Horseflesh and Beaver Pelts: Aspects of Faunal Studies in Medieval Novgorod and its Region

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Introduction

Novgorod is located in North West Russia about 160 km south of St Petersburg (Figure 1). The earliest archaeological deposits from the medieval town date from the early 10th century (Yanin 1992). It was one of the most important towns in Russia during the medieval period. Until the later 15th century, it was the capital of a huge independent state that stretched from the Baltic to the Urals (Yanin *et al.* 2007) and the focus of local and international trade with particularly strong links with the Baltic trading networks (Gaimster 2001; 2006).

The town is situated on both sides of the River Volkhov, which flows northwards out of Lake Ilmen, just to the south of the town (Figure 1). The layout of the densely occupied defended medieval town has been clearly established. The river divides the town into two parts (Figure 2). On the west bank lie the walled Kremlin and the main cathedral, St Sophia. To the east is the trade side, which included the market area and wharves as well as the residences of Gotlandic and German merchants (Gaimster 2001). The properties of local boyars (aristocratic merchants) have also been recorded on both sides of the town.

Since 1932, excavations have taken place on over 30 sites within the town (Yanin *et al.* 2007), the most extensive of which have been on the Nerevsky and Troitsky sites, situated to the north and south respectively of the Kremlin (Figure 2). The waterlogged conditions in Novgorod have resulted in the survival of several metres of anaerobic deposits in most areas of the town. Exceptional preservation of wood has produced spectacular discoveries of a wide range of structures and artefacts (Brisbane and Hather 2007). Other organic materials including bones, leather and pollen have also survived extremely well in these conditions. Around one thousand birch-bark documents dating to between the 11th and 15th centuries have been recovered. Many of these documents have been translated and provide fascinating insights into the lives and transactions of some of the inhabitants of the town (Yanin 1992; Rybina 2001). Excavations of many sites have been on a large scale with the Troitsky sites extending over 6,000 square metres through waterlogged deposits five metres thick (Yanin *et al.* 2007).

Investigation of this exceptionally rich archaeological resource has produced a wealth of finds but also many problems. Conservation of artefacts has been restricted mainly to complete objects and many materials including most pottery and, apart from worked artefacts, not all bones are retained. Limited space for storage and the critical lack of resources for conservation and even for bags and boxes for storage have been amongst the factors that have prevented retention of finds. Therefore, some materials have been inadequately studied. Despite annual seasons of excavations since their publication, the only analyses of animal bones from Novgorod prior to the research discussed in this paper were published over 40 years ago (Tsalkin 1956; Sychevskaya

1965). Routine excavation methods within the town do not include sieving and there have been no zooarchaeologists directly associated with the excavations.

To obtain a better understanding of the potential of the archaeological resource in Novgorod and its lands, a series of European Union-funded collaborative projects were developed from 1992 (Brisbane 2001) and the results of these collaborations are currently being published in a series of volumes (Orton 2006; Brisbane and Hather 2007; Brisbane *et al.* 2012; Maltby forthcoming). This includes the evaluation of the animal bones from Novgorod and several sites in its hinterland. The project was designed to assess the potential of animal bone studies rather than to be a definitive study. However, substantial amounts of data have been accumulated from three of the Troitsky sites. A selection of some of the results and issues raised are discussed here. A detailed zooarchaeological analysis is provided in Maltby (forthcoming) and a broader summary of the results can be found in Maltby (2012).

This paper will focus on just two mammal species (horse and beaver), whose remains provide a small proportion of the overall animal bone assemblage retrieved by hand from Troitsky sites IX-XI. Excavation methods involved the removal of the deposits in spits, thus providing a broad chronological sequence for the finds discovered within them. However, for logistical reasons, the excavators were not able to provide much in the way of horizontal controls for the bones recovered from the excavations. From site XI, it was possible to compare assemblages from two properties but not from different areas or structures within them, which inevitably restricts the ability to evaluate intra-site variability. The evaluation of the animal bones from these (and other) sites involved three trained zooarchaeologists from Britain (the author, Sheila Hamilton-Dyer and Ellen Hambleton) supported by a number of students and other assistants from Bournemouth University and Russia. Altogether, over 63,000 animal bone elements were recovered including over 33,719 identified mammalian remains. The identified material was dominated by bones of cattle and, to a lesser extent, by those of pig and sheep/goat. Horse comprised only 3.2% of the identified mammal elements and beaver under 0.3%.

