall and Kenward 1990; Kenward and Hall 1995).

Finally, sample 381 came from the destruction or sealing layer of house FS 88 and may have provided the foundation layer for houses in this plot at building level 11. It contained a very mixed fauna, dominated by generalist decomposers, many of which would be common in haystack refuse, straw, manure and compost. The most frequently occurring species were *Oxytelus sculptus*, *Leptacinus intermediatus/pusillus*, *Quedius/Philonthus* spp, *Ptenidium* spp and *Cercon analis*. The range of fly puparia present also reflects both foul and domestic waste material, including the housefly *Musca domestica*, the stable-biting fly, *Stomoxys calcitrans*, animal/human faeces indicator *Coproica* spp. and the blowfly, *Calliphora vicina*. An interesting beetle recorded here but not in other samples was *Phacophallus parumpunctatus*, a species thought not to have arrived in Ireland or Britain until relatively recent times (Lott and Anderson 2011). This beetle bears superficial similarities to *Leptacinus* but the punctures on the head are quite distinctive. Its frequent recording in archaeological deposits from the Iron Age onwards in Britain, particularly settlement sites, suggests that it arrived in these islands at a much earlier date and may even be native to Britain (Buckland and Buckland 2006). Its presence here is curious and, along with the wide range of straw/hay-related species, might suggest perhaps dumped packing material from shipped products. The number of potentially 'non-native' species in this house/plot sets it apart from others and suggests perhaps a direct link with people or traded goods from outside Ireland. Decaying or waste wood, wood chips or bark also formed part of this deposit with *Anobium punctatum*, *Euplectus* sp (under bark/wood moss), *Scolytus mali* (under bark of hawthorn, blackthorn, elm, apple), *Hemicrepidius hirtus* (larvae in dead wood) and *Phratora vulgatissima* (buds and leaves of willow/poplar) all present in the assemblage.

Plot 10, FS 89

E190 331, 333 and 334: FS 89 was another three-aisled Type 1 house neighbouring FS 88. The northwestern part of the house, including most of the northern aisle, was badly damaged by subsequent features. The majority of the floor area in the central and northern aisle was covered by a similar compact organic layer, 677, which contained matted plant remains, charred wood, hazelnut shells and clay. Sample 331 came from this deposit in the northeastern corner of the northern aisle area. Sample 333 came from the main yard deposit outside FS 89 to the east, 703, which consisted of gravelly organic with visible inclusions of animal and bird bone, shell, plant remains and wood. Also in this area was pit 702, which may have been cut into 703 (above). It was filled with various layers, the primary (or basal) layer represented here by sample 334. This was a black organic mix with straw, fruit stones, shell and bone.

Sample 331 produced an extremely rich assemblage of 'house' fauna, notably high numbers of *A. brunneus*, *Xylodromus concinnus*, *Ptinus fur*, *Cryptophagus dentatus* grp and *Crataraea suturalis*. In addition, high numbers of *Omosita colon* were recorded, which, along with *Trox scaber* and *Dendrophilus punctatus*, might be indicative of dried skins or hides either hanging up forming a screen, rolled up and stored or covering the bedding area. It seems less likely in the context of the location, that they are indicative of butchery waste or carrion. However, if mixture of deposits occurred or the northeastern corner changed use during its lifetime this is a possibility. The presence of bird's nests in the roof supports of the house is another possible source for some of these beetles.

Sample 333 from the yard area outside the house produced a typical mixed assemblage of foul-indicating and generalist decomposers but also a reasonably high representation of house fauna. This may be due to material being swept out from the house to the area immediately outside the door and perhaps across the surface of the pathway. A moderately high number of plant-feeding beetles are also recorded here, a fairly typical feature of outdoor assemblages. The species were a mix of urban weed, wetland plant and cultivated plant indicators. One puparia of the fly genus, *Delia*, was also recorded here. These flies are leaf miners in various plants including cultivated cereals (Smith 1989). *Hylotrupes bajulus* and *Ptelobius vittatus* may have been casualties in household sweepings or from the path planks. The majority of path planks identified in Fishamble Street were of ash (Daly 1998).

The basal layer of the pit (sample 334), which may represent an original fill as opposed to a later re-use, produced a disappointingly small beetle fauna but very high numbers of the seaweed fly *Thoracochaeta zosterae*, a characteristic member of the cesspit fauna. Numbers of foul-indicating beetles were relatively small, however, and the deposit seemed to be diluted with plant matter, bone and shell, presumably household waste.

Plot 11, FS 90

E190 342, 344, 349 and 350: FS 90 was a large, well-built Type 1 house that appeared to have two phases of occupation. One relates to the possible 'interim' building level 9/10 (see above). The other fits firmly into Building Level 10 and it is from this phase that most of these samples are taken. In Phase 2, the building was lengthened westward, a drain was introduced through the central aisle and various wattle mats were added to the floors. Mat F652 covered the eastern part of the drain in the central aisle and sample 344 came from this mat. This black, slightly humified organic material contained numerous small fragments of wood from the mat itself.

The northeastern and southeastern corners of the north and south aisles were partitioned off with grooved timber frame bases, between which was laid plank flooring (F631). Both compartments were floored with wattle mats (F636 and 637). Two samples were taken in the northeastern corner – samples

349 and 350 – from immediately under mat F637. The upper of the two layers (from which sample 349 is taken) contained numerous wattle fragments, reeds and shells and probably represents the contact layer between the mat and the underlying floor. The lower of the two layers (from which sample 350 was taken i.e. the earliest deposit) was a dark organic deposit with charcoal, wood fragments, bone and shell inclusions. This may represent layer F684, the earlier floor of Phase 1 of FS 89. If this is the case, than this is the earliest layer represented in this collection of samples.

