INTEGRATING ZOOARCHAEOLOGY INTO STUDIES OF ROMAN BRITAIN AND MEDIEVAL RUSSIA

Volume 1

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Integrating Zooarchaeology into Studies of Roman Britain and Medieval Russia

Mark Maltby

Abstract

This volume and supporting papers constitute the submission for an award of a PhD research degree by publication. Eleven works completed by the author within the last 15 years (eight published; three in press) have been submitted for consideration. All the papers are concerned with animal exploitation in late prehistoric and Roman Britain and/or Medieval north-west Russia.

To put these submissions into context, Chapter 2 summarizes the author's academic career and the history of the research projects with which he has been involved. The next two chapters provide summaries and critically evaluative comments concerning the submitted works. Chapter 3 discusses the works concerned with the exploitation of animals and their products in the late Iron Age and Roman periods in Britain. Chapter 4 considers papers principally concerned with the exploitation of animals within the Medieval town and territory of Novgorod in north-west Russia.

Chapter 5 presents an evaluation of the contribution the submitted works have made to furthering knowledge, not only of the specific periods and regions involved, but also more generally to the development of urban zooarchaeology (including comparisons between urban and rural faunal assemblages), the study of carcass processing, and the integration of zooarchaeology into general research questions.

Acknowledgements

There are numerous people to acknowledge in relation to the production of this case for support and the published works associated with it. Firstly, I am grateful to Dr Kate Welham and Professor Matthew Bennett, who encouraged me to register for the degree and granted me study leave, during which time I prepared this submission. Many thanks are due to Dr Clare Randall, who so effectively covered my teaching duties during my leave. My mentors, Professors Tim Darvill and Terry O'Connor (University of York), provided me with good counsel throughout and very constructive comments on the first draft of the submission.

In relation to the submitted works, in addition to those acknowledged in the papers themselves, I would like to thank all those (too numerous to name individually) who provided me with the assemblages to study and who invited me to take part in conference sessions and/or contribute to conference proceedings. There are some, however, whose help I would like to highlight here. I am indebted to Professor Mark Brisbane, who invited me to become involved with the Novgorod project and has given me great support throughout. This has been the most challenging, but at the same time, the most fascinating project I have been involved with during my career. Sheila Hamilton-Dyer has been of immense help, not only as a colleague in Novgorod, but also as a guru for bird and fish bone identifications on many of my projects. Dr Ellen Hambleton, in addition to taking the photograph of the great auk, has also offered great encouragement and it has been a pleasure to work with her on a number of projects during the last decade.

On the domestic front, I am grateful for the great support my parents, Cyril and Sheila, have given me throughout my career. My wife, Julia, and daughter, Hannah, have become accustomed to sharing the house with boxes of bones, archives and other scattered debris resulting from my activities. They have also had to endure my endless pacing (and grumpiness) during periods of writer's block. Without their tolerance, patience and support, I would not have been able to complete this work, which is dedicated to them.

List of Contents

Volume 1

Abstract i

Acknowledgements ii

List of Contents iii

List of Figures vii

List of Tables vii

Chapter 1: Introduction 1

1.1. Rationale 1

1.2. Main Research Themes 1

1.3. Publications Submitted for Examination 2

1.4. The Structure of this Supporting Document 4

Chapter 2: History of the Research 6

2.1. Introduction 6

2.2. Academic Training and First Influences: 1971-1977 6

2.3. Wessex and Beyond: 1977-1990 8

2.4. Research and Consultancy in Britain: 1990-2010 12

2.5. Broadening the Mind: Eastern European Adventures: 1993-2010 15

2.6. Summary of the History of Research 22

Chapter 3: Exploitation of Animals and their Products in the Later Iron Age and Roman Britain 23

3.1. Introduction 23

3.2. Submission 1 23

3.3. Submission 2 25

3.4. Submission 4 26

3.5. Submission 5 27

3.6. Submission 6 28

3.7. Submission 7 29

3.8. Submission 8 30

Chapter 4: The Exploitation of Animals in Medieval North-West Russia 36

4.1. Introduction 36

4.2. Submission 3 36

4.3. Submission 9 37

4.4. Submission 10 38

4.5. Submission 11 39

Chapter 5: The Major Research Themes and their Contribution to Knowledge 42

5.1. Introduction 42

5.2. Research in Urban Zooarchaeology 42

5.2.1. Winchester and Novgorod 42

5.2.2. Comparisons of Urban And Rural Faunal Assemblages 43

5.3. Research into Carcass Processing 45

5.4. Zooarchaeology is Archaeology 48

5.5. Concluding Remarks 51

References 53

Appendix 1: List of Author's Published Works, Professional Papers and Other Reports with Limited Circulation 72

Monographs 72

Edited Volumes 72

Journal Articles 72

Chapters in Edited Volumes/Sections in Excavation Reports 74

Professional Papers and Other Reports with Limited Circulation

a) Large Reports 83

Professional Papers and Other Reports with Limited Circulation

b) Small Reports 86

Submissions

Submission 1. Maltby, M. 1997. Domestic fowl on Romano-British sites: inter-site comparisons of abundance. *International Journal of Osteoarchaeology* **7**, 402-414.

Submission 2. Maltby, M. 2002. Animal bones in archaeology: how archaeozoologists can make a greater contribution to British Iron Age and Romano-British archaeology. In K. Dobney and T. O'Connor (eds.), *Bones and the Man: studies in honour of Don Brothwell*. Oxford: Oxbow, 88-94.

Submission 3. 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.

Submission 4. Maltby, M. 2006. Salt and animal products: linking production and use in Iron Age Britain. In M. Maltby (ed), *Integrating Zooarchaeology*. Proceedings of the 9th ICAZ Conference, Durham 2002. Oxford: Oxbow, 119-124.

Submission 5. Maltby, M. 2007. Chop and change: specialist cattle carcass processing in Roman Britain. In B. Croxford, N. Ray, R. Roth and N. White (eds.), *TRAC 2006: Proceedings of the 16th Annual Theoretical Roman Archaeology Conference, Cambridge 2006*. Oxford: Oxbow, 59-76.

Submission 6. Maltby, M. 2009. Bones: mammals, birds and fish, in S. Palmer *Excavation of an enigmatic multi-period settlement on the Isle of Portland, Dorset*. British Archaeological Reports (British Series) **499**. Oxford: Archaeopress, 27-43.

Submission 7. Maltby, M. 2010. Zooarchaeology and the interpretation of depositions in shafts. In J. Morris and M. Maltby (eds.) *Integrating Social and Environmental Archaeologies: reconsidering Deposition.* British Archaeological Reports (International Series) **S2077**. Oxford: Archaeopress, 24-32.

Submission 9. Maltby, M. 2011. From *Alces* to Zander: a summary of the zooarchaeological evidence from Novgorod, Gorodishche and Minino. In M. Brisbane, E. Nosov and N. Makarov, (eds.), *The Archaeology of Medieval Novgorod in its wider Context.* Oxford: Oxbow, Chapter 19.

Submission 10. Maltby, M. 2011. Horseflesh and beaver pelts: aspects of faunal studies in medieval Novgorod and its region. In A. Choyke, G. Jaritz and A. Pluskowski (eds.) *The Bestial City: animals and medieval urban space.* Oxford: Oxbow.

Submission 11. Maltby, M. 2011c (in press) Zooarchaeology and the study of towns: past present and future. In F. Worley, J. Morris, P. Baker, M. Maltby and N. Sykes

(eds.), *Influencing, Supporting and Maintaining our Profession: past, present and future*. Proceedings of ICAZ Conference Session, Paris 2010. Paris: Muséum National d'Histoire Naturelle, Service des Publications scientifiques. Digital Volume.

Volume 2

Submission 8. Maltby, M. 2010. *Feeding a Roman Town: Environmental Evidence from Excavations in Winchester, 1972-1985.* Winchester: Winchester Museums Service.

List of Figures

Figure 1. Excavations of one of the Troitsky sites in Novgorod 1993 21

Figure 2. Wet-sieving in the River Volkhov 1993 25

Figure 3. Great auk humerus from Weston Road, Portland 39

List of Tables

Table 1. General trends in Romano-British animal exploitation 58

Chapter 1: Introduction

1.1 Rationale

This document comprises the case for support for the submission for an award of a PhD research degree by publication. The author has specialised in the field of zooarchaeological studies and a selection of his works around the themes of animal exploitation in Britain and Russia published within the last 15 years is submitted for consideration. These published works are supplemented by some recent articles accepted for publication and in press. This supporting document is designed to highlight and critically evaluate the contributions these works have made towards the advancement of knowledge both within the field of zooarchaeology and within the discipline of archaeology more generally.

1.2 Main Research Themes

This submission is based on publications that centre upon two broad areas of zooarchaeological research that the author has been involved with during his career. The first of these research themes concerns the exploitation of animals and their products in the later Iron Age and Roman periods in Britain. The second area concerns the exploitation of animals in medieval north-west Russia.

The submitted publications with regard to Iron Age and Roman Britain include syntheses on the evidence for the exploitation of animals on a range of different types of later prehistoric and Romano-British settlements and detailed analyses of faunal remains from Roman towns. These include contributions to knowledge in a number of areas, including the development of specialist butchery methods in Roman Britain; the impact of increased salt production on carcass processing and trade; intra-site variability in towns; chronological and regional variability in the exploitation of animals; acculturation; and ritual depositions of animals.

The research in Russia is centred around improving our understanding of the exploitation of animals within and around the medieval town of Novgorod. Among the themes discussed in publications emanating from this collaborative research programme are chronological and regional variability in the exploitation of animals; integration of different sources of evidence for the exploitation of animals and their products; sampling strategies; carcass processing of domestic mammals; and the fur trade.

Although the publications derive from different periods and areas, there are a number of common themes that demonstrate a unified approach to the study of zooarchaeological data. Much of the research from both areas is centred upon urban studies and the results have provided significant new knowledge upon how faunal analyses can contribute to our understanding about the provisioning and internal economic functioning of towns. However, understanding the relationship between towns and their hinterlands is also crucial to such interpretations and this question has been addressed in a number of the published works. Another common theme is the examination of intra-settlement variability both within towns and their suburbs, and in other types of settlement. Such variations can be the result of complex depositional histories. These studies include examples where such variability can be shown to have been caused by retrieval bias; differential bone preservation; carcass processing methods; bone-working; dietary preferences; and ritual deposition. This contextual approach has provided a much deeper understanding of the nature of faunal assemblages and how to study them. In many respects, the research has demonstrated that zooarchaeology can contribute to many wider research themes. Many of the published works emphasise the need for better integration between zooarchaeological and other archaeological research and a more holistic approach to the study of peoples' attitudes to, and exploitation of, animals in the past. The author has been one of the leading advocates of this research development for many years.

1.3 Publications Submitted for Examination

The books, journal articles and chapters submitted for consideration have been selected from an extensive range of works published by the author (see Appendix 1 for the

complete list of publications and consultancy reports). The rationale for selection has drawn upon on three criteria:-

a) They have been published within the last 15 years, or are in press.

b) They are relevant to one or both of the two main research themes outlined in Section 1.2.

c) They best represent how zooarchaeological studies can be incorporated into broad archaeological research questions.

The publications, listed in chronological order, are:

Submission 1. Maltby, M. 1997. Domestic fowl on Romano-British sites: inter-site comparisons of abundance. *International Journal of Osteoarchaeology* **7**, 402-414.

Submission 2. Maltby, M. 2002. Animal bones in archaeology: how archaeozoologists can make a greater contribution to British Iron Age and Romano-British archaeology. In K. Dobney and T. O'Connor (eds.), *Bones and the Man: studies in honour of Don Brothwell*. Oxford: Oxbow, 88-94.

Submission 3. 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.