Horse

Horsemeat is not considered to have been part of the human diet in most parts of medieval Europe because of Christian taboos following the decree of Pope Gregory III in 732 (Bartosiewicz 2003: 117). However, evidence for the consumption of horseflesh has been found in other parts of Christian medieval Europe including Hungary (Bartosiewicz pers. comm.). Horse bones are present in small but fairly consistent percentages in the Novgorod assemblage, providing between 2.5% and 5.4% of the identified domestic mammal elements from different spits and properties from Troitsky sites IX-XI (Maltby 2012). Examination of their bones demonstrated that their carcasses were regularly processed. Over 17% of the horse elements (excluding loose teeth) bear processing marks (Table 1). A number of these marks, particularly those on the phalanges, metapodials and radii, are skinning and bone-working marks but many others, particularly those observed on the scapula and upper limb bones, were made during dismemberment and filleting. Many of these butchery marks are very similar to those found on cattle, a species of similar size (Maltby forthcoming). Although the relative frequency of processing marks was lower than for cattle (30%), implying that the exploitation of horsemeat was less intensive, it would

nevertheless seem that substantial numbers of the horse carcasses were butchered. It is possible that some of this meat was prepared for dogs but there is no firm evidence to support this. There is a high percentage of gnawed horse bones (41%), indicating that dogs regularly had access to horse carcasses but such damage was also commonly observed on the bones of all other domestic species including 31% of the cattle elements. It seems therefore that the inhabitants of Novgorod consumed horseflesh throughout the medieval period, forming a small supplement to the meat diet.

Evidence for the exploitation of the hides and skins of domestic mammals in Novgorod has been obtained from a variety of sources. The anaerobic conditions have resulted in the preservation of manufactured leather items of footwear and other objects (Rybina 1992). Workshops associated with their production have been discovered on the Nerevsky and Troitsky sites (Rybina 1992: Kublo 2007). Large accumulations of offcuts discarded by the leatherworkers have been found on several properties. Analysis of the insect remains associated with one such accumulation from Troitsky Site XIII indicated the presence of species that commonly infest stored hides (Reilly 2012). Several birch-bark documents include references to skins and hides of sheep, goat and calf. It is perhaps surprising that there is no mention of horse and adult cattle hides in the birch-bark documents but it is possible that their hides were too common a commodity to receive special attention in such records. Although a preliminary survey of a small amount of the leather offcuts from the Troitsky sites also did not produce any positive identification of horse (Dean Sully pers comm.), fine knife cuts made at the onset of skinning were observed on the shafts of several first and second phalanges of horses from different properties within the Troitsky sites. This supports the impression that much of the carcass processing took place within individual properties.

Apart from Smirnova's (2001, 2005) articles on the manufacturing of rare osseous materials and comprehensive study of combs respectively, there has been no detailed analysis of worked bone and antler objects from Novgorod (Rybina 1992). In the present study, any worked bones observed on site had previously been removed from the assemblages and recorded as small finds. However, several horse radii, metacarpals and metatarsals bear distinctive trimming marks indicative of skate manufacture. Some of these have surfaces that have become polished through use. Many similar skates have been recovered from previous excavations in Novgorod. In addition, the horse bone assemblage includes an unusually high number of carpals (Table 1). Carpals are small bones that lie below the radius and ulna and above the metacarpals forming the wrist joint. Although horses possess six of these bones in each forelimb, their small size means carpals are often overlooked during normal excavation and they rarely form a significant proportion of an archaeological assemblage. For example, in an assemblage (NISP = 681) from the Roman town of Winchester, in southern England, carpals formed only 1% of the horse assemblage (Maltby 2010). In Novgorod, however, they provide nearly 10% of the horse elements (Table 1), whereas they form less than 2% of the cattle assemblage from the same deposits (Maltby forthcoming). Although the slightly smaller size of cattle carpals and the greater fragmentation of the cattle assemblage could bias such results, it would nevertheless appear that horse carpals were more likely to be deposited within these properties. Indeed, all the lower limb bones of horse are better represented than other parts of the body (Table 1). This may be related to the manufacture of the skates. The lower limbs of horses may have been disarticulated on

