UNIVERSITY OF CAMBRIDGE

Department of Archaeology

HUMAN-ANIMAL RELATIONSHIPS IN THE EURASIAN STEPPE IRON AGE: AN EXPLORATION INTO SOCIAL, ECONOMIC AND IDEOLOGICAL CHANGE

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To my Father and Mother, for all they have done…

Declaration of Original Research and Content

This dissertation is the result of my own work and includes nothing that is the outcome of work done in collaboration except where specifically indicated in the text.

Statement of Length

This dissertation does not exceed the word limit as stipulated by the Degree Committee for the Faculty of Archaeology and Anthropology.

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Summary

As an overarching theme, this thesis is concerned with investigating the symbolic relationships created between humans and animals during the Eurasian steppe Early Iron Age period. Based on first-hand experience in cooperative zooarchaeological fieldwork with the Russian Academy of Sciences, the thesis critically examines conventional theoretical models of early *semi-nomadic* and *nomadic* pastoralist development and associated social, economic and political changes connected with this phenomenon. Further to this, the thesis investigates the symbolic complexity of changing ideological and cognitive frameworks relating to mortuary behaviours and other ritual practices which have been traditionally linked to the appearance of vertically stratified warrior-based societies. These significant issues are evaluated through both a review of traditional theoretical and methodological approaches to the Early Iron Age period of the Eurasian steppe region and the presentation of original zooarchaeological analyses of faunal remains recovered from fortified settlement sites and kurgan (barrow) funerary constructions in the Trans Ural region, Russian Federation.

In the early chapters of the thesis, conventional models surrounding the development of warrior nomadic societies are assessed in relation to the traditional use of rigid ethnonymic constructs and static models of neo-evolutionary societal development, which have been problematically connected with a normative view of cultural formation and development. These important concerns are addressed through a review of the development of archaeology during the Soviet and Post-Soviet periods and connected theoretical and methodological developments. It is further argued that the significance of understanding culture as a multivariate formation is crucial for extending current interpretations of the Eurasian Early Iron Age and for understanding changing patterns of material culture relating to ethnicity, ideology and socio-cultural interaction and change. Relating to this, the concept of *tribalisation* (i.e. interface between state-based and non-state based societies) is explored in relation to the intensification of cultural contact during the Iron Age with subsequent changes in both socio-economic and socio-political organisation.

In the later chapters the presentation of original zooarchaeological research, conducted during three seasons of collaborative archaeological fieldwork in the Middle Tobol River region, Russian Federation, is presented with regard to conventional hypotheses of Early Iron Age semi-nomadic pastoralist development in the forest-steppe zone. The results of this research challenge conventional socio-economic models that suggest the rise of stratified chiefdom level societies and hierarchical settlement patterns. It is argued, based on a contextual analysis (inter-site/intra-site) of the faunal remains from the fortified settlement site of Pavlinovo, that a much lower scale of domestic socio-economic organisation and settlement occupation prevailed during this period. It is further emphasized that new developments in both theoretical modelling and archaeological fieldwork methods must be achieved in order to more effectively approach the complexity of archaeofaunal patterns in settlement sites. It is also postulated, through a discussion of the contextual analysis of faunal remains from mortuary sites and associated ritual practices, that Early Iron Age funerary practices in the Middle Tobol region also do not correlate with conventional models of social stratification. Rather, it is suggested that they are more indicative of vibrant patterns of social identity which reflect a widely shared *warrior ethos*. It is hypothesised that this development is connected to the military activities of individuals involved in campaigns and conflicts outside their own territories, whereby the amalgamation of different cultures or ethnicities reinforced a horizontal social dimension representing the status of *warriors* rather than local elites controlling defined territories and stockbreeding production.

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CHAPTER ONE

INTRODUCTION:

RESEARCH STRUCTURE AND METHODOLOGY

"The organisation of the animal world and the parts of carcasses offer a wealth of natural patterning that can be used as hooks on which to hang the logic of the social and cultural wealth of man."

(Hodder 1982, 112)

1.1 Opening Statements

As Hodder's optimistic statement on the previous page clearly reflects, there is a profound sense within the discipline of archaeology of the remarkable diversity and richness of information associated with the contextual distribution of faunal remains within archaeological sites. In recent years, archaeological theory has progressively moved towards stronger contextual *readings* of material culture and as a result zooarchaeological studies have been frequently drawn upon in attempts to illuminate the complexity of the symbolic framework of human-animal relationships.

But within this realm of scholarship, there exists a very uneasy tension between theoretical application and the scientific methodology associated with the analysis of faunal materials. The interpretative archaeology agenda, a recent outgrowth of the post-processual movement, has clearly focused upon the *reading* of material culture in light of social practice and meaning, and has emphasised the significance of context within frameworks of research and archaeological interpretation. The study of zooarchaeology, an area of study greatly amplified during the processual movement, has consistently emphasised the objective nature of faunal studies and the importance of scientific and empirical testing, issues quite at odds with the underlying epistemology of the post-processual paradigm. This is problematic, however, as faunal remains which are distributed horizontally and vertically across archaeological contexts provide not only an important medium for understanding patterns of material culture but also reveal substantive information about the human behaviours that produced the patterns. Moreover, the deposition, recovery, and analysis of faunal remains reflect a broad range of taphonomic processes, from the natural environmental characteristics and human cultural milieu which influence animal populations (biotic), to the inherent biases regarding the final analysis and publication of faunal remains (trephic) (O'Connor 2000, 20).

Hence, it may be said that the zooarchaeological endeavour is placed firmly between the competing epistemological foundations of the processual and post-processual schools of thought. This then, is perhaps the real significance of this area of archaeological scholarship, as it is clearly well situated to offer both a strong interpretative approach, as well as a coherent and explicit methodological foundation for archaeological investigation.

1.2 Thesis Orientation

As a general theme, this thesis is concerned with what may be considered as both the practical and symbolic relationships that are created between humans and animals. Within my research, I have attempted to investigate a topic that can be characterised as both dynamic and fluid and one which certainly crosscuts the very social processes that archaeologists endeavour to understand within prehistory; that is, that human-animal relationships exist within economic as well as ideological and symbolic expression and thus have engendered a wide variety of associations with past human behaviour (Ingold 1980; 1986).

As this thesis sets out to explore, this topic has particular relevance to the socio-cultural developments that were part of the early Iron Age period of Western Siberia and the early pastoralist societies that developed and interacted within this region of Eurasia. The proceeding investigation will seek to uncover and analyse the complexity and variability associated with these relationships and the resultant patterns that may be interpreted from the archaeological record. By initiating a thematic investigation, focusing on the symbolic complexity associated with human-animal relationships, this study will address a considerable amount of information and data; engaging with changing economic strategies, ideological and cognitive frameworks relating to mortuary practices and other ritual activities, and the palimpsest of ethnicity that represents the archaeological record of the eastern Eurasian steppe and forest-steppe regions.

Just as importantly perhaps, the following study also reflects the convergence of two differing theoretical paradigms and realms of archaeological scholarship. Although offering independent and original results, this thesis is the culmination of my participation in a collaborative international research project, which spanned four seasons of fieldwork with a Russian Academy of Science (R.A.S)/ Centre National de La Récherche Scientifique - France (C.N.R.S) team within Western Siberia, as well as a one-year research study period at the institutions of Ural State University and the Institute of Ecology and Animal Science, both located in Ekaterinburg, Russian Federation. As such, this research endeavour has been one of an exciting and dynamic blend of varying influences regarding scholarship and theoretical orientation as well as field methodology and practice.

1.3 Research Topic Development

To begin with, I feel that a few words are necessary concerning the development of both the PhD thesis topic as well as the research strategy that has evolved over the past four years. My work in Russia first began in the summer of 1998 when I attended an archaeological field school in the Trans-Ural region of Western Siberia (Map 1.1). The field school was offered by Ural State University and was directed by Professor L. N. Koryakova of the Institute of History and Archaeology (Ural branch of the Russian Academy of Sciences). After my rewarding participation in this field school, which centred on the excavation of Bronze and Iron Age period kurgans (barrows), I became greatly intrigued with the prehistory of the Eurasian steppe region and the current archaeological investigations taking place within the Trans-Ural forest-steppe region.

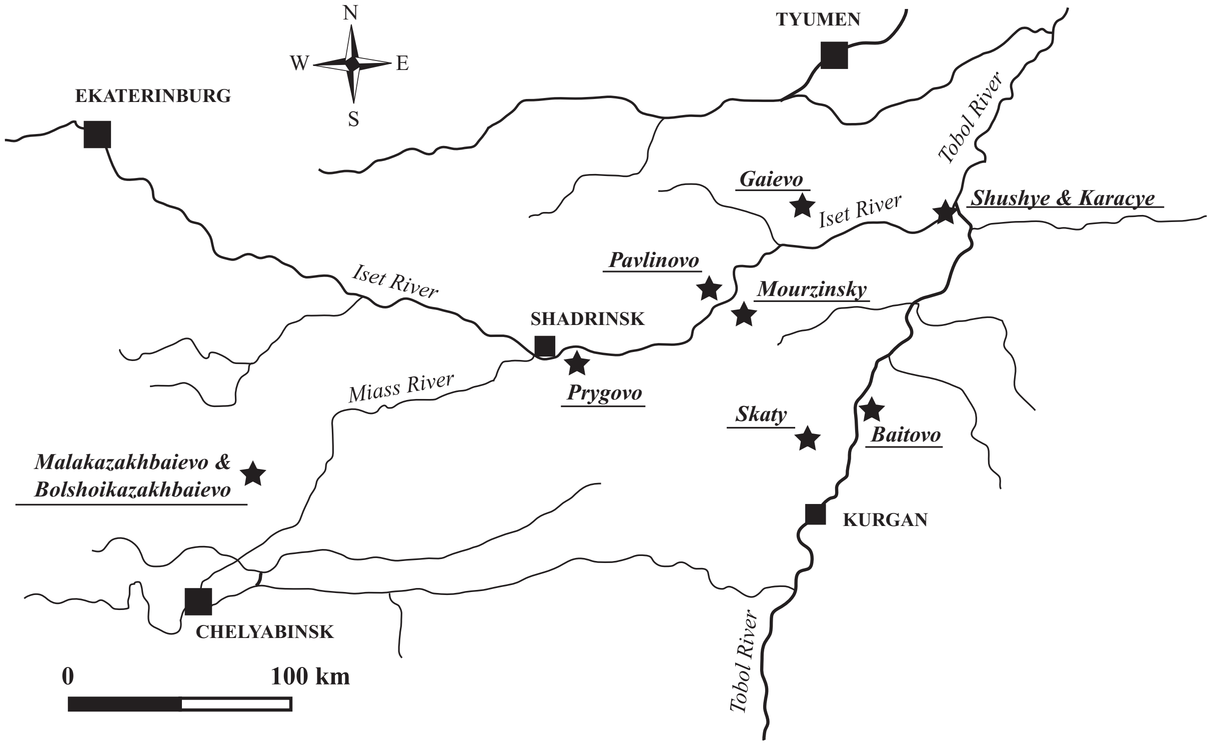
Subsequently, as I began the Master's degree programme in archaeology at the University of Sheffield, I began to work more closely with the team from the Institute of Archaeology and History (R.A.S) in Ekaterinburg. Throughout the 1998-1999 academic year, during the completion of my M.A .dissertation, I began to focus on the interpretation of nomadic Iron Age period burials in the southern Ural Mountain region relating to the Sauro-Sarmatian period (6^{th}-3^{rd} c. BC). As my M.A.

Map 1.1. *Map detailing the geographical location of the PhD research within the Trans-Ural region of the Russian Federation.*

degree work came to a close, I looked forward to pursuing Ph.D. research with Dr. Koryakova and her team and was offered a place of study at the University of Cambridge, in the Department of Archaeology.

Initially, I wished to continue my line of research regarding the interpretative investigation of the numerous kurgan burial sites within the Western Siberian region. However, I was prompted by my Russian and French colleagues to reconsider and to select a topic that would be both useful and integrative to the Russian-French team as a whole, as this would afford me the opportunity to engage in fieldwork as well as undertake a reassessment of contemporary interpretations of the prehistory of the Trans-Ural region. As a potential area of research, I was offered the opportunity to work with the extensive collection of faunal remains that had previously only been analysed quantitatively by a zoologist working in Ekaterinburg. In short, very little contextual or interpretive research had been undertaken with these remains.

Although this proposed topic reflected an area of practical and methodological work unknown to me at the time (zooarchaeology), I nevertheless accepted the idea that I would focus primarily on the ritual nature of the faunal remains and their relationship to the Iron Age period kurgans of the Trans-Ural forest-steppe region and the material cultural pattern known as the Gorokhovo-Sargat phase (7^{th} – 3^{rd} c. BC). However, during the first year of the PhD it became all too apparent that to engage in a study of human-animal interaction, and related socio-cultural, socio-economic and socio-political concerns, faunal remains and associated archaeological materials relating to the settlement sites would have to be investigated as well. As I was soon to discover, this research orientation correlated perfectly



Map 1.2. *Map detailing locations of sites (stars) excavated by French-Russian team in the Trans-Ural region of Western Siberia from 1995-2002.*

with the field excavation research that I was subsequently involved in during my collaboration with the RAS/CNRS team from 1998-2001 (Map 1.2).

In 1998, I participated in the excavation of Iron and Bronze Age period barrows at the site of Bolshoikazakhbaievo and in 1999, the excavation of the Pavlinovo settlement-fortress site was undertaken. In the summer of 2000, five kurgans at the site of Shushye-Karacye were excavated in the confluence zone of the Tobol and Iset rivers. In 2001, our excavation team returned once again to the site of Pavlinovo on the Iset River for an extension of the earlier 1999 excavation area.

These field seasons provided me with the important opportunity to take an active role in the excavation strategy and methodology used by Russian Federation archaeologists, as well as the subsequent analyses of materials and resultant interpretations of the RAS/CNRS group I was working with. Consequently, I feel that this thesis has been significantly strengthened by not only its critical review of conventional interpretations of the Trans-Uralian Iron Age period, but also in its informed investigation of the current archaeological practices being utilized by archaeologists in this region.

1.3.1 Structure of Research

Concerning the principal goals and structure of this thesis, it may be concisely stated that this work aims to address the following three main concerns:

1) To present an original body of research relating to the excavation, analysis, and contextual interpretation of faunal remains recovered from three seasons of archaeological fieldwork with the RAS/CNRS.

2) To address specific theoretical and methodological issues relating to zooarchaeological research and to apply an interpretative research framework to the investigation of human-animal relationships and the specific symbolism and hypothesised patterns of faunal deposition relating to this issue.

3) To investigate the conventional hypothesis that the Early Iron Age period represents a dynamic shift in both socio-political and socio-economic organisation within the Eurasian steppe region. This hypothesis will be critically examined with regard to the distinct problems associated with conventional zooarchaeological methods and theoretical approaches.

Specifically regarding the last two points, it will be argued throughout the thesis that these issues have negatively impacted commonly held interpretations of the Early Iron Age period and that conventional economic classifications such as 'semi-nomadic' and 'nomadic' have been erroneously perpetuated without any systematic attempts to test or validate the variation proposed for these theorised economic strategies. The significance of this methodological deficiency for the later prehistoric period of the Eurasian steppe region has been cogently raised by a number of scholars in recent years (Antipina 1997; Morales-Muñiz & Antipina 2000; Rassamakin 1999).

Therefore, by initiating a strong contextual approach to the analysis of archaeofaunal assemblages, this thesis explores significant theoretical issues relating to societal interaction between nomadic and sedentary populations, the manifestation through material culture of ideology and cognitive developments within ritual and religion, and substantial change pertaining to the socio-economic organisation and development of early nomadic pastoralist societies within Eurasia.

1.3.2 Theoretical Orientation

The theoretical approach of the PhD has obviously evolved throughout the research period as a result of several factors: an intensive survey of relevant Western and Eastern literature, archival research undertaken in Russia, and archaeological fieldwork and laboratory analysis in Western Siberia. Some of the general, albeit highly significant, problematic issues relating to the traditional study of Eurasian steppe pastoral groups that have been approached within the thesis include:

- Over-generalised models relating to processes of social and cultural change through the use of systemic neo-evolutionary classification schemes (e.g. tribes and chiefdoms) regarding socio-political organisation and development.

- Ethnonymic classifications (representative of a cultural-historical approach) for what have been widely perceived of as tightly bounded cultural patterns.

- Rigid and simplified economic classifications (e.g. nomadic and semi-nomadic) regarding the interpretation of the material cultural patterns associated with mobile pastoral subsistence regimes.

By contrast, through the development of my own theoretical research framework, I have endeavoured to acknowledge the following significant points concerning these key conceptual areas:

- An acknowledgement of the substantial complexity and variability associated with mortuary behaviour and ritual practice and subsequent interpretations regarding societal organisation and frameworks of ritualised practice.

- A more critical approach to understanding the relationship between socio-cultural groups, ethnicity, ideology, and resultant patterns of material culture, through the acknowledgment of culture as a multivariate phenomenon.

- Awareness for the dynamism and complexity associated with the non-static nature of mobile pastoral economies and their relationship to socio-political and socio-economic structures and organisation.

Hence, the three main topical areas outlined above: the process of socio-cultural change and its relationship to changing frameworks of ritual practices, analytical models relating to material cultural patterns and constructs of ethno-cultural identification, and the socio-political nature of mobile pastoral groups, have been continually approached throughout the theoretical development of this thesis.

1.4 Investigated Sites and Methodological Approaches

The thesis begins with a critical overview of some of the present problems associated with the study of the socio-cultural dynamics of early Iron Age Eurasian pastoralist societies and then continues with a more focused investigation of traditional interpretations of archaeofaunal materials from this period of prehistory. The thesis then brings these two significant areas of investigation together in a progressively intensifying treatment of associated literature and material culture from the early Iron Age period of Western Siberia.

In the later stages of the thesis, the focus will be brought to bear on a specific temporal and spatial archaeological context, one which provides a case study for the application of the theoretical and methodological constructs developed throughout the earlier sections of the thesis. This chosen case study relates to a particular archaeological pattern, termed the Gorokhovo-Sargat period by contemporary regional specialists, which falls chronologically within the first millennium BC (7^{th}-3^{rd} c. BC) and the beginning of the Iron Age period.

Concerning the selected archaeological sites for this study, the thesis focuses on two main areas of investigation:

1) *Settlement Sites:*
This area of research examines conventional interpretations of pastoral nomadism and semi-nomadism in relation to Early Iron Age settlement sites in the Middle Tobol River region of Western Siberia.

2) *Mortuary Sites:*
This area of investigation addresses the intensification of animal utilisation and symbolism in the Early Iron Age period of Western Siberia and their connection to issues such as social power, ideology, and the development of new frameworks of ritual practice.

Certainly one of the most crucial aspects of the thesis research was to define a specific geographical area and selection of archaeological sites for investigation. During my research periods in Western Siberia, and after spending a considerable amount of time reviewing archaeological and faunal site reports relating to the Gorokhovo-Sargat period, I narrowed my research focus to the Middle Tobol River area, a geographical region where the Tobol and Iset rivers converge in the forest-steppe ecological zone. My reason for choosing this particular area for study was based upon several factors:

- Previous personal experience in archaeological fieldwork in this area.
- Numerous sites (settlements and mortuary complexes) in the region have been excavated and published by Russian Federation scholars.
- Nearly all faunal materials recovered from archaeological sites in this region have been processed, analysed, and placed in storage at the Institute of Ecology (RAS) in Ekaterinburg.
- The quality of archaeological excavation in this region is quite high.

1.4.1 Settlement Sites

One of the key points within my methodological approach to the faunal remains recovered from settlements was the examination of the inter-site and intra-site contextual depositional patterning (horizontal/vertical) of animal bone assemblages. More explicit contextual approaches such as this have been greatly favoured in recent years by scholars as a way of approaching more clearly the variation and complexity relating to faunal deposition practices (e.g. Gummerman 1997; Crabtree 1990; Marciniak 1999; Parker Pearson 1999). It has been stressed that it is particularly through this approach that the significance and role of animal remains may be interpreted in relation to respective socio-cultural milieus (Hesse & Wapnish 1985).

Therefore, in Chapters Four and Five, I argue that much more sophisticated analytical and methodological strategies must be employed in order to understand how faunal deposition patterns correlate with theoretical models favouring hierarchical settlement patterns and proposed societal organisation operating at the tribal or chiefdom levels, as has been conventionally proposed for the Early Iron Age Middle Tobol River region.

Unfortunately, conventional analyses of faunal materials from the Trans-Ural settlement sites have typically provided only quantified species lists, which are then used to project a *cross-section* or projected model of past living pastoral herds (including composition and size). This approach is fundamentally based on the use of NISP (Number of Identified Specimens per taxon) and MNI counts (Minimum Number of Individuals) and does not provide an interpretation of fragmentation patterns, bone treatment, or site taphonomic processes. This traditional methodology has been highly problematic for several reasons: (i) lack of awareness for the degree of fragmentation of the remains, (ii) the nature and degree of deposition within the respective sites, and (iii) that faunal assemblages within the settlement site contexts reflect mortality profiles rather than a cross-section of an actual living herd.

Therefore, in my investigation of recovered animal bone remains from settlement sites in Chapters Four and Five, I favour an analytical approach that attempts to account for the human behaviours that produced the faunal patterns, a clearer understanding of taphonomy and site formation processes, and a more developed awareness for the archaeological sampling and retrieval biases that ultimately impact the final analyses and quantification of the excavated materials.

1.4.2 Pavlinovo

A significant amount of the research time for the PhD, comprising two eight week field seasons and approximately seven months of laboratory analysis, was spent on a thorough investigation of the faunal remains recovered from the fortified settlement site of Pavlinovo. I had the opportunity to participate in excavations at this site during the summers of 1999 and 2001.

Several large faunal concentrations, as well as numerous scattered bones from upper level soil contexts, were recovered from within the confines of two Early Iron Age dwelling structures and associated archaeological features. Aside from general information gained from analysing the bones (e.g. element, species, taphonomy, etc.), age determinations were achieved from tooth eruption/attrition patterns and epiphysial fusion and a methodology was devised relating to the patterns of bone treatment and fragmentation (more specific details regarding the zooarchaeological methodology used for the excavation, recording, and analysis of these materials will be outlined in Chapter Five).

Through reviewing the past analyses of faunal materials in the Middle Tobol region, it was apparent that there had not been a thorough examination of the variation of faunal materials within in the dwelling structures, between dwelling structures (i.e. those occurring within the fortified area and those positioned outside) or between settlement site locales. More specifically, little attention had been placed on investigating how the materials related to human activities within the settlement site, or the general patterns of deposition associated with the structures and other features of the site. Unfortunately, my study of the settlement sites was impacted substantially by the lack of sieving and flotation methodology associated with the traditional excavation fieldwork in the Trans-Ural region. Generally speaking, Russian archaeological methods do not favour the implementation of sieving or flotation within field practices and only in certain circumstances will this particular sampling methodology be utilised.

Clearly, these techniques introduce a bias favouring a higher representation of large fauna as well as a lower representation for other potential elements of the economy base (e.g. a mixed form of economy such as agro-pastoralism). Nevertheless, the results obtained through the thesis research clearly establishes that there is a substantial amount of information that may be gained by conducting more finely detailed analyses of recovered faunal remains from settlement contexts. Further to this, it is anticipated that the achieved research relating to this thesis will provide an important foundation for future investigations and continuing interpretations regarding the seasonality, economy, and political organisation of Early Iron Age Middle Tobol River settlements.

1.4.3 Mortuary Sites Investigation

My approach to the study of mortuary complexes within the thesis follows two main themes of investigation. The first represents a general cross-comparative analysis (Chapter Three) of the mortuary complex features associated with some of the more well known burials in the Western Siberian region (e.g. Pazyryk, Arzhan, Ak-Alakha, etc) and the southern steppe region (e.g. relating to the Sauro-Sarmatian and the Saka periods). The purpose of this study was to define more clearly the contextual differences between the mortuary ritual practices of Iron Age pastoral populations in West Siberia and the Trans-Ural region. This provided a comparative overview of the developments associated with burial ritual patterns and their material culture constituents. In particular, the burial structures and the related structured deposition of faunal remains were specifically examined as they relate to distinct frameworks of ritual practice, ethno-cultural identification, and issues regarding societal stratification.

The second component of the mortuary study was initiated to investigate more closely the contextual specifics and regional variation of the Gorokhovo-Sargat period in the Middle-Tobol River region (Chapter Six), particularly regarding patterns of faunal deposition and their relationship to the construction characteristics of the kurgan structure (e.g. inhumation pits, peripheral ditch features, central wooden structures) as well as the associated grave good articles. This area of investigation focused on previous investigations in the Middle-Tobol river region as well as the excavation and analysis of faunal materials recovered during my participation in archaeological fieldwork at the Shushye-Karacye cemetery in the summer of 2000.

1.4.4 Shushye-Karacye

The primary resources for my own field research with mortuary materials were gained through the excavation of five Iron Age kurgan burial structures at the Shushye-Karacye cemetery site. My fieldwork responsibility during this excavation related to the retrieval, recording, and analysis of the faunal remains from the five sites. Through my participation, I achieved an important awareness of conventional archaeological investigations and the inherent problems related to such methodologies and related sampling biases.

My work at the Shushye-Karacye site also provided me with an important opportunity to see first-hand the types of patterns associated with structured faunal deposition in Iron Age mortuary contexts. More specifically, in this area of research I focused on the contextual patterns relating to the kurgan mound structures and the three main contexts of faunal deposition: a) partial and/or fully articulated animal carcasses placed with or near the human corpse(s); b) scattered faunal remains distributed throughout and within the super-strata of the mound structure; c) secondary structured depositions placed within the boundary of the mound structure or around the periphery. A full description and discussion of the methodology used for the excavation, recovery, and analysis of the Shushye-Karacye archaeofaunal materials is detailed in Chapter Six.

1.5 Chapter Synopses

Chapter One has set out the basic framework of the thesis, particularly concerning the general methodology and theoretical orientation used, and has explicitly stated the primary direction and goals of the research. It has also covered the development of the thesis topic and described in detail the institutions and organisations within the Russian Federation that were responsible for facilitating the field and laboratory based components of this research.

Chapter Two provides a critical overview of conventional approaches and traditional problems associated with the scholarship of the Eurasian steppe Early Iron Age period. As this chapter highlights, a number of misconceptions and problematic terminologies exist regarding the hypothesised rise of pastoral nomadic societies, and issues relating to later prehistoric socio-economic and socio-political organisation. Commonly used terms such as *Scytho-Siberian cultural unity* and *Scythian Triad* (mortuary pattern) are examined in relation to traditional interpretations, which have generally favoured rigid ethno-cultural classifications and assumptions concerning the socio-evolutionary development of later prehistoric steppe societies.

These significant issues are also reviewed in relation to the historical development of archaeological scholarship during the Soviet Period and the overarching Marxist doctrine and state enforced ideology propagated during this time. This discussion seeks to identify some of the major trends in analytical and intellectual thinking within the discipline of archaeology during this period and ultimately the degree of their impact on conventional interpretative patterns associated with the scholarship of the Early Iron Age period. Furthermore, a discussion of the recent paradigm shift in academic scholarship, as a result of the decline and break up of the Soviet Union, is discussed within the framework of Post-Soviet developments in the discipline of archaeology.

Chapter 3 focuses more specifically on the examination of the development of Iron Age nomadic pastoralism in the eastern steppe region. Issues pertaining to animal husbandry practices, environmental considerations, and changing patterns of ritual and mortuary practices are interpreted in relation to the hypothesised appearance of warrior nomadic pastoralist societies within the arid steppe region.

In addition, a thorough overview is provided relating to conventional direct historical approaches to the study of steppe pastoralist societies. Through this discussion, the *economic-cultural* type – a prominent theoretical construct relating to Soviet Period ethnography – is examined in relation to the development of socio-typological models within the Marxist perspective of pre-state societal formation. This issue is then further discussed in connection with the general cultural historical framework of interpretation, which continues to be the predominate paradigm used by Russian scholars for the study of the Eurasian steppe prehistoric period.

Recent theoretical models of interpretation, favouring tribe and chiefdom level developments and the concept of *World Systems Theory,* are also examined in relation to the hypothesised changes occurring at the beginning of the Iron Age period. These constructs are compared to other recent approaches to later prehistoric socio-cultural development through the examination of multivariate cultural formations and the concept of *tribalisation*, which, it has been argued, relates to the creation of a dynamic interface between state-based societies and non-state societies (Jones 1997; Ferguson & Whitehead 1992). These important theoretical perspectives are utilised to build an interpretative framework that acknowledges the dynamic and active nature of ethno-cultural identification and changing patterns of social organisation relating to the hypothesised rise of stratified warrior nomadic societies in the Early Iron Age period.

The second half of Chapter Three investigates a number of burial contexts relating to new and conspicuous mortuary constructions, formalised frameworks of ritual practice, and the significance of the utilisation of animal symbolism within this sphere of interaction and development. A number of examples are drawn upon, including the Pazyryk burials and the Arzhan sites in the Altai Mountain region, as well as a number of cemeteries relating to the eastern steppe zone and the Saka and Sauro-Sarmatian developments. Through this examination, it is argued that animals and the symbolism surrounding animal sacrifice represented an important social medium for the display of various ethno-cultural elements relating to social power, the rise of a widespread warrior ethos, and dynamic new frameworks of ideological representation relating to the cavalry mode of warfare.

In *Chapter 4* I discuss the Early Iron Age developments associated with the Trans-Ural region. In the early sections of this chapter, a general description of the physical and cultural geography of the area is undertaken and the general chronological stages relating to the Early Iron Age period are outlined.

The basic archaeological characteristics conventionally used to define this period are set out and a discussion surrounding the parameters for the identification of the Gorokhovo, Sargat, Itkul and other conventionally hypothesised archaeological *cultures* is developed. These are seen as important considerations in relation to how Soviet and Post-Soviet scholars have defined the temporal and spatial boundaries for the archaeological material patterns of this region. This issue relates directly to the culture-historical framework of interpretation that continues to be the predominant theoretical paradigm used by scholars within this region.

In the later sections of the chapter, a critical evaluation of conventional models and interpretations of the Early Iron Age socio-economic and socio-political developments in this region is presented. More specifically, a number of hypothetical models set out in recently published works by L.N. Koryakova and N.P. Matveeva are discussed in detail regarding the Middle-Tobol River region and the Gorokhovo-Sargat period of development.

The characteristics of Early Iron Age settlement sites (fortified and non-fortified) and their theorised connection to hierarchical settlement organisation, territorial divisions, and socio-economic regimes are critically reviewed with regard to the conventionally proposed economic models (i.e. nomadic and semi-nomadic) for the Early Iron Age period. This presentation and discussion of the basic patterns of faunal deposition in the Middle-Tobol River region provides a necessary framework for the following chapters, which move towards a more definite grounding of the various models and approaches to the Gorokhovo-Sargat phase with the presentation of the PhD thesis fieldwork at the sites of Pavlinovo and Shushye-Karacye.

Chapter 5 focuses on a zooarchaeological approach to Early Iron Age settlement complexity with the investigation of the Pavlinovo fortified settlement site in the Middle Tobol region. The chapter presents the results of the research and faunal analysis pertaining to the 1999 and 2001 archaeological field seasons. The Pavlinovo site represents a classic example of a Gorokhovo-Sargat period fortified settlement and therefore provides an excellent case study for the exploration of issues relating to Early Iron Age settlement patterning, regional socio-economic organisation, and faunal deposition characteristics associated with settlement contexts.

In the first half of the chapter, the general results of previous zooarchaeological analyses are discussed in relation to the socio-economic models outlined in Chapter Four and to the theorised hierarchical settlement patterning. A critical discussion of conventional methodologies relating to the archaeological investigation of settlement sites is undertaken and the main areas of sampling biases are outlined.

In the second half of the chapter, a detailed description of the 1999 and 2001 excavation seasons is presented and the data relating to the contextual faunal analysis are interpreted in relation to the complexity of horizontal bone concentrations and the variety of taphonomic considerations for the

Pavlinovo site. Important issues relating to bone fragmentation, marrow extraction, and possible dietary stress indicators are also examined.

The main characteristics of variation between the primary and secondary deposits of animal bone remains within the site are also re-considered in relation to possible models of settlement occupation and seasonality indicators for the Early Iron Age period. These important issues are interpreted in the light of conventional models of pastoralism which include the problematic semi-nomadic and nomadic categories.

In the conclusion of this chapter, an argument is presented relating to the problems associated with an archaeology of pastoral nomadism. Several important points are put forward, based on the results of the 1999 and 2001 faunal remains analysis, pertaining to the utilisation of faunal data for modelling early pastoral herd compositions, interpreting elements of societal mobility, and approaches to the interpretation of settlement site occupation sequences. The results of the faunal analyses are reviewed in relation to posited models of complex hierarchical economies for the Trans-Ural region based on the chiefdom model of social organisation. It is argued that the remains recovered from the 1999 and 2001 excavation seasons do not appear to support these hypotheses and indicate rather smaller scale social organisation and animal husbandry practices.

Finally, it is argued that more coherent and systematic approaches are needed for the investigation of significant questions surrounding Early Iron Age socio-economic developments. Relating to this, a structured methodology for the future recovery and analysis of faunal remains from Middle Tobol River settlement sites is outlined.

In *Chapter 6,* the faunal analyses associated with Trans-Ural cemetery sites are discussed in relation to hypothetical models of socio-political change and vertical stratification proposed for the forest-steppe region of Western Siberia during the Gorokhovo-Sargat period. A general discussion of the utilisation of animals within mortuary practices is presented and a more specific examination of the regional variation of these patterns is analysed.

Information presented within this chapter provides a general introduction to conventional interpretations of the kurgan cemetery complexes within the Middle-Tobol region, and their associated ritual activities. An overview of the variation in kurgan types and their construction features is discussed in light of possible social frameworks of ritual practice and the symbolic association of domestic and wild animal sacrifice and deposition within the mortuary sites. It is argued that these characteristics of the kurgan mortuary sites represent an important element relating to the construction of the kurgan complexes, aspects of communal feasting, and the sacrifice and deposition of various animal carcass elements within specific zones of the kurgan. In this respect, an approach to an archaeology of ritual practice is developed in relation to the particular construction features of the kurgan complexes.

Relating to this, similarities with the southern nomadic patterns of animal sacrifice, consumption, and deposition are drawn on as they relate to possible shared frameworks of ritual practice, cosmological belief systems, and ideological representation relating to the development of a widespread warrior ethos. It is argued that these important developments are key elements in the changing social atmosphere and increased socio-cultural interaction proposed for the Early Iron Age period in the Trans-Ural forest-steppe zone.

In support of these theoretical perspectives, a discussion of the faunal remains recovered from five kurgan complexes at the Shushye-Karacye mortuary site during the 2001 field season is presented. Although only a limited amount of faunal material was recovered from these excavations, the recovery and analysis of the assemblages provides an important perspective relating to Early Iron Age mortuary practices in the Middle Tobol River region. My participation in the excavation of these sites provided for me an important perspective concerning current excavation practices and the biases that these conventional methodologies introduce upon the retrieval of faunal remains from mortuary contexts.

Chapter 7 provides the conclusion of the thesis and as such brings together many of the methodological and theoretical elements of zooarchaeological scholarship approached throughout the thesis. More specifically, the concept of human-animal relationships is examined in relation to the theoretical interface between zooarchaeological methodologies and interpretive theoretical approaches to the symbolism associated with animal utilisation in the Early Iron Age period of the Eurasian steppe region.

A summary of the main points of Chapters 2, 3 & 4 provides a critical reassessment of issues relating to prehistoric social organisation, approaches to early nomadic pastoralism, and the important impact that Soviet and Post-Soviet scholarship has had on contemporary interpretations of the later prehistory of the steppe region.

Several main points relating to the problems associated with conventional socio-economic models regarding pastoralism are examined in light of the specific results of the Pavlinovo faunal analyses in Chapter 5. It is argued that the application of rigid socio-economic interpretations has created distinct problems for investigating elements of settlement occupation in Early Iron Age archaeological sites. Specific issues such as primary and secondary deposition, horizontal variations associated with midden deposits, and the importance of applying contextual approaches to particular activity zones within the settlement sites is emphasised.

Lastly, the discussion of the results from the Shushye-Karacye cemetery excavations are examined in light of the interpretation of social stratification in the Early Iron Age and what appear to be distinct changes in mortuary ritual practices. The significance of contextual readings of faunal remains within such sites is emphasised as being an important indication of social activities relating to funerary practices, the symbolism of animal sacrifice, and related questions concerning social power and ethno-cultural identification.

The thesis will now move into Chapter 2, where an introduction to the Eurasians steppe Early Iron Age perios will be presented and many of the persistent problems relating to this period of research will be outlined. This sets the tempo for the later chapters and provides an important foundation for the following evaluative discussions of conventional zooarchaeological research and interpretations of the later prehistory of the Eurasian steppe region.

CHAPTER TWO

The Eurasian Steppe Iron Age:

Conventional Approaches and Traditional Problems

...from time immemorial down to present day, they {Eurasian steppes} have been the dwelling-place of savage nomads and barbaric hordes in whom no independent seed bearing the idea of the state, the building of towns or cultural development ever took root, but who attracted the attention of the rest of the world only through their activities which were hostile to and destructive of all culture......

(Kohl 1841, as cited in Rolle 1980, 17)

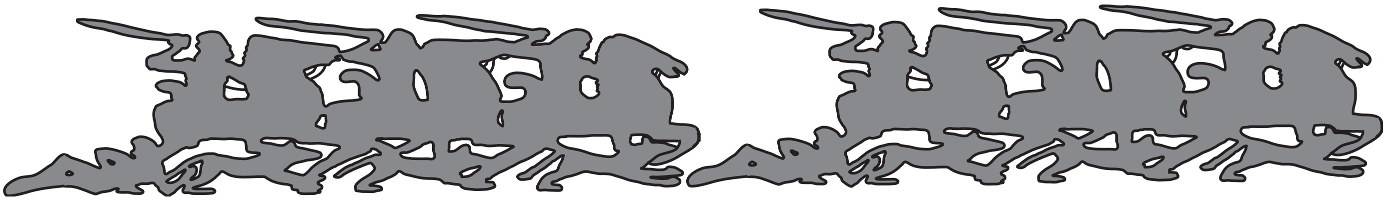


Figure 2.1 *Image on a sarcophagus from Klazomenai of a battle between Greeks and mounted warriors (Rolle 1989, 73)*

2.1 Introduction

There exists within the modern imagination a rather distinct stereotype of the Eurasian steppe nomad, one that perhaps transcends any true temporal or spatial classification. Images of thundering warrior horsemen riding across the steppe striking fear into all who cross their path come quickly to mind when the names, Scythians, Sarmatians, Mongols, or Genghis Khan are mentioned. Indeed, the image of the warlike and ceaselessly wandering steppe nomad almost seems to exist somewhere between the status of an icon and a myth within the popular culture of today, and it has clearly captured the imagination of historians, writers, and romanticists for centuries (Fig. 2.2). But intertwined within the richly woven myths are the material cultural remnants, the elaborately detailed narratives of classical authors, and the interpretations of past generations of historians and archaeologists who have been intrigued with the rich past of the Eurasian steppe. Somewhere within this mixture of truth and fiction lies a fascinating history of socio-cultural change and development.

As this chapter sets out to investigate, many traditional interpretations of the development of Eurasian steppe nomadic groups have been based on rather rigid assumptions and classifications concerning the structure of mobile pastoral societies and the cultural complexity relating to this form of subsistence and way of life. It may also be noted, that such perspectives were strongly initiated and reinforced during the rise of archaeological and anthropological scholarship within the Soviet Period. Fixed stages of social evolution were clearly one of the main tenets of the Marxist view of historical development and attempts to substantiate this ideological paradigm were actively sought through archaeological and ethnographical research during much of the twentieth century. As such, these historical and political developments have had a substantial influence on structuring conventional approaches to the prehistory of the Eurasian steppe region. These important considerations, and their particular connection to the historical development of the archaeology of the steppe region, will be addressed in more detail within the latter half of this chapter.

However, at the outset, it is perhaps vital to discuss in some detail a few of the key problems that are currently resounding within studies of the Early Iron Age period of the steppe region. In so doing, the overall tone of the thesis may be set and the necessary framework and context for the following chapters initiated. This is particularly important, as the structure and analytical focus of the thesis moves from a rather general overview of a series of problems to a more specific temporal-spatial case study in Western Siberia.

2.2 Conventional Approaches and Traditional Problems

It is widely acknowledged among scholars that the first millennium BC reflects a period of substantial social, technological, and ideological change within the vast Eurasian steppe region. Conventional archaeological interpretations of this period have sought to emphasise changes in subsistence practices, settlement and mortuary patterning, and deep structural transitions in religious beliefs and ritual practices (Khazanov 1978, 120; 1984, 94; Kuzmina 1994; Renfrew 1996, 83; Vainshtein 1978, 128). Many scholars have referred to these widespread and dramatic changes as the rise of the "nomadic world" or "Scythian-Siberian world" (Koryakova 1991; 1996, 261; 1998a; Bashilov & Yablonsky 1995). Within this framework of understanding, numerous theories have been put forth to account for the proposed development of both nomadic and semi-nomadic populations and their interaction and impact on sedentary societies situated on the periphery of the steppe region. Some of the key issues relating to these historical dynamics that have been widely discussed among scholars are:

- Large-scale social transitions associated with fully nomadic pastoral practices in the arid steppe region.
- Appearance and influence of warrior horsemen and the cavalry mode of warfare.
- Increased population migrations and subsequent interaction between various societies within the steppe region and its periphery.
- An overall increase in societal stress and warfare.
- Significant changes in socio-political organization.
- Rise of 'classic' warrior nomadic societies and the development of pan-tribal confederations or nomadic states.
- Distinct transitions or innovations in mortuary ritual traditions and kurgan funerary constructions.
- Widespread distribution of the "animal-style" form of art within various material cultural contexts.

Certainly, each of the above points is worthy of a much more detailed consideration, however, this would easily impede the underlying goal of the thesis which is to investigate the inherent complexity and variation of human-animal relationships in the Iron Age period. Nevertheless, one may note that within each of the points outlined above one of the important active variables is human-animal relationships – manifest within the significance and value of domestic livestock herds, seasonal animal husbandry practices and related population movements, and the symbolism interwoven within the fabric of animal sacrifice and animal imagery within various socio-cultural contexts. Therefore, in the following sections of this chapter, I wish to focus specifically on three main issues related to the conventional methods and traditional problems of the scholarship of the Iron Age period: 1) problems associated with the rigid use of ethnonymic or cultural labelling for pastoral nomadic groups and how this negatively impacts a clear understanding of the variation in the socio-cultural structure of mobile pastoral groups; 2) the seemingly widespread "Scythian-Siberian" cultural unity and the often circular debates associated with the interpretation of the symbolism associated with this phenomenon and its connection with patterns of ritual practice; 3) the analytical and methodological imprecision associated with using generalised economic classifications such as nomadic, semi-nomadic and semi-sedentary pastoralism.

2.2.1 Culture History and Ethno-Cultural Limitations

The key issues noted above have traditionally been linked with distinctly bounded cultural patterns and chronological sequences for the Eurasian steppe region, which have been achieved primarily through culture-historical interpretations. The resultant map of these patterns reflects a hypothesised social geography comprised of a number of nomadic cultures with specifically defined spatial and temporal boundaries (Map 2.1 & Fig. 2.3). I would argue that this questionable concept of geographically bounded and homogeneous 'tribal' entities has become one of the most common and problematic issues currently confronting the scholarship of the Eurasian steppe Iron Age period. Scholars associated with the study of this period have consistently been divided over the exact cultural development of the various steppe nomadic groups and innumerable debates have been perpetuated regarding the concept of *ethnogenesis* – a particularly prominent research paradigm borne out of Soviet Period archaeology. As Shnirelman notes, "ethnogenesis is understood in Russia as a long continuing process

Map 2.1 *Map of Eurasia detailing the conventionally held distribution of Iron Age cultural groups.*

of the emergence of the main characteristics of an ethnic community: physical appearance, language, cultural features and the like” (Shnirelman 1996, 219).

Within a cultural-historical framework of interpretation, concepts of ethnicity and culture are often tied directly to artefact remains as rather static models of socio-cultural development are inferred. This situation has stimulated a variety of circular arguments over the ethnogenesis of particular ‘archaeological cultures’, and their related chronological sequences, as well as perpetuated the problem of drawing lines on maps to designate proposed social, cultural, and geographical boundaries for steppe populations. This situation relates directly to the concept of a normative view of culture, a key component in cultural historical approaches, whereby the archaeological record is perceived as a telltale signature for homogeneous cultural groups with distinct ethnic connotations. As Zvelebil has concisely noted, a normative view of culture can be simply defined as, “one people, one common identity, one culture – both archaeologically demonstrated and symbolically perceived – and one language group” (1998:287). From this perspective, the material record is interpreted as an archaeological viable signature for distinctly bounded cultural groups with a strong monoethnic connotation (Jones 1997, 24).

DATES	European Steppe	Western Siberia	Asiatic Steppe	Middle Asia	Central Asia	China
BC 800	Transitional Kimmerians (pre-scythian period)	**LBA**	Arzhan Transitional period	Yaz1 Cities-oasises Achae-menidian	**LBA** Plate Grave Culture	**BA** Tcheou dynasty
700	**EIA**	Transitional period Pre-Sargat	Early Sacians			
600	Early Scythians Sauromatiea		**EIA**	Yaz 2 **EIA**		**Iron Age**
500		**IA1 (EIA)** Sargat-Gorokhovo	Sacians			
400	Scythian Kingdom			Alexander the Great	Hun Kingdom	Chzhan-Go (combatting kingdoms)
300	Early Sarmatians Aorsi	**IA2 (EIA)**		Greco-Bactria	Huns-China wars	Tsin Shih Huandy dynasty
200		Sargat				
100	Roxolany		Hunnic conquest	Parthians		
0			Alans			
AD 100	Western Alans	Huns **IA3**		Kangiui period of Khorasmia	Huns separation Syanbi	
200	Goths	Late Sargat		Kushan Kingdom Huns		
300						China division
400	Huns	Sargat separation		Sassanians		

Fig. 2.3 *Eurasian Iron Age chronology by region (adapted from Koryakova 1996, 252).*

Although some cultural labels have originated simply as a result of the application of a formal-typological method of material cultural studies, the scholarship associated with the Eurasian steppe nomads has been fundamentally influenced by the study of historiography. In this case, cultural labelling has a direct historical connection with the search for material cultural evidence in which to associate with the narratives produced by the various Classical Greek and Roman authors (e.g. Herodotus and Strabo) who have left us their descriptions of Early Iron Age steppe cultures (Bosi 1994).

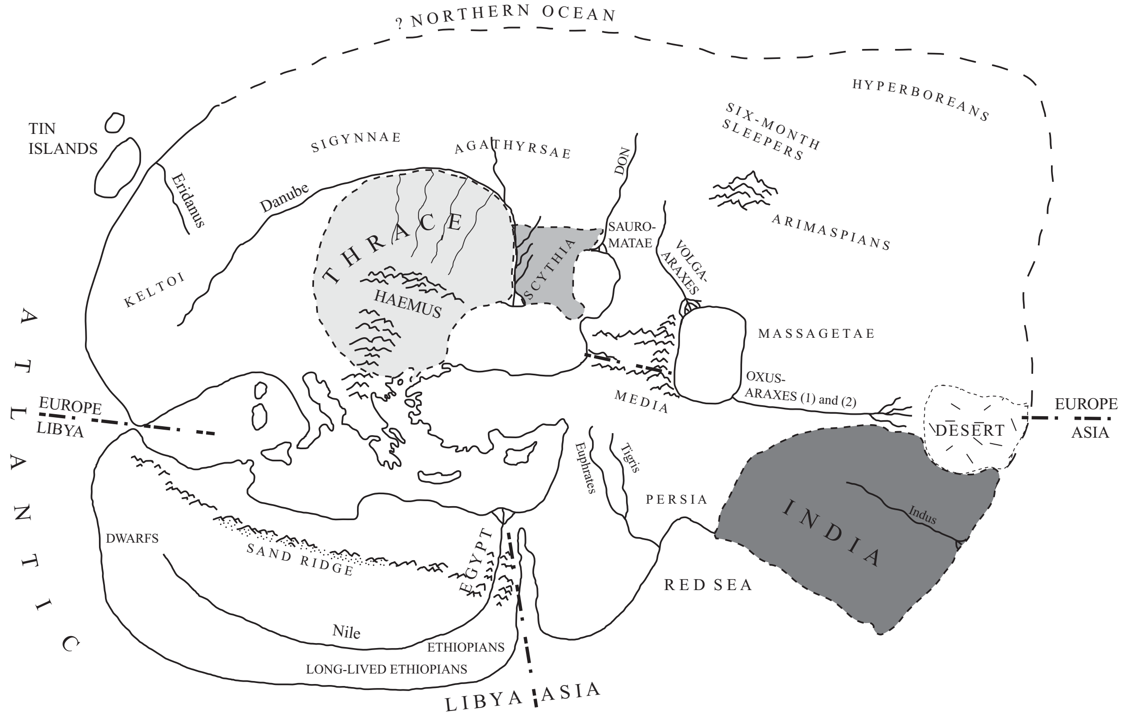
2.2.2 The World According to Herodotus

Although there are other literary accounts concerning the Eurasian steppe nomads, such as those from the Assyrian courts in the seventh century and the later chronicles of the Han Dynasty in China, the most commonly utilised first hand account of the steppe nomads must be attributed to Herodotus and his description of a visit to the northern Black Sea coastal trading centre of Olbia in the mid-fifth century BC. Through Herodotus' narrative, we are provided with engaging descriptions of not only political and military events of the region but also with rich and fascinating details regarding the social and cultural fabric of the nomadic societies inhabiting this area. While some scholars have been quite dubious of Herodotus' accounts (West 1999; 2000) others have taken very literal interpretations of his descriptions of the nomadic groups inhabiting the steppe lands north of the Black Sea (Taylor 1994; 2001; Sulimirski & Taylor 1991; Rolle 1980).

During the late nineteenth and early twentieth centuries, archaeological research in the North Pontic steppe area brought to light rich material remains from the Iron Age period. Based on the extensive research (and systemised categorisation of artefacts) of scholars, such as Gorodtsov and Rostovtsev, archaeological investigations in this region became a traditional element not only in the later work connected with Eurasian steppe nomads but also in the rise and development of the archaeological discipline within Russia (Yablonsky, *forthcoming*). During this early phase of steppe nomadic studies, archaeological investigations attempted to trace the groups mentioned in Herodotus' accounts, such as the Scythians, Sauromatae, and Massagetae, to specific geographical areas within the steppe region. Through this historiographic approach, numerous archaeological sites were investigated and attempts were made to link the material cultural remains to specific 'tribes' detailed in Herodotus' descriptions. For example, in the following passage Herodotus describes several cultural groups who occupied the territory found to the east of *Scythia* (Map 2.2):

> Once across the Tanais, one has left Scythia behind, and comes first to the Sauromatae, who occupy a stretch of country which runs northward fifteen days' journey from the northern tip of the Sea of Azov, and is entirely bare of trees, wild or cultivated. The next region beyond the Sauromatae belongs to the Budini, and is plentifully supplied with timber of all sorts. Northward again the country is uninhabited over the distance for a seven days' journey, until by turning a little easterly one comes to the Thyssagetae, a distinct and numerous race which gets its living by hunting.
>
> (Herodotus Book IV, 21)

This literal mapping of supposed ethno-cultural entities within discrete spatial geographical contexts (based at least in theory on historical testimony) is well represented in Figure 2.4, which illustrates the proposed complex strata of the Scythian and Thracian societies and their connections with other neighbouring nomadic groups detailed in Herodotus' accounts. This model of Early Iron

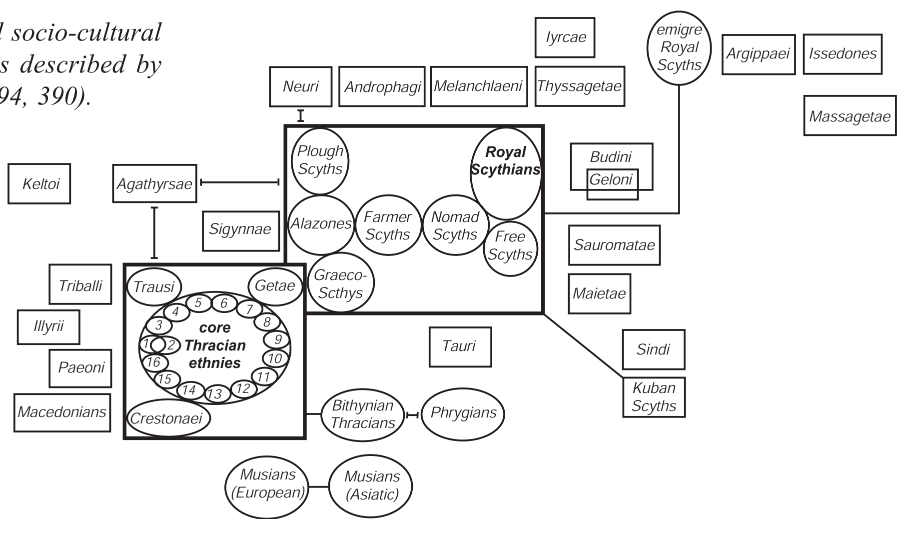


Map 2.2 *World according to Herodotus (redrawn from Taylor 1994, 386).*

Age nomadic society is therefore contingent on the perceptions and biases of Herodotus and his narratives.

I would argue that this heavy reliance on a historiographic approach has created not only substantial problems for interpreting the societal structures associated with the Iron Age Eurasian steppe populations but also for interpretations of the changing patterns of ethnicity and cultural identity associated with this time period. At this point, I feel that it may be helpful to turn towards a brief overview of some of the recent trends of scholarship associated with the Iron Age period of temperate Europe and the populations that have been traditionally labelled as 'Celtic' and 'Germanic'. In recent years a particular emphasis has been placed on trying to understand with a greater degree of analytical resolution how

Figure 2.4 *Spatial distribution and socio-cultural connections of the Iron Age groups described by Herodotus (redrawn from Taylor 1994, 390).*



these terms relate to constructs of both ethnicity and cultural identity and the changing cultural fabric of Iron Age peoples.

2.2.3 Ethnicity and Social Identity in Prehistory

A substantial amount of recent research on the European Iron Age has drawn heavily on contemporary theoretical trends within post-processual archaeology. For example, key approaches in social theory such as the use of *Agency Theory* (Giddens 1984), Bourdieu's (1977) concept of *habitus*, and an emphasis on the fluidity and multivariate nature of social identity and ethnicity (Jones 1997), have all been common themes used by scholars in the task of redefining the social and cultural environment of the European Iron Age period. Within many of these approaches, an attempt has been made to offer more sophisticated interpretations of the dynamism and complexity associated with prehistoric identity and ethnicity. As a result, commonly used terminology such as 'Celts', 'Germans', and 'Scythians', which have had a long tradition of use for describing various Iron Age populations of Europe and/or particular stylistic patterns of material culture, have in recent years come under particular scrutiny for generating a too simplistic elucidation of how European Iron Age groups and individuals constructed their identities. Regarding this, a recent book by Peter Wells (2001), concerning the identity of the Iron Age peoples of Europe, rightly argues for a more sophisticated interpretation of specific patterns of material culture and the way in which Iron Age peoples sought to construct, define, and maintain various elements of ethnicity and cultural identity. As Wells notes:

> Recent studies show how objects that people make and use can be understood as media of social action and as such play roles in shaping relations between people. We cannot assume a recurrent, consistent correlation between a particular kind of material culture and a specific identity. For example, we cannot speak of a 'Celtic fibula' or a 'Germanic belt hook'. Context is all-important. The same object can have different meanings in different situations, and similar meanings can be conveyed by different objects."
>
> (Wells 2001, 25)

The important argument here is that a 'reading' of the material culture of the Early Iron Age period may be possible through a more sophisticated rendering of the material cultural patterning, in that models relating to cultural or ethnic boundaries need not follow conventional interpretations of the 'tribal' groups of Iron Age Europe, which have been perpetually maintained since the time of Herodotus. Moreover, it may be seen that Iron Age populations reacted to the growing scale of interaction with the classical world as well as through interregional dynamism. The result was a shift in both individual and group orientation and expression through material cultural patterns – archaeologically defined within changing frameworks of material culture, mortuary ritual, and settlement patterning.

For example, Wells argues that the resultant changes that occurred within the socio-political grouping of the native Iron Age populations may have been a rather late phenomenon and changes regarding territoriality, group affiliation, and leadership – in principle a process of 'tribalisation' – may all have been a direct development of, and response to, Roman expansion and pressure (2001, 113). This point of view is particularly important to the arguments noted above because it suggests that patterns of material culture and specific material elements where an important medium for the restructuring of social identities as a result of external contact. As an example, Wells discusses the appearance of a 'cavalry elite' among the European Iron Age populations, based upon the evidence of horse accoutrements, weaponry items, and the common inclusion of Roman trade goods found within various burial contexts. This distinct change in the presentation of identity through mortuary practices was likely a direct result of interaction with the Roman military presence in Europe and the integration or conscription of 'Germanic' cavalrymen within the Roman army (2001, 121). As such, new social identities reflecting distinct elements of a military 'ethos' were forged and displayed through the process of mortuary ritual behaviour reflecting a new form of social identity, the horse-riding warrior.

Wells' arguments also provide a particularly important perspective regarding the interactions taking place between the state-based societies of the Classical world and the indigenous Eurasian steppe inhabitants. Observations by Classical authors, regarding the social structure of the 'Scythians', may have been as much a reflection of the biases of the authors themselves as it was an expression of contemporarily induced colonial expansion and subsequent socio-cultural changes taking place within the North Pontic steppe zone. In other words, precisely what Classical authors implied by their use of terms such as *Keltoi* or *Skythai* were probably historically contingent upon the cultural assimilation and acculturation taking place at that particular time and within certain spheres of socio-political interaction. From this perspective, the societal template used to describe the 'Scythians' should not be freely used, as it often is, to characterise the general socio-political structure and socio-economic practices of steppe nomadic populations.

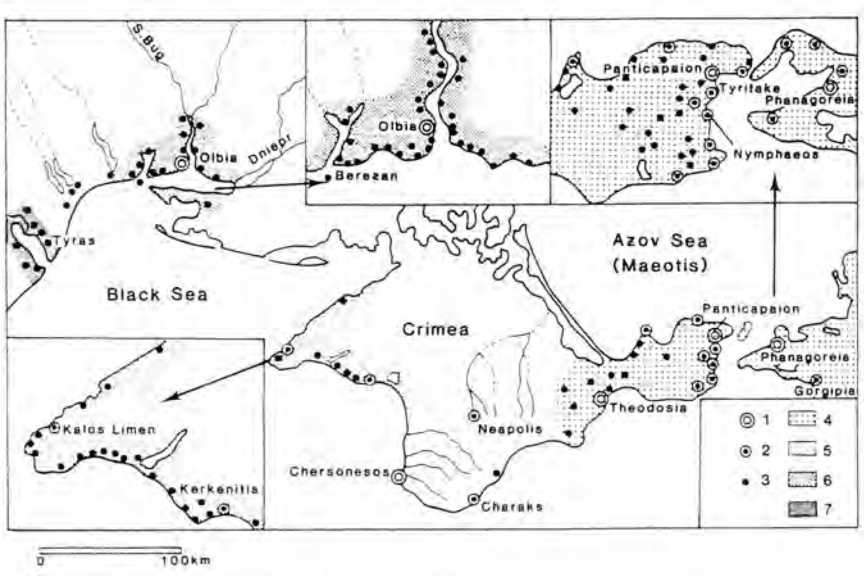
I am of the opinion that this situation has been a crucial factor in the creation of a false sense of homogenisation regarding interpretations of what is characterised as the 'Scythian culture' development – often seen as having a wider geographical distribution within the steppe zone. Perhaps the perception of the movements of the Scythians has been much over dramatised by the important role that steppe warrior-horsemen often took as mercenaries in various military campaigns by the Greeks, Macedonians and Persians (Yalichev 1997). In this case, what have been termed as Scythian military campaigns, or large-scale Scythian societal movements, may in fact simply be an issue of misreading the military exploits of various warriors who originated somewhere in the steppe region but eventually took on an active role in militaristic endeavours within the Central Asian and European political spheres. This has, perhaps to a significant degree, clouded contemporary perceptions of the ethno-cultural dynamics of this time period and interpretations of the complexity and variation inherent within the Early Iron Age steppe societies.