Submission 4. Maltby, M. 2006a. Salt and animal products: linking production and use in Iron Age Britain. In M. Maltby (ed), *Integrating Zooarchaeology*. Proceedings of the 9th ICAZ Conference, Durham 2002. Oxford: Oxbow, 119-124.

Submission 5. Maltby, M. 2007a. Chop and change: specialist cattle carcass processing in Roman Britain. In B. Croxford, N. Ray, R. Roth and N. White (eds.), *TRAC 2006: Proceedings of the 16th Annual Theoretical Roman Archaeology Conference, Cambridge 2006*. Oxford: Oxbow, 59-76.

Submission 6. Maltby, M. 2009a. Bones: mammals, birds and fish, in S. Palmer, *Excavation of an enigmatic multi-period settlement on the Isle of Portland, Dorset*.

British Archaeological Reports (British Series) **499**. Oxford: Archaeopress, 27-43 plus tables on microfiche.

Submission 7. Maltby, M. 2010a. Zooarchaeology and the interpretation of depositions in shafts. In J. Morris and M. Maltby (eds.) *Integrating Social and Environmental Archaeologies: reconsidering deposition.* British Archaeological Reports (International Series) **S2077**. Oxford: Archaeopress, 24-32.

Submission 8. Maltby, M. 2010b. *Feeding a Roman Town: environmental evidence from excavations in Winchester, 1972-1985.* Winchester: Winchester Museums Service.

Submission 9. Maltby, M. 2011a (in press). From *Alces* to Zander: a summary of the zooarchaeological evidence from Novgorod, Gorodishche and Minino. In M. Brisbane, E. Nosov and N. Makarov, (eds.), *The Archaeology of Medieval Novgorod in its wider Context.* Oxford: Oxbow, (provisional pages) 361-391.

Submission 10. Maltby, M. 2011b (in press). Horseflesh and beaver pelts: aspects of faunal studies in medieval Novgorod and its region. In A. Choyke, G. Jaritz and A. Pluskowski (eds.) *The Bestial City: animals and medieval urban space.* Oxford: Oxbow.

Submission 11. Maltby, M. 2011c (in press). Zooarchaeology and the study of towns: past present and future. In F. Worley, J. Morris, P. Baker, M. Maltby and N. Sykes (eds.), *Influencing, Supporting and Maintaining our Profession: past, present and future*. Proceedings of ICAZ Conference Session, Paris 2010. Paris: Muséum National d'Histoire Naturelle, Service des Publications scientifiques. Digital Volume.

1.4 The Structure of this Supporting Document

Chapter 2 provides an account of my career and research. This is necessary in order to understand how the publications selected for this assessment were created. I have chosen no publication prior to 1997 and most of those submitted have been published in the last five years. However, in most cases they encompass research questions and utilise data that have a much earlier origin and they merely represent a selection of the

latest instalments of a long evolutionary research trajectory. In essence, Chapter 2 provides the equivalent of the background history of previous research and critical literature review found in conventional PhD formats.

Chapter 3 critically evaluates the contributions of the publications primarily concerned with the exploitation of animals and their products in the later Iron Age and Roman Britain (Maltby 1997; 2002a; 2006a; 2007a; 2009a; 2010a; 2010b). Chapter 4 examines the second theme - the exploitation of animals in medieval north-west Russia – examining papers that are either fully or partially concerned with research on the town of Novgorod and its region (Brisbane and Maltby 2002b; Maltby 2011a; 2011b; 2011c). Chapter 5 begins with an evaluation of some of the general themes discussed in Chapters 3-4 (urban zooarchaeology; comparisons of urban and rural faunal assemblages; carcass processing; integration of zooarchaeology into general research questions) and provides an overall conclusion that summarises what I believe have been my major contributions to knowledge.

In addition to the traditional bibliography giving details of all the references cited in the text, Appendix 1 lists all my publications under the categories of monographs; edited volumes; journal articles; chapter in books and/or sections in excavation reports; professional papers and other reports with limited circulation (including Ancient Monuments Laboratory and consultancy reports).

Chapter 2: History of the Research

2.1 Introduction

This chapter sets the selected publications into the context of the author's career and research profile and also considers them in relation to general developments in zooarchaeology and archaeology over the last 30 years. As this is a personal review of my own career, this and subsequent sections are written in the first person.

2.2 Academic Training and First Influences: 1971-1977

Between 1971 and 1974 I was an undergraduate at the University of Sheffield reading for a BA in Prehistory and Archaeology. My lecturers included Professors Colin Renfrew, Paul Mellars, John Collis, Robin Dennell and Graeme Barker. This was the era that with the aid of hindsight became known as the "New Archaeology"; the period dominated by processual archaeology (Trigger 2006). Both Robin and Graeme were students of Eric Higgs at the University of Cambridge and came to Sheffield fresh from their doctorates. Their approach incorporated and encouraged the use of environmental archaeology in the study of prehistoric societies. Inevitably this led to many of their students becoming interested in pollen, plant macrofossils, soils and animal bones. I was no exception, although we did not receive much in the way of practical training. However, sieving and sorting through thousands of limpets and fish bones on Paul's Mesolithic excavations in Orkney made me begin to appreciate the intensive labour and patience involved in acquiring good faunal samples!

John Collis's inspirational lectures on the European and British Iron Age awakened my interest in later prehistory and when the opportunity arose to carry out postgraduate research, I was keen to study Iron Age subsistence economies. John had no suitable material of that period available but he did have a lot of boxes of Roman and Medieval animal bones from Exeter, Devon. So, in 1974, serendipity rather than any burning

research questions was largely responsible for a student of prehistory embarking on postgraduate research concerned with material of historic date.

The initial research was funded by a grant from the Department of Education and Science. It became apparent that the amount of bones to be studied (this was before the days of post-excavation assessments) was much greater than could be completed in 12 months. Subsequently the research was funded by the Exeter Archaeological Unit, although this meant I had to add substantial amounts of new material from a number of their more recent excavations in the city. However, this did enable me to observe and discuss significant inter-site variations. I eventually stopped recording data (>75,000 bone fragments) and wrote up the results for a Masters thesis, which was subsequently published as a monograph (Maltby 1979a). This volume was influential in creating a new research agenda for zooarchaeology in Britain and the approach was emulated by a number of subsequent researchers (O'Connor 2000; 2003).

Needless to say this was an important formative period in my zooarchaeological career. Much of the early part of the research was spent learning how to identify bones and appreciating the value of, and the need to build up, skeleton reference collections. Recording methods, which would now be regarded as standard, were in developmental stages and relied heavily on Chaplin (1971). Data were recorded by hand (I still have the forms!) and easily-accessible and interactive computer technology was in its infancy. It would be untrue to claim that I began with any clear idea of the important research questions that were specifically relevant to historic towns. However, to apply methods that essentially had their origins in prehistoric studies to later periods was a novel approach and it soon became clear that faunal analysis allowed access to avenues of research previously under-explored in studies of Romano-British and medieval towns. Thus began my enduring interest in such matters that is reflected in the publications submitted here.

During the final year of my time in Sheffield, I began to undertake a number of contracts to analyse and report upon animal bone assemblages from other British sites. In addition to paying the bills, these provided a broader range of experience in studying material from different periods and various types of site. One of the frustrations of the research in Exeter had been the lack of sites in the hinterland to compare with the urban

assemblages. Excavations at Okehampton Castle, West Devon, provided one of the first large assemblages to be studied from a high status British medieval site. The results showed that there were distinct differences between Exeter and the castle, particularly in terms of species (and dietary) diversity and anatomical representation (Maltby 1982a). I also studied a substantial assemblage from the Roman small town at Alcester, Warwickshire. This showed many similar characteristics to those observed in the *civitas* capital at Exeter. Unfortunately, this work was not published until many years later (Maltby 2001a). Analysis of several samples from rescue excavations in Gloucester allowed me to study material from another major Roman town (*colonia*) and some of its medieval sites (Maltby 1979b; 1983a).

2.3 Wessex and Beyond: 1977-1990

In September 1977 I was appointed as a Research Fellow in the Faunal Remains Project (later Unit) within the Department of Archaeology at the University of Southampton. The project was funded by the Ancient Monuments Laboratory (AML) of the Department of the Environment. Under the directorship of Jennie Coy, this was one of a number of University-based projects set up mainly to deal with the post-excavation backlog created by rescue excavations in the 1970s. Subsequently we were also involved with the analysis of material from ongoing publicly-funded excavations. Our regional brief was “Wessex”, which encompassed the modern counties of Hampshire, Dorset, Wiltshire, Berkshire and the Isle of Wight.

There was an enormous amount of material available to study. In recognition of this, the AML expanded the unit to three Research Fellows in 1981. Jennie and I were joined first by Sarah Colley and then by her replacement, Jennifer Bourdillon. Jennie Coy left the unit in 1989, after which I became its director until I departed in 1990. During my final year there we were joined by Andrea Bullock.

Although somewhat constrained by the needs of working to the deadlines imposed by the environment of rescue archaeology, we were able to develop research strategies within which we operated. I was eager to study later prehistoric material, which allowed me to carry out research on a number of Iron Age sites in Hampshire, including the

settlements at Old Down Farm (Maltby 1981a) and Winnall Down/Easton Lane (Maltby 1985a; 1989a), and the hillfort at Balksbury (Maltby 1995a). In addition to writing the site reports, it was during this period, that I made my first attempts to synthesise the evidence of animal exploitation in southern England (Maltby 1981b; Coy and Maltby 1987). However, I also expanded the types of intra-settlement studies I had developed in the analyses of bones from towns and applied them to prehistoric sites. Based initially on a largely processual approach and heavily influenced by the developing interest in faunal taphonomy (Binford 1978; 1981), these studies required more detailed recording of bone preservation, fragmentation and butchery and I was involved in developing the AML recording systems to facilitate this (Jones *et al.* 1980). These recording methods facilitated detailed contextual analyses of bones and the results demonstrated significant patterning in the assemblages from Iron Age and Romano-British rural sites (e.g. Maltby 1985a; Coy and Maltby 1987; 1991). The archival data were also made available to other researchers and the Winnall Down and Balksbury datasets formed an important part of J.D. Hill's influential doctoral research (Hill 1995).

A number of other Iron Age, early Romano-British and Saxon rural settlements were investigated during the 1980s. These included analyses of various assemblages from sites around Basingstoke in Hampshire, such as those from Viables Farm (Maltby 1982b), Cowdery's Down (Maltby 1983b), Oakridge II (Maltby 1994a) and Brighton Hill South (Maltby 1995b). Viables Farm included an unusual group of animal skeletons associated with human burials in a pit. The assemblage from Oakridge II was almost entirely derived from a Roman well, which included an amazing array of animal bone depositions. Both these studies were influential in developing a critical awareness that it was naïve to interpret all animal burials, and so-called "special deposits", (*sensu* Grant 1984) as a single phenomenon, a topic subsequently considered in Submission 7 (Maltby 2010a).

However, by far the most important of the rural settlement assemblages studied during my time at the Faunal Remains Unit, was from Owslebury, near Winchester in Hampshire. Excavated in the 1960s (Collis 1968; 1970), the site produced over 80,000 bone fragments spanning the Middle Iron Age to the late Romano-British period. This enabled me to examine the history of animal exploitation at one settlement occupied either side of the Roman invasion. Although a substantial AML animal bone report was

produced (Maltby 1987), the excavations are still unpublished. It is even more unfortunate that the digital and printed archives have respectively become unreadable and thrown away since I left the unit. This means that subsequent reworking of the dataset by myself and others to utilise the detailed information available has proved impossible. Some of the surviving data have been incorporated in some of the subsequent research (e.g. Maltby 1989b; 2007a; 2010b) and the metrical data are available on the Archaeological Data Service's Animal Bone Metrical Archive Project (University of Southampton 2003) but the full potential of this assemblage has not yet been realised. Access to the original data from other sites was also compromised. In addition, many of the published reports only include summary data. Much of these data are only available in unpublished Ancient Monument Reports (see Appendix 1, Professional Papers and Other Reports with Limited Circulation).