these properties for the acquisition of the long bones used for skates. Fine incisions on a few of the carpals and several of the tarsals (astragalus and calcaneus) appear to be more complex than those usually associated with initial skinning and removal of the feet and indicate that these bones were on occasions carefully separated from the major limb bones. These would then have been discarded.

Metrical analysis of the horse bones from the Troitsky sites has included the measurement of nearly 100 complete long bones, which have provided withers height estimates using the method developed by Vitt (1952). Results have shown that the horses represented cover quite a broad range in size ranging between 117cm and 153cm with a mean of 133.4cm (standard deviation 7.0cm). The average-sized equid was therefore the size of a large pony but both substantially smaller and larger animals were also kept. None of the equid remains possess distinctive characteristics of mules (Johnstone 2004).

The zooarchaeological evidence has therefore produced evidence for the exploitation of the flesh, hides and bones of horses within Novgorod, perhaps on a greater scale than would be expected. However, it is generally accepted that horses would have been of far greater value to the inhabitants for riding and as beasts of burden. Evidence for the stabling of horses in various Novgorod properties has been supported by the analyses of both plant macrofossils and insects (Monk and Johnston 2012; Reilly 2012). Horses are mentioned in birch-bark documents much more frequently than other species (Rybina 2001). This frequency reflects their high value. The analysis of horse epiphyseal fusion data has revealed that over 93% of the latest-fusing limb bones epiphyses found on the Troitsky sites are fused (NISP = 89) and the tooth ageing evidence also indicates that the majority of horses lived to maturity to be exploited as working animals. Excavations in Novgorod have produced much evidence for horse riding gear, including objects made of organic materials such as harnesses, saddles and whips (Dubrovin 2007).

Our understanding of how horses were exploited in Novgorod therefore does not rely solely on zooarchaeological evidence. Evidence from documents, insect remains, plant macrofossils, wooden objects, metal objects and building plans have also been utilised.

Beaver

Although skeletal elements of beaver provide only a tiny proportion of the Troitsky assemblage (<0.3% of the identified mammal elements), the types of beaver bones represented on the Troitsky sites clearly indicate that whole carcasses were sometimes brought to the town (Table 1). Although mandibles are the best represented elements, many of the bones belong to the upper limbs. Autopodium bones are under-represented. These bones may often have been removed with the skins off-site. However, it is also possible that these small bones were commonly overlooked during normal excavation. More extensive sieving experiments are required to establish that their absence is not simply a factor of differential retrieval. Processing marks were observed on 35% of the beaver elements recovered. Clear skinning marks were observed near the orbits of one skull and on the buccal aspect (cheek) of a mandible. However, most of the remaining butchery marks were made during dismemberment and filleting of the shoulder, pelvis and upper limbs rather than skinning (Table 1). It

is fair to say, however, that the beaver's and other wild mammal species' great importance as providers of pelts for regional and international trade is not reflected in the zooarchaeological material from Novgorod itself where the assemblages are dominated by bones associated with meat consumption rather than skinning.

To find this evidence we have to look around 400km to the east to the area near Kubenskoe Lake, towards the edge of Novogorod lands. Excavations of the contemporary early medieval settlement at Minino have produced a faunal assemblage that is very different from the ones in Novgorod. The inhabitants of Minino ate much more meat from wild mammals than the residents of Novgorod. Wild mammal elements contribute 65% of the identified mammal remains (NISP = 2,451). Beaver is the best represented species forming 35% of the assemblage (Makarov 2006; Savinetskii forthcoming). Again these bones include many elements from the upper limbs. Animals hunted for their pelts, particularly beaver, squirrels and marten, also provided significant amounts of meat for the local community.

