Zooarchaeology and the Study of Towns: Past, Present and Future

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Abstract

This paper briefly summarises and critically reviews the history and current state of urban zooarchaeology in Britain and Russia, using case studies drawn mainly from Romano-British towns and the medieval centre of Novgorod in north-west Russia. Although the history of zooarchaeological studies in the two countries is different, they face many of the same problems and consideration is given to potential research questions where carefully targeted zooarchaeological research in towns could be made more effective.

Introduction

One of the surprising and rather disappointing features of the ICAZ Conference in Paris in 2010 was the paucity of sessions, individual papers and posters that incorporated zooarchaeological evidence from towns as one of their main themes. It is surprising because during the period of ICAZ's existence, towns have probably produced more animal bones than any other type of site. Many zooarchaeologists have spent substantial portions of their careers studying material from such sites, so a

review of our progress in studying urban assemblage seems apposite in a selection of papers such as these.

This review will largely be based on personal experience. I began my zooarchaeological career working on Roman, Medieval and Post-medieval material from the town of Exeter, in south-west England (Maltby 1979a) and have also recently been focusing on other urban sites, particularly assemblages from another Romano-British *civitas* capital at Winchester (Maltby 2010a) and material from the Medieval centre of Novgorod in north-west Russia (Maltby 2011). This therefore is a good opportunity to:

1) reflect upon how much has been achieved in urban zooarchaeological studies over the last 30 years, concentrating principally on Britain;

2) evaluate the current situation pertaining to zooarchaeological work in some British and Russian towns;

3) discuss ways in which urban zooarchaeological studies should develop over the next decade

Britain Past and Present

Terry O'Connor (2000) has discussed the history of urban zooarchaeology in depth and it is not necessary here to repeat all of the valid observations he has made. In Britain, the burgeoning of rescue excavations within towns in the 1970s produced

large faunal assemblages. The retention of animal bones from historic sites was a fairly new phenomenon, encouraged by the development of environmental archaeology in the study of prehistoric sites in general and early domestication in particular (Higgs 1972; Ucko & Dimbleby 1969) Examples of these early studies include work in Saxon Southampton (Bourdillon & Coy 1980), Exeter (Maltby 1979a) and London (Armitage 1982). These analyses applied a number of standard zooarchaeological methods that, although refined, are still in use today. These include developments in methods to study species quantification (Chaplin 1971), tooth eruption and wear (Grant 1975; Payne 1973), epiphyseal fusion (Silver 1969) and measurements (von den Driesch 1976).

It would be fair to say that the early studies of British urban assemblages, whilst they did pay some heed to intra-site variability, were more concerned with general statements regarding the exploitation of animals in the towns. Certainly, the amount of detailed contextual analysis was much less than would be expected today (O'Connor 2003, 71-72). It was recognised that to understand what was happening in towns, comparisons with sites in their hinterland would be valuable. However, not many such sites were available in the early stages of urban zooarchaeological studies. There was very little collaboration with historians and the potential of documentary data was not given a lot of consideration. Many faunal specialists worked largely in isolation and integrated studies of archaeological materials were a rarity. The York Archaeological Trust was a notable exception. Here at least, environmental archaeologists based in the University of York worked together on the same sites, such as the Viking site at Coppergate (Jorvik) and the Anglian site at Fishergate (Eforwic). However, even in York, there was an element of artificial compartmentalization, exemplified by the publication policy, which subdivided the

contribution of different specialists into separate volumes. Thus, animal bone studies (e.g. O'Connor 1988, 1989a, 1991) formed part of Volume 15. Other environmental studies were in Volume 14, whereas small find studies (including skeletal materials) were in Volume 17 and so on. Only in the later stages of the publication series did more integrated and synthetic overviews begin to emerge (e.g Hall *et al.* 2004).

During the latter half of the 1970s into the 1980s sieved sampling programmes were becoming part of most urban excavations programmes, for example in Winchester and York (Gomersall *et al.* 2010; O'Connor 2003, 93-112). These improved the efficiency in the recovery of fish bones in particular and allowed for more comprehensive and accurate assessments of the range of species exploited. Needless to say, not everyone sampled in the same way, making coherent comparisons between sites difficult, a problem that is still prevalent today.