I also undertook research on earlier prehistoric material from later Bronze Age sites on the Marlborough Downs (Maltby 1992) and from sites excavated in the Stonehenge Environs Project (Maltby 1990). The latter included examination of bones from the so-called "Coneybury Anomaly", an early Neolithic pit which produced substantial numbers of cattle head and foot bones plus many bones of roe deer and bones of a number of other species. The bones appeared to have been deposited over a short period of time along with significant quantities of pottery and flint. The implications of these finds have been much discussed in subsequent publications on Neolithic Britain (e.g. Edmonds 1999; Thomas 1999). The work on all the Stonehenge Environs sites was important in my development because it focused my attention much more on the complexities of deposition. The results posed challenging questions as to what extent it was possible to make broad statements about developments in pastoral farming from evidence derived from ritual depositions and/or large-scale consumption events. Indeed, this project enabled me to demonstrate what I had long believed to be the case; that the role of the faunal specialist could be extended beyond the traditional narrow parameters of environmental archaeology.

I had first briefly addressed this theme in a paper published in the *Beyond Domestication* volume (Maltby 1985b). In this I tried to go beyond issues solely concerned with taphonomy to consider potential variability resulting from exchange, trade and consumption in animal products. I did not, however, adequately consider the

impact that religious and other ritual practices could have on the formation of faunal assemblages.

Most of the research in my final years at the FRU reverted to the study of animal bone assemblages from Roman towns. Substantial samples from the Greyhound Yard site, Dorchester were analysed (Maltby 1993) and more modest samples were also examined from sites in Silchester (Maltby 1984a). The initial analysis of material from the suburbs and defences of Roman Winchester had begun but remained unfinished when I left the unit in 1990. After several episodes of rephasing, reanalysis and rewriting, the fruits of this labour were eventually published in a monograph (Maltby 2010b) (Submission 8).

One of the main areas of methodological innovation I developed during this period was in the recording and analysis of butchery. These methods were based initially on the AML recording system (Jones *et al.* 1980) but were gradually refined. Several papers considering butchery marks and the challenges of how to analyse them were published in the 1980s (Maltby 1984b; 1985c; 1989b). These were concerned mainly with the identification and quantification of Romano-British specialist carcass processing practices and the subsequent disposal of butchery waste. These methods have subsequently been applied to a wide range of sites by myself (e.g. Hambleton and Maltby 2009; Maltby 1998a; 2010b;) and others (e.g. Hamilton-Dyer 2004; Hammon 2005; Seetah 2006) and the topic is focused upon in Submission 5 (Maltby 2007a).

The period spent at the Faunal Remains Unit was one where I was able to greatly expand my zooarchaeological expertise and apply my approaches to a wide range of sites from different periods. In addition to the fabulous support and encouragement I received from my colleagues in the Unit, I was able to carry out my work in a department which had vibrant and diverse research interests. During my time there I discussed my work with, and was influenced by the ideas of, many notable established and blossoming academics including Clive Gamble, Colin Renfrew, Peter Ucko, Stephen Shennan, Tim Champion, Tim Darvill, J.D. Hill, Richard Hingley and Lewis Binford (Visiting Professor). I was heavily involved in the organization of the World Archaeological Congress hosted in Southampton in 1986, which proved to be a landmark event (Ucko 1987). Involvement with this congress, along with attendance of

several TAG and other conferences, broadened my understanding of archaeological issues in different parts of the world, including the Eastern Block, where I was to become heavily involved in future years.

2.4 Research and Consultancy in Britain 1990-2010

In 1990, I was appointed to the post of Senior Lecturer in Archaeology by the Dorset College of Further Education based in Bournemouth. By the time I joined in September of that year the College had become Bournemouth Polytechnic and subsequently emerged as one of the "new" Universities in 1992. I was course leader for the BSc Archaeology programme for four years and subsequently helped to design and lead the MSc Osteoarchaeology programme. I was promoted to Reader in 1999.

The appointment meant that my research in zooarchaeology became a part-time occupation. However, the opportunity to develop teaching and learning in areas beyond my major area of expertise has been one that has broadened my understanding of both prehistoric and historic societies and made me further appreciate that zooarchaeology should not be studied in isolation from other branches of archaeology. Over the past two decades I have developed and delivered lectures in modules as diverse as Statistics, Environmental Archaeology, Iron Age Britain, Archaeological Theory and The Social Use of Space alongside developing teaching in zooarchaeology. An example of how this broader experience has impacted upon my publication output can be seen in the paper on late Iron Age salt production and trade presented to the ICAZ conference in Durham in 2002. This integrated knowledge gained from preparing lectures for an unit on Iron Age Britain with reinterpretations of zooarchaeological data. The resultant publication forms Submission 4 (Maltby 2006a).

Various research papers initially based on my work in Southampton were published in the 1990s. These included further reviews of the exploitation of animals in Iron Age Britain (Maltby 1996a) and comparisons between animal bones from Roman Dorchester and Winchester with those from Owslebury and other non-urban sites within the hinterland of the towns (Maltby 1994b).

I was also invited to contribute to the ICAZ bird conference in Southampton in 1995. This resulted in an extensive review of the abundance of domestic fowl found on different types of Roman sites, which forms the earliest of the published works submitted here (Submission 1) (Maltby 1997).

During the 1990s and into the 2000s I began to expand consultancy activity and won contracts to carry out faunal analyses for several archaeological units and national bodies such as English Heritage, CADW and the National Museum of Wales. Ellen Hambleton was initially appointed as my Research Assistant in 1998 and we have collaborated on a number of projects both prior to and since her promotion to lecturer. Amongst the assemblages studied were a number of important later prehistoric and Roman sites. I examined further substantial Roman urban samples from Cirencester (Maltby 1998a) for Cotswold Archaeological Trust, and was the principal investigator for the analysis of bones from the vicinity of the Basilica in Caerwent in SE Wales (Hambleton and Maltby 2009). I also studied a number of other Roman sites in the vicinity of Cirencester (Maltby 1998b). These provided further data to examine the diet and organisation of meat provisioning in Roman *civitas* capitals and to compare these with sites in their hinterland.

I was also co-investigator for the analyses of two substantial samples from Iron Age sites. The first of these was funded by the AML and in collaboration with Sheila Hamilton-Dyer. This involved the examination of bones from a selection of later prehistoric deposits at the hillfort of Cadbury Castle, Somerset (Hamilton-Dyer and Maltby 2000). The second was a detailed analysis of bones from deposits adjacent to the hillfort of Battlesbury, Wiltshire (Hambleton and Maltby 2008) in work carried out for Wessex Archaeology. Both analyses involved detailed contextual studies including close examination and interpretation of numerous animal bone groups. The study of bone deposition was also a principal research objective in the analysis of bones from a number of Neolithic and Bronze Age sites on Cranborne Chase, Dorset (e.g. Maltby 2007b; 2007c), and at the Neolithic causewayed enclosure at Whitesheet Hill, Wiltshire (Maltby 2004). I have also collaborated in a Leverhulme-sponsored research project into the study of grave goods from early Bronze Age burials, in which I identified and recorded the bone artefacts (Woodward *et al*. 2005).

Most of the consultancy undertaken since 2000 has been based in the eastern Midlands, mainly in projects led by Albion Archaeology (formerly the Bedfordshire Archaeology Unit). The most relevant projects to one of the principal research themes of this submission are those that involved the study of faunal assemblages from a range of later prehistoric and Roman sites, particularly from Bedfordshire, for example at Biddenham Loop (Maltby 2009b), and Marsh Leys (Maltby 2011e) on the outskirts of Bedford, and Wilby Way, Wellingborough, Northamptonshire (Maltby 2003a). A number of other projects from Bedfordshire have been completed but are, as yet, unpublished (Appendix 1). Although much of this has been site-specific commercial work, the projects and the data that they have yielded have contributed significantly to the development of my broader research interests.

Finally, I was the bone specialist contracted by the Portland Archaeological Trust for a Heritage Lottery-funded project on a (mainly) Roman site on the Isle of Portland, Dorset. This excavation produced an unusual range of birds and fish and the report includes comparisons with assemblages from Dorchester and other contemporary sites in Dorset (Maltby 2009a). This site report forms Submission 6, and is included as an example of the type of detailed analysis I undertake in all the consultancy reports I write.

In addition to their contribution to the interpretations of the individual sites, some of the data from consultancy work has been incorporated into other publications including several of those submitted for consideration here. For example, information from Caerwent and Cirencester has been included within the synthetic review of the zooarchaeology of Romano-British towns embedded in the monograph on Winchester (Maltby 2010b).

As discussed briefly above, for some time I had become increasingly aware that zooarchaeological studies were only of limited value if considered in isolation. They can contribute to much wider archaeological discourses and zooarchaeologists often need to embrace evidence from other sources to produce a better understanding of how humans and animals interacted in the past. The desire for a more holistic approach led me to organise a session on *Integrating Zooarchaeology* at the ICAZ conference held in Durham in 2002. I chaired the session and subsequently edited the volume of papers that combined zooarchaeological information with a range of other sources, including

documents, art, ceramics and other artefacts, and environmental data (Maltby 2006b). The arguments for a more integrated approach were also addressed at the conference in honour of Don Brothwell in York in 1999. My paper in the conference proceedings forms Submission 2 here (Maltby 2002).

2.5 Broadening the Mind: Eastern European Adventures: 1993-2010

When I was invited by my Bournemouth colleague, Mark Brisbane, to join him on a visit to the excavations in the Medieval town of Novgorod, in north-west Russia in 1993, I never envisaged that I was about to embark on a project with which I would still be involved nearly two decades later. There are prospects of extending my involvement even beyond that. I thought it was a one-off assessment exercise!

Novgorod is a World Heritage site. It was founded in the mid-10th century and became one of the most important cities in Russia throughout the medieval period (Halperin 1999). It was prominent in regional and international trade, particularly in animal furs (Makarov 2006). The waterlogged conditions mean that the preservation of the archaeology is superb and substantial areas have been excavated since 1932 (Figure 1).

Developing links forged from the World Archaeological Congress held in Southampton in 1986, Mark had gained a European Union INTAS grant to set up a collaborative programme to provide Russian colleagues with some equipment and to develop expertise in various areas of research. My role initially was to assess the potential of studying animal bones from Novgorod. At that time, the animal bones were not being collected from the annual summer excavations. There was no zooarchaeologist working with the excavation team and no reference skeleton collection. In collaboration with Sheila Hamilton-Dyer and with the assistance of Bournemouth University undergraduates, we embarked on the initial assessment. It was already clear from published material (Thompson 1965; Brisbane 1992) that the potential of the resource was immense for environmental archaeologists. Many organic materials survived extremely well in the anaerobic deposits. A lot of attention had been drawn to the unique birch-bark documents, of which over 1,000 have now been discovered, and there was clearly an abundance of surviving wood, leather, plant remains and other materials.

Indeed, the abundance of finds from Novgorod itself created huge logistical problems of retrieval, sampling, recording, conservation and storage. No samples were being taken for environmental analysis and only the more complete or unusual leather and wooden objects were being retained for conservation and analysis.

Figure 1: Excavations of one of the Troitsky sites in Novgorod 1993 (Source: author)

The main problems were the lack of financial, physical, technical and human resources. Everyone concerned with the excavations knew that they were recovering exciting and important finds. Excavations in various parts of the town over the previous 50 years had provided a chronological overview of the town's layout, the nature of its properties and an amazing range of artefacts. There had been many research projects into different categories of artefacts in particular. Many members of the project were also aware that recent scientific advances meant that the full potential of the archaeology was not being realised. However, appropriate equipment, storage and trained personnel were lacking. The attraction of the INTAS grant was that it was aimed at improving some of these resources, initially focussing on environmental archaeology.