2.3 The 'Scythian World'

There can of course be no doubt as to the dramatic developments which took place in the North Pontic steppe as a result of the interaction between Greek colonies on the Black Sea coast and the local populations inhabiting the inner steppe region. Particularly along the Crimea Peninsula, and the coastal area where the rivers of the Bug and the Dnepr empty into the Black Sea, several Greek colonies were established by the seventh to fifth centuries BC (Map 2.3).

Kryzhitskii (1997) has classified four such colonies as large city-states, including the site of Olbia which Herodotus describes in his accounts. The ancient city of Olbia, though today half submerged due to marine transgression, covered nearly 55 hectares and had an estimated population of 13,000-16,000 (Kryzhitskii 1997, 104). Within such coastal settlements, Greek artisans and craftsmen produced a variety of products and wares for trade with the indigenous populations. The Hellenic expansion into this region clearly utilised the new territory for the acquisition of important raw materials; such as grain, timber, animal livestock products, and slaves. Numerous smaller peripheral settlements acted as important links for the exploitation of the larger region and the predominantly agro-pastoral form of economy.

Through the process of coastal and riverine colonisation, and the subsequent increase in trade and exchange networks, the rise of regional inland centres in both the steppe and forest-steppe zones also occurred. These centres, as well as many of the coastal sites, were heavily fortified (Fig. 2.5).



Map 2.3 *Greek city-states in the North Pontic area: 1 - capitals of the states; 2 - less important city-states; 3 - rural sites; 4 - agricultural hinterland of Bosporan kingdom; 5 - agricultural hinterland of Chersonesos; 6 - agricultural hinterland of Olbia; 7 - agricultural hinterland of Tyras (Kryzhitskii 1997, 102).*

Figure 2.5 *Photo of a Scythian period defensive earthworks (20 ft high) south of present day Kiev, Ukraine (Tolochko & Polin 1999, 83).*

One such site on the border between the steppe and forest-steppe, known today as Bel'sk, was located on the Vorskla tributary of the Dnepr River (Fig. 2.6). This immense fortified area comprised two fortresses (the west fort covers nearly 72 hectares itself) and was enclosed by a long rampart 33 kilometres in length (Taylor 1994, 389). Sites such as these attest to the substantial scale of socio-economic and socio-political development within the hinterland of the Pontic steppe region as a result of the Greek coastal colonies.

One of the other important developments of this time period was the increase in large richly furnished kurgan (tumulus) burial sites. These sites, situated along

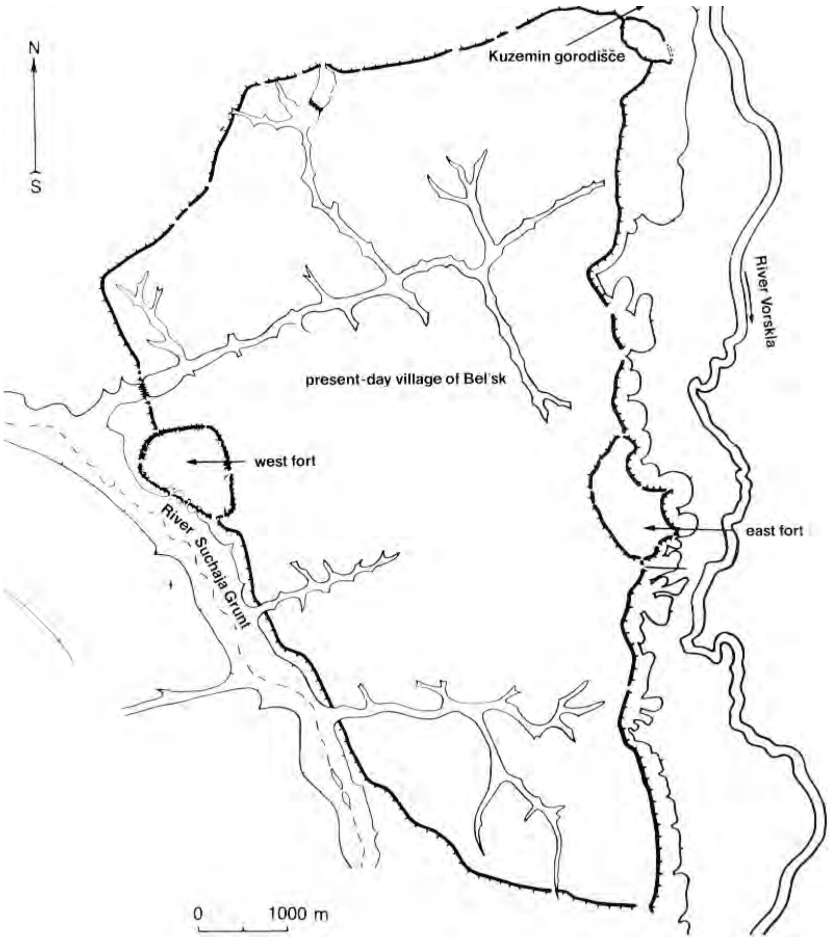


Figure 2.6 *Plan of the fortified settlement of Bel'sk (Rolle 1980, 118).*

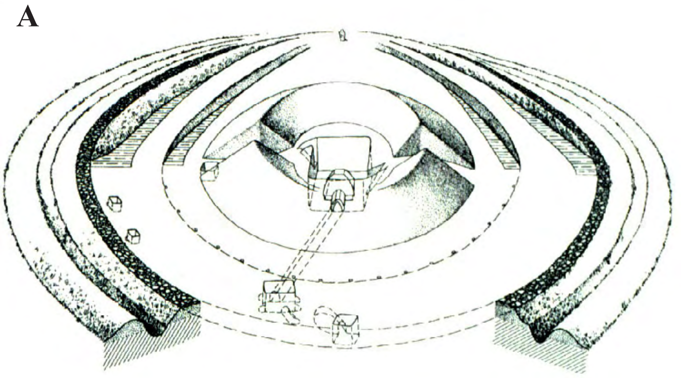
the main river valleys (with the strongest concentration along the lower Dnepr River), have yielded complex funeral constructions, evidence of lavish animal sacrifice (and human sacrifice), and richly furnished tombs (Fig. 2.7). Grave good articles recovered from these tombs are indicative of Greek patterns of craftsmanship and yet clearly reflect stylistic elements more representative of the culture and ideology of the local steppe populations. Scenes of warrior horsemen, pastoral scenes illustrating horses and other domestic animals, and specific elements associated with the animal-style art motif are all commonly represented in the material culture of the funerary artefacts (Fig. 2.8). The appearance of these mortuary complexes and the elaborate construction and conspicuous consumption of material objects clearly reflect the distinct changes among the nomadic pastoralists of the region as a result of the dynamic interaction sphere created by direct contact with Hellenic civilisation.

The common model used to characterise the socio-political developments in the North Pontic steppe zone is predominantly based on the idea of the development of powerful chiefly elites among the Scythian nomadic population. Therefore the social typology typically used to define the Scythians is that of tribes and chiefdoms and sometimes even the term “supratribal” organisation is used to reflect the collective political power of the nomadic populations. Although the Early Iron Age societies are generally regarded as existing at a pre-state level, some scholars have characterised the development of the Scythian society in the Pontic steppe, certainly during the 5th-4th centuries BC during the height of the Greek colonisation of the area, as reflecting a powerful state-based society. It is generally held that the chiefly elites rose in power through shear military might and the ability to develop and maintain strong political alliances. It is also believed that the nomads held sway in the region because of their ability to organise large militaristic groups and to raid at will both the sedentary populations in the northern forest and forest-steppe areas as well as the Greek colonies located along the coastal region. In this scenario, we see the ‘Scythians’ as both dependent upon, and controlling of, both regional trade and long distance connections with the external world. This “bi-polar” relationship, as Di Cosmo has termed it, has been, and continues to be, the predominant interpretation of the nomadic societies of the Eurasian steppe region (1994, 1095). This perception is principally tied to the way in which nomadic economies are perceived – that they are not self-sufficient and are dependent upon trade with sedentary societies (Khazanov 1984, 70). Taken as such, the idea of a “trade or raid” scenario has become a classic way of viewing the dynamics created between nomadic and sedentary societies (Di Cosmo 1994, 1093). This interpretation certainly fits with conventional interpretations of the Scythian-Greek interaction dynamic.

However, it may also be argued that the developments within the North Pontic steppe zone, as a direct result of the Greek colonisation and interaction, set the stage for complex social, cultural, and political transformations. Certainly within a few generations of the initial contact and settlement of the

Figure 2.7 *Kurgan burials from the Black Sea steppe region: A - Kurgan Ohuz (Tolochoko & Polin 1999, 89); B - Aul Ul' Kurgan 1 illustrating the arrangement of nearly 360 sacrificed horses (Rolle 1980, 45); C - Plan of the Tolstaya Mogila kurgan showing the distribution of grave good items (Rolle 1980, 35).*

A



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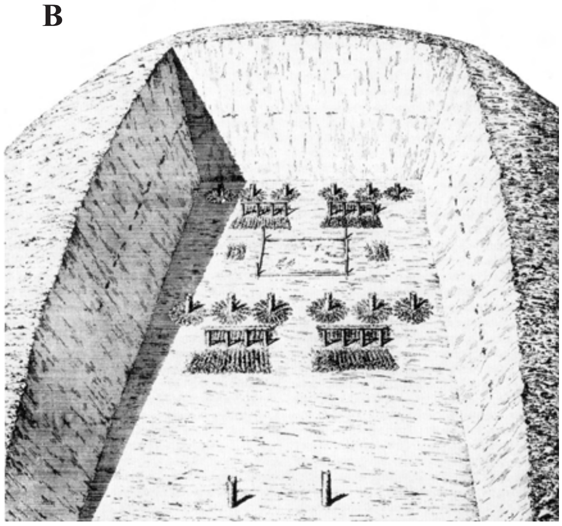


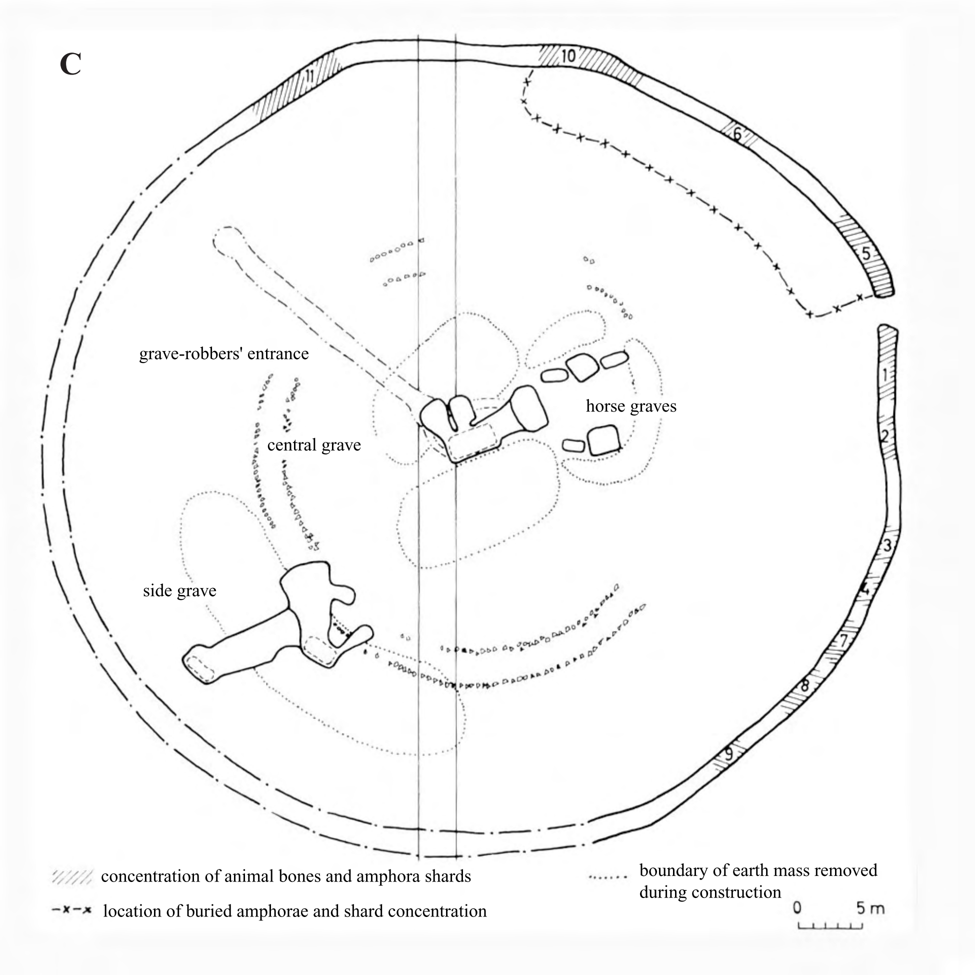
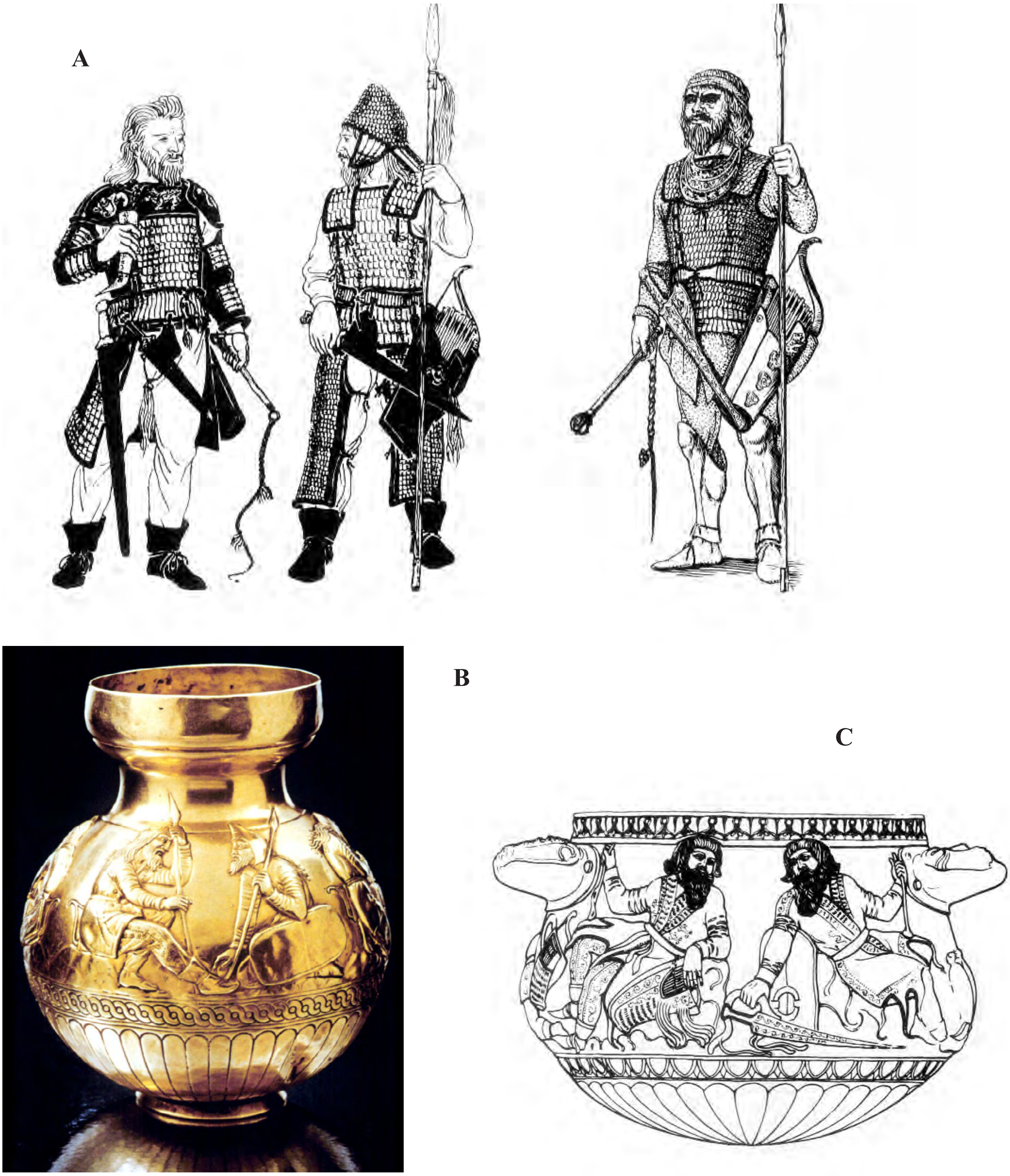


Figure 2.7 *A - Reconstructions of Scythian armour, weapons, and grave goods based on material finds by M.V. Gorelik (Rolle 1980, 69); B - golden beaker from the Kul'-Oba kurgan showing scenes of Scythian warriors; C - gold-plated silver bowl from the Gaymanova kurgan, which was discovered in a special concealed cache in the floor of the grave with other ornate drinking vessels (Rolle 1980, 59).*



coastal areas the acculturative process would have taken hold and what we may perceive as strong black and white distinctions between nomadic society and Greek society would have blurred as new socio-cultural boundaries were formed as a result of the assimilation process. In this way, when Herodotus describes Scythian society as being composed of "plough Scyths", "farmer Scyths", "nomad Scyths", etc. we can envisage the complex process of acculturation and assimilation that took place within this region as a result of the interaction between Hellenistic and indigenous steppe cultures.

It is obvious that a much finer grained interpretation of these processes is warranted within future research of the north Pontic region and the 'Scythian' development. However, at this point, it is necessary to move away from further specific discussions of the Greek-Scythian interaction and speak more generally about how characterisations of the developments in this region have in some ways negatively affected our understandings of other pastoral nomadic populations within the Eurasian steppe region.

Therefore, to summarise briefly, the point that has been reinforced within the preceding section is that contemporary images of Scythian society are more a product of the historically contingent processes of interaction associated with the Greek colonisation of the North Pontic region. Steppe nomadic society, greatly characterised by the observations of Herodotus during his visit to Olbia, have very much been structured according to historigraphic approaches to the Black Sea region. This may indeed contrast with what scholars have perceived as 'Scythian society', which may in fact may be more a reflection of the regional dynamics created between Hellenistic society and steppe indigenous populations, as opposed to the concept of 'Scythian culture', which is taken to have a much wider resonance within the material culture of the whole of the steppe region. In short, it may be argued that the specific socio-cultural dynamics and socio-political developments associated with the Greek-Scythian interaction sphere should not be used as a template in which to characterise other pastoral nomadic societies of the Eurasian steppe region. Although this may seem a very straightforward and obvious point it is still a persistent problem. As the late Mikhail Gryaznov once noted concerning the ancient nomadic populations of the south Siberian region, "contemporary writers also sometimes use such terms as "Sacians of the Altai", "Scythians of the Altai", "Western Asian Scythians", and so on; but general designations of this kind are unsatisfactory, since they ignore the marked local variations between the different groups of nomads which enable us to study the separate histories of these groups" (1969, 133).

Even though Gryaznov's cogent remarks were made over thirty years ago, scholars have continued to draw strong ethno-genetic parallels between various regions and have argued for widespread social and cultural unity among the ancient Eurasian pastoral nomads. Therefore, in this next section, I wish to quickly touch on some of the problems associated with the issue of "Scythian-Siberian unity", a debate that has been particularly problematic and enduring within scholarship of the steppe region. It is possible to see within the core of this debate many of the problematical elements that have been detailed from the beginning of this chapter. Furthermore, by engaging in a discussion of this issue it will be possible to set the stage for a discussion of the interface between an ethno-anthropological perspective of nomadic pastoralism and one more attuned to an approach of the archaeology of nomadic populations.

2.3.2 The "Scythian-Siberian" Unity Debate

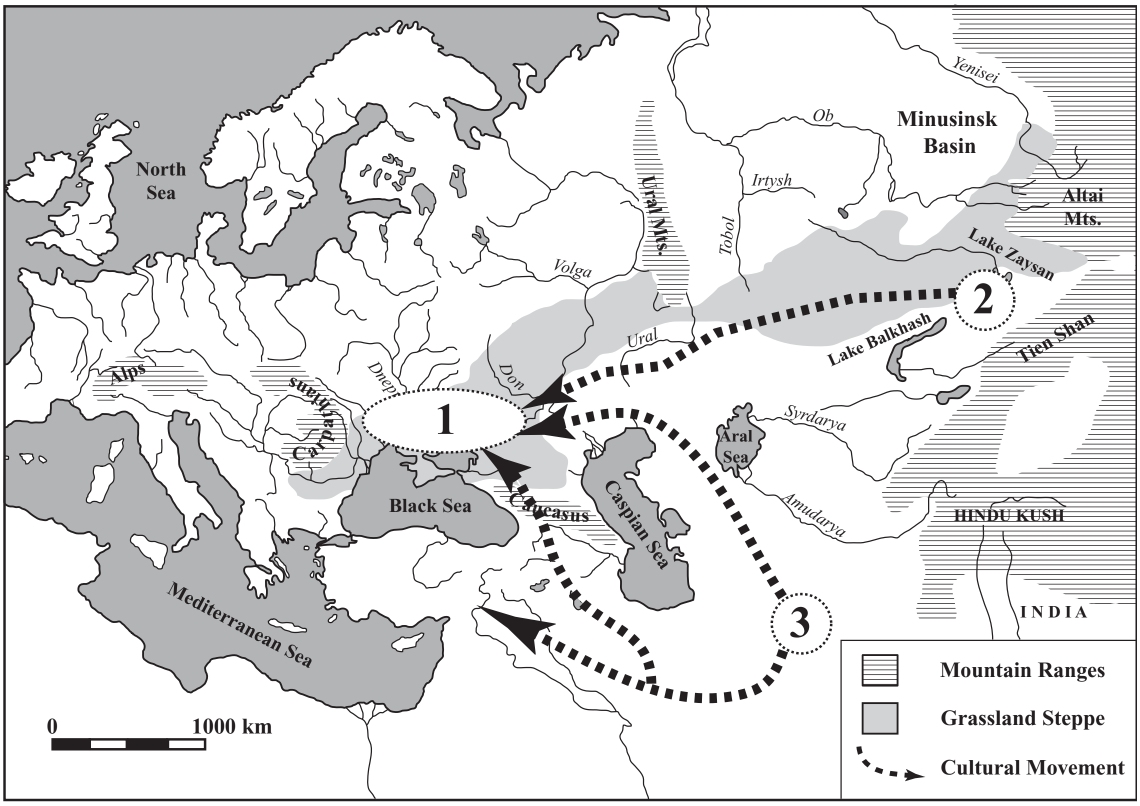
As was discussed at an earlier point above, concerning the issue of North Pontic Scythian studies, while there has clearly been a long tradition of accepted systemised studies (relating to the formal-typological method) of the recovered artefacts from the region, scholars have continued to debate, often with very circular reasoning, interpretative issues regarding the origin and spatial and temporal boundaries of the Scythian ethnogenetic development. Concerning this, it would be very easy to get caught up in a discussion and synthesis of the current polemics surrounding this area of research, however the momentum of this thesis would be quickly lost in trying to cover the innumerable debates over artefact typologies, relative chronologies, and other specific regional problems associated with the North Pontic Steppe. This region of study, as well as the Scythian ethnogenesis issue itself, has always constituted its own specific place within the greater realm of Iron Age archaeological research within Russia, from the Soviet Period up through the present day. While I do not wish to side-step this very important issue regarding ethno-cultural interpretations (as generally discussed above), I feel that it is necessary to focus more precisely on one particular element within the polemics surrounding Scythian ethnogenesis, that is, the "Scythian Triad" and "Scythian-Siberian World" concepts envisaged as representing a widespread cultural unity between Iron Age nomadic groups.

In principle, this commonly discussed issue of unity relates to the frequently occurring complex of grave goods, encountered initially within Iron Age kurgans of the North Pontic steppe region, and noted as weaponry items, horse harnesses and other riding accoutrements, and items decorated in the so-called "Animal Style" (Bashilov & Yablonsky 1995, *XII*). The term, "Scythian Triad" was therefore first coined by Grakov and Melukova (1953, 92-93), wherein it was suggested that this particular archaeological pattern was representative of "real" Scythian tribes and their respective movements within the Eurasian steppe region (Yablonsky 2000, 3). As Yablonsky has noted:

> Upon discovery of the Altaic burials in the 1930's and 1940's, such phrases as the 'altai culture and population of the Scythian period' appeared (Rudenko 1953; 1960). Following this example, a direct transfer of the ethnonym 'Scythian' occurred with reference to both the diverse typological and chronological aspects of the site (Rudenko and Rudenko 1949; Tolstov 1961; 1963). At present, as was the case in the past, ethno-oriented clichés such as 'Scythians' and 'Scythoid Culture' are still frequently-and absolutely incorrectly-incorporated into archaeological publications.
> (Yablonsky 2000, 3-4)

It can be seen that this idea of a shared cultural unity has been inextricably tied with the numerous hypotheses regarding the origin, development, and subsequent spread of the Scythian "tribes" within the Eurasian steppe region. At present, three primary hypotheses are favoured regarding this problematical issue: 1) that the Scythian development was an autochthonous one (continuity from the earlier Bronze Age phase) with an epicentre located within the North Pontic steppe area; 2) that the Scythian development represented a westward movement of nomadic tribes from Central Asia; and 3) that the Scythian development represented a westward movement of nomadic tribes from the Near East (Map 2.4) (Bokovenko 1996, 97). Of course, all of these theories have their adherents and strong debate continues over the issue of the 'origin' of the true 'Scythian' culture. This situation has in effect created several problems for understanding the distribution of what have been perceived as similar artefacts and burial ritual traditions.

In response to this, in a series of papers, Yablonsky and Bashilov have targeted the problems associated with the widespread use of simplistic terminology to describe what has been interpreted as a shared cultural unity stretching from the North Pontic steppe to the Altai region in Western Siberia (Yablonsky 2000; forthcoming; Bashilov & Yablonsky 1995; 2000; Bashilov 1994). Bashilov, in particular, has posited that this problematical issue has been perpetuated because of a lack of a proper theoretical framework in which to explain both the ubiquitous deposition of the 'triad' elements



Map 2.4 *Three main hypotheses concerning the origin and spread of the Scythian 'tribes': 1 - historical development from Bronze Age populations in the North Pontic region; 2 - core development in the eastern steppe region with a westward migration; 3 - core development in Central Asia with a westward migration.*

(weaponry, horse riding accoutrements, and animal style art) in mortuary features and the explicit independent and localised variation existing within the actual manifestation of these symbolic variables. As such, he has argued for the use of the concepts "cultural horizons" and "horizon makers", concepts originally put forth by Willey (1948) in an attempt to explain the spread of similar artistic styles and material cultural patterns in the Central Andean region of South America. As Bashilov notes, "one can clearly see that the concept of 'cultural horizons' is quite applicable to the phenomenon of the 'Scytho-Siberian' archaeological unity. The objects of the "triad" can be considered here as the "horizon makers" (Bashilov 1994, 244). Further to this, Yablonsky has argued that, "we have to develop special archaeological terminology that is free from mechanical and often meaningless ethnic-terminological borrowings, i.e. 'historical unity' and 'historical-cultural community,' and replace them with a system of concepts that have archaeological and geographical semantics, i.e. 'cultural horizon', 'cultural area', and 'cultural district', 'groups of sites', etc. (forthcoming, 88).

There can be no doubt that reactions such as these to conventional cultural-historical terminologies is a positive move towards redefining how spatial-temporal distribution patterns of material culture relate to more sophisticated conceptualisations of societal interaction and the movement of ideas, symbolism, technology, and material artefacts within and between ancient steppe population groups, which has culminated in providing the material markers so easily used to distinguish the Inner Asian pastoral nomads. Taken together, all of these factors are inherently significant and clearly speak to the core of societal and cultural structure for the mosaic of pastoral societies that were part of the Eurasian Early Iron Age period. As many scholars have suggested, it is clear that more sophisticated analyses are needed that are based on stronger regional studies emphasising the context of material remains and practices.

This issue of the 'Scythian triad' and its varying regional contexts certainly deserves more attention than has been given here. Hence, I will return to this issue once again in the following chapter, whereby I provide a discussion of material cultural patterns and focus more upon the variation and complexity inherent within kurgan mortuary complexes in Western Siberia and in the Southern Ural Mountain region. This topic and related discussion provide an important context for a more sophisticated treatment of this significant material cultural context. However, in the proceeding section a discussion will be initiated regarding the use of 'macro-scale' models to understand the dynamics relating to the Inner Eurasian nomads and the state-based societies of Outer Eurasian. In particular, a critique will be made whereby the usage of such models as 'world systems' and 'core-periphery' can be seen to negatively effect clearer understandings of the inter-regional interaction and development of various nomadic pastoral societies.

2.3.1 'World Systems' Approaches and 'Core-Periphery' Relationships

It has become rather commonplace in discussions of the Eurasian steppe Iron Age to characterise large-scale socio-political dynamics in terms of 'world systems' approaches. This has in effect led to

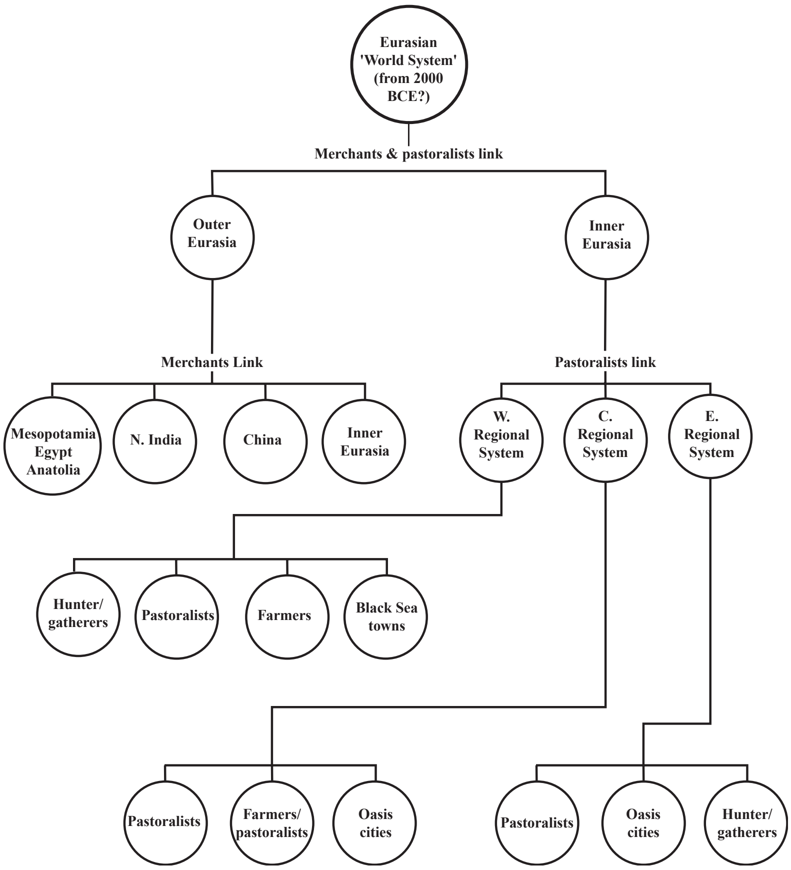


Figure 2.9 *Schematic illustrating 'World System' between Inner and Outer Eurasia (redrawn from Christian 1998, 154).*

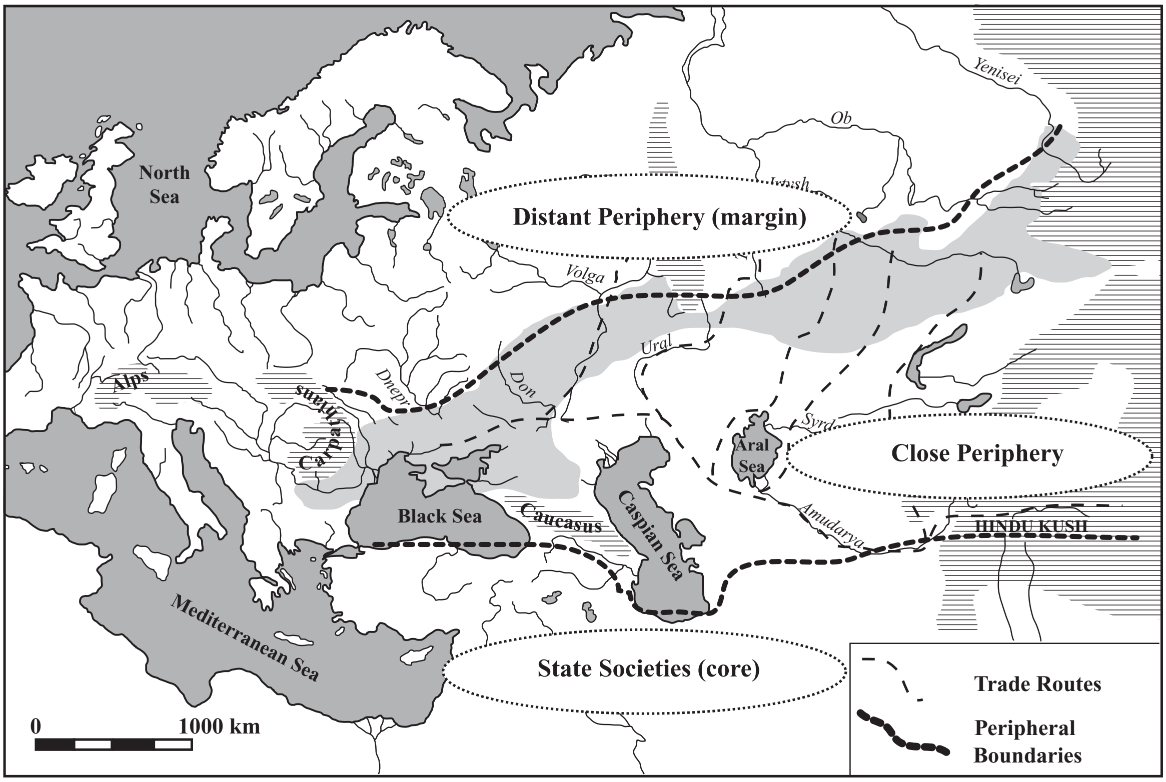
terminologies such as the 'Scythian world', or the 'nomadic world', and the concept of 'core-periphery' relationships to describe the social and political frameworks and interregional connections between populations of the Eurasian steppe region and the surrounding territories of Central Asia, south eastern Europe, and the northern Eurasian forest zone (Christian 2000; Koryakova 1996; 1998a; Kristiansen 1994; 1998).

In this tone, Christian has recently put forth a model (Fig. 2.8) linking the nomadic pastoralist societies of the steppe region, seen as representing Inner Eurasia, to the larger socio-political realms of the state-based civilisations of the south and their merchant trade networks, which are seen as being situated in Outer Eurasia (Christian 2000, 155). In effect, this projects the Inner Asian pastoral societies in two particular roles: 1) as 'middlemen' in various trade and exchange networks throughout the Eurasian region, and 2) as being 'peripheral' to the 'core' city-states of Outer Eurasia.

Certainly the position of the steppe zone pastoral societies geographically oriented them for contact with both the northern forest societies of Eurasia as well as the centralised state societies of Central Eurasia. The long distant movement of material trade items is clearly attested to within the archaeological record; however, the exact mechanisms and scale of such trade networks are still widely open for interpretation. Many scholars have stressed the importance of the nomadic societies in both regional as well as global exchange networks. For example, Koryakova has in recent years sought to emphasise the distinction between various 'cultural worlds' within the Eurasian region, again using a 'core-periphery' model of interpretation. In particular, she has highlighted the significant role of the northern 'periphery' (Map 2.6), seen as situated within the forest and forest-steppe zones, as well as the societies of the 'nomadic world' situated within the arid steppe region, as having played a much more active role in pan-Eurasian socio-political dynamics:

> By the end of the 1st millennium BC, the world was already divided into spheres of influence between the Roman and Parthian empires and the Han dynasty of China. The cultures of the

> temperate Eurasian zone as their close periphery were much influenced by them, more socially and ideologically than economically because of different environmental resources. The nomads competed not only for pastures but also for the trade routes which crossed these pastures. They conquered the forest population in order to gain access to fur because it was in demand in the states.
>
> (Koryakova 1996, 268)



Map. 2.5 *Koryakova's model of 'core-periphery' relationships between state-based societies in Central Asia, steppe nomadic groups, and the peripheral forest-steppe populations in Northern Eurasia (map created from schematic in Koryakova 1996, 262).*

One can see that the rather conventional view of the nomadic societies of the steppe region is based upon the perception of a classical socio-political 'tension' existing historically. This characterises nomadic societies as being dependent upon the peripheral sedentary societies but at the same time also playing a significant role in controlling long-distance trade networks and the territories that facilitated them. But one may ask, how does this perspective bias our interpretations of the complexity of the Eurasian steppe societies? Concerning the perception of the 'core-periphery' relationship of Inner to Outer Eurasia, several scholars have disagreed with the overall perspective this has created regarding prehistoric societies and their respective worldviews. As Taylor has cogently noted, concerning a similar discussion on the relationship between the 'classical world' and the northern 'barbarian periphery' of Europe:

> "The terms 'core' and 'periphery' underestimate the significance of the Achaemenid Persian model of empire as a political aspiration for all those – Aetus, Alexander, or Ariovistus, Burebista or Caesar – who sought great power in the second half of the first millennium BC. The Scythians, Celts, Germans and Dacians each strove for dominion as hard as Greece, Macedonia and Rome. Only hindsight projects Rome as inevitably core, and Germania and Dacia as naturally peripheral.
>
> (Taylor 2001, 27)

Therefore, it may be argued that although 'world-system' approaches may be useful at a broad level of analytical resolution, concerning orientation to trading activities, they do not provide the micro-scale or regional approach necessitated for clearer understandings of social change and socio-political dynamics. Concerning the development of Inner Eurasian pastoral societies, it is clear that to gain a clearer insight into the fundamental changes taking place within economic practices and social and cultural transitions it is necessary to focus more on understanding regional specifics and complexity in light of the larger pan-Eurasian models. This, unfortunately, has not been the case with traditional studies of early pastoral nomadic societies in the Eurasian steppe.

One main point that has been underscored time and time again is that nomadic societies are dependent upon agricultural products (Lattimore 1979; Khazanov 1984; Goldschmidt 1979). In this sense, it is necessary for nomadic societies to either engage in trade or to control sedentary societies through coercion – based upon a stronger militaristic presence manifest through the ability to raid and attack at will. Thus, it is taken that there is a constant state of tension between these societies – in essence, the classic model of an interface between the 'steppe and the sown'. But does this accurately reflect the general complexity inherent within nomadic pastoral societies? And does this classic view truly correlate with the archaeological record for ancient pastoral nomadism in the steppe? These are both highly significant questions worthy of further discussion.

In recent years, several scholars have reacted to the classic model by stating that the cultural and societal interfaces between pastoral societies of the steppe are a much more complex matter than has hitherto been traditionally acknowledged. For example, Di Cosmo has in recent years argued, regarding the relationships between China and the Inner Asian nomads, that there is strong evidence (historical, archaeological and ethnographical) for the importance of agricultural practices within the steppe region and that this development can be associated with the cultural sequences of the nomadic groups themselves (Di Cosmo 1994).

Whether it was a case of the nomads securing these goods through political dominance of local farming populations or through a more complex mixed socio-economic strategy that may be termed 'agro-pastoralism', the point is that the classic view of Inner Asian nomads being entirely dependent upon external sources (i.e. outside the steppe region) of agricultural products is false. This way of thinking contradicts previous environmental models (that have been traditionally held), which suggest increasing aridity at the beginning of the Iron Age period. This factor is believed to have favoured a turn towards more mobile forms of pastoralism (as argued by Yablonsky 1995; Lamb 1966; Riabtseva 1970; Zdanovich and Shreiber 1988). Di Cosmo's viewpoint also follows suit with recent focused environmental approaches to the archaeology of the economies of the steppe populations during the Saka-Wusun period (approximately 750 BC – AD 200), in the area of present day south eastern Kazakhstan, which have provided excellent regional evidence as to the importance of agro-pastoralism among populations traditionally considered nomadic (Rosen et al. 2000; Chang and Tourtellote 1998). As Chang and Tourtellotte have noted, "the romantic stereotype of mounted horse nomadism on the Eurasian steppe has coloured our ability to consider the agrarian foundations for these military confederacies or states. No doubt mounted horse riding allowed for the rapid spread and diffusion of languages, religion, and culture, although the foundations for steppe culture probably rested upon a multi-resource economic base" (1998, 267). This view is very important, as it suggests that a great deal more complexity can be noted concerning not only the societal structure of the steppe nomadic groups, but also the variation associated with the economic and subsistence regimes that have been too broadly characterised for much of the steppe region.

Thus far within this chapter, I have tried to establish some of the particularly problematic issues surrounding scholarship of the Eurasian Iron Age steppe populations. In this next section, I wish to move more towards an examination of how the socio-economic structure of nomadic pastoralism has been characterised for the steppe region. I will do this by first presenting the conventional typological characterisations of nomadic pastoralism and then move forward with a discussion of the problems of these traditional approaches and their important connection with the archaeology of nomadism.

2.4 Eurasian Steppe Pastoral Nomads – Between Myth and Reality

Scholars have been quite consistently divided over the exact temporal and spatial development of nomadic pastoralism in the Eurasian steppe region. While some have argued for the development of nomadic practices by the Eneolithic period, (linked to the proposed earliest bitted riding of horses in the steppe – Anthony and Brown 1991; Anthony 1995a), and the Bronze Age period (Shishlina 2001; Shishlina & Hiebert 1998), others have continually reinforced the traditional view of nomadic pastoralism being a much later development coinciding with the transition between the second and first millennium BC (Khazanov 1984; Koryakova 1996; forthcoming; Vinogradov & Yepimakov 2000). This latter opinion is connected with the appearance and development of what are generally perceived of as chiefdom, tribal, or warrior based nomadic societies (e.g. Scythian, Sarmatian, Saka, etc.), which have traditionally painted popular images of the nomadic steppe populations of the Iron Age period.

Certainly, the early arguments put forward by Marija Gimbutas, and her theory concerning the connection between the development and spread of Proto-Indo-European language through several expansionist waves of nomadic warriors from the Eurasian steppe area (attributed to the "Kurgan Culture" – 1961, 193), have coloured popular images of the rise of nomadic pastoralism in the steppe (Gimbutas 1961). However, as a result of a lack of solid archaeological evidence to support such claims, many scholars have heavily criticized Gimbutas theories regarding a 'Kurgan Culture' (Rassamkin 1999; Renfrew 1999; 1998; Levine 1999; Kuzmina 1994). Nevertheless, in the past decade, Gimbutas' theories regarding the early Eneolithic-Bronze Age impact of nomadic warrior societies have still influenced the thinking of some scholars concerned with the rise of nomadic pastoralism in Eurasia (Cavalli-Sforza 1996; Diamond 1991).

In principle, this problem has been greatly reinforced by the polemics surrounding the earliest domestication of horses on the Eurasian steppe. Anthony and Brown have argued that their 'bit-wear' studies, which have been based on experimental testing of metal bit wear on the second lower premolar [P_2] of 52 domestic and 20 feral horses and of organic bit wear on four horses, provides a strong methodology for examining evidence of induced wear by bits on horse teeth found in Eneolithic archaeological contexts. Their investigation of ancient horse teeth has been primarily based on a sample of 6 teeth (2 with proposed bit wear) from the site of Dereivka (in present day Ukraine) and 19 teeth (5 with proposed bit wear) from the site of Botai (in present day Kazakhstan) (Anthony 1986; Anthony & Brown 1991; Brown and Anthony 1998).

The relative dating (based on burial type and stratigraphic context) associated with the Dereivka stallion was until recently considered by many to be substantial proof of the early bitted riding of horses on the steppe, and indeed Anthony and Brown's bit-wear study of the second lower premolar [P_2] of the Dereivka stallion appeared to provide a strong argument concerning this issue (Anthony & Brown 1991). However, recent radiocarbon dating of the stallion remains has shown that they in fact they relate to a much later Iron Age period sequence (700-200 BC cal.) and are not from the Eneolithic context as was previously assumed (Anthony 2000). Nevertheless, even though this new data has come to light regarding the Dereivka stallion, Anthony and Brown have continued to argue for the merit of their 'bit-wear' studies and of solid evidence for bitted horse riding by 3500-3000 BC cal. at the site of Botai, an Eneolithic settlement site located in present day Kazakhstan that has yielded over 300,000 faunal bone remains with 99 percent being represented by horses (Anthony 2000, 76).

However, other scholars have not been so optimistic about pinpointing the exact temporal and spatial first appearance of horse domestication and riding activities based solely on zooarchaeological analyses, and in particular on the methodology and results of bit-wear studies, which are at present seen as being based on too small a representative sample and it has not been demonstrated that the bit wear evidence proclaimed could not be created by another factor such as abnormal occlusion with the upper second premolar (Levine 1999, 11; Olsen forthcoming). As Levine has argued, one method is not enough to define the actual period when the horse was first domesticated and ridden and that, "it is necessary to employ a multidimensional, interdisciplinary approach in which nothing is assumed and everything is tested", using methods such as the micormorphology of settlement deposits, biomolecular analyses, and stable isotope information regarding paleodietary patterns (Levine 1999, 53).

Nevertheless, while there may still be strong debate over the initial domestication and use of the horse for riding within the Eurasian steppe, strong material evidence (archaeological and representational) supports the fact that the use of the horse as a draft animal preceded its importance in later mounted militaristic activities. With regard to the exploitation of the horse as a draft animal, some of the earliest evidence for this comes from the steppe region west of the Ural Mountains. As Anthony and Vinogradov have noted, "more than 100 wagon and cart burials, radiocarbon dated from ca. 3000 BC to 2200 BC, have been identified in high-status graves in the steppe west of the Urals' (Anthony & Vinogradov 1995, 38). Evidence for the utilisation of the horse to pull chariots, potentially reflecting the significant prestige status associated with this form of transport, is well documented by the appearance of the earliest chariot burials found thus far in the Eurasian steppe at the Bronze Age site of Krivoe Ozera, which has been dated to 2026 BC cal. (Anthony & Vinogradov 1995, 38).

As for the earliest evidence of the riding of horses, representational art provides a date of the 12-13th centuries BC by depicting individuals on horseback from Assyrian palace wall reliefs as well as Egyptian royal reliefs detailing the riding of horses away from a battle scene (as noted by Renfrew 1998, 276). In addition, Kuzmina has suggested evidence for the mounted riding of the horse in the Eurasian steppe to the 12th century BC, based upon evidence of *psalia* (i.e. cheek pieces used for harnessing) found within various burial contexts (Kuzmina 1984). However, evidence for the first widespread use of the horse for mounted military combat is not known until around 1,000 BC, the point at which most scholars agree is the beginning of the pervasive spread of nomadic pastoralism.

Therefore, concerning the dynamism associated with human-horse relationships, it is quite clear that based on several points of material evidence the use of horses by warrior nomadic pastoralists was a very recent phenomenon in terms of the history of the Eurasian steppe region. As Khazanov has concisely remarked concerning Gimbutas' arguments for early mounted nomadic steppe warriors and a 'Kurgan Culture': "this culture, which Gimbutas (1970:155-97) insists really existed, is only an artificial and speculative construction which unites under one heading many archaeological cultures which themselves are very different and from different periods" (1984, 90). As such, one can clearly see the sequence of utilisation of the horse, from significance as a food resource, with possible domestication and herding by the Neolithic Period, the use of horses to pull carts, wagons, and then chariots by the second millennium BC in the Bronze Age period, and finally for the use of horses for mounted cavalry warfare by the beginning of the first millennium BC.

This historical trajectory of horse utilisation, and the symbolism attached to the use of horses in varying socio-cultural contexts, has been characterised by Renfrew as relating to what may be termed ‘cognitive constellations’, that is the “symbolic representation of groups of associated ideas and concepts that may have been significant in forming and then in illustrating and reinforcing the ethos of the society of the day” (Renfrew 1998, 260). It is within this vein of interpretation that one can perceive the movement and spread of technology in Eurasia as taking place through both a cultural and symbolic framework of interaction and exchange and not simply through the dramatic and decisive movements of one particular ‘Kurgan Culture’ or associated population groups.

It is apparent that the horse has been an incredibly significant economic, technological, and symbolic resource throughout the past several millennia of human societal and cultural development. As such, I wish to move towards a more detailed discussion concerning the role of the horse in the development of mortuary and ritual behaviours in Chapter Three, which focuses on the Early Iron Age period and associated transition and intensification of animal sacrifice in the eastern steppe and West Siberian regions. Within this spatial-temporal context, it will be possible to approach the complexity and variation inherent within the material cultural pattern known as the ‘Scythian triad’ form of burial and to approach the archaeology of death and animal symbolism associated with the kurgan form of burial.

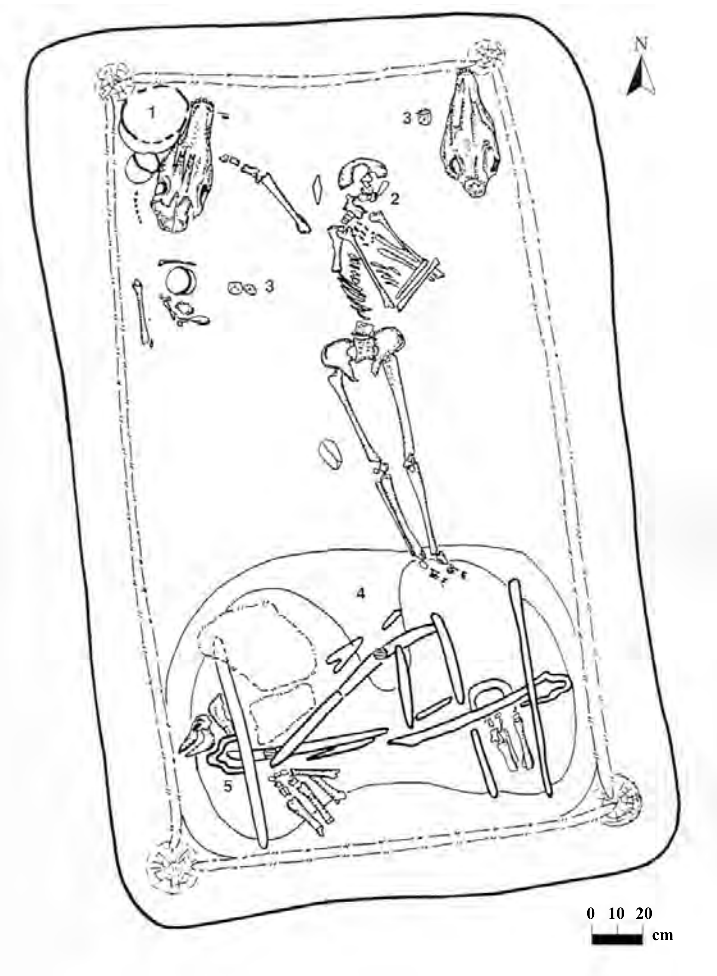


Figure 2.10 *Plan of chariot burial at the Krivoe Ozera mortuary site: 1 - horse skull with three pots, two bridle cheekpieces and the points of two spears and arrows; 2 - charioteer; 3 - bone cheekpieces; 4 - stains outlining the structure of the chariot, including the wheels and axle fragments; 5 - yellow lines revealing the location of the spokes and wheel hub exterior (Anthony & Vinogradov 1995, 39).*

However, at this point within this chapter, I would like to pursue more detailed issues surrounding the development of pastoral nomadism in the Eurasian steppe and the socio-cultural characteristics associated with this phenomenon. In the proceeding discussion, a more pragmatic exploration of the widely used terminology of semi-nomadic and nomadic pastoralism will be initiated and an examination of the important dynamics associated with human-animal relationships in the Early Iron Age period will be undertaken.

2.4.1 Nomads and Semi-Nomads: Definitions and Theories

Conventional scholarship has identified several key variables to explain the transition of sedentary pastoral economies to that of mobile pastoral regimes in the Eurasian steppe zone. The most commonly cited factors are: (i) increasing climatic aridity that seemingly reached a zenith at the beginning of the first millennium BC and favoured a turn towards nomadic steppe pastoralism (Lamb 1966; Riabtseva 1970; Zdanovich and Shreiber 1988), (ii) the progressive change in animal husbandry practices as a result of increased herd populations and resultant mobile strategies (Gryaznov 1957), (iii) the interaction and subsequent socio-economic pressure placed upon steppe populations by the emerging state civilizations bordering the southern steppe region (Lattimore 1951), and (iv) the development of certain prerequisite conditions (socio-economic and technological), which provided the foundation for a more mobile form of pastoralism (Khazanov 1984, 94).

These 'classic' interpretations of the economic transition to full-scale nomadic pastoralism often reflect a strong evolutionary framework, whereby several underlying mechanisms and preconditions are needed in order to bring about a transition towards nomadism. This particular view, as it relates to the Eurasian steppe region, is perhaps best reflected in the words of the late Mikhail Gryaznov who postulated a trajectory of change associated with the dawn of the ancient nomads in the steppe:

> After five centuries of migration between their winter settlements and their summer pastures the steppe peoples of the Late Bronze Age were ready for the change to a completely nomadic way of life. They were skilled horsemen, they had long been accustomed to using wheeled transport (carts drawn by a pair of oxen), and in some areas may already have been moving about from place to place during the summer. Then in the 8th century BC some particular tribe, or perhaps a number of tribes in different parts of the steppe zone, abandoned their settled way of life and took to nomadism, moving constantly in search of fresh grazing for their herds. The territory previously owned by a clan or tribe was not sufficient for nomadic herding: new land was required. The acquisition of additional territory could be achieved only by force; and accordingly the change to a nomadic way of life was not a matter for the individual family but one involving the whole clan or, more probably, the whole tribe.
>
> (Gryaznov 1969,131)

This sort of classic interpretation of the rise of Eurasian steppe nomadism is founded upon principles inherent within rigid socio-economic frameworks. And, in effect, this situation has perpetuated problems associated with typological categorisations such as nomadic, semi-nomadic, semi-sedentary, etc. to describe varying degrees of mobility associated with nomadic pastoralism. Even though there has been a tremendous amount of ethnographic research undertaken on contemporary nomadic pastoral populations throughout the world, scholars continue to debate classifications and typologies associated with this type of economic regime and livelihood. Unfortunately, this situation has also impacted scholarship of ancient nomadic pastoralism and the archaeology associated with the early nomads of the steppe region. Hence, there has developed a considerable, and highly problematic, flexibility in the use of such terms as nomadic and semi-nomadic to describe prehistoric pastoral practices. This has led to a great deal of current confusion regarding early socio-cultural and socio-political developments among later prehistoric pastoral populations in the steppe.

With these factors in mind, it will be helpful at this point to examine the complexity and dynamism naturally inherent within pastoralist societies and to review some of the key elements associated with this lifeway. By doing this, it will be possible to pick up on several of the variables associated with this pattern of life and more specific issues relating to animal husbandry practices. This will provide an important framework for approaching the current difficulties associated with defining an archaeological approach to ancient nomadism and will allow for a more critical examination of the present models associated with semi-nomadic and nomadic characterisations commonly used for prehistoric steppe pastoralism.

To begin with, it is quite useful to review the basic typology set forth by Khazanov that describes the different schemes of population and herd movement associated with ancient steppe nomads. It must be noted, however, that these classifications follow a general direct historical approach and analogy through the use of ethnographic data taken during the 19th and 20th centuries within the various regions of the Eurasian steppe area. As such, Khazanov posits the following schemes relating to nomadic pastoralism:

1. *The first scheme* relates to an entire population following a completely nomadic subsistence regime following no particular set routes or staying in any one area for any extended length of time (the Scythian groups representative of the 8th and 7th centuries BC and the Huns of the 4th and 5th centuries AD are given as examples).

2. *The second scheme* also allows for an entire population to move yearly following unstable ‘meridional (north-south) or radial (multidirectional) circumferential routes’ and having no significant wintering area.

3. *The third scheme* again characterizes entire population shifts, however these movements follow specific routes and have distinct areas for winter use (the ancient Sarmatian groups are given as an example). These groups are traditionally seen as not practising any supplemental form of agriculture.

4. *The fourth scheme* of mobile subsistence activity is based upon the whole population practising seasonal mobility in ‘meridional or vertical directions’ with winters being spent in permanent settlements. Supplemental agricultural practices may be seen within these groups.

5. *The fifth scheme* is based upon partial populations following mobile subsistence regimes, perhaps seasonally in 'meridional or vertical directions', while the residual population remains sedentary and is primarily concerned with agricultural pursuits.

(after Khazanov 1978, 120)

According to Khazanov, the last two schemes, which may be characterised as semi-nomadic in nature, are probably representative of most of the population groups traditionally seen as nomadic pastoralists (ibid). This typological scheme set out by Khazanov provides a useful starting point for approaching the broad variation inherent within nomadic pastoralist regimes. However, in reality, one must underscore the fluid and opportunistic patterns associated with what may be defined more loosely as 'mobile pastoralism'. The important point to be made here is that active economic patterns associated with the movement of livestock can conform to a variety of different social and cultural situations exhibited across a broad range of environmental conditions. In this case, Khazanov's classification scheme outlined above comprises a range of variables inherent within the pastoral mode of subsistence. These variables have been discussed by numerous scholars and as such typically relate to the following set of criteria: 1) specific characteristics of the physical environment and overall land resources, 2) composition of the livestock herd, 3) dependency on agricultural based products, and 4) human factors concerning animal husbandry practices and labour resources required for the management of a stockbreeding economy.

Taken as such, nomadic pastoralism may be more aptly characterised as relating to a continuum, whereby mobile pastoralist strategies operate somewhere within a range of purely sedentary settlement patterns at one end of the scale and a completely (and hypothetically) 'pure' nomadic society at the other extreme (Johnson 1969, 12). This 'continuum' has been well represented through ethnoarchaeological work undertaken by Cribb (1991), which clearly illuminates correlations between mobility and mode of subsistence among pastoral populations within present day Turkey (Fig. 2.10). As Cribb notes, "nomadic pastoralism is a dual concept comprising two logically independent dimensions – nomadism and pastoralism. Within each of these dimensions dualisms such as nomadic/sedentary, agricultural/pastoral, the desert and the sown, perpetrate gross distortions of our ability to understand the relationship between the two. Each dimension may be viewed as a continuum, and the relationship between them is best represented in terms of a probability space in which groups or individuals are uniquely located with respect to each axis" (1991, 16).