As noted above, the importance of Novgorod in the international fur trade is well known (Martin 2004) and a detailed synthesis of recent work associated with this project is provided by Makarov (2012). There is evidence, however, that the numbers of beaver caught by the inhabitants of Minino declined in the 13th century arguably through over-exploitation. The percentage of beaver decreases from 41% in deposits dated to the 11th and early 12th century to 22% in features of 13th century date, with corresponding decreases in the numbers of squirrel and marten bone (Makarov 2006; Savinetskii forthcoming). Overexploitation, possibly reflected in the beaver mortality patterns at Minino, and the clearance of woodland for agriculture and pasture are both likely to have been factors in their decline. This decline also seems to be reflected at Novgorod. There are scarcely any beaver remains from the upper layers of the Troitsky deposits, which date from the 13th to 15th centuries. This supports other evidence for the decline in the beaver fur trade at this time (Martin 2004; Makarov 2012). It is probably also significant that none of the Novgorod birch-bark documents that make reference to beavers are dated later than the early 13th century (Rybina 2007: 132).

Therefore, the international importance of the Novgorodian fur industry is best reflected in the composition of the zooarchaeological assemblage at Minino, located near one of the major procurement areas. Here, many of the skinned animals were also butchered for meat. However, the beaver's importance is not evident in the faunal assemblage from Novgorod itself. Most skinning took place elsewhere and therefore it was their pelts, rather that their meat that was brought to the town. In addition, the majority of the pelts were subsequently exported. Zooarchaeological evidence for the importance of furs and skins of all wild species to the inhabitants of Novgorod is therefore likely to be extremely limited.

Conclusions

Studies of the evidence for the exploitation of horses and beavers in Novgorod have been used to illustrate the benefits of a holistic approach to medieval urban studies. To understand the complexity of life in a medieval town, it is necessary to embrace as many sources of evidence as possible. A similar approach can be made for the investigation of the importance of other species found in Novgorod. For example, the

importance of fishing to the Novogorod economy is only partially reflected in the zooarchaeological data currently available (Brisbane and Maltby 2002; Maltby 2012). A much more extensive programme of sieving is required to establish more clearly the importance of the exploitation of fish, birds and many of the smaller mammal species including beaver. This assessment has also demonstrated that there are opportunities to make much more detailed comparisons of the faunal assemblages within and between properties and between different areas of the town. To achieve this, however, a much more systematic collection policy for animal bones and other environmental data is required.

The study of the beaver remains in particular has demonstrated that the study of urban bone assemblages has to be complemented by analyses of remains recovered from other settlements within the region. The beaver assemblage from Novgorod probably mainly consists of animals captured in the near vicinity, which provided an occasional supplement to the urban diet. This local beaver population may have largely disappeared by the later medieval period. However, the analysis of the faunal assemblage from Minino has revealed that the settlement was located in one of the areas where hunting flourished. It is in remote settlements like this rather than in the town itself where the importance of the fur trade can be best investigated through zooarchaeological analysis.

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Bibliography

Bartosiewicz, L. (2003) A millennium of migrations: proto-historic mobile pastoralism in Hungary, *Bulletin of the Florida Museum of Natural History*, 44, 101-130.

Brisbane, M. (2001) Medieval Novgorod and its hinterland: ten years of international collaboration. In Brisbane, M. and Gaimster, D. (eds.), *Novgorod: the Archaeology of a Russian Medieval City and its Hinterland*, London: British Museum Occasional Papers 141, 1-4.

Brisbane, M. and Hather, J. (eds.), *Wood Use in Medieval Novgorod*, Oxford: Oxbow.

Brisbane, M. and Maltby, M. (2002) Love letters to bare bones: a comparison of two types of evidence for the use of animals in medieval Novgorod, *Archaeological Review from Cambridge* 18, 99-119.

Brisbane, M, Nosov, E. N. and Makarov, N. (eds.) (2012), *The Archaeology of Medieval Novgorod in its Wider Context.* Oxford: Oxbow.