We recognised that we needed to do some preliminary recording and analysis of any animal bones we looked at, in order to support any assertions we made about the potential of the material. We therefore requested our Russian colleagues to save bones from the excavations in 1993, mainly from the Troitsky sites in the south-west quarter of the town. Our primary aim was to advise on sampling and recording methods and to help set up a system whereby a coherent programme of faunal analysis could be carried out in the future by members of the project team based in Russia.

Initially, we had planned just one visit to Novgorod to assess the potential of the animal bones. However, after discussions with the excavation directors, Alexander Sorokin (Moscow State University) and Peter Gaidukov (Russian Academy of Sciences), it was agreed that after we had looked at the bones already collected, we would also examine any bones currently being excavated from the remaining spits from Peter's site (Troitsky X). This would involve a second visit in 1994 to complete the assessment.

We retained the most complete bones to begin to build up a reference collection. Part of the first INTAS grant was used to purchase wooden boxes, in which the reference material could be retained. The collection was expanded each year as suitable bones were found. There are still inevitably gaps in the reference material, particularly amongst the rarer mammals, birds and fish. However, until modern skeletons can be acquired, the reference material is now fit for the purpose of aiding identification of the major domestic and wild mammals and the most common species of birds.

As expected, there was clearly a preponderance of larger bones amongst the excavated material we initially examined and it seemed likely that the sample was heavily biased against the retrieval of smaller bones, particularly those of birds and fish. This is not unusual in any excavation that relies solely upon hand-retrieval. We initiated some sieving experiments in 1993. A small number of samples were wet-sieved using water from the nearby River Volkhov during 1993 and 1994 (Figure 2). The results demonstrated that many fish bones in particular were being overlooked during normal excavation. The results of the sieving experiments have been discussed within several publications (e.g. Maltby 2000; 2011a; Maltby and Hamilton-Dyer 2001a; 2001b).

Another serious problem was the lack of recording of the location of the bones recovered. Excavation was in arbitrary 20cm spits which enabled some degree of vertical control, although we continue to have major reservations about the validity of this approach. However, although collection of the bones from each square was carried out, limitations in the number of bags and other containers meant that bones from each of the two-metre squares were amalgamated into one large assemblage for each spit across the site. This clearly limited the contextual validity of the sample. When Peter Gaidukov began excavations of Troitsky XI in 1995, he agreed that the bones from the site would be separated by property as well as by spit. Although one property covered most of the site, it has been possible to compare assemblages from there with those from parts of two other properties. Although this was a step in the right direction, it has still proved impracticable to carry out more detailed intra-site variability studies within individual properties – a limitation that that been commented upon in several publications (e.g. Maltby 2011a; 2011b; 2011c).

With the assistance of several more Bournemouth students and Russian trainees, recording of the animal bones from the entire sequence at Troitsky XI was carried out during a series of subsequent visits to Novgorod between 1996 and 2002. This allowed us to examine animal bones dating from the earliest foundation of Novgorod through to 15th century levels. The full results from these and all the other assemblages we examined in Novgorod will be produced soon (Maltby 2012 in prep.). A detailed synthesis of the results, however, is also being published with a broader readership in mind and this forms Submission 9 here (Maltby 2011a).

Evgenij Nosov, (Institute for the History of Material Culture in St Petersburg) was heavily involved in the development of the INTAS collaboration. He had been carrying out fieldwork since the 1970s on medieval sites in the vicinity of Novgorod, principally at the high status settlement of Ryurik Gorodishche (Nosov 1992). In 1993, the excavations were producing animal bones dated mainly to the 9th and 10th centuries. Although also handicapped by lack of resources and equipment, systematic sieving was being carried out, from which large numbers of fish bones were being retrieved. We decided that we should also record the animal bones from these excavations to provide comparisons with Novgorod. These were recorded in detail by Sheila Hamilton-Dyer and myself in 1994 and 1995. Subsequent assemblages were examined by Ellen

Hambleton and Sheila in 2003. Some of the results of the analysis have already been published (e.g. Hamilton-Dyer 2002; Maltby; 2011a; Maltby and Hamilton-Dyer 2001a; 2001b) and the full report will appear in the zooarchaeology monograph (Maltby 2012 in prep.). The 2003 excavations also produced the exceptional find of a macaque (*Macaca sylvanus*) in a deposit dated to the 12th century. The implications of this find, which provides evidence for contact indirectly or directly between the court of the princes of Novgorod with North Africa has been discussed in a number of publications (e.g. Brisbane *et al.* 2007a; 2007b).

Figure 2: Wet-sieving in the River Volkhov 1993 (Source: author)

From 1994 onwards we were joined in Novgorod by Mick Monk of the University of Cork, who was recruited to assess the potential of the plant macrofossil remains. The success of INTAS1 led to two more sets of funding to expand the project. The award of the second INTAS grant, allowed the project to expand. This involved collaboration and financial support to develop the studies of ceramics, dendrochronology and wooden artefacts and brought in new partners from University College London, the British Museum, The National Museum of Denmark and the University of Lund. Clive Orton

and Jon Hather (University College, London) developed assessment and analytical research on the ceramics and wooden artefacts respectively and, incorporating contributions from Russian colleagues, edited two monographs published in the series emanating from this project (Orton 2006; Brisbane and Hather 2007). Eileen Riley, then of the University of Dublin, an expert on insect remains, was brought into assess the potential of such studies in the waterlogged deposits at Troitsky in 2001 and 2002. It was fascinating and instructive to work in close proximity to these eminent specialists and to discuss aspects of their studies. They faced many of the same questions and challenges that we had encountered with the faunal remains. These discussions and other observations further convinced me of the value of having integrated post-excavation projects. A monograph that brought together contributions from different specialists, incorporating some of the INTAS1 and INTAS2 work, was created from papers presented at the EAA conference held in Bournemouth in 1999 (Brisbane and Gaimster 2001) and included our preliminary results on the animal bones from Novgorod and Gorodishche (Maltby and Hamilton-Dyer 2001a). Mark Brisbane and I also compared some of the faunal data from Novgorod with information pertaining to animals gleaned from the birch-bark documents, again demonstrating the value of an integrated approach (Brisbane and Maltby 2002). This paper has been included in this submission.

For INTAS3, Mark added Nikolaj Makarov, President of the Institute of Archaeology, Russian Academy of Sciences into the collaboration. Several seasons of his excavations at Minino, 180km to the east of Novgorod had been producing animal bones. It was believed from several strands of archaeological and documentary evidence that the inhabitants of this region may have been heavily involved with the fur trade. The opportunity to include analysis of faunal material from a contemporary medieval site in that area was one we were keen to include within our general integrated approach to the analysis of production and consumption of materials in Novgorod and its region.

The mammal bones from Minino were being analysed by Arkady Savinetsii at the Institute of Ecology and Evolution, Russian Academy of Sciences in Moscow, where I first discussed our project with him in 2002. The faunal assemblage included substantial proportions of beaver, squirrel and pine marten bones, which confirmed that

hunting such species for their pelts was being carried out on a large scale. His results have been disseminated in subsequent publications emanating from the project. Sieved sampling had been taking place at the Minino excavations and a substantial number of fish bones had been collected. A sample of this material was analysed by Sheila Hamilton-Dyer in 2003 and is also being incorporated into the publication reports (Maltby 2011a; Maltby 2012 in prep.)

As can be seen, the Novgorod assessment project has developed into a much more wide-ranging, albeit still formative, survey of animal exploitation in Novgorod, its immediate hinterland and its distant territories. The original intention to assess the potential of the resource and to facilitate future research was achieved. However, by the time we completed recording, nearly 60,000 mammal bone fragments had been counted from the Troitsky sites alone, including over 34,000 identified to species. Added to those were over 4,000 bird and nearly 3,500 fish bones. In addition, we recorded in detail nearly 17,000 bones from Gorodishche and around 4,000 bones from other sites in the hinterland and incorporated a further 3,000 mammal bones and a sample of over 3,800 fish bones from Minino (Maltby 2011a).

I have prepared several conference papers, in which I have discussed data from the project. A conference in Hungary in 2008 has resulted in a paper highlighting the exploitation of horse and beaver in the Novgorod region, again incorporating other evidence besides zooarchaeological data (Maltby 2011b). I was invited to a conference in Kaliningrad in November 2010 and my paper from that event has been submitted for publication in the resulting monograph. A shortened version of my synthetic overview is currently being translated into Russian in preparation for submission to a refereed journal. I also presented a paper at the ICAZ conference in Paris in August 2010 that reviewed the history of urban zooarchaeology and postulated on its future. This included further discussion of the Novgorod experience. The presentation led to a lively and constructive debate amongst an international audience. The subsequent conference paper has been accepted for publication and is included as Submission 11 here (Maltby 2011c).

To complete the story of my contributions to Eastern European medieval archaeology, I should include the work carried out at Malbork Castle in collaboration with Aleks

Pluskowski and Krish Seetah (both then at the University of Cambridge) in 2007. Again this was essentially an assessment exercise studying the faunal remains and other evidence pertaining to the castle's long period of occupation by the Teutonic Order and others. The overall results of the assessment on material that dated from the 11th through to the 19th century, have now been published (Maltby *et al.* 2009) and a paper describing and interpreting a number of horse pathological vertebrae found at the castle has also been published (Pluskowski *et al.* 2010).

2.6 Summary of the History of Research

This broadly chronological review of my career and my research during that period shows how the 11 published works submitted for assessment came to be written, and the academic context from which they derived. They have evolved from a combination of targeted research questions and opportunities created by the nature of the faunal assemblages studied. Although I have highlighted two main themes in the chosen publications (the exploitation of animals and their products in the later Iron Age and Roman Britain (Chapter 3), and the exploitation of animals in medieval north-west Russia (Chapter 4), these should not be seen in isolation. The publications should be regarded as the latest stepping points of a research journey that began over three decades ago, and one which will continue for many more years.

Chapter 3: Exploitation of Animals and their Products in the Later Iron Age and Roman Britain

3.1 Introduction

As discussed in Chapter 2, I have worked on a large number of late prehistoric and Roman sites over the past three decades. The largest assemblages have consisted of over 20,000 bones, for example, Owslebury (Maltby 1987), Caerwent (Hambleton and Maltby 2009), Greyhound Yard, Dorchester (Maltby 1993) and Winchester (Maltby 2010b) and many others have provided over 5,000 fragments. Hardly surprisingly, rich pickings have been gained from such an enormous dataset. The book and papers submitted for consideration here provide a fair reflection of how this information has been utilised in contributing to our understanding of animal exploitation in these periods. I use the term "exploitation" in a broad sense to include the use of animals in ritual and other social practices. The published works will be considered in chronological order.

3.2 Submission 1

Maltby, M. 1997. Domestic fowl on Romano-British sites: inter-site comparisions of abundance. *International Journal of Osteoarchaeology* 7: 402-414.

I have always thought it is ironic that as someone who spent many years being rather critical of Anthony King's (1978; 1984; 1999) methods of comparing NISP counts of cattle, sheep/goat and pig from different types of Roman site without, in my view, giving adequate consideration of intra-settlement variation, that I should embark on a very similar exercise in assessing the relative importance of domestic fowl on different types of site. I had previously been among the first to comment on the fact that domestic fowl were absent or rare on most British Iron Age sites (Maltby 1981b). One notable exception was the late Iron Age assemblage from Skeleton Green, Braughing (Ashdown 1981). There was no doubt that domestic fowl were more abundant in the Romano-British period (Parker 1988) and it seemed likely that this was linked in some way to

direct Roman or, at least, continental influence. I believed it was important to investigate whether these general observations could be supported and refined by a more detailed quantified synthetic study.