These points are extremely important for discussions concerning ancient pastoral practices and what may be considered as approaches to the archaeology of pastoral nomadism. This of course stimulates a very important question. If, for example, contemporary nomadic pastoral practices are so

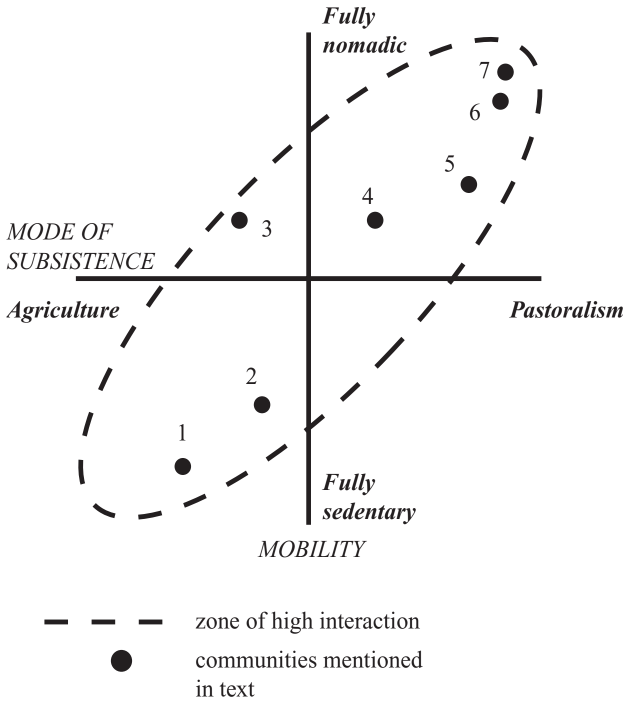


Figure 2.10 *Cribb's model showing correlation between mobility and subsistence of a number of contemporary pastoral communities in Anatolia (redrawn from Cribb 1991, 17).*

difficult to categorise in terms of static patterns, then how may it be possible to approach a classification of ancient pastoralism, as concerns the use of terminologies such as semi-nomadic and nomadic developments? Furthermore, what particular model(s) may be inferred relating to nomadic patterns of material culture and other evidence relating to animal husbandry practices and associated economic subsistence pursuits? In short, how does one differentiate between the range of sedentary and mobile pastoral practices possible for prehistoric nomadic practices within an archaeological context? It is apparent that answers to these questions have not been so easily forthcoming, as has been argued by numerous scholars concerned with this issue (e.g. Johnson 1973; Crawford 1978).

2.4.2 Towards an Archaeology of Nomadism

> I want to conclude…with a characterisation that I think can be sustained; people who live by herding domestic animals have a pride, a hauteur, a strong sense of individual worth and a strong sense of the nobility of pastoralism as a calling.
>
> (Goldschmidt 1979, 26)

This statement by Goldschmidt clearly establishes the *ethnos* that has been considered by many ethnographers to be widespread among peoples engaged in a pastoral nomadic way of life. A characterisation that is perhaps common not only to contemporary nomads but also for perceptions of prehistoric nomads as well. While ethnographers may have the luxury of 'developing a sense' of the ethnos of the particular group of people they are examining, through an active interaction within the respective socio-cultural milieu, archaeologists are left only with the traces of past life ways biased by the passage of time and the unrelenting effects of the elements of the earth. Hence, there has always been a distinct analytical tension between ethnographic studies of present day nomads and an archaeological approach to ancient remains believed to represent some form of a nomadic subsistence pattern.

Certainly, Cribb's work in Turkey, which sought to develop a methodology for an archaeological approach to pastoral nomadism, has provided an important framework for approaching the issue of what previously has been considered an archaeological 'invisibility' for pastoral nomads (Cribb 1991, 65; Gilbert 1983; Evans 1983). Although this approach is illuminating, especially concerning the societal structure and material cultural patterns of Near Eastern nomadic groups, the overall methodological approach cannot be taken *ad hoc* for issues pertaining to the archaeology of Eurasian steppe nomads. While emphasising a strong spatial analysis regarding nomadic architecture, domestic space, and the location of nomadic camps and settlements, Cribb developed several 'middle-range' theories to account for these structuring principles within the context of the nomadic sites. While focusing on a broad range of material artefact distribution and density, primarily through an ethnoarchaeological approach, Cribb's study does not however provide a universal framework for analysing faunal remains and other environmental indicators specific to the long-term and short-term occupations of pastoral populations. This is, of course, in great part due to the contingent cultural practices of the pastoral groups investigated and the overall methodological approach based on surface finds and activity areas.

Although using an ethnographic perspective for modelling the material cultural signature of nomadic groups, Cribb did not try to simply apply set models to the structure of ancient nomadic remains. As Cribb notes, "the object has been not to extrapolate contemporary nomad material culture and spatial behaviour back into the past, but to try to discover the factors, and systems of factors, that give rise to the observed regularities and variability. More is involved here than the adoption of uniformitarian assumptions and arguments by analogy" (1991, 227). This is an important point, and one especially pertinent to Eurasian steppe nomadic studies, as direct ethnographic analogies are frequently used in attempts to interpret ancient settlement and mortuary sites believed to be remnants of semi-nomadic or nomadic populations.

Nevertheless, some of the main arguments developed within Cribb's work are highly significant for any approach to the archaeological remains of what may be interpreted as nomadic societies. For example, nomadic settlements have an inherently fluid or ephemeral nature and thus represent a principally unstable system of settlement – a particularly salient point concerning site architectural features, artefact densities and the structuring and sequencing of dwelling space. As such, Cribb underscores the importance of horizontal investigations of nomadic sites rather than stressing vertical or stratigraphic relationships (Cribb 1991, 228). This point relates directly to the factor of short-term sequencing or phasing associated with ephemeral settlement systems. This may seem a rather obvious argument, however, I will return to this important issue in Chapter Five when I discuss the methodological approaches to settlement sites used within the Trans-Ural region, where an emphasis has clearly been placed on excavating specific features within sites and a strong focus is placed on stratigraphic relationships.

Cribb's study, like many ethnographic and ethnoarchaeological approaches, provides important points concerning the issue of an archaeology of mobile pastoralism. Certainly one of the key factors common to these studies is that there cannot be one overarching model used to distinguish the variability associated with the settlement patterning of mobile pastoralists. Rather, it is necessary to apply a strong contextual approach regarding the characteristics of the particular region and site(s) within archaeological investigations. With this in mind, I would like to move towards a discussion of the particular characteristics of an approach to the archaeology of nomadism in the Eurasian steppe region, as this will be a more productive way of contextualising the arguments presented later within the thesis.

Concerning the archaeology of Eurasian steppe nomadism, many scholars have recently begun to react to the widespread use of loosely defined paleoeconomic models such as semi-nomadic, nomadic, etc. For example, Rassamakin as undertaken an intensive examination of the archaeological evidence for early nomadic pastoralism, regarding the Eneolithic Yamnaya phase in the North Pontic steppe zone, and as cogently noted that:

> These (forms of mobile pastoralism) were usually characterized as seasonal, semi-nomadic, nomadic, without close attention being paid to defining the actual mechanisms by which they functioned within particular societies and cultures. Attempts to resolve this problem methodologically have failed, crucially because of the nature and composition of the archaeological evidence, for which it is very difficult to find appropriate ethnographic parallels"
>
> (Rassamakin 1999, 130).

As Rassamakin's statement indicates, it has been common practice within the scholarship of the steppe region to apply specific ethnographic models or analogies to the interpretation of ancient archaeological remains. This method has been widely utilized and accepted as an appropriate way to approach prehistoric nomadic practices. However, as the discussion concerning Cribb's work above clearly illuminated, it is not possible to project present day models of pastoral nomadism into the past, instead it is necessary to approach the more general variables and systems of factors representative of the nomadic way of life within specific environmental, ecological, and cultural contexts.

Some of the problems associated with conventional approaches to the archaeology of nomadism in the Eurasian steppe, particularly with respect to the analysis of zooarchaeological materials, may be outlined as follows: (i) the interpretation of ancient herd compositions based on faunal remains within settlements and mortuary sites, (ii) rigid correlations between faunal assemblage patterns and static subsistence models – with less emphasis on complexity and variation, (iii) a strong lack of contextual intra-site and inter-site investigation and interpretation regarding horizontal patterns of faunal remains and related material artefacts and architectural structures and features.

Event though faunal remains represent one of the most frequently occurring classes of artefact in Eurasian steppe sites, the three points outlined above actually provide only a general starting point for problems surrounding the interpretation of faunal remains. There is obviously a strong theoretical weakness concerning a heavy reliance on ethnographic analogy, however, there are also distinct problems concerning methodological approaches to the excavation of sites. For example, excavations rarely encompass the screening (sieving) and flotation of soils and geomorphological work is only starting to be applied to structured floor deposits and other activity zones within settlement sites (e.g. French and Kousoulakou 2000). Furthermore, the total collection of all artefacts, such as pottery and bone fragments, is also rarely undertaken and heavy biases are common in the sampling of material culture and environmental and economic indicators (pers. com. Pavel Kosintsev). There are additional factors to consider, however, and I will reserve this for later discussions in Chapters 3, 4 & 5, which provide specific details regarding methodological biases in regards to archaeological and zooarchaeological approaches. I would now like to return briefly to a discussion of some of the new approaches that have been undertaken regarding the archaeology of sites believed to exhibit physical indicators of pastoral nomadism.

In a recent paper, Bunyatyan has attempted to define sets of criteria for archaeological patterning in settlement sites that may relate to animal husbandry practices (Bunyatyan 1994). This approach, which focuses on a typology for particular patterns of animal husbandry, is applied to the possible set of archaeological indicators that may be found within the archaeological excavation of settlement sites (Table 2.1) These indicators relate to the physical evidence (e.g. corrals, shelters, barns, etc.) for managing animals on sites, such as the need for 'stalling' animals at specific times of the year or for particular types of herding practices, as well as the types of faunal indicators that may be expected relating to these regimes. However, as Rassamakin notes, "each element in each of these schemes raises a wide range of issues. These include stalling and feeding regimes, the consumption and distribution of food products, the length of time that settlements were in use, and the degree of sedentism (or conversely, mobility) of a specific population" (1999, 130).

Although Bunyatyan's methodology does provide a useful way of approaching some of the variation found within the archaeology of pastoral sites, it does not, as Rassamakin clearly notes, provide all the answers to the questions that are generated through an examination of the data from archaeological sites. While there can be no set analytical framework for dealing with the issue of an archaeological signature for nomadic pastoralists, as each region and archaeological site presents its own unique characteristics regarding the distribution of material remains, there is a general approach that may be taken towards illuminating the complexity associated with settlement sites and geographical zones where nomadic pastoralism is commonly followed as a mode of subsistence.

For example, as was noted above, there has been excellent work done in recent years by Rosen, Chang and colleagues regarding the archaeological investigation and paleoenvironmental research at the Saka-Wusun period Iron Age sites in the southeastern region of Kazakhstan (2000). The

A

FORMS OF ECONOMY	agriculture		complex		animal husbandry	
TYPE OF ACTIVITY	agriculture	animal husbandry	agriculture	animal husbandry	agriculture	animal husbandry
RELATIVE IMPORTANCE	dominant	subordinate	approximately equal		irregular or absent	dominant or exclusive
DEVELOPMENT	intensive		mixed		extensive	

B

basic modes			
extensive (pasturing out)	**intensive (stalling)**		
day	night	**stall-pasturing**	*variants*
summer	winter	**transhumance ('vertical transhumance')**	
summer	-	**pastoral nomadism**	
-	year-round	**stall-animal husbandry**	

Table 2.1 *Animal husbandry models put forth by Bunyatyan: A - System for the management of cattle breeding based on form of economy; B - System of managing cattle based on mobile pastoralism type (as cited in Rassamakin 1999, 131 following Bunyatyan 1994)*

particular importance of this work is that it has sought to address the issue of cultural complexity and regional agro-pastoralism practices through the use of a variety of analytical testing. Drawing on evidence provided by phytolith, geomorphological, and faunal analyses, as well as an intense regional survey and mapping endeavour, excellent information regarding the various phases of environmental and subsistence changes, and physical phases of settlement patterns has produced an important new model for understanding agro-pastoral practices. This model relates directly to the types of regional complexity one can expect for the Iron Age period and the unstable nature of the settlements and related economic regimes.

This multi-dimensional approach is easily the best case scenario for the investigation of sites associated with pastoral nomadism, as it provides a much broader spectrum of data relating to the full suit of subsistence practices possible for specific regions as well as particular socio-cultural milieus. In this way, it may be possible to approach important issues relating to changing or fluid agro-pastoral practices. This stands in contrast to conventional investigations that typically focus on rather superficial examinations of faunal remains and other economic indicators. It is obvious that a more finely grained approach, one focusing on the geomorphology of living and activity spaces, the interpretation of phytolith evidence, and a more detailed approach to zooarchaeological investigations, is necessary to provide a deeper resolution regarding economic and subsistence strategies and to address the complexity associated with agro-pastoral practices.

In the preceding discussion, I have clearly favoured the multi-dimensional approach, as offered by Rosen et al., to the archaeology of nomadism. However, this approach is still largely unattainable for much of the archaeological investigations taking place within the steppe region in the present day. Nevertheless, archaeological investigations do continue and therefore it is a fruitful endeavour to pursue a more reliable methodology and theoretical orientation to the material culture commonly recovered from settlement and mortuary sites in the Eurasian steppe that are suspected of being closely tied to mobile pastoralism populations. Hence, in the next chapter I will attempt to provide a more structured approach to the issue of human-animal relationships and the importance of zooarchaeological analyses of faunal materials from varying contexts within settlements and mortuary sites. It will be shown that there is a great deal of vital information that may be retrieved through a strongly structured methodological approach to faunal remains recovery, analysis, and interpretation, and that a more sophisticated theoretical framework may be postulated that accounts for a broad range of human-animal interaction and elements of symbolism.

In this final section of the chapter I wish to provide a rather brief and general discussion concerning both the theoretical and methodological developments within the discipline of archaeology during the Soviet Period as well as some of the distinct changes and transitions that have occurred within the Post-Soviet Period. As I have thus far provided a rather over-critical interpretation of many of the conventional tendencies of Russian archaeology, I feel that it absolutely necessary to set these within a proper historical frame of reference and to bring to the forefront some of the larger ideological, institutional, and intellectual currents that have impacted and moulded the discipline of archaeology with Russia. Although this discussion will only provide a rather superficial treatment of a topic, one which is clearly deserving of a much more detailed investigation, I have also attempted to link discussions of Russian archaeological method and theory throughout the thesis to larger socio-political or historical trends. Nevertheless, I regretfully acknowledge that this is still inadequate in terms of addressing many of the important issues at hand regarding the actively changing paradigms within the archaeological discipline of Russia and its effect on developments in both methodology and theory.

2.5 Kurgans and the Rise of the Russian Archaeological Discipline

> The revolutionary leaders of the new state looked to scientific knowledge to modernize the Russian economy and to eliminate Russia's age-old mysticism, which was viewed as a hindrance to social and economic progress. The social sciences, including archaeology, had a crucial role to play in the ensuing ideological struggle.
>
> (Trigger 1989, 12).

There can be no doubt that the intriguing kurgan burial mounds spread throughout the vast Eurasian steppe region have stimulated a strong sense of fascination for both scholars and lay people

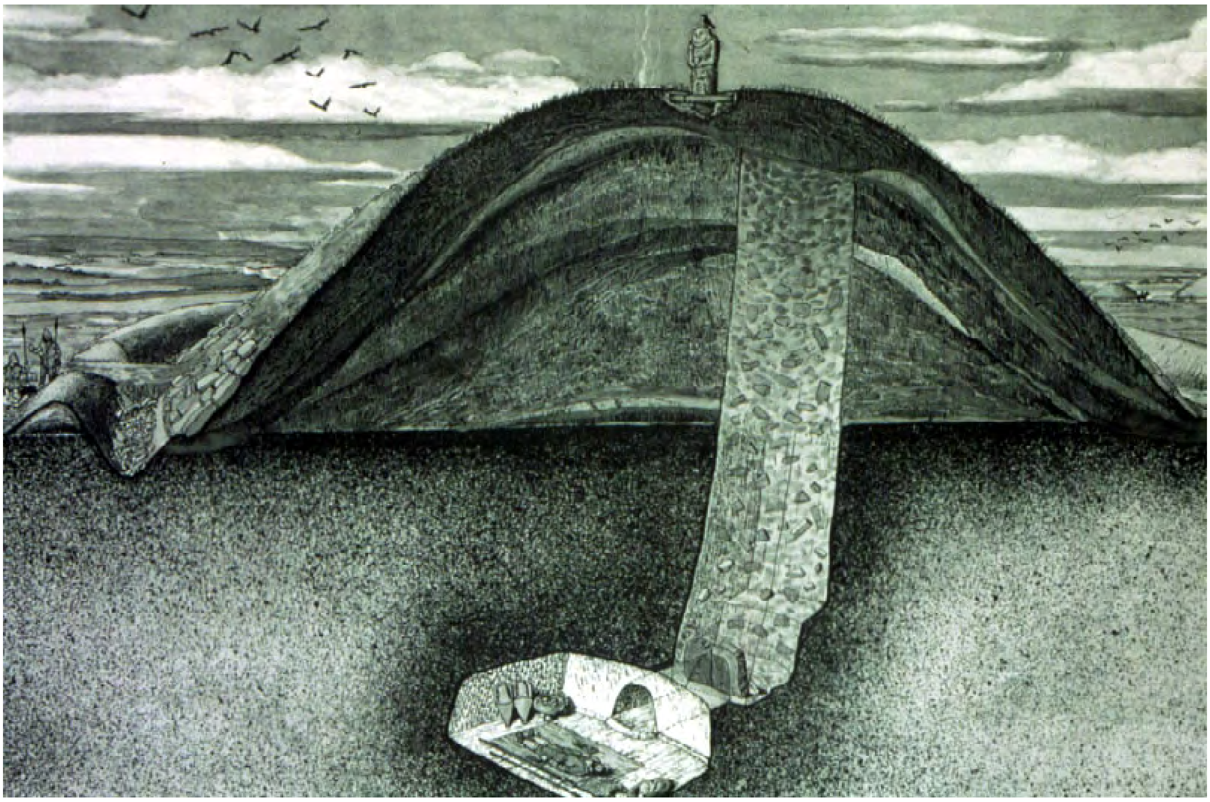


Figure 2.12 *Kurgan with 'Scythian' warrior's grave near the village of Pervomaievka in the central Dnepr River region (drawing by Korniienko, in Bohush and Buzian 1999, 96).*

alike for centuries. As a result, innumerable interpretations have developed around the nature and meaning of the kurgan mortuary complexes and their place within the history of the steppe region. Significant issues surrounding the large-scale demographic developments of prehistoric pastoral nomadic groups, the origin and spread of the Indo-European languages, and the rise of warrior nomadic military developments have all been linked to the archaeological record of the steppe region, and by consequence, also linked to the ubiquitous kurgan burial sites.

It may also be said that the curiosity and investigation of these unique burial complexes have played an extremely active role in shaping the evolution of Russian scholarly approaches to the prehistory and archaeology of the Eurasian steppe region. The variations in the material remains of these sites have stimulated how scholars have framed their perceptions of the relationships between constructs of the past and present and ultimately the material cultural patterns associated with the flow of history. Indeed, interpretations of these sites have always played a significant role within contemporary ideological frameworks, represented throughout the Imperial, Soviet, and Post-Soviet periods of Russian history (Table 2.2). Throughout these changing socio-political and socio-cultural spectrums, kurgan complexes have consistently stimulated curiosity and necessitated explanation (Fig. 2.12).

In reality, the kurgan form of burial represents a funerary system developed over a period of nearly five thousand years, which in numerous variations spread throughout the vast Eurasian steppe region. These mortuary sites have consistently reflected a unique source of interest for various individuals.

TIME PERIOD	IMPETUS FOR INTEREST IN THE PAST	MATERIALS REFLECTING INTEREST	RESULTING & COINCIDING THOUGHT OR INSTITUTION
18th Century	Aristocratic Interest	Various Archaeological Remains from Burials	Museum Collections
19th Century	Cultural Heritage, Nationalistic and Political Agendas	Various Archaeological Remains from Burials	Development of Academic Societies, Ethno-cultural Approach, Deductive Classification Approach
20th Century	Socio-cultural, Socio-economic Interests	Various Archaeological Remains from Burials	Exemplars of Historical Materialsm

Table 2.2 *Historical interest in kurgan investigation and interpretation (after Hanks 2001c).*

Local populations, often seeking valuable artefacts through the looting of kurgans, are representative of a great deal of the past exploration and exploitation of these sites. However, early systematic attempts at kurgan investigation were developed and employed on a wide-scale. For example, Tsar Peter the Great, in the early eighteenth century, instigated the first centralised and managed efforts for the retrieval of archaeological remains from kurgans. Numerous sites, with a particular focus on burial mounds of the Iron Age Period in the North Pontic steppe zone and in the Western Siberian region, were exploited with the contents collected and then distributed to the aristocratic governing bodies. Many of the artefacts taken from these investigations eventually ended up in the famous Siberian Collection of Peter the Great and are currently housed in various museums such as the Hermitage in St. Petersburg and in numerous other smaller collections in Moscow and various provincial museums.

The second half of the nineteenth century saw a turn in Russia towards an increased sense of pan-Slavism, which was undoubtedly a response to the political and foreign policy movements of the Russian State and its efforts to extend Russian influence into Eastern Europe. Aristocratic interest in archaeological investigation increased during this period and the development of societies such as the Imperial Archaeology Society in St. Petersburg (1851) and the Imperial Russian Archaeological Society, founded by Count Aleksey Uvarovin in Moscow, were instituted (Trigger 1989, 10-11).

One of the more important issues of this time was the development of the ethno-cultural approach to prehistory. This theoretical paradigm was born out of the necessity to classify the incredible amount of material evidence that had been retrieved through the long history of artefact collection in Russia, with many of the materials coming directly from the numerous kurgan investigations. Two important figures in the development of the ethno-cultural approach were Gorodstov (1860-1945) and Spitzyn (1858-1931). Gorodstov put forth a deductive-classificatory approach to his analysis of prehistoric pottery. In his application of this approach to the Bronze Age burials in southern Russia, he posited three chronologically consecutive ‘cultures’: Pit-Grave, Catacomb and Timber Grave, which are still being used as cultural designations today (Dolukhanov 1996, 202). Strong issues relating to ethnicity and ethnogenesis were also born out of the ethno-cultural paradigm and were clearly related to nationalistic trends of this period.

2.5.1 The Soviet Paradigm and its Significance on Archaeological Interpretation

With the rise of the Soviet Union the discipline of archaeology was once again heavily drawn upon for its socio-cultural utilitarian value as well as political significance. Within the emerging Soviet ideology a strong emphasis was placed upon the historical materialism posited by Marx's doctrine as Marxism was introduced into archaeology at the end of the 1920's and early 1930's (Shnirelman 1995, 124). The manner in which this transformation took root and developed is inherently complex and interwoven within the Soviet Communist Party development and spread of influence.

Figure 2.13 *Photograph of Lenin Statue in front of Tyumen University, Tyumen, Russian Federation (photo by author).*

It was of course Engels' 1884 publication, *The Origin of the Family, Private Property, and the State,* which provided the classic outline for the study of prehistory during the Soviet Period. From this work, Marx's view of 'primitive society' (prehistory) was further divided into the following classifications, which can be roughly related to the prehistoric classification system used in Europe today (as noted in brackets): the primitive herd (Lower Palaeolithic), primitive community (Upper Palaeolithic), matriarchal clan society (Neolithic), patriarchal clan society (Bronze Age), and the disintegration of tribal society (Iron Age) (Mongait 1961, 29).

Interestingly, Engels' publication of *The Origin*, which drew heavily upon Lewis Henry Morgan's publication *Ancient Society* (1877)*,* was inspired by notes made by Marx himself during his reading of Morgan's book – with Engels not having read the original source himself. Although Engels' publication has been thoroughly deconstructed from numerous points of view, its impact and continuing influence cannot be denied. Certainly, the significance of *The Origin*, as it related to the rising communist ideology of the time, was clearly solidified by Lenin when he stated that: "This is one of the fundamental works of modern socialism, every sentence of which can be accepted with confidence, in the assurance that it has not been said at random but is based on immense historical and political material" (Lenin, Collected Works, Vol. 30, 473).

Archaeological theory therefore underwent a major change as a result of the impact of the ideology associated with the emergence of the Soviet era (Fig. 2.13). As a result of the Marx doctrine, archaeological inquiry began to shift its focus towards an emphasis on the socio-economic aspects of past cultures as they related to material remains. In due course, an abandonment of the earlier ethno-cultural model ensued and a new emphasis was placed upon autochthonous explanations rather than factors associated with migration and diffusion. In addition, issues relating to ethnicity were no longer explored and developed. However, this pattern also changed in time and by the 1960's Soviet archaeologists were abandoning this theoretical framework and again returning to ideas of migration and diffusion, which were generally seen as core ethnogenetic developments originating from within the Russian geographical area and spreading outwards. These analytical trends were clearly very much in line with the contemporary and prominent nationalist movements taking place within the Soviet Union (Dolukhanov 1996, 204-205).

The preceding discussion clearly illustrates the dynamic nature that has characterised the long development of the discipline of archaeology within Russia. Although only briefly touched upon here, the significance with which this socio-political and ideological atmosphere has permeated archaeological inquiry cannot be taken lightly. As noted, one of the primary areas of emphasis for Russian archaeological investigation, especially heightened during the Soviet Period, was that of societal relations and structures. As a result of this sociological emphasis, and the fact that kurgan burials were one of the most easily identified and visually recognised archaeological sites within Russia, interpretations of burial sites and funerary ritual practices have been heavily utilised in the reconstruction of past demographic patterns and social-evolutionary typologies.

Concerning the relationship of these developments to the historical and interpretative interest in kurgan burials, one can see that through the development of the Marxist-Leninist approach to social theory rigid frameworks for understanding prehistoric socio-cultural models were based upon the concept of historical periodisation and the construct of the progressive five stages of socio-economic formations. Accordingly, widespread generalisations of prehistoric cultural formation through both time and space became common. As Koryakova has noted, "…all reconstructions (those applying to different regions and different cultures) became very similar, being sometimes almost identical to each other. As a result, archaeologists lost interest in this problem (social reconstruction)..." (Koryakova 1996, 244).

It would appear then, as developed within the discussion above, that interpretative analytical approaches to the material of the Eurasian Early Iron Age period have varied between broad-based understandings of the historical process through time and those which seek to explore more specific meanings relevant to contextual approaches. Within these schemes the temporal and spatial movements of cosmology, ideology and cultural practices are sought in relation to the material cultural residues. Nevertheless, within the varying approaches to these issues the complexity and variability inherent within social practice, and reflected within its material markers, is often restricted through the use of societal typologies where rigid classifications are imposed upon the materials of the past. It is precisely these analytical frameworks, surrounding the distribution of material cultural patterns, which have led to conventional and rather broad characterisations such as archaeological cultures and cultural horizons for prehistoric nomadic steppe groups.

2.5.2 Post-Soviet Theoretical and Methodological Developments

The post-Soviet period has also witnessed dramatic changes within the archaeology of Russia. The break-up of the centralised system for the state-controlled Soviet Sciences has created disastrous results concerning funding, organisational support, and frameworks for scientific publications. As Chernykh notes:

> Some scientific teams were physically isolated and deprived of valuable information about research in related fields done elsewhere. The volume of scientific publications decreased dramatically. By the end of 1993, this near total collapse had even reached the point where several scientific institutes of the Russian Academy of Sciences did not have enough money to pay for electricity, water, and other utilities. At the same time, the salary of a newspaper vendor or delivery person was 2-3 times that of a professor of an academic institution.
>
> (Chernykh 1995,140)

In addition to the problems associated with the infrastructure and funding for the sciences, emergent nationalism has also become a significant contemporary theme as old nationalistic agendas as well as newly formed debates have all come to the forefront in recent years. (Klejn 1991; 1993; Shnirelman 1995; 1996; 1999). Within this spectrum, a near total abandonment of Marxism has developed and through various nationalistic movements the ethno-cultural model has once again become utilised in the advancement of certain racial and ethnic agendas (Dolukhanov 1996, 209).

While Soviet Period archaeologists were constrained by Marxist theory in their interpretations of prehistoric social and cultural development (from a social evolutionary perspective), contemporary scholars now have the opportunity to explore new avenues of interpretation and theoretical approaches. Nevertheless, while one may openhandedly dismiss the relevance of Marxist approaches within the contemporary framework of Russian archaeological theory, one can find that there is not a wholesale abandonment of previous theoretical structures. Instead, one can find attempts to bridge both terminology and general underlying theoretical principles between Western and Eastern theory. For example, Koryakova states, "it is not difficult to see that Marxist and processual-evolutionary approaches have much in common with regard to explanatory social processes in an historical context, although they have different origins, the former based on historical sources and philosophical principles…the latter deriving from ethnographic source analysis" (1996, 247). This statement by Koryakova reveals the common theoretical ground sought by Post-Soviet scholars over the past decade, as a greater connection to Western archaeological theory and methodology became possible and collaborative projects were initiated.

Although there has been a progressive increase in the collaboration between archaeologists of the West and Russia, conventional approaches to the prehistory and archaeology of the Eurasian steppe region have in many ways been slow to develop. Regional chronologies, traditionally fixed through typological classifications of material artefacts, continue to prevail within much contemporary research, with the result being a complex representation of ‘archaeological cultures’ and rigid periodisations of chronological sequences. In some cases, these are even argued in the face of newly achieved radiometric dating results.

Furthermore, fundamental approaches to archaeological site excavation and environmental sampling, such as wet/dry sieving, flotation, test pitting, geomorphological investigations etc, have still not become standardised or fully integrated into contemporary archaeological approaches within the Russian Federation. Where strong collaborations exist between scholars from the East and the West, more intensive approaches to archaeological investigation, paleoenvironmental reconstruction, and more refined sampling techniques have been applied and have yielded important new information. A fine example of this has been discussed above, concerning the multi-dimensional approach to the Saka-Wusun period sites being investigated by Chang, Rosen and associates in Kazakhstan. It is precisely projects like these, which utilise a variety of analytical approaches in archaeological investigation, which will provide a substantive data rich framework in which to push beyond conventional static models and culture historical interpretations of the prehistory of the steppe region.

2.6 Conclusion – New Approaches to Old Problems

This rather dense chapter has attempted to illuminate just a few of the general and particularly problematic issues currently confronting the research of the Eurasian Steppe Iron Age period. Through an examination of the traditional approaches of scholars in the Black Sea region, it was shown that the use of historigraphic approaches have predominately marked interpretations of the development of nomadic pastoral societies in the steppe. It was argued that this has created a false sense of the ethno-cultural complexity associated with the ‘Greek-Scythian’ interaction in the middle of the first millennium BC and its effect on other pastoral societies in the steppe region. The problematic nature of using homogeneous terms such as ‘Scythian-Siberian Unity’ and ‘Scythian World’ have also clearly provided a false perspective for viewing the development of the pastoral nomadic societies and are one of the perpetual problems still plaguing Iron Age studies.

Furthermore, an attempt was made to characterise the debate over the earliest start for pastoral nomadism in the Eurasian steppe. It was shown that scholars are still quite divided over this issue with some arguing for forms of mobile pastoralism as early as the Eneolithic and Early Bronze Age period, while other scholars follow the more traditional argument favouring widespread nomadism at the beginning of the first millennium BC and the transition into the Iron Age period. Important factors involved within this debate centre around the earliest domestication of the horse, the rise of the 'chariot horizon', and the development of lavish mortuary ritual activities and animal sacrifice.

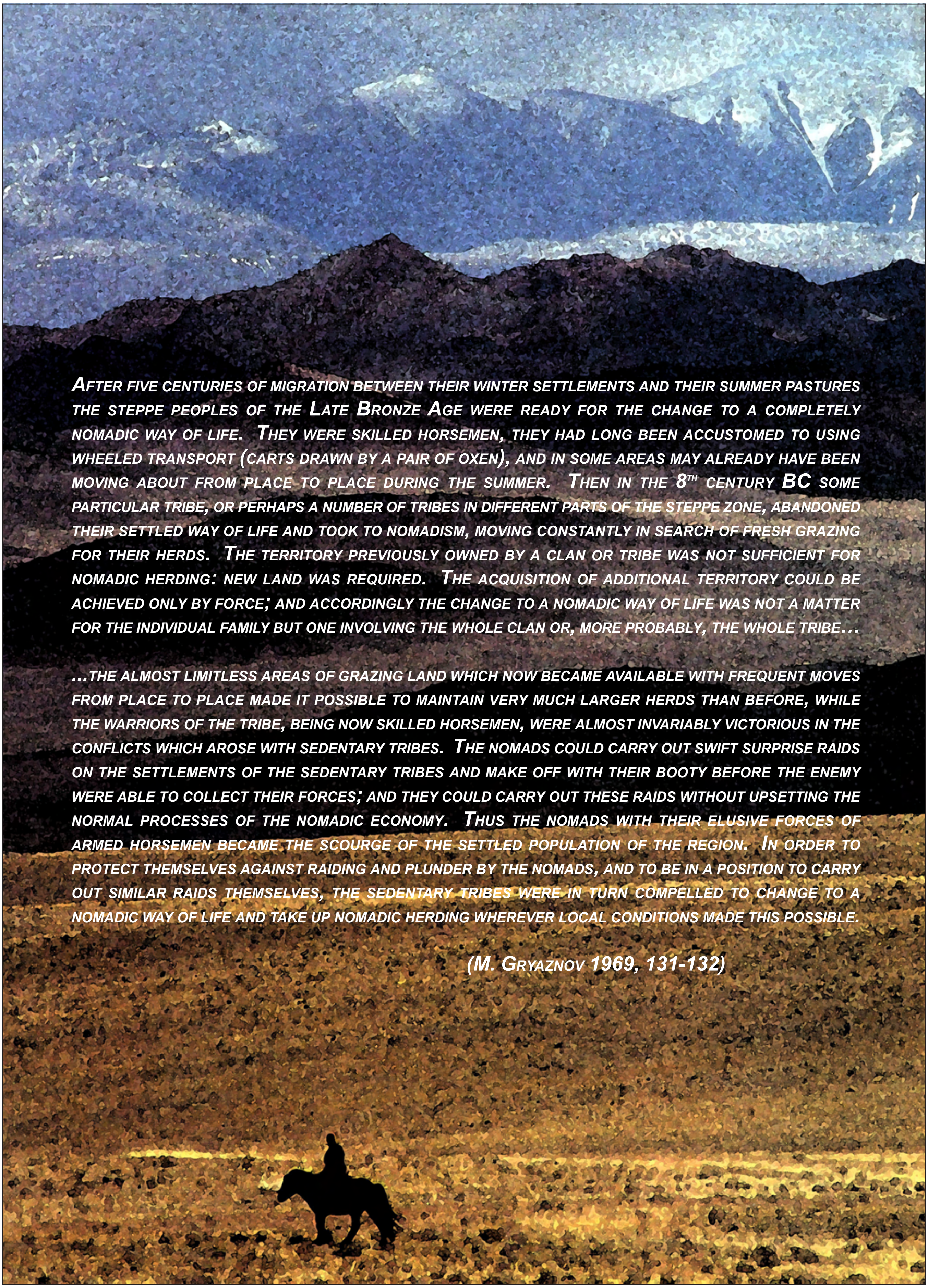
A rather brief overview of the problems associated with 'an archaeological approach to nomadism' was presented and it was shown that at the heart of the matter there is a principle disjunction between ethnographic and ethnoarchaeological approaches to contemporary nomadic populations and feasible models used for an approach to prehistoric nomadism and the investigation of archaeological sites. Regarding this, the fluid range of social and cultural practices associated with nomadic pastoralism was highlighted and it was shown that much more finely grained multi-dimensional approaches are needed in order to affect changes in archaeological approaches and field methodologies.

The final section of this chapter has attempted to set the issue of the approach to the Iron Age prehistory of the Eurasian steppe region within the larger socio-cultural and socio-political events that were part of the Imperial Period of Russia through the rise of Soviet ideology and finally the dynamism that has characterised the Post-Soviet disintegration. Issues concerning nationalism, ethno-cultural links to the past, as well as more practical concerns such as scientific funding, international collaborations and the general change in approaches to the prehistory of Eurasia were highlighted.

The principal goal of this chapter has been to provide a general overview of contemporary archaeological research within the Russian Federation, and more specifically, the realm of scholarship focusing on the Iron Age period. In doing so, many of the conventional problems as well as traditional interpretations of early pastoral nomads were highlighted. As this thesis now begins to become more focused on the patterns and characteristics of a particular region and temporal period, many of the issues touched upon within this chapter will become more relevant through a contextualisation of particular archaeological sites and the scholarship associated with the investigation of these sites. As the theme human-animal relationships is applied to the material remains of these sites, a strong attempt will be made to illuminate a different perspective concerning the interpretation of the Early Iron Age period. This will be achieved through a much stronger focus on the merit of zooarchaeological analyses and the richness associated with the faunal record.

CHAPTER THREE

Socio-Economic Dynamics East of the Ural Mountains



After five centuries of migration between their winter settlements and their summer pastures the steppe peoples of the Late Bronze Age were ready for the change to a completely nomadic way of life. They were skilled horsemen, they had long been accustomed to using wheeled transport (carts drawn by a pair of oxen), and in some areas may already have been moving about from place to place during the summer. Then in the 8th century BC some particular tribe, or perhaps a number of tribes in different parts of the steppe zone, abandoned their settled way of life and took to nomadism, moving constantly in search of fresh grazing for their herds. The territory previously owned by a clan or tribe was not sufficient for nomadic herding: new land was required. The acquisition of additional territory could be achieved only by force; and accordingly the change to a nomadic way of life was not a matter for the individual family but one involving the whole clan or, more probably, the whole tribe…

…the almost limitless areas of grazing land which now became available with frequent moves from place to place made it possible to maintain very much larger herds than before, while the warriors of the tribe, being now skilled horsemen, were almost invariably victorious in the conflicts which arose with sedentary tribes. The nomads could carry out swift surprise raids on the settlements of the sedentary tribes and make off with their booty before the enemy were able to collect their forces; and they could carry out these raids without upsetting the normal processes of the nomadic economy. Thus the nomads with their elusive forces of armed horsemen became the scourge of the settled population of the region. In order to protect themselves against raiding and plunder by the nomads, and to be in a position to carry out similar raids themselves, the sedentary tribes were in turn compelled to change to a nomadic way of life and take up nomadic herding wherever local conditions made this possible.

(M. Gryaznov 1969, 131-132)

3.1 Introduction

These two important excerpts from Gryaznov's book, *South Siberia* (1969), provide both a vivid narrative as well as a concise view of what scholars have traditionally supported as a theory for the development of warrior nomadic pastoralism in the Eurasian steppe region. Furthermore, by looking more deeply into the structure of the text one can discern several key elements that clearly relate to the Marxist approach to prehistoric social and cultural development. Although on one hand it may be argued that such approaches have largely been abandoned in recent years by Post-Soviet scholars, concerning the study of prehistoric cultures, I on the other hand would argue that the underlying 'structures' relating to models of socio-cultural change are still very much active at a certain scale and are being carried into new directions of archaeological research.

To support my point of view on this matter it will be necessary to identify some of the main theoretical elements inherent within Gryaznov's discussion above and then to link them with recent developments and approaches regarding the study of the Early Iron Age period in the Eurasian steppe region. This will, in effect, provide an important foundation for the discussions presented within this chapter, which seek to investigate the dynamic relationships between socio-economic transitions, socio-political organisation, the appearance of new forms of ritual practice and mortuary behaviour, and how all of these issues have been addressed within various theoretical developments within Russian archaeology.

In regards to these important issues, I wish to follow a line of discussion relating to the dynamism associated with the creation of new relationships between humans and animals in the Early Iron Age period. I use the term relationship in this case to underscore the active means by which animals were utilised across a variety of symbolic fields within socio-cultural interaction and discourse. The material record provides ample evidence that animals represented subsistence, power, prestige, wealth, and ethno-cultural identification within a variety of social and cultural contexts within the Early Iron Age period. As such, I argue that animals represented an important 'common denominator' and were therefore active media in many of the most significant developments conventionally connected with the Bronze to Iron Age transition and what has been traditionally seen as the rise of warrior nomadic pastoralism in the Eurasian steppe.

3.2 Tribes, Chiefs, and Warrior Elites?

> Do tribes exist? Or are they chimeras, imaginary compounds of various and, at times, incongruous parts, societal illusions fabricated for diverse reasons but, once created, endowed with such solid reality as to have profound effect on the lives of millions of people?
>
> (Fried 1975, 1)

* Image on previous page adapted (i.e. watercoloured in Photoshop 6) from photo in Goldstein and Beall, 1994. *The Changing World of Mongolia's Nomads.* Los Angeles: University of California Press (p. 14).

Returning to Gryaznov's comments above, it may be stated that these passages reflect a classic interpretation of the hypothesised dramatic Iron Age developments associated with the steppe region. More specifically, one can note several important elements within his interpretation that have been perpetuated throughout the last three decades within conventional scholarship:

1) A linear progression of technology and social and cultural development.
2) An environmentally deterministic interpretation of social, technological and economic development and change.
3) Inherent societal mechanisms relating to cross-cultural interaction and subsequent stress-aggression which create a genesis for societal change.
4) A rigid interpretation of societal organisation based on the socio-evolutionary typology of tribe-chiefdom.

These four points encapsulate the theoretical foundation of Gryzanov's statements above, and by extension, also the Marx-Engels interpretation of pre-state societal development, which was the primary canon used within Soviet Period scholarship. A highly respected archaeologist in the Soviet Union, Gryaznov conducted numerous archaeological investigations within the western and southern areas of Siberia and the easternmost zone of the Eurasian steppe. It is a well-known fact that this geographical region was particularly important during the Soviet Period for the ethno-historical study of indigenous pastoralist populations (e.g. Vainshtein 1972; 1978). This early research was based largely on the use of direct historical analogies relating to the Marxist theoretical classification of pre-state socio-cultural and socio-economic evolution. Research among contemporary pastoral peoples such as the Tatars, Kazakhs and Bashkirs provided an important arena of fieldwork in which to address issues concerning the "economic-cultural type", a theory developed by two Soviet ethnographers (Levin and Cheboksarov 1955) based on the early work of Tolstov (1934).

As Humphrey has noted, "Levin and Cheboksarov defined the 'economic-cultural type' as: a historically formed complex of economic and cultural features characteristic of social groups at specific levels of development or evolution and living in a given kind of environment" (Humphrey 1980, 5). The concept of *culture*, used in this sense, relates to the intersection of three main components: a territory, a particular temporal span, and a defined ethnicity which can be seen to have developed through time (ethnogenesis) (Humphrey 1980, 7). This approach to the concept of culture was stimulated as a result of the interpretation of prehistory through the Marx-Engels canon, which was based on the five progressive stages of socio-evolutionary development and their respective modes of production.

I do not wish to digress into too deep a treatment of the epistemological foundation of classical Marxist theory, rather my intent here is to signal some of the important issues which I feel are still connected with contemporary approaches to such questions as societal organisation and the categorisation of prehistoric societies within socio-evolutionary typologies. This having been said, I wish to provide an explicit clarification of terminology, which I feel is very much warranted within discussions of societal formation and cultural development relating to Early Iron Age period studies in the steppe region.

One of the most currently debated terms in use within anthropology and archaeology is 'tribe'. Regarding this, there has been a progressively intensifying rejection of the socio-evolutionary typology of band-tribe-chiefdom-state configuration – which has been one of the main analytical constructs for the interpretation of prehistoric and historic societal development and organisation (Yoffee 1993; McIntosh 1999; Dietler 1995). This issue has great bearing on discussions of the Early Iron Age of Eurasia, as the use of such terms as tribes and chiefdoms are commonplace for the description of societies organised at what is considered to be a pre-state level of development. I do not wish to set out on a journey that attempts to solve the epistemological conflict surrounding this terminology. Instead, I wish to clarify my stance on the issue and the way in which I make use of the term tribe within this chapter. However debatable, I find the term to be useful in a general sense for providing a framework for discussion on issues associated with pre-state societal formation and development. I reject the rigid use of the term as it relates to issues surrounding socio-cultural evolution, as espoused by Service (1962), but favour some of the ideas put forth by Sahlins (1968), especially regarding the development of particular social institutions (e.g. age-grades, warrior societies, etc.) which cross-cut other seemingly rigid ethno-cultural boundaries. Furthermore, Fried's investigations in *The Notion of the Tribe* (1975) make the important suggestion that tribes may be seen as "secondary phenomena" resulting from contact with state based societies:

> This discussion {book} has suggested that there is one usage that is in excellent accord with our knowledge and experience; this is tribe as a secondary socio-political phenomenon, brought about by the intercession of more complexly ordered societies, states in particular. I call this the "secondary tribe" and I believe that all the tribes with which we have experience are this kind. The "pristine tribe", on the other hand, is a creation of myth and legend, pertaining either to the golden ages of the noble savage or romantic barbarian, or to the twisted map of hell that is a projection of our own war-riven world.
>
> (Fried 1975, 114)

This idea of 'tribalisation', as a product of interaction between state and non-state societies, is an important concept and is one that has been employed more widely within recent anthropological and archaeological research. I have already touched on the importance of this concept in Chapter Two, regarding the processes of socio-cultural transition relating to the interaction between Iron Age populations within Europe and the Classical state societies of Greece and Rome, and I would like to expand on this issue now.

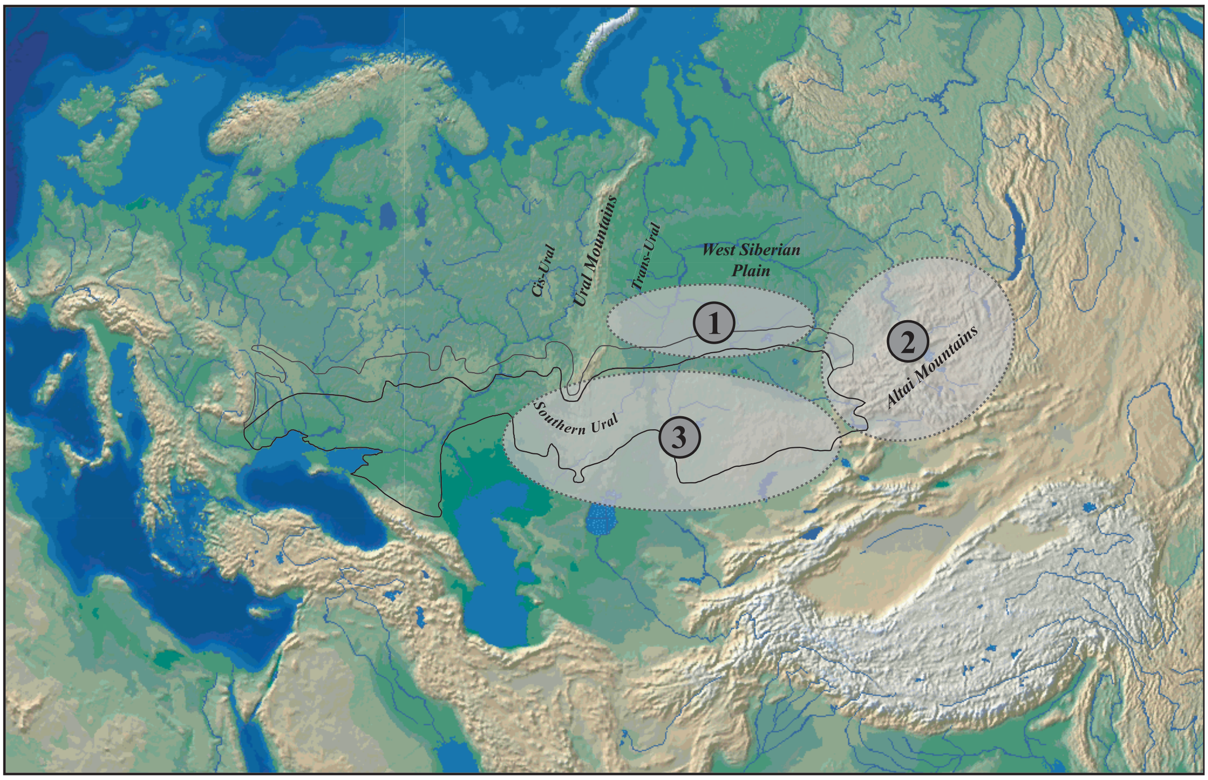
As I noted in Chapter Two, the use of *World Systems Theory* has been frequently used in discussions concerning the interactions between eastern Eurasian steppe pastoral nomad populations, northern forest populations, and Central Asian state based societies (Koryakova 1996; 1998a; 1998b; 2000; Christian 2000). I criticised the use of this theoretical construct, as I argued that it over-emphasised the role of the proposed 'core' (state societies) and underrepresented the active developments which occur at the proposed 'periphery' (postulated tribal societies). Relating to this, Ferguson and Whitehead (1992a), in a series of comparative papers on the concept of *Tribal Zone* (seen as the active point of contact between state and non-state societies), have provided a sound critique of *World Systems Theory* as it relates to this problem. Recent comparative anthropological research has effectively illuminated the historical contingency of such socio-cultural and socio-political contacts and has emphasised the fluid and dynamic construction of ethno-cultural identity and social organisation in such situations (McIntosh 1999; Ferguson & Whitehead 1992b).

Archaeologists have also addressed these issues through interpretative approaches to the material record, as was discussed in Chapter Two regarding Peter Wells' (2001) research on the expansion of the Roman Empire and its effect on Iron Age societies within Central and Northern Europe. Recent research has suggested that during the Iron Age within Europe, and indeed within the greater Eurasian region, contact between complex state societies and less complex non-state populations stimulated distinct changes through the process of 'tribalisation', which created "more self-consciously defined groups, with a sense of territory, group identity and a political structure focused on a singe leader – 'king' or 'chief'" (Wells 2001, 32). This model of structural change associated with Early Iron Age populations provides an important framework for investigating the relationships between the creation of dynamic 'social boundaries' and the vibrant construction of identity and ethnicity. This view is clearly at odds with conventional interpretations which favour rigid constructs of spatially bounded 'tribal' groupings that are associated with monolithic ethnic connotations (Jones 1997, 31). Nevertheless, some of the most tangible evidence of such interactions and social change relate to the appearance of new forms of mortuary behaviour and the construction of specific forms of ritual practice. Specifically how these developments relate to new social constructs of ethnicity and identity, power and prestige, and socio-political organisation remains an extremely important question in contemporary and future lines of archaeological discourse and interpretation concerning the Eurasian Iron Age period. Therefore, with these important theoretical points in mind, I now want to move into a more detailed discussion of the eastern steppe region, where I provide a more detailed archaeological context for the exploration of some of these issues as they relate to larger socio-cultural changes in the first half of the first millennium BC and the rise of specific patterns of animal use and symbolism.

3.3 The Eastern Steppe Region

In the last chapter, I touched on several important themes that I feel are significant for understanding the general nature of scholarship for the Eurasian steppe Early Iron Age period and a few of the challenging problems currently confronting this area of research. Among the most important of these were issues relating to societal organisation, ethno-cultural 'genesis' and problems confronting the study of the 'archaeology of nomadism'. Concerning one of the main research focuses within this thesis, i.e. the investigation of the hypothesised relationships between Iron Age populations in the northern forest-steppe zone and the proposed intensification of Iron Age period contact with southern nomadic pastoralist groups within the steppe region, all three of these issues are particularly important.

As Map 3.1 illustrates, this thesis is primarily concerned with examining three main geographical zones east of the Urals: 1) the Trans-Ural forest-steppe zone; 2) The Sayan-Altai Mountain region; and 3) the southern steppe zone. It will not be possible to speak in detail about all three zones, however, I feel that it is important to provide a comparative overview of some of the main characteristics concerning the variability of pastoral economic patterns, and related animal husbandry practices, as well as to underscore the significant symbolic and active role animals represented within mortuary ritual contexts and in larger structural frameworks relating to social organisation and ethno-cultural identity. Therefore, this chapter will address zones 2 & 3 through a survey and discussion of several key Iron



Map 3.1 *Map detailing three main regions discussed within chapter: 1 - Trans-Ural forest-steppe region; 2 - Sayan-Altai Mountain region; 3 - eastern grassland steppe region.*

Age sites (primarily mortuary complexes) and then zone 1 will be covered in more detail in the following chapters.

The eastern steppe region, as I have broadly defined it in this sense, represents a large geographical expanse situated to the south and east of the Ural Mountains. This area represents a grassland steppe zone at the interface of the West Siberian Plateau, the Trans-Ural region (eastern foothill region of the Ural Mountains), and the more southern arid steppe-dessert region of Central Asia. Hence, environmentally, this area is well represented by a grassland steppe zone bounded by forest-steppe, forest, and mountain ecological zones. This geographical area is exemplified by its significance within the prehistoric archaeological record, yielding a vast array of sites dating from the Palaeolithic to the early historic era.

3.3.1 Paleoenvironmental Considerations

To begin with, it is necessary to provide a general overview of the paleoenvironmental information available for the Early Iron Age period. I feel that this is a very important issue, as there has been a predominant trend among Russian scholars to use environmentally deterministic approaches in the construction of models for understanding long-term socio-economic changes between the Bronze and Iron Age periods. This is particularly relevant to the greater eastern steppe region regarding the transition towards widespread nomadic pastoralism within the steppe, as was clearly noted above within Gryaznov's interpretations.

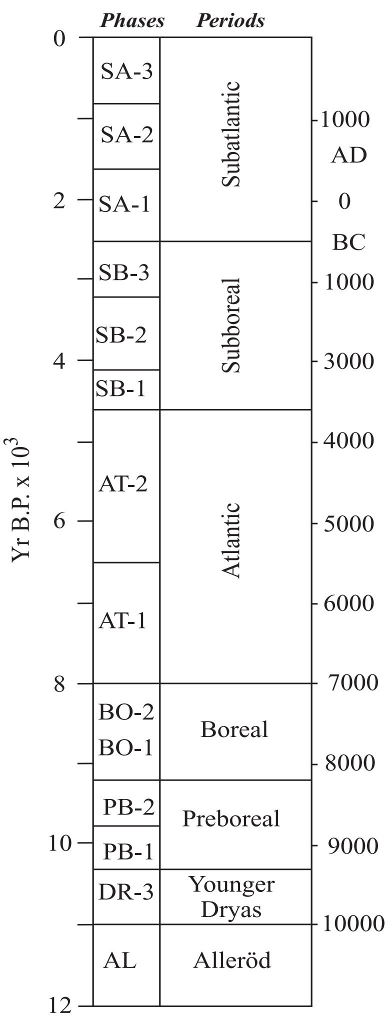


Figure 3.1 *Holocene chronological subdivision (after Khotinskiy 1984).*

In recent years, paleoenvironmental research has shown that the general environmental conditions and characteristics found today, for both soils and climatic conditions, are very similar to those of the first millennium BC in the eastern steppe region. Most of the palynological data for the Holocene of Central Asia and Western Siberia, based on core samples from lake and bog sites, has been summarised by Khotinskiy (1984). As a result of a general correlation with the European Holocene climatic phases, Khotinskiy has utilised the European terminology for outlining the main climatic phases for the eastern steppe region (Fig. 3.1). More recently, Kremenitsky (1997) has provided more detailed environmental sequences for West Siberia and the area of present day Kazakhstan and has suggested

(Kremenitsky forthcoming) more precise evidence regarding the environmental boundaries of the steppe and forest-steppe zones and has noted the geographical areas most impacted by prehistoric mining activities (Bronze and Iron Age periods - Map 3.2).

Nevertheless, as noted by Rosen et al. (2000, 613), there is a distinct contradiction between Khotinskiy's interpretation and Kremenitsky's for the Early Iron Age period (Table 3.1), particularly relating to the start of the Subatlantic Period (ca. 650 cal BC). While Khotinskiy favours a transition from a cool to a warm-moist climate at this time Kremenitsky suggests a warm-arid phase. However, Kremenitsky has cautioned that there are very few well-dated pollen sequences relating specifically to the Kazakhstan area for this time period and that currently it is quite problematic to reconstruct the precise environments relating to the steppe and forest-steppe zones of this region (Kremenitsky forthcoming).

Rosen et al. have also cogently addressed the problems of comparing pollen data with various archaeological phases, "it is difficult to interpolate calendar dates on pollen sequences because of variations in sedimentation rates. One also must consider the lag-time between actual climatic change and the colonization by new vegetation communities" (Rosen, et al. 2000, 613).

These comments are particularly relevant for discussions of the Late Bronze Age to Early Iron Age transition and hypothesised socio-economic shifts towards increased nomadic pastoralism. For example, Yablonsky has argued for increasing aridity at the start of the first millennium BC, which supposedly stimulated distinct changes in regional socio-economic patterns and resulted in increased migration:

> It was during the transition from the Late Bronze Age to the Early Iron Age that the Eurasian steppes went through the almost universal transition from the traditional complex economy consisting of cattle breeding, primitive agriculture, hunting, fishing, and gathering to one of predominantly simple cattle breeding. Of no small importance during this transition were climatic changes that affected the steppes in the late 2nd to early 1st millennium BC. The sharp rise in aridity brought about a significant reduction in the availability of cultivatable lands in the estuaries, and furthermore, a decline in pasture land (Zdanovich and Shreiber 1988). The aridity was probably the stimulus for Bronze Age steppe groups to push south in search of grazing land in the river deltas.
>
> (Yablonsky 1995b, 242)

Yablonsky's argument generally reflects the view of many Russian scholars who place the rise and spread of nomadic pastoralism at the start of the first millennium BC (Tairov 1993; Koryakova 1991; 1996; Khazanov 1984). However, based on the discussion of the palynological interpretations above, there are still distinct problems with the correlation of paleoenvironmental evidence and archaeological interpretations of Early Iron Age sites and socio-economic developments. Nevertheless,

Map 3.2 *Map of Eurasia detailing the environmental boundaries for the Holocene Period: steppe zone (solid black line), the southern limit of the forest zone (dotted black line), and the main regions of prehistoric mining and metal production (dotted yellow lines). Information for environmental and metallurgical boundaries taken from Kremenetski 2000.*

Calendar Dates	Phase	Period	Talgar Fan	Tien Shan Glaciers	Pollen: Kazakhstan	Pollen: Siberia	Lake Balkash
1500 AD				Advance		Cool	
1400							Regression
1300					Moist		
1200		Medieval	Unit 2 Semi-Arid	Soil Formation Retreat			
1100							
1000							
900							
800				Advance Cool/Moist			
700							
600							
500			Erosion	Soil Formation Retreat	Semi-Arid		
400							
300							Transgression
200			Landscape Stability Soil 2 Warm/Moist				
100				Advance Cool/Moist			
0 BC/AD		Wusun			Moist		
100 BC							
200							
300	Early Subatlantic					Warm/Moist	Regression
400							
500					Warm/Arid		
600		Saka	Unit 3 Alluvial Silt Cool/Moist	No Data			
700							
800							
900							
1000						Cool	
1100	Late Subboreal						
1200							Transgression
1300					Moist		
1400							
1500							
1600							
1700						Warm/Moist	
1800	Mid-Subboreal						
1900					Cool/Dry		
2000							

Table 3.1 *Palaeoenvironmental reconstructions for the Kazakhstan and Siberian regions based on a range of data from various sources and radiocarbon dates: Tien Shan - Savoskul & Solomina 1996; Kazakhstan - Krementski 1997; Siberia - Khotinskiy 1984; Balkash - Venus 1985; Khrustalev & Chernousov 1992 (table redrawn from Rosen, Chang, et al. 2000,).*

as I argued in Chapter Two, regional studies such as that being done for the Saka period in Kazakhstan by Rosen et al., and the research by Di Cosmo (1994) concerning Early Iron Age pastoral nomads in Inner Asia, have clearly illuminated the economic variability regarding agro-pastoral practices in the Iron Age. This stands in stark contrast to the developments postulated by Yablonsky above for the Saka period. This situation suggests that scholars must adopt more comprehensive regional studies which focus on systematic methods of paleoenvironmental reconstruction. Although pollen and geomorphological studies have clearly shown their value within the work of Rosen et al. (ibid.) in the steppe zone, zooarchaeological analyses must also be considered as an extremely important method for complementing other paleoenvironmental and paleoeconomic reconstruction. With these issues in mind, I wish to move into a more detailed discussion of the relationship between conventional Russian models of Early Iron Age socio-economic transitions to more specific zooarchaeological concerns which address problematic interpretations of ancient stockbreeding developments.