Dubrovin, G. E. (2007) Land transport. In Brisbane, M. and Hather, J. (eds.), *Wood Use in Medieval Novgorod*, Oxford: Oxbow (The Archaeology of Medieval Novgorod Series), 209-228.

Gaimster, D. (2001) Pelts, pitch and pottery: the archaeology of Hanseatic trade in medieval Novgorod. In Brisbane, M. and Gaimster, D. (eds.), *Novgorod: the Archaeology of a Russian Medieval City and its Hinterland*, London: British Museum Occasional Papers 141, 67-78.

Gaimster, D. (2006) Pottery imported from the West: reception and resistance. In Orton, C. (ed.), *The Pottery from Medieval Novgorod and its Region.* Oxford: Oxbow, 135-144.

Kublo, E. K. (2007) Footwear production. In Brisbane, M. and Hather, J. (eds.), *Wood Use in Medieval Novgorod*, Oxford: Oxbow, 158-164.

Makarov, N. (2006) Traders in the forest: the northern periphery of Rus' in the medieval trade network. In Tracy, J. D., Reyerson, K. L., Noonan, T.S. and Stavrou, T. G. (eds.), *Pre-modern Russia and its World: Essays in honor of Thomas S. Noonan*. Wiesbaden: Harrassowitz, 115-134.

Makarov, N. (2012) The fur trade in the economy of the Northern Borderlands of medieval Russia. In Brisbane, M., Nosov, E. N. and Makarov, N. (eds.), *The Archaeology of Medieval Novgorod in its Wider Context.* Oxford: Oxbow, 381-390.

Maltby, M. (2010) *Feeding a Roman Town: Environmental Evidence from Excavations in Winchester 1972–1985.* (Winchester Museum Service Archaeological Report Monograph) Winchester: Winchester Museums and English Heritage.

Maltby, M. (2012) From *Alces* to Zander*:* a summary of the zooarchaeological evidence from Novgorod, Gorodishche and Minino. In Brisbane, M., Nosov, E. N. and Makarov, N. (eds.), *The Archaeology of Medieval Novgorod in its Wider Context.* Oxford: Oxbow, 351-380.

Maltby, M (forthcoming) *Animals and Archaeology in Northern Medieval Russia*. Oxford: Oxbow.

Martin. J. (2004) *Treasures of the Land of Darkness: the Fur Trade and its Significance for Medieval Russia*. Cambridge: Cambridge University Press.

Monk, M. and Johnston, P. (2012) Perspectives on non-wood plants in the sampled assemblage from the Troitsky excavations in medieval Novgorod. In Brisbane, M., Nosov, E. N. and Makarov, N. (eds.), *The Archaeology of Medieval Novgorod in its Wider Context.* Oxford: Oxbow, 283-320.

Orton, C. (ed.) (2006) *The Pottery from Medieval Novgorod and its Region.* Oxford: Oxbow, 283-320.

Reilly, E. (2012) Fair and foul: analysis of sub-fossil insect remains from Troitsky XI-XIII, Novgorod (1996-2002). In Brisbane, M., Nosov, E. N. and Makarov, N. (eds.), *The Archaeology of Medieval Novgorod in its Wider Context.* Oxford: Oxbow, 265-282.

Rybina, E. A. (1992) Recent finds from excavations in Novgorod. In Brisbane, M. (ed.), *The Archaeology of Novgorod, Russia: recent Results from the Town and its Hinterland.* Lincoln: Society for Medieval Archaeology Monograph 13, 160-192.

Rybina, E. A. (2001) The birch-bark letters: the domestic economy of medieval Novgorod. In Brisbane, M. and Gaimster, D. (eds.), *Novgorod: the Archaeology of a Russian Medieval City and its Hinterland*. London: British Museum Occasional Papers 141, 127-131.

Rybina E. A. (2007) Fishing and hunting. In Brisbane, M. and Hather, J. (eds.), *Wood Use in Medieval Novgorod*. Oxford: Oxbow, 124-135.