Data on the abundance of domestic fowl were accumulated from 123 assemblages from 68 Romano-British sites. I utilised previous surveys by King (1984) and Parker (1988) as a basis for the work and supplemented these with a number of more recently studied assemblages including several of my own. I compared the NISP counts of domestic fowl with those of pigs and sheep/goat only. I excluded cattle because of problems associated with retrieval bias and the presence of large dumps of cattle waste in a number of assemblages. My previous experience of intra-site variability in Roman towns made any comparisons that included cattle unreliable. These bivariate comparisons were a novel approach that had the advantage of decreasing biases of differential preservation and recovery, although I was not naïve enough to believe that all such biases had been eradicated (Serjeantson 2009, 93).

The results showed some coherent patterns and I was able to suggest that domestic fowl were more likely to have been deposited and therefore presumably consumed on major urban sites than on non-villa rural settlements. To an extent these trends mirrored those observed by King (1984), who concluded that the inhabitants of major towns and military sites were more reliant on beef and pork than residents on “native” rural settlements. Innovations in diet seemed more likely to be embraced by inhabitants of “Romanised settlements” The use of the term “Romanised” reflects the influence of Millett’s (1990) work in particular. The efficacy of this term has been much discussed by a number of scholars (e.g. Gardner 2007; Hawkes 1999; 2001; Hingley 1996; Russell and Laycock 2010; Webster 2001). However, whether the terminology remains appropriate or not, the results still demonstrated that there were significant dietary variations between people who lived on different types of settlement. As such it can be argued that the research made a significant contribution towards investigating changes during the Iron Age/Romano-British transition and to what extent, if at all, new commodities and ideas were adopted during those periods.

3.3 Submission 2

Maltby, M. 2002. Animal bones in archaeology: how archaeozoologists can make a greater contribution to British Iron Age and Romano-British archaeology. In K. Dobney and T. O'Connor (eds.), *Bones and the Man: studies in honour of Don Brothwell*. Oxford: Oxbow, 88-94.

This paper was originally presented at a conference in York in 1999 to celebrate the career of Don Brothwell. The main thrust of the paper was to draw attention to the need for better integration between zooarchaeologists and other archaeologists. This was needed both in the practicalities of running an archaeological project, from planning through to publication, and in the formulation of research questions and interpretations.

Using the British Iron Age and Roman periods as an example, the paper briefly summarises some of the recent results achieved in zooarchaeology. These results are discussed in more detail in other papers presented here. It was argued that these advances had not been incorporated into general discussions about Roman Britain in particular. The lack of zooarchaeological articles in the journal *Britannia* was cited as an example. Since 2000, this omission has been partially addressed through the publication within the journal of a number of papers largely based on faunal data (e.g. King 2006; Locker 2007) or incorporating zooarchaeological data within integrated studies (e.g. Fulford 2001). The Theoretical Roman Archaeology Conference (TRAC) has continued to be a source of articles that utilise faunal evidence (e.g. Hawkes 2001; Maltby 2007a) The situation has also improved somewhat in the use of animal bone data in some (but not all) general surveys of Roman Britain (e.g. Todd 2004), and also in books devoted to the evidence for food and drink (Alcock 2001; Cool 2006). Progress, however, is patchy.

The paper proceeds to discuss ways in which the use of zooarchaeology in Iron Age and Roman studies could be improved (education; project management; dissemination of results; integrated research). This included a critique of MAP2 (Management of Archaeological Projects 2) based on personal experience. MAP2 has been complemented by its descendant , MoRPHE (Management of Research Projects in the

Historic Environment). Whether this will improve the situation has yet to be fully tested. Although the paper is a reflection of the situation that prevailed at the turn of the millennium, many of the issues it raises are still relevant over a decade later.

3.4 Submission 4:

Maltby, M. 2006a. Salt and animal products: linking production and use in Iron Age Britain. In M. Maltby (ed), *Integrating Zooarchaeology*. Proceedings of the 9th ICAZ Conference, Durham 2002. Oxford: Oxbow, 119-124.

Integration was a major theme of the previous paper and the interest in combining zooarchaeological evidence with other sources was one of the motivations behind this research. The aim of the paper was to draw attention to the fact that zooarchaeologists have tended to overlook the probability that many people in the past ate preserved rather than fresh meat. Yet there is abundant evidence for a significant increase in salt production in the late prehistoric period, much of which was surely destined for meat preservation. Was there any evidence of this in the archaeological record? Few British zooarchaeologists have addressed this issue, Keith Dobney being a notable exception (Dobney 2001; Dobney *et al.* 1996). Similarly there was much literature on salt production and distribution but little on how it was used. (e.g. Lane and Morris 2001; Morris 1996). A few late Iron Age assemblages had unusually high percentages of pigs, particularly the sites around Braughing in Hertfordshire (Ashdown and Evans 1981; Ower, in Poole Harbour, Dorset (Coy 1987) and an earlier Iron Age assemblage at Mount Batten, near Plymouth in Devon (Grant 1986). These unusually high percentages had previously been noted by a number of authors (e.g. Hambleton 1999; King 1984; Maltby 1981b; 1996) and were thought to be linked with changes in diet associated with increased continent contact in the late Iron Age. This paper extends this argument by noting the unusual bias towards head and neck bones in the two coastal assemblages and the limited range in ages in pigs represented at all three sites, as Grant (1988) had originally described at Mount Batten. I argued that these were not usual butchery depositions and that large scale processing was taking place to prepare pig carcasses. I also noted that all three sites had abundant evidence for imports and suggested that joints of preserved pork and bacon were probably part of the items being

prepared and traded. Braughing was a consumer site where some pigs were imported. As such, I argued that cured pork should be added to the list of items such as salt, amphorae and other ceramics, metal artefacts and wine that were being traded in significant amounts in and around the southern part of Britain at that time.

The paper clearly demonstrates the ability to evaluate data from other sources and develop the authors' original interpretations. It also successfully integrated zooarchaeological data with other archaeological information and contributes to deepening our understanding of the Late Iron Age in southern England. I should perhaps have expanded the conclusions to consider more about the impact of these changes. However, since this paper was completed, I have re-examined the animal bones from Braughing, looking in particular at butchery practices and reformatting the ageing data. Some of these results were presented at the ICAZ conference in Paris in 2010. Therefore a further paper considering pork (and beef) production in the late Iron Age of south-east England is being prepared.

3.5 Submission 5

Maltby, M. 2007a. Chop and change: specialist cattle carcass processing in Roman Britain. In B. Croxford, N. Ray, R. Roth and N. White (eds.), *TRAC 2006: Proceedings of the 16th Annual Theoretical Roman Archaeology Conference, Cambridge 2006*. Oxford: Oxbow, 59-76.

My interest in this topic originally stemmed from my work in Exeter where I observed large-scale depositions of cattle head and foot bones (Maltby 1979a), a phenomenon that I soon discovered was common on Roman urban sites (Maltby 1984a; 1984b). However, I did not record butchery marks in detail at Exeter and it was only when I adopted the AML system (Jones *et al.* 1980) to record butchery that a set of useable data developed. I have made earlier attempts to quantify Iron Age and Roman butchery patterns (Maltby 1989b; 1994b; 1998a) but these were mainly concerned with comparisons between small numbers of sites. The paper presented at the conference drew together information from many of my analyses supplemented by information from other sources. It highlighted a number of butchery traits found on cattle bones

(including filleting marks made with a heavy blade; axially split upper limb bones; transversely split metapodials) from major urban sites and I argued that they signified the operations of specialist butchers. The paper discussed the inferences about meat provisioning in towns and noted some of the socio-economic changes that this may have involved. Comparisons were made with material from non-urban settlements where such traits occurred much less frequently. The paper makes one of the few attempts in British zooarchaeological literature to use quantified butchery data (albeit very crudely) to make inter-site comparisons. The results are encouraging and I would argue that they have already substantially enhanced our understanding of the provisioning of beef in Roman Britain and have the potential to contribute more generally to the study of trade and consumption patterns in the province.

3.6 Submission 6

Maltby, M. 2009a. Bones: mammals, birds and fish, in S. Palmer, *Excavation of an enigmatic multi-period Settlement on the Isle of Portland, Dorset*. British Archaeological Reports (British Series) 499. Oxford: Archaeopress, 27-43.

This contribution is extracted from the excavation report of the Weston Road site. Nearly all the bones are Roman in date. The text excludes most of the original tables that can be found on the CD that accompanies the volume (I have provided printed versions of these). The main highlight of the assemblage was the identification of the butchered remains of at least one great auk (Figure 3). The implications of the first discovery of this extinct flightless bird on the northern side of the English Channel are discussed in relation to other finds of this species of Roman date or later.

Another important feature of the investigation was the fish bone assemblage, which despite the lack of sieving, produced an unusually large range of species for a Romano-British site. These included several species of sea bream and large cod that one would not expect to catch in the vicinity of Portland in the present day. The implications of these discoveries are discussed with special reference to the fish bone assemblages from Dorchester (Hamilton-Dyer 1993a; 1993b) and more broadly with the results of the

recent survey of fish bones from Roman Britain (Locker 2007) and possible changes in fish stocks and species distribution.

Another major theme of the report is the discussion comparing the zooarchaeological evidence on the Isle of Portland with the results from Dorchester. There are significant differences in species abundance, butchery methods and mortality profiles. The report again demonstrates the diversity in animal exploitation and meat diet that can be found within Roman Britain. The Weston Road assemblage reflects local adaptation to the resources easily available on the island but is not totally isolated from Roman innovations.

Figure 3: Great auk humerus from Weston Road, Portland (Source: E. Hambleton)

3.7 Submission 7

Maltby, M. 2010a. Zooarchaeology and the interpretation of depositions in shafts. In J. Morris and M. Maltby (eds.) *Integrating Social and Environmental Archaeologies:*

reconsidering deposition. British Archaeological Reports (International Series) S2077. Oxford: Archaeopress, 24-32.

The issue of how we should interpret the deposition of animal skeletons in Iron Age contexts and, in due course, Roman deposits, has been one that has run throughout my career (Fulford 2001; Grant 1984; Hill 1995; Wilson 1992; 1999; Morris 2008; 2010). I have not been a leading player in these debates despite apparently providing more of the relevant skeletons that anyone else (Morris 2010)! I had been concerned that interpretations were at times over-simplistic, leading to the impression that all animal bone groups (ABGs) must be "ritual" and "mean" the same thing. The paper was in direct response to one in *World Archaeology*, which re-interpreted the ABGs I had studied from some of the shafts from Greyhound Yard, Dorchester (Woodward and Woodward 2004). The paper raised some good points but in my view ignored several important facets of the evidence. My paper, based on a session at the AEA Conference organised by Jim Morris and myself, consists of a detailed critique of Woodward and Woodward's paper, within which the specific details of all the ABGs are described and discussed. The reader is also reminded that other material was also deposited in the same shaft and should not be ignored. Discussion of the ABGs of one of the shafts I had studied from Winchester (Maltby 2010b) was also included. The conclusions stressed that interpretations of ABGs need to take context and taphonomy fully into account. All ABGs are not the same. They need much better recording and sampling during excavation than is usually the case. Holistic approaches advocated by Woodward and Woodward (2004) are also important provided the relevant specialists are also fully engaged with the discussions and interpretations. The paper and the volume within which it lies (Morris and Maltby 2010) are primarily aimed to encourage zooarchaeologists and environmental archaeologists to become more actively engaged in debates regarding deposition. This is valuable in itself but needs greater dissemination. I am currently preparing a similar paper for a broader archaeological audience.

3.8 Submission 8

Maltby, M. 2010b *Feeding a Roman Town: environmental evidence from excavations in Winchester, 1972-1985.* Winchester: Winchester Museums Service.