Nevertheless, the 1980s and 1990s saw a significant expansion of studies on urban assemblages in Britain. If we take Roman Britain as an example, many analyses were undertaken on faunal assemblages from a number of *civitas* capitals. Table 1 provides a list of Romano-British major urban sites from where substantial assemblages have been published. These exclude unpublished reports available currently only in grey literature, such as consultancy reports and doctoral theses. The large number of reports published from 1990 onwards should be noted.

A similar list could be compiled for Medieval towns. A good range of the assemblages early Medieval date from both Britain and northern Europe can be found in O'Connor (2010). Other important British urban Medieval assemblages are referenced within Sykes (2006).

There have been a number of synthetic reviews of the evidence from towns that have considered various aspects of the zooarchaeological assemblages. Again to take the Romano-British period as an example, a number of publications have included discussions of the presence and abundance of the major domestic mammals (e.g. King 1978, 1984, 1991, 1999; Maltby 2010a), birds (Maltby 1997, 2010a; Parker 1988; Yalden and Albarella 2009), and fish (Locker 2007; Maltby 2010a). Most of these works have compared the evidence from towns with other types of Roman site, such as villas, military sites, small towns, and other rural settlements. Similar surveys have been carried out on British Medieval towns, again usually compared with data from other types of settlement (e.g. Albarella 2005, 2006; Albarella & Davis 1996; Grant 1988; Locker 2001; Smith 1998; Sykes 2006). In a few cases surveys of some of the periods have been expanded to include other areas of Europe (e.g. Luff 1982; King 1984, 1999; O'Connor 2010).

It would be fair to say that the main emphases in these surveys have been concerned with species representation in relation to broad dietary variations. It is rarer for other aspects of the faunal assemblages to be considered in much detail. Comparisons of ageing data occur in some surveys (e.g. Maltby 2010a; Sykes 2006). Cattle butchery evidence from Romano-British towns has been considered by Grant (1989a) and Maltby (1984b, 2007, 2010a). Fulford (2001) has reviewed the evidence for possible ritual depositions of animals in Silchester and some other Roman towns. Similarly, King's (2005) survey of animal bones associated with Romano-British temples includes data from towns. Comparisons that take into account possible variations between the suburbs and the centre of towns, or between different properties within them are much rarer. In addition, in some surveys the data from all towns are

combined and then compared with amalgamated data from other settlements (e.g. Grant 1988; Sykes 2006).

(INSERT TABLE 1 HERE)

Comparisons of bone assemblages from a particular town with specific sites in its hinterland have been made, but not as frequently as might be expected. Examples include comparisons of Roman assemblages between the town of Winchester with Owslebury and other rural settlements in its hinterland (Maltby 1994, 2010a). No material from villas was available for comparison in this research. Wilson (1994) compared evidence from Medieval Oxford with assemblages from contempory manor houses and Iron Age assemblages from the Upper Thames Valley, paying particular attention to variations in mortality profiles. Indeed even within the same town detailed intra-settlement studies are fairly limited, although this situation is improving with recently published examples including York (Bond & O'Connor 1999) and Winchester (Maltby 2010a; Serjeantson & Rees 2009) adding to earlier comparisons (e.g. Luff 1993; Maltby 1979a).

In Britain, there is still a lot of archaeological work taking place in some towns, although the recent recession has had an impact on all archaeological activity. However, the problem is that the impact of developer-funded sites has severely limited the scope zooarchaeologists have to evaluate their information beyond the level of the individual site.

To give an example of the severity of the problem, the work of the Museum of London Archaeology (MoLA) can be highlighted. Table 2 provides the number of sites within London that zooarchaeologists employed by MoLA have been involved with since 2005 (Morris pers. comm.). Two hundred sites have had assessments and approaching 100 have had more detailed faunal analyses completed. In addition a number of other archaeological companies have also been excavating within the city. Extracts of these animal bone reports are usually published in site excavation reports (see Table 1). However, there has been no detailed synthesis of animal bones from London in recent times and few opportunities have been granted to carry out such research. This is the direct consequence of developer-funding. Funds are available for the archaeology of a site or a specific area only. London is by no means an exception in seeing a number of different archaeological units operating within the town.

(INSERT TABLE 2 HERE)

An associated problem is the amount of material that has been collected but lies unstudied because of shortfalls in post-excavation funding. Many museum stores contain large numbers of boxes of bones from urban sites that have never been adequately studied.