Finally, a layer of clayey sod (F607) containing numerous wooden pegs, large amounts of scrap wattle, furnace ash, charred wood, bone and slag sealed the whole building. Sample 342 came from this deposit.

Sample 344 from the central aisle wattle mat produced a moderate sized assemblage dominated by house fauna, notably *Aglenus brunneus*. Generalist decomposers like *Acritus nigricornis* and *Dendrophilus punctatus* are also present here as well as a moderate number of human fleas. Sample 349 and 350 came from the northeast corner under a wattle mat. Sample 350 came from the earlier deposit, which may have been part of the original floor of Phase 1 of the house. This produced a very rich assemblage dominated by house fauna, especially, *A. brunneus*, but also with very high numbers of *Xylodromus concinnus*, *Cryptophagus* spp and *Crataraea suturalis*. Similar to other corner samples previously examined, this deposit also contained high numbers of *Omosita colon* and *Dendrophilus punctatus*, and moderate numbers of *Trox scaber*, *Tenebrio obscurus* and *Dermestes lardarius*. *Sitophilus granarius,* the grain weevil, was recorded here, the first such record for Fishamble St. Among the plant-feeding beetles *Atomaria ?linearis*, *Phyllotreta nemorum*, *Chaetocnema hortensis* and *Sitona ambiguus* may suggest the presence of processed or gather cereals and legumes. This extraordinary range of indoor 'cellar' type fauna and cultivated ground indicators would strongly suggest that this corner of the house was used for storage of foodstuffs, dry goods, possibly skins or hides and, potentially, cereal grain. Sample 349 was equally rich and contained a very similar range of house fauna, storage indicators, plant feeding-beetles indicative of legumes/clover and indicators of hides, skins or old bones. The sample was taken in the same location as sample 350 albeit at a higher level and from directly under the wattle mat, but it would appear that this corner of the house was used for storage of foodstuffs and other dry goods throughout its lifetime.

Sample 342 came from the deposit that sealed FS 90. House fauna dominated the mid-sized assemblage, as well as beetles found in multiple habitats, especially all types of litter. Outdoor species, including plant-feeding and dung beetles, are fairly well represented also. Overall, it is clear that this deposit has multiple origins and was open to the elements resulting in a fairly mixed habitat signature.

Plot 12, outside and inside FS 91

E190 360, 364, 365, 367 and 370: FS 91 was another large three-aisled house neighbouring FS 90. The northern and central parts of the house were better preserved than the southern aisle area. The northwestern corner of the house was evidently partitioned off. A cobbled path led up to the western doorway. Various kerbing was also evident around the hearth area. Sample 370 was taken from the final floor layer evident in the central aisle (F273) close to the hearth. This was a matted organic layer with visible straw, hazelnut shells, ash, clay and wood fragments.

Sample 367 came from one of the surviving layers in the southern aisle area (F275). F275 was a layer of black decayed straw and other plant remains, occasional shell and wood that sealed the primary floor of this aisle - a wood chip layer (F277).

The other three samples from this plot came from two large intercutting pits (F268A and 268B) located to the southeast of FS 91. The boundary wall between plots 11 and 12 respected the outline of these pits suggesting is belonged to the residents of FS 91. It can be assumed that 268B simply represented

a deepening and widening of the original pit 268A. Sample 364 came from the top fill of pit A and was dominated by matted plant remains with occasional bone and gravel inclusions. Sample 365 came from the bottom fill of pit B, and consisted of pure black matted organic matter, bones, seeds and fragments of wood. Sample 360 also came from a fill of the 268 pits but it is not specified whether it is from pit A or B. This matted organic layer contained visible plant remains, wood chips, bone, charcoal, seeds and shell.

Sample 370 from the central aisle deposit beside the hearth produced a very small assemblage of only 30 beetles, dominated by *A. brunneus*, which accounted for 14 of the 30. In addition, 25 examples of *Pulex irritans* were also recorded in this deposit. The partially-burnt and ashy nature of this deposit probably accounts for the low numbers of beetles and complete absence of flies. Flea heads, however, are extremely robust and survive well, even under otherwise poor preservation conditions.

Sample 367 from the south aisle produced a typical 'aisle' fauna totally dominated by house fauna, most notably *A. brunneus*. A large number of human fleas were also recorded in this deposit, suggesting that houses at this building level had particularly high infestations of fleas. *Dendrophilus punctatus* is the second most numerous species present, albeit on a very minor scale next to *A. brunneus*. The various pathways by which this beetle might have ended up in aisle floor deposits have already been discussed.