3.3.2 Iron Age Nomadic Pastoralism and the Rise of 'Cattle Breeding Societies'

To begin with, it is necessary to point out some of the conventional and rather problematic models used to describe the stockbreeding practices associated with the rise of Iron Age nomadic pastoralism. As outlined above, this topic is particularly relevant to the eastern steppe region, as many of the rather rigid categories used to describe the various types of pastoralism (i.e. nomadic, semi-nomadic, etc.) have been stimulated from either ethnographic research during the Soviet Period or from early accounts of ethno-historical contact in the 18th and 19th centuries between indigenous pastoralist populations and Russian immigrants seeking to colonise the Siberian region.

However, in the first case, it is important to clarify a particular term which has created some confusion between Western and Russian scholars about the pastoral mode of subsistence within the steppe region. This problem is relevant to both studies of contemporary pastoralists as well as ancient nomadism. The Russian terms *skotovodstovo* and *skotovoda*, literally translated as *cattle breeding* and *cattle breeder* respectively, are frequently cited in a variety of contexts to describe stockbreeding and stock herding practices associated with a pastoralist form of economy (*skoto* translating as herd). Even though these terms imply a specialisation relating to the rearing of cattle stock, they in fact can be used more loosely to refer to the rearing of mixed stock herds; such as horses, cattle, sheep and goats, and in some instances camels. Therefore, an important point must be made that the conventional characterization of mobile cattle breeders should be seen only as a generalized term regarding stockbreeding and the pastoral mode of subsistence, regardless of the inferred species composition of the herd.

There is also some general confusion regarding the postulated trends of stockbreeding practices associated with the start of the Early Iron Age period in the Eurasian steppe. For example, as Khazanov notes concerning cattle breeding: "For the mobile Eurasian nomads who did not lay fodder for future use the cow was admittedly a valuable animal, but it was too capricious and ill suited to being driven over long distances. Rychkov (1877, 22) wrote that cows '…cannot pasture in the steppes, for this reason the Kirghiz keep few of them, and the richest man never has more than twenty'" (Khazanov 1984, 47). This contradicts Vainshtein's opinion of cattle herding somewhat, when he states that: "Cattle have been of great economic importance for nomads: they provided meat milk, skins, and, in the case of oxen, transport. During shifts they would pull the carts laden with the herdsmen's belongings, they could be ridden, and they were the chief tractive power in agriculture" (Vainshtein 1980,72).

To some degree, the difference of opinion on this matter can be attributed to the variation associated with pastoralist practices in different locations of the greater steppe region. In this case, Vainshtein's (1980) publication on pastoral nomadism in the Tuva region (located near the Altai Mountains region) is one of the most important works on the subject of the variability associated with pastoralism within the South Siberia region. Vainshtein's discussion of herd compositions found within the Tuva area (relating to direct historical evidence) illuminates the varying strategies of mobile pastoralism and agriculture, with some geographical niches favouring seasonal vertical shifts associated with the mountain steppes, while other groups utilise open and non-wooded pastures near the taiga. Based on this research, Vainshtein postulates that Early Iron Age nomadic pastoralism comprised herds with variations of sheep, goats, horses, cattle, camels, and perhaps even yaks (1980, 51-52). Khazanov also emphasises the variability in herd composition across the expanse of the Eurasian steppe, but draws specific attention to the heartiness of the horse, sheep and goat in the harsh arid steppe areas, such as central Kazakhstan today (Khazanov 1984, 46-47).

Therefore, concerning herd compositions relating to the Early Iron Age period, one can see that a great deal of ethno-historical information has been used for constructing models relating to types of pastoralism as well as herd compositions. Nevertheless, there are several contradictions regarding this, as was noted above. These problematic issues can be related to the general paucity of faunal evidence available for the steppe Iron Age period. This has stimulated the frequent debates over the earliest appearance of nomadic pastoralism within the steppe region, wherein conventional interpretations stress the decline of sedentism towards the end of the Bronze Age.

Based on the literature, it would appear that settlement evidence for the early Iron Age period is greatly lacking within the eastern steppe region. As noted in the last chapter, scholars have emphasised changes in the environment and societal transitions to account for this decline of settlement evidence, which has largely been attributed to the rise of pastoral nomadic societies. However, I would argue that this picture will slowly begin to take on a much more complex representation as more intensive, and scientifically comprehensive, approaches are undertaken to settlement site excavations focusing on the Late Bronze Age to Early Iron Age period (ca. 1200 – 800 BC). Although the evidence appears to reflect a wide scale transition towards nomadic pastoralism in the whole of the Eurasian steppe area, the excellent work by Chang et al. (1998) and Di Cosmo (1994) noted in Chapter Two paints a much different picture, one reflecting complex change with the intensification of agro-pastoralism in a mosaic of varying patterns respective of particular environmental niches and changing socio-economic patterns.

However, at the moment, there are numerous questions still open for debate regarding economic shifts, changes in occupation patterns, and general models relating to pastoral animal husbandry practices for the Early Iron Age period. I will approach these in more detail in the following chapters, where I discuss the supposed socio-economic shifts relating to the forest-steppe region east of the Ural Mountains and focus more specifically on the particular area in which I have conducted fieldwork. Therefore, I do not feel that it will be productive to extend the discussion at this point on the proposed patterns of stockbreeding that have been proposed for the Early Iron Age period in the eastern steppe region. Instead, I will return to this issue in Chapters 4 & 5 and provide a more comprehensive archaeological context for a discussion of these matters.

At this stage of the chapter, I feel that it will be fruitful to move into a discussion of the patterns of mortuary practices represented within the eastern steppe region, as there as been a very strong focus within Russian scholarship on the excavation and publication of the ubiquitous kurgan mortuary sites. This area of research has typically emphasised the rich burial contexts which have been conventionally correlated with hypothesised Iron Age warrior nomadic developments. Certainly, as will be examined within the remainder of the chapter, one of the main elements associated with these sites is the sacrifice and deposition of various animals as part of the ritual process as well as explicit indications of complex animal symbolism (Animal Style art pattern) connected with both grave goods and imagery associated with what may be broadly defined as the development of a 'warrior ethos'. The following discussion will therefore investigate theoretical explanations of these significant symbols as they relate to interpretations of the changing societal structure of the Early Iron Age period.

3.4 Death and Animal Symbolism

The ubiquitous kurgan burial mounds in the Eurasian steppe region, referred to as "pyramids of the steppe" by Renate Rolle (1989,19), reflect in a general sense a form of mortuary ritual practice developed over a period of 5,000 years (Trigger 1989, 208). I discussed the importance of these sites within the historical development of the archaeological discipline within Russia in the last chapter and I wish now to provide a more detailed discussion of some of the theoretical approaches taken in the interpretation of these sites.

In contrast to the scant evidence for settlement sites in the Early Iron Age of Eurasia, there is a plethora of sites relating to the kurgan form of burial. Many of the kurgans were heavily looted during the Russian colonisation of Siberia in the seventeenth century, and indeed, many are still plundered today (particularly in parts of Western Siberia and the Altai Mountain region). Nevertheless, the interpretation of the kurgan mortuary sites and the materials recovered from them has been used as primary resources for the development of many different theoretical models relating to:

1. *Population Movements*:
   Relating to seasonal as well as large-scale population migration between regions.

2. *Pastoral Herd Composition:*
   Based on species recovered from mortuary site contexts.

3. *Social Organisation and Ethno-Cultural Affiliation*:
   Based on mortuary site variability (mortuary construction types, grave goods, etc.).

For these three areas of conventional interpretation, one can note several distinct problems. Certainly, population movements for either full-scale or seasonal migration can only be generally hypothesised when drawing on the material record from mortuary sites. The use of general spatial distribution characteristics of cemetery sites, without substantial chronological data or specialised analyses such as stable isotope (e.g. lead and strontium) approaches, is highly problematic. Nonetheless, scholars have fervently debated issues about the movement of nomadic 'tribes' based on the spatial distribution of particular types of artefacts or specific burial patterns. A perfect case in point is the appearance of the 'Scythian tribes' in the North Pontic area and the various hypothetical models about their supposed westward migration at the start of the Iron Age period (Bokovenko 1995b; 1996; Yablonsky 2000). I briefly touched on the issue of the hypothesised *Scythian Triad* form of burial in the last chapter and how this has issue has created problems with the interpretation of particular types of burial patterning across the Eurasian steppe during the Early Iron Age period. I will return to this important topic below, and provide a more developed archaeological context in which to critisise it.

The second issue noted above, relating to the interpretation of herd composition (and the predominance of certain species) based on the presence of particular bone elements or domestic animals species, which are deposited either within kurgan grave burial pits or within the general physical context of the kurgans, is also highly problematic. Responding to a similar problem, although relating to Eneolithic Period Yamnaya burials in the North Pontic steppe, Rassamakin notes that:

> It follows that we cannot, on the basis of faunal evidence from burials, make any detailed claims about the nature of the herd or about the predominance of any given species among the Yamnaya tribes. We must be especially careful to avoid lumping together species composition and relative percentage data from burials with those from settlement sites. Direct ethnographic analogy

> with the economy of the Astrakhan Kalmyks is not acceptable owing to the incommensurability of the social and demographic dimension of the respective phenomena. The attempt to identify parallels immediately leads to circularity, as it presupposes the underlying similarity of the phenomena, which cannot in fact be presumed. I think little needs to be said regarding this issue, as it obvious that the patterns of ritual practice and animal selection need not follow the exact patterns associated with animal herds.
>
> (Rassamakin 1999, 130)

Rassamakin's comments provide a sound argument against the traditional interpretation of animal remains recovered from mortuary contexts for the development of models regarding herd compositions within the steppe zone. Unfortunately, this problem relates specifically to the paucity of settlement data for the Early Iron Age period, where scholars have attempted to utilise the only evidence available regarding domestic animal remains.

The third point noted above, relating to the interpretation of mortuary materials relating to constructs of societal stratification and hierarchical stratification, is an extremely important issue and is one which clearly deserves further elaboration at this point. There are, of course, many theoretical angles concerning approaches to the archaeology of death and burial, however, it will only be possible to discuss a few specific examples within the remaining sections of this chapter. Nevertheless, as I will be presenting a discussion below which addresses the theoretical interface between conventional Russian approaches to the interpretation of mortuary sites and recent developing trends within archaeological theory in the West, I feel that it is critical that I provide a general theoretical foundation to some of the issues I will be exploring in more detail below and those which will appear in the remaining chapters of the thesis.

3.4.1 Conventional Theoretical Foundations

It can be generally stated that the interpretation of past prehistoric societal organisation has often drawn heavily upon interpretations of mortuary evidence. Hypotheses regarding social rank, status, and role have all been developed through the examination of material evidence in the form of mortuary structures, grave good assemblages, and skeletal evidence. The patterns of these approaches have closely followed the paradigmatic nature of the archaeological discipline, and have thus been developed extensively over the course of the past four decades. Through these varying approaches, the material evidence has often been utilised as a sliding scale for interpretations of societal hierarchy, and is thus often taken as a direct reflection of the deceased and their position in life at the time of their death.

Over the past three decades Western scholars have been strongly influenced by the early work of several key individuals during the formative period of the *New Archaeology* movement of the late 1960's and 1970's. One such important individual was A. Saxe whose doctoral dissertation, *Social*

Dimensions of Mortuary Practices (1970), had a significant impact (with long-standing implications) on the way in which mortuary practices were viewed. Saxe's main premise pertained to the sociological significance of burial and its relationship to issues such as competition for resources, social frameworks for lineal descent, and the creation of separate formalised and bounded areas for burial practices (Morris 1991, 148). Saxe's substantial contribution was later extended by the work of Goldstein (1976), who applied and broadened Saxe's original contribution through the use of a broad-based cross-cultural approach. In so doing, Goldstein focused particularly upon the development of formal disposal areas by 'corporate groups', which Saxe had originally postulated, and sought to test this hypothesis cross-culturally. Goldstein suggested that the problem was the question of whether cultures with similar environmental and economic conditions will symbolise and ritualise aspects of their organisation in similar ways (Carr 1995, 122). As a result of Goldstein's clarification and extension of Saxe's work, widespread acceptance of this pattern of inquiry emerged and the Saxe/Goldstein hypothesis became significantly influential within the New Archaeology movement.

Binford's work in the 1970's also added significantly to the emerging analytical treatment of mortuary remains during this period. In Binford's *Mortuary Practices: Their Study and Their Potential*, it was asserted that there were significant associations between rank and status and their resultant reflection within the burial rite in the form of quality and quantity of grave 'furniture' and the nature of the grave 'facility' (Binford 1971, 232-233). Taken in conjunction, the strategies offered by the Saxe/Goldstein and Binford hypotheses became the primary tools used in the study of mortuary practices and added greatly to the formulation of the New Archaeology and the subsequent processual movement (Chapman 1987, 202). Within this scheme, the primary goal concerning societal reconstruction was the 'fitting' of the evidence into a set of prescribed social typologies, which was comparable to the early anthropological work of Service (1962) and Fried (1967), and was seen as an evolutionary ladder of societal organisation based upon the concepts of band, tribe, chiefdom, etc. (O'Shea 1984, 13; Tainter 1978). This scheme emphasised the exploration of within group-differentiation as opposed to between-group differences and sought to support the assumption that burial variability was a reflection of the stratification posited within general social formation and organisation.

In recent years, however, with the rise of the post-processual paradigm of thought there has been a general reaction to rigid applications of the analytical structure detailed above. As Härke has noted, on the relationship of burial material to a reconstruction of past social organisation and cultural dynamism, "…'burials are not mirrors of life': if anything, they are a 'hall of mirrors of life' providing distorted reflections of the past" (Härke 1997, 25). Through various critiques, post-processualists have emphasised the importance of the living 'actors' within the process of death and burial and have investigated the dynamic relationships created between the living and the dead through the social structure of mortuary practice (Barrett 1994; 2000; Carr 1995; Chapman 2000; Parker Pearson 1993; 1995; 1999a; Morris 1991).

Certainly, one of the key points in many of the post-processual critiques is that the living members of past societies are often viewed as 'passive' actors within rituality, or as Hodder has stated: "individuals appear controlled by rituals according to universal expectations; there is no sense in which they actively manipulate and negotiate ideologies" (Hodder 1986, 27). Further to this, one can note the 'political' decisions which are made by the living through the process of the burial of the deceased. In this way, "funerary practices are products of political decisions (or sequences of decisions) in which the corpse is manipulated for the purposes of the survivors. Their treatment of the deceased is conditioned by their perception of death and their relationships with each other as much as by their relationship to the deceased whilst alive" (Parker Pearson 1993, 203).

This relationship between the process of ritual and the active and knowledgeable *human agency* of the human participants has been explored in depth in recent years through the concept of agency and structuration theory (Barrett 1994; Dobres 2000; Dobres and Robb 2000). Within these approaches, emphasis is brought to bear upon the structure of ritual practice as it relates to the reproduction and reconstitution of society (Giddens 1984). Regarding this, Garwood has noted that the, "…structure is inherently historical: social reproduction, far from being the unchanging continuity of social form, involves the perpetual reconstitution of society through practical discourses conditioned by the social and material relations that already exist" (Garwood 1989, 13). Thus, one may consider the rituality surrounding mortuary practices as being a structured process that can be substantially charged with varying levels of symbolism (human actions and material culture) and one which clearly provides an important medium for the negotiation of relationships between the dead and the living as well as amongst the living members of the respective society. Regarding these factors, one might suspect that there are particular universals at play concerning the process of ritual and the socio-cultural frameworks, which both facilitate and structure rituals surrounding mortuary practice. However, scholars must be cautiously aware of the potential of the distinct contextual variability of such past practices and that the application of "quasi-universals", often based on middle-range theory developed from ethnographic analogy, can provide a misreading of the specific patterns of mortuary practice (Parker Pearson 1999a, 33).

Although postprocessual theory has provided an interesting movement in terms of approaches to death and burial, some scholars have critiqued the epistemological foundations of such post-processual approaches. For example, Renfrew notes that: "…concern has been expressed by a number of recent commentators that some of the discussion conducted under the banner of "postprocessual" archaeology, now often termed "interpretive" archaeology (Hodder et al. 1995), have lacked a coherent and explicit logical framework which would permit critical analysis or evaluation in the light of further data" (Renfrew 2001, 123). Other scholars have also stressed the problem of post-processual approaches that seek to blur the conventional dichotomy between 'secular/profane' practices. This is particularly the case when concerning the interpretation of sites that can be broadly defined as domestic locales, such as settlement sites. As Brück has cogently noted:

> Postprocessual archaeology's interest in the social and ideological aspects of human existence, although timely, has meant that the symbolic aspects of human action have all too often been stressed at the expense of the practical. The material products of human action (artefacts, sites, etc.) are frequently interpreted as metaphorical representations of past social and cosmological orders…the danger of this approach is that everything becomes subsumed within the category of ritual.
>
> (Brück 1999, 325)

Taken together, these various critiques illuminate some of the fundamental problems within recent theoretical approaches to the archaeology of death and burial and what may be understood as structured ritual practice within various locations. As Härke has noted, postprocessual approaches, which generally fall into the categories of either symbolic 'readings' (contextual) or sociological interpretations (e.g. structuration theory and significance of human agency), lack clear methodological premises and are often based on implicit definitions of archaeological 'context' (1997a, 21). With these cautionary remarks in mind, it is clear that there is still a necessity for more sophisticated and explicit methodologies relating to the interpretation of 'ritual' practices, and by extension, the development of more informed approaches to the archaeology of death and burial.

At this point I wish to advance towards a more focused discussion of Eurasian Iron Age burial evidence. With the discussion developed above, I have attempted to briefly outline a few of the general theoretical points that have been widely used within Anglo-American approaches to funerary archaeology and I have addressed some current epistemological conflictions. However, these issues have not been discussed in relation to conventional Russian archaeological approaches to mortuary interpretation and therefore it will be necessary to address this issue in the following section, which presents some of the traditional interpretations of Early Eurasian Iron Age burials east of the Ural Mountain region and investigates in more detail significant theoretical issues relating to death, burial, structured ritual practices and their relationship to the symbolism surrounding human-animal relationships.

3.5 Warriors, Ideology, and Structured Ritual Practice

> As regards war, the Scythian custom is for every man to drink the blood of the first man he kills. The heads of all enemies killed in battle are taken to the king; if he brings a head, a soldier is admitted to his share of the loot; no head, no loot. He strips the skin off the head by making a circular cut round the ears and shaking out the skull; he then scrapes the flesh off the skin with the rib of an ox, and when it is clean works it in his fingers until it is supple, and fit to be used as a sort of handkerchief. He hangs these handkerchiefs on the bridle of his horse, and is very proud of them. The best man is the man who has the greatest number.
>
> (Herodotus IV, 64)

The historical processes associated with the appearance of the Iron Age kurgan burial patterns can be generally related to the dynamic changes that took place within the whole of the Eurasian steppe region at the beginning of the first millennium BC. The appearance of new forms of burial, often with elaborate construction schemes, as well as the inclusion of horse riding accoutrements and military weaponry, became widespread themes throughout the whole of the steppe region. The expansion of these mortuary patterns, often problematically interpreted as the *Scythian Triad* mortuary complex (as discussed in the previous chapter), has been conventionally associated with the wide-scale emergence of pastoral nomadism and the development of stratified military societies.

The Early Iron Age burials east of the Ural Mountains have yielded a dazzling array of archaeological remains, from the well-known Pazyryk frozen tombs (Rudenko 1979) in the high Altai Mountain valleys to the little known *Usami* (so-called 'moustache') tombs of the central Kazakhstan steppes (Yablonsky 1995b). The material remains from these burial contexts have provided intriguing evidence as to the rich symbolism and complex ritual practices of the Early Iron Age peoples of the eastern steppe region. At the beginning of this chapter I provided two passages from Gryazanov's 1969 publication *South Siberia*. In these excerpts, Gryaznov emphasised the development of warrior nomadism as a result of both internal and external factors associated with the transition towards more mobile forms of pastoralism. This traditional model can best be illustrated in Figure 3.2, which details the hypothetical development of a warrior-based society. As this conventional interpretation argues, the transition to nomadic pastoralism created the concept of movable wealth among developing nomadic societies. The increase in population movements, due to environmental, social, and economic changes, associated with nomadic subsistence cycles increased interaction between other nomadic groups as well as with sedentary populations living

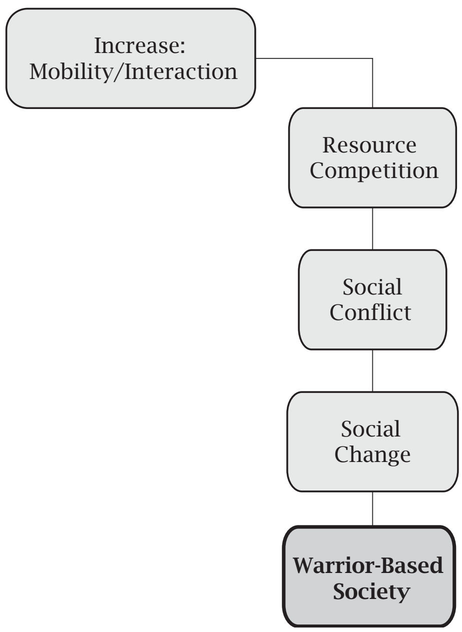


Figure 3.2 *General model of societal change relating to warrior nomadic developments.*

on the periphery of the steppe region. These interactions subsequently stimulated conflict relating to territorial pastures and seasonal migration routes. As a result of increased societal conflict, a warrior elite super-stratum within nomadic societies developed in order to protect resources. Through the process of this development, warriors achieved prestige and power which is reflected within the construction of large and complex burial structures, lavish animal sacrifice, and the deposition of rich material artefacts.

Much like the Saxe-Goldstein and Binford approaches noted above, the vertical social position of the deceased is typically scaled according to the size and type of the associated funerary monument as well as the quality and quantity of included grave good items. A ranked social system is inferred, generally relating to the Russian classification of the *military hierarchical democracy* - a concept used to account for pre-state societal developments within a Marxist socio-evolutionary framework. This development was initially rooted in Morgan's early work on the *military democracy* (1877) with further elaborations by Kubbel (1988) to account for social development relating to early class formation. As Koryakova notes: "In hierarchical society, chiefly leadership was not yet based upon tradition, but on the power of the army, a part of which was composed of mercenaries" (1996, 246). By the 1970's, many Russian scholars had begun to accept the chiefdom concept used within Western anthropological theory, which was typologically similar to the military hierarchical democracy level used within Russian scholarship. This particular model of social development has set the standard for how most Early Iron Age mortuary sites are interpreted.

Concerning Iron Age burials east of the Ural Mountains, a broad classification put forth by Khazanov (1975) (with further elaboration by Grach – 1980), has provided the general typological approach for their interpretation (Fig.3.3). The *Royal Burials* (generally referred to as *Tsar* kurgans – constructions often over 60 metres in diameter) are the largest kurgan constructions and typically yield evidence of lavish animal sacrifice and rich grave goods deposits. *Elite Burials* are also represented by rather large and complex kurgan constructions with elements of animal sacrifice and rich grave goods, however, burials of the *Ordinary Population*, as Koryakova notes, "are the most numerous in all cultures (60-70%) and usually yield a restricted range of tools, arrowheads, personal

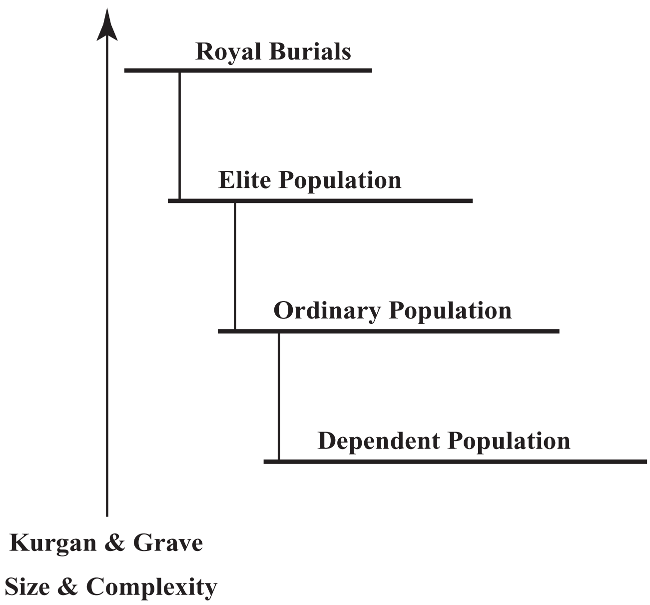


Figure 3.3 *Conventional hierarchical model of Iron Age nomadic society in the first millennium BC.*

jewellery, vessels, and animal bones" (1996, 267). The final category relates to the burials of the *Dependent Population*, and it is argued that it is representative of people with little or no property or status. Burials assigned to this category often contain skeletal remains exhibiting evidence of violent death and/or unusual burial deposition (Koryakova 1996, 267).

Certainly, one can argue that these four categories provide too rigid a framework for the interpretation of mortuary evidence, particularly in consideration of the discussion above regarding critiques of the New Archaeology approaches to burial variability. However, it would be wrong to assume that there is no correlation between size, complexity and richness of mortuary remains and vertical differentiation within societies, as recent cross-cultural approaches have shown (Carr 1995). Nevertheless, postprocessual critiques have stimulated a new direction of theoretical enquiry regarding interpretations of mortuary behaviours and structured ritual practice, of which only a few were outlined above. Two particular areas that have been highlighted by such recent trends in scholarship are the concepts of ideology and social power, particularly as they are situated among the living members of a society and how death and burial may embody the dynamic interplay between these two social structures. As Shanks and Tilley have noted: "…space and time form a medium for the networking of power and ideology in relation to competing interests and social strategies of individuals and groups. Power, ideology, contradiction, conflict, space and time can only be understood relationally" (Shanks and Tilley 1987, 179).

Through the discussion thus far within the thesis, it would appear that a more sophisticated investigation of ideology, and its relationship to the social power of individuals and the collective power achieved through various social institutions (e.g. sodalities, warrior societies, etc.), would be in a position to stimulate new ways of thinking about the Early Iron Age period and the hypothesised rise of warrior nomadic societies. It is surprising then, especially in light of the increased significance attached to these issues by many scholars, that Kristiansen has recently refuted such a position concerning pastoral societies. As he notes, "although pastoralism can adopt a wide range of forms from rather egalitarian to highly stratified societies, there are a number of common trains, recently summarised by Goldschmidt (1979)…to this we may add the extremely conservative nature of pastoral ideology and behaviour, making generalisation possible in time and space, despite variations in both ecology and social complexity" (Kristiansen, 1998, 187). This statement encapsulates what I consider to be a historically static view of pastoral nomadic social organisation and complexity, and one which clearly has negatively affected conventional interpretations.

Thus far within the thesis I have attempted to provide a broad outline of some of the main approaches to the rise of pastoral nomadism and the development of warrior societies in the Early Eurasian Iron Age period. In my opinion, new approaches to the study of these historical developments must be constructed in an attempt to approach the level of complexity and dynamism which I feel are clearly associated with them and which I have striven to illuminate certain aspects of thus far within the thesis. With these important considerations in mind, I would like to begin a discussion of some of the particularly intriguing mortuary sites associated with the Early Iron Age in the eastern steppe region and to approach some vital points regarding elements of animal symbolism associated with them.

As was discussed in the previous chapter, one of the most problematic issues confronting the Early Eurasian Iron Age is the concept of the *Scythian-Triad* form of burial. Many scholars have interpreted this pattern as direct evidence of population migrations of specific ethno-cultural groups (e.g. Scythians) while others have stressed that it relates to specific 'horizons' of social and technological development, often related to rigid Marxist theories of economic-cultural development discussed at the beginning of this chapter. In contrast to this, through the following sections below, I wish to provide four archaeological case studies which investigate the variability associated with this phenomenon as it relates to the use of animals within mortuary ritual practices as well as through other important symbolic manifestations. Through the following discussion, it will be argued that animals acted as a significant component within the construction of what may be broadly termed a 'warrior ethos', as well as acting as a highly active and symbolic media for the active negotiation of social prestige and display in societies and through social institutions that cross-cut more formalised ethno-cultural boundaries[1]. As I will be covering a great deal of archaeological material through my discussion of these examples, it will not be possible to provide a full discussion of each of the case studies. Instead, I will provide a more detailed interpretation at the end of the chapter, wherein I draw on various elements of the four case studies to suggest a new approach to understanding the dynamism associated with Early Iron Age developments and how they relate to new patterns of animal symbolism and structures of social power, organisation and identity.

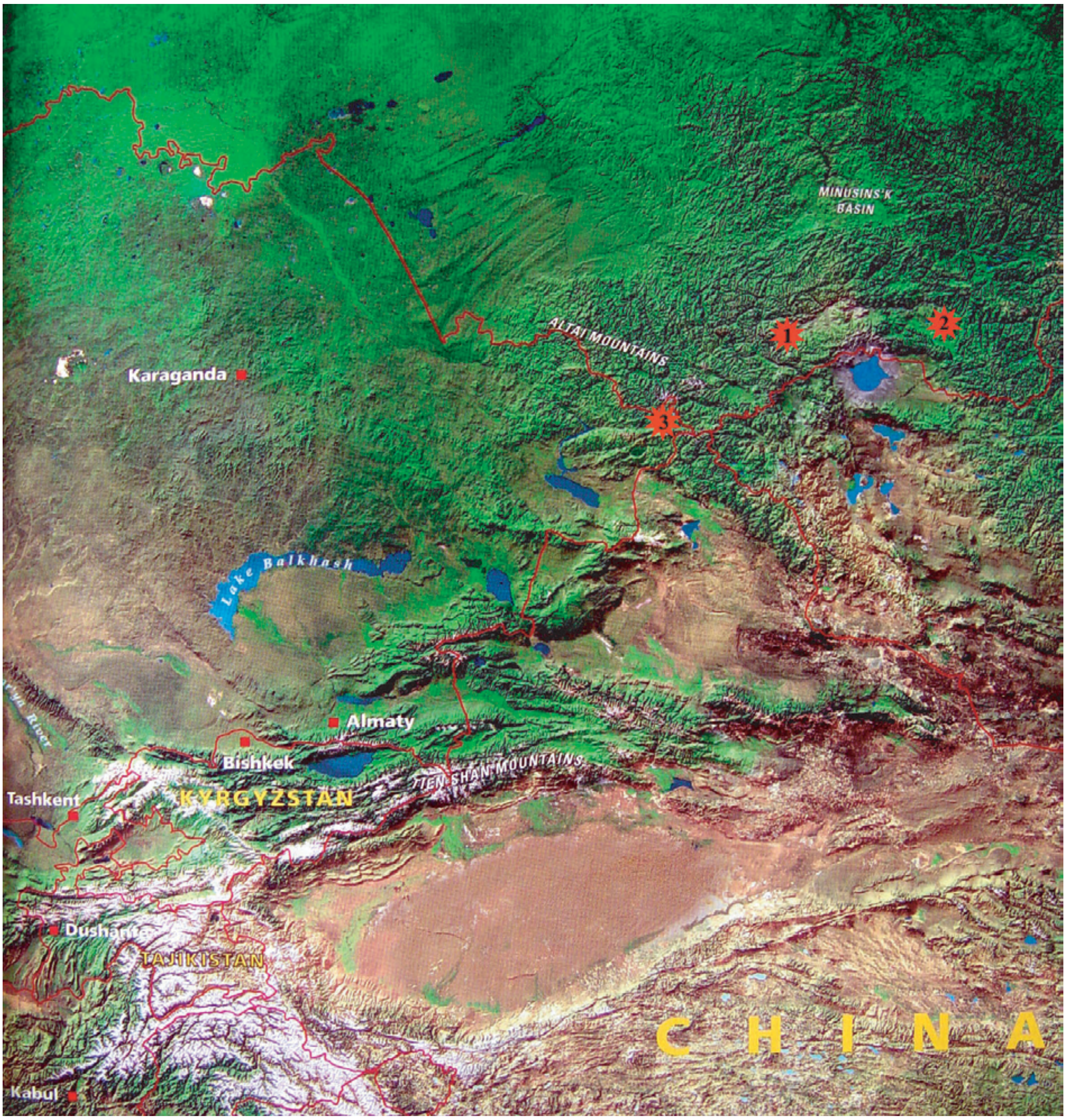
3.5.1 The Arzhan Kurgan Complex

One of the most important Early Iron Age mortuary sites east of the Ural Mountains is the famous site of Arzhan, located in the Uyukskaya highland depression in Tuva (Map. 3.3-2), which was excavated by M.P. Gryaznov and M.Ch. Mannai-ool from 1971-74. The physical structure of this immense and unique kurgan was comprised of a lower complex wooden structure of seventy burial chambers each defined by massive larch logs (Figs. 3.4, 3.5 & 3.6). Several passageways had been constructed to allow for movement between the wooden cells. This wooden complex was then covered over with roof timbers and an immense cylindrical covering of stones was added, in addition to the construction of a 2.5 metre high stone wall around the outer periphery of the structure. In all, the grand tomb measured 120 metres in diameter, 4 metres in height, and

[1] Davis-Kimball (1997; 1998) has argued for the significant status of females during this period and has theorised that a status of 'warrior-priestess' existed among Early Iron Age nomads. However, I have disagreed with these arguments based on Davis-Kimball's analysis of grave goods and the lack of positive supporting osteological evidence (Hanks 2000).

encompassed a total area of approximately 5000 m². The size of the individual burial chambers varied from 15 to 150 m² and some reached a height of nearly 3 metres. In the centre of the construction were located two smaller cells (Fig. 3.7-A), which unfortunately had been heavily looted in antiquity. Positioned within these cells were the log coffins that held the corpses of the interred presumed elite couple (Bokovenko 1995a, 267; Gryaznov 1980).

Accompanying the two central coffins, seven other individuals (interpreted as 'servants') were placed with the addition of six horses with full riding gear. In the surrounding chambers of the complex, seven other human corpses (also interpreted as servants) were deposited. However, one



Map 3.3 *Satellite image of the eastern steppe region detailing the locations of the early Iron Age burial sites in the Altai Mountains: 1 - Pazyryk; 2 - Arzhan; 3 - Berel (map adapted from Reeder 1999, 21).*

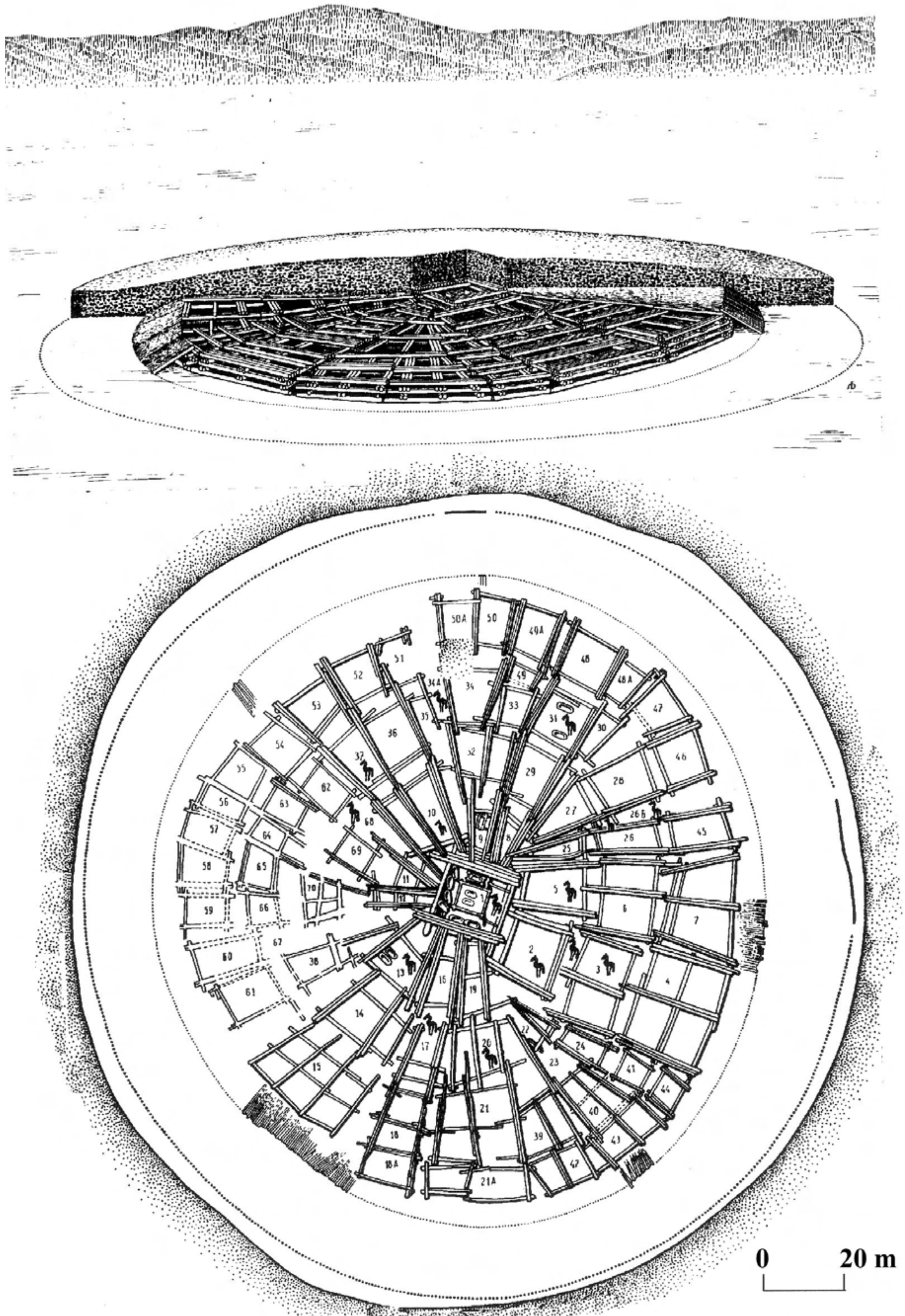


Figure 3.4 *Isometric and plan view of the Arzhan kurgan - small horse symbols represent specific concentrations of sacrificed horses (Bokovenko 1995a, 266).*

Figure 3.5 *View of Chamber 31 at Arzhan (Bokovenko 1996, 103).*

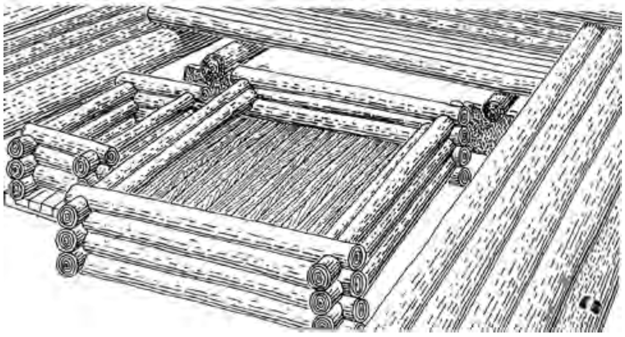


Figure 3.6 *Reconstructed view of the chambers within the Arzhan kurgan (Bokovenko 1995a, 268).*

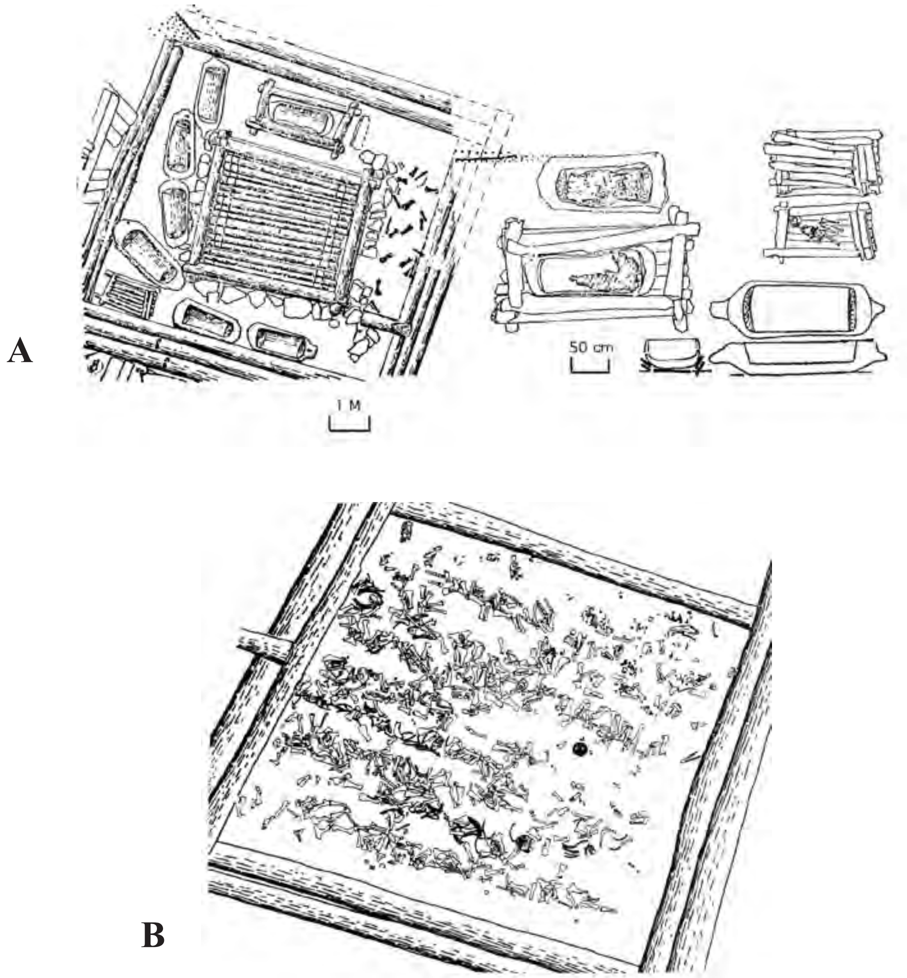


Figure 3.7 *Examples of burial chambers at Arzhan: A - central burial and types of log coffins; B - heavy concentration of horse bone remains in one of the log cells (Bokovenko 1995a, 268-269).*

of the most intriguing features of the kurgan was the deposition of approximately 160-harnessed horses in mixed concentration within various cells of the complex (Fig. 3.7-B). The bronze bits, bridles, harness trappings, and other associated riding accoutrements associated with the sacrificed horses represented marked variability in both form and style (Fig. 3.8). Some of the burial complexes contained twelve variations of bridle cheek pieces as well as the bronze snaffle type bits (Fig. 3.9) (Bokovenko 1995a, 269). In all, 24 unique styles of horse bridle sets were recovered during the excavation with many of the trappings representing some of the earliest Animal Style art found within the steppe region.

Although there has been persistent debate over the absolute date of the Arzhan site, recent data suggests that an early date of the 8^{th} to 10^{th} centuries BC is probable (Hall 1997: 867; Mallory et al 2000). This will be discussed in more detail below, in conjunction with the Pazyryk tombs, where recent attempts to provide a more systematic approach to both ^{14}C and dendrochronological links between the two mortuary sites have been undertaken.

Earlier attempts at dendrochronological analyses of the Arzhan complex revealed that the large larch timbers used in the construction of the kurgan site were all cut at approximately the same time. Taking this into consideration with the structural evidence it would appear that the kurgan complex itself was constructed in a single phase. Interestingly, the proposed early date for the kurgan also reflects the inclusion of artefacts that exhibit some of the earliest forms of Animal Style art (also known as 'Scytho-Siberian' animal style) in the steppe region, such as the expressive 'curled-feline' form (Fig. 3.10). Additionally, a fragment from one of the intriguing anthropomorphic deer stones (*Olenniye Kamni*) was also uncovered within the top stratum of the barrow structure and revealed the patterns of a belt with a dagger, whetstone, and bow attached, as well as a row of deer on their tip-toes (considered as an early stage of Animal Style art – Gryaznov 1984a) and a row of wild boars below them (Fig. 3.11). These finds have important implications on debates concerning the earliest appearance and development of this widespread artistic motif within Eurasia, as it appears to predate analogous artefacts recovered from the well-known Scythian royal burials of the North Black Sea area.

It should also be noted that a substantial amount of other evidence from within the site, as well as around the periphery of the kurgan structure, revealed high concentrations of faunal remains and pottery sherds, suggesting wide-scale feasting and cult practices associated with the construction and post-construction activities of the complex. An area just outside the surrounding stone wall contained approximately 300 separate stone enclosures, each 2-3 metres in diameter, which contained numerous animal bone remains (predominantly head and metapodial elements – suggestive of animal skins attached to the head and hooves) representing sheep and goats, cattle and horses (Rolle 1989, 43). These remains clearly speak to the continuing significance of the site for ritual activities after its construction.

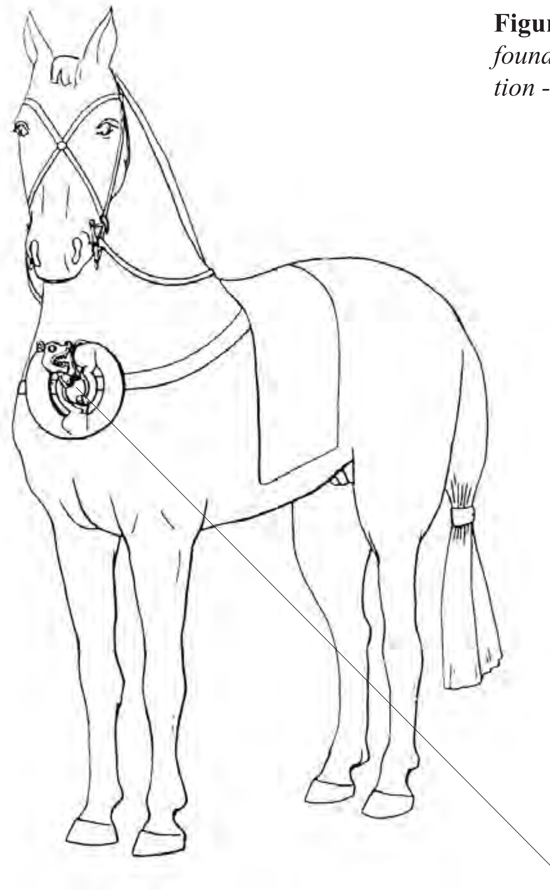
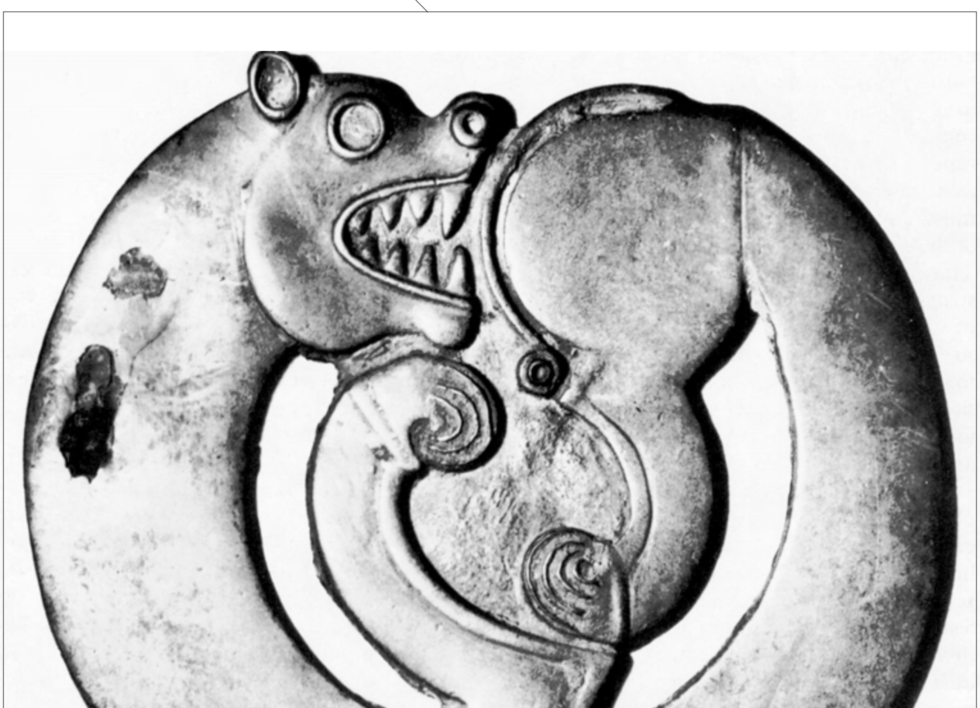


Figure 3.8 *Illustrations detailing the bronze feline breast plate found at Arzhan in Chamber 2 (25 cm in diameter) (horse illustration - Bokovenko 1996, 108; large plaque image - Rolle 1989, 42).*



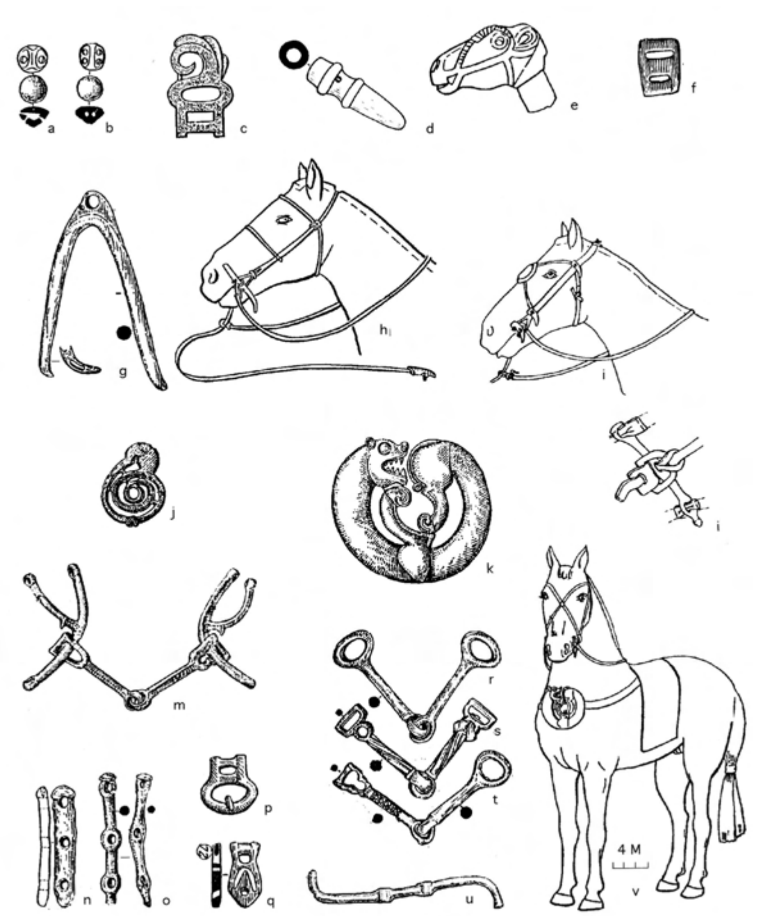


Figure 3.9 *Horse harness equipment from Arzhan (Bokovenko 1995a, 270).*

Figure 3.10 *Various examples of Eurasian curled-feline motifs (Bokovenko 1996, 113).*

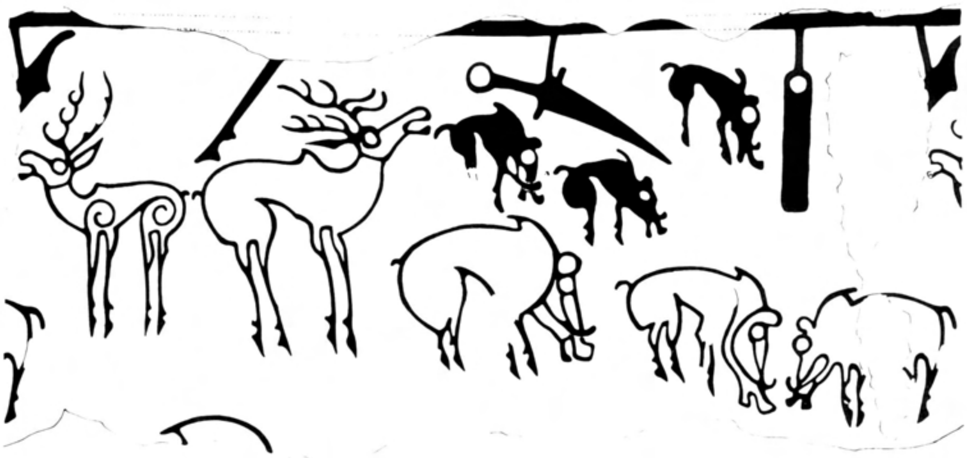


Figure 3.11 *Images from Arzhan 'Stag Stone' with weapon and animal motifs (Rolle 1989, 44).*

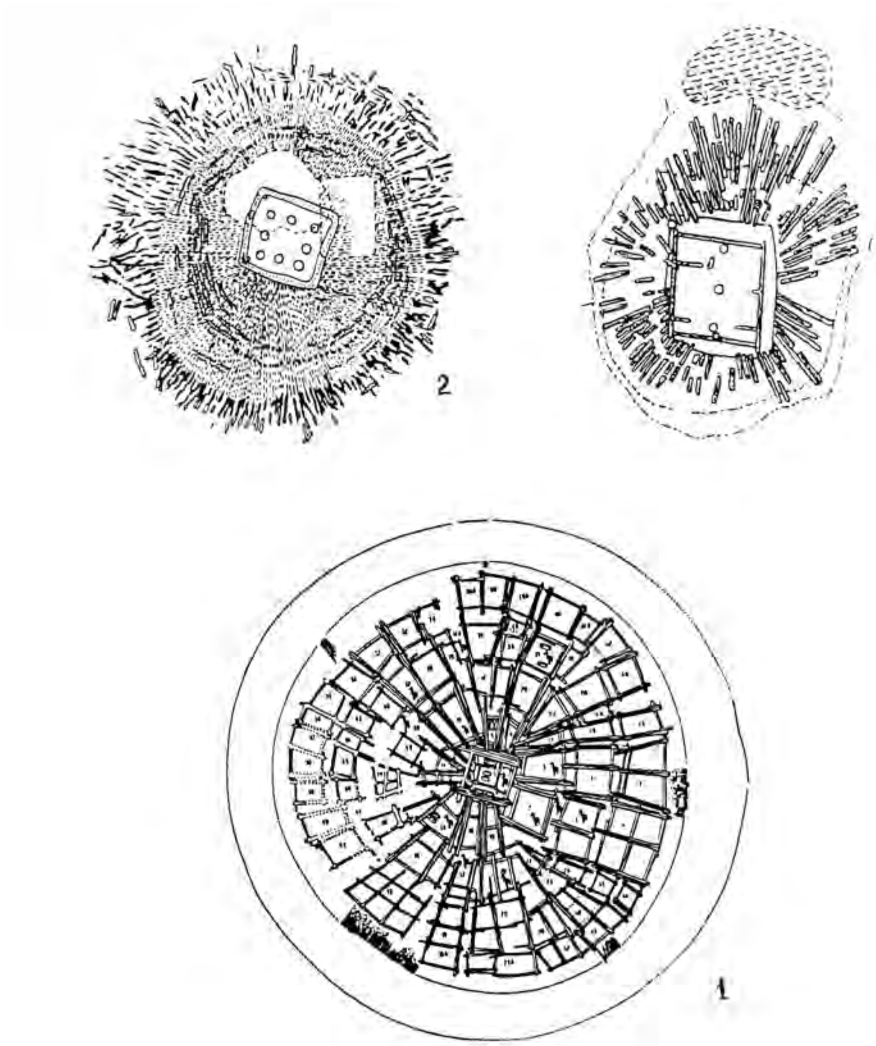


Figure 3.12 *'Tent shaped' kurgan constructions: 1 - Flyarovka (N. Black Sea Coast); 2 - Durovka (N. Black Sea Coast); 3 - Arzhan (Tuva, Altai region) (Bokovenko 1996,109).*

Interestingly, there has been a long historical significance attached to Arzhan and annual festivities by local populations have been carried out at the site for centuries. Tradition holds that since the earliest of times a freshwater spring has flowed from near the centre of Arzhan and local people have come together regularly to engage in organised festivities, competitions (e.g. horse races), and feasting (Rolle 1989, 39).

The sheer size and complexity of the Arzhan complex, as well as the richly elaborate and symbolic nature of the sacrifice and interment of both humans and animals, reflects an enormous expenditure of both energy and materials and clearly speaks to the development of strong patterns of ideology and the materialisation of wide-ranging social power. Typological comparisons of the material cultural remains from the site have led some scholars to suggest the burials in the northern zone of the complex represent materials from the region of eastern Kazakhstan, the Altai Mountains, and the Minusinsk Basin. Artefacts from the southern zone of the construction are indicative of the region of Tuva and Mongolia. Unfortunately, no recent publications have been produced regarding this site and there has never been a full publication concerning the analysis of the horse remains. Sadly, there is some indication that the horse bone materials may not have been preserved and have therefore been lost to future scholarship and further scientific analysis.

In terms of elaboration and overall construction characteristics, no other barrow site in the eastern steppe is comparable in scale. However, recently, another barrow in the Arzhan style (radial wooden construction covered with stones) was found near the original site of Arzhan. During the summer of 2001 this new barrow (now named Arzhan II) was excavated and has revealed a wealth of materials, including the remains of 14 sacrificed horses and numerous gold and bronze artefacts (Chugunov et al. 2002). Although constructed on a much smaller scale than the original Arzhan site (and suggestive of a later date), its significance will hopefully add important new information relating to these types of sites and their importance within the historical trajectory of the region and changing patterns of mortuary practices.

Bokovenko has recently stressed the importance of Arzhan because of its size and complexity (as well as its Early Iron Age date) and has also noted some important details regarding construction elements, which he labels as "tent-shaped" kurgan complexes (Bokovenko 1996, 114). As a result of these characteristics, he draws parallels with other large barrow constructions in the North Black Sea area (Fig 3.12) as well as with the Middle-Late Bronze Age chariot burials in the Southern Ural steppe region, which have also yielded rich evidence regarding animal sacrifice and complex burial tomb construction. With these important points in mind, it may be postulated that the Arzhan site represents an important transitional phase of mortuary development between the Late Bronze and the Early Iron

Age periods when the appearance of horse-riding and specific sets of warrior grave goods displaced earlier conventions associated with Bronze Age chariot technology and ritual contexts (e.g. Sintashta-Petrovka chariot burials – Fig. 3.13).

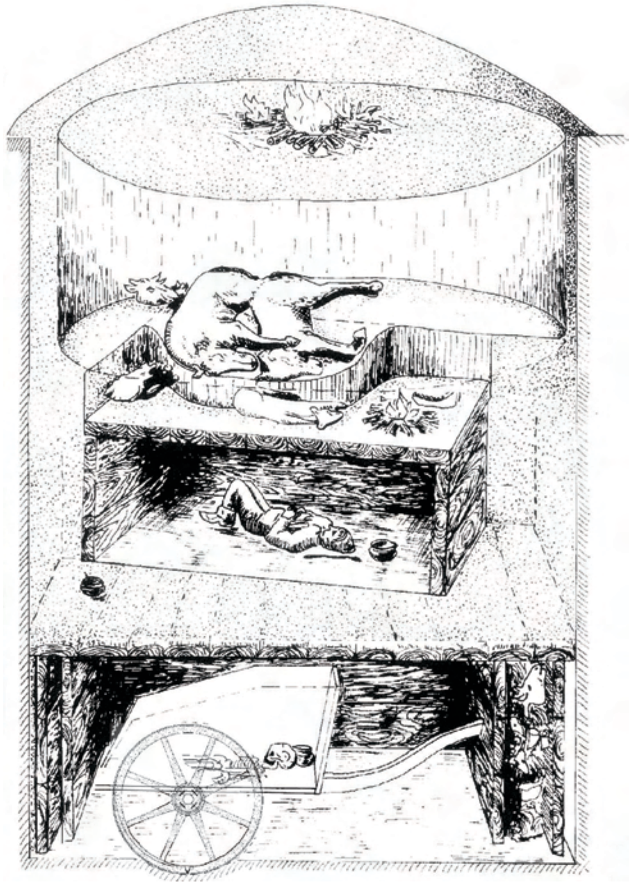


Figure 3.13 *Reconstruction of Burials # 10 & # 16 at the Sintashta CM Cemetery complex. Illustration details characteristcs associated with multi-level burials of the Bronze Age Sintashta-Petrovka type (after Gening et al. 1992, 154).*

Regarding the Early Iron Age phase (11^{th} – 7^{th} c. BC) of burials in the area of present day Kazakhstan and the Sayan-Altai Mountains region, Bokovenko has noted five distinct patterns of 'warrior-burials':

1) Burials of a warrior and a fully equipped horse on the ancient daylight surface in log-huts or shallow graves (e.g. Kurtu II, Cherni Anuim Ust' Kuyum, Koksu-su – the Altai Region; Arzhan and Badanka IV – the Sayan range).