However, although zooarchaeological studies in British towns have been piecemeal and uneven, a lot of analyses have been published and several general syntheses have been produced, which do provide a sound basis for current and future studies.

Russia Past and Present

This section will review past and current activity in zooarchaeological studies of urban sites in Russia focussing particularly on Novgorod. The history of urban zooarchaeology in Russia is much more restricted. To take Novgorod, as an example, despite a long period of excavations (see below), the only substantial papers on animal bones published prior to current research are those on mammals by Tsalkin (1956), which is largely zoological in nature, and on fish by Sychevskaya (1965). Elsewhere there have been a few reports on urban animal bones understandably mainly written in Russian (e.g. Glazunova *et al.* 2009) but very few syntheses.

The situation in Novgorod, a World Heritage site in north-west Russia (Figure 1), is very frustrating for zooarchaeologists. The town was the focal point of a huge territory from the 10th to the 15th centuries (Halperin 1999). Its wealth was based principally on the international fur trade and it enjoyed extensive links with northern European trading networks including the Hanseatic League as well as with polities to the south and east (Makarov 2011a; Martin 1986). The extensive remains of the Medieval town survive in anaerobic conditions beneath the modern city. Preservation of organic materials is superb and finds from excavations which began in the 1930s include nearly a thousand birch-bark documents and numerous wooden cylinder seals, which provide records about traded items, tribute and other information concerning the literate merchants resident in the town. Countless wooden and leather artefacts and their production waste have been recovered alongside the abundant remains of other material culture. Sequences of wooden streets, property boundaries and the footings of buildings survive in waterlogged deposits up to seven metres deep in places (Brisbane & Gaimster 2001; Brisbane *et al.* 2011).

Excavations have taken place in Novgorod during most summers since the 1930s. Several areas of the town, particularly in the western half, have received extensive excavation (Figure 2). In recent years most of the focus of attention has been on the Troitsky excavations in the south-west of the town. The finds have been spectacular and papers relating to this work have been published widely in Russian and increasingly in English (e.g. Brisbane & Gaimster 2001; Brisbane & Hather 2007; Brisbane *et al.* 2011; Orton 2006).

During the past 20 years several excavations of Medieval sites have also taken place in the immediate hinterland to the south of the town. Most of these slightly predate the foundation of Novgorod, dating to the 9th and 10th centuries, but nevertheless form the foundation of potential urban-rural comparisons. The most important of these excavations have taken place on the high status site of Ryurik Gorodishche, situated two kilometres to the south of Novgorod on the eastern bank of the River Volkhov. For much of its occupation Gorodishche was the residence for the Novgorodian royal family. It began as a high status trading settlement in the 9th and 10th centuries, from when most of the stratified archaeological deposits have derived (Nosov 1992, 2007).

Around 500 km to the east of Novgorod lay Minino located on the edge of Novgorodian lands and those of Suzdal and Rostov to the south. Recent excavations have demonstrated that the inhabitants of this settlement were heavily involved in the acquisition and trading of pelts during its occupation from the late 10th to early 13th centuries (Makarov 2000, 2011b). Therefore, in addition to the sites in the close proximity to Novgorod, there are contemporary sites in the interior available for comparison. Excavations at Minino and Gorodishche have included extensive sieving

programmes and bone preservation is very good, particularly at the latter, which includes some anaerobic deposits and quite large samples of bones have been collected and retained (Maltby 2011).

However, very unfortunately, animal bones have not been collected from most of the Novgorod excavations. There have not been the physical or human resources available to extract, store and record animal bones. Assessment of the potential for zooarchaeological studies from the town was one of the principal objectives of the EU-funded project co-ordinated by Mark Brisbane (Brisbane *et al.* 2011). This has involved the scanning and selected recording of over 58,000 animal bones collected by hand from three of the Troitsky sites, supported by the assessment of bones retrieved from a very limited sieving programme. Some of this information has now been published (Hamilton-Dyer 2002; Maltby 2011; Maltby & Hamilton-Dyer 2001) and more detailed accounts with comparisons with Gorodishche, Minino and other sites are near completion (Maltby 2012).