The final three samples will be discussed together as they all come from the intercutting pits in the yard of this plot. While sample 364 is probably stratigraphically slightly earlier than sample 365, the exact relationship between these two samples and sample 360 is not clear as a layer number was not specified in the sample register. However, it is possible that it is the latest of the three and that the intercutting nature of pit 268 and the designation 'A' or 'B' did not become apparently until after this layer was sampled and the pit feature was fully excavated. Sample 364 produced a relatively small fauna (as did all three pit fills), with evidence for mixing of both household waste and cess. House fauna accounts for over 50% of the assemblage, while dung/foul beetles makes up a relatively small proportion overall. However, fly species including *Coproica/Limosina* spp and *Potamia littoralis*, would point to the presence of human faeces and urine. It is likely that the pit fills were 'diluted' with household waste, in some cases possibly deliberated dumped to cap smells emanating from the pit. *Gracilia minuta* is found in this fill (and also in sample 360) and may have been in discarded wattle. This sample also sees the first record for *Blaps lethifera*, a beetle that is regarded as strongly synanthropic found primarily in indoor locations in cellars, stores, barns etc. It was first noted in a house deposit and pit fill from Christchurch Place and Wood Quay dating from 11th century (O'Connor 1979; Coope 1981). This date ties with the postulated date for Building Level 10 also. Either *B. lethifera* first arrived in the city at this time via shipped goods from Britain or further afield or this is the first time it becomes 'visible' in the record due to the intensive nature of settlement in Dublin at this time. Sample 365 produced a smaller assemblage, although the amount of material available was also smaller at only 2 litres. However, once again house fauna dominate, particularly the woodworm beetle *Anobium punctatum*, which may have been in discarded household waste or simply present in the plot generally in fences/posts and, indeed, the lid of the cesspit. Fly species are once again more indicative of human waste. One Mallophaga louse was also identified from this deposit. This could not be identified to species but Mallophaga (chewing or biting) lice are found on a wide variety of animals and birds. Finally, sample 360 from a later pit fill produced a small assemblage of beetles (58) but a very large assemblage of flies, in particular high numbers of *Thoracochaeta zosterae*, indicative of human faeces and urine. The presence of a single *Sitophilus granarius* (a link to FS 90 next door) is most likely due to ingestion of spoilt grain. Moderately high numbers of dung beetles could suggest the presence of animal dung too, however, all three species present can also inhabit rotting plant matter and may simply have found suitable breeding conditions within the pit.

Building Level 11

Plot 3, outside FS 92

E172 205 and 206: FS 92 was the only building built in Plot 3 during this period. It was a typical Type 1 house, erected on a sod foundation, but with internal sub-division features poorly preserved. The primary floor layer in the centre of the house was 233, a matted organic layer of plant remains, reeds, leaf litter, wood fragments and shell. Sample 205 came from this deposit.

To the east of FS 92 was an open area. The earliest deposit in the yard was a well-humified organic material, made up of finely broken down plant remains. Sample 206 came from this deposit. A coin of Athelred's reign (AD 1003-9) was found in the yard area to the west of FS 92.

These two deposits produced unusual assemblages given their locations. Sample 205 from inside FS 92 produced a very mixed assemblage of house fauna, dung and foul indicators, generalist decomposers tending towards the damper end of the spectrum and some outdoor ground beetles, typical of cultivated ground and gardens. There was also a varied range of flies, generally indicative of manure, dung, human cess, and lots of human fleas. It is possible that this mixed picture is a product of either a change of use of the building in its final phase (to temporary byre) or complete abandonment. Strangely, the deposit from outside the house (sample 206) produced a more typical 'indoor' assemblage (except that it was very small) dominated by house fauna and human fleas. One human louse, *Pediculus humanus*, was also recorded in this deposit. A higher number of water and damp ground beetles than might be typical of indoors is one of the only indicators of its outdoor origin. It is likely that this deposit was almost entirely derived from an indoor location, possibly sweepings from the house.

Plot 4, FS 93

E172 221: Again, Plot 4 showed a paucity of building activity at this level. A partially surviving arc of double wattle walling suggests that a building stood here, however, as well as a foundation of sod material (172). Two timbers within the house may have been associated with internal divisions but most of the other internal features did not survive. Sample 221 came from the foundation sod layer. It consisted of matted plant remains, shell, bone and stones. It produced quite a mixed signal largely dominated by house fauna but with other habitat groups well represented, especially generalist decomposers like *Ptenidium* spp., *Acritus nigricornis* and *Leptacinus*. A high number of foul-indicating fly species were also recorded here suggesting mixing of both sod and foul trampled material in building up the footprint of the new building. However, the fact that the house was so completely dismantled/destroyed may also be a factor in the high number of fly species recorded as this deposit may have been exposed for some time prior to building resuming in this plot at Building Level 13.

Plot 9, FS 97 and 'outbuilding' 532/533

E190 418, 419 and 422: FS 97 was founded on a layer of estuarine clay, which may have been laid deliberately to level the ground before construction. Later features largely removed the southwestern corner of the house, however, the rest of the building was very well-preserved. The outer double wattle walls still had their packing between them. There was an entrance to the west and to the east with elaborate door-jambs. The house was divided into three aisles, as usual, and the three surviving corners were also subdivided and partitioned, with possible doors. Some of these corners had wattle mats on the floors. Sample 418 came from the main floor deposit F503 (location not specified) in the north and south aisles and in the northeast and northwest corners. This material was described during excavation as 'soft organic flooring, containing brushwood, wood chips, vegetal material, flint nodules, scraps of hide'

(sample register). During processing the material appeared more like chewed grass or manure. Sample 419 came from the same deposit but specifically under wattle mat F506 in the southern aisle, west of one of the internal roof supports (F9/23). In this location F503 was black, matted organic material with wood fragments, straw and other plant remains.

Outside FS 97 towards the eastern end of the plot, two wattle walls and a series of upright planks may have formed part of an outhouse, designated Building F532/533. It appears to have been built on top of a widespread layer, F527. This appears to be yard material rather than sod but served as the foundation level for the building. Sample 422 came from this deposit. It consisted of brown-black organic clay with visible stones, bone and shell.