It is fitting that the final submission associated with the exploitation of animals in the later Iron Age and Roman Britain is the largest. Although it is only recently published, as discussed in Chapter 2, the original recording of the bones took place in Southampton over 20 years previously. The first full draft report was completed in 1992. Thereafter, publication was delayed for several years during which time the Winchester Museums Service updated their excavation records. A second draft to incorporate some phasing changes and to update the references took place around 2000. Thereafter things again went quiet until English Heritage and the Winchester Museums Service agreed a new publication programme. English Heritage requested that an extra chapter should be added that synthesised information from other Roman towns. This section was completed in 2006. With the invaluable assistance of Helen Rees of the Winchester Museums Service the first publication draft was prepared in 2008. However, one of the original excavators then requested further phasing revisions for some of the deposits! These required some minor changes to the text and many of the tables had to be revised. The final version was submitted in 2009 and published the following year.

Although the monograph is in my name, I have not written all the sections as reports from other zooarchaeologists and environmental archaeologists were requested to be included as part of the agreement with English Heritage. The introductory chapter is written by Ken Qualmann and others from Winchester Museums. This valuable contribution sets out the history and nature of the archaeology of the Roman Suburbs and defences of Winchester, from which the environmental data were derived. My work focussed on the mammal and bird bones from the later Roman (mid 2nd-early 5th centuries) deposits from several sites in the Northern Suburb plus three sites located near the defences (Maltby 2010b, 48-238, 245-254). A short fish bone report was included within this section (Bullock 2010). This was written around 1990 and only includes analysis of material from one of the Northern Suburb sites. The report stands largely as originally written, although in the final draft I was able to add a few references to Locker's (2007) review of fish from Roman Britain. The volume also contains shorter reports from other zooarchaeologists. The earlier Roman material from the Victoria Road East and West sites in the Northern Suburb was studied by Julie Pfeiffer in the late 1980s (Pfeiffer 2010) and around the same time Jennie Coy with the assistance of John Bradfield (Winchester Museums) analysed Roman material from

several sites in the Western Suburb (Coy and Bradfield 2010). Again these reports remain largely as originally written.

Section 3 is the review of the zooarchaeological evidence from Romano-British major towns that I was requested to add (Maltby 2010b, 255-304). This incorporates material from over 50 sites from 17 towns published before 2006 plus unpublished data from Caerwent (Hambleton and Maltby 2009).

Mollusc and plant remains reports complete the text of the volume (Green 2010; Thomas 2010). Finally, all the measurements taken from the material I studied are presented in Appendix 1 (Maltby and Ford 2010).

Fortunately some of the Winchester evidence had been incorporated within previous publications (e.g. Maltby 1989b; 1994b; 1997; 2007a) but it was very frustrating that the whole report did not become available sooner. The findings regarding butchery and the depositions in one of the shafts have been discussed above (Section 3.5 and 3.7) and will not be repeated here. Other areas where I believe this work has made a significant contribution to Romano-British studies are outlined below.

Firstly, there is an extensive survey of the animal bone found in the deposits from all the sites investigated. This is the first detailed account of a substantial assemblage of animal bones from Roman Winchester to be published and one of the relatively few surveys of material from a suburb as opposed to the central areas of a Romano-British town (see Dobney *et al.* 1996; Levitan 1989; Luff 1993 for other examples).

The contextual analysis demonstrated significant variations between individual features, different feature types and different sites, although the interpretations are handicapped by the predominance of material from soil layers, which undoubtedly contained some residual material. In general, it was not feasible to carry out a detailed diachronic study of the animal bones because of this problem.

There were some innovations in the comparison of species quantification methods. Four methods of quantification of the major domestic species were undertaken. These demonstrated that cattle were better represented in Number of Individual Specimen

(NISP) counts and Selected Bone Counts (SBC), whereas the Most Represented Element counts (MRE - analogous to Minimum Number of Individual (MNI) counts) and Whole Bone Equivalent counts (WBE - based on counts of the proportion of a bone surviving) were more favourable to sheep/goat (Maltby 2010b, 91-105). Variations between NISP and MNI counts have often been discussed by zooarchaeologists (e.g. Grayson 1981; Lyman 1994; 2008; Marshall and Pilgram 1993) and are linked to various taphonomic factors and sometimes small sample sizes. Comparisons of SBC counts with other methods are much rarer. To have carried this comparison out is important because of the increasing popularity in the use of SBC in British zooarchaeology (see Albarella and Davis 1996 for an example of this method). The attraction of using SBC is that it speeds up recording and focuses attention on bones that will provide the most information. In one respect the Winchester results would support the effectiveness of the SBC method in that there was little difference in the percentages of NISP and SBC of the major species. However, both the MRE and WBE calculations suggest that SBC counts overemphasise the importance of cattle and this problem needs to be recognised.

The excavations produced a number of partial sheep skeletons found in several buildings of the Northern Suburb and in other features. These skeletons were unusual in that they were disarticulated, and often bore evidence of butchery and sometimes charring. I argued that these represented sheep that had been skinned, cooked (usually spit-roasted) and the meat consumed before the bones were carefully gathered together and deposited carefully as foundation burials in buildings or on significant boundaries (Maltby 2010b, 152-158). Although a few examples of similar behaviour had been discovered elsewhere (Maltby 2010b, 297-303; Maltby 2011d), their possible implications had not been discussed previously.

Another phenomenon that I had highlighted in several previous publications (e.g Maltby 1993; 1994b), but one which has been overlooked by many of my colleagues, was the appearance of hornless sheep. I have pointed out that hornless sheep have been found very rarely on Iron Age sites yet they appear on early Roman sites including Winchester. They do not appear at nearby Owslebury, however, until the late Roman period. The possibility that these were derived from improved breeds and/or new stock originally imported from the continent is discussed (Maltby 2010b, 181-183).

The synthesis of material from Roman towns included comparisons of selected data from over 50 excavations from 17 major towns. The chapter includes sections on domestic mammal, wild mammal, bird and fish representation, specialist processing of cattle carcasses, comparisons of mortality profiles, and associated bone groups along with a brief review of metrical data (Maltby 2010b, 255-304). This is the first time such a review has been undertaken specifically on Romano-British towns. The results confirm the consistency of butchery practices and the widespread presence of large dumps of cattle butchery remains, as also discussed in the TRAC paper (Maltby 2007a). Fairly consistent patterns (but with some interesting variations) were found in the ageing evidence of the domestic species and in the tendency for cows rather than oxen and bulls to predominate amongst the adult cattle. The results pertaining to species representation challenged King's widely accepted assertions that cattle became more abundant in later Roman assemblages (King 1984; 1999). In sites with multi-period assemblages, it is true that the majority did show an increase in cattle in the latest phases but this was by no means universal and cattle abundance is more positively correlated with the presence of specialist processing waste than with chronology (Maltby 2010b, 265-267). The comparison of metrical data does confirm previous observations that the cattle and sheep assemblages from towns in southern and eastern England tended to include more bones of larger stock than those in the west (Maltby 2010b, 292-295), supporting the contention that improvements in animal husbandry and in the quality of stock was not found throughout the province. I would confidently argue that Albarella *et al*'s (2008) assertion that this trend had not been proven is incorrect.

The chapter provides an updated synthesis of data on animal bones from major Roman towns, which will be a valuable source of reference for colleagues hopefully for many years to come.

Feeding a Roman Town has some limitations. An overall conclusion at the end of the volume would have been helpful and the section on intra-site variability is perhaps too long. Further information could perhaps have been gained from the metrical and pathological data. It would also have been useful to have compared the results with assemblages from sites within the walls but these were excavated by other archaeologists employing different bone specialists and the reports are not yet available.

Nevertheless, I believe the volume does much to advance our understanding of the nature of provisioning, consumption and deposition in Winchester and other Roman towns.

Chapter 4: The Exploitation of Animals in Medieval North-West Russia

4.1 Introduction

The work carried out in Russia intermittently between 1993 and the present day (see Section 2.5) will culminate in a monograph due to be published in 2012 (Maltby 2012 in prep.), after the final stages of the text and illustrations have been completed and the few remaining reports from colleagues contributing to the volume have been submitted. However, several related publications have already been produced and this chapter provides a brief synopsis of four of these papers, which have been included for consideration.

4.2 Submission 3

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.

I have collaborated with several colleagues to produce a number of reports and research papers over the years (see Appendix 1). I have included just one of these submissions, as an example. The paper compares the evidence pertaining to animal exploitation gleaned from the birch-bark documents found in Novgorod with the early results of the zooarchaeological research. I wrote the sections concerned with the zooarchaeological evidence, whereas Mark Brisbane provided the section on the archaeological background. We co-wrote the sections on the birch-bark documents and the concluding discussion.

An English translation of the catalogue of the birch-bark documents has never been produced. We were able to obtain the relevant documentary evidence through our collaboration with the Novgorod project, particularly with Elena Rybina (2001). This therefore was new information for a non-Russian readership. The similarities and, in particular, the differences between the information gathered from these disparate

sources was one that has implications for anyone comparing documentary and archaeological data. Neither necessarily tells the full story. Literacy and formal accounts in the medieval period were restricted to the elite classes (in this case mainly merchants). Many of the Novgorod documents are concerned with traded items, including prestige or rare commodities. The zooarchaeological evidence provided a much broader view of everyday food consumption and animal husbandry practices. Their evidence is complementary but, as discussed in later submissions considered below, this paper points out that there is very little evidence for Novgorod's pivotal role in the fur trade from the zooarchaeological evidence from the town itself. Conversely the fish diet, for example, (even with the problems of retrieval) could be shown to be much broader and more locally-based than would be the impression gained from the birch-bark documents alone.

4.3 Submission 9

Maltby, M. 2011a (in press). From *Alces* to Zander: a summary of the zooarchaeological evidence from Novgorod, Gorodishche and Minino. In M. Brisbane, E. Nosov and N. Makarov (eds.), *The Archaeology of Medieval Novgorod in its wider context.* Oxford: Oxbow, (provisional pages) 361-391.

This is one of 23 chapters in this monograph that are designed to provide a comprehensive overview of the archaeological evidence from Novgorod and its region. It essentially provides the overall synthesis of the results of the zooarchaeological research in Novgorod and its hinterland. This paper is based on a broader range of data than was available when the previous paper was published. It incorporates additional material from both Novgorod and Gorodishche. It also includes information from smaller assemblages from 9th-10th century settlements in the vicinity of the town. It also provides data analysed originally by Arkady Savinetskii and Sheila-Hamilton-Dyer respectively on mammal and fish bones from the site of Minino, situated deep within the forest zone at the extremity of Novgorod's enormous territory. Minino provided the evidence for the exploitation of fur-bearing mammals such as beaver and squirrel, species whose bones have rarely been found in the assemblages from Novgorod itself. The paper does not provide the full details of all the zooarchaeological analyses. For

example, it excludes detailed descriptions and interpretations of metrical analysis and butchery methods. These will appear in the final monograph aimed principally at zooarchaeologists (Maltby 2012 in prep.). This synoptic paper is aimed at a broader audience. At the time of writing (March 2011), the paper has been refereed and the publishers are about to produce the final proofs for the volume, which will be published in the Autumn of 2011.

Although the paper is based principally on faunal data, it also incorporates other sources of documentary and archaeological information, particularly other environmental data. The synthesis attempts to provide a more holistic approach to the interpretation of how animals were used by people in the region, and as such goes beyond standard zooarchaeological reporting.

The text is arranged thematically with a detailed discussion on meat consumption on the various sites, followed by sections on dairy and egg production, hides, wool, furs and skins, the use of animal products as raw material in artefact manufacture, and the roles of commensal species. It demonstrates that to understand more fully how animals were exploited in Novgorod and its region during the medieval period, we need to acquire data from a variety of sites and also utilise a broader range of archaeological evidence. The paper highlights some of the interesting diachronic and inter-settlement variations that were emerging from the research. There are clearly many gaps to fill but this paper demonstrates that zooarchaeology can be used effectively in building up a more comprehensive picture of how animals were exploited in the Novgorod region during the medieval period.