Savinetskii, A. (forthcoming) Archaeozoological materials from Minino and changes in populations of utilized mammals from the North of European Russia from the Mesolithic to the Medieval period. In Maltby M, *Animals and Archaeology in Northern Medieval Russia*. Oxford: Oxbow.

Smirnova, L. (2001) Utilization of rare bone materials in medieval Novgorod. In Choyke, A. M. and Bartosiewicz, L. (eds.), *Crafting Bone-Skeletal Technologies through Time and Space*, Oxford: British Archaeological Reports (British Series) 937, 9-17.

Smirnova, L. (2005) *Comb-Making in Medieval Novgorod (950-1450): an Industry in Transition.* Oxford: British Archaeological Reports (International Series) 1369.

Sychevskaya, E. K. (1965) Fish of medieval Novgorod, *Soviet Archaeology* 1, 236-256.

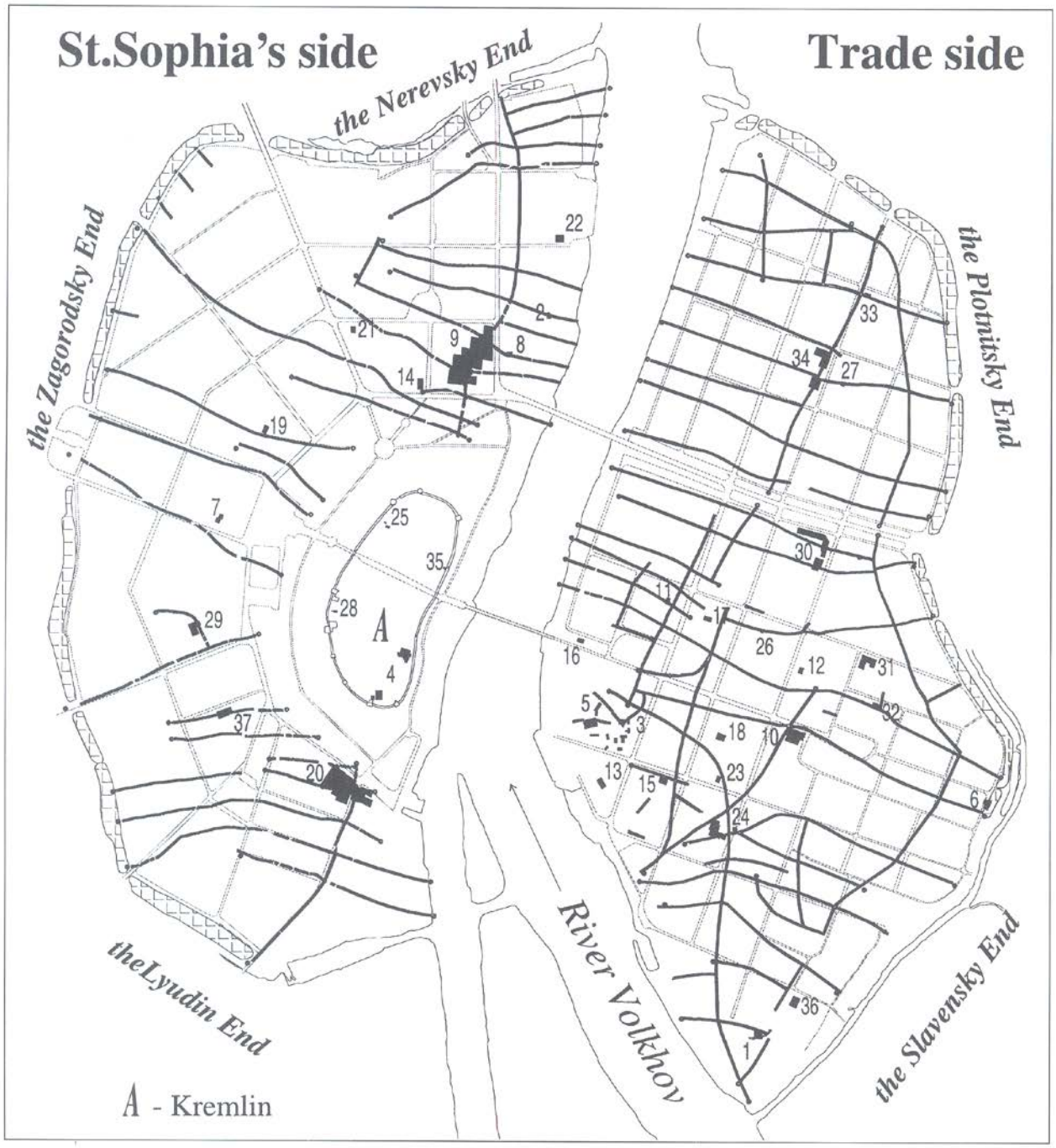
Tsalkin, V. I. (1956) Material concerning the history of animal husbandry and hunting in medieval Russia, *Materials and Investigations of Archaeology, USSR* 51, Moscow: Academy of Sciences.