Sample 418 and 419 produced similar assemblages, although 419 was richer in terms of house fauna, most notably *A. brunneus*. Both contained similarly high numbers of *Dendrophilus punctatus*, *Xylodromus concinnus* and *Anobium punctatum*. *Blaps lethifera* and *Hylotrupes bajulus* are both present in this house. 419 also produced moderately high numbers of house fly puparia and one possible *Bovicola ?caprae* louse, which is primarily a parasite of goats (but also cattle, horses, pigs and sheep). 418 also produced a large number of *Formica* ants. Various *Formica* species build nests in leaf litter, twig mounds and tree stumps. Presumably they found many suitable habitats among the wattle structures of Fishamble Street. The wattle mat doesn't appear to have added any specific wood-related species to the assemblage.

The assemblage from the 'foundation' deposit in Building 532/533 was an interesting mix of house fauna and dung/foul beetles, with a higher than usual representation of damp ground indicators. While the sample came from within the footprint of the outbuilding, its clear that the widespread 'yard' deposit on which the structure was built had an influence on the composition of the fauna. High numbers of *Neobisnius villosulus*, *Carpelimus bilineatus/erichsoni* and *Anotylus rugosus* suggest muddy, damp foul conditions, similar to stable manure. *Esolus parallelepipedus*, a riffle beetle, suggests the presence of water from the river within the building. A mix of fly species are also suggestive of foul ground conditions, including urine-soaked plant matter, and a single example of a sheep ked, *Melophagus ovinus*, may hint at one possible use of the outbuilding as a byre. Animals may have been temporarily housed in this and other outbuildings prior to export or prior to processing for wool and food products.

Plot 11, FS 99

E190 441, 444, 445, 446, 455, 456, 457, 458 and 459: FS 99 appears to have been constructed in Plot 11 after a fallow period. During the fallow period, various accumulations of possibly dumped rubbish built up. One deposit, 602, consisted of mixed blackish-green organic material, straw, nutshells, slag and bone. Sample 458 came from this material.

This produced a small interesting assemblage with high numbers of dung and stable manure associates. Moderately high numbers of fly puparia, including blow flies, attest to generally foul conditions within the plot prior to construction of FS 99. This is not surprising if the plot lay fallow for any length of time.

FS 99 was a three-aisled Type 1 house with partitioned corners and entrances west and east. An outer wattle wall existed to the east, which may have served as a revetment for the foundation layer of the house. It was filled with a shelly, clayey deposit. A similar feature was recorded in the southwest corner. Sample 457 possibly came from the wall-packing fill in this location, although a specific location was not given for the material sampled, it was simply described as 'from wall of house'. The material was very organic with lots of wattle fragments. It produced a very large rich assemblage, dominated by house fauna but not overwhelmed by *A. brunneus*. Instead, other house fauna species more indicative of the super-structure of the house are present in high numbers including *Anobium punctatum*, *Mycetaea hirta*,

Ptinus fur and *Tipnus unicolor*. The latter three may have come from the straw and hay that was used either to pack the wall or used in the roof. Large numbers of certain decomposers indicative of damp, foul conditions, including dung, may lend credence to the suggestion that dung was used in the fill of the walls and/or to provide insulation on the exterior. Once again, moderately high numbers of beetles indicative of animal hides, skins or birds nests, are recorded from this deposit, including one only found in this deposit, *Nitidula rufipes*. This beetle is also known from dried and cured meats. Certainly, birds nesting in the roof eves could explain their present. Equally, skins or hides used as wall hangings might explain their present or stored meat products hanging in this corner of the house. Few fly puparia are recorded from this deposit, perhaps unsurprising, given the confined or protected nature of the location.

Wattle walls erected on drilled frame bases demarcated the aisles inside the house. The primary surface in the central aisle was F457, a compact organic layer charred in places and containing many hazelnuts. This deposit also extended into the western part of the building. Sample 446 came from this material. Eventually, the central floor area was covered by F416, a gritty organic mixed layer, with sand, ash, shell, stones and hazelnut shells. This may represent the final activity phase of this house or possibly even an abandonment phase. Sample 441 came from this material.

While there isn't a marked difference in the range of habitats represented in the two samples, there is a dramatic difference in the productivity of the two samples, with the original floor layer (sample 446) producing a large assemblage and sample 441 a very small one. This would suggest that preservation conditions were not as good in deposit F416. However, this may simply be due to hearth material becoming incorporated into the floor, rather than abandonment of the house entirely. Proportionally, house fauna dominate both samples with *Aglenus brunneus* the most frequently occurring species. However, in sample 446, large numbers of *Anobium punctatum, Tipnus unicolor, Mycetaea subterranea* and *Xylodromus concinnus* mirrors aspects of the rich 'hay' and structural wood fauna found in the wall packing. Along with very high numbers of *Formica* ants, it perhaps suggests longevity or stability of this deposit - exposed for a long time and incorporating beetles falling from the roof as well as those living within the floor itself. Interestingly, the potential 'birds nest' or 'skin/hide' element of the wall packing and house corner assemblages is not apparent here.

In the northern aisle, the primary layer was F460, a mixed organic layer comprised of clay, sand, plant remains (inc. reeds), charcoal, shell and some ashes. Sample 459 came from this material. Above this was recorded a further organic layer, F458, with some clay and wood fragment inclusions. Sample 444 came from this deposit. A brushwood layer, F441, was laid above this again. It covered an area almost 4m long (east-west) and was comprised primarily of wood fragments with clay inclusions. Sample 445 came from this layer.