4.4 Submission 10

Maltby, M. 2011b (in press). Horseflesh and beaver pelts: aspects of faunal studies in medieval Novgorod and its region. In A. Choyke, G. Jaritz and A. Pluskowski (eds.), *The Bestial City: animals and medieval urban space.* Oxford: Oxbow**.**

This paper was prepared for a conference in Hungary in 2007. The paper has been refereed and the volume is in press at the time of writing (March 2011). It provides a

discussion on the evidence of two of the species, horses and beavers, represented in the assemblages from Novgorod and its territory. The main purpose of the paper was to again highlight that to understand the exploitation of animals in urban societies, one ideally needs to draw upon disparate lines of evidence and consider material from a range of sites. This paper therefore revisits several of the themes and data also discussed in Maltby 2011a. For example, the decline in the percentages of beaver bones in the later assemblages from Minino and their virtual disappearance from the zooarchaeological record in Novgorod itself from around the same time is discussed. The paper also includes data not previously discussed in detail, such as the evidence for the body parts represented of these species and the butchery and the bone-working evidence relating to the production of skates made from horse metapodials. Again, the volume in which this paper is being published should attract a readership not purely drawn from zooarchaeologists.

4.5 Submission 11

Maltby, M. 2011c (in press). Zooarchaeology and the study of towns: past, present and future. In F. Worley, J. Morris, P. Baker, M. Maltby and N. Sykes (eds.), *Influencing, Supporting and Maintaining our Profession: past, present and future*. Proceedings of ICAZ Conference Session, Paris 2010. Paris: Muséum National d'Histoire Naturelle, Service des Publications scientifiques. Digital Volume.

This paper has developed and expanded significantly from the original presentation given at the conference in August 2010. At the time of writing (March 2011), the paper has been independently refereed and accepted for publication by other members of the editorial panel listed above. It is intended that all the papers published from this session will be available online during the summer of 2011.

This paper combines the two main themes in Chapters 3 and 4 and is therefore not limited to Russian material. It provides a brief critical review of the development of zooarchaeological studies in towns, with particular emphasis on Romano-British material and Russian Medieval studies. The current situation pertaining to zooarchaeological studies in towns in Britain and in Novgorod are compared. In Britain

(at least until the current recession), many excavations have been carried out within a large number of towns in the last three decades but within each town this work has increasingly often been undertaken by different archaeological units. This has resulted in the accumulation of a huge amount of data that has rarely been utilised beyond the site report level and there are few syntheses of the results from individual towns. Indeed, there has been little progress towards ensuring consistent deposition of archives so that such syntheses can be undertaken. Nor have there been many coherent comparisons between urban and rural assemblages within the vicinity of particular towns. There is also a huge amount of material that still lies unstudied or not available in the published domain. Meanwhile, in Novgorod, most sites are still being excavated without bones even being retained, although ironically there have been some good studies of assemblages in the near hinterland and on the edges of Novgorod territory as discussed in Maltby 2011a and 2011b. It is argued that in both Britain and Russia, there is a lot more that could be done. One major problem is that there is a paucity of research questions currently relating to urban zooarchaeology. The paper discusses some of the questions that could be considered and again encourages zooarchaeologists to work much more closely with other archaeologists in generating research questions and in adopting a more holistic approach to studying and interpreting urban archaeology.

The main value of this paper is that it distils knowledge derived from 30 years of experience in working with faunal assemblages from towns in different parts of Europe and provides a considered review of how the discipline has developed. In many ways it mirrors the reflections of my personal experience described in Chapter 2. It also provides an update of the list of sites where zooarchaeological information is available from Romano-British towns. Although the research questions are derived mainly from the Romano-British and Russian medieval case studies, it is argued that they have broad relevance and can be applied to urban studies in other areas. This is a paper aimed principally at zooarchaeologists but one which tries to put the work of such specialists into past, present and future contexts. Zooarchaeologists need to consider more deeply how they should engage with other areas of the archaeological profession. As a consequence of this and other papers published from this conference, I have recently become involved with some of the other organisers of the session in plans to produce guidelines concerning standards expected in zooarchaeological analyses undertaken on developer-funded (and other) projects in England.

Chapter 5: The Major Research Themes and their Contribution to Knowledge

5.1 Introduction

This final chapter will briefly review some of the common themes that link the submissions discussed in Chapters 3-4 and provide a critical evaluation of the impact these publications have had towards contributing to the development of zooarchaeological studies and their relevance to archaeological knowledge. This is a perspective that is not possible within a conventional PhD, as these draw upon work that has developed over a long period.

5.2 Research into Urban Zooarchaeology

The research into urban zooarchaeology can be placed under two main headings. The first relates to the specific studies in Winchester and Novgorod. The second is concerned with more general comparisons between urban and rural settlements.

5.2.1 Winchester and Novgorod

Eight of the 11 publications selected for this submission are focussed wholly or partially on analyses of zooarchaeological data from towns, with information from the substantial assemblages from Winchester and Novgorod being central to several of these studies. The research has significantly enhanced our knowledge about how animals were exploited in those particular towns in the Roman and medieval periods respectively. Both in Winchester and in Novgorod, problems of sampling and dating have handicapped the analysis of intra-site variation. However, despite these problems, the studies in Winchester have demonstrated that there were significant variations in the deposition of animal bones in different parts of the suburbs. It has been possible to identify areas that were used for the disposal of butchery and bone-working waste and

foundation deposits consisting of the butchered remains of sheep have been identified in several buildings and on property boundaries. This practice had not been recognised previously. In both Novgorod and Winchester, the published works have provided detailed information about the relative importance of domestic and wild mammals, birds and fish, and the culling patterns of the major species. In addition, the Winchester volume has provided comprehensive analyses of associated bone groups, butchery and fragmentation patterns, skeletal element representation and metrical data. Similar data have been analysed from Novgorod but await publication (Maltby 2012). Further research in both towns is needed to investigate possible chronological and inter-settlement variations, but these analyses have provided a secure platform, from which to base future research into the diet of the inhabitants, the organisation of their meat supply, their attitudes to animals and deposition practices.

5.2.2 Comparisons of Urban and Rural Faunal Assemblages

Although one of the conclusions we have drawn from the research into urban zooarchaeology (Submission 11) has been that we should treat each town as an individual entity and recognise that each might have had an unique history of development (Maltby 2011c), comparisons of assemblages from towns with those from other types of settlements have also produced significant results. Such research, particularly with regard to Romano-British towns, forms an important component of Submissions 1, 5, 7 and 8 (Maltby 1997; 2007a; 2010a; 2010b, 255-304). Although these follow some of the formats of previous surveys (e.g. Grant 1989; King 1999; Parker 1988), the analyses have extended beyond comparisons largely based on species representation to include discussions of butchery practices, mortality and sexing evidence, depositions of animal bone groups and metrical data. A summary of many of the large number of trends discussed in several of the submitted publications is provided in Table 1. In some cases these involve innovative interpretations of animal exploitation in Roman Britain, particularly in relation to towns. In other cases they provide more detailed interpretations of trends recognised by myself and others in previous publications.

As argued in Submissions 2 and 11 (Maltby 2002; 2011c), the results derived from zooarchaeological research can contribute to broader discussions relating to Roman Britain. Topics include access to new commodities; urban development; the impact of this development on local and wider economies; cultural and economic differentiation within towns and their hinterlands; the role of specialist producers and traders; the degree of engagement with the Roman world; and ceremonial and other ritual practices.

Table 1: General trends in Romano-British animal exploitation

	Trends discussed	Sources (Maltby)
1	Significant intra-site variations in species represented in towns	2010b
2	Significant variations in cattle frequencies linked to deposition practices	2010b
3	No consistent evidence that cattle increased in importance in later Romano-British period	2010b
4	Pigs usually better represented on sites in centres of towns	2010b
5	Horses more poorly represented in towns than on rural sites	2010b
6	Domestic fowl better represented in towns than on rural sites	1997
7	Domestic fowl better represented in villas than on other rural sites	1997
8	Wild mammals very poorly represented in most urban assemblages	2010b
9	Most cattle processed by specialist butchers in towns	2007a 2010b
10	Specialist butchers left distinctive filleting and dismemberment marks on cattle bones	2007a 2010b
11	Large dumps of cattle processing waste have been found in most Romano-British towns	2007a 2010b
12	Cattle bones processed by specialists rarely found on rural sites	2007a
13	Shoulders of beef preserved by specialist butchers and traded widely	2006a 2007a
14	Peak ages of slaughter of major species more pronounced in towns	2010b
15	Adult oxen less well represented in towns than on rural sites	2010b
16	Hornless sheep better represented in towns than on neighbouring rural sites	2009a 2010b
17	More larger-sized sheep and pigs represented in Winchester than on neighbouring rural sites	2010b
18	Wide range in sizes of dogs found in towns	2010b
19	More larger sized sheep and cattle represented in the south and east than the west of Roman Britain	2010b
20	Butchered sheep found in foundation deposits in Romano-British towns	2010b
21	Animal bone groups created by a combination of different depositional practices	2010a 2010b

The relationship between town, hinterland and region is also an important component of the work in Russia and has been discussed extensively in Submissions 9-11 (Maltby 2011a; 2011b; 2011c). The research has demonstrated that the historically well-documented trade in furs and pelts is scarcely reflected in the zooarchaeological evidence from Novgorod itself and we need instead to consider evidence from contemporary sites from the areas in its territory where squirrels, beavers and other fur-producing species were hunted in large numbers. Evidence for the import of luxury fish (e.g. sturgeon, salmon) is also more apparent in documentary sources than in the zooarchaeological record (Brisbane and Maltby 2002; Maltby 2011a). It is also significant that it is the high status site of Gorodishche rather than Novgorod itself that has produced evidence for the import of the macaque (Maltby 2011a; see also Brisbane *et al.* 2007a; 2007b).

Investigations into the relationship between towns and the countryside have long been considered to be an important aspect of zooarchaeological research, although, for a variety of reasons, comparisons have tended to be very generalised rather than focussed on the relationship between a particular town and its hinterland (Maltby 2011c; see also Table 1). Although it cannot be claimed that a fully representative selection of sites in and around Roman Winchester (and to a lesser extent Dorchester) and Medieval Novgorod has been sampled, there is sufficient encouragement from the results of these inter-settlement comparisons to argue that such studies can provide significant contributions to our understanding of how animals were exploited in the region rather than just in the towns themselves. The results add weight to the argument that more such studies are required and that they need to be better planned (Maltby 2002; 2011c).

5.3 Research into Carcass Processing

A recurrent theme in many of the papers submitted for consideration here and in my research profile in general concerns research into butchery practices. As demonstrated in some of the publications (Maltby 2009a; 2010b), substantial details are provided in many of my analyses regarding the recording of butchery marks. These are based on a system of recording individual butchery marks (knife cuts, cleaver marks etc.) utilising descriptive coding systems devised many years ago (Jones *et al.* 1980). These

individual records have been transformed into more general categories (Maltby 1989b). These were originally designed to investigate Iron Age and Romano-British butchery patterns but have also served as a basis of analysis of material from other periods. An example of the use of these categories and their quantification can be found in the Winchester volume (Maltby 2010b, 126-141). There are undoubted flaws in this system of recording, particularly for those trying to compare results. For example, there are only limited examples of diagrams and photographs illustrating the categories and the numbering of the different categories reflects the order in which they were first recorded than any consistent or logical sequence. Nor would I claim that I am the first or only person undertaking detailed butchery studies of assemblages from the periods I am considering (e.g. Dobney *et al.* 1996; Grant 1989; Lauwerier 1988; Lepetz 2008; Lignereux and Peters 1996; O'Connor 1988; Rixson 2000; Seetah 2006; Wilson 1978). However, butchery analysis tends to form a higher proportion of my analytical reports than in most zooarchaeological reports concerned with these periods. This is because butchery has proved to be such a productive area of analysis and comparison in Iron Age and Romano-British assemblages.