However, these studies represent no more than a preliminary assessment of the evidence for animal exploitation of Novgorod and its territory. It has not yet been possible, for example, to carry out contextual analysis to look for patterns of disposal within and between individual properties and different areas of the town. The sieving programme so far has simply demonstrated that most of the fish bones were overlooked by normal methods. Since our collection of bones in the mid-1990s, there has been no systematic collection of animal bones from the Troitsky sites and retention of bones from other sites in the town has been infrequent. Despite the creation of a skeleton reference collection in Novgorod, no one has been assigned to carry out routine analyses of animal bones.

So although the potential for zooarchaeological analysis is exceptional in Novgorod, it is currently not being fulfilled. This is especially galling given the availability of information pertaining to animal exploitation from documentary sources (Rybina 2001), artefacts and other environmental evidence (Monk & Johnston 2011; Reilly 2011). Elsewhere in Russia, it has been rare for bones from excavations in Medieval towns to be retained for study by zooarchaeologists. In Moscow, for example, animal bones from the Romanov Dvor excavations were the first from the city in recent years to receive detailed examination (Glazunova *et al.* 2009). There have also been detailed studies of animal bones from the Kremlin site in Tver (Lantseva & Lapshin 2001).

The Future

So what has been demonstrated by this brief comparison between a country that has a long tradition in urban zooarchaeology with one where such studies are in their infancy? It has shown that in Britain a wealth of data exists (either in publications, grey literature or in museum stores) but this has not been utilised very effectively, whereas in Russia, the relevance of zooarchaeological studies on such sites is, at best, only just beginning to be fully appreciated, and, at worst, is still being ignored. Surveys of other European countries would reveal similar problems.

To summarize these problems:

a) Animal bones are often not retained from urban sites and/or are not retrieved efficiently.

b) There are large amounts of unstudied material awaiting analysis.

c) There has been insufficient synthetic work that pulls together disparate information from sites within the same town.

d) There have been insufficient coherent comparisons between specific towns and their hinterlands.

e) There has been a lack of integration between zooarchaeologists and other archaeologists and historians.

f) Zooarchaeologists too often pay only a passive role in the formulation of research questions involving urban studies.

These problems are inter-related. Animal bones will not be retrieved effectively, or indeed collected at all, unless the research questions that justify their retention have been formulated. For example, for many years in Britain, when excavating multi-period urban sites, it was common practice to discard material from Post-medieval layers in order to concentrate attention and resources on earlier deposits. In many cases this could be justified because of problems such as residuality. However, many opportunities were missed to study closely-dated discrete groups of bones. These may have provided information about species exploitation, introduction of non-native species, butchery methods, industrial activities and the stature of the domestic stock, for example. Recent European studies have demonstrated that post-medieval studies of animal bones can be very effective (e.g. Murphy 2007; Pupputi 2008; Thomas 2009).

Robust research questions need to be based on a good knowledge of the quality of information that already exists. This is why there is an urgent need to put some of our limited resources into assessing what is known from the analyses that have already taken place. In England this is being partially addressed by various period and regional reviews of the zooarchaeological resource funded by English Heritage (e.g. Hambleton 2008). These and other broad surveys referenced above can develop general research questions but by their nature these reviews are not intended to be settlement-specific. Towns are large, complex and vary greatly in their development and they need to be considered individually. Even in the most extensively excavated towns, the full range of spatial and chronological variations is unlikely to have been encountered. However, with the disparate nature of archaeological investigations in recent years (including many that have not been fully published), it is getting increasingly difficult to assess the quality of the resource we already have, or indeed the potential of some of the faunal assemblages excavated but yet to be analysed. Archaeologists bidding to carry out developer-funded projects are rightly required to justify costs with appropriate research questions. However, it is increasingly difficult for them, and indeed for those who monitor these bids, to be confident that the questions being asked are still appropriate in the light of the lack of adequate syntheses of previous work.

It is becoming increasing clear that the most potentially fruitful research questions require zooarchaeologists to work in close conjunction with other archaeologists and specialists in other disciplines. This is particularly appropriate with regard to urban archaeology. Zooarchaeologists have tended to have been rather passive in their engagement with integrated research questions. Their potential contributions often appear like “add-ons” in research applications. They need to be more active in

devising these questions, not least because they know better than anyone else the potential and limitations of their material.