2) Burials of a warrior and horse-harness on the ancient daylight surface (Ujgarak and Tagisken in Kazakhstan).

3) Burials of a warrior in a ground pit and of horse-harness on the ancient daylight surface (Aldy-Bel' I, Hemchik-bom III, Ortaa_Hem, Badanka IV – in Tuva and the Sayan region; Kotanemel I and Izmailovka in Kazakhstan).

4) Burials of a warrior, a horse hide and harness in the same ground pit (Tasmola I, V, VI in Kazakhstan).

5) Burials of a warrior and horse-harness in the same ground pit (Blizhnie Elbani XIV, Solnechnaya, Grishkin Log, Surtaika – in the Sayan-Altai region; also similar to the Tagisken and Uigarak complexes in Kazakhstan).

(Bokovenko 1996, 102)

As Bokovenko notes, there are no Late Bronze Age burials of a similar or transitional type relating to the Early Iron Age Arzhan complex in South Siberia (ibid). Hence, many authors have proposed either a Mongolian or Kazakhstanian origin (i.e relating to geographical area) for the people interred within the Arzhan kurgan and may therefore represent a link with the Early Saka culture developments noted for the eastern steppe region (Savinov 1994; Bokovenko 1996; Kyzlasov 1977). However, this topic is still being hotly debated among scholars. Perhaps new evidence from current excavations within the region will help to shed new light on the matter, especially as the Mongolian region has been investigated too superficially at this stage (Bokovenko 1996, 106).

Through my brief discussion of the Arzhan site, several important issues have been touched upon: (i) the early date of the site, representative of the transition between the Late Bronze Age and Early Iron Age periods, (ii) the significant number of horse remains recovered as well as the technological and typological variability associated with the accompanying horse riding gear, which has been suggested originate from different regions of the eastern steppe, (iii) evidence for very early forms of Animal Style art forms, which predate the later use of the style in the North Pontic steppe region by approximately 300-400 years. There are many important issues relating to each of these points and I will return to them in more detail at the end of the chapter where I discuss the relevance of each of the cased studies in regards to the larger theoretical themes I have outlined above.

At this point, I would like to turn to a discussion of the well known Pazyryk frozen tombs of the Altai region, where the recovery of over a thousand organic artefact remains decorated in the Animal Style art pattern has provided a new dimension to our understanding of the true complexity associated with animal symbolism among Early Iron Age societies in the eastern steppe region, as well as added a host of important new questions for future research.

3.5.2 The Pazyryk Frozen Tombs

The eponymous Pazyryk frozen barrows, situated in the Altai Mountains (Map 3.3-1), represent a total of 25 stone cairns dating from the 3rd to 4th c. BC (Pazyryk 2: 301-382 cal. BC to Pazyryk 5: 252-235 cal. BC), based on recent re-dating and calibration of the Pazyryk tomb timbers (Mallory et al. 2000) (Fig. 3.14). Six of the barrows have yielded a wealth of organic materials from unique frozen

Figure 3.14 *Photo of the stone cairn covering one of the Pazyryk frozen tombs (Wilson & Piotrovsky 1978, 22).*

contexts (Fig. 3.15). This rather strange occurrence was the result of a combination of the natural permafrost conditions in the region and the fact that ancient looters had dug down into the mortuary complexes to extract the precious items deposited within the wooden burial chambers. The residual tunnels left from these intrusive activities provided the means for moisture to accumulate in the burial chambers, whereby the stone covering provided the necessary air circulation to preserve the formation of ice below the surface of the ground. As a result, perfect conditions were created for organic preservation.

Gryaznov excavated the first Pazyryk tomb in 1929, followed by Rudenko's excavations of 5 more tombs between 1947 and 1949 (Fig.3.16). These burials have become renowned for both the incredible preservation of the human corpses (and horse carcasses) as well as the vast array of material objects included within the burials, which reflect a widespread distribution of artistic and material influence (Map 3.4).

Unfortunately, it will not be possible within the space here to discuss the many interesting aspects of the Pazyryk tombs, therefore, I will concentrate primarily on presenting a discussion of the animal symbolism represented by the mortuary sites through artistic motifs and the characteristics associated with the sacrificed horses and their patterns of deposition within the tombs. These particular elements of the Pazyryk mortuary patterns will be most relevant to my discussions within this chapter. Nevertheless, it will be helpful to provide a general outline of the six barrows and their contents for comparison (Table 3.2).

One of the most striking characteristics of the material artefacts recovered from the tombs was the high degree of stylisation associated with the so-called *Animal Style* art pattern (term first coined by M. Rostovtzeff in 1922), also known as the Scytho-Siberian style. The recovered Pazyryk materials displayed an amazing variety of zoomorphic representation, with a particularly common pattern being compositions of the 'predator-prey' type, a recurrent motif within the Eurasian Animal Style art pattern.

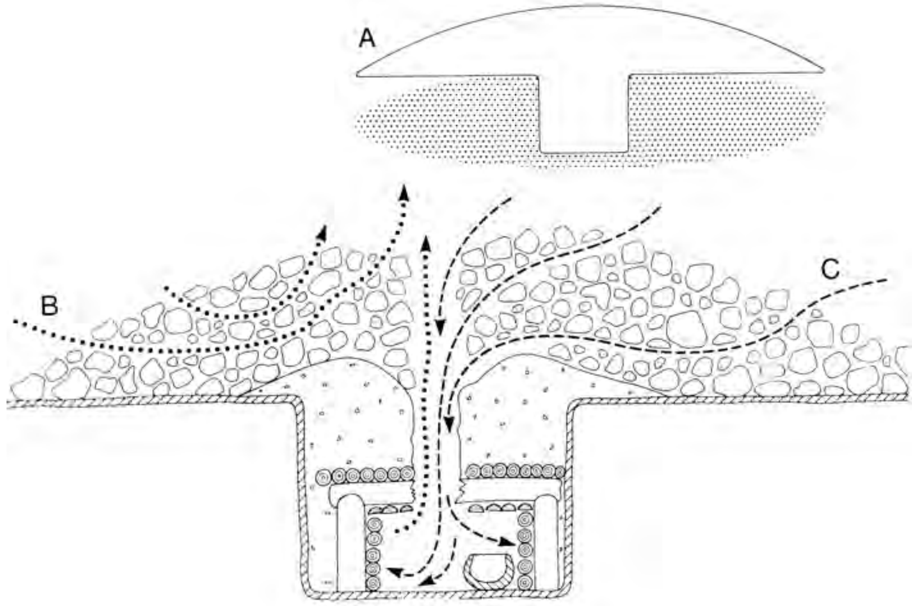
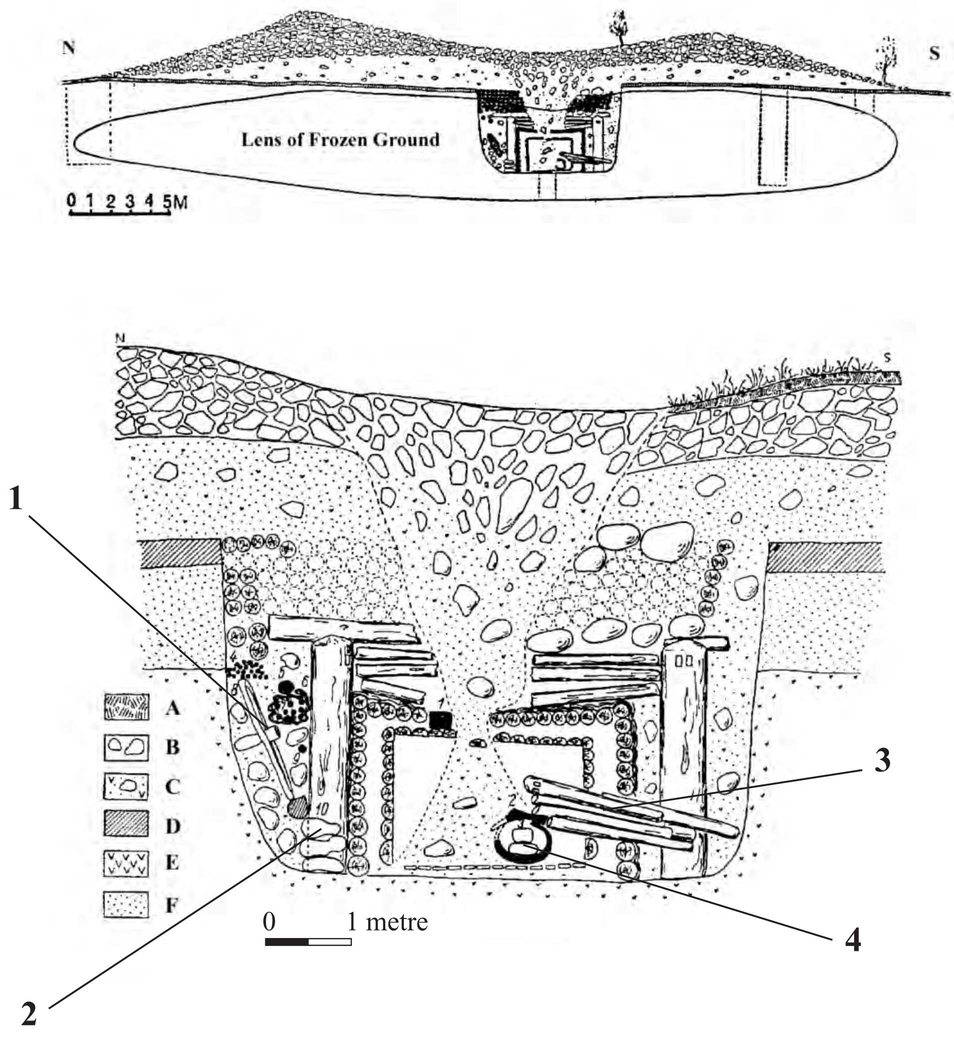
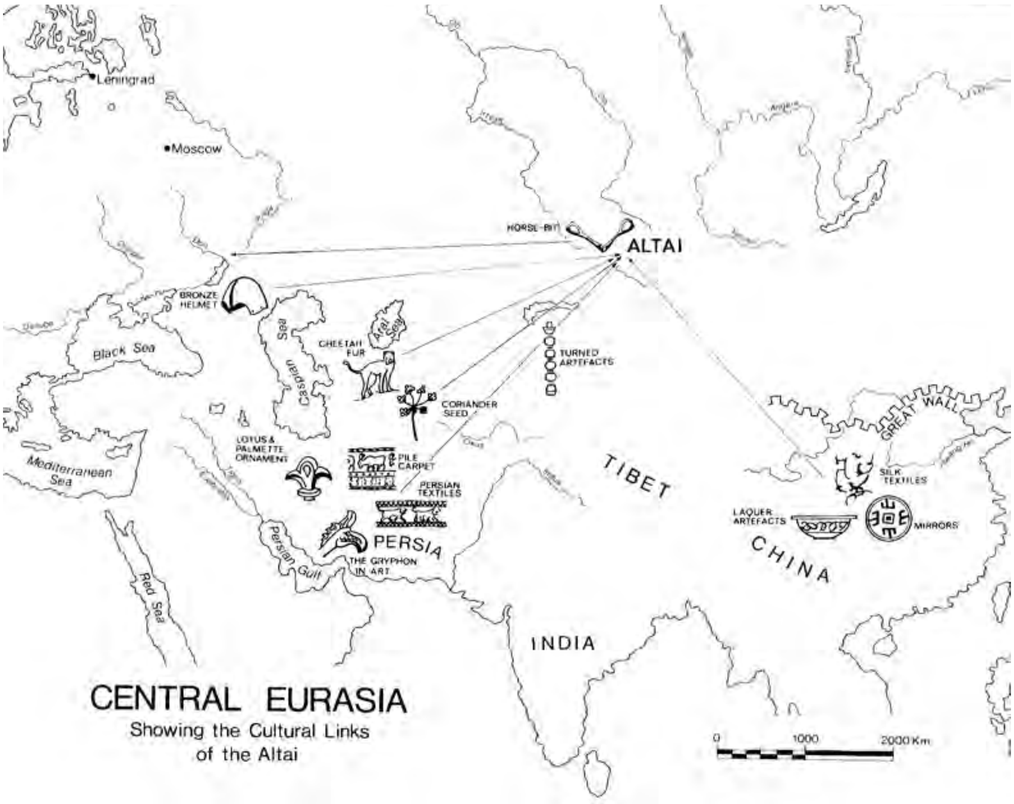


Figure 3.15 *Illustration of a typical frozen Altai tomb: A - formation of permafrost beneath the stone mound; B - warm air rises and is cooled by the stones and moisture is deposited; C - The cold air sinks and drives out the warm air creating a frozen effect (Wilson & Piotrovsky 1978, 23).*

Figure 3.16 *Section of Pazyryk Barrow 5 detailing wooden tomb and its contents: A - soil; B - cairn; C - disturbed ground; D - buried surface; E - natural clay; F - natural sand; 1 - carriage wheel; 2 - area where sacrificed horses were deposited; 3 - wooden logs wedged over log coffin; 4 - log coffin (Rudenko 1970, 20).*





Map 3.4 *Map illustrating Early Iron Age (Pazyryk period) material culture links between the Altai region, greater Eurasia and China (Wilson & Piotrovsky 1978, 12).*

Tomb No.	Excavator	Date Excavated	Size	Human Corpses	Horse Carcasses	Specific Details
Pazyryk 1	Gryaznov	1929	47 m diameter/ 2.2 m height	main burial destroyed	10 - with bridles and saddles	none
Pazyryk 2	Rudenko	1947-48	36 m diameter/ 3.75 m height	man and woman mummified	7 - with bridles and saddles	male with tattoos & artificial beard, hemp smoking apparatus, carved figures, primitive lyre
Pazyryk 3	Rudenko	1948	36 m diameter/ 2.6 m height	male skeleton	14 - bridles, saddles and other ornaments	textiles including silks
Pazyryk 4	Rudenko	1948	24 m diameter/ 1.5 m height	male and female skeletons	14 - bridles and saddles	none
Pazyryk 5	Rudenko	1949	42 m diameter/ 3.75 m height	male and female mummified	9 - bridles and saddles	four-wheeled wagon, large felt carpet and large pile carpet
Pazyryk 6	Rudenko	1949	15 m diameter/ .7 m height	skeletons of woman (?) and girl	3 - various carcass remains	chinese mirror, plates of red lacquer

Table 3.2 *Chart illustrating main characteristics of the Pazyryk barrows.*

Figure 3.17 *Saddle cover from Pazyryk Barrow 1- constructed of felt, leather, fur and hair (Wilson & Piotrovsky 1978,37).*

Figure 3.18 *Leather cut-out of a Tiger savaging an elk from Pazyryk Barrow 1 (Wilson & Piotrovsky 1978, 56).*

Fine examples of this can be seen in Figs. 3.17 & 3.18, which show a saddle cover of applied felt design with an image of an eagle-griffin attacking a mountain goat and a leather felt cut-out of a lion attacking an elk, both from the Pazyryk Barrow 1.

The general characteristics of this artistic expression draw upon the main motifs of the stag, feline forms, birds, the juxtaposition of planes (such as the 180 degree twisting of the body) and the various mixing or compartmentalisation of the body parts of the animal or creature (Reeder 1999, 45). The general patterns of this artist style were widespread throughout the Eurasian steppe region during the first millennium BC and much of the original inspiration for its development can be attributed to Central Asia (particularly the Achaemenid Empire), the Near East, and Mesopotamia – where analogous motifs such as griffins, lions, and other carnivores attacking herbivores (particularly ungulates) were commonly shown through iconographic representation (Rudenko 1970, 265-266; Brentjes 2000).

Over the past several decades, many interpretations have been forwarded relating to the cultural connections, the movement and adaptation of artistic styles, and the symbolic significance of the Animal Style art pattern (e.g. Jacobson 1983, 1993; Jettmar 1967). Often, in the case of the problematic 'Scythian Triad' term, they have been used to infer the movement or migration of certain populations across the steppe region. However, many scholars have argued against this interpretation and instead have emphasised the strong variation and regional characteristics of the patterns (Yablonsky 2000; forthcoming; Bashilov 1994).

There are of course many important issues relating to the development and spread of Animal Style art, however, it would be impossible to delve too deeply into a review of the various hypotheses and arguments surrounding this body of literature within this chapter. Indeed, this particular topic is worthy of a thesis on its own! Suffice it to say, there is general agreement among scholars that the Pazyryk Animal Style art patterns reflect external influence regarding the basic motifs and compositions, however, there is clearly artistic development and particular characteristics of the art that reflect local style and content innovation. In fact, Gryaznov (1984a) hypothesised that there was a possible connection between the so-called 'stag stones' (as mentioned above regarding the Arzhan site) and the early development of Animal Style art. He suggested that these types of large artistic designs first developed by being applied to either tree trunks or large wooden posts, which stimulated the 'wrap around' effect (Fig. 3.19: 3, 6, 9). Later developments related to the application of such artistic elements on large stone slabs ('stag stones'), which were placed on or near tomb constructions.

Another intriguing theory, also first posited by Gryaznov (1984b), was that these wooden or stone standing monuments provided an embodiment of warriors, and that the animal designs depicted on them could relate to either body paint or tattoos associated with Iron Age warriors, such as those

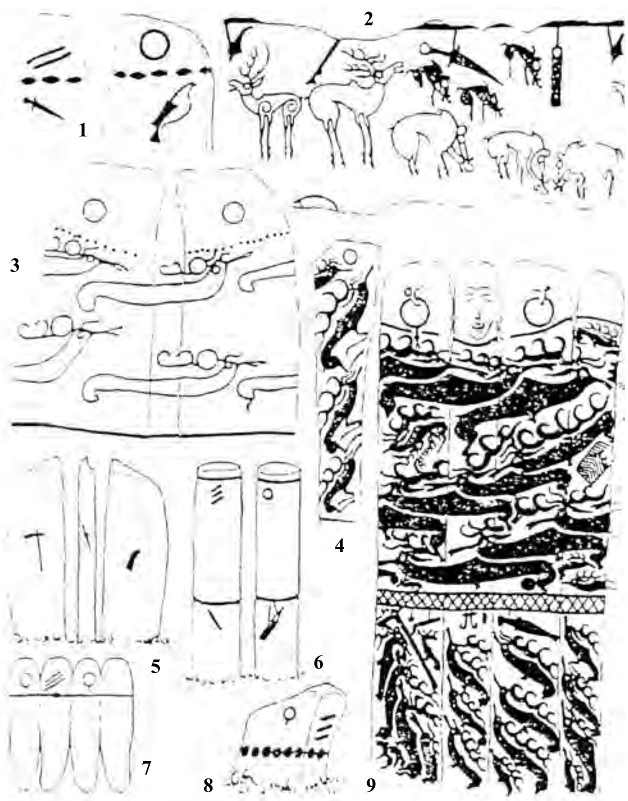


Figure 3.19 *Examples of 'stag stones' from Mongolia and the Altai Mountain region. The 'wrapping around' effect is most clearly illustrated in the stones 3, 6, and 9 (after Jettmar 1994, 9).*

found on the male corpse from the Pazyryk 2 tomb. Jettmar (1994) has expanded on this hypothesis and noted that the 'stag stone' representations often reveal distinct registers or anatomical zones where there are indications of necklaces or pendants, earrings, and/or lines separating the upper 'head area' from the lower part of the stone. In addition, there is often a belt drawn near the 'torso area' with several tools hanging from it, such as daggers, whetstones, and the famous *gorythos* ('Scythian' bow-quiver combination). The applications of Animal Style art patterns are typically concentrated either between the 'neck' and the 'waist' or below the belt line on what may be considered the 'thigh' area (Fig. 3.19: 1,2, 6). Because of the early appearance of the 'stag stones', as noted above with the Arzhan barrow, this stylistic occurrence may have been particularly important regarding regional developments of the Animal Style patterns as well as having a strong connection with the social practice of tattooing, which has a long tradition of use within Central Asia and among many cultures within the greater Siberian region (Rudenko 1970).

Concerning the socially constituted meaning or context of the animal symbolism represented by the Pazyryk tombs, several scholars have favoured the hypothesis of a totemic structure, even going so far as to suggest that the ancient 'tribes' could be divided into two 'fraternities' with each fraternity representing five, seven, or eight specific families each with different symbolic signs (Bokovenko 1995b, 292). Rudenko's own interpretation contrasts sharply with these hypotheses however:

> Although animals depicted on weapons and other utilitarian objects could be totemic, this would only have been the case in the earlier stages of economic and social development among hunting peoples and not among people at the social level of the Altaians. So if this or that animal was depicted on the riding equipment or other articles it can only be regarded as a survival of a long-vanished past and not as expressing the contemporary ideology of the time.
>
> (Rudenko 1970, 288)

Rudenko's comment here clearly reflects the rigid classic Marxist approach to prehistory in terms of an interpretation based on distinct stages of socio-economic development. Although Rudenko's statement can easily be criticised in this context, I do agree within his summation that the distinct variation of Animal Style art patterns used on each of the sacrificed horses (which were in some cases accompanied by rich sets of ornamentation and head gear) does seem to indicate that the artistic representation presented by the Pazyryk materials was more fluid and dynamic in this sense than one which would have been used to project a pure 'totemic' social association with a particular animal motif.

One should also note that there were a variety of motifs represented by the complex zoomorphic tattoo designs on the corpse of the male individual recovered from Pazyryk Barrow 2 (Fig. 3.20). The tattoos depict mythological beings such as stags with eagle heads, winged tigers, figures of mountain goats, a beast of prey with an eagle head, and a large fish design on the lower right leg. Although there appears to be a great deal of variety concerning the application of motifs to both objects as well as the human corpses and the gear associated with the horses, Parker-Pearson has suggested that there are nevertheless certain contexts of application which deserve further scrutiny (1999a, 66). This is particularly the case for where objects, with their respective animal art patterns, were placed within the tomb – either in the inner chamber with the human bodies or in the outer chamber with the horses and their associated gear.

Accordingly, there appears to be an association with the application of the chimera/griffin creatures, and to a lesser extent certain bird motifs, with the human bodies in the inner chamber. Whereas, other motifs, particularly the 'predator-prey' figures of carnivores attacking herbivores, are more commonly associated with the horses and are thus situated in the outer chamber. Parker-Pearson also notes that the 'predator-prey' motif is often applied to the saddles and saddle covers and may have acted as an important symbolic interface between the rider and the horse (1999a, 67).

The presence of the tattoos on the man from Pazyryk Barrow 2 is extremely important, as more recent burials uncovered in the Altai region by Polos'mok (also relating to the Pazyryk period), have also produced preserved bodies with tattooing (Polos'mok 1992; 1994), including the body of a woman. There have been excellent studies on the importance of tattooing among various cultures of the world and certainly it can be seen that the use of tattoos as an apotropaic practice is a common theme among societies with strong elements of violence and warfare (Gell 1993). In this way, the tattooed skin is considered to act as an important protective layer, a 'second skin' if you will, of symbolic armour by which the wearer gains some measure of defence against harm (Gell, 1993, 33-34; 1998; Parker-Pearson 1999a, 65).

Interestingly, the tattoos on the Pazyryk Barrow 2 corpse represent 16 animals, with seven of them being beasts of the chimera/griffin type. There are also lines of dots along the lower spine area of the back and on the right leg, which may have related to some form of medicinal treatment for the

Figure 3.20 *Details of the tatoos from the male from Pazyryk Barrow 2: human with tattoos (Wilson & Piotrovsky 1978, 47); skin from right arm with tattoos (Wilson & Piotrovsky 1978,35); tattoos on right leg (Rolle 1989, 85).*

individual. Investigation of the corpse revealed that the tattoos had been applied when the individual was quite young, as there was no indication of discoloration of the fat layer below the skin, which would have developed as the man matured (Rudenko 1970). It is also highly unlikely that other members of the society would have seen the tattoos openly, as the clothing found with the corpses indicated that they were probably fully clothed when alive (close-fitting shirts, breeches, kaftans, shoes and stockings) (Parker-Pearson 1999a, 65). Therefore, one may suggest that the tattooing of the Pazyryk Barrow 2 man was conducted as part of an age-grade transition or *rite de passage* relating to his possible role as a warrior within the society. Analysis of the corpse showed that the man was in his 60's and had died from being struck in the head twice with an axe-like instrument. He had then been scalped with the skin torn from ear to ear backwards to the neck.

There was also obviously a great deal of ritual complexity associated with the preparation of the Pazyryk corpses, as they had been prepared through embalming, with the removal of the entrails, musculature and brains through trepanation. Long slits were also made along the arms, legs, back, thorax, and across the stomach. These incisions were sewn up with horsehair or sinew thread and in tombs 2 and 5 the women's body cavities had been padded with horsehair and plant material. Other remarkable details associated with Barrow 2, such as the presence of a false beard for the male corpse, the small leather bag with a lock of human hair, and another leather bag containing human fingernail clippings, all speak to the high degree of complex symbolism and social power connected with the human bodies.

In addition to the human bodies at Pazyryk, the sacrificed horses and their associated gear also reflect an amazing diversity of Animal Style art representation and colourful ornamentation (Fig. 3.21). All six of the main Pazyryk tombs contained the remains of sacrificed horses, all of which had been pole-axed in the frontal part of the cranium as part of the sacrificial ritual. As Table 3.2 shows, the sacrifice and deposition of several horses within each of the six tombs was a very important element of the funerary process. Although the preservation varied somewhat for the horse remains, all the horses were buried as full carcasses with associated riding gear and other stylistic and ornamental accoutrements.

Certainly, one of the most intriguing elements concerning the horse gear are the richly designed masks and headdresses, of which there are several types ranging from stylised deer and elk antlers to various combinations of animals. Two headdresses recovered from Barrow 2 provide excellent examples of the complexity of their associated imagery. The first is comprised of an elaborate combination of the head of a deer with a ram's head above and a dove perched on the ram's horns (Fig. 3.22). The second headdress is composed of deer's head clutched within the beak of a griffin (Fig. 3.23). In addition to the masks and headdresses, the harness trappings associated with the horses have also

Figure 3.21 *Reconstruction of the horse trappings and adornments from Pazyryk Barrow 1 - horse # 10 (Rolle 1989, 67).*

been well preserved and exhibit a stunning array of ornamentation and complexity, such as this elaborately stylised bridle decorated in the Animal Style art pattern from Barrow 5 (Fig. 3.24).

Thus far, no one has worked seriously with providing interpretations of the use or symbolism associated with the horse masks and other stylised equipment. Interestingly, Rudenko notes (1970) that many of these items showed evidence of wear and repair, which suggests that the equipment had been used frequently prior to the funerary ceremonies and therefore may have been an important element within various social activities and displays.

Figure 3.22 Horse's headdress topped by a ram with a dove sitting on the ram's horns, recovered from Barrow 2 (Rudenko 1970, 182).

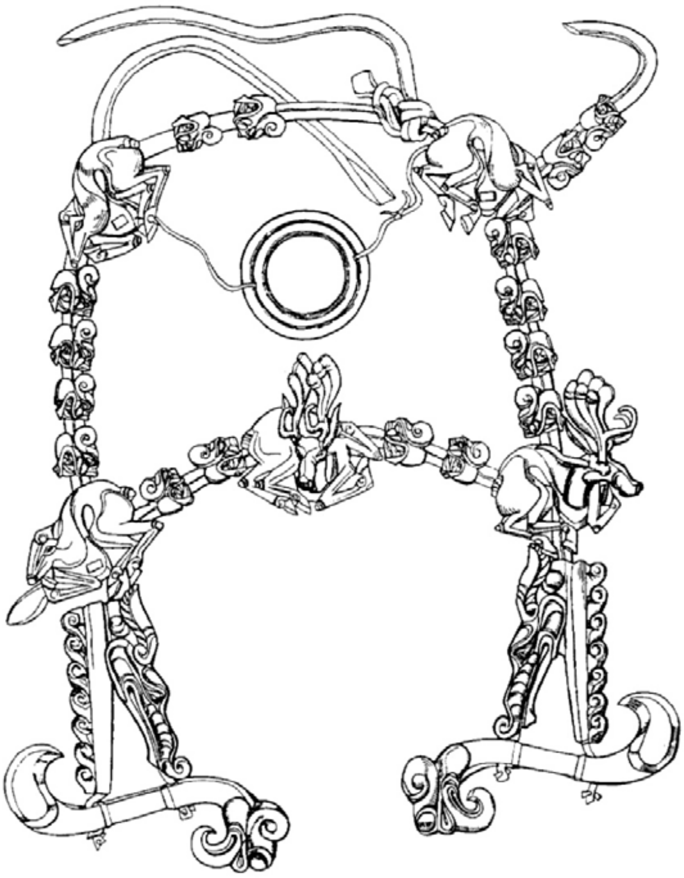


Figure 3.24 *Horse bridle from Pazyryk Barrow 5 (Rudenko 1970,171).*

Figure 3.23 *Headdress made of wood and leather showing a deer's head caught in the beak of a griffin, recovered from Pazyryk Barrow 2 (Wilson & Piotrovsky 1978, 57).*

Although much has been made of the 'predator-prey' motif and metaphors relating to the image of the 'warrior', as it relates to the "blood-thirstiness, remoteness, ferocity or sensitivity, and so on", Rudenko states that these interpretations are not backed up by any firm evidence or ethnographic analogy (Rudenko 1970, 288).

One may argue that Rudenko is correct in his assertion that it is wrong to make too much out of the possible metaphorical relationships, however, I disagree and by contrast follow Gell's interpretation of the vibrant nature of art and its active use across varying social contexts: "In place of symbolic communication, I place all the emphasis on *agency*, *intention*, *causation*, *result*, and *transformation*. I view art as a system of action, intended to change the world rather than encode symbolic propositions about it" (1998, 6 – author's own emphasis). From this perspective, one may envisage art as an expressive means by which to configure and project a meaning that transcends the mere aesthetic appeal of the art itself, thus providing an effective medium of representation for specific messages concerning social actions and intent. When viewed within this context, I disagree with Rudenko's interpretation concerning the metaphorical qualities of the animals represented within the Pazyryk art patterns and suggest that they were in fact being used precisely as a means of explicit communication, which may best be interpreted within the context of warfare or as a pretence to warfare. The horses, seen as both technological as well as social agents, provided a crucial media for the display of power and prestige for their riders and/or the social group. The various motifs, and their composition, would have provided a highly active means by which to project certain characteristic elements relating to the warrior ideology of the period.

Recently, Nielsen (1997) has addressed similar issues relating to the use of Style-II animal art during the Merovingian Period in Europe. In Nielsen's case study, it was determined that the animal art style and its motifs could be understood in relation to the concept of a political badge, representing specific elements of social power or social institutions. The use of the particular art style varied somewhat through time, as it was contingent upon the various transitions and political dynamics that changed through this particular period. Nevertheless, the art style itself was perpetuated and clearly represented an important media for the projection of power and influence.

Returning to the issue of the Pazyryk horses, there has been much discussion over their physical characteristics, and their possible representation of different horse breeds for the Early Iron Age period (Littauer 1971). The Pazyryk horse remains were originally analysed by V. O. Vitt, and in a 1937 article he noted that there was variation in both the size (calculated withers heights) and general morphological characteristics (differentially proportioned) of the horses recovered from Pazyryk Barrow 1 in 1929. This original article created a great deal of discussion about the possibility of the variation in the horses being the result of either trading or raiding, through which the seemingly larger and finer horses could have been obtained. Indeed, this prompted Gryaznov (1969) to suggest that the best of the horses belonged to the famous ancient Central Asiatic breed, which has been speculated were the progenitors of the famous Akhal-Teké breed known in Turkmenistan today. It was assumed that the rest of the horses, being smaller and of less striking confirmation, may have been the result of the crossbreeding of the Central Asian type with the small but strong and hardy local horse stock.

However, these hypotheses were refuted by Littauer, who argued that Vitt's later work with the additional Pazyryk horses, which were recovered from the other barrows, had not been properly acknowledged by scholars (Littauer 1971, 293). Indeed, Vitt retracted his earlier suggestions after working with the larger sample of horses and suggested that the four groups (based on morphological characteristics) of horses that he initially put forth actually graded into each other and that they could not be seen as representing four distinct breeds (Vitt 1952). Indeed, the withers heights of the tallest horses would only register as approximately one inch over the modern pony-class entries of today (Littauer 1971, 293). Littauer has also suggested that the morphological variation among the Pazyryk horses may be more a reflection of early age gelding of the specimens, as this can induce distinct changes (e.g. greater withers height) associated with skeletal bone development, hence, much of the variation between the horses from the Pazyryk tombs may be more representative of phenotypic rather than genotypic traits (Littauer 1971, 294).

According to Rudenko, all of the horses recovered from the six tombs were geldings, which were highly variable in age. In each of the barrows, horses were recovered that varied in age from young specimens, approximately 2-3 years old, to adult aged individuals as well as some very old

Figure 3.25 Ownership marks on the ears of the horses from Barrows 1 & 5 at Pazyryk *(Rudenko 1970, 118).*

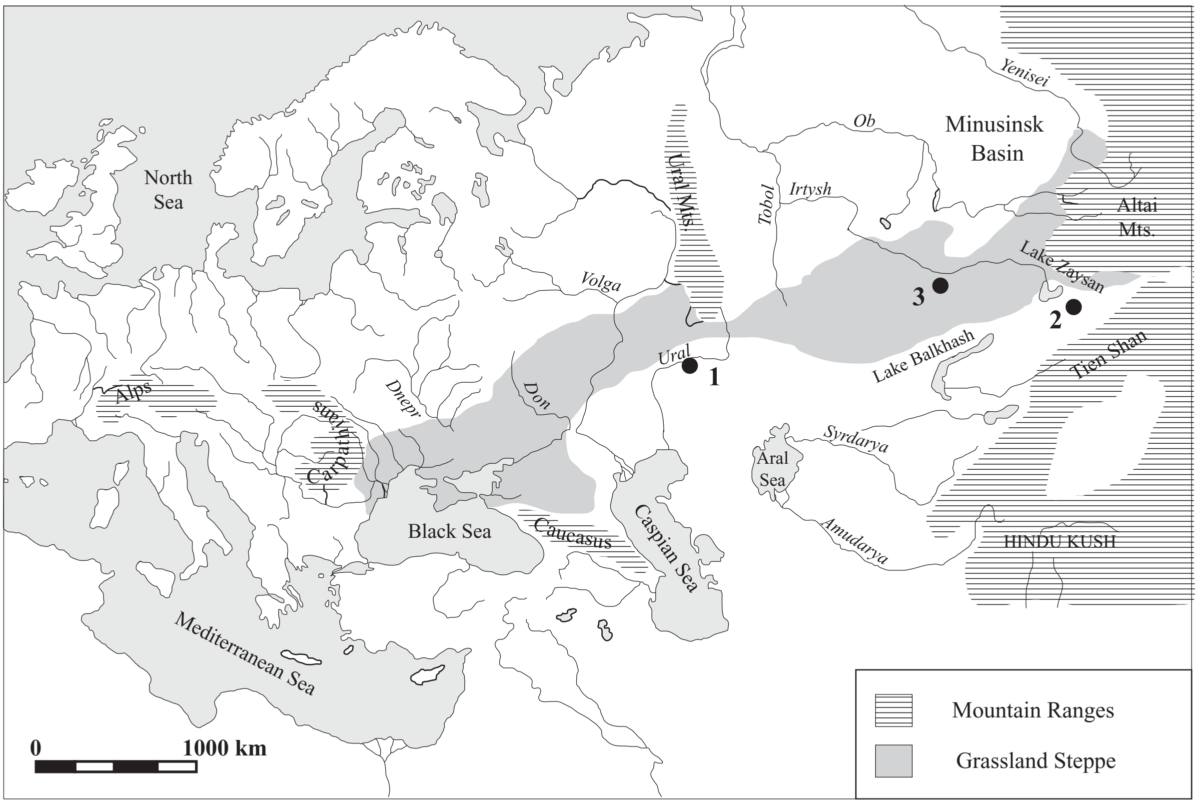
specimens aged from 15-20 years or more (1970, 119). Some of the horses also displayed notched ears, which have been interpreted as ownership identifications (Fig. 3.25). Interestingly, each of the Pazyryk tombs contained horses that bore different markings. Gryaznov (1969) interpreted this as a sign that the various horses were given as gifts to the deceased by different individuals. However, by contrast, Rudenko interpreted these markings as reflecting original signs of ownership, which would represent horses that had been purchased, swapped, or received as gifts during the individual's lifetime. Therefore, in essence, he saw these horses as being the property of the deceased individual(s) and as such were included within the burial for use in the afterlife (1970, 119).

One could seemingly continue forever with interpretations of the materials from the Pazyryk tombs. However, one thing is certainly clear, as I have attempted to emphasise within the discussion above, and that is that the horses recovered from the Pazyryk barrows provide an important insight into the complex relationships which developed between humans and horses within the Iron Age period. In recent years, many discussions have developed over the earliest appearance of horse domestication and the important role that this played in the social, cultural and technological changes associated with the later prehistory of the steppe region. A great deal of this discussion has been focused on the early Eneolithic and Neolithic periods. However, I am of the opinion that too little emphasis has been placed on the distinct changes that occurred regarding the role of the horse within social transitions at the end of the Bronze Age and the beginning of the Iron Age period. The Pazyryk materials, in part because of the fortunate circumstances which provided the preservation of the organic materials, have revealed an extraordinary glimpse into the dynamic role that horses played within larger socio-cultural spheres of interaction and representation regarding social power, prestige and symbolic agency. It is also clear that they provided an important element within deeper structural changes taking place within social ceremony, ritual practice, and changing perceptions of ancient cosmology and religion. Recently, another frozen burial has been excavated near Berel, Kazakhstan (Map 3.3 – 3). The excavation of this site, a joint international project between France and Kazakhstan, has yielded the remains of 14 frozen horse carcasses with associated horse trappings and masks (Samashev et al. 2000). Further analysis and publication of these important findings will hopefully provide new insights into the uses of horses within the Altai region during the Early Iron Age period.

At this point I want to conclude my brief but interesting discussion of the Pazyryk materials and move westward from the Altai region towards an overview of some of the burial patterns associated with the grassland steppe region of present day Kazakhstan and the Southern Ural Mountain region of the Russian Federation. I will return to summarise the Pazyryk materials in my discussion at the end of the chapter, whereby I integrate the importance of the Pazyryk burials within the larger context of the social developments in the Early Iron Age period.

3.6 Early Iron Age Steppe Mortuary Patterns

The Southern Ural Mountain region and the central steppe region of present-day Kazakhstan contain numerous mortuary sites relating to the Early Iron Age cultural developments known as the Sauro-Sarmatian and Saka (Map 3.5). Both of these Early Iron Age developments have been a source of great study and interest but also intense debate. For example, it has been suggested that the development and dispersal of the Sarmatian cultural tradition is reflected across a geographical area of over 3,000 miles and nearly a 1,000-year time span (Sulimirski 1970). Unfortunately, there is not sufficient space here to investigate the many issues relating to both Saka and Sauro-Sarmatian research. However, I feel that it is important to provide a brief overview within the remaining space of this chapter, as there has been a great deal of discussion regarding the interaction between both the Saka and Sarmatian groups in the central steppe region and the northern forest-steppe populations situated within the West Siberian plain and the Trans-Ural Mountain region – areas that I will be talking in great detail about in the following chapters of the thesis.



Map 3.5 *Map illustrating approximate locations of sites discussed in text: 1 - Sauro-Sarmatian cemetery site of Pokrovka in the Southern Ural Mountain region; 2 - the Chilikta cemetery in eastern Kazakhstan; 3 - the Tasmola/Saka cemetery site.*

As scholars have traditionally emphasised the lack of settlement evidence for the Saka and Sauro-Sarmatian groups, instead proclaiming the general nomadic tendencies of these populations (Yablonsky 1995a; 1995b; 1998; Tairov 1993; Koryakova 1996), the following discussion will focus primarily on outlining some of the main mortuary patterns and characteristics associated with the Early Iron Age period within the eastern steppe geographical region. I feel that it will be most useful to provide a brief discussion of the conventional interpretations of the 'cultural genesis' of one of the developments (Sauro-Sarmatians), as this will provide a general context for a later discussion at the end of the chapter regarding problematic interpretations of Early Iron Age burial patterns and the variability associated with them. I feel that the points I wish to make within the remaining space can be concisely addressed through a relevant discussion of the Sauro-Sarmatian research.

Clearly, the 'Saka' development (and its various hypothesised 'tribal' variants, such as the Massagetae) is important in its own right, representing specific archaeological sites discovered in the eastern end of the steppe zone within Central Asia. However, I will not venture into detail over the various hypotheses regarding the appearance of this cultural phenomenon or the heavily contested chronologies relating to its temporal development. Although it is generally held that elements of the Saka development began around the 8th to 10th centuries BC (as discussed above regarding the Arzhan kurgan), the appearance of the 'classic' Saka culture can be set within the middle of the first millennium BC, coinciding with the expansionist period of the Achaemenid Persian state (Yablonksy 1998).

3.6.1 Conventional Sauro-Sarmatian Research

Many interpretations of the Sauro-Sarmatian 'tribes' have been put forward over the past several decades, however, Grakov's early studies concerning the 'ethnogenesis' of these groups produced the two most discussed hypotheses: first, that there was an ethnogenetic tie between Sauromatian and Sarmatian groups, and second that the Sarmatians represented an external group which had arrived from the east through migration (Grakov 1928). In the decades following Grakov's work, acceptance of the cultural continuity tie between Sauromatian and Sarmatian groups was accepted by many scholars and his earlier temporal framework evolved into one of the most widely recognized chronologies:

Sauromatian: 6th - 4th C. BC
Early Sarmatian: 4th - 2nd C. BC
Middle Sarmatian: 2nd C. BC - 2nd C. AD
Late Sarmatian: 2nd - 4th C. AD

(after Moshkova 1995, 92)

Smirnov (1964) continued this line of studies regarding the Sauro-Sarmatian 'ethnogenesis' and suggested that the origin of the early Sauromatians could be traced to two regions: the lower Volga River region and the Southern Ural Mountain area. The importance of Smirnov's work relates to his hypothesis that these two groups could be characterized as descendants of the previous Bronze Age Timber-Grave and Andronovo cultural developments. More recent work regarding this hypothesis has been undertaken by Ochir-Goryayeva through a comparative study of the mortuary evidence from the lower Volga area and the southern Ural steppe region. As a result, she has suggested that there are two distinct archaeological cultures represented within these regions as they relate to the concept of Sauromatian continuity (Ochir-Goryayeva 1988). However, other scholars have been more conservative in their views of this. As Moshkova has noted, "this concept may be correct but not all of the problems are resolved. Unfortunately, the archaeological terminology has not been established nor the criteria developed to attribute the archaeological complexes to the specific cultures or the local variants" (Moshkova 1995, 95). This problematic situation clearly ties in with my discussion in the earlier sections of this chapter, where I detailed some of the issues associated with rigid interpretations of supposed ethno-cultural developments and connections to particular patterns of mortuary practices and/or material culture.

Nevertheless, most Russian scholars are in general agreement that there are two variations associated with the development of the Sauromatian culture: (i) the southern Ural steppe and (ii) the Don-Volga interfluvial zone group (Dvornichenko 1995, 101). This perspective, coupled with Smirnov's hypothesis that the Sauromatian culture was linked with the earlier Bronze Age Andronovo and Timber-Grave cultural developments, produces an image of a transitional phase between the Bronze and Iron Age periods. As noted earlier within this chapter, this transitional period is perceived as being strongly influenced by the large-scale climatic changes that supposedly stimulated the turn from a more sedentary subsistence to the nomadic cattle-breeding way of life. Taken as such, this new mobile lifestyle stimulated increased cultural and economic contact and exchange, as well as proposed conflict for the developing Iron Age nomadic groups (Tairov 1993; Koryakova 1998a, 215).

This brief outline that I have provided sums up many of the conventional hypotheses regarding the appearance of the Sauro-Sarmatian cultural phenomenon in the eastern steppe zone. Nearly all of the evidence associated with these developments can be attributed to the archaeological investigation of mortuary sites typically situated along the high terraces of the larger regional rivers. It should be emphasised, however, that it is precisely through the interpretation of these burial sites that many of the hypotheses regarding the developments of the Sauro-Sarmatian groups have been formulated and discussed among scholars. Therefore, at this point, I would like to move towards a discussion of some of the general mortuary characteristics of the Sauro-Sarmatian type and more specifically to point out some of the particular patterns associated with the use of animals in the so-called 'Scythian Triad' form of burial. By investigating these patterns, and comparing them with some of the main characteristics of both the Arzhan site and the Pazyryk barrows, it will be possible to present a general model regarding the changing mortuary patterns of the Late Bronze Age to Early Iron Age period and more specifically to underscore the important role that animals came to play within new forms of funerary ritual and within larger frameworks of cosmology and the development of religious practices.

3.6.2 Sauro-Sarmatian Burial Patterns

The Southern Ural Mountain Sauromatian period burial structures were typically comprised of earthen barrows with the addition of stone construction elements or complex superstructures made of wood (Dvornichenko 1995, 102). Graves were often primary in nature and were placed within purposely built mound structures, however, there were instances when burials were placed as secondary interments within pre-existing Bronze Age kurgan structures associated with the Pit Grave and Andronovo phases.

The nature of the burial pit was generally a grave shaft of either narrow or wide rectangular shape. The inhumed dead were usually placed in a supine position . Frequently, traces of the ritual use of fire are encountered and archaeologists have discovered large hearths placed near the grave shaft as well as remnants of charcoal and ash in the grave pit bottoms. It is believed that such uses of fire within the mortuary ritual reflects a general continuity of the fire cult associated with the earlier Bronze Age Andronovo period mortuary sites. In addition, evidence of chalk and ochre use (often sprinkled over the corpse) has been identified within the burial contexts and small lumps of these substances are encountered within specific locations in the grave pit area.

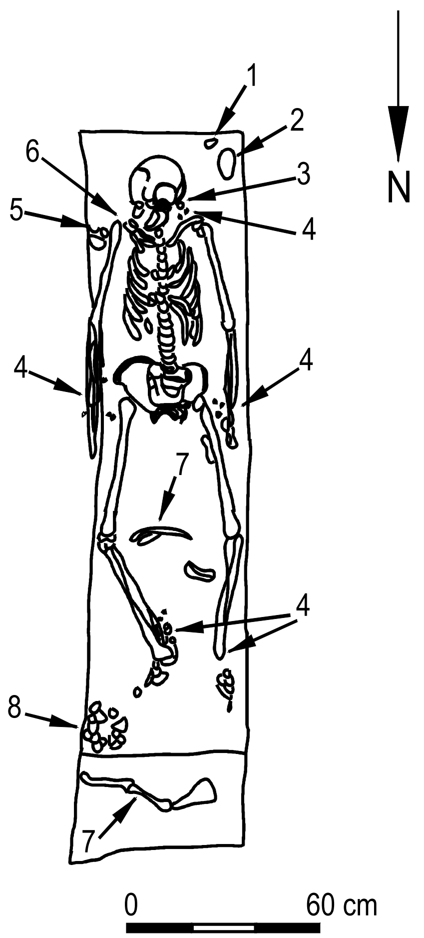


Figure 3.26 *Female Sauro-Sarmatian burial with associated grave items: 1 – chalk fragment; 2 – bronze mirror fragment; 3 – bronze ear-ring; 4 – beads; 5 – bone tool fragment; 6 – chalk fragment; 7 – faunal remains (sheep/goat); 8 – fragmented pottery vessel – (Pokrovka Cemetery 8, Kurgan 6, Burial 1 – redrawn from Yablonsky 1993: 114).*

Grave goods associated with the Sauromatian burials reflect what has been considered by Russian scholars to be clear patterns of nomadism as well as strong militaristic material elements. Common items included within the burial rite were weaponry (swords, daggers, arrows, bows, etc.), tools, personal adornments (jewellery, talismans, etc.), ritual offerings including faunal remains, and various pottery storage vessels. Male graves commonly contained weaponry and horse bridle sets while female graves continued to have small tools, personal adornments, and ‘toiletry’ items such as bronze mirrors, bone spoons and combs, and river shells with traces of ochre or chalk residue (Fig. 3.26).

The early Sarmatian period burials, within the Southern Ural Mountain region during the late 5th to 4th centuries BC, are particularly characteristic for revealing new innovations in funerary ritual practices. As discussed above, it is believed that this *cultural genesis* was brought about by some continuity from the earlier Sauromatian period as well as other contributing factors, such as an influx of populations from the northern forest-steppe region and migrations from the southern steppe region of what is present day Kazakhstan (Barbarunova 1995, 121). New additions to funerary construction were typified by the development of *podbois*, *catacomb* and *ledge* type grave pit constructions (Figs. 3.27 & 3.28). In addition, a change in corpse orientation, with the head directed towards the south, was instituted within the funeral structures of the emerging Sarmatian period. Corpses were typically arranged in the supine position with the arms placed at the sides. Kurgans were often constructed either around a larger kurgan structure or burials were placed within older kurgans with an enhancement to the size of the overlying mound.

The grave good assemblages of the Sarmatian period showed considerable continuity from the earlier Sauromatian types, with the frequent inclusion of weaponry in male burials and personal adornment items and bronze mirrors being associated with female burials. Pottery included within the burial rite often included both wheel-made imported wares (often of Central Asian origin) as well as local hand-made round bottomed vessels with a heavy talc additive, reflecting an influence by the forest-steppe populations located in the Trans-Ural region.

Concerning the use of animals within the funeral rite, the deposition of various animal elements continued, with the placement of sheep/goat and horse remains being the most common. In contrast to the burials discussed above for the Altai Mountain region, it appears that most of the animal remains deposited as part of the Sauro-Sarmatian funeral context related to the placement of specific elements of the animal carcasses. For example, the front quarters or hind quarters of the animal were often placed within the grave pit itself, near the head or feet of the deceased, or were placed within particular niches constructed in the grave pit area. The placement of specific anatomical elements relates to the butchery of the animals as part of the ritual process and the consumption of the animal(s) through feasting. This is indicated by the deposition of the large meat bearing parts of the animal carcass, for example the front quarters comprising the scapula, humerus, and lower metacarpus, either within the grave pit or within a specific location of the kurgan mortuary complex (as illustrated in Fig. 3.29). Scattered animal remains throughout the various strata of the mound are also an important indication of feasting activities and it appears that it was a much more common pattern to consume parts of the animals through the process of ritual, rather than to deposit whole animal carcasses as was discussed above relating to the Arzhan mortuary complex and the Pazyryk barrows (Fig. 3.30).

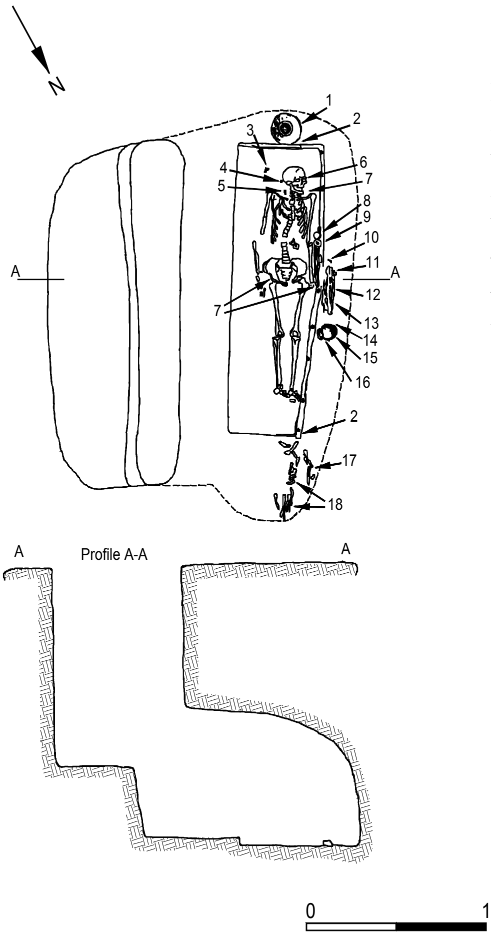


Figure 3.27 *Sauro-Sarmatian Podbois type burial with associated grave goods: 1 – hand moulded pottery vessel; 2 – wood; 3 – arrowhead; 4, 6 – gilded bronze ear-ring; 5 – bronze mirror; 7 – beads; 8 – chalk fragment; 9 – spindle-whorl; 10 – wood; 11 – stone; 12 – arrowheads; 13 – quiver; 14 – stone drill; 15 – clay ball (unfired); 16 – moulded pottery vessel; 17 – knife; 18 – faunal remains (sheep-goat) – (Pokrovka Cemetery 2, Kurgan 8, Burial 5 – redrawn from Yablonsky 1995a: 144).*

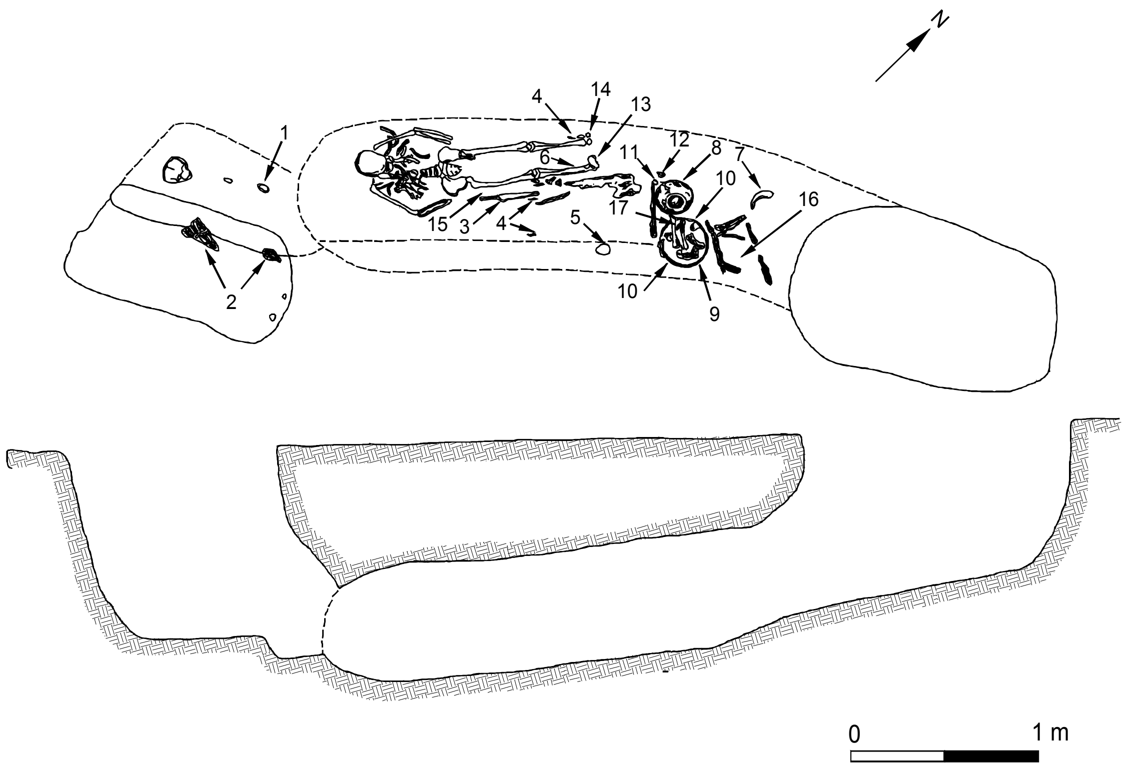


Figure 3.28 *A Sauro-Sarmatian Catacomb type burial with associated grave goods: 1 – bead; 2 – decayed sack with arrowheads; 3 – dagger; 4 – arrowheads; 5 – wooden bowl; 6 – iron knife; 7 – animal tusk; 8 – hand moulded pottery vessel; 9 – wooden container; 10 – quiver; 11, 12 – shells; 13 – astragalus; 14 – small pieces of coal; 15 – tree bark; 16 – wood; 17 – faunal remains (sheep/goat) –(Pokrovka Cemetery 2, Kurgan 8, Burials 4 and 7 – redrawn from Yablonsky 1995a: 143).*

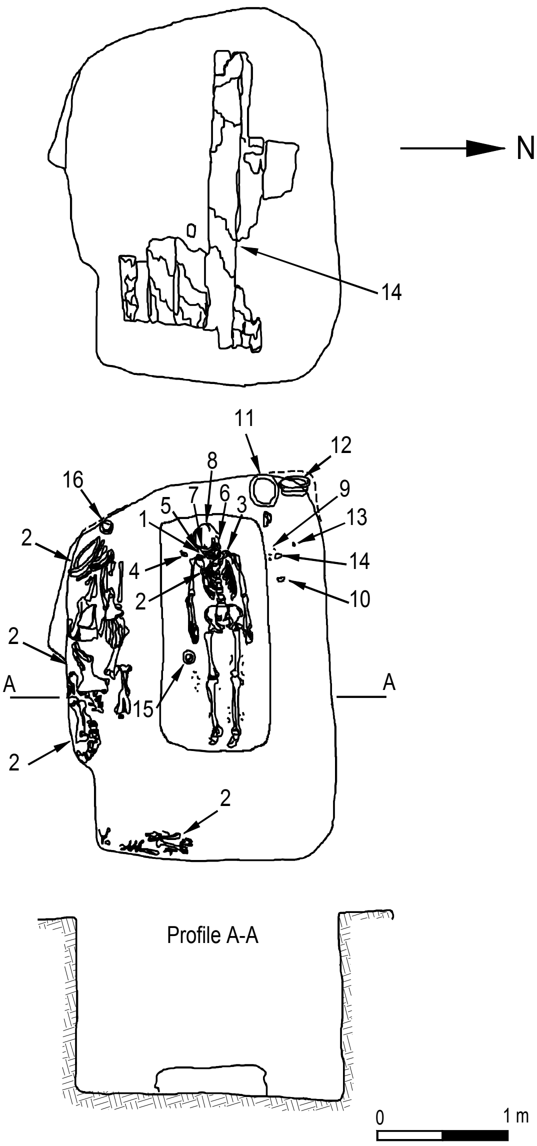


Figure 3.29 *A Sauro-Sarmatian burial with wooden burial structure and associated grave goods: 1,4,7 – gold ornaments; 2, 3 – faunal remains; 5, 6, - gold pendants; 7, 8 – gold ornaments; 9 – realgar (orange-red arsenic ore); 10 - shells; 11 – bronze mirror; 12 – stone altar; 13 – bone articles; 14 – wood; 15, 16 – small hand moulded pottery vessel – (Pokrovka Cemetery 2, Kurgan 3, Burial 2 – redrawn from Yablonsky 1994a: 129).*

Figure 3.30 *Scattered pattern of horse mandibles and crania associated with Sauro-Sarmatian kurgan mound structure (Pokrovka Cemetery 2, Kurgan 1 – redrawn from Yablonsky 1993: 89).*

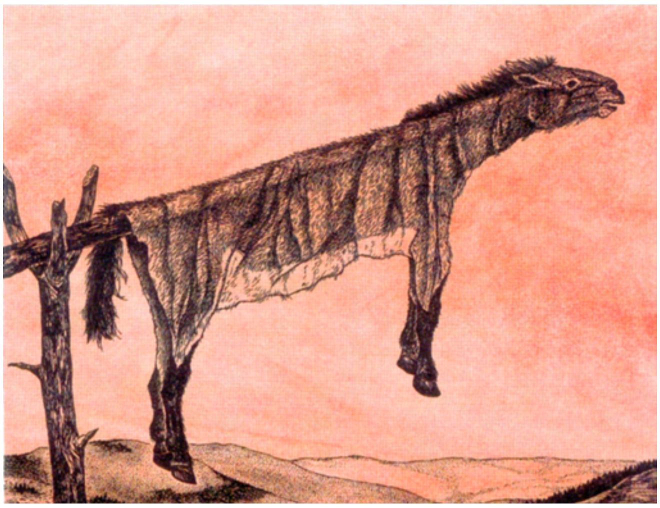


Figure 3.31 *Artist's reconstruction of horsehide with attached head and hooves (Drawing by Nancy J. Perkins - in Anthony 1996,73).*

One of the most interesting patterns associated with animal deposition within kurgan mortuary sites is the ubiquitous 'head and hoof' type burials, which is a well-known prehistoric mortuary deposition pattern for both the Eurasian steppe region as well as within Europe (Piggott 1962). As scholars have suggested, the deposition of both heads and hoofs (metapodial elements) together probably represents the skinning of the particular animal with the hide being left attached to the head and lower legs (Crubézy et al. 1996). As Anthony has argued (1996), this may have been done in order to stretch or hang the animal hide over a pole framework at the mortuary site, or simply to deposit the remaining hide, head, and leg elements within the mortuary complex (Fig. 3.31).

3.6.3 Dromos Kurgans

One rather unique form of kurgan construction found in the steppe region is the *dromos* type, which has been found both in eastern Kazakhstan (relating to the Saka) as well as in the Southern Ural Mountains region (relating to the Sauro-Sarmatian groups) (Fig.3.32). These structures ranged from 20 to100 meters in diameter and often had a height of between 8 to10 meters. They were constructed of layers of earth and fine gravel with an outer covering of large stones. The grave chamber was square in shape and was constructed of wooden logs and stones and had a 'dromos' type entrance that was normally sealed but which could be reopened if necessary (Yablonsky 1995b: 209). Weapons, horse trappings, and objects decorated in the Animal Style art pattern are particularly representative of the grave goods recovered from within these types of tombs. These particular sites date to around the 8th to 6th centuries BC and are of a much larger size than other kurgan type constructions found in Central Kazakhstan that are believed to relate to the Saka cultural development.

A small number of dromos style kurgans dating from the 5th to 4th centuries BC have also been found in the Southern Ural region of Russia and relate to the Iron Age Sarmatian groups of that region. These large and complex wooden rectangular structures typically incorporated square or rectangular pit type burials and had pyramidal shaped roofs that were covered with soil. Although this form of kurgan burial is quite rare for the Sarmatian culture it is nonetheless a very important development. Most of the other Sarmatian type mortuary complexes in the Southern Ural region were comprised of either kurgans with single inhumations or clusters of kurgans with one or more inhumation burials. By

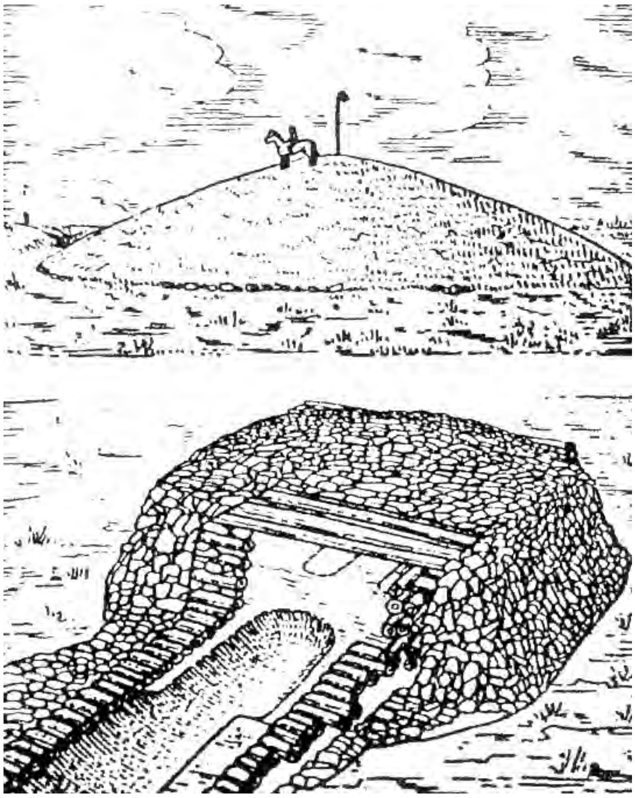


Figure 3.32 *Example of 'Dromos' type kurgan from Chilikta in eastern Kazakhstan (Yablonsky 1995b, 201).*

contrast, the 'dromos' structures provided a collective tomb for the incorporation of specific societal members or perhaps members of a single family or kinship network.

It has been argued by some scholars that the appearance of this tomb form may reflect particular political relationships that developed among the nomadic groups within this region during the Iron Age period as a result of the expansion of the state-based Persian Empire in the south and the early formulation of long distance east-west trade routes (Koryakova 1998a; Tairov 1993). Furthermore, as a result of these influences new forms of burial ritual and ideological frameworks were formulated to respond to issues such as pastoral land ownership and access or control over the movement of material items through the establishment of trade networks (Tairov 1993).

3.6.4 The 'Usami' Mortuary Patterns

The last mortuary pattern I wish to briefly discuss is the *Usami*, or so-called kurgans with a 'moustache'. These unusual stone and earth constructions are found within Central Kazakhstan and relate to the Iron Age Tasmola groups, which is traditionally interpreted as a variant of the Saka culture. These mortuary complexes typically consisted of a large kurgan connected to two smaller kurgans by semi-circular stone ridges (Fig. 3.33). Pit graves with human burials were placed within the larger mound and horse burials (either complete or with specific skeletal elements) with associated evidence of ritual fire use are often found in the smaller outlying mounds. Typically, at the foot of the deceased, horse crania wrapped in horsehides, various horse harness accoutrements, and the crania and scapula of a sheep or goat were deposited (Fig. 3.34).

Interestingly, the *Usami* kurgan constructions typically occur in small numbers within larger clusters of the general Tasmola earthen mound kurgan types). The conventional interpretation of this peculiar construction (stone ridges) suggest that they relate to a possible solar cult, in that the orientation of the kurgan constructions face eastward towards the rising sun (Kadyrbaev 1966). Certainly one of the most intriguing aspects of these kurgans is that they represent a unique burial pattern which is often

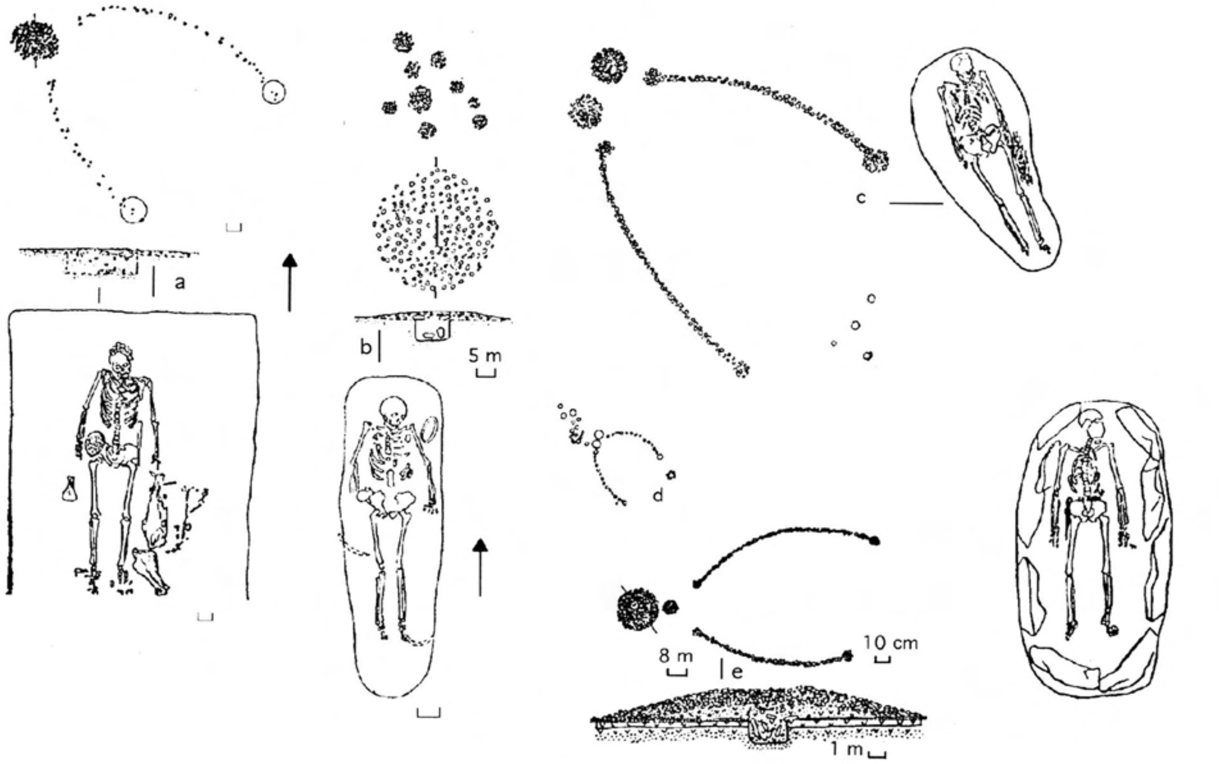


Figure 3.33 *Examples of Tasmola kurgans "with mustaches" (Yablonsky 1995b, 203).*

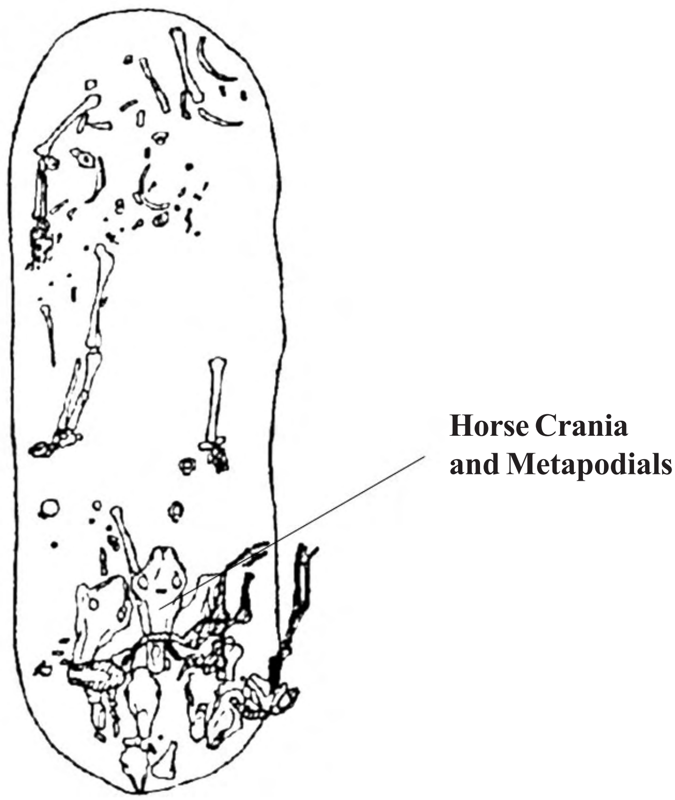


Figure 3.34 *Grave with horse bone deposits (Yablonsky 1995b, 203).*

found situated within either typical Tasmola cemetery sites or among the greater Saka mortuary patterns (Yablonsky 1995b: 202). The creation of distinct variations in burial patterns within a wider set of mortuary practices may suggest the importance of the formulation of certain types of social identity. Basic elements associated with these sites are the prevalence of single human inhumations, substantial evidence of horse sacrifice and the inclusion of militaristic weaponry such as iron swords, arrowheads, daggers, etc. (Fig. 3.35). These factors, associated with the unusual construction form of the kurgans, may represent a set of mortuary ritual practices and cosmology shared by a specific group or subgroup within a larger social and cultural setting. The material evidence recovered from these sites clearly suggests a strong connection to the significant symbolism surrounding the technological nature of the horse and militaristic accoutrements.

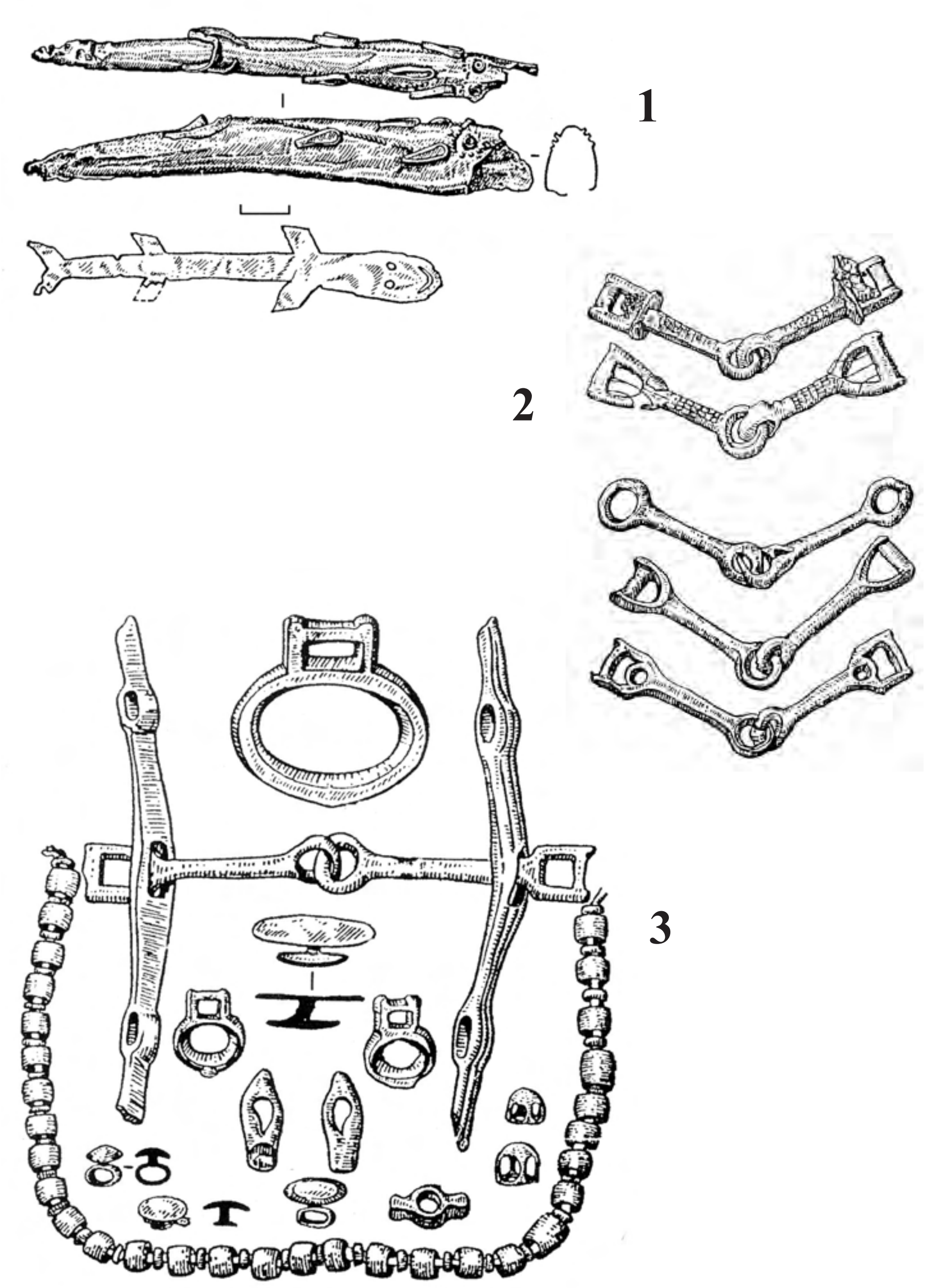


Figure 3.35 *Recovered artefacts from the Chilitka and Tasmola cemeteries: 1 - golden fish ornament from Chilitka; 2 - bridle bit sets from Tasmola;; 3 - horse trappings from female burial at Tasmola (Yablonsky 1995b, 204, 205, 213).*

3.7 Conclusion

This chapter has attempted to cover a great deal of ground concerning conventional theoretical approaches to the interpretation of Early Iron Age social and cultural developments in the eastern steppe region. As such, I have attempted to both illuminate to some degree the historical context of this area of research as well as provide a necessary overview of some of the main trends associated with the appearance of new forms of technology, cosmological orientation and ritual practices, and changes associated with socio-economic patterns.

It is clear through my examples above that the investigation of mortuary sites has provided the main interpretive framework for conventional hypotheses regarding Early Iron Age societal changes. I have also shown that a great deal of the variability and dynamism associated with changing ritual practices has been lost through either the application of rigid Marxist interpretative frameworks relating to socio-economic changes or through models which attempt to frame mortuary patterns according to a sliding scale of rank and status based on the size and complexity of the respective sites and their mortuary features.

By contrast, I have argued for a more sophisticated interpretation of the changing patterns of mortuary ritual and material culture and their importance in the construction of new forms of social identity, power and prestige. As Jones has cogently noted, “material culture is actively structured and structuring throughout its social life, and consequently its meaning is not fixed but constantly subject to reproduction and transformation” (Jones 1997: 126). I feel that this point of view is particularly important concerning the Early Iron Age burial patterns, as the process of burial provides an important locus for the ritual symbolism created between the living and the dead and the active negotiation of social identity and representation through the dynamic media of material culture.

Nevertheless, I feel that to conclude this chapter it is necessary to make some specific points about the Early Iron Age period through the context of the case study discussions I have presented above. I feel that within this chapter I have touched upon three significant issues that can be related to the general arguments and direction of research represented within this thesis:

1) The substantial social and cultural changes associated with the technology of horse riding and the appearance of mounted warfare.
2) The appearance of new forms of ideology and ritual and cult patterns associated with a ‘warrior ethos’.
3) The changing symbolism surrounding the use of animals across varying socio-cultural contexts and ethno-cultural boundaries.

Concerning the first point, I would agree with Renfrew’s position (1998) regarding both the technological as well as cognitive shift associated with the transition to warrior horsemanship in the

Early Iron Age period. From this point of view, the iconography and symbolism of horse riding can be seen across a variety of socio-cultural contexts and provide an important medium for social display and communication. As Renfrew notes, "…it is the complete symbolic system, the cognitive constellation, that determines what is represented and even what is used. The availability of the necessary technology is not the determining factor" (Renfrew 1998: 281). Through the variety of the case studies discussed above, the representation of horses and associated military technology are clearly a commonly emphasised theme within the mortuary practices.

Nevertheless, one can also envisage that the transition from the use of the chariot in the Bronze Age, which may have well been associated with distinct controlled prestige networks of technology and practice, to the emergence of individual warfare on horseback created a new social environment for a completely new perception of individual mobility and prestige – one that was initiated and reinforced through either large-scale or smaller militaristic endeavours. Certainly the horse, as most vividly exemplified with the recovered materials from the Pazyryk barrows, provided a dynamic 'social canvas' in which to project the most flamboyant attributes associated with warfare and the symbolism attached to the ideology of the warrior.

And of course, I must emphasise again the significant symbolism constituted within the practice of tattooing, as discussed above for the male individual from Barrow 2, which clearly illustrates the mapping of complex imagery within the construction of the social identity of the individuals. As Treherne has stated, "there is a bodily *aesthetics* to warfare and violence which is cultivated through the *life style* of the warrior" (1995, 127). The importance of the aesthetics and identity associated with warriors and warfare has been the subject of much discussion recently by scholars, as it has been suggested that more sophisticated approaches be applied to the interpretation of both prehistoric ritual practice and mortuary behaviours (Wells 2001; Treherne 1995; Babič 2002). Certainly Peter Wells' interpretation of European Iron Age burials underscores many of these elements when he states that:

> In the dynamic and fluid social context of Early Iron Age Europe, we need to understand rich burials not as reflections of a static hierarchical society, but as representations of moments within a process of social expression and display among the living. These graves are complex structures, and they express identity on different levels.
>
> (Wells 2001, 46)

Relating to the second point above, I would argue that this interface between technology and social perception stimulated distinct transitions in ideology and brought about innovation regarding new forms of cult and ritual practices, all of which helped to structure and reinforce new social institutions based around the effectiveness of mounted warfare. Although these new patterns of mortuary practice have been traditionally interpreted as relating to rather discrete ethno-cultural boundaries, or representative of the elite level of the societies, I suggest that it is also possible to interpret them as social institutions which cross-cut these more formalised and conventionally interpreted social boundaries. Individual warriors or groups of warriors may well have been drawn from many different social groups in various regions during certain periods of conflict and warfare and through the process of 'tribalisation, which I discussed at length above. This mobilisation would have provided a perfect structure for the blending of tradition and practice associated with a 'warrior ethos'. Indeed, such practices may have been necessitated in order to provide a common or shared identity in which to bring diverse individuals together during periods of warfare or defence. This may have provided just the framework needed for the transmission of the so-called "Scythian Triad" from of burial, which upon closer inspection reflects only a general material cultural pattern used to describe burials exhibiting elements of Animal Style art, militaristic grave goods, and evidence of conspicuous animal sacrifice and consumption. As my discussions above have illuminated, this generalised pattern can be seen as manifested within a variety of different mortuary practices, many of which need not be related to common and fixed cultural terminology for the Iron Age steppe populations. In this case I am in full agreement with Yablonsky when he states that:

> To escape from a network of ancient and modern myths it is necessary to create specific regional and special archaeological reconstructions on the basis of general taxonomic achievement. We have to develop strict, taxonomically verified, scientific classifications since there is no place for single-level taxons such as… the "Sarmatian Culture," the "Prohorovo Culture," and the "Sauromatian-Sarmatian Historical Community."
>
> (Yablonsky, forthcoming)

The third and final point noted above is an important one, as I have attempted to emphasise throughout this chapter the substantial role that animals have played within many of the changing social structures of the Early Iron Age period. From the developed form of technology that the horse provided in cavalry warfare, to the complex and dynamic symbolism reflected within the Animal Style art pattern, animals and the symbolism surrounding them provided a highly significant framework for the construction of social and ethnic identity and clearly reflected concepts of power and prestige.

The widespread use of animal sacrifice and consumption within Iron Age funerary traditions exemplifies the construction of new forms of social organisation and ritual practices. Such important social implications concerning prehistoric societies have become a common theme within discussions surrounding the issue of feasting and the ritual frameworks which structure this social constituted practice (Hayden 2001; Gummerman 1997). Feasting was clearly an important aspect of the organisation of labour for the construction of the various burial sites discussed above and would have been an important component within the *rites de passage* of the funerary processes (Dietler 2001, 72). From the Arzhan kurgan in the Altai Mountains to the Sauromatian burial complexes in the Southern Ural Mountain region, faunal evidence strongly suggests the importance of feasting within the various traditions of funerary practices. I will pick up on this important topic again in Chapter 6, wherein I provide a discussion of my archaeological fieldwork relating to Early Iron Age barrows in the Trans-Ural region and patterns of faunal deposition relating to feasting practices.

At this point it is time to close this chapter and move towards a more detailed investigation of the particular region in which I have conducted my PhD fieldwork. However, it will be shown that many of the issues that I have raised within my discussions in the last two chapters will be extended into a further exploration of the issues surrounding the Early Iron Age of the Trans-Ural region and the socio-cultural and socio-economic transitions that occurred there. Hence, with this chapter, I have provided an important structure for an examination of similar issues relating to the northern forest-steppe region, where distinct changes in both settlement and mortuary patterns provide evidence of shifts in socio-economic practices as well as new frameworks of ritual practices and mortuary behaviours.

CHAPTER FOUR

Early Iron Age Developments in the Trans-Urals: The Gorokhovo-Sargat Period

4.1 Introduction

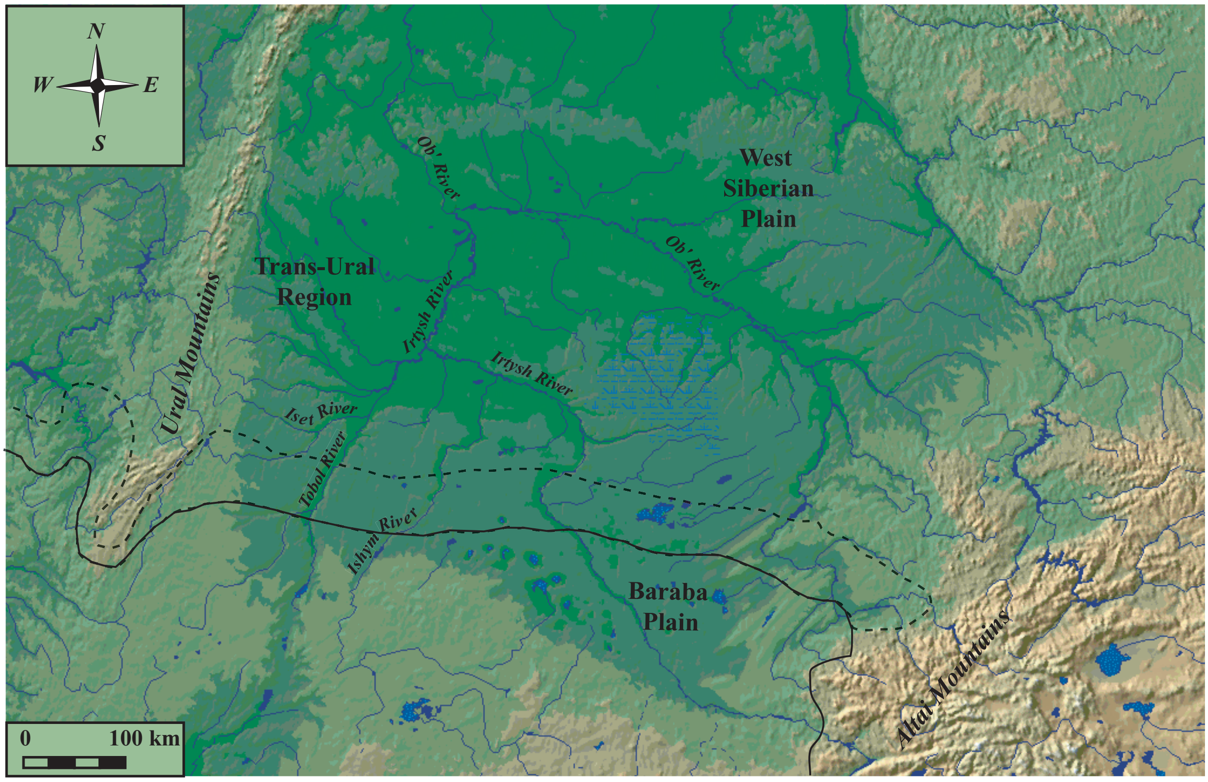
In this chapter, I wish to present a more detailed investigation of the particular region and case study that represent the archaeological fieldwork undertaken for the thesis research. The discussion will begin with a necessary introduction to the history of scholarship for the Trans-Ural region and then will follow with an outline of the temporal and spatial characteristics associated with the Early Iron Age period. The focus will then be narrowed to the Middle-Tobol River region and a detailed presentation of some representative settlement sites relating to the Gorokhovo-Sargat phase. The chapter will then finish with a critique of the models associated with conventional archaeological interpretations of this region. Furthermore, a stress will be placed on how interpretations of zooarchaeological remains have been used to develop and support certain hypotheses regarding Early Iron Age socio-economic developments such as semi-nomadic and semi-settled animal husbandry practices. This will provide an important framework for Chapter Five, which will present two field seasons of collaborative archaeological fieldwork and subsequent zooarchaeological analyses relating to the Early Iron Age fortified settlement site of Pavlinovo.

4.2 Trans-Ural Region – Environment and Ecology

As was noted in Chapter Three, the Trans-Ural geographical region is situated just to the east of the north-south oriented Ural Mountains and represents an alluvial plain with small rolling hills on the westernmost edge of the larger West Siberian plain. This area today signifies the border between Asia and Europe. The region is characterized by rather distinct climatic and environmental zones represented by heavy taiga forests in the north, broken forest-steppe in the central Ural Mountain area, and a transition into the more arid grassland steppes found in the southern Ural Mountain region (Map 4.1). These distinct environmental divisions run nearly parallel to each other in an east-west direction, with the steppe zone penetrating along the river valleys on a more northern latitude than the steppe areas to the west of the Ural Mountains on the European side.

The general climate of the Trans-Ural region today is quite similar to that of the Early Iron Age period, as it is representative of the continental type with sharp temperature extremes and unpredictable weather patterns throughout the year. During the height of the summer, dry hot air masses from the southern steppes in Central Asia induce high temperatures and low rainfall into the region. Additionally, the Ural Mountains tend to draw a large proportion of the precipitation moving eastwards with storm fronts coming from the European side. During the long winter season, cold arctic air masses from the north bring extremely frigid conditions into the Trans-Urals area, yet yield relatively low amounts of precipitation. Comparisons for the seasonal precipitation of the region reveal approximately 150 mm for January to approximately 250 mm for July. The annual fluctuation in temperature ranges from approximately –20 ° C in the winter to 24 ° in the summer (Milner-Gulland & Dejevsky 1991, 22-23).

Although the river network in the Trans-Ural is not of significant density, there are several large rivers, namely the Ob, Irtysh, Ishym and Tobol. The latter three are all of the Kazakhstan type, in that



Map 4.1 *Map illustrating the main geographical elements in the West Siberian Plain area and the Trans-Ural region (dotted line indicates border between forest and forest-steppe zones and solid line indicates border between forest-steppe and steppe zones).*

they originate in the present day territory of Kazakhstan and are characterised by a high flow rate of water in the spring and relatively low levels during the rest of the year. As a result, corresponding cyclical droughts are historically common for the region and occur with some regularity every 8-12 years (Koryakova & Sergeev 1986, 90). As the West Siberian Plateau has a gentle northward decline in elevation, all the main rivers of the region flow in a northerly direction to join the large Ob River, which then empties into the Kara Sea region of the Arctic Ocean. The large Ob River has its origins in West Siberia and drains the western slopes of the extensive Sayan and Altai Mountain regions. Although the Trans-Ural region can also be characterised by its numerous lakes and marshes, it is primarily the large river valleys with their fluvial deposits and high terraces that have provided the main areas of human habitation. These riverine environments have also provided important pathways historically for long distance movement through the landscape both east to west and north to south for ancient populations.

In the forest-steppe zone, located within the Middle Ural Mountain region, mixed forests of birch, pines, poplar and maple are common. The birch and aspen, occurring in coppice formations, are the primary arboreal species, as are the pines, which clearly predominate the coniferous species

(Marguerie & Marcoux 2000,75). The three river valleys of the Irtysh, Ishym, and Tobol can be characterised by high fluvial deposits that have yielded ancient sedimentary terraces with high saline contents. Chernozems and grey and brown forest soils are also common to the region.

Peripheral to the riverine environments, open meadows with patchy broken forest cover provide a veritable mosaic of vegetation patterns with abundant varieties of herbs, wild cereals, bean plants, and meadowsweet grass species. These environments, with their diversity of flora, provide a particularly rich late spring, summer, and early fall seasonal habitat.

The wild fauna of the region comprise a mixture of both forest and steppe species and, until recently, large mammals such as bears, beavers, wolves, wild pigs, elk, roe deer, steppe antelope (saiga), and foxes were found in abundance within the landscape. However, over the past two hundred years, as a result of the clear-cutting of forests and intensive agricultural and industrial development, numerous species have been severely impacted. In recent years, various state funded programs have been initiated to reintroduce certain animal species back into the Trans-Ural ecosystem.

The Middle Ural Mountain region and the forest-steppe zone of West Siberia have also provided a historically important environment for the development of domestic stockbreeding. Faunal remains representing the three main categories of domesticates, namely *Equus caballus* (horse), *Bos taurus* (cow), and *Ovicaprids* (sheep/goat), were introduced into the forest-steppe region by the Mid-Holocene Period and osteological remains from these species are widespread among settlement and mortuary sites by the beginning of the 11th century BC (Kosintsev 1999, 138). The development of the large mammal fauna for the Holocene Period in both the Middle Ural Mountain region and the forest-steppe zone of West Siberia are outlined in Tables 4.1 & 4.2 respectively.

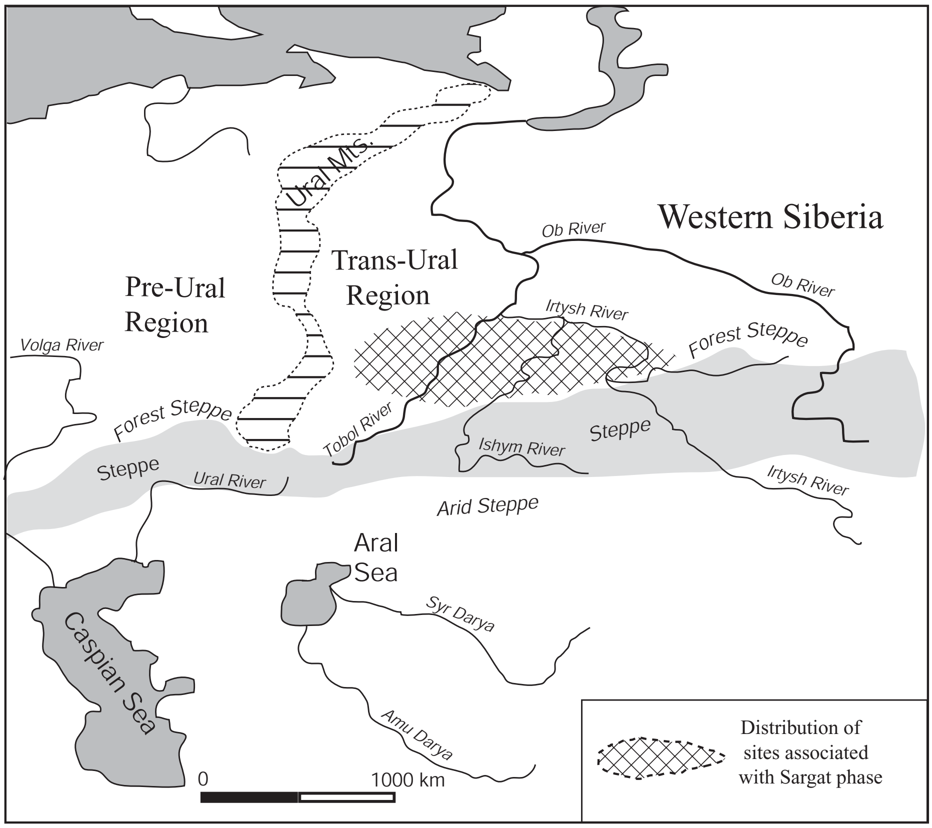
Just as the first millennium BC reflects a period of intense cultural change within the general Eurasian steppe area, the archaeological record of the Trans-Ural region indicates important and significant social and cultural developments as well. The transition from the Late Bronze Age to the Early Iron Age reflects numerous changes within both settlement sites and mortuary complexes. The Sargat sequence reflects one particular pattern that has been actively studied in the Trans-Ural region by Russian scholars since the beginning of the last century (Map 4.2). Nevertheless, this realm of research is nearly unknown outside present day Russian scholarship and in some respects even beyond the Trans-Ural region itself. This may seem an insignificant fact when compared with the actual scale of archaeological studies for the whole of the Eurasian landmass, nevertheless, the mere fact of the size of this region, as well as its location and hence significance within the larger social and political developments of the steppe region, clearly speak to its importance within the larger scope of Iron Age studies of the Eurasian steppe.

Table 4.1 *Development of large mammal fauna in the Middle Ural Mountain region from the Late Glacial to the present (redrawn from Kosintsev 1999, 135).*

SPECIES	Late Glacial (14,000-11,000 BP)	Early Holocene (11,000-8,000 BP)	Middle Holocene (8,000-2,500 BP)	Late Holocene 2,500-200/100 BP)	Present (last 100/200 yrs)
Lepus tanaiticus	—	—	— ?		
Lepus timidus			? —	—	—
Lepus europaeus					—
Sciurus vulgaris	—	—	—	—	—
Marmota bobac	—	—	—		
Castor fiber	—	—	—	—	—
Nyctereutes procyonoides					—
Canis lupus	—	—	—	—	—
Alopex lagopus	—	—			
Vulpes vulpes	—	—	—	—	—
Ursus spelaeus	—				
Ursus arctos	—	—	—	—	—
Martes zibellina		—	—	—	—
Martes martes	—	—	—	—	—
Gulo gulo	—	—	—	—	—
Mustela erminea	—	—	—	—	—
Mustela nivalis	—	—	—	—	—
Mustela sibirica	? – –	—	—	—	—
Mustela lutreola	? – –	—	—	—	—
Mustela vison					—
Mustela putorius		? —	—	—	—
Mustela eversmanni	—	?			
Meles meles		—	—	—	—
Lutra lutra		—	—	—	—
Felis lynx		?	—	—	—
Equus sp. (ferus)	—	—	— ?		
Coelodonta antiquitatus	—	— ?			
Sus scrofa		?	—	—	—
Cervus elaphus		—	—		
Capreolus pygargus		—	—	—	—
Megaloceros giganteus	?	?			
Alces alces	—	—	—	—	—
Rangifer tarandus	—	—	—	—	
Bison priscus	—				
Saiga borealis	—				
Ovibos pallantis	— ?				
Oryctolagus domestica					—
Canis familiaris		—	—	—	—
Felis domestica					—
Equus caballus			—	—	—
Sus scrofa f. domestica					—
Bos taurus			—	—	—
Ovis aries			—	—	—
Capra hircus			—	—	—

Table 4.2 *Development of large mammal fauna in the forest-steppe zone of West Siberia from the Late Glacial to the present (redrawn from Kosintsev 1999, 137).*

SPECIES	Late Glacial (14,500-11,000 BP)	Early Holocene (11,000-8,000 BP)	Middle Holocene (8,000-2,700 BP)	Late Holocene 2,700-200/100 BP)	Present (last 100/200 yrs)
Lepus tanaiticus	—	?	?		
Lepus timidus			? —	—	—
Lepus europaeus					—
Marmota bobac	—	?	—	—	—
Castor fiber			—	—	— —
Nyctereutes procyonoides					—
Canis lupus	—	?	—	—	—
Alopex lagopus	—				
Vulpes vulpes	—	?	—	—	—
Vulpes corsac	?	?	—	?	—
Ursus arctos		?	? —	—	
Martes zibellina		?	?	? —	—
Martes martes	?	?	—	—	—
Gulo gulo	—	?	—	—	—
Mustela erminea	—	?	—	—	—
Mustela nivalis	?	?	—	—	—
Mustela sibirica	?	?	?	?	—
Mustela vison					—
Mustela eversmanni	—	?	—	—	—
Meles meles		?	—	—	—
Lutra lutra		?	—	—	—
Mammuthus primigenius	—				
Equus sp. (ferus)	—	—	— ?		
Sus scrofa		?	—	—	—
Camelus ferus?			—		
Cervus elaphus		?	—	—	—
Capreolus pygargus		?	—	—	—
Megaloceros giganteus	? —	— ?			
Alces alces		?	—	—	—
Rangifer tarandus	—	?	—	—	
Bos primigenius		?	—		
Bison priscus	—				
Bison bonasus		? —	— ?		
Saiga borealis	—				
Saiga tatarica		?	—	—	
Oryctolagus domestica					—
Canis familiaris		?	—	—	—
Felis domestica					—
Equus caballus			? —	—	—
Sus scrofa f. domestica			—		—
Camelus bactrianus				—	
Bos taurus			—	—	—
Ovis aries			—	—	—
Capra hircus			—	—	—



Map 4.2 *Map showing the spatial distribution of sites associated with the Sargat period.*

4.3 History of Scholarship

The history of scholarship surrounding the Early Iron Age of the Trans-Ural region can be seen to have its starting point with the early work of V. Tolmatchev, who at the beginning of the twentieth century collected information and oral history on the region and produced a general archaeological map of the east side of the Ural Mountains and the eastern forest-steppe environmental zone. Following the early efforts of Tolmatchev, historians such as P. Dimitriev, V. Tchernetsov, K. Salinkov, and others initiated more focused archaeological investigations in the 1920's and 1930's. It was at this time that explanations regarding the material culture of the region were put forth suggesting either the autochthonous development of the local forest-steppe cultures, or that contact with the Saka and Sauro-Sarmatian nomadic populations in the south, induced the ethno-cultural change associated with the Early Iron Age period of this region. Additionally, Salinkov (1966) suggested that an Ugrian origin (linguistic and ethnocultural classification associated with northern forest populations in West Siberia) could be favoured for the ethnogenesis of the region (Sharapova 2000, 207).

More recent archaeological investigations, from the 1960's up through the present time, reflect the work of such scholars as L. Koryakova (1988) , N. Matveeva (2000) , V. Gening (1993), V. Mogil'inikov (1976), N. Palos'mok (1994), V. Stoyanov (1969), and others and have provided the contemporary picture of the Early Iron Age developments within the Trans-Ural region and defined the scope and characteristics of the Sargat development.

One of the results of this conventional scholarship has been the generation of a number of archaeological cultures, sub cultures, and various cultural and genetic connections to account for typological patterning found within the material record. As such, a complex and often confusing model of social development emerges, with several lines of proposed cultural and *ethnogenetic* development being proposed for the Late Bronze to Early Iron Age transition.

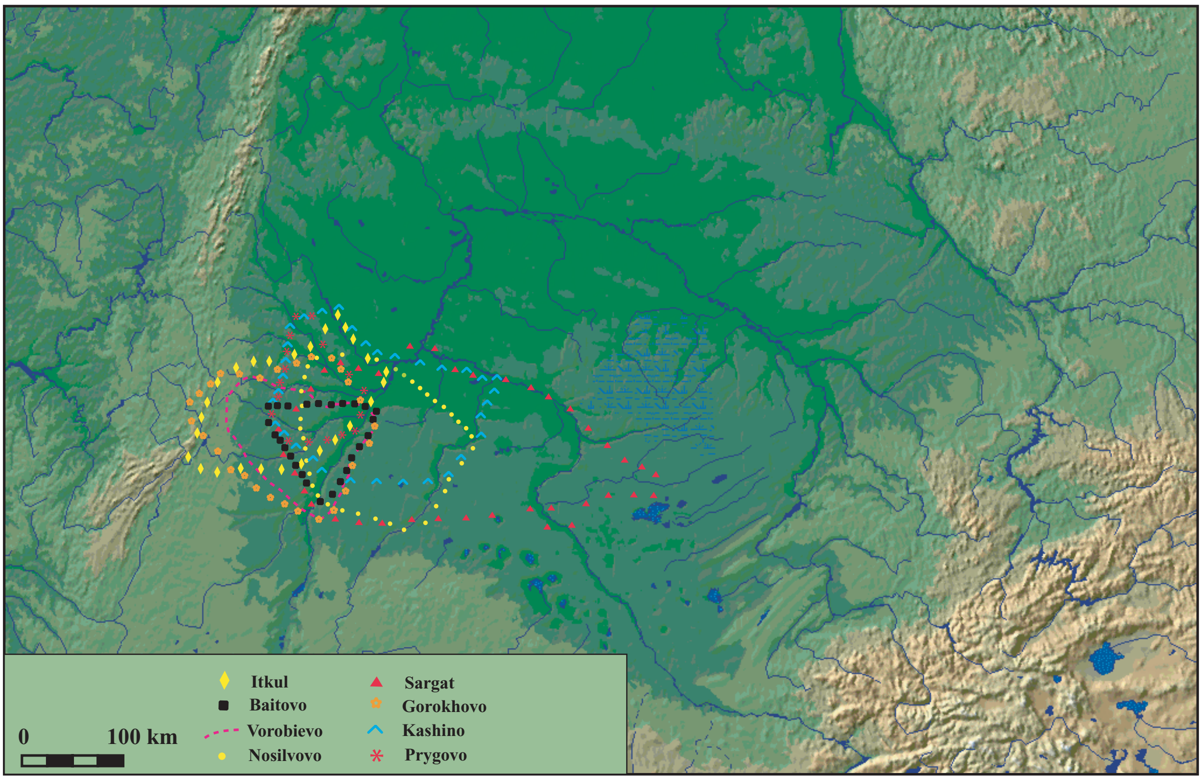
Concerning the issue of historical scholarship for the Trans-Ural area, as well as conventional models associated with *ethnogenesis*, I feel that it is of paramount importance that one attempts to understand the historically situated foundation that has produced the traditional models of explanation for archaeological cultures in this region. Merely challenging these issues from an outside perspective will not address the interface between the theoretical and methodological considerations of Russian and Western archaeological approaches. Therefore, in the following sections a general outline will be presented and an attempt will be made to frame conventional scholarship and the currently held models for the historical development of the Early Iron Age populations situated in the forest-steppe zone of the Trans-Ural region. It is hoped that by presenting the conventional scholarship in this way, a more precise and informed discussion and critique can be initiated at the end of the chapter. This will then lay the groundwork for a stronger contextual approach to the issue of human-animal relationships and the significant socio-cultural dynamics and long-term changes associated with the Trans-Ural area within prehistory.

4.3.1 Cultural Historical Frameworks

Russian archaeologists working within a cultural historical framework, as has been discussed in various sections within the previous chapters of this thesis, have actively utilized the concepts of *ethnogenesis* and *archaeological cultures* for various social and cultural interpretations of the Early Iron Age of the Eurasian steppe area. This is also clearly the case concerning the conventional scholarship of the Trans-Ural forest-steppe region. Although the terminology of the archaeological cultures, such as the Gorokhovo and Sargat, does not reflect any specific ethnonymic labelling in the true sense of the term, these cultural names nonetheless refer to particular archaeological patterns that have been postulated by regional archaeologists to represent general cultural continuity or discontinuity and related socio-cultural dynamics between Iron Age populations. This situation should not be confused with the ethnonymic labelling common for Scythian, Saka, and Sauro-Sarmatian studies in the steppe region, which have drawn heavily upon early historical accounts by ancient authors such as Herodotus, Strabo and others.

Classifications of the variously proposed archaeological cultures in the Trans-Ural region have been predominantly based upon the formal-typological study of material culture and in particular on the research associated with ancient pottery remains. The collection and collation of ceramics from Trans-

Ural archaeological sites reflected the first serious attempts at the systematised organisation and chronological dating of archaeological materials and their respective sites. In particular, Stoyanov's (1969) original work with the Trans-Uralian pottery can be seen as a landmark for the achievement of a formal-typological categorisation and chronological development of the Trans-Ural ceramics. Recent ceramic analyses by Sharapova (1999a; 1999b; 2000) have provided new insights into the complexity and variability of the ceramic patterns of the region as well as suggested a highly useful interpretation of Trans-Ural archaeological sites reflected the first serious attempts at the systematised organisation and



Map 4.3 *Map illustrating the spatial distribution of Late Bronze - Early Iron Age pottery types in the Trans-Ural region (map prepared based on information from Sharapova 2000).*

Trans-Ural archaeological sites reflected the first serious attempts at the systemised organisation and chronological dating of archaeological materials and their respective sites. In particular, Stoyanov's (1969) original work with the Trans-Uralian pottery can be seen as a landmark for the achievement of a formal-typological categorisation and chronological development of the Trans-Ural ceramics. Recent ceramic analyses by Sharapova (1999a; 1999b; 2000) have produced new insights into the complexity and variability of the cermamic patterns of the region as well as provided a highly useful interpretation of the distribution or spread zones of the particular pottery types associated with the Late Bronze Age through the Iron Age period for the Trans-Ural region (Map 4.3).

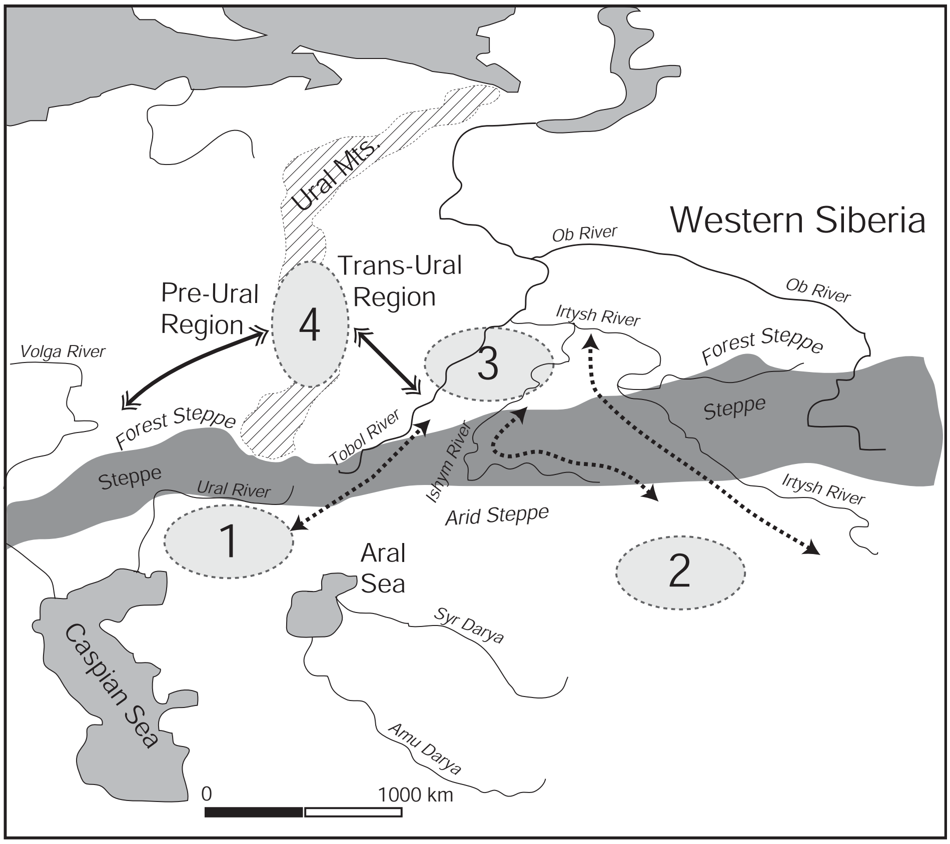
One may note that historically such interpretations of the distribution of particular pottery types (including form and stylistic attributes) have been extremely influential in the development of various models concerning Early Iron Age social and cultural development, as well as probable population demographics associated with the concept of 'archaeological cultures' and social and cultural 'genesis'.

4.4 Early Iron Age Dynamics

Generally speaking, conventional scholarship of the Early Iron Age developments within the Trans-Ural region has emphasised cultural interaction and subsequent socio-economic changes relating to three main cultural components: (1) theorised intrusive movements of southern pastoral nomadic tribes, known traditionally as the Saka and later Sauro-Sarmatian tribes, which are believed to have ranged north to south seasonally within the steppe and forest-steppe region; (2) the Ural Mountain metallurgical populations, known as the Itkul culture, which provided important metal resources for both the southern nomadic groups and the populations to the east of the Urals; (3) the autochthonous development of the earlier sedentary Bronze Age forest-steppe populations known as the Baitovo, Vorobievo, and Nosilivo cultures, which had previously developed in the forest steppe region during the second to first millennium BC transition (Map 4.4). Based upon these three main cultural factors, a model that compares the changes taking place within settlement patterns, mortuary practices, and economic regimes within both the forest-steppe and steppe zones of the Trans-Ural region can be presented in Table 4.3. This model provides a general overview of the long-term historical change that has been suggested through conventional interpretations of regional archaeological investigations.

Most scholars believe that a combination of larger factors was responsible for initiating these changes. The commonly held view is that climatic changes in the form of higher precipitation in the humid zone of the northern forest (resulting in the extension of the forest-steppe environment further south) (Koryakova 1998a, 216; Borzunov 1992), increasing aridity in the steppe region (Zdanovich & Shrieber 1988, Riabtseva 1970; Yablonsky 1995b), and the expansionist politics of the Achaemenid rulers of Central Asia (Tairov 1991; 1993) were all significant factors. As a result, it is generally held that through these factors a notable shift among populations was induced as northern indigenous forest groups moved south and nomadic groups began to range further north near the forest-steppe region. These associated population movements created a progressively intensifying interaction sphere between the forest-steppe populations, the metal producing groups in the Ural Mountains, and the nomadic populations generally associated with the southern Ural Mountain and Kazakhstan steppe region.

It is traditionally believed that settlement patterns in the forest-steppe altered as a result of the increasing nomadic influence and higher levels of social contact. The outward result of this possible demographic stress was the intensification of fortified sites within the forest-steppe zone. At the same time, archaeological evidence seems to indicate that settlement sites in the southern steppe region declined as population groups in this area began to pursue a more nomadic form of pastoral activity throughout the year. It is also believed that the convergence of sedentary and nomadic/semi-nomadic



Map 4.4 *Map showing general interaction sphere between steppe nomadic (1, 2), forest-steppe(3) and Ural Mountain metallurgical (4) population groups. Dotted arrows reflect general direction of nomadic transmigrations and double headed arrows reflect general movement of metallurgical materials (after Hanks forthcoming-b).*

Table 4.3 *General socio-economic developments in the first millennium BC: A - changes in the forest-steppe region; B - changes in the steppe region.*

A

CHRONOLOGY	SETTLEMENTS	FUNERARY PRACTICES	ECONOMY
1000-800 BC	Open/Fortified Settlements	Appearance of New Mortuary Patterns	Increase in Mobile Pastoralism
800-500 BC	Increase in Fortified Settlements	Large Kurgans with Single Inhumations	'Classic' Nomadic/ Semi-Nomadic Pastoralism
500-300 BC	Stabilisation of Settlement Patterns	Grouped Kurgans with Multiple Inhumations	'Classic' Nomadic/ Semi-Nomadic Pastoralism

B

CHRONOLOGY	SETTLEMENTS	FUNERARY PRACTICES	ECONOMY
1000-800 BC	Settlement Evidence Declines	Transition in Kurgan Mortuary Practices	Increase in Mobile Pastoralism
800-500 BC	Lack of Settlement Evidence	Large Kurgans with Single Inhumations	'Classic' Nomadic Pastoralism
500-300 BC	Lack of Settlement Evidence	Grouped Kurgans with Multiple Inhumations	'Classic' Nomadic Pastoralism

populations initiated change and stimulated the social, cultural, and technological evolution of the indigenous forest-steppe cultures, thus providing a catalyst for the development of the Sargat phase of occupation in the forest-steppe region.

Furthermore, it has been generally accepted that changes in cosmological orientation and ritual activities associated with this developed, as new construction types of the kurgan burial patterns began to emerge within the forest-steppe region around the 5th century BC. These cemetery complexes reflect not only a similarity, and in some cases continuity, of earlier Bronze Age material cultural patterns of the indigenous populations, but also reveal evidence of new ritual components common to southern nomadic burial construction types and ritual practice. These new mortuary practices included such elements as corpse orientation, types of grave goods inclusion, and specific practices associated with the sacrifice and deposition of either whole or particular elements of wild and domestic animals.

4.4.1 The Sargat Archaeological Pattern

Although there is some debate among scholars over the exact developments outlined above, the general culture historical model regarding these developments can best be presented in Figure 4.1, which shows not only the overall spatial characteristics but also the relative chronological framework

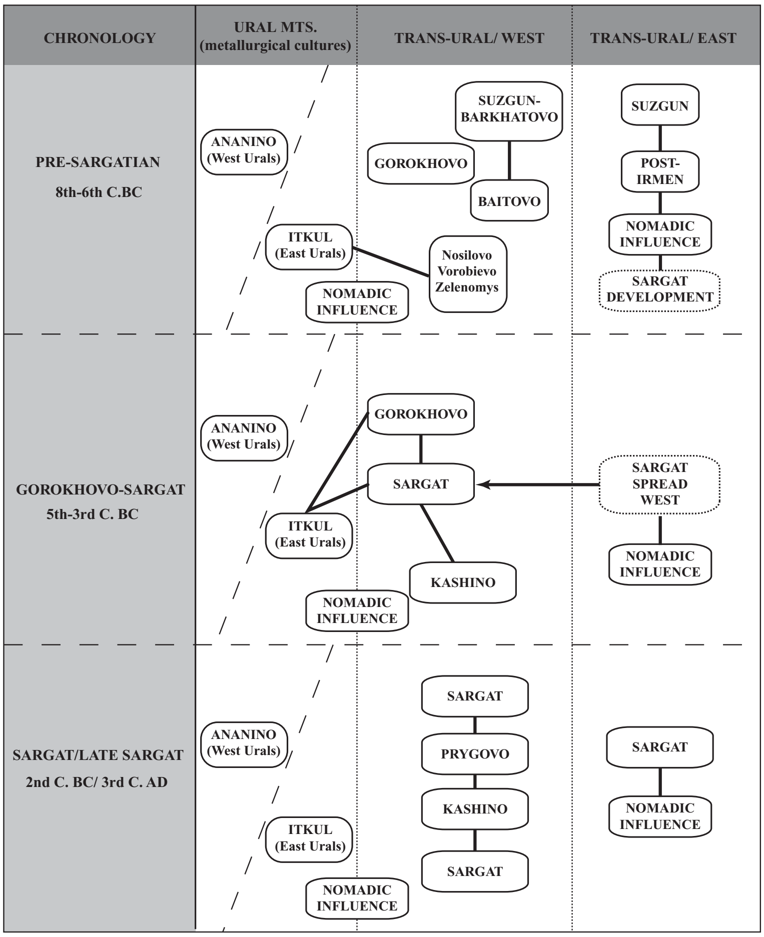


Figure 4.1 *Schematic detailing the spatial-temporal developments within the Trans-Ural region regarding conventional 'archaeological culture' patterns.*

for the proposed interaction and development among variously proposed 'archaeological cultures' during the development of the Sargat phase. Following a temporal framework put forth by Koryakova and Daire (1997), Figure 4.1 shows that the Early Iron Age period for the Trans-Ural region can be broadly divided into three chronological divisions: the Pre-Sargat (8^{th}-6^{th} c. BC), Gorokhovo-Sargat (5^{th}-3^{rd} c. BC), and the Sargat/Late-Sargat (2^{nd} c.

BC/ 3rd c. AD). The *Pre-Sargat stage* reflects the significant interaction between the Itkul metallurgical populations, located in the eastern area of the Ural Mountains, and the nomadic Saka and later Sauro-Sarmatian populations of the southern steppe that ranged north and south seasonally and penetrated the Trans-Ural area.

This interaction is in turn thought to have directly influenced the development of the indigenous forest and forest-steppe cultures in the western Trans-Ural that are known as the Iset group; comprised of the Nosilovo, Vorobievo and Zelenomys cultures. From this significant sphere of contact, two main cultural lines are believed to have developed and are named the Gorokhovo and Baitovo. According to Koryakova and Daire (1997, 166), the Baitovo cultural tradition may be connected to the earlier Suzgun Barkhatovo pattern associated with the Late Bronze Age period.

In the eastern Trans-Ural, the Pre-Sargat stage also reflects an important period of contact with the nomadic populations of the south. In this case, there is a proposed direct interaction and stimulation of the Suzgun cultural group and its subsequent development in connection with the Post-Irmen type. From these socio-cultural dynamics the earliest development, or *genesis*, of the Sargat culture is inferred and the start of its expansion is taken to be visible in the archaeological record.

The *Gorokhovo-Sargat stage* reflects continued interaction between the Trans-Ural forest-steppe and metallurgical cultures with the nomadic Saka and Sauro-Sarmatian tribes of the southern Kazakhstan steppe region. During this period the Gorokhovo culture absorbed the other local Iset groups (i.e. Baitovo, Nosilovo, etc.) and became a more significant factor in the socio-political development of the Trans-Ural region. As such, the Gorokhovo culture has traditionally been characterised as a *semi-nomadic chiefdom level* society that reached its zenith during the 4th-3rd centuries BC (Koryakova 1988, Koryakova and Daire 1997, 167).

It is also at this time that the hypothesised westward expansion of the Sargat cultural groups occurred, whereby the gradual absorption of the Gorokhovo and other cultural groups took place by the end of the 3rd century BC. It is believed that within this time frame the Sargat cultural pattern intensified and thus extended from the Ural Mountains east to the Baraba plain in the West Siberian plateau. As Koryakova and Daire have stated:

> "the early Sargat complexes emerged and spread westward. In the Ishym River valley the traditions of the western and eastern parts intermingled. The main characteristic of the cultures in the Pre-Sargat stage was their capacity to coexist under diverse conditions. The cultural genesis ran like the process of natural selection, resulting in the dominance of the Sargat line of evolution."
>
> (1997, 167)

In the *Sargat/Late-Sargat* phase, according to most regional scholars, a general stabilisation period for the Trans-Ural region can be inferred. The widespread Sargat culture became a vital component in the ever-increasing activity of long distance trade and exchange networks associated with the larger Eurasian geographical sphere. It is at this time that artefacts reflecting Roman, Chinese, Hunnic and Central Asian origins or influences appeared in several Sargat settlement and mortuary contexts in the east and west of the Trans-Ural region. Some scholars have emphasised the important role of the Sargat phase in the early development of a long distance trade route between eastern and western Eurasia, one that perhaps may have provided an early foundation for the later Silk Road trade route (Koryakova 1988; 1998a, 215; Matveeva 1993b; 2000, 76). According to Koryakova and Daire, concerning imported objects in the Sargat region, “about 25% derive from the south, about 15% come from the eastern (Hunnic) world and about 10% from the west” (1997, 171). The increasing importance of the Sargat groups within the greater regional dynamics signalled a stronger orientation towards the southern Central Asian area and the nomadic groups that occupied this region. The material record, reflected in the settlements and mortuary sites of the Sargat culture, yields a strong connection in both artefacts as well as particular patterns of mortuary practices. Some of these patterns will be discussed and illustrated in more detail in the following sections of this chapter (settlement sites) and also Chapter Seven, which investigates the mortuary materials in more detail.

Concerning the *Late Sargat phase*, archaeologists have suggested the appearance of new lines of cultural development evident in pottery styles labelled as the Kashino and Prigovo types. This coincides with the general decline of the Sargat phase, which can be seen to occur from the 3rd to 5th centuries AD. Unfortunately, this final period is very poorly understood and not well represented archaeologically. Nevertheless, the general picture is that of a progressive disintegration of several of the larger cultural patterns both in the Trans-Urals, relating to the Sargat and Itkul groups, and in the Southern Ural region regarding the nomadic Sarmatian tribes. The causes of these socio-political changes have been connected with a number of factors: climatic changes, appearance and spread of various northern forest cultures southward into the forest-steppe zone, and the territorial growth of the Hun tribes in the eastern area and the Alans in the southern region. These developments and their associated population demographics have often been linked with the greater historical phenomenon known as the Great Migration Period, which appeared throughout much of Eurasia by the 5th century AD.

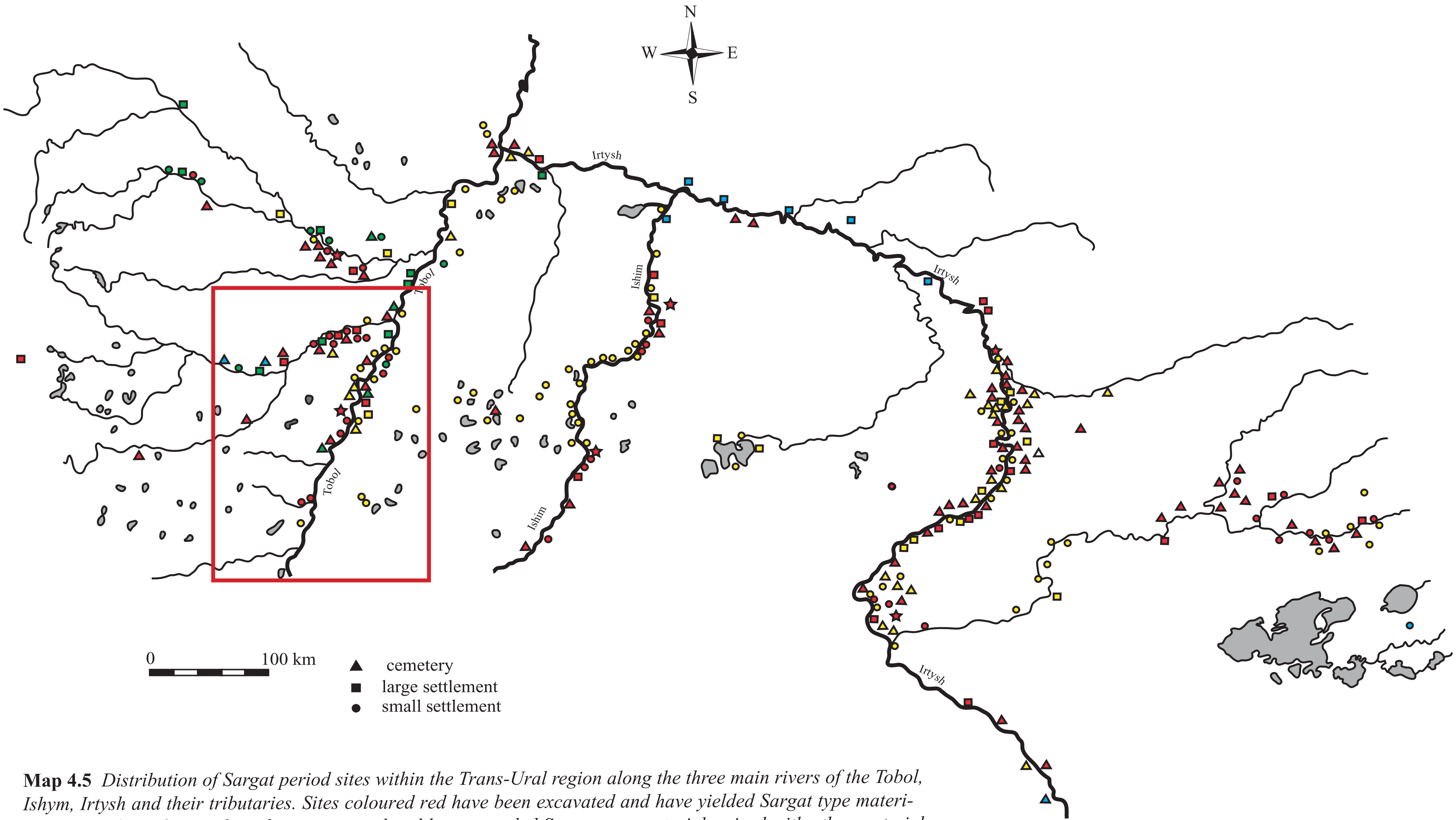
Based on the general culture historical overview of the Early Iron Age of the Trans-Ural region presented above, one may point to a number of issues that necessitate a finer-grained approach both archaeologically and theoretically. Because of the long spatial and temporal development of the Sargat culture, indeed nearly 1,000 years, and the fact that there are approximately 600 sites recognised for the Sargat phase (including south west Siberia and Trans-Ural territories – Matveeva 2000), it would not be feasible to attempt to address the whole of this period through the goals and structure of this thesis. Therefore, a more focused attempt will be placed on analysing the Gorokhovo-Sargat phase, which has a temporal horizon of approximately the 5th to 3rd centuries BC. Furthermore, attention will be placed on investigating the western development of the Gorokhovo-Sargat in the Middle-Tobol River region, where there is a higher degree of archaeological excavation and the number of settlement and mortuary sites that have been investigated is more balanced.

4.5 The Middle Tobol River Region

The archaeological investigation of the Sargat phase in the Trans-Ural region has been conventionally characterised by the survey and excavation of numerous kurgan mortuary complexes as well as open plan and fortified settlement complexes yielding similar material cultural patterns. The general geography of the region, as outlined above, is represented by the three large river systems of the Irtysh, Ishym, and Tobol, all of which flow northward into the Ob River. It can be seen that most of the settlements and mortuary sites within this region are situated along the three main river valleys and their associated tributaries (Map 4.5).

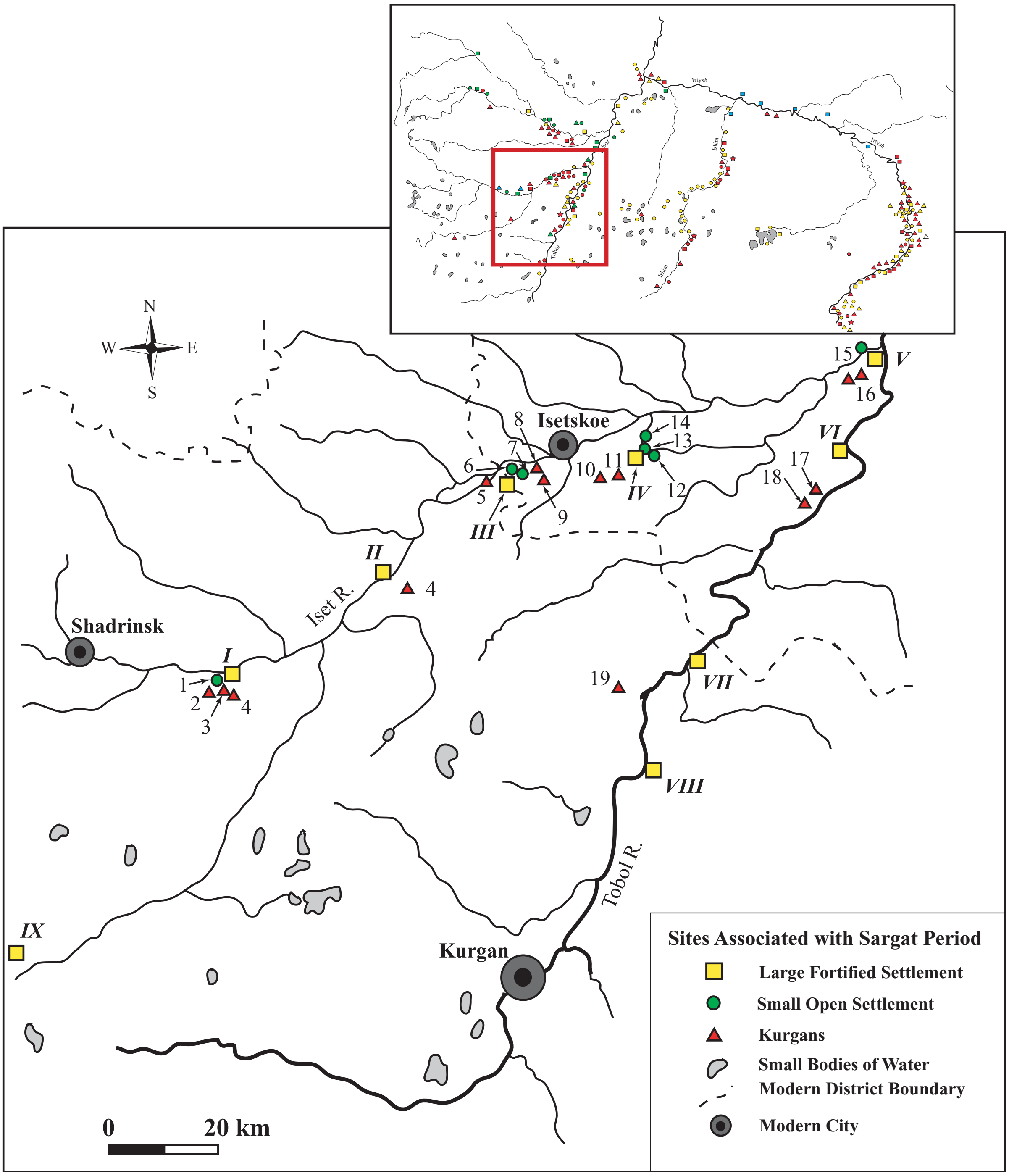
Survey and archaeological excavation in the eastern Trans-Ural region, i.e. along the Ishym and Irtysh river valleys, have produced important information regarding mortuary contexts (particularly a few burial sites of the Late Sargat Period with rich varied grave good sets) and settlement sites. Unfortunately, the documentation and publication of the archaeological work in this region has up to the present time been very limited and unpublished information on this region was unavailable for consultation. By contrast, however, in recent years a substantial amount of investigation has been undertaken in the western Trans-Ural region, particularly within the Middle Tobol River area where the river Iset joins the Tobol (Map 4.6). Sites relating to the Iron Age period within this zone have been actively investigated during the past two decades by two main archaeological groups: (1) archaeological teams from Ural State University and the Institute of History and Archaeology in Ekaterinburg, under the direction of L.N. Koryakova (also in collaboration with French archaeological teams since 1993), and (2) archaeological teams from the Institute of Archaeology in Tyumen, under the direction of N.P. Matveeva and A.V. Matveev. A number of field reports as well as professional publications have been generated by both groups working within this region and much of the research relating to the Ekaterinburg based archaeology teams was made available to me for my thesis research.

Although it will not be possible to present a large proportion of information regarding the research in the Middle-Tobol region within this thesis, it is nevertheless important to provide a general overview of the approaches to the archaeology of the region, as well as some of the main theoretical



Map 4.5 *Distribution of Sargat period sites within the Trans-Ural region along the three main rivers of the Tobol, Ishym, Irtysh and their tributaries. Sites coloured red have been excavated and have yielded Sargat type materials, sites coloured green have been excavated and have revealed Sargat type materials mixed with other material artefact types, and sites in yellow have only been surveyed. Area denoted within red rectangle is the Middle-Tobol River region.*

Map 4.6 *Map of the Middle-Tobol River region detailing the settlement and mortuary sites of the Sargat phase that are discussed within text.*



Sites Discussed in Text

Fortified Settlements		Open Settlements		Cemeteries	
I	Prigovo	1	Prigovo	2, 3, 4	Prigovo 1,
II	Pavlinovo	6, 7	Rafailovo-1, 2	5	Gaievo
III	Ravailovo	12, 13, 14	Kolovo-1, 2, 3	8, 9	Ravailovo 1, 2
IV	Kolovo	15	Karasi	10, 11	Krasnogorskii Borok
V	Staro-Libayevo			16	Shushye - Karacye
VI	Malo Ziryanka			17	Savinovski
VII	Baitovo			18	Tyutrinski
VIII	Uval			19	Skaty
IX	MaloKazakhbaievo				

models regarding the Sargat phase that have been generated in recent years. As such, the following discussion will mainly draw upon the publications and associated research of both the Ekaterinburg and Tyumen teams.

It should be noted, however, that there is considerable agreement and disagreement between these two teams regarding the hypotheses of the Sargat development. For example, in recent years Matveeva has been particularly active in the discussion of the proposed settlement patterning and territorial organisation of the Middle-Tobol region (e.g. Matveeva 1993a; 2000). The result of this has been several publications detailing various hypotheses regarding socio-economic models and proposed spatial characteristics inherent within semi-nomadic pastoralist practices. Koryakova, on the other hand, has developed a collaborative research project with the CNRS in France, and has attempted to undertake a more scientific and 'environmentally aware' research program, combining specialists in faunal studies, geoarchaeology, and archaeobotanical research in the investigation of settlements and mortuary sites. Koryakova's publications have also been more conservative regarding the relationships between the various settlement sites and mortuary complexes, and instead have underscored the variability and complexity of the material record as well as the need to achieve a more precise chronological framework for the Early Iron Age period in the Trans-Ural region.

4.5.1 Modelling Territorial Organisation and Settlement Patterns

In several recent publications, Matveeva has presented archaeological materials relating to the Gorokhovo and Sargat phases in the Trans-Ural region (1987, 1993a, 1993b, 2000, Matveeva & Larin 2000). One of the primary results of this work has been the compilation of a significant database of excavated Early Iron Age sites and their respective patterns of material culture. As a result, a great deal of useful information has been published regarding the number of sites and their associative cultural materials and contexts. For example, charts detailing the total number of settlements and mortuary sites, relative to both Gorokhovo and Sargat material cultural patterns by region, can be found in Table 4.4. These tables give an indication as to the substantial number of archaeological sites relating to this Early Iron Age phase in the Trans-Ural region.

REGION	GOROKHOVO SETTLEMENTS	GOROKHOVO CEMETERIES
Tobol River and Tributaries	185	42
REGION	SARGAT SETTLEMENTS	SARGAT CEMETERIES
Baraba Plain	19	65
Irtysh River and Tributaries	83	13
Ishym River and Tributaries	48	11
Tobol and Tributaries	60	48

Table 4.4 *Number of settlements and cemetery sites relating to Gorokhovo and Sargat phases (data assembled from Matveeva 2000).*

One of the most distinctive models regarding the territorial organisation of the Middle-Tobol area has also been put forth by Matveeva, who has argued for a recognisable patterned distribution of fortified and non-fortified settlement sites and related cemetery complexes. This model is important because it speaks directly to a theoretical interpretation of the socio-political, economic, and territorial organisation of the Middle-Tobol area from the Pre-Sargat to the Late Sargat phases. Matveeva's model can be interpreted as one that generally follows the pattern of spatial analysis used for establishing hierarchical settlement patterns within specified geographical locales. In short, it falls in within the concept of *Central Place Theory,* an analytical construct commonly used among processual archaeologists in the West. Indeed, within a recent publication (2000), Matveeva cites several references to early Western literature (e.g. Blouet 1972, Johnson 1972; Renfrew 1977) regarding analytical approaches to settlement patterning. Through the use of this particular theoretical construct, Matveeva has sought to establish parameters for relationships between larger fortified settlements, smaller open planned settlements, and associated kurgan cemetery complexes.

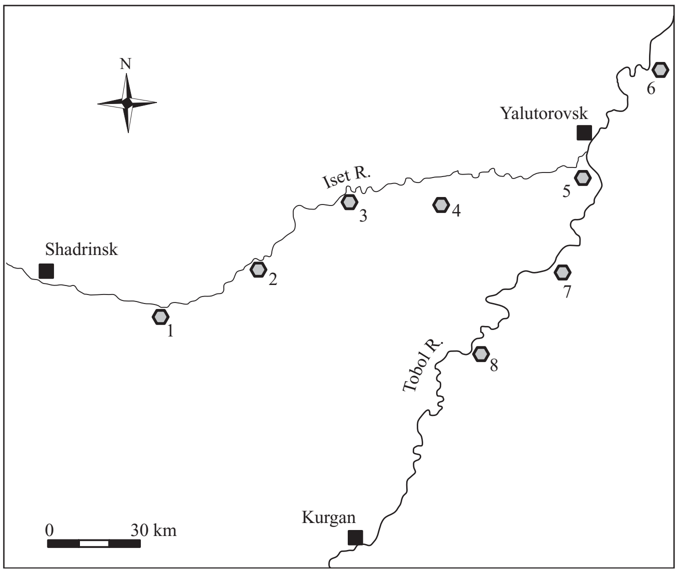


Figure 4.2 *Map detailing the distribution of fortified sites relating to the Gorokhovo and Sargat Period: 1 - Prigovo; 2 - Pavlinovo; 3 - Rafailovo; 4 - Kolovo; 5 - Staro-Libaevskoe; 6 - Revda; 7 - Skorodum; Uval-4 (redrawn from Matveeva 2000, 32).*

For example, Figure 4.2 provides a map showing the distribution of large fortified settlements along the Iset and Tobol rivers, which according to Matveeva represent distinctively individual *territorial zones* (Matveeva & Larin 2000, 15-16). In total, Matveeva has listed 10 such fortified sites in the Tobol basin, 5 in the Ishym, and 14 in the Irtysh. These proposed zones are situated approximately 8-10 km apart with the fortified settlement sites ranging approximately 30-40 km apart. A total of 10-15 sites are taken to represent each zone and comprise a combination of open and fortified settlements and kurgan cemetery complexes situated along the larger river courses or tributaries.

Matveeva's concept of the territorial zone is based upon a premise that the Early Iron Age populations, which inhabited the Middle-Tobol region, can be most aptly characterised as tribal societies existing at the chiefdom level. It is inferred that such a distinctly ranked form of society would account for not only the nucleated type of settlement patterning, with representative hierarchical and centralised settlement complexes, but also for what has been proposed as evidence for distinct hierarchical social ranking (based on grave goods and burial constructions) in the burials of the temporally and spatially associated cemetery complexes (Matveeva 1994).

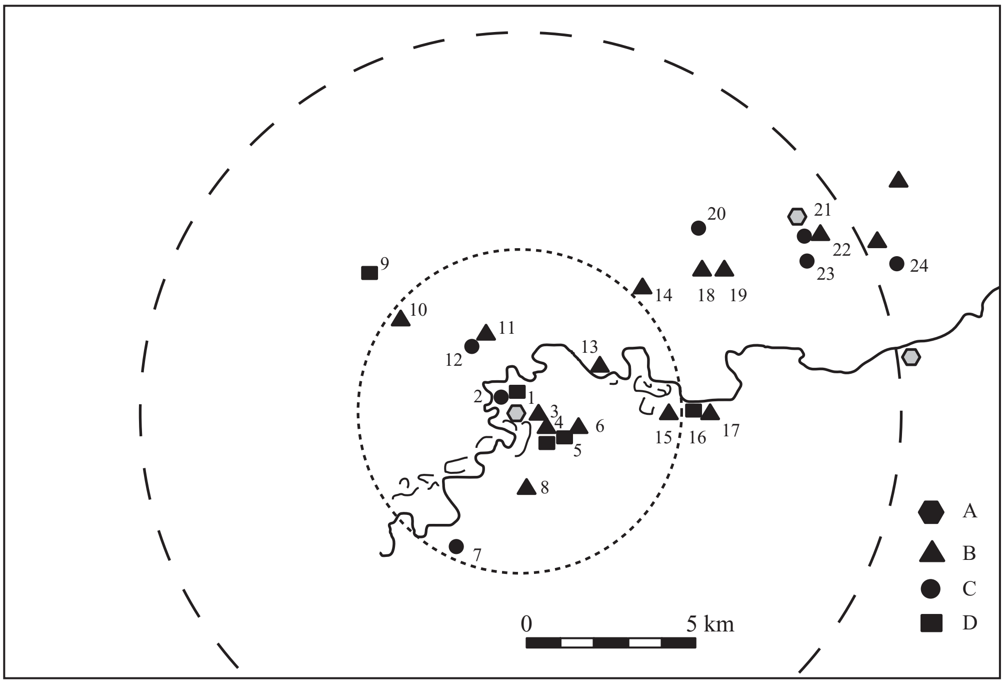


Figure 4.3 *Proposed territorial zone for the fortified settlement site of Rafailovo: A - large settlement; B - kurgan site; C - small seasonal settlement; D - multi-phase or multi-cultural settlement (redrawn from Matveeva 2000, 33).*

Although Matveeva has investigated several archaeological sites within the Middle-Tobol region, the fortified settlements of Raifailovo and Kolovo have received a great deal of attention by the Tyumen archaeological teams and have been published in some detail. For example, Figure 4.3 illustrates the proposed territorial zone of the fortified site of Rafailovo. According to Matveeva's argument, fortification settlements such as these acted as focal points for the initial settlement of the territory by the westward moving Sargat tribes. Following a model that suggests the populations were semi-nomadic, it is believed that the surrounding unfortified settlements, and associated mortuary complexes, reflect the progressive development of territorial boundaries within individual zones (Matveeva & Larin 2000).

Further to this, Matveeva has put forth a typology regarding the fortification centres, which has been based on the orientation plans of the settlement sites, proposed chronological occupation phases (achieved primarily through relative dating), and the characteristics of the dwelling structures and fortification systems:

1. *Leader's Residence*: characterised by a small fortress with a much larger associated settlement area. Fortified areas are believed to be the actual residence of higher ranked societal members (sites of Prigovo and Kolovo given as examples).

2. *Common Refuge*: large fortresses with a smaller surrounding settlement area. Fortifications may have acted as place of refuge in time of stress (the Rafailovo fortified settlement and Batakovo-XIX are given as examples).

3. *Watch-Tower*: These sites acted as outpost settlements on the periphery of the Sargat territory (the sites of Bogdanovo-1, Kartashovo-3, Stary Pogost, and Ak-Tau are given as examples).

4. *Tribal Centre*: These fortified sites acted as large population centres and reflect trading focal points for both regional and long-distance trade, developed handicrafts, and a mixed cultural population (Rafailovo settlement given as an example).

(Matveeva 1999; forthcoming, 330)

Again, one can see that the proposed typological structure of the settlements fits within a hierarchical framework that is based upon the respective size of the sites, complexity of the associated physical structures, and relationships to peripheral settlement areas. Furthermore, it has been theorised that the site hierarchy can best be described as relating to a chiefdom level of social organisation (Figure 4.4). Although this model may provide a good starting point for exploring the variation between the settlements, the archaeological investigation of the various sites have not exactly attempted to 'test' this particular model. I will develop this point in more detail below through my discussion of the results of settlement excavations in the Middle Tobol River region. I will return to this issue and the problems associated with such interpretations in the final section of the chapter. However, at this time, I would like to discuss in more detail some of the main characteristics associated with the settlements as well as some of the general categories of artefacts that have been recovered during excavation. This will help to build a general picture of the settlement patterns and material artefact categories. This will then provide an important archaeological context for a further discussion concerning Early Iron Age economic models and hypothesised animal husbandry regimes and their relationship to the specific characteristics of the animal bone remains that have been recovered from the sites.

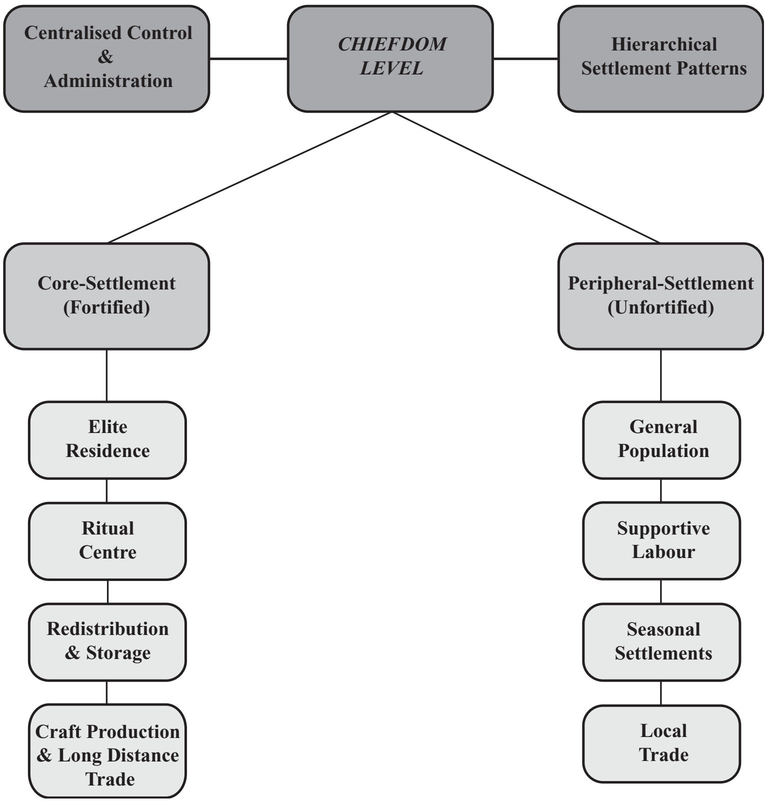


Figure 4.4 *Hypothetical model of chiefdom level social organisation and related settlement patterning for the Early Iron Age Trans-Ural region.*

There are several general characteristics that the fortified settlement sites within the Middle-Tobol region have in common. The majority of the sites are located along high riverbank terraces and are typically situated in areas where the naturally formed terraces can be incorporated within the

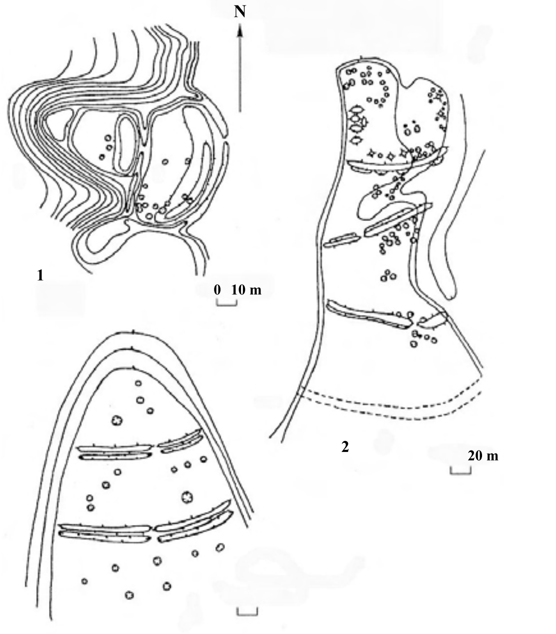


Figure 4.5 *Plan detailing the types of fortified settlements associated with the Sargat Period: 1 - promontory type (Uct'-Tercukskoe); 2 - cape type (Prigovo); 3 - waterside type (Barkhatovckoe) (after Matveeva 2000, 44).*

strategy of the fortification construction of the site. As a result of the use of the naturally occurring topographical features, there is a great deal of inconsistency within the overall orientation or arrangement of the settlements. This includes defensive features, open areas, and the general clustering or spacing of house structures located both within the fortification zone and on the outside. Although there is rather strong variability among the sites, Matveeva (forthcoming) has recently classified the fortification settlements into three broad categories: cape, promontory, and waterside (Fig. 4.5).

According to Matveeva (ibid.), the cape type settlements are situated on narrow terraces, often with water on one or more sides, and are enclosed by fortification features that bisect the cape in one or more areas. The promontory types, which have been previously investigated and characterised by Koryakova (1988), are situated on high promontory terrace features and make use of both the natural bank line associated with the course of the river and various constructed banks and ditches on the other sides that form in a circular manner. The waterside types are generally characterised by a rectangular or circular enclosure system, and are also comprised of banks, ditches, and other defensive structures.

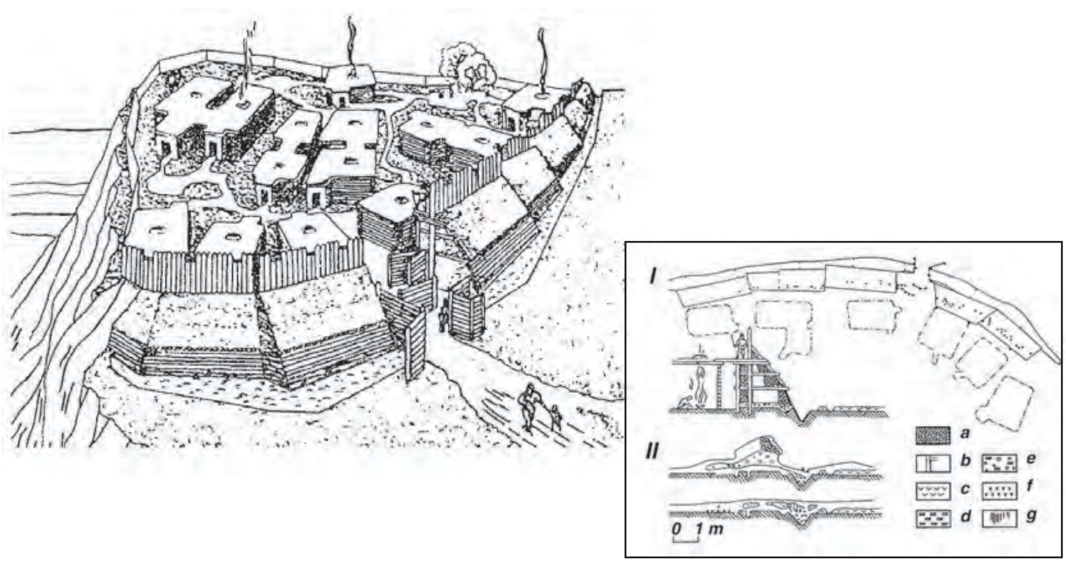


Figure 4.6 *Reconstruction of the Ak-Tau fortified settlement: I - plan of ditch and bank features; II - elements of fortification destruction and erosion; a - earthen wall feature; b - wooden construction; c - clay stratum; d - foundation; e - charcoal; f - firepit (Khabdulina 1994).*

The fortified settlements also have a tendency to reveal archaeological indications for the intensive use of wooden constructions, such as palisades and escarpments, for the strengthening of the defensive structures. One of the best examples of such a complex is the site of Ak-Tau (Fig. 4.6). M.K. Khabdulina has thoroughly studied the methods of construction for the fortifications at this site and has developed several interesting possible reconstructions of the defensive complex (1993).

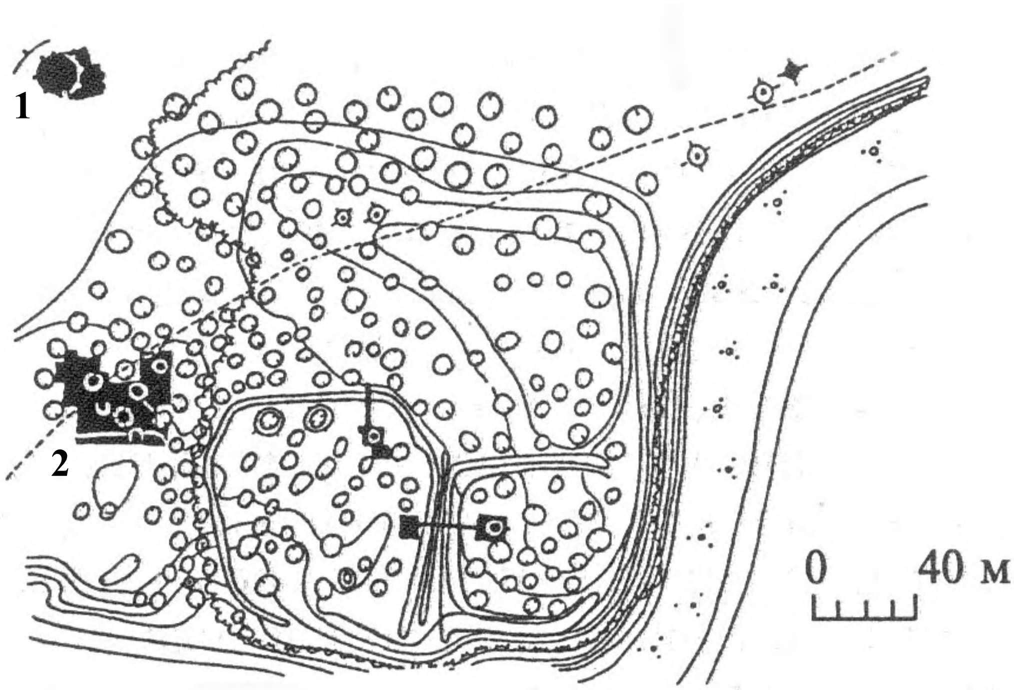
The overall spatial territory of the fortified settlements varies from between 1 to 6 hectares, which includes areas enclosed by defensive constructions as well as the dwellings and associated structures (typically seen as circular or oval shaped depressions in the landscape) situated on the outside. The total area enclosed by the fortifications also varies considerably and can range from 2,000 - 10,000 m^2.

4.5.2 The Rafailovo Fortified Settlement

As an example, the fortified site of Rafailovo (Fig. 4.7) is a particularly large fortification complex yielding two different phases of occupation based on stratigraphic association and calibrated radiocarbon dating – an early date of approximately 420-345 BC Cal and a second at 220-190 BC Cal (Matveeva 2000). During 1983-1987 the site was investigated by archaeological teams from Tyumen city, who undertook the excavation (both plan excavation and trenching) of areas inside the fortifications, a large area outside the fortified complex, and several kurgan burial mounds located at the periphery of the settlement on elevated terraces. The settlement area itself comprised two large fortified areas (65 m x 80 m and 90 m x 100 m) as well as an open habitation area around the periphery. In all, the excavations revealed 21 dwelling structures, 7 supplemental domestic structures, various defensive constructions, general open square areas, and kurgan mortuary complexes (Matveeva 2000, 148). Figure 4.8 provides a general plan of the excavated area outside the fortification and illustrates a number of the dwelling structures and associated features in addition to evidence for the various construction phases of the site.

The dwelling structures associated with the Rafailovo settlement are typical of those found at other contemporaneous Gorokhovo-Sargat period settlement sites; Figure 4.9 provides some examples of the general plan or layout features of the dwelling structures. Although most of the structures are referred to as ‘houses’ within the Russian literature and archaeological field reports, there is substantial variation in the size and orientation of the foundations of the structures and it is likely that some of these constructions may have been used for activities other than as simple ‘dwellings’. For example, Figure 4.10 provides an example of a large square structure with two entrances and a rectangular attached structure. One should consider the likelihood that attached structures such as these may have been used for other purposes such as work areas for various tasks, shelter or stalling for either young

Figure 4.7 *Plan of the Rafailovo fortified settlement site and peripheral kurgans: 1 - excavated kurgans; 2 - plan excavation of settlement features (dark squares and trenches); small circles represent topographical depressions that are Iron Age dwelling structure features (after Matveeva 1993b,149).*



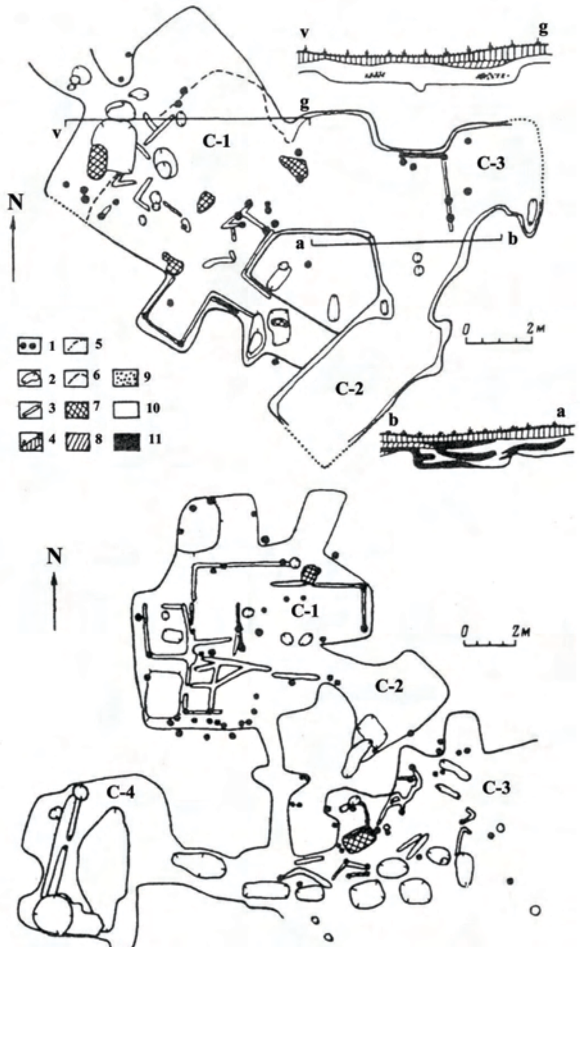


Figure 4.8 *Excavation plan from the Rafailovo settlement site, Dwelling structures 1(2) and 3(1): C 1-4 - individual rooms; 1 - posthole; 2 - domestic pit feature; 3 - ditch; 4 - charcoal deposit; 5 - foundation limits; 6 - construction feature; 7 - fire pit; 8 - grey sandy loam; 9 - ash deposit; 10 - grey-brown sandy loam; 11 - black sandy loam (after Matveeva 1993b, 152).*

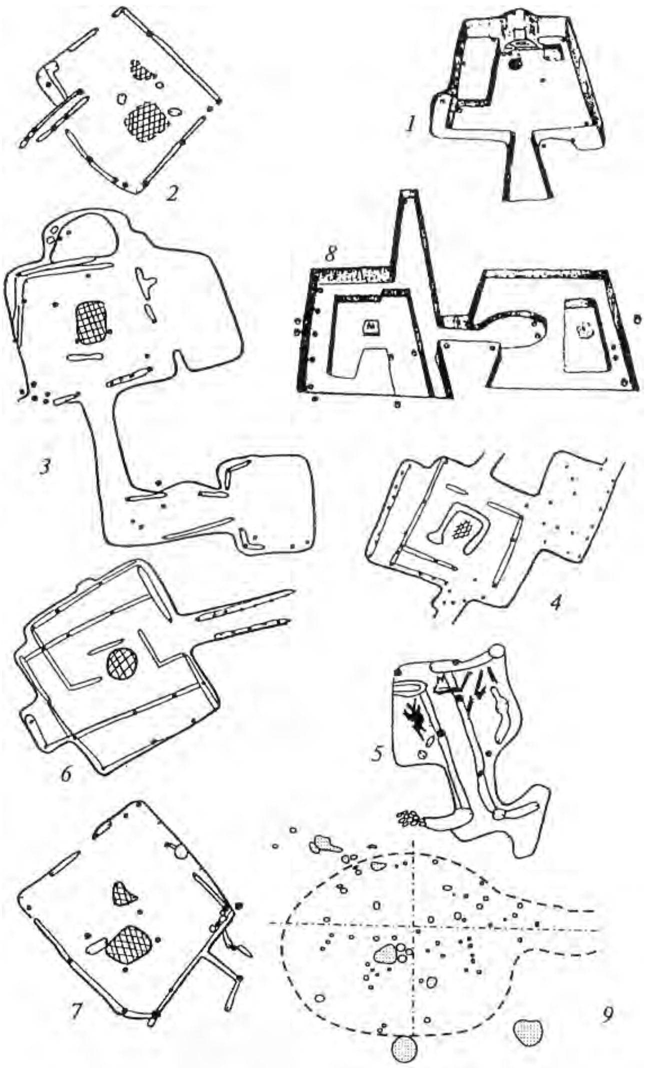


Figure 4.9 *General plans of dwelling structures from various settlement sites associated with the Sargat period: 1 - house # 5 Rafailovo settlement; 2, 5, 7 - general domestic structures from the Rafailovo settlement; 4 - house # 2 feature from Ingalinka-1 settlement; 6 - dwelling structure from Rafailovo island site; 8 - house # 1 from Rechkinskovo-2 settlement; 9 - house # 1 from Loshka-4 settlement (after Matveeva 2000, 39).*

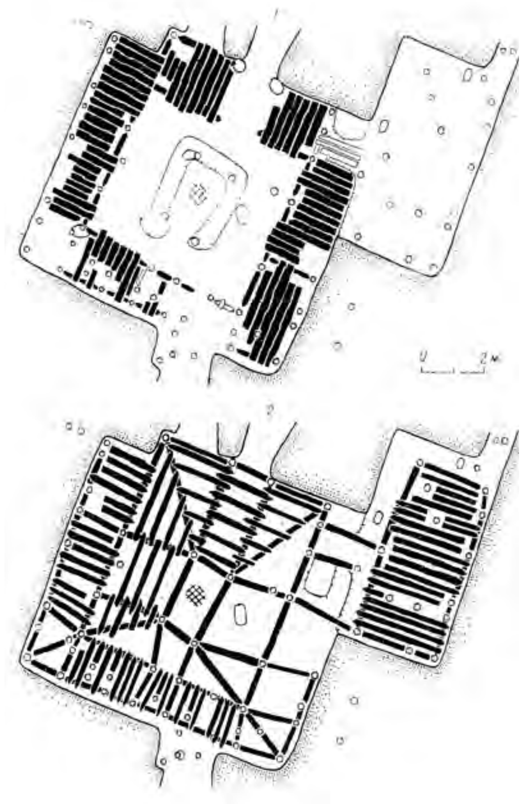
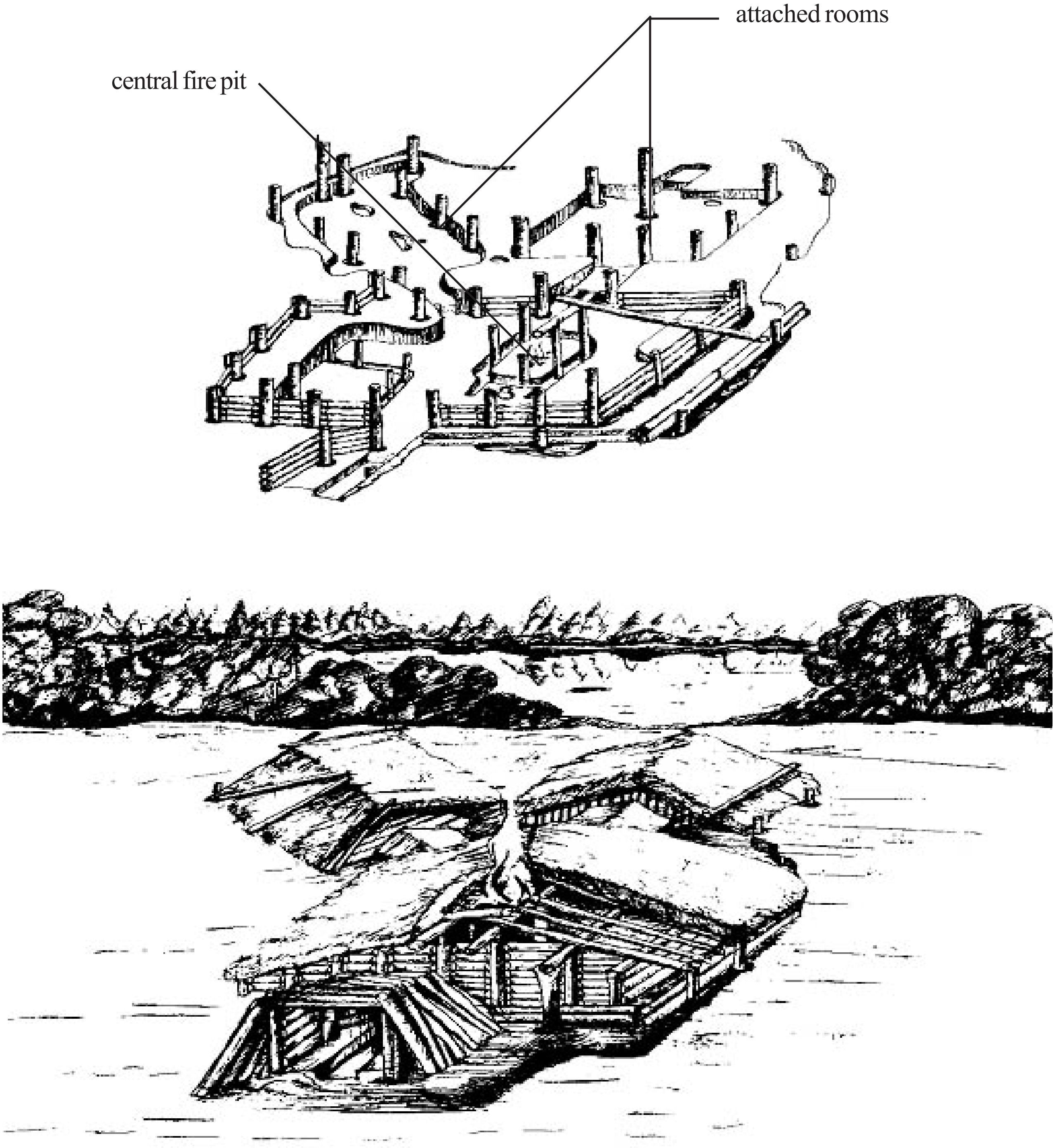
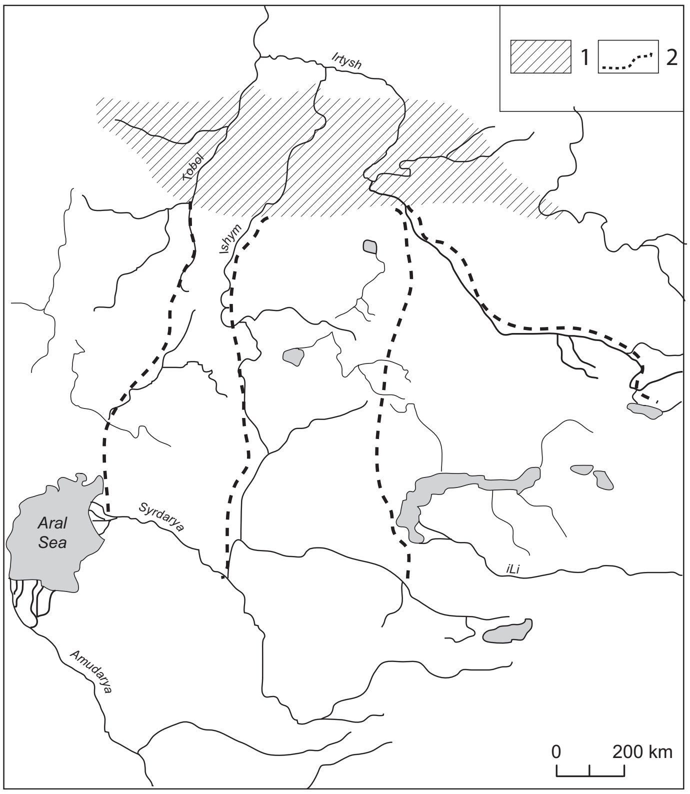


Figure 4.10 *Plan of dwelling structure from the Sargat settlement site of Ingalinka-1 (Matveeva 1993,130).*

Figure 4.11 *Reconstruction of Sargat period dwelling structure based on a general plan from the settlement site of Duvanskoe-2 (after Koryakova 1988).*





Map 4.7 *Map showing proposed caravan routes based on distribution of artefacts between steppe and forest-steppe regions: 1 - distribution area of Sargat period sites; 2 - proposed caravan routes (redrawn from Matveeva 2000, 77).*

animals or individual animals such as horses, and as possible storage areas. All of these possibilities are significant when considering the deposition patterns of both faunal remains and other material cultural traces within the settlements. I will return to this issue later in Chapter Five, when I provide a detailed discussion of the Pavlinovo fortified settlement and the presentation of data obtained through fieldwork at this site.

Generally speaking, the traces of the foundations of the Iron Age buildings are usually quite well preserved as a result of being dug down through the paleo-soil levels. Although they cannot be considered as truly semi-subterranean in construction, the limits of the wooden structures are usually quite easily defined during excavation. Hence, the cultural floor levels, postholes, fire pits, subsoil pits, animal bone remains, tools, pottery fragments and other remains associated with both the architectural features as well as the deposited remains associated with various past human activities are usually well preserved and are typically encountered during archaeological investigations.

The larger 'house' structures are usually comprised of a sizeable central room with a fire pit and a U-shaped feature surrounding it (Fig. 4.11). Additionally, one or more adjacent or attached rooms are commonly associated with the buildings. These separate rooms also typically reveal evidence of fire pits, ceramics and animal bone fragment debris, and pit features within the floors. Therefore, the 'dwelling' structures are quite complex in their construction and layout and generally provide rich contexts concerning material artefact deposits. As noted above, a more detailed investigation of these particular contexts will be presented in Chapter Five through a discussion of the Pavlinovo fortified settlement.

Returning to the topic of the Rafailovo settlement, Matveeva (2000; Matveeva & Larin 2000) has postulated that this site was a major regional centre and functioned as an important link for long distance trade with Central Asia (Map 4.7). The high number of import items, represented by a total of 40 different categories of artefacts, clearly reflect the importance of this site in trade and exchange

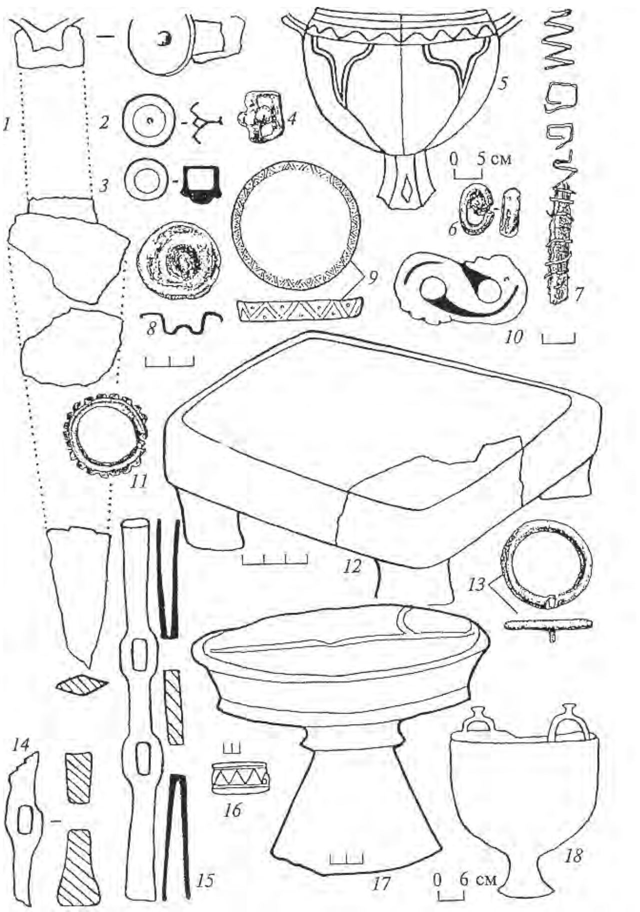


Figure 4.12 *Artefacts recovered from the site of Rafailovo reflecting long-distance trade: 1 - iron-bronze knife; 2, 3, 4, 6, 10, 11,13 - bronze ornaments and fasteners; 5, 18 - bronze cauldrons; 7, 8 silver fragments; 12 - 'altar' stone; 14, 15 iron implements - adze and horse harness element; 16 - clay ring; 17 - clay 'alrar' (after Matveeva 2000, 64).*

between the northern forest-steppe region and the steppe zone of Central Asia (Figure 4.12) during the Early Iron Age period. The presence of camel bones (*Camelus bactrianus*) recovered from faunal assemblages from various forest-steppe settlement locales has also been used to support the theory of the development of an early caravan trade route between the north and south (Table 4.5).

Based on both relative dating (achieved through artefact typologies and stratigraphic associations) and radiocarbon dating the earlier phase of settlement at Rafailovo, 4th-2nd c. BC, corresponds with the Gorokhovo-Sargat phases encountered within other fortified and non-fortified settlement sites excavated within the region. Matveeva proposes the associative chronologies for the following sites (taken from forthcoming, 329): Prigovo – from 4th-3rd c. BC to 3rd-2nd c. AD; Pavlinovo – 4th-2nd c. BC (after Sergeev, Sharapova, Koryakova, and Kovrigin 1995); Rafailovo and Kolovo – 4th-2nd c. BC (Matveeva 1993b); Uval-4 – 3rd-2nd c. BC.

Settlement Site	Cow NISP %	Sheep/Goat NISP %	Horse NISP %	Camel NISP %
Kalachik-1, G.	42.9	-	57.1	-
Rafailovskoe, G	42.4	14.7	39.5	3.4
Rafailovskii O.	45	10	42.5	2.5
Kolovskoe, G.	33.3	25	41.7	-
Rechkinskoe-	31.2	18.8	50	-
Rechkinskoe-1	58.8	5.9	35.3	-
Duvanskoe-2	42.1	15.8	42.1	-
Duvansko1	50	-	50	-
Duanskoe-18	28.6	28.6	42.8	-
Bochantsevskoe-1	59.3	18.5	22.2	-
Verkhne-Ingal'skii Borok-2	40	30	30	-
Uzlovskoe	40	20	33.4	6.6
Ak-Tau	27.3	18.2	45.4	9.1
Gornaya Bitiya	30	10	60	-
Kokonovskoe	36.8	36.8	26.4	-
Bitiye Gorki	25	50	25	-
Bogdanovskoe, G.	22.9	20.3	56.8	-
Karganovskoe	50	-	50	-
Lozhkovskoe-4	40	20	40	-
Markovskoe-5	20	60	20	-

Table 4.5 *Number of total fragments percentages for main domestic species and camel from several Sargat period sites in the forest-steppe zone (Matveeva 2000, 55).*

It is clear, based on the chronological examples above, that interesting Early Iron Age developments took place in both territorial organisation as well as settlement patterning during the Gorokhovo-Sargat phase. As the discussion above has shown, there is evidence that a strong emphasis was placed upon the development of defensive complexes within many of the settlement sites relating to this time period. Through the various models discussed above relating to Matveeva's publications, one can sense a particularly strong micro-level or regional explanation for the organisational patterns seen within the Middle-Tobol region. This view contrasts somewhat with the more macro-level interpretation offered by Koryakova, who has instead emphasised the importance of the forest-steppe zone as a northern periphery to the developments taking place within Central Asia and in the steppe environmental region in particular. Regarding this, Koryakova has often used the concept of World Systems theory to explain the effect of long distance trade and cultural interaction as well as the socio-economic and socio-political consequences of this within the Trans-Ural region and more specifically the Middle-Tobol River area.

4.6 The "Eurasian Crossroads" Project

While Matveeva has stressed a regional approach to the archaeological record of the Trans-Ural, Koryakova has attempted to extend beyond regional dynamics to suggest that during the Early Iron Age the Sargat territory was part of a much larger socio-political sphere, in effect, a significant component of a much wider Eurasian social and cultural world system:

> …during the early Scythian period, corresponding to the Hallstatt period in central and western Europe, the Eurasian temperate zone was drawn into a global network, accompanied by growing social complexity. By the 6th-5h centuries BC in the steppe and forest-steppe a specific system of highly stratified, centralised societies and chiefdoms had been established. In terms put forward in Russian theoretical explanations, this development can be described as an early class model (Khazanov 1975, 258).
>
> (Koryakova 1996, 265)

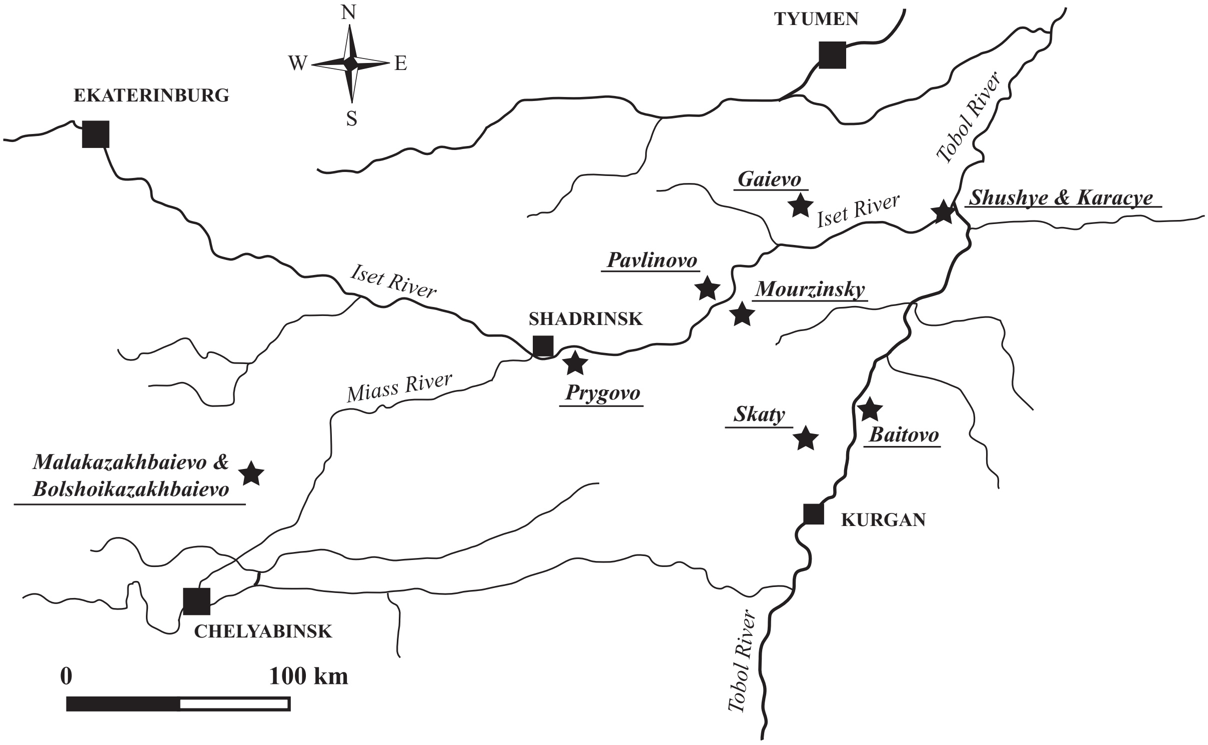
According to Koryakova, the Eurasian geographical area was divided into distinct 'cultural worlds', such as the nomadic world of the southern steppe region, the world of the proto-Finno-Permian cultures of the Pre-Ural region, and the Trans-Uralian forest-steppe cultures; all of which constituted the northern periphery of the nomadic world (Koryakova 2000). This concept of distinct spatial and "cultural worlds" has its underlying premise within the theoretical construct of *World Systems* approaches, a theory first proposed by I. Wallerstein (1974) regarding the interaction, exchange, and socio-political developments that took place between Europe and the newly discovered Americas. In recent years, several scholars have utilized this particular theoretical approach in an attempt to address larger spatial relationships between prehistoric cultural entities in Eurasia, particularly during the Bronze and Iron Ages (Kristiansen 1994; Sherratt 1993; Koryakova 1997).

Although Koryakova has emphasised the need to view the Sargat development in terms of the larger historical dynamics within Eurasia at the time, she has also been keen on developing stronger scientific fieldwork investigations at the regional level. As a result, a French-Russian collaborative fieldwork program has been in effect since 1993. This international program is composed of team members from the French CNRS (Rennes & Bordeaux) and the Russian Academy of Science (Institute of History and Archaeology & Ural State University – Ekaterinburg). The project has been under the direction of L.N. Koryakova for the Russian team and J-P. Pautreau and M-Y. Daire for the French team (Pautreau 1993-94 and Daire since 1995). The general theme of the work has been to examine settlement and mortuary sites within the Trans-Ural forest-steppe region, an area designated as a "Eurasian Crossroads" within the Early Iron Age period (Koryakova and Daire 2000).

Unfortunately, space constraints within this thesis prohibit more than an overview of the investigated sites associated with this international project. Nevertheless, the multidisciplinary investigations at these sites have yielded important archaeological, environmental, and cultural information regarding the inhabitation of the Middle Tobol River region during the Sargat period. This information has in turn stimulated further important theoretical questions concerning processes associated with the long-term dynamics of social and cultural change during the Early Iron Age period. It may also be noted, that a great deal of interpretation regarding animal husbandry practices, as well as theoretical hypotheses regarding the economic development of the period, have been stimulated from the excavations and the analyses of their associated zooarchaeological remains. I will therefore present and discuss some of the published results of the faunal analyses and compare them to data from other sites in the Middle Tobol region. My investigation of the faunal data will then provide an important foundation for exploring issues associated with conventional zooarchaeological methodologies and analyses, the specific problems associated with these, and ultimately their impact on understanding socio-economic and socio-cultural developments during the Early Iron Age period.

The research investigations associated with the international project have mainly focused on the Middle-Tobol River region, that is, sites located along the middle stretch of the Tobol River and its associated tributaries in this area (Iset, Miass and Karabolka Rivers). Since the project was initiated, a total of 8 archaeological sites, comprising 4 settlements and 6 cemetery complexes (Map 4.8), have been investigated and several area surveys undertaken. Chronologically, the sites are associated with the 7th c. BC to the 3rd c. AD and relate to the Gorokhovo-Sargat phases. However, a number of the sites clearly reveal earlier prehistoric traces (e.g. Neolithic) as well as much later Medieval Period activities (Fig. 4.13). Basic information regarding the location of the sites and their respective archaeological features is exemplified in Table 4.6. The following sections will provide an overview of the sites and their respective archaeological features and material cultural patterns. This information will be correlated with published and unpublished information regarding the recovered faunal remains from the sites as well. Taken together, this information will provide an important foundation for the contemporary models used for interpreting the Early Iron Age Gorokhovo-Sargat phase.

Map 4.8 *Map detailing locations of sites (dots) excavated by French-Russian team in the Trans-Ural region of Western Siberia from 1995-2002.*



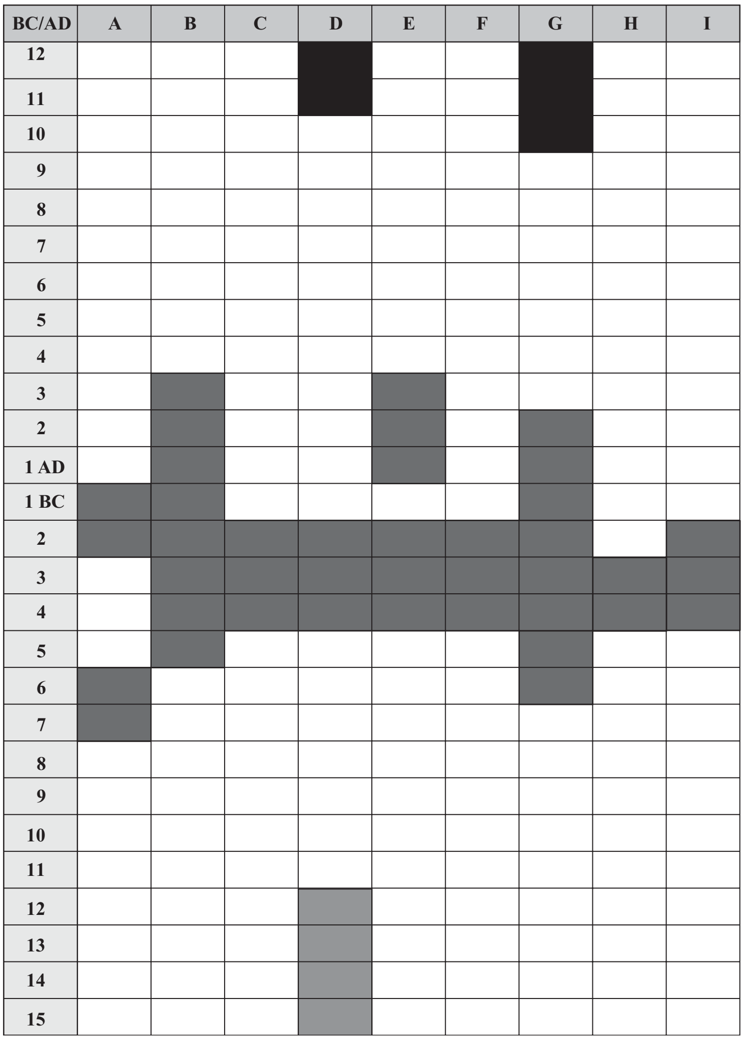


Figure 4.13 *Chronology chart exemplifying relative dates of excavated Sargat and Gorokhovo type settlement and mortuary sites: A - Prygovo cemetery; B - Murzino; C - Skaty; D - Bolshoi-Kazakhbaievo; E - Gaievo; F - Baitovo settlement; G - Prygovo settlement; H - Malo-Kazakhbaievo cemetery; I - Pavlinovo; black squares - Medieval Period features; dark grey - Iron Age Period features; light grey - Bronze Age features (redrawn from Koryakova & Daire 2000, 70).*

Cemetery	Location	No. of Kurgans	Kurgans Excavated	No. of Burials Excavated
Prygovo 2	Iset River	>12	3	4
Murzino	Iset River	25	9	19
Bolshoi-Kazakhbaievo	Karabolka River	>30	5	36
Skaty	Tobol River	>30	4	10
Gaievo 2	Iset River	>9	5	20
Shushye-Karacye	Iset River	>20	6	10
Settlement	**Location**	**Square Area**	**Excavated Area**	**No. of Houses and Structures Excavated**
Baitovo	Tobol River	10,000 m^2	200 m^2	3
Prygovo	Iset River	25,000 m^2	460 m^2	8
Malo-Kazakhbaievo	Karabolka	2,000 m^2	260 m^2	4
Pavlinovo	Iset River	100,000 m^2	1,200 m^2	12

Table 4.6 *General information relating to the archaeological sites investigated by the French-Russian international team since 1995 (after Koryakova and Daire 2000, 70).*

I should also like to note that a recent book, Daire & Koryakova 2002, was published approximately one month before the submission of this thesis. This publication details the results of the French-Russian archaeological field excavations at various sites within the Middle Tobol River region and thus shows a strong correlation with the various discussion and arguments put forth within this thesis. Prior to the publication of this book, I obtained most of the information needed for my thesis research through unpublished annual fieldwork and laboratory reports. This was particularly the case for the data concerning recovered faunal remains, which are discussed in detail below. As a result of the new publication, I made a concerted effort to incorporate as much of the newly published information as possible, however in some cases a combination of the unpublished and published information has been used. I should also like to note, that in the case of a contradiction between data in the published book and that detailed in the related and previously unpublished laboratory reports I chose to use the original laboratory data source.

Therefore, at this point I would like to move into a discussion of the archaeological characteristics of two large settlement site excavations and one smaller site excavation that have been undertaken by the joint French-Russian archaeological team. Information relative to the fortified settlements of Baitovo, Prygovo and MaloKazakhbaievo will be presented at this stage, however a detailed discussion of the fortified site of Pavlinovo will be undertaken in Chapter Five, which will also present the fieldwork relating to my two field seasons of PhD thesis research at this site. The three settlement sites of Baitovo, Prygovo and Pavlinovo have all produced large quantities of faunal remains, which have been analysed in some detail and the reports made available to me for use within this thesis. The information concerning the faunal remains recovered from various mortuary sites will be presented in Chapter 6, wherein I also present my original results from fieldwork and faunal analysis from the Shushye and Karacye cemeteries. Through my discussion of this material I will focus on the importance of the structured depositions involving animal remains and their relationship to the mortuary constructions and elements of ritual practice that may be recognized within the kurgan constructions. This is especially significant in lieu of the theories regarding structural changes in societal development and the appearance of new forms of burial ritual and other mortuary traditions.

4.6.1 The Prygovo Fortified Settlement

The Prygovo fortress, investigated by the French-Russian team in 1993 and 1995, was situated on a naturally occurring island within the Iset River (Fig. 4.14 - 1). This topographical feature was particularly significant, as it provided one of the best areas in the region in which to cross the Iset River and would have undoubtedly been a strategically important settlement area historically. The Prygovo fortified settlement is actually part of a much larger complex comprising more than ten distinct archaeological sites: two fortresses, three kurgan mortuary sites, one flat ground mortuary site, and several settlements. Chronologically, various excavations at these sites have yielded materials from human activities dating from the Neolithic up through the Medieval Period (Koryakova & Daire 2000, 65).

Site Characteristics

The Prygovo fortification area consisted of two defensive lines made up of embankments and ditches and provided evidence of several occupational sequences. The excavations (comprising two areas) were situated along the western edge of the defensive structure and over several large surface depressions (Fig. 4.14 - 2). These depressions represented the remains of the ancient wooden dwellings and other associated structures within the site. The excavations revealed the presence of three different phases of occupation, represented by the foundations of the various structures (Fig. 4.15). Structure 1 (not shown on plan) related to the third, and last (*terminus ante quem*), building phase and can be dated to the 10th-13th centuries A.D. The second building phase, underlying Structure 1, revealed the remains of Structures 2, 4 & 5, which can be dated to approximately the 2nd c. BC to 1st c. AD. At this horizon, evidence of repairs to the structures was evident and it is apparent that they were undertaken within the same period of occupation (Koryakova & Daire 2000, 66). Pottery remains at this level were primarily representative of the Prygovo types. The first building phase, associated with Structure 3, represented the earliest Iron Age habitation level (*terminus post quem*) and revealed pottery remains indicative of the 7th-4th centuries BC: Nosilovo, Baitovo, Vorobievo, Gorokhovo and Itkul.

Concerning the various construction phases, it is believed that the internal ditch of the fortification corresponds to the Middle Age inhabitation of the site while the outer ditch construction relates to the Iron Age sequence. Several sedimentary deposition levels, associated with the alluvial terrace phasing of the river channel, represent the natural stratigraphic composition of the site. As such, the basic stratigraphy encountered during the excavations yielded the following composition (Fig. 4.15): (i) a top strata represented by the contemporary topsoil level with various disturbed artefacts such as pottery

Figure 4.14 *1 - general plan of the Prygovo site showing main archaeological features; 2 - topographical plan showing excavated areas of the site (Daire and Koryakova 2002, 208).*

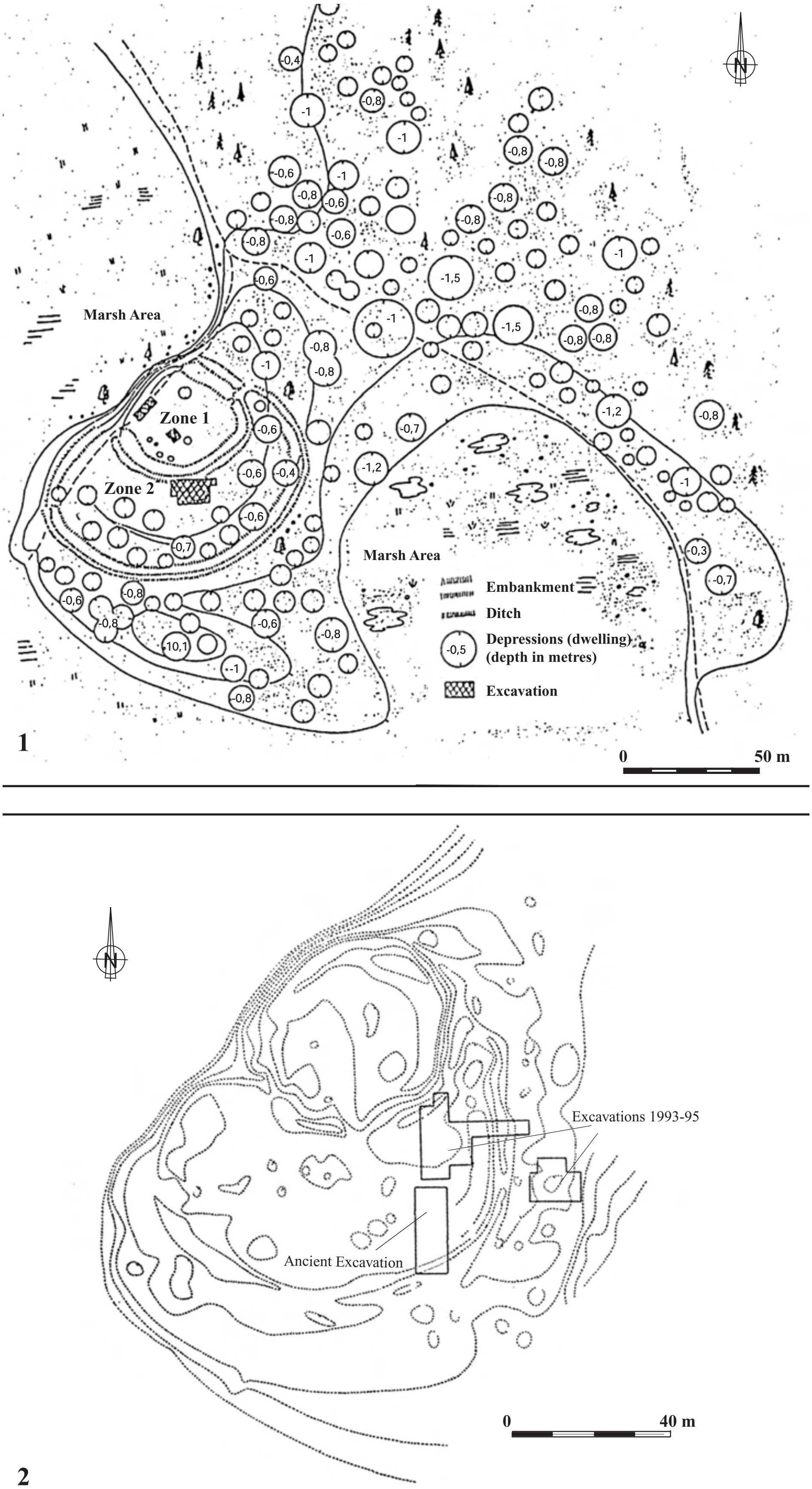
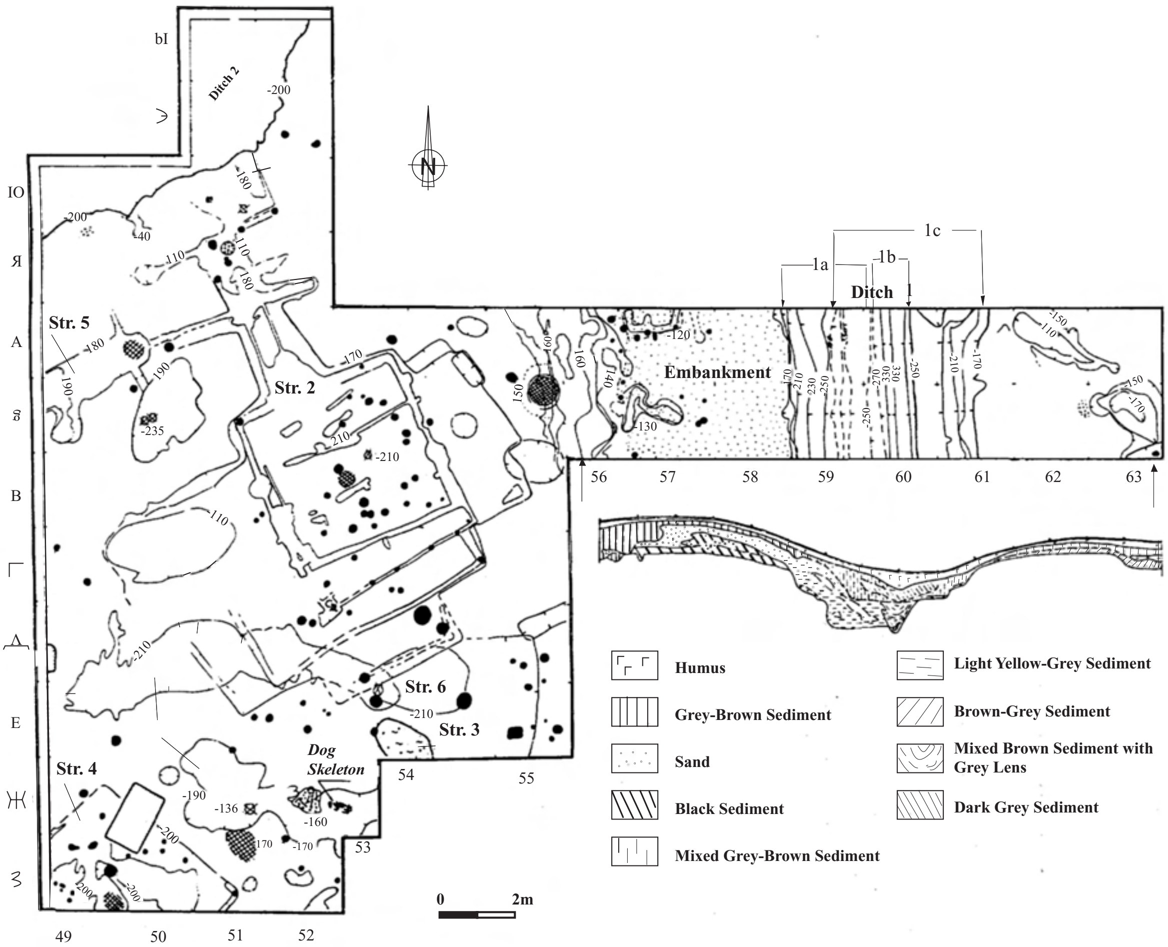


Figure 4.15 *General plan and profile of the excavation at the Prygovo settlement site - 'house' structures are denoted by Str. 2-6 (Daire and Koryakova 2002, 214).*



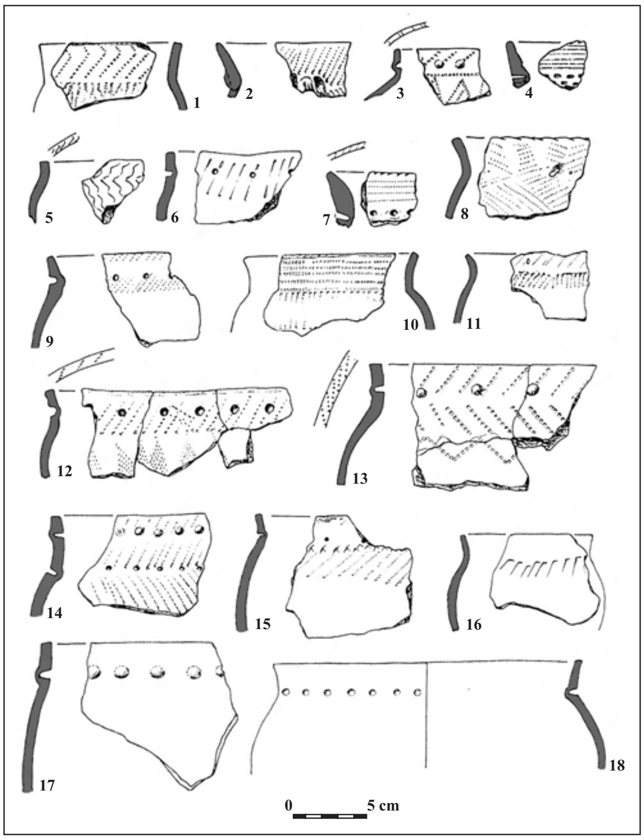
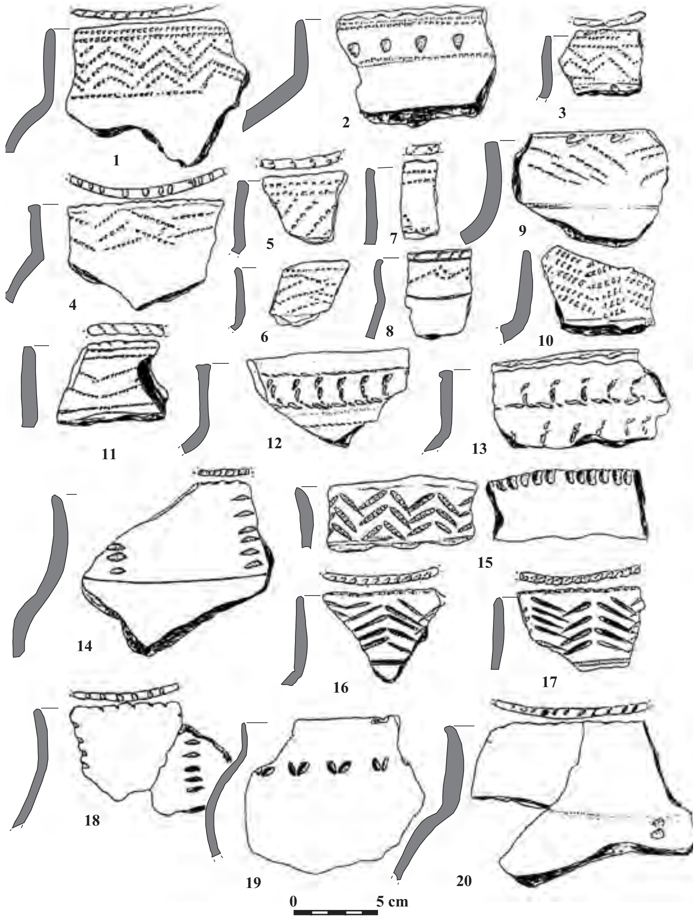


Figure 4.16 *Pottery types recovered from the Prygovo excavations: 1, 3, 5, 6, 9, 12-15 - Nosilovo type; 16-18 - Baitovo type; 2, 4, 7, 8, 10, 11 - Itkul type (Daire and Koryakova 2002, 236).*

Figure 4.17 *Pottery remains recovered from Prygovo excavations: 1-13 - Prygovo type; 14-20 - Sargat type (after Daire and Koryakova 2002, 229).*



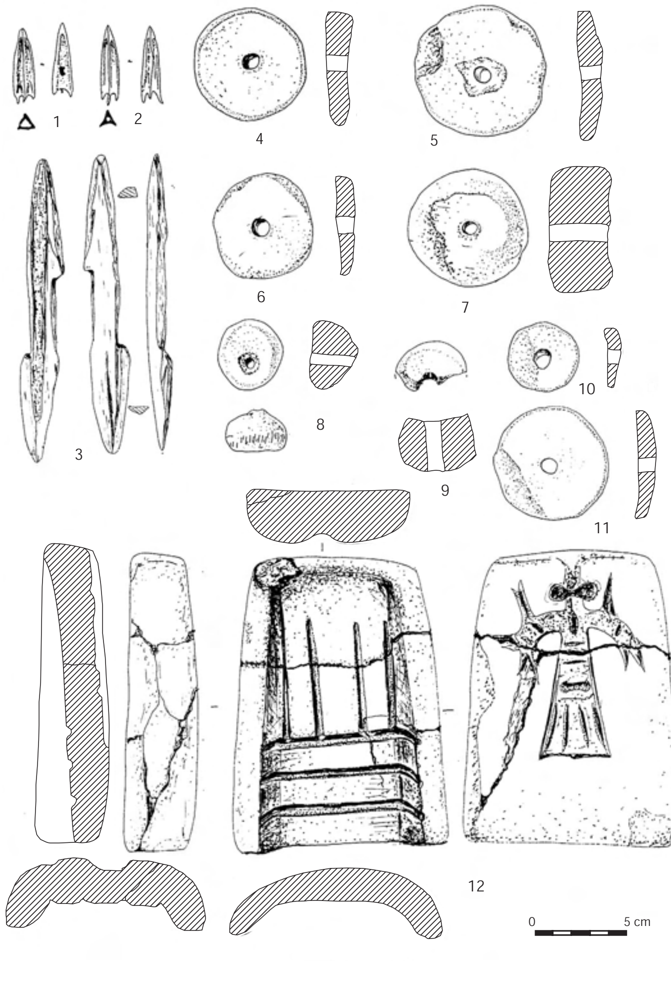
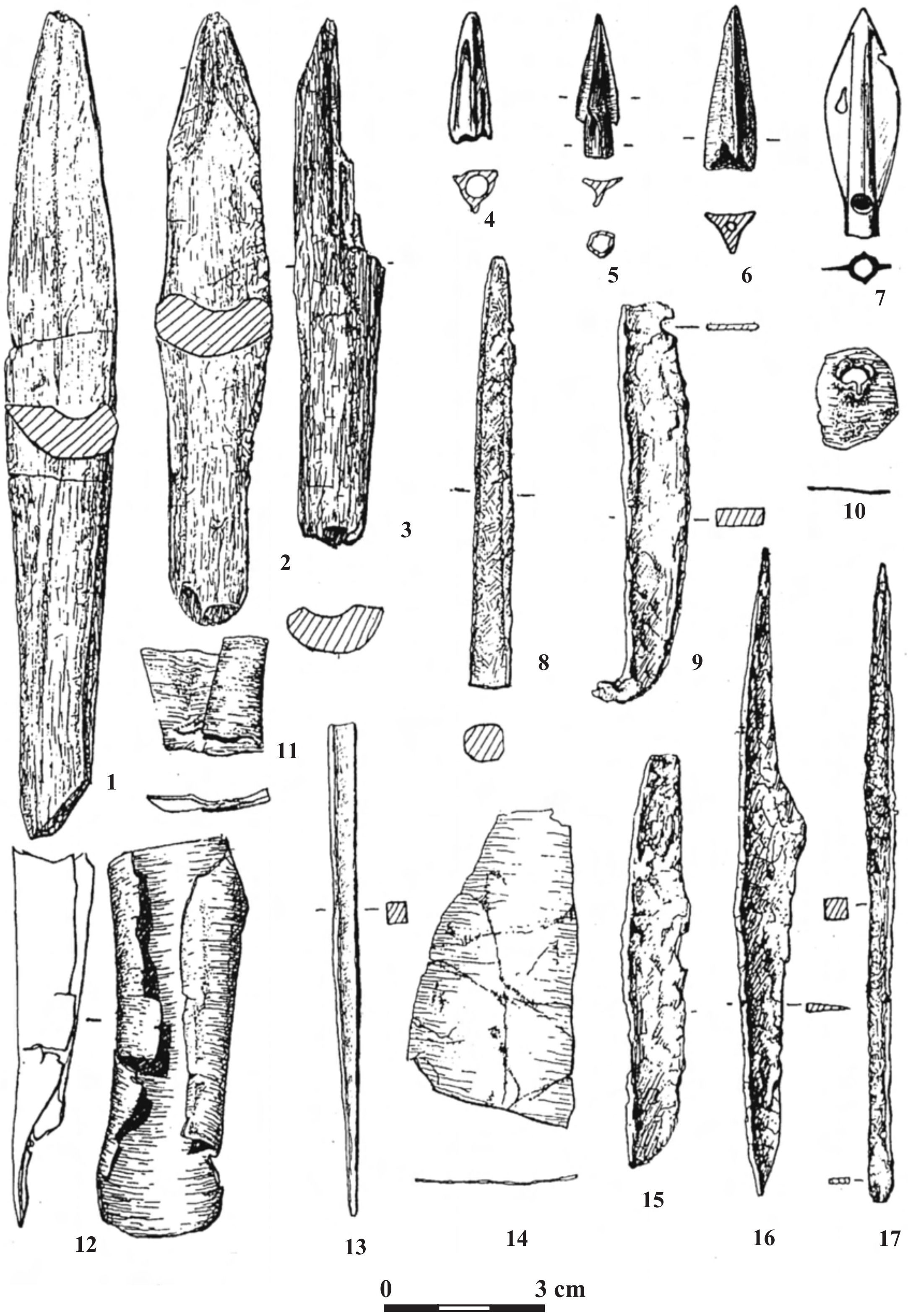


Figure 4.18 *Various artefacts from Prygovo excavations: 1-2 - bronze arrowheads; 3 - bone points; 4-11 - ceramic spindle whorls; 12 - axe molds (after Daire and Koryakova 2002, 224).*

Figure 4.19 *Artefacts recovered from Prygovo site: 1-3 - shaped points from animal bone; 4-7 - bronze arrowheads; 10-14 - various bronze implements; 8, 9, 15-17 - various iron implement fragments (after Daire and Koryakova 2002, 220).*



sherds and animal bones, (ii) grey-sandy soil horizon representing the level with the most recovered artefacts, (iii) dark grey sediments representing various structure infilling and strong indications of ash that related to the destruction of the final building sequences, and (iv) grey-brown sediments that correspond to the paleosoil levels (Pautreau et al. 1994).

Artefacts

Numerous artefacts were recovered during the excavations as well, representing nearly 2,000 finds (excluding faunal remains), with 90% of the artefacts representing pottery remains (Figs. 4.16 & 4.17). The numerous pottery fragments and whole pots recovered reflected nine different "cultural" and chronological types (Koryakova and Daire 2000, 67). In addition, iron slag, moulds, and smelting cauldrons were recovered as well, all indicative of some degree of metallurgical activities on the site (Fig 4.18). Several bronze arrowheads were recovered as well and are analogous to types of the 5th-4th centuries BC Sarmatian period in the Southern Ural Mountain region (Fig. 4.19). In addition to the numerous pottery and metal artefacts recovered during the Prygovo excavations a total of 1,917 bone fragments were also recovered.

Faunal Remains

The animal bone remains were analysed by P.A. Kosintsev at the Institute of Plant and Animal Science, Ekaterinburg (Kosintsev 1995 – unpublished faunal analysis report on file at the Institute of Plant and Animal Science, Ekaterinburg, Russia). The faunal remains from the site of Prygovo were recovered through 'hand collection' (i.e. use of shovels and trowels) and no wet/dry sieving of the soil was undertaken. The recovered large mammal remains represent both domestic animals as well as various wild fauna (Table 4.7). No micro-fauna remains were recovered or analysed from the site. Concerning the deposition characteristics of the bone remains, there were three main concentrations recovered during the 1993 season, with the remainder of the bones coming from other scattered deposits and the upper stratigraphic levels of the site. According to Kosintsev, the remains were indicative of general 'kitchen waste', that is, bone remains resulting from the butchery and preparation of animal carcasses for cooking and other utilitarian needs (Kosintsev 1995). Unfortunately, no detailed information regarding the exact deposition characteristics of the bone remains was recorded, other than the existence of the three distinct concentrations.

However, Kosintsev notes some peculiarities associated with the elk (*Alces alces*) remains from concentrations # 1 & # 2. According to the analysis, two phalanges from concentration # 1 and two metacarpal fragments from concentration # 2 appeared to be from the same individual. From this, it was deduced that the two concentrations were contemporaneous and were likely formed at approximately the same time. No further information was given in the report concerning the general

Table 4.7 *Animal species remains recovered from the Prygovo 1993 excavation (Kosintsev 1995).*

Species	Concentration-1		Concentration-2		Concentration-3		Other	Total	Total
	NISP	MNI	NISP	MNI	NISP	MNI	NISP	NISP	MNI
Bos taurus (cow)	12	2	19	1	-	-	400	434	54
Ovicaprids (sheep/goat)	-	-	-	-	1	1	94	96	35
Equus caballus (horse)	11	1	21	2	5	1	571	612	44
Camelus bactrianus (bactrian camel)	-	-	-	-	-	-	11	23	3
Canis familiaris (dog)	-	-	-	-	-	-	3	3	1
Alces alces (elk)	-	-	-	-	10	2	77	89	5
Capreolus pygargus (deer)	-	-	-	-	-	-	25	25	4
Sus scrofa (pig)	-	-	-	-	-	-	2	2	1
Ursus arctos (bear)	-	-	-	-	-	-	2	2	1
Canis lupus (wolf)	-	-	-	-	-	-	2	2	1
Vulpes vulpes (fox)	-	-	-	-	-	-	1	1	1
Castor fiber (beaver)	-	-	-	-	-	-	10	10	3
Marmota bobac	-	-	-	-	-	-	1	1	1
Lepus timidus (rabbit)	-	-	-	-	-	-	1	1	1
Mammalia indeterminate	-	-	16	-	28	-	572	616	-
Total	**23**	**3**	**56**	**3**	**54**	**6**	**1,772**	**1,917**	**155**

Epiphysial Fusion - Cow *(Bos taurus)*				
Bone	**Proximal/Distal**	**Fused**	**Unfused**	**Total**
humerus	proximal	19	0	19
radius	proximal	11	10	21
calcaneus	-	4	4	8
metapodial	distal	20	13	33
phalange I	proximal	17	6	23
phalange II	proximal	8	0	8

Table 4.8a *Epiphysial fusion data for cattle remains from Prygovo excavations (table created from information taken from Kosintsev 1995).*

Dentition Eruption Stage	Age (months)	total # of teeth	% of total teeth
M3	>28	30	56
M2/ not M3	18-28	15	28
M1/ not M2	6-18	7	13
not M1	<6	2	3

Table 4.8b *Ageing data based on eruption patterns of recovered cattle teeth (Kosintsev 1995).*

Table 4.9 *Ageing data based on eruption patterns of recovered sheep/goat teeth (Kosintsev 1995).*

Dentition Eruption Stage	Age (months)	total # of teeth	% of total teeth
M3	>24	18	51
M2/ not M3	12-24	14	40
M1/ not M2	6-18	3	9
not M1	<6	-	0

Epiphysial Fusion - Horse *(Equus caballus)*				
Bone	**Proximal/Distal**	**Fused**	**Unfused**	**Total**
femur	proximal	6	4	10
tibia	proximal	7	1	8
radius	proximal	7	1	8
radius	distal	9	3	12
calcaneus	-	8	2	10
phalange I	proximal	28	4	32
phalange II	proximal	18	2	20

Table 4.10 *Epiphysial fusion data for horse remains from Prygovo excavations (table created from information taken from Kosintsev 1995).*

Age Category	Total Number	Percentage
Juvenile	13	30 %
Subadult	12	27 %
Adult	13	30 %
Old Adult	6	13 %

Table 4.11 *Ageing data for horse teeth from Prygovo excavations (table created from information taken from Kosintsev 1995).*

Table 4.12 *Relative age categories for animals based on Schmid 1972, 60.*

Scientific Term	Relative Age and Osteological Characteristics
embryonal	early before birth
foetal	shortly before birth
neonatal	at birth
infantile	in infancy
juvenile	in childhood (replacement of teeth, many juvenile epiphyses separated)
preadult (subadult)	in adolescence and youth (replacement of teeth finished, epiphyses nearly ossificated)
adult	in adulthood (permanent dentition in funtion, epiphyseal lines ossificated)
mature	in maturity (adult for a long period of time, attachment of muscle-tendons prominent, teeth have some degree of wear
senile	in old age (teeth deeply worn or lost. Often complete disappearance of alveoli, resorbtion of bone in jaws and bones)

taphonomic characteristics of the concentrations. Nevertheless, data from the laboratory analyses does provide some useful information regarding the general frequency patterns of bone fragments by species (NISP and MNI), as well as some mortality information for the domestic animals based on epiphysial fusion and tooth eruption sequences for juveniles and sub adults.

Species Composition and Ageing

Approximately 90% of the bone fragments recovered during the Prygovo excavations represented domestic species and the other 10 % wild fauna. Concerning the domestic species, 53 % of the total bone fragments count was represented by horse remains, 37 % by cattle, 8 % by sheep/ goats, and 2 % by camel remains. No precise information has been provided regarding the exact relationship between fragmentation and skeletal representation (e.g. ribs, long bones, crania, etc.), however, Kosintsev notes that in general all skeletal elements for each species were represented to some degree within the assemblage (Kosintsev 1995), with a clear predominance of teeth and lower mandible fragments for the sheep/goat material and a higher frequency of fragments from the extremities (i.e. long bones and metapodials) for the camel material.

The ageing of the bone remains was based on the fusion of the epiphyses (i.e. proximal and distal) for the long bones and metapodial elements and on tooth eruption patterns. Concerning this, Tables 4.8a & 4.8b provides general data for the cattle remains and Table 4.9 provides dental eruption data for the sheep/goat remains. The ageing of the horse material was based on epiphysial fusion and dental eruption/attrition patterns (Tables 4.10 & 4.11). Kosintsev used four general categories for ageing the horse teeth: juvenile, sub adult, adult, and old adult. No specific ages are given for these categories, however through personal communication Kosintsev noted that these categories generally follow the guidelines set out in Schmid 1972 (Table 4.12) and that the juvenile category reflects animals 3 years or less in age and the adult category relates to animals approximately 5 years and older (i.e. full dentition and all teeth in wear)

At this point, it will only be necessary to summarise briefly the interpretation of the faunal data from the Prygovo site, as I will return to a more detailed discussion and critique of the methodology of the faunal recovery and analysis as well as the issue of animal husbandry regimes and proposed economic models when I conclude with the discussion of the settlement site investigations below and with my introductory section in the next chapter, which sets out the problems associated with conventional zooarchaeological methods and how I have sought to overcome these with my approach to the analysis of faunal remains from the Pavlinovo excavation.

Based on the analysis of the faunal remains, Kosintsev noted that they are generally representative of the faunal remains recovered from other contemporaneous Iron Age sites within the region, with a typically higher frequency of bone fragments (NISP) from horse and cattle remains and lower frequency counts representative of the sheep/goat and wild taxa. Kosintsev uses the ageing data to support the conventional interpretation of the animal husbandry practices of the Iron Age period, in that cattle were primarily raised for dairy and meat products and that the horse remains represent an emphasis on the use of the horse for tasks such as riding and possible traction (although traction is rarely discussed in the literature on the Iron Age sites) as well as for meat production (Kosintsev 1995). These conclusions are based on mortality profiles that reflect specific kill patterns for livestock. For example, there is a higher percentage of remains for cattle above the age of 2.5, which may correlate with the keeping of cows (female) for dairying and bullocks (males) for the attainment of prime meat weight (approximately 4-5 years – data after Dahl & Hjort 1976). In addition, the sheep/goat remains appear to indicate two main categories of mortality: (i) a 12-24 month period representing 40 % (n = 14) of the sampled tooth remains (possible culling of male lambs for meat), and (ii) animals over the age of 24 months representing 51 % (n = 51) of the sampled teeth, which may represent the keeping of older ewes (females) for lamb, milk, and wool production. It should be noted that these general characterisations are based on relatively small samples of both teeth and long bones (a more critical discussion of this methodology follows below). Nevertheless, the available data does appear to fit the generally expected model for the pastoral practices associated with the three main domestic taxa categories in the Iron Age period.

Discussion

The general conclusions concerning the Prygovo site, in conjunction with the analyses of the faunal data, have been used by Koryakova and Daire to support their hypothesis that the site functioned as an important fortified settlement from the early Iron Age Period for semi-settled pastoralism through to the Medieval Period (7th c. BC to 13th c. AD) (Koryakova & Daire 2000, 66; Daire & Koryakova 2002, 241). As noted above, the stratigraphy of the site revealed three main phases of occupation: (i) *a primary phase* revealing evidence of ceramic sherds of the Nosilovo, Baitovo, Gorokhovo, Vorobievo, and Itkul types in conjunction with bronze arrowheads, all of which provide a relative date of the 7th-3rd centuries BC; (ii) *a secondary phase* relating to ceramics of the Sargat and Prygovo types that can be dated to the 2nd c. BC to 2nd C. AD. The building features # 2, #4 and the 'dwelling' structure in area # 5 all relate to the secondary phase of occupation; (iii) the *third phase* relates to the Medieval period of occupation and the 'dwelling' # 1, ditch # 2, some hearth features, and ceramic fragments of the Makoushinsky and Yudinsky types are related to this level. Only one sample from the site, a camel bone fragment, was analysed for radiocarbon dating. Unfortunately, based on the achieved data, the sample does not appear to correlate with the Iron Age occupation of the settlement as it provided a range of dates for the Medieval Period (Table 4.13).

Table 4.13 *Calibrated radiocarbon dates from the Prygovo settlement (unpublished radiocarbon laboratory report - on file at the Institute of History and Archaeology, Ekaterinburg, Russian Federation).*

No.	Site	Feature	Material	BP	BC/AD 1-*sigma* 65 % 2-*sigma* 98 %
Le-5040	Prigovo Settlement	Ex.5	camel bone	700 ± 80	1257-1320 AD 1-*sigma*
					1340-1394 AD 1-*sigma*
					1208-1414 AD 2-*sigma*

The general plan of the Prygovo site, the nature of the fortification complexes and the long duration of occupation emphasise the strategic geographical importance of the this locale within the Middle Tobol River region as an important crossing point within the Iset River valley. Control over this particular area would have been crucial during times of both political and environmental stress and would have been a major factor in the movement of both human and animal populations within the local region. As such, this site is one of the more developed settlement centres, as was discussed above in relation to Matveeva's hypothesis of small regional centres based on the distribution of larger fortified settlements and smaller surrounding open settlements. At this point, I would like to move towards a discussion of the Baitovo settlement and the material remains that have been recovered during excavations at this site by the French-Russian team.

4.6.2 The Baitovo Fortified Settlement

Another large fortified settlement site excavated by the French-Russian team was the site of Baitovo, located in the Tobol River valley 80 km northeast of the city of Kurgan. The site was first discovered in 1961 by an archaeological team from Ural State University under the direction of T. Bushueva. The Baitovo settlement site is situated in an area of the Tobol River valley that is approximately 5 to 7 km in wide where the riverine environment is particularly rich with numerous waterfowl and small mammal populations. This settlement also represented the eponymous site for the Baitovo type of ceramics (pit-pricked type ornamentation) noted above that belong to the Baitovo archaeological culture, which has been conventionally interpreted as a Late Bronze – Early Iron Age development within the Middle Tobol River region (Sharapova 2000, 208).

Site Characteristics

It should be noted that the area of the Baitovo site represents a broad fertile lowland area with numerous small lakes and marshes. The Baitovo settlement, situated on a higher terrace level, provided an important settlement area within this environment. In addition, research of old texts and maps of the region have shown that the site of Baitovo has been situated on the margin of historically important trackways or roadways through the region. It has also been suggested that the proposed early caravan routes connecting the forest-steppe with Central Asia, as noted above, also made use of these important pathways through the region and would therefore have had important connections with the early development of the settlement (pers. com. with L. N. Koryakova).

The settlement site itself comprises two different parts, a central fortified area delineated by two concentric lines of ditches and banks, with an entrance on the east side, and a larger settlement area on the outside of the fortified zone with numerous topographical depressions indicative of the foundations of the prehistoric dwellings and other building structures. The investigation of the site by the French-Russian team occurred during 1995 and 1996 and consisted of a rectangular plan excavation in the southern part of the fortified area as well as two trenches extending to the north and south from the main excavated area through the bank and ditch features (Fig. 4.20). As a result of the excavations (a total area of 462 m^2) one depression area (ancient building foundation) and both the inner and outer ditch features were investigated (Fig. 4.21).

The general stratigraphy of the site revealed a complex composition of various sedimentary horizons as well as depositional processes associated with human activities. The general geomorphological character of the site is composed of a sandy soil with a higher concentration of clay deposits in the southern area of the fortification zone. The stratigraphy encountered during excavation was comprised of the following: (i) a top stratum composed of the modern humus level – approximately 20 cm in depth over the fortification area (banks and ditches) and 40 cm in depth near the centre of the depression of the ancient dwelling foundation. There were mixed animal bones and other artefacts associated with this level as well; (ii) the second stratum was composed of grey sandy soil approximately 40-60 cm in depth with mixed ash and various soil colour nuances. This level relates to the paleosoil level and the associated human activities of the ancient settlement, thus, the highest frequency of artefacts and animal bones were encountered at this level; (iii) the third stratum related to the infilling of the site's ancient features and was composed of dark-grey sediments – the depth of this level ranged from between 10-20 cm, except in the instance of the infilling of posthole features (stratigraphic information taken from Daire & Koryakova 2002, 186-187).

Artefacts

The number of recovered artefacts from the site of Baitovo was very high, with an average concentration of 40 items per m^2 being recorded during the excavations (Koryakova and Daire 2002, 187). A broad range of artefacts were also represented within the Baitovo assemblage, with a number of bronze arrowheads being recovered (6), a bronze cauldron, numerous whole and fragmented spindle whorls (28), clay polishers made from broken pottery vessel sherds (122), stone portable altars (2 fragments), one bronze bracelet, one ornithomorphic figurine fragment, and a high number of broken pottery vessels and miscellaneous sherds representing five different typological variants (Figs. 4.22 &

Figure 4.20 *Plan of the Baitovo Fortification Settlement (after Daire and Koryakova 2002, 178).*

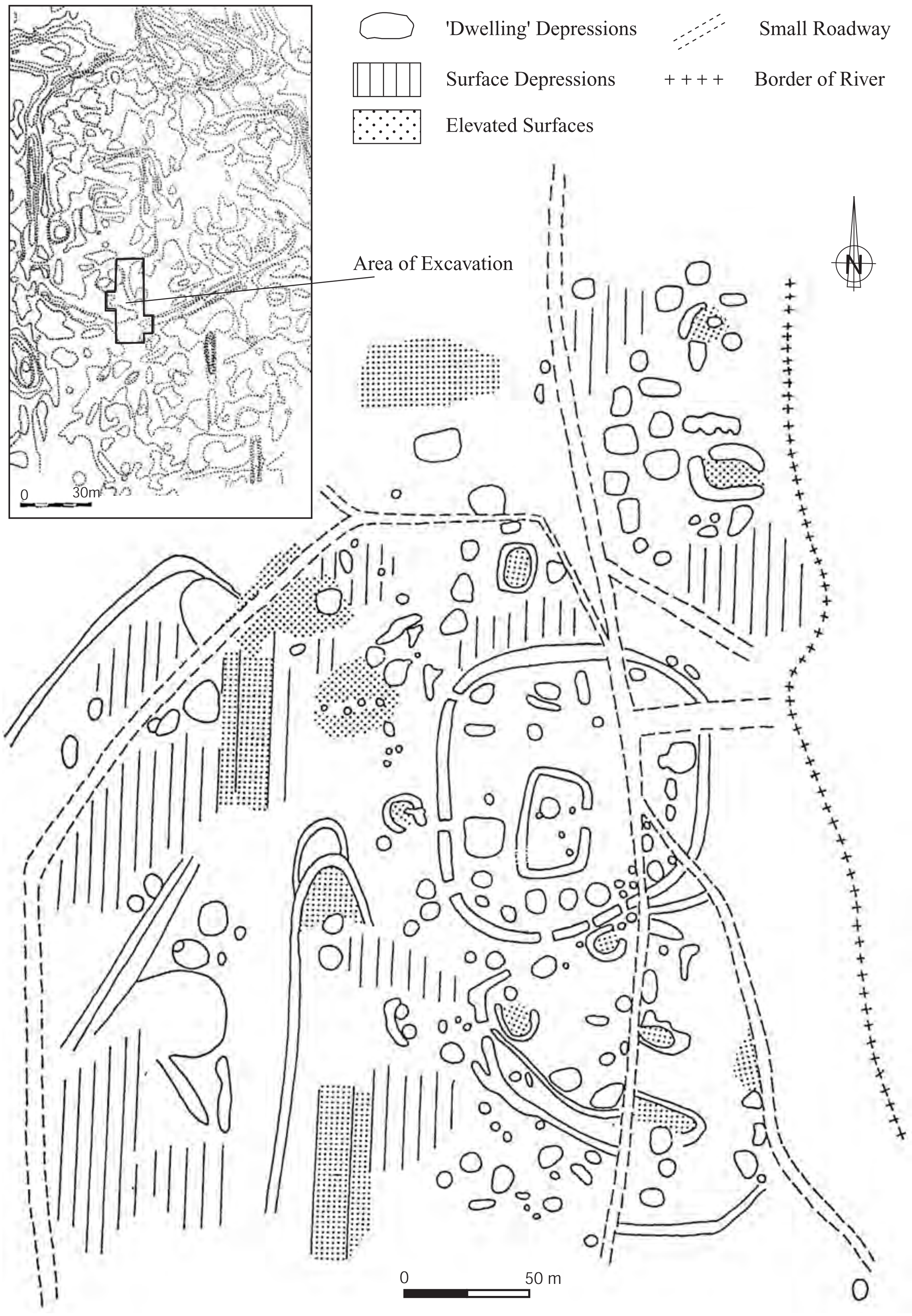
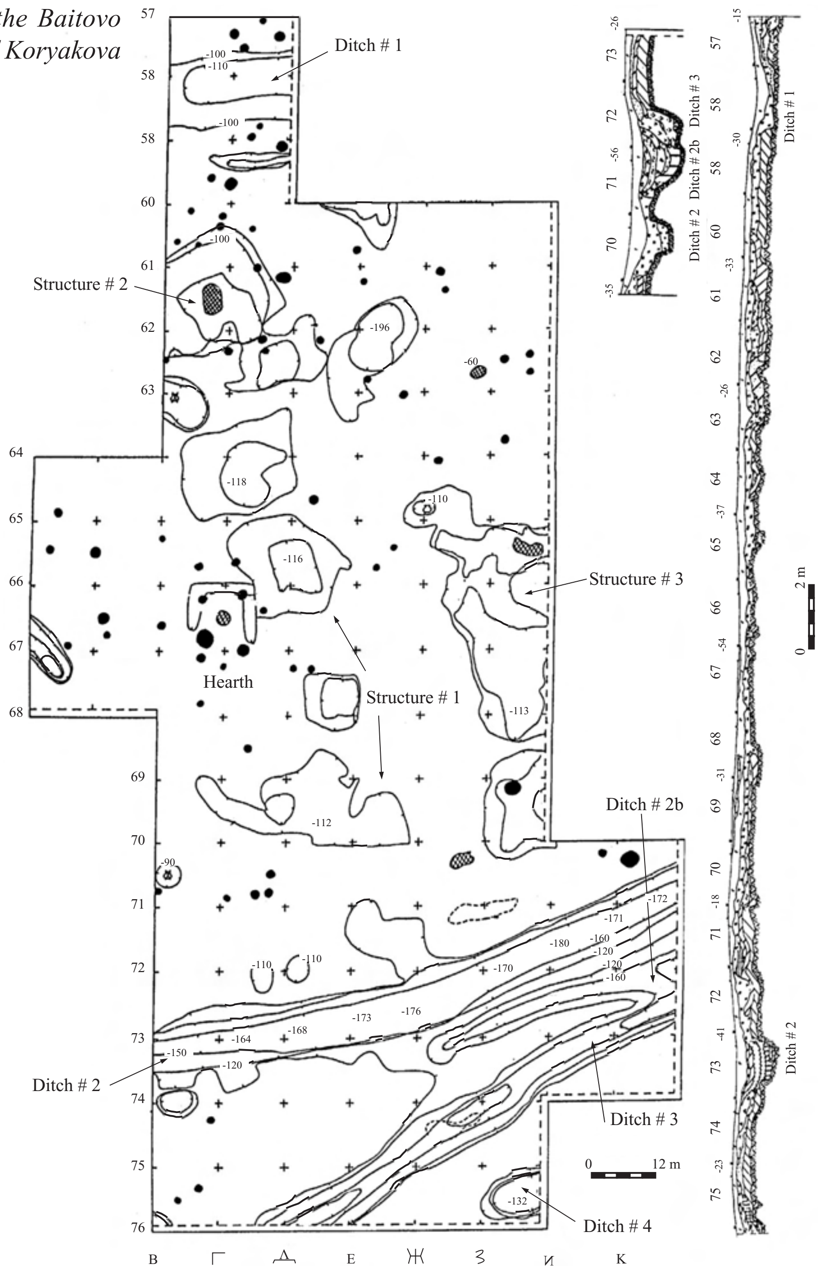
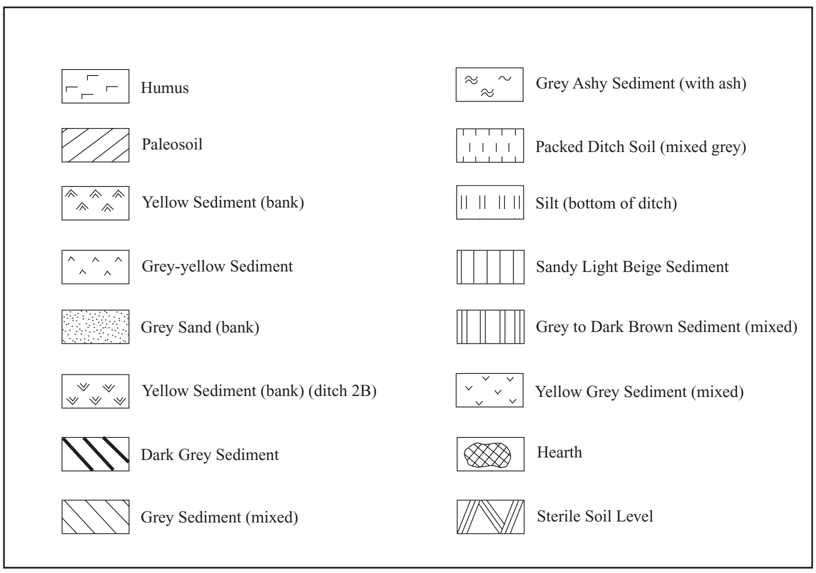


Figure 4.21 *Plan and profile of the Baitovo excavation 1995-96 (after Daire and Koryakova 2002, 185).*





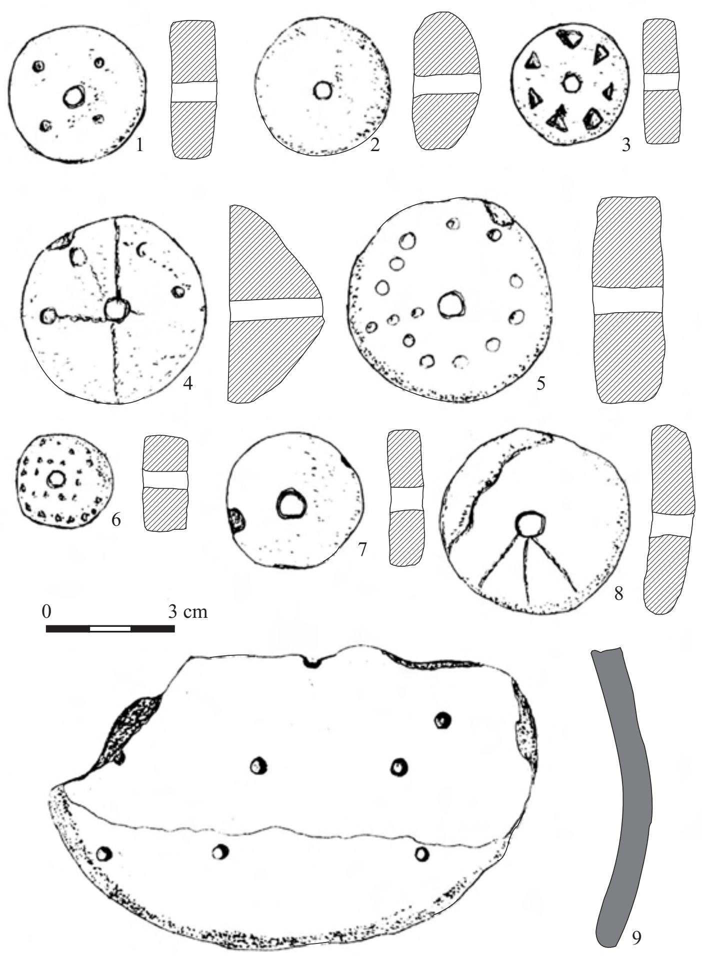


Figure 4.22 *Clay spindle whorls from the Baitovo settlement (after Daire and Koryakova 2002, 188).*

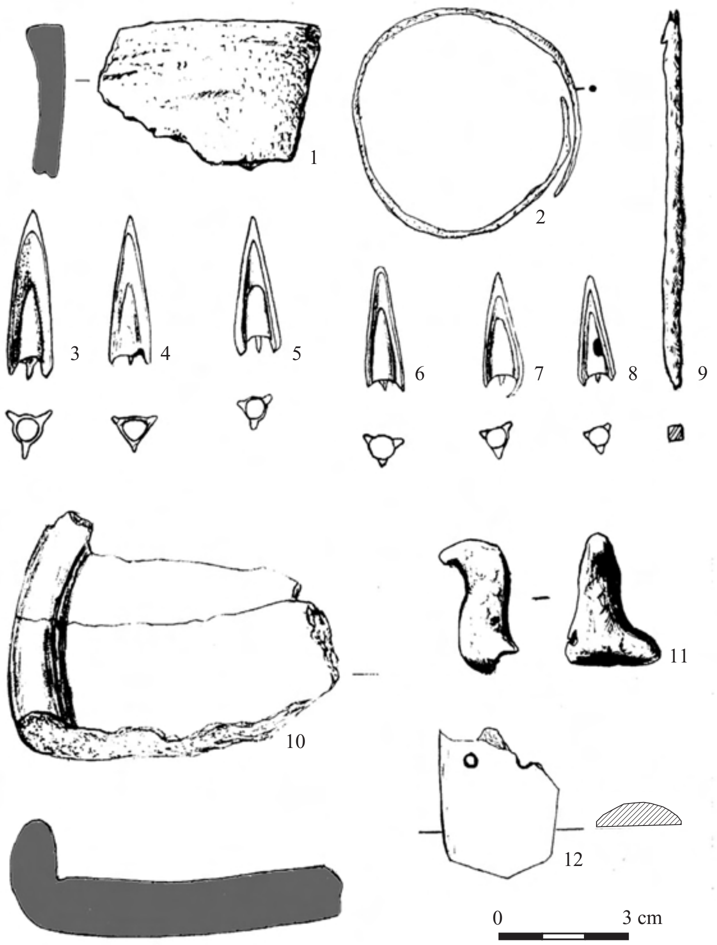


Figure 4.23 *Various artefacts from the Baitovo settlement: 1 - bronze cauldron fragment; 2 - bronze bracelet; 3-8 - bronze arrowheads; 9 - iron awl; 10 - clay portable altar fragment; 11 - clay figurine (stylised bird's head) fragment; 12 - bone plaque (armour or wrist guard) (after Daire and Koryakova 2002, 189).*

Figure 4.24 *Pottery types recovered from the Baitovo excavation: 1, 4, 5, 7 - Sargat type; 2, 8, 10-12, 15 - Nosilovo type; 3, 6, 9, 13 - Gorokhovo type; 14 - Vobobievo type; 16 - Itkul type (after Daire and Koryakova 2002, 194).*