Vitt, V. O. (1952) Loshadi Pezyryksich kuganov (The horses of the Pazyryk Kurgans). *Sovetskaja Archeologija* 16, 163-205.

Yanin, V. L. (1992) The archaeological study of Novgorod: an historical perspective. In Brisbane, M (ed.), *The Archaeology of Novgorod, Russia: recent Results from the Town and its Hinterland,* Lincoln: Society for Medieval Archaeology Monograph 13, 67-106.

Yanin, V. L., Khoroshev, A. S. and Brisbane, M. (2007) Novgorod: an introduction. In Brisbane, M. and Hather, J. (eds.), *Wood Use in Medieval Novgorod*, Oxford: Oxbow, 1-12.

Figure 1: Map showing location of Novgorod. Source Yanin *et al*. (2007: 2)



The sites are numbered in the order they were excavated and are as follows: 1 - on Slavensky Hill. 2 - on Borkovaya Street. 3 + 5 - in Yaroslav's Court. 4, 25, 28 + 35 - in the Kremlin. 6 - on the eastern rampart. 7 - on Chudintsevaya Street. 8 - on Kholopya Street. 9 - Nerevsky. 10 - Ilyinsky. 11 - Buyany. 12 - Slavensky. 13 - Gotsky. 14 - Tikhvinsky. 15 - Mikhailovsky. 16 - Torgovy. 17 - Rogatitsky. 18 - Kirovsky. 19 - Lyudogoshchinsky. 20 - Troitsky. 21 - Kosmodemyansky. 22 - Dmitrievsky. 23 - Duboshin. 24 - Nutny. 26 - on Bolshevikov Street. 27 - Molotkovsky. 29 - Mikhailo-Arkhangelsky. 30 - Fedorovsky. 31 - Ipatevsky. 32 - Lukinsky. 33 - Konyukhov. 34 - Andreevsky. 36 - Polsolsky. 37 - Dobrynin.

Figure 2: Plan of medieval Novgorod showing locations of excavations. Source Yanin *et al*. (2007: 8)

Element	Horse	Horse		Beaver	Beaver	
	NISP	Butchered		NISP	Butchered	
Maxilla	11			4		
Skull frag	23	3		3	1	
Mandible	41	5		16	6	
Teeth	82			6		
Scapula	43	18		6	5	
Clavicle				2	1	
Humerus	41	6		8	6	
Radius	67	23		3	2	
Ulna	34	10		6	2	
Pelvis	21	7		10	5	
Femur	44	5		7	2	
Patella	7	2				
Tibia	79	21		11	3	
Fibula				2		
Carpals	107	3				
Astragalus	28	5		1		
Calcaneus	31	5		2		
Other tarsals	38	4				
Metacarpal	70	12				
Metatarsal	47	9		1		
Metapodial	22	6				
Peripheral Mp	42	1				
Phalanx 1	65	12				
Phalanx 2	47	4				
Phalanx 3	48	4				
Sesamoids	9					
Vertebrae	36	11		5		
Ribs	9	2		7	2	
Total	1092	178		100	35	
% butchered		17.6				
% butchered excludes teeth						

Table 1: Elements of horse and beaver from Troitsky Sites IX-XI, Novgorod