One can use Novgorod as an example of the advantages of following an integrated approach. In devising research questions designed to assess the importance of fishing in the town and its hinterland, clearly we would need to target deposits which would produce well-provenanced and closely-dated assemblages of fish bones and devise an appropriate sieving programme. We could also ask questions about whether the relative importance of different fish species changed through time or within and between different properties within one or more areas of the town. These are basic zooarchaeological questions, which we would expect to be asked. However, in Novgorod, the investigation can also incorporate other types of evidence. The zooarchaeological finds can be compared with the documentary evidence, particularly the birch-bark documents. Preliminary comparisons have shown interesting contrasts between the species represented in the two datasets (Brisbane & Maltby 2002; Rybina 2001). Various other forms of artefactual evidence are also available. These include fishing rods, nets, floats, weights, fish-hooks and boats (Dubrovin 2007; Rybina 2007). A similar integrated approach to the study of fishing has already been carried out at Pskov, a contemporary important centre to the west of Novgorod (Salmina 2008). Evidence for processing and storage of fish has yet to be found in Novgord but such evidence has been discovered at Minino (Maltby 2011) and potentially could also be found in Novgorod. Of course, Novgorod is extremely fortunate to have a wealth of organic materials to compare and similar comparisons would not be possible everywhere. However, this is perhaps the point. Each town needs to be assessed individually based on what is already known and what additional information is potentially available from new excavations. Documentary, artefactual and spatial

evidence can be combined to investigate research questions pertinent to specific towns and their hinterlands.

Integrated approaches need to be encouraged. For example, Mike MacKinnon in this volume and elsewhere (e.g. MacKinnon 2006) has shown the benefits of such approaches to studies in the Roman Empire, and papers in Woolgar *et al.* (2006) provide an excellent combination of the use of archaeological and documentary sources. The development of Wikis such as the Medieval Animal Data Network (http://www.imareal.oeaw.ac.at/mad/) is also to be applauded. These will provide better opportunities for zooarchaeologists to collaborate with colleagues from other disciplines and will supplement the zooarchaeological networks discussed elsewhere in this volume. It should also be added that zooarchaeological data can be incorporated into more generic research questions. Examples that may be relevant to urban studies include the distribution and nature of specialist activities within the towns. For example, were there industrial areas that incorporated those working with animal products (tanners; butchers; horn-workers etc) or was production more dispersed within individual properties within the towns? These questions have been raised within the zooarchaeological and artefactual volumes in York (Bond & O'Connor 1999; Mainman & Rogers 2004) and Novgorod (Brisbane *et al.* 2011) and could readily be extended to most urban complexes.

Other aspects of the social use of urban space can also benefit from integrated studies. For example, it is becoming increasingly apparent that there can be significant differences in zooarchaeological assemblages found in the suburbs of Roman towns compared with samples obtained from more central locations (Grant 2000; Luff 1993; Grimm 2008; Maltby 2010a). Further research is required to investigate these patterns

in more depth within individual towns. It would be valuable if such zooarchaeological research could be linked more explicitly with general questions about the location of different socio-economic groups within the towns, by integrating this research with other types of archaeological evidence.

Similarly, quite a lot of attention has been paid in recent years to the question of deposition of complete and partial animal skeletons in urban and other deposits in Roman Britain. It has been argued that many of these depositions are ritual in nature. It is perhaps unsurprising that most of the discussions of this type of evidence originate from non-zooarchaeologists (e.g Fulford 2001; Woodward & Woodward 2004), as the discussions often incorporate other types of archaeological evidence, such as the presence of complete ceramic vessels and various small finds. Zooarchaeologists have often seemed to be not directly involved with these studies and their interpretations. For example, Woodward & Woodward's (2004) insightful discussions did not cite the original bone report (Maltby 1993) and Reilly's (2000) report on bones from the Eastern Cemetery in London was restricted to a discussion of material not directly associated with the human burials, whereas the bones from the burials themselves and animal burials were instead discussed by the project leaders (Barber & Bowsher 2004). Problems arising from this lack of integration have been highlighted by Maltby (2010b). The best ways of overcoming them are to ensure that zooarchaeologists are more fully engaged with other archaeologists throughout the duration of a project. Zooarchaeologists, however, should not wait to be approached. They should be generating some of the questions themselves.