Sample 459 from the primary deposit in the north aisle was poor in terms of numbers, producing an assemblage more characteristic of outdoors than indoors. The pre-house layer 602 (above) on which the house was built may have influenced this assemblage with foul-indicating fly puparia just as numerous as beetles. However, the clay and sand in the deposit may simply have been inimical to good preservation. Sample 444 from the deposit laid over F460 produced a more typical side-aisle assemblage with high numbers of house fauna, especially *A. brunneus,* and stored product and indoor species such as *Tenebrio obscurus* and *Blaps lethifera*. *Sitona striatellus* is an interesting inclusion here as it is generally found exclusively on gorse, which is perhaps unlikely to have been used as bedding material for people. However, the presence of a small number of dung beetles may indicate that this is part of a stable manure signature as gorse was regularly fed to cattle as a winter feed in the early medieval period. The final deposit in the north aisle produced a similar sized fauna to sample 444, but with a more diverse range of house fauna, especially high numbers of *Anobium punctatum*, *Xylodromus concinnus* and *Mycetaea*

subterranea. The high numbers of *A. punctatum* are a recurring feature of this house, again adding to the notion that this house was long-lived. *M. subterranea* and *X. concinnus* are likely to have been in hay/straw used in the bedding zone and/or in the roof above the aisle. High numbers of *Dendrophilus punctatus* again suggests the presence of skins or hides covering the bedding area or the presence of bird's nests in the roof.

Outside the building to the west a woven wattle pathway (F468) was laid down over which a later plank pathway was laid (F450). Samples 455 and 456 were taken from the yard area between the southern boundary wall and the wattle screen (455) and north of this screen (456). No context numbers are listed in the sample register but the location descriptions are very specific. The deposit sampled were similar - matted plant remains with gritty inorganic inclusions, shells, bone and charcoal.

The two samples produced similar large foul/dung-rich assemblages, with numerous beetles associated with damp wet stable manure, rotting vegetation, grassland plants and urban weeds. The necessity for the wattle and plank pathways is clear, as underlying ground conditions in the yard were clearly very mucky! The sheer number of stable manure/dung indicators would strongly suggest that animals were kept within this plot and perhaps explains the slightly 'dungy' signature of some of the indoor deposits.

Building Level 13

Plot 3, FS 94

E172 235: Within Plot 3 at this level was a type 1 house FS 116. Towards the western end of the plot lay FS 94, which may have been a small Type 5 'outbuilding' or simply a pen. The walls were erected on the general deposits recorded across the whole plot in this area. The upper layer was a mixed stoney organic deposit with visible shell, wood, bone and plant remains (F135). Sample 235 came from this layer. While this is the 'floor' of FS 94, it could also be regarded as an outdoor yard deposit if FS 94 was a pen and unroofed.

The assemblage from this deposit was small and mixed, with moderately high representation of house fauna taxa but dung, foul, outdoor and water-side beetles are also present. There is nothing in the assemblage to confirm that the structure was unroofed or only used as an animal pen. Indeed, the number of true dung associated is relatively small. Therefore, the exact use of this building is not clear from the beetles. Many central aisle samples are similarly mixed, while some yard deposits are similarly numerically poor. The high inorganic content of the deposit may be the main reason for the poor assemblage.

Plot 4, FS 104, Building 106/107 (Q) and associated pit

E172 243, 245, 249, 247 and 251: The main building in Plot 4 was a Type 1 house FS 104. It was located at the eastern end of the plot and the interior was much damaged by a later pit (pit G). A wattle-lined drain ran out of the west doorway. A gravel layer and some cobbling were laid down in southwest corner. The house was built on a sod foundation layer (F137), a layer of compacted plant remains with shell and wood fragment inclusions. Sample 249 came from this layer. Much of the interior was then covered in various mixed organic layers. Layer F79 cover the north aisle and comprised black matted organic material with visible plant remains, twigs and shell. Sample 245 came from this material.

Sample 249 from the sod produced a large assemblage dominated by house fauna but with a high number of plant-feeding beetles. *Sitona lepidus* and *S. hispidulus* are both found on clover and other ground herbs and may be reflective of where the sod came from. However, a moderately high number of dung beetles,

especially *Aphodius contaminatus*, might also indicate a stable manure signature, something that is not uncommon in foundation level deposits through mixing with fouler yard material. Overall, the deposit isn't particularly foul though so the former explanation is still possible. The most frequently occurring species (after *A. brunneus*) is *Xantholinus linearis*, a beetle found in litter of all sorts and frequently found in dry decomposing matter both indoors and outdoors during this period. Sample 245 from the north aisle produced a large rich fauna, dominated by *A. brunneus*, *Anobium punctatum* and *Xylodromus concinnus*. The lower numbers of *A. brunneus* suggests that this floor is not as clean or dry as is normally the case for north aisle samples. This may be as a result of mixing or taphonomy due to the later disturbance by pit G or may simply be a reflection of a very late or post-use phase of the building. Dung beetles, 'outdoor' ground beetles and lots of generalist decomposer species also suggest more mixing than normal. One example of *Melophagus ovinus* (sheep ked) sees an interesting link with buildings from previous levels. Sheep keds normally stay with their hosts and their presence in deposits may be as a result of processed wool in the house or close contact with sheep in the town. Wood dependent beetles from this deposit (apart from *A. punctatum*) include *Ptelobius vittatus* (ash/elm), *Gracilia minuta* (wickerwork/wattle – hazel, willow) and *Hylotrupes bajulus*. The presence of *Bruchus* sp. suggests the presence of contaminated beans or other pulses. A very high number of *Formica* ants, similar to houses at Level 11, might suggest stability or longevity of this deposit and perhaps, by extension, this house.