Some of the results of the studies into cattle butchery have been synthesised in Submission 5 (Maltby 2007a). Although the methods of quantification are simplistic, they have demonstrated that they can be used to make meaningful inter-site comparisons and have provided new insights into where specialist butchers operated in Roman Britain. The distinctive residues of these processes have been fully described and has assisted other researchers to recognise where these occur (e.g. Grimm 2008; Hamilton-Dyer 2004; Hammon 2005).

Discussions relating to meat preservation can be found within several of the submitted works but particularly in the ICAZ paper presented in Durham (Maltby 2006a). Within this paper, it is argued that there may have been long-distance trading in salted pork and bacon during the later Iron Age across southern England. Discussions relating to the probability that shoulders of preserved beef were commonly prepared by specialists for trading beyond Romano-British urban centres can also be found (Maltby 2006a; 2007a; 2010b, 129, 284-287), expanding upon earlier identifications and discussions of this phenomenon (Dobney *et al.* 1996; Maltby 1989b; O'Connor 1988).

To date, published butchery analyses relating to the Russian investigations have not been as detailed as for the British sites, although summary information can be found in relation to cattle butchery at Gorodishche (Maltby 2011a; see also Maltby and Hamilton-Dyer 2001a) and for other mammals, particularly beaver and horse (Maltby 2011b). The same methods of butchery recording and categorisation have been applied to the analysis of all the Gorodishche material and to a substantial sample of the Troitsky 11 sample from Novgorod, showing that the methodology can be successfully transferred to assemblages of different periods.

Butchery studies relate directly to human attitudes to different species of animal and how intensively they exploited each of them for different products. My research has demonstrated that the inhabitants of Novgorod were not averse to eating the meat of horse, dog and beaver (Maltby 2011a; 2011b). Nesting seabirds including great auk were sometimes eaten by the inhabitants of Roman Portland (Maltby 2009a). Horses were also eaten in Roman towns and other settlements but their carcasses were not exploited as intensively as cattle (Maltby 2010b, 208-209). On occasions in Winchester (and in some other Roman settlements) a sheep, or sometimes two, was slaughtered, skinned, roasted on a spit, butchered and its remains carefully gathered up for burial as a foundation deposit (Maltby 2010b, 152-158, 297-304). The beef supply in Roman towns was largely in the hands of specialist butchers, whereas more traditional methods of butchery and meat distribution continued for longer on non-urban sites (Maltby 2007a). In contrast, it seems that much of the butchery of cattle in Novgorod was carried out within the properties of the residents, whereas substantial amounts of primary butchery waste of cattle appear to have been dumped on the periphery of the high status settlement at Gorodishche (Maltby 2011a). Furthermore, butchery evidence underpins the important inference that there was substantial local and possibly long-distance trade in preserved pork and beef in the late Iron Age and Romano-British periods (Maltby 2006a; 2007a).

The carcass processing studies have also contributed to our understanding of processing of other animal products. Upper limb bones of cattle were frequently gathered together for mass processing of marrow in major Roman towns and, perhaps much less frequently, on smaller nucleated settlements and villas (Maltby 2007b). Substantial accumulations of horn-working waste have also been found in many Roman towns and

bone-working waste has been found in some parts of Winchester and on several properties in Novgorod (Maltby 2010b; 2011a; 2011b). In Russia, evidence for the processing of pelts of wild mammals, although scarce, has nevertheless been recovered from Novgorod and Gorodishche. Marks associated with the acquisition and preparation of the hides and skins of domestic mammals are, however, much more common in both Russia (Maltby 2011a) and England (Maltby 2010b, 251-252), and sometimes include evidence that cat skins were exploited (Maltby 2009a; 2011a).

These results have, in my opinion, fully justified the investment in time taken to record the thousand of cut marks on bones in the samples I have analysed. They can be used to support my belief that butchery analyses should be integral parts of zooarchaeological reports (Maltby 2011c). If we ignore how carcasses of different species were processed, we are in danger of overlooking fundamental aspects of our past attitudes to animals and how their various products were acquired, prepared and distributed. Allied with recent improvement in scientific techniques, which can supplement information gained via traditional morphological investigations (e.g. Koon *et al.* 2010), butchery studies continue to have great potential.

5.4 Zooarchaeology is Archaeology

I regard myself as being an archaeologist with an expertise in zooarchaeology not *vice versa*. I dislike being labelled a "Zooarchaeologist", an "Archaeozoologist" or an "Environmental Archaeologist" (although I am a member of both the International Council for Archaeozoology and the Association of Environmental Archaeologists). I certainly do not regard myself as an "Archaeological Scientist". All archaeologists are likely to have some specialist expertise and categorisations are inevitable. However, encouraging archaeologists, at least implicitly, to be shoehorned into convenient categories does the profession a disservice. As discussed in the paper on zooarchaeology and the interpretation of depositions in shafts (Maltby 2010a), to produce an excavation report on a complex urban site such as Greyhound Yard, Dorchester (Woodward *et al*. 1993), can involve dozens of specialists. Finds are separated from the excavation records and analysed by different experts, many of whom have probably never seen the site. The resultant syntheses of the excavations are often

unsatisfactory. Excavation reports are also inevitably under pressure to be as concise as possible. There will never be enough space in printed publications to permit the inclusion of the substantial amounts of data accumulated by zooarchaeologists and other specialists. Over the years, the data from some analyses, principally of interest to other specialists, have sometimes been included on microfiche or compact discs, or have been made available via digital media. However, huge amounts of data together with substantial parts of more extensive specialist reports are consigned unread to museum archives. Therefore, most published zooarchaeological reports are heavily edited versions of the specialist's original reports shorn of much of their data and inadequately incorporated into the overall report. Examples from my own experience would include the analyses from Balksbury (Maltby 1995a), Cadbury Castle (Hamilton-Dyer and Maltby 2000) and Battlesbury Bowl (Hambleton and Maltby 2008). In the relatively rare event that the zooarchaeological assemblages are deemed large or important enough to merit full reporting, they are published as separate monographs and therefore still not necessarily integrated satisfactorily with the rest of the archaeological record. Examples of these include the original work in Exeter (Maltby 1979a), Colchester (Luff 1993) and Lincoln (Dobney *et al.* 1996).

The situation is perhaps not as unsatisfactory in some research projects where specialists usually have more opportunity to be included as core contributors to the projects, although artificial boundaries can still exist. Nevertheless, there is still much room for improvement in how all archaeological specialists are used effectively. It is this theme that transcends many of the papers submitted here (Brisbane and Maltby 2002; Maltby 2006a; 2010a; 2011a; 2011b; 2011c). Submissions 3, 9 and 11 (Maltby 2002; 2010a; 2011c) are principally concerned with providing critical evaluations of the role of zooarchaeologists in archaeological projects and emphasising the need for their more proactive engagement in the design, implementation and reporting of the projects. Some of the papers incorporate different forms of evidence to complement and compare with the zooarchaeological data. For example, evidence from the birch-bark documents is used in most of the publications (Submissions 3, 9-10) concerned with Novgorod (Brisbane and Maltby 2002; Maltby 2011a; 2011b). Environmental and some artefact evidence has also been used to support interpretations about the exploitation of animals in the Novgorod region (Maltby 2011a). Evidence for salt production and the trade of amphorae products are key components of Submission 4 (Maltby 2006a).

It is gratifying that more zooarchaeologists have become involved in collaborating with others in research and publication and incorporating other types of data into their research. To take mainly British examples, these include discussions of faunal remains in relation to analyses of lipids, DNA, collagen and stable isotopes (e.g. Craig *et al.* 2005; Dobney and Larson 2006; Koon *et al.* 2010; Viner *et al.* 2010). The incorporation of these and other scientific techniques are providing exciting new avenues of interpretation that should be regarded as complementing rather than replacing more traditional macroscopic zooarchaeological studies. There also has been an increase in the frequency of papers published that integrate zooarchaeology with other environmental data (e.g. Murphy *et al.* 2000; van der Veen and O'Connor 1998; Randall 2010), although there is plenty of scope for more such studies. There has been a bigger increase in the number of publications that have recently incorporated documentary and iconographic data (e.g. MacKinnon 2004; 2006; Pluskowski 2007; Stallibrass 2005; Thomas 2006; Woolgar *et al.* 2006). There are, however, surprising few publications that integrate zooarchaeological data with artefact studies, work by Kansa *et al.* (2006), Seetah (2006) and Mould *et al.* (2003) representing three of the few exceptions, comparing information from ceramic, metal artefacts, and a combination of artefactual, environmental and documentary data respectively.

It is within the context of this gradual, albeit inconsistent, trend of increasing integration that the ongoing research on Russian material should be seen. The synthetic paper (Submission 9) on Novgorod (Maltby 201la) will take its place in a volume devoted to papers all concerned with production and trade within the town (Brisbane *et al.* 2011). Admittedly, it still forms a separate chapter but it does include data from quite a wide range of studies of documentary and archaeological materials. With the wealth of superbly-preserved organic evidence available, Novgorod provides an unprecedented opportunity to integrate osteological evidence with a wide range of materials not normally available, such as leather, wood and even insects. If one adds the information obtained from the virtually unique birch-bark documents, the abundance of inorganic finds preserved in the urban properties and the availability of contemporary sites both in its immediate hinterland and deep within its territory, the potential of this archaeological resource from Novgorod is exceptional. Sadly, the Novgorod project currently has insufficient financial and physical resources and inadequate excavation methods to

acquire the quantity and quality of samples that would meet the requirements needed for such integrated studies to be fully effective. It is this dilemma that is highlighted as an example of the challenges facing urban zooarchaeologists more generally in future years (Maltby 2010c).

Therefore integrated zooarchaeological research, like the current state of zooarchaeological research in Novgorod itself, can still be seen as largely aspirational. My research has at times made some progress in incorporating non-archaeozoological data and I have consistently pleaded for further such integration in my papers. It is significant that all the examples given above illustrating successful integrated studies have all been carried out by people based mainly in academic institutions on projects that have been research-funded. Most zooarchaeologists do not have those benefits or opportunities. It is not clear how such aspirations can be effectively incorporated in the framework of developer-funded archaeology without radical changes in how these projects are set up and organised.

5.5 Concluding Remarks

All archaeological research can be regarded as work in progress. The research in Russia in particular falls into that category, although I believe that the works already published demonstrate adequately how much the research has already contributed to improving knowledge about the inhabitants of one of the most important towns of medieval Europe. The publication of the Novgorod zooarchaeological monograph in 2012 may have marked a more convenient milestone for this research. That monograph will certainly provide more data and provide broader comparisons with other contemporary sites in eastern Europe. However, the main results of that research assessment have already been published amongst the papers submitted here. Nor will 2012 necessarily see the end of the project. Preparatory visits are already been planned this summer, and monies are being sought, to set up an ambitious multidisciplinary project on a new site in Novgorod where, at least for a short period in 2012, specialists from a wide range of disciplines will gather to collect samples, examine and analyse material excavated from carefully targeted areas from a single property. This could fulfil my dream of having a

fully integrated research programme in which different specialists work closely together during and in the immediate aftermath of the excavations themselves.

Arguably the publication of the Winchester volume (Maltby 2010b) also provides a convenient milestone to evaluate the contribution of my researches into human-animal relationships in later prehistoric and Roman Britain. However, in many ways my research into these periods is as much work in progress as is it is in the case of the Russian research. I have recently carried out further analyses on several sites in Bedfordshire, late Iron Age Braughing, Hertfordshire, and a Roman villa at Wortley, Gloucestershire. Synthetic papers related to this and other research are being prepared to consider late Iron Age and Roman animal husbandry in south-east England and the history of animal exploitation in Bedfordshire. Hopefully, it can be seen that much has already been achieved through my research into these periods. However, I sincerely believe that zooarchaeology of the late prehistoric and historic periods has much more to offer in providing new insights into those periods. I aim to have much more to contribute to this myself.

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