This observation applies to the integration of new scientific methods as well as traditional zooarchaeological methods. As the ICAZ conference in Paris demonstrated,

analyses of DNA, stable isotopes and lipids are having a major impact and their use can apply just as much to urban studies as to the rest of archaeology. There is no doubt that research in these and other scientific areas will continue to have a significant role to play over the next decade. However, it is important that these studies are also targeted on specific research questions.

As noted at the beginning of this paper, it has not been my intention to provide a comprehensive survey of urban zooarchaeology over a broad geographical area. The discussion has instead focused on observations concerning the two regions with which I have been most heavily involved during my career. In some ways the history of zooarchaeology in Russia and England can be viewed as being very different. It is an incontrovertible fact that many more towns have produced zooarchaeological data that have been analysed in Britain. In many ways the situation currently in Russia is similar to that found in Britain in the early 1970s. However, one hopes that with the advantage of hindsight, some of the mistakes that have hindered the development of urban zooarchaeology in Britain can be avoided in Russia. A successful future for the discipline in both countries and elsewhere needs the active involvement of zooarchaeologists with other archaeological colleagues, and with historians, art historians and other specialists, to generate research questions that are appropriate to individual towns and periods. Zooarchaeology needs to be targeted on specific questions (and particular deposits) that can be realistically answered in the constraints of limited funding. It is right to bemoan the lack of collection of bones in a town like Novgorod. However, to simply retain bones on the off-chance that one day someone may be able to do something with them, or record them just for the sake of providing a site-specific archival record, will only generate the same problems that are a legacy of excavations in many British towns. Urban excavations offer fantastic opportunities

for zooarchaeologists to make real contributions to the understanding of the history of the development of towns and the people who lived in them. Let us hope that future ICAZ conferences will be able to celebrate the successes of such contributions.

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Zooarchaeology and the Study of Towns: Past, Present and Future Tables

Table 1: Reports and discussions on animal bones from major Romano-British towns (Adapted from Maltby 2010, 255 – only published works cited).

Town	Sources
Canterbury	King 1982
Chichester	Hamilton-Dyer 2004; Levitan 1989
Cirencester	Maltby 1998; Thawley 1982
Colchester	Dobney *et al.* 1999; Luff 1982, 1993; Locker 1992
Dorchester	Hamilton Dyer 1993a, 1993b, 2008; Grimm 2008; Maltby 1993, 1994; Woodward & Woodward 2004
Exeter	Maltby 1979a; Wilkinson 1979
Gloucester	Dobney *et al*. 1999; Levine 1986; Maltby 1979b, 1983
Leicester	Baxter 1996, 2004, 2005; Brown 1985; Gidney 1999, 2000 Goudwell 1994; Nicholson 1999, 2004
Lincoln	Dobney *et al.* 1996, 1998, 1999; Scott 1999
London*	Ainsley 2002, 2004; Armitage 1980, 1982; Armitage *et al.* 1987; Clutton-Brock and Armitage 1977; Gask 1977; Hamilton-Dyer 2009; Jones 1988a; Liddle 2006, 2007, 2008; Liddle *et al.* 2009; Locker 1980, 1988; Macready & Sidell 1998; Pipe 2002, 2003, 2008; Reilly 2000, 2001, 2002, 2004, 2005, 2006a, 2006b; Tharle *et* al. 2008; Watson 1973; West 1993
St Albans	Fulford 2001; King 2005; Locker 1999; Wilson 1984
Silchester	Clark 2006; Fulford 2001; Grant 1989b, 2000, 2002; Hamilton-Dyer 2000; Ingrem 2006; Maltby 1984b; Serjeantson 2000
Winchester	Bullock 2010; Coy & Bradfield 2010; Maltby 1989, 1994, 2010a; Pfeiffer 2010
Wroxeter	Armour-Chelu 1997; Locker 1997; Meddens 2000
York	Dobney *et al*. 1999; Jones 1988b; O'Connor 1988