Outside the west doorway was a badly preserved timber pathway, a small area of brushwood and cobbling. Just west of the northwest corner of the house was an arc of post-and-wattle walling (F136). Sample 243 came from an accumulation of organic 'straw-like' material within this yard area, F67. The moderate-sized assemblage had a very similar profile to the indoor samples, dominated by house fauna and with very small percentage presence of dung/outdoor beetles. A proportionally high number of plant feeding beetles may come from straw or other gathered plant material or from urban weeds within the plot. It is likely that the majority of this dumped material came from within a house, however, probably sweepings-out of floors.

A number of other buildings were erected in Plot 4 during this period. Building 106/7 (Q) was located in the southwestern corner of the plot. The building only partially survived, primarily the fairly substantial northern wall, the curving western wall, a possible northern aisle internal division and a series of wattle mats. It was not entirely clear if the building was a three-aisled Type 1 building or a smaller Type 3 building ('106' is listed as Type 3 in PFW book, '107' as Type 1). The whole building was founded on a foundation sod deposit, F66. This was a compact clayey organic layer with visible plant remains and shell. Sample 247 came from this deposit. This produced an unusual rich but highly mixed assemblage, certainly suggesting that this is not a typical 'indoor' deposit. Foundation deposits do tend to be mixed and many have a higher presence of outdoor and dung beetles as this assemblage does. However, this deposit has a very high presence of damp ground (*Neobisnius villosus*), muddy ground (*Dryops* spp), brackish water (*Ochthebius ?punctatus, O. ?marinus*), freshwater (*Esolus parallelepipedus*) and stagnant water beetles (*Helophorus aequalis*, other *Helophorus* spp). This suggests that either water was gathered/stored in this building perhaps for watering animals or, possibly, that the clay that formed this foundation deposit came directly from the riverbank. High numbers of *Anobium punctatum* presumably came from structural timbers in the building.

Outside this building to the north was a cobbled east-west path, which partially overlay a wide shallow pit filled with a variety of silty/gritty loam layers. One of theses, the second layer from the base, F166, was sampled (sample 251). This layer included matted plant remains and shells. The relatively small assemblage from this pit fill had a strong cesspit signature, with fly species *Potamia littoralis* present, as well as *Cercyon haemorrhoidalis* and *C. unipunctatus*, the latter two common in cesspits of this time. There was a moderately high representation of house fauna, probably present through mixing of household

sweepings or additions of straw to the pit to cap the smell emanating from it. Overall it was a small assemblage though suggesting perhaps that this was a temporary pit not used for a long time.

Plot 5, FS 120

E172 253: The fairly ephemeral remains of FS 120 were located in Plot 5. It was probably a Type 1 house. Small amounts of the northern and southern wall survive, as well as a partial wattle screen and ash spread, possibly associated with a hearth. No context numbers are given for the foundation sod layer of this house but sample 253 came from this deposit. It was a compact clayey organic layer. The building may have stood open for sometime after it went out of use. The assemblage from this foundation layer was not large and was quite mixed, similar to previous foundation layers. House fauna are proportionally high (*A. brunneus*, *A. punctatum*) but other habitat groups are also well represented especially generalist decomposers, foul decomposers and outdoor beetles. The seaweed or cesspit fly, *Thoracochaeta zosterae*, was frequently recorded, which suggests the presence of human cess/urine. However, the mixed nature of the fauna may simply be a reflection of abandonment of the building or the fact that the floor deposit was largely inorganic.

Plot 10, timber pathway complex F8B

E190 497: Unfortunately, there are very few structures in Fishamble Street III (E190) at level 13. The only useful sample that could be examined was from a timber pathway, F29, part of a complex pathway feature F8B. F29 comprised about eight planks laid east-west, covering an area of 1.8m by 0.8m. This may have served as a path in its own right or simply as a foundation level for the F8B pathway, a combination plank, brushwood and stone feature. Sample 497 was taken from the organic build up around and between the planks of F29 and comprised reed-like plant remains and wood chips. This produced a very small beetle assemblage, mainly house and dry decomposer fauna, but a large number of *Thoracochaeta zosterae* puparia was also recorded. This fly, as already mentioned, occurs on decaying seaweed but is also known from cesspits from this period. It suggests that either seaweed or urine-soaked plant matter was incorporated into the organic build up between the planks. There are few other true foul/dung indicators. It is a curious mix.

Building Level 14

All samples from this level are from Fishamble Street II (E172). No suitable samples existed from the final identified buildings in Fishamble Street III (E190). Building at this level was sporadic but some plots had more activity than others. A small number of samples were chosen from amongst those available to ensure the level was represented.

Plot 2, FS 101

E172 257: A very small section of a building of unknown type survived at the centre of this plot, FS 101. Within the house a clay floor, F151, was identified underneath which a thin organic layer, F152, was also recorded. It was yellowish brown in colour with clay and matted plant remains. Another clay floor (153/155) was identified beneath this layer. Sample 257 came from layer F152. It is possible that this represented an old floor surface but may also have come from earlier activity within this plot.

Sample 257 had a small mixed assemblage with house fauna proportionally the most frequently occurring species. However, small numbers of other habitat indicators, including generalist decomposers, water beetles, dung beetles and grassland plant feeders, also occurred. Two unusual wood-dependents were recorded here – *Rhizophagus bipustulatus*, found under bark of many broadleaved trees but not currently

known from Ireland, and *Ptilinus pectinicornis*, in dead wood of many tree species and also known as a furniture pest. *R. bipustulatus* was previously recorded from Tumbeagh Bog, Co. Offaly (Reilly 2006) and *P. pectinicornis* from 12th/13th century deposits in Peter Street-Olaf Street, Waterford (Reilly 1994). They may have come from structural wood alongside *Anobium punctatum* and *Hylotrupes bajulus*, which also occur in this deposit. The number of foul-indicating fly puparia species recorded would suggest that the deposit was trampled and mixed and perhaps did represent an old floor surface within this house.

