CHAPTER 16

The Black Rat

Kevin Rielly

Introduction

Present knowledge about the early history of Britain's black rat (*Rattus rattus*) is based almost entirely on information gleaned from archaeological excavations of the last 30 years. Before 1970 it was generally agreed the species was introduced in the late eleventh century by returning Crusaders (Barrett-Hamilton and Hinton 1910–1922, 582). Then came two breakthrough archaeological discoveries, the first from St Magnus in the City of London where a juvenile rat femur was identified from a late tenth-century deposit (Armitage 1979) and the second from Skeldergate, York, where fourth-century well fills yielded several rat bones including a complete skull (Rackham 1979). Subsequent finds occasioned a series of articles on the species (Armitage *et al*.1984; Armitage 1994; Dobney and Harwood 1998; McCormick 2003; O'Connor 1991a) and their accumulated evidence has pushed back the introduction date suggesting that rats arrived shortly after AD 43. It is now thought that, although black rats

FIGURE 34. Medieval black rat skull (*centre*) compared with modern black rat (*left*) and brown rat (*right*).

Century A.D.	England	Wales	Scotland	Ireland	Isle of Man
1st	6				
2nd	10				
2nd/3rd	2	1			
3rd	1				
3rd/4th	9				
4th	7				
4th/5th	1				
6th/7th					
8th/9th	2				
9th/10th	3				
10th/11th	8				
10th–12th					1
11th/12th	13				
12th	2			1	
12th/13th	13		1		
13th	10				
13th/14th	6			2	

TABLE 8. Inter-period variation in the number of sites on which rat are represented (source Rielly in prep. a).

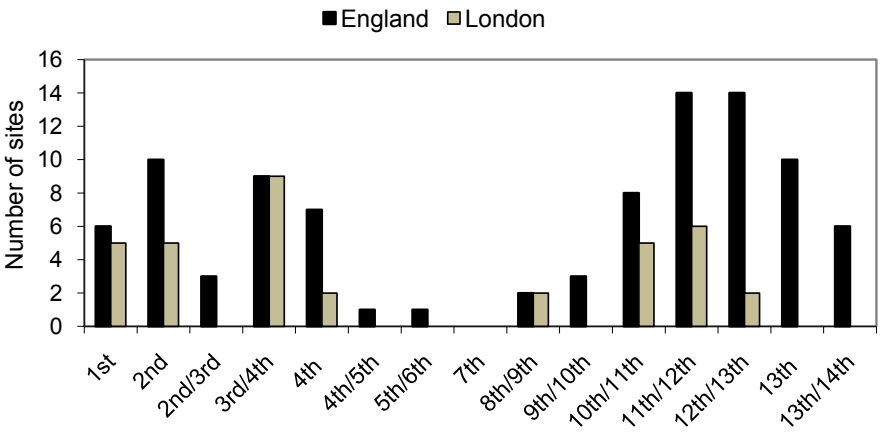

FIGURE 35. Inter-period variation in the number of sites which rat are represented (source Rielly in prep. a), separating London from the rest of England.

were distributed throughout Late Roman Britain, their population collapsed in the Early and Middle Saxon period, only becoming re-established in the late Saxon and/or early medieval period.

This chapter reviews the Roman and early medieval evidence for the black rat's introduction and spread. Discussion is based on an extensive dataset, synthesised from both published and grey literature (Rielly in prep a) and summarised in Table 8 and Figure 35. The dataset's reliability is dependent on

issues of identification, dating and recovery. Here it has been assumed that the researchers whose records have been collated for this study made every attempt to differentiate black *Rattus rattus* from brown rat *Rattus norvegicus*, as well as from their similarly-sized relative, the water vole *Arvicola terrestris*. In general, it is easier to separate rat from vole than black from brown rat, the greater level of identification dependant on skeletal part and completeness (Lawrence and Brown 1973, 196, Wolff *et al*. 1980 and Armitage *et al*. 1984). For this study problems of misidentification are alleviated somewhat by the fact that the brown rat was not introduced to Britain until the eighteenth century (Yalden 1999, 183); for this reason specimens identified only to *Rattus* spp have been included in this study. It is possible that either re-deposition or the burrowing habit of the brown rat could affect dating of the specimens. In order to limit these factors, the study has only included specimens from well-sealed deposits containing associated dateable materials covering no more than 200 years. It is more difficult to account for burrowing because such diggings rarely show in the archaeological record; however the deep post-medieval overburden seen on urban sites should have guarded the Roman and medieval against the more recent activities of the brown rat.