* includes sites in Southwark

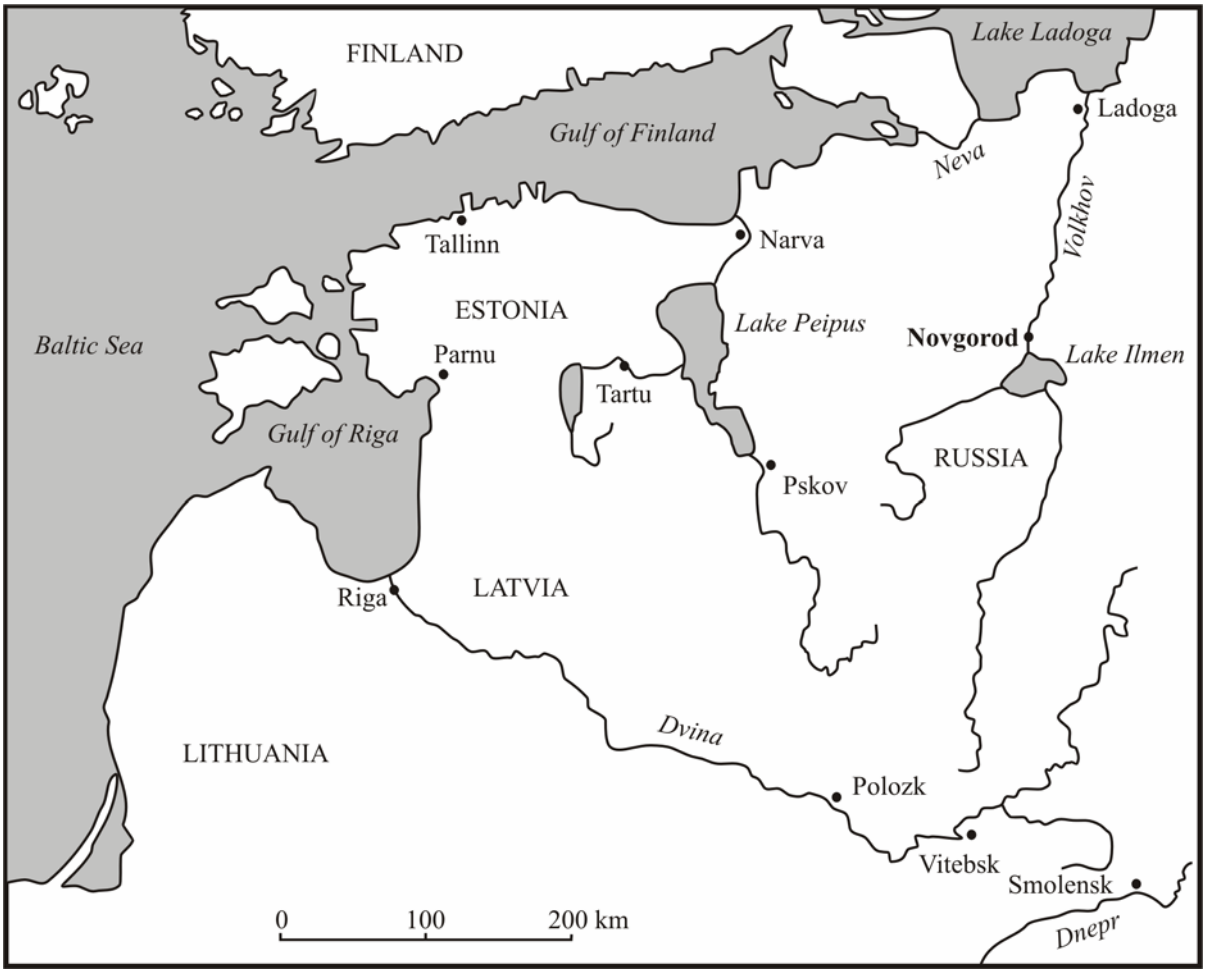
Table 2: Museum of London Bone Report and Assessments (data from James Morris)