Plot 3, FS 102, FS 103 and path AY

E172 259, 261, 265, 266, 269 and 268: In contrast to Plot 2 a number of reasonably well-preserved buildings were found in Plot 3. These extended along the full length of the plot. FS 122 was a probable Type 1 house and was built at the eastern end of the plot. This house was either not sampled or no samples survive from it. In the middle of the plot was FS 102. This was also a Type 1 house of fairly small size with some of its internal features disturbed by a later pit. Wooden base plates, rather than wattle, marked out the aisles. There is some suggestion of further sub-divisions of the northern aisle in particular. A complex stratigraphy was recorded within the house with early layers respecting the sub-divisions. Later layers appear to cover the whole floor area and may suggest a change of use for the building during its lifetime.

Sample 259 came from 'F98', which is not mentioned in the stratigraphic report. However, the sample register is quite definite in its description of this deposit as 'stomach contents from F98, in house AQ (i.e. FS 102)'. The material does appear to be chewed grass and it may have been a small isolated deposit within a larger floor layer. Samples 265 and 266 came from floor layers F90 and F92. These organic layers appeared to be spread across the whole house at an early stage and may pre-date the subdivisions. In both cases they appeared as black matted organic material with visible charred hazelnut shells, wood chip and waste wattle pieces. Sample 261 came from organic layer F42, which covered the southern aisle area (post-dating 90/92). It was comprised of dark brown matted plant remains, wood chips, waste wattle and hazelnut shells.

Samples 259 produced a small beetle and fly assemblage mostly indicative of decomposing plant matter and foul material. The most frequently occurring species was *T. zosterae* and it is likely that this deposit was a small isolated deposit of manure. Samples 265 and 266 came from the central aisle area of the house. While different context numbers are given, the layers appear to be essentially similar in matrix and, importantly, may pre-date the aisles. This may suggest, for example, a change of use for this building? While house fauna are well represented in both deposits, the largest habitat group represented in both is the generalist decomposers, particularly those from the fouler end of the decomposer spectrum e.g. *Carpelimus bilineatus/erichsoni, Oxytelus sculptus, Gyrohypnus fraticornis, Xylodromus* spp and *Cercyon analis*. While true dung beetles are not common, other dung beetles that also live in putrefying plant matter and both human/animal excreta such as *Cercyon unipunctatus, Oxytelus laqueatus* and *C. haemorrhoidalis* are present. Along side fairly high numbers of foul-indicating fly puparia in sample 265 (F90), its is most likely that the early phase of this building was not a typical house for human occupation. It may have served as a temporary byre or was abandoned for a while after being initially constructed before being subsequently re-occupied and sub-divided, as the archaeological interpretation suggests. Interestingly, sample 265 produced high numbers of *Neobisnius villosulus*, found in damp litter beside rivers, and suggests that while the deposits were on a similar level, zonal differentiations did occur within the house (we are not exactly sure where these samples are located within the building, only that they seem to 'pre-date' sub-division into aisles). Sample 266 does not contain the same high 'dampness' signature as 265 nor are there any foul indicating fly puparia in this deposit. In other respects, however, the 'stable manure' and foul decomposing signatures of both assemblages are very similar. Sample 266 also produced two interesting wood-dependent beetles, *Gracilia minuta* and *Hylesinus oleiperda*, the latter

found in branches and twigs of ash and no longer recorded from Ireland. Sample 261 from the later south aisle deposit F42 produced a more typical 'side aisle' assemblage with high overall percentage presence of house fauna, especially *Anobium punctatum, A. brunneus* and *Xylodromus concinnus*. Certainly, the impression is of somewhat dried 'mouldy' hay-type conditions under foot here. However, there is an interesting mix of fly puparia present also, particularly those indicative of dung. Two sheep keds were also recorded here, a common theme in samples from Building Level 11 onwards. *Formica* ants were also present. Wood-dependent species *Gracilia minuta* and *Lepersinus varius* join high numbers of *A. punctatum* and probably come from the structural wood elements of the house. While the assemblage is more typical of 'human occupation' side aisles, the fouler elements in the fly puparia and the sheep keds would suggest that the previous deposits from the house's earlier may have become mixed with later deposits. Its also possible that animal husbandry of some sort continued in this plot, thus influencing the interior cleanliness of the house.

Outside FS 102 on the north side of the plot was a pathway AY comprised of a wattle layer (F119), stone paving (F49) and a wattle screen (F131). Sample 269 came from the wattle layer 119. The assemblage from this deposit produced a large mixed fauna with high numbers of house fauna, primarily *Anobium punctatum*, and generalist decomposers, particularly *Cercyon analis* and *Carpelimus bilineatus/erichsoni*. Alongside damp-ground species like *Neobisnius villosulus*, water beetles like *Ochthebius bicolon*, and dung beetles like *Platystethus arenarius*, clearly wet-decomposing and foul material built up around and along the pathway. The presence of small number of 'outdoor' ground beetles and urban weed/grassland plant feeding beetles would also appear to corroborate this picture. Large numbers of ants were also recorded in this deposit and clearly the wattle layer was an ideal habitat for nest-building. Wood-dependent beetle *Rhopalomesites tardyi* and *Gracilia minuta* presumably also came from the wattle.