Sieving is invaluable for the recovery of small mammal bones (see Brothwell and Jones 1978, 48), and it is no surprise that the major discoveries, summarised above, coincided with the onset of systematic sampling. The efficacy of this retrieval method varies according to sampling procedure and the size of the sieves' mesh but most of the specimens detailed in this report were retrieved using mesh of 2mm or less. Sieving is important not only for indicating the presence of rats but also for highlighting their absence. Negative evidence is particularly pertinent when comparing the species' distribution with areas outside England and also when illustrating the apparent lack of rats from Early and Middle Saxon deposits. The sample evidence has also been used as an approximate indicator of relative abundance, essentially limited to York and London, noting the proportion of samples with rat bones (after O'Connor 1988, 105).

Distribution of rats from Roman times to the medieval period

Rat bones from Roman levels are no longer limited to the third- and fourth-century examples described by Armitage *et al.* (1984, 375) and there is now clear evidence that black rats were established in Britain at an earlier date (Figure 36). The earliest securely-dated rat bone (a pelvis identified by Philip Armitage), was recovered during excavations at 168 Fenchurch Street from an occupation deposit within a multi-roomed mud-brick building, which was burnt to the ground during the Boudican revolt of AD 60/1 (Dunwoodie 2004, 15–20; Rielly 2004, 59). The means whereby this particular animal, or a close relative, was imported to London may be indicated by the concentrations of carbonised grain found in an adjacent room within the same building. While these grain samples were dominated by wheat, with some barley and oats, there were also

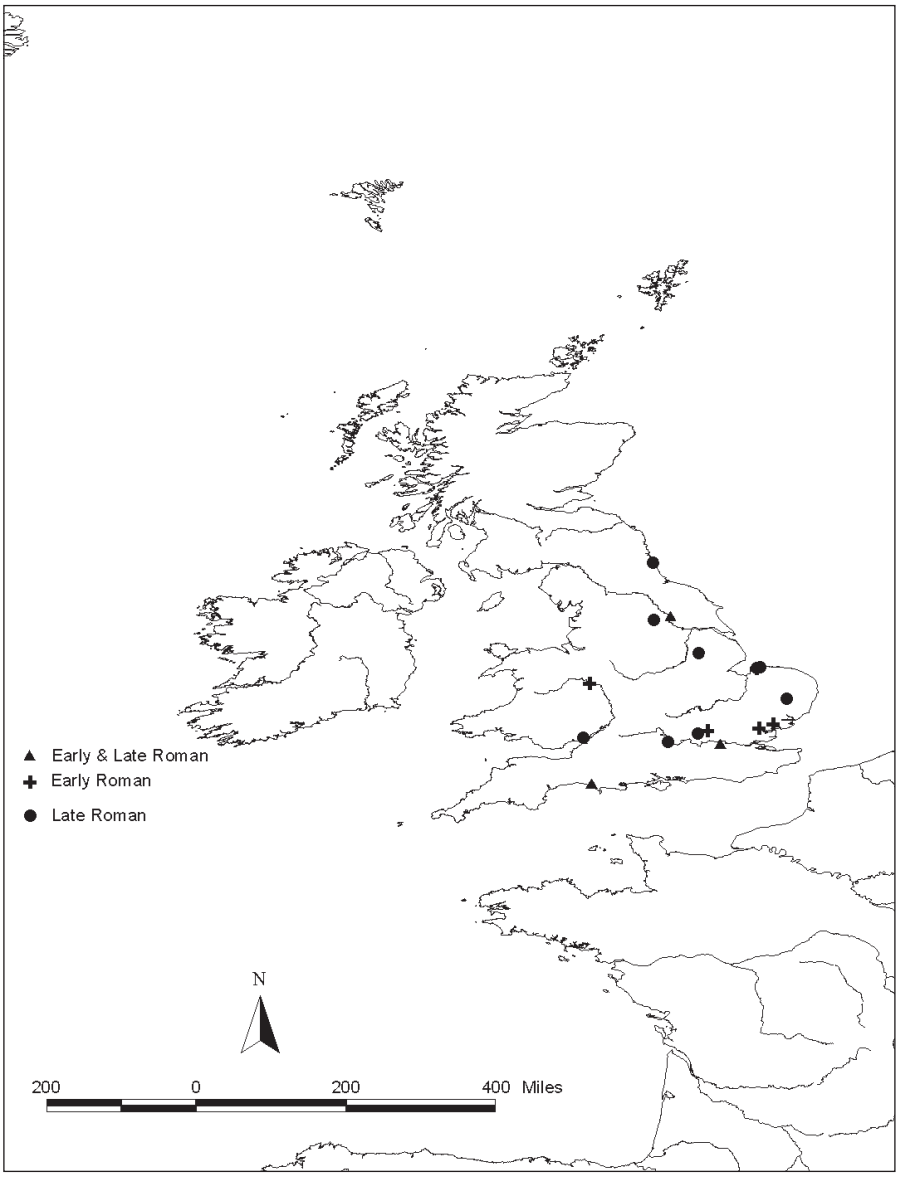

FIGURE 36. The distribution of Roman sites with rat bones (source Rielly in prep.).

small quantities of lentils, einkorn and bitter vetch seeds. The last two were essentially Southern European crops and their presence strongly suggest that the grain was imported, most probably from the Mediterranean or Near East. It is logical to assume that the rats were carried along as 'unwelcome companions' (Davis 2004, 56–7) and, after disembarking from the ships, quickly exploited the sources of food and habitation offered by the restaurants and warehouses of Roman London. This is exemplified by other first-century examples from London which include a tentatively-identified axis from a dump deposit at 1 Poultry (Pipe in prep) but also a more substantial collection (19 bones from

at least three individuals) recovered from Fish Street Hill. These remains came from a well, located in a small enclosed yard, that contained large quantities of rubbish (fine wares, glass and other objects, as well as large concentrations of food waste, especially bird and fish bones, cereals, spices and fruit seeds), interpreted as the refuse from a nearby inn (Rielly and Davis in prep). In this deposit the rats were accompanied by the remains of at least 15 house mice, suggesting the efficacy of this feature as a pit-fall trap and perhaps the presence of a notable rodent population in this area at this time. Certainly the species appears to have colonised the main suburb of Southwark by the end of the first century, as evidenced by the single black rat femur recovered from the Southwark Cathedral site (Armitage in prep).

The first-century date of introduction in London is reflected in other parts of England. For instance rat bones were recovered from a Romano-British enclosure settlement unearthed at Ivy Chimneys, near Witham, south-west of Colchester in Essex (Luff 1999). Shortly after the Conquest this settlement was bisected by the London to Colchester Roman road, which would have offered a perfect route for the inadvertent export of rats from London. At Wroxeter in Shropshire a rat skull and mandible were recovered with several other small mammal bones and it is assumed these represent the remains of one or more owl pellets (O'Connor 2002, 62). They were located amongst the ruins of the legionary fortress, abandoned in the late first century. A similar date may apply to these remains; however, it is always possible that these ruins were used as a convenient owl roost or perch for some years following their abandonment. Another possible early find is the rat from the enclosure settlement at Thornham near the north Norfolk coast (Lawrence 1986). The site has been generally dated to the first century, but the rat bone(s) as Romano-British.

Rat remains have been recovered from a greater number of second-century sites. For London almost all the specimens come from the suburb of Southwark, with the exception of a single bone from a pit possibly associated with a building at 2–12 Gresham Street (Ainsley 2002; Rielly in prep b). These rat bones were all recovered from sites within the southern part of the Jubilee Line Extension (JLE) project, with excavations adjacent to London Bridge Station. A notable feature of these sites and, in particular, from the Main Ticket Hall, Borough High Street, was the recovery of dumps with copious quantities of carbonised seeds (Gray 2002, 249). There is no evidence for foreign imports (einkorn or bitter vetch) amongst these grain dumps, so it cannot be deduced whether the Southwark rats were independently introduced or if they spread to this locality from the city across the river. However, it can be supposed that this 'concentration' of rats may bear some relation to the storage of grain in this area. Most of the JLE rat bones were recovered from deep features (wells and pits), apart from one bone taken from an occupation deposit associated with a building at the Area 8 site.

Beyond London, the second-century distribution of the black rat extends from York in the north to Dorchester in the south-west. The evidence for black rats from the more westerly and northern areas of Britain is rather sparse, with just

one find from the Roman town at Caerwent (*Venta Silurium*) in Wales, where deposits within the forum-basilica provided two late third-century rat mandibles and a third possibly dated to the second century (M. Maltby pers. comm.). The absence of rats from other Roman settlements in Wales may relate to the acidic soils found in certain areas, particularly in North Wales. Recovery methods are also likely to have biased the archaeological representation of rats because, although large collections of animal bones have been retrieved from Welsh sites, they tend to pre-date the active use of sieving, as for example during the 1975–9 excavations of the Roman fort of *Segontium*, near Caernarfon (Noddle 1993).

Where rats are present, the range of sites they occupied is of interest, including not only the urban centres of York and Colchester but also the villa at Gorhambury and a rural settlement on the outskirts of Dorchester (Locker 1990; Rielly 1997). At the latter site a series of structures and agricultural features dating to the third century suggest the presence of a villa-like settlement (Smith *et al*. 1997, 304). It would certainly appear that rats had both the ability and the inclination to settle in areas other than in close proximity to highly populated ports of entry. The earliest rats at York, from late second-century deposits, probably date to within a decade or two of the establishment of the main civilian *Colonia* (O'Connor 1988, 68). In contrast, the *Colonia* at Colchester was founded in AD 49, but the earliest rat is from a second-century level (Grimm in prep). This absence could relate to a lack of sieving at several sites, but sampling programmes have been in operation at a number of sites within the city, including Culver Street that featured well stratified first- to fourth-century occupation levels (Crummy 1993, 34; Luff 1993, 11–12).

The third and fourth centuries appear to have witnessed the greatest distribution of rats in the Roman era, with further evidence from York and Dorchester, at other urban centres such as Lincoln as well as sites towards the northern periphery of Roman rule – the fort at South Shields and the villa at Dalton Parlours in West Yorkshire (Dobney and Harwood 1998). Again, these bones were found in a variety of settlement types, including a number of rural sites. Sieving is cited as an issue regarding the lack of rats from earlier levels at Lincoln, where amongst a variety of sites only those from the late Roman waterfront area where routinely sampled (*ibid*.). The quantity of rat bones from these sites tends to be rather small, with the exception of the General Accident site at York (O'Connor 1988) and also from the earlier phase at Dalton Parlours. While it is difficult to ascertain the reason(s) for the good recovery of rats at this York site, the late third/early fourth-century collection at Dalton Parlours are clearly associated with a granary, these levels providing a minimum number (MNI) of 20 rats as well as 60 mice (Huntley and Stallibrass 1995, 145). It is of interest that rats were also found in a later context within this granary, dating to the late fourth century, but following the abandonment of this structure. This change of usage undoubtedly had an effect on the rodent population, as suggested by the recovery of a MNI of 2 rats and 6 mice. It can be seen that the density of rats found at the General Accident Site appears to increase by

Location	Date (centuries AD)	N	N1	% (N/N1x100)
London	1st–2nd	10	78	12.8
	3rd–4th	12	59	20.0
	10th–11th	5	105	4.8
	11th–12th	15	135	11.1
	12th–13th	6	72	8.3
York (GA)	Mid-late 2nd	1	51	1.9
	Late 2nd–early 3rd	5	25	20.0
	11th–12th	1	4	25.0
	12th–13th	10	58	17.2
York (CG)	Late 9th	11	59	18.6

TABLE 9. Relative abundance of samples with rat bones from the General Accident Site (GA) and Coppergate (CG), York and a combination of sites from London, where N is the number of samples with rat bones and N1 is the number of samples with animal bones (London information taken from Rielly in prep and York data from O'Connor 1988, 107 and 1991b, 257).

the third century (see Table 9), perhaps indicating a general increase in the rat population within the *colonia*. An expansion in rat populations is also indicated by the evidence for third/fourth-century London, which appears to suggest an expansion in their distribution, with rats bones found at several occupied as well as abandoned sites in both the centre and periphery of the City. For instance, rats were found alongside or just outside the eastern perimeter in the area of the east London cemeteries, areas that were clearly used as city dumps and that would have attracted scavenging rats.

No sooner had rats become established than their population seems to have crashed, reflected by the clear paucity of finds dating between the fifth and ninth century (Figure 37). In London, there appear to be just two finds from this long period, both dating to the late eighth/mid-ninth centuries, each taken from sites within the Middle Saxon settlement of Lundenwic (Rackham *et al*. 1989). This small number of bones is highlighted by the large number of excavations undertaken in this area, based on modern day Covent Garden, many of which were extensively sampled. The rest of England is similarly bereft, as particularly shown by the well-sampled excavations in York, with rats not appearing until the later ninth century, at Coppergate (O'Connor 1991a). Neither York nor London can offer much evidence for fifth- to seventh-century occupation. However, the absence of rats at the early sites of West Heslerton (Berg 1998; pers. comm.; Dobney and Harwood 1998, 378) and West Stow (Crabtree 1989; 1996), of which only the former was sieved, is probably significant. Further negative evidence is provided by the large bone collections derived from the extensive excavations at the Middle Saxon era sites of Flixborough in Lincolnshire, plus Wicken Bonhunt, Brandon and Ipswich, all in East Anglia (Crabtree 1996), and then in Southampton (Hamwic), the sites of Melbourne Street (Bourdillon and Coy 1980), Six Dials (Bourdillon with Andrews 1997) and the Friends Provident St Mary's Stadium (Hamilton-Dyer 2005). With the exception of Melbourne Street and Wicken Bonhunt all of these sites were sieved and, although there is insufficient evidence to warrant firm conclusions concerning the initial decline of the rat population, there is little doubt that the nationwide density of this species had declined dramatically by the seventh/eighth centuries.

It is of interest that their probable re-emergence coincides with the period of Viking contact, evidence from York strongly suggesting that this species was

FIGURE 37. The distribution of Saxon period sites with rat bones (source Rielly in prep.).

reintroduced via Viking trading ships (O'Connor 1991b, 257). The density of rats at the Scandinavian settlement at Coppergate in York (see Table 9) is similar to that observed at the later levels at the General Accident site and also within Late Roman London. It can perhaps be proposed that favourable conditions and/or a sizeable introduction outweighed the initial limitations on population expansion that might be expected for a newly arrived species. While the evidence regarding this introduction is rather slight in other parts of England, the number of sites dated to the ninth and early tenth centuries with rat bones,

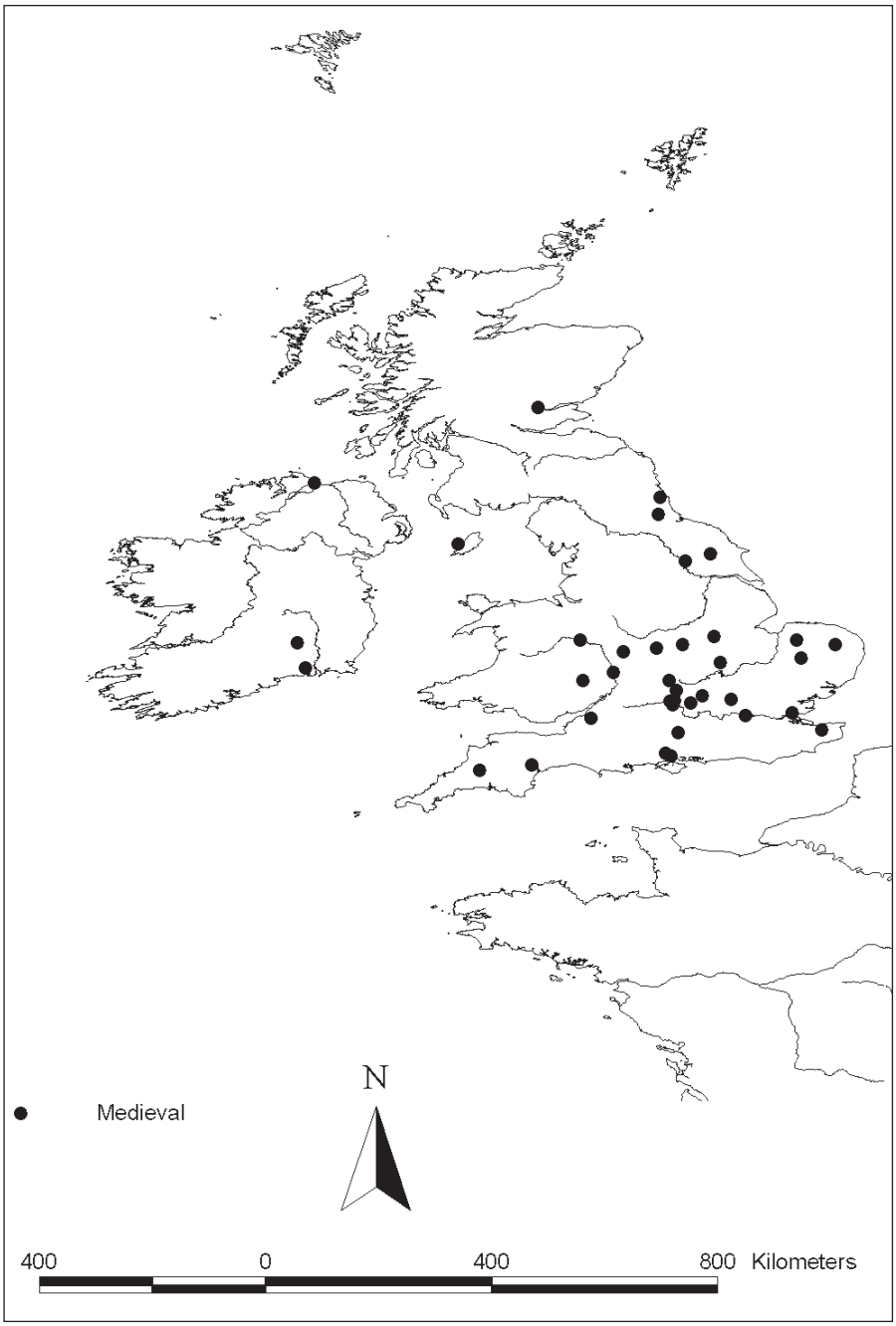

FIG 38. The distribution of medieval period sites with rat bones (source Rielly in prep.).

in comparison with the extensive negative evidence from Middle Saxon sites in the same localities, does appear to indicate a general trend.

The following two centuries are marked by a steady increase in rat representation (Figure 38). London is clearly well populated with rats by the eleventh/twelfth centuries as shown by their wide distribution, extending from the City into Southwark and also at one of the outlying monastic houses, at Merton Priory (Pipe

2007). This resurgence of rats in London was probably supported by the extensive rubbish deposition and the stalling/feeding of domestic animals (Bowsher *et al.* 2007, 83; Hill and Rowsome 2008). Rats were similarly well distributed around England by this period, although perhaps not re-attaining Roman densities until the thirteenth/fourteenth centuries. In comparison to the Roman period, these rats had obviously occupied a wide selection of settlements, from farmsteads and monastic houses to castles and major urban centres. While widespread, the quantities of rat bones recovered were invariably quite small, with the notable exception of the 36 bones from the eleventh/twelfth-century castle at Middleton Stoney, described as deriving from a stone-lined shaft (Levitan 1984).

For Wales, during this later period, it is necessary to turn to historical and linguistic evidence. Giraldus Cambrensis, in his *Journey Through Wales* written in 1188, describes 'a large species of rodents, called rats' referring to a story he had 'read somewhere', which shows he knew of the existence of this creature but not necessarily that it occupied Wales during this time (Thorpe 1978, 170). Perhaps of greater significance is the Welsh word for rat '*llygoden mawr*' or '*llygoden ffrengig*' which translate as large mouse or French mouse. The latter name could derive from the fact that it entered, or possibly re-entered, Wales with the French-speaking Normans, which may have been as early as the late eleventh century coinciding with the Norman invasion of South Wales.

The same twelfth-century author and traveller has a little more to offer concerning the presence of rats in Ireland, when he refers, in approximately 1180, to 'larger mice that are commonly called rats' eating the books of the Bishop of Ferns (O'Meara 1982, 81). This would appear to be the earliest written reference to rats in Ireland (McCormick 1999, 366), coinciding with the arrival of the Normans in the twelfth century. It is of interest, in this respect, that the Irish name for the rat, following the Welsh name, is French mouse *luch francach*. The earliest archaeological evidence is represented by a skull from a mid twelfth-century deposit within a site interpreted as the remains of medieval tenements at 2–4 Peter Street, Waterford (McCormick 1997, 837). There is undoubtedly a great potential for an earlier introduction, most notably via the Viking settlements. The lack of such evidence could again relate to the absence of sieving, although ironically, the Waterford example was hand-collected. However, the numerous samples taken from Viking Age deposits from Dublin (*c.* 917 to 1030 AD), admittedly for botanical rather than zoological purposes, were described as containing 'no bones of rats or mice' (Geraghty 1996, 55). Later finds of rat bones include examples from Kilferagh, a small rural settlement in County Kilkenny (McCormick 1987, 99–100) and a single pelvis from a dump possibly associated with the medieval castle at Greencastle, County Down (Beglane 2007), again all hand-collected.

The Isle of Man evidence is limited to a few bones taken from deposits associated with a Norse settlement on St Patricks Isle, Peel, dating between the eighth and twelfth centuries and just predating the late twelfth/early thirteenth-century construction of the Cathedral of St German on the same site. Unlike Ireland and Wales, there is no obvious indication either from the local name for

rat or from historical texts to suggest whether this animal was present during the medieval period. While outside the remit of this report, it is worth mentioning that the Black Death, which ravaged most of Britain in 1348–50 (Horrox 1994, 10, 81–2 and 85), was not mentioned in the *Chronicle of Man* (yearly accounts between 1249 and 1374) for 1348 (Coakley 2008). The Peel example suggests that rats were present on the island in the early medieval period. However, they may have either become extinct or perhaps never attained the population density necessary to trigger an epidemic (see McCormick 2003, 2–4). Alternatively, they may not have carried the vector flea, *Xenopsylla cheopis* to the island. Of interest also is the linguistic evidence, where the Manx *rodden* for rat is apparently derived from northern English, probably entering the local vocabulary in the fifteenth century with the arrival of the Stanley lords or possibly a little later via merchants (Ball and Fife 1993, 283).

The single example from Scotland was provided by a deposit associated with a row of houses facing the High Street in early medieval Perth. There would appear to be no corroborative evidence, either historically or otherwise, to confirm whether rats were introduced at or prior to the thirteenth century in Scotland. However, as mentioned above, concerning the spread of plague, it can be assumed that rats were relatively plentiful in certain areas of Scotland by the later fourteenth century (Horrox 1994, 85).

Discussion

Rats entered this country as early as the mid first century, most probably as unwelcome guests accompanying grain imports from the eastern Mediterranean, becoming well-established throughout England and extending into Wales by the Later Roman period. A point worth considering is the means whereby the rat population was maintained. By the later second century, there was less trade between the Mediterranean and Britain, suggesting that the rat population must have been self-sustaining or at least reliant on transfers from rat colonies in other parts of north-west Europe, where trade continued into the later Roman period (see Fulford 1991, 44).

In sharp contrast to the Roman period, there follows an uninterrupted dearth of rats, right up to the mid-ninth century. The timing of their demise is as yet poorly understood, but the negative evidence from sites such as West Heslerton would suggest it took place either coinciding with or soon after the end of the Roman era. A major reason for the population collapse may be the dismantling of the Roman infrastructure, which had provided optimal conditions for this 'warmth-loving' species that had adapted to a purely commensal existence in the north European limits of the Roman empire (after Armitage 1994, 233–4 and McCormick 2003, 11). Climate change may have also played a part, given that records suggest cooler temperatures and prolonged wetness in the years between the early fifth and eighth centuries (Armitage 1994, 234).

There is a question concerning whether the rat population suffered a major decline rather than extinction. However, it can perhaps be assumed that if any

rats had survived, they would have been restored to something like their former glory within the concentrated and waste littered urban centres set up by the seventh/eighth centuries in various parts of England, from York in the north to Southampton in the south (Hill 2001, 3). The evidence regarding the subsequent discovery of black rats at ninth-century York and at a few other sites, dated to the ninth or tenth centuries, has been used to suggest a reintroduction, most probably by Viking traders. An interesting aspect of this event, as found at Coppergate, is the notably large density of rats. This is clearly different to the first-century Roman evidence from London or indeed to the initial occurrences of this species at York. The greater quantity of rats could relate to the method of introduction, with a direct transfer by ship from rat-infested Scandinavian ports (note the early ninth-century occurrence of this species at Birka in Sweden as described by Bengt Wigh 2001, 54 and 125–6 taken from McCormick 2003, 7) compared to the more arduous overland route via the east coast of Spain and then along the Rhone/Rhine or Rhone/Loire rivers as used by first- and second-century Roman traders (Peacock 1978 cited in Milne 1985, 112).

There are relatively few tenth- to eleventh-century sites with rat bones, perhaps suggesting initially a rather slow rate of colonisation. However, they were certainly better represented by the twelfth century, when they reached the Irish ports, and had extended beyond the major urban centres in England to smaller settlements as the villages of Thrislington and Wharram Percy by the thirteenth/fourteenth centuries. This widespread distribution clearly provided the means whereby, in 1348, the plague was able to cause such devastation across Britain.

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Preface

All books are a labour of love, and this one has been particularly protracted. It has taken longer than usual to bring to press, thanks in part to the usual exigencies of competing demands (and childbirth on the part of at least two contributors), and in part to the developments and new finds that are constantly being made in the field. Even at the time of writing, we are aware of new discoveries that (fortunately) strengthen the arguments made in this volume. Studies of wildlife are becoming more aware of, and informed by, the long-term record provided by historical and archaeological sources, and we hope that this volume will be seen as a timely addition.

We thank the many contributors for their expertise and patience, and thank Windgather Press and subsequently Oxbow Books for theirs, and for supporting the project. We are grateful to staff and students, in particular Tom Hartman and Alex Hyde of the University of Nottingham's MSc in Biological Photography and Imaging, who provided some of the beautiful images for this book. We thank all of those who have given permission for their images to be used here, in particular Julie Curl, whose illustrations for Figures 31 and 40 add art to this work of, we hope, science. Figures 22, 23, 34 and 42 are by TPOC. NS would like to thank both the University of Nottingham and the Arts and Humanities Research Council who supported the period of research leave in which this volume was edited.

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