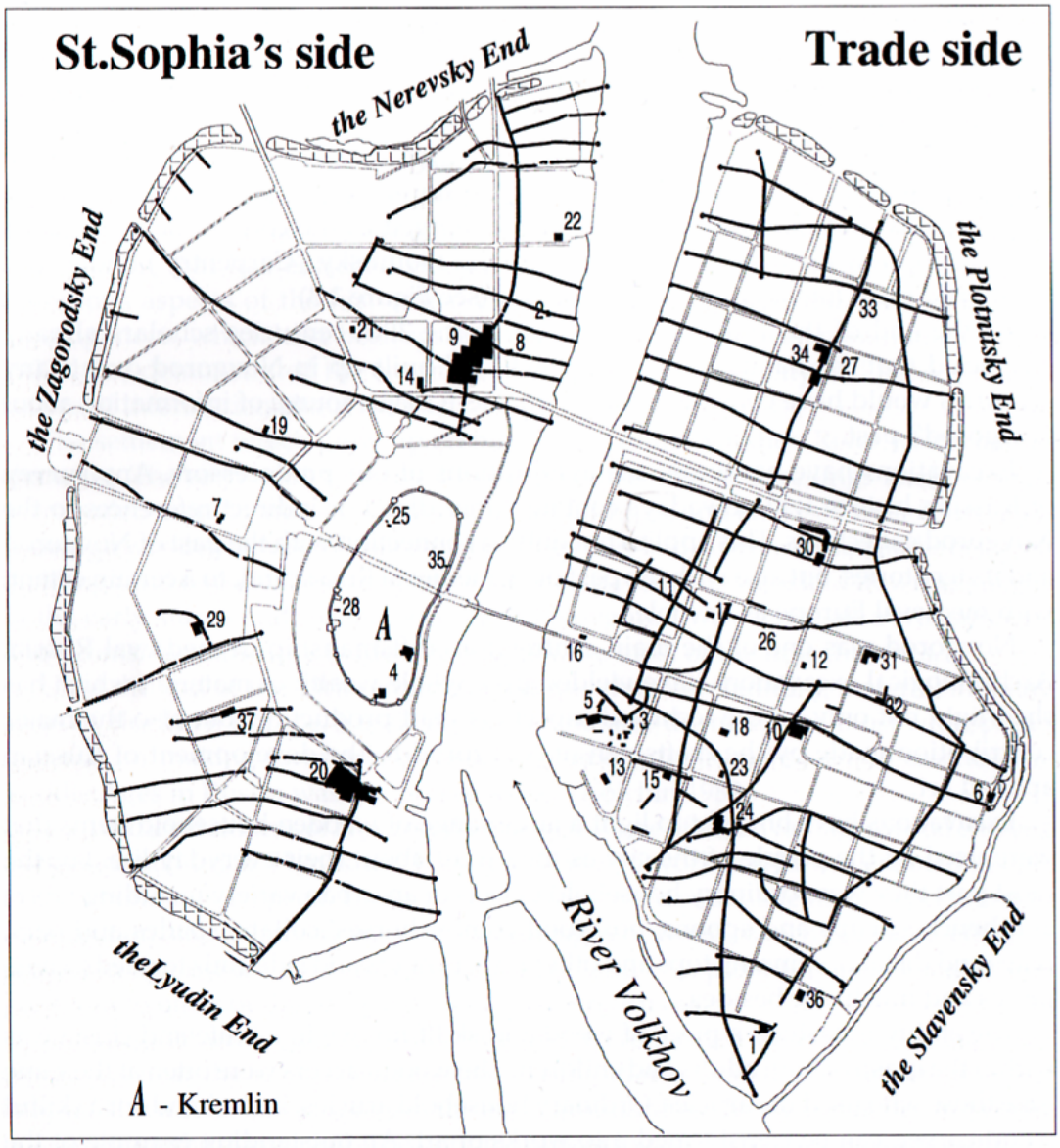
Year	Assessments	Reports
2005	31	16
2006	32	19
2007	40	10
2008	48	9
2009	36	19
2010	13	20
Total	200	93

Figure Captions

Figure 1: Map of Eastern Baltic showing location of Novgorod (adapted from Brisbane *et al*. 2011)

Figure 2: Map of Novgorod showing location of excavated sites (adapted from Brisbane & Gaimster 2001). 20 = Troitsky sites


FINLAND
Lake Ladoga
Ladoga
Gulf of Finland
Neva
Volkhov
Tallinn
Narva
ESTONIA
Lake Peipus
Novgorod
Lake Ilmen
Baltic Sea
Parnu
Tartu
Gulf of Riga
RUSSIA
Pskov
Riga
LATVIA
Dvina
LITHUANIA
Polozk
Vitebsk
Smolensk
0
100
200 km
Dnepr


St.Sophia's side
Trade side
the Nerevsky End
the Zagorodsky End
the Plotnitsky End
theLyudin End
the Slavensky End
River Volkhov
A - Kremlin