FS 103 was a small Type 5 building at the west end of Plot 3. A doorway in the north wall led out into a small yard area between the boundary fence and FS 102. A later pit disturbed most of the interior. The western end was partly divided from the rest of the building by a large timber (F114). Sample 268 appears to come from a wood chip layer (F32) in the western end of the building, although this layer is not specifically describe in the stratigraphic report. The deposit was made up of matted plant remains, wood chips/waste wattle and decayed shell. It produced a moderate sized mixed assemblage of house fauna and generalist decomposers, generally those indicating fouler habitats. *A. brunneus* does not occur in high numbers and the most frequently occurring species in the assemblage is the fly *Heleomyza serrata*, which is found in the humus layer of soils and in birds nests. The assemblage would appear to reflect the abandonment of the building rather than an active occupation phase. However, it probably wasn't unroofed as we might expect to see more damp/muddy ground and water beetles in that case.

Plot 4, outside FS 118

E172 273: Two buildings were constructed side by side at the eastern end of this plot, though FS 117 is actually later than FS 118. FS 117 was a Type 1 house and FS 118 a smaller Type 3 and much less well preserved. However, no suitable samples exist for the interiors of either. Instead, sample 273 came from a wattle-lined drain feature, F72/73, which ran out through the centre of the west doorway to pit AC. This was filled with an organic/clayey mix with visible shell and hazelnut shells. The assemblage from this drain fill was rich and mixed, with an equally high proportion of house fauna and 'multiple habitat' fauna, especially *Quedius/Philonthus* spp. Members of both these large genera occur in a wide variety of habitats from grassland to river shingle, from carrion to rotting plant matter and dung. This suggests that the drain may have been acting as a 'pit fall' trap for surface fauna generally ubiquitous in the urban environment. Also present were moderately high numbers of 'outdoor', foul, damp ground indicators and beetles found in decaying wood. Of the latter group, *Scolytus scolytus* was an interesting addition to the wood-dependent fauna from Fishamble Street. Elm played a role in house construction here

and the presence of the elm bark beetle, alongside other indicators of elm and ash (*Ptelobius vittatus*), clearly demonstrates its use in this plot. However, the most numerous taxon recovered in this deposit was *Thoracochaeta zosterae*, the seaweed fly, 139 puparia in total. This would seem to indicate that the primary fill of the drain was human waste, possible urine-soaked plant matter or faeces. There are no other indicators of seaweed, as such, so it seems unlikely that this is why *T. zosterae* was breeding in the drain. It is also possible that some other combination of factors provided attractive breeding conditions for this fly, perhaps waste from the manufacture of plant or animal products. The fact that FS 118 was a smaller Type 3 house certainly allows for the possibility that this was not a domestic structure but rather a workshop or outbuilding of some sort.

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Online tables

Table I: List of samples analysed, grouped according to contexts - http://doi.org/10.32028/9781803276526-TableI

Table II: Summary of sample productivity – total number of beetles per context group and average MNI - http://doi.org/10.32028/9781803276526-TableII

Table III: Boulder clay and Building Level 1 - http://doi.org/10.32028/9781803276526-TableIII

Table IV: Building Level 2 - http://doi.org/10.32028/9781803276526-TableIV

Table V: Building Levels 3 and 4 - http://doi.org/10.32028/9781803276526-TableV

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Table VII: Building Level 7 - http://doi.org/10.32028/9781803276526-TableVII

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Table IX: Building Level 10 - http://doi.org/10.32028/9781803276526-TableIX

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Table XI: Building Level 13 - http://doi.org/10.32028/9781803276526-TableXI

Table XII: Building Level 14 - http://doi.org/10.32028/9781803276526-TableXII

Table XIII: Insect analysis from Drumclay AE/10/99 - http://doi.org/10.32028/9781803276526-TableXIII

Table XIV: Preliminary parasite analysis from Fishamble Street - http://doi.org/10.32028/9781803276526-TableXIV

What would it have been like to walk down the streets of Viking Age Dublin a thousand years ago? What would you have seen, heard and smelled? How would this urban settlement have been different from an early medieval rural dwelling of this time – a rath, a crannog or dún situated in the countryside? Such questions not only potentially interrogate the reality of people's lives in the past, but also open up topics such as diet, health and disease in urban and rural settings, the alteration and management of past environments and emergence of new forms of urban and rural communities in Europe.

This book explores the living conditions and environments as experienced by early medieval people in Ireland, touching upon a wide range of environmental, architectural, artefactual and historical datasets from significant archaeological excavations of settlement sites across Ireland and Northern Europe.

At its heart it focuses on a new and significant body of insect analysis from one of the most iconic sites of Viking Dublin – Fishamble Street. These new data are discussed with reference to other excavated and previously published research, especially from the rural rath at Deer Park Farms, Co. Antrim, and some preliminary data from Drumclay Crannog, Co. Fermanagh.

The book concludes with a wider discussion of dirt, disease and hygiene in early medieval Ireland: what can the environmental data and historical texts tell us about the way that people in early medieval Ireland felt about and interacted with 'dirt' and dirty places?

Eileen Reilly completed her BA in Archaeology and Geography at University College Dublin, followed by a MSc in Environmental Archaeology and Palaeoeconomy at Sheffield University. She then completed a Diploma in Environmental Impact Assessment Management, University College Dublin, and in 2008 she was awarded a PhD from the Botany Department, Trinity College, Dublin. In 2015 Eileen finished a Government of Ireland Post Doctoral Research position at University College Dublin. Her research was titled 'Dirt, dwellings and culture: reconstructing living conditions in early medieval Ireland and northwestern Europe AD 600-1000' and forms the basis of this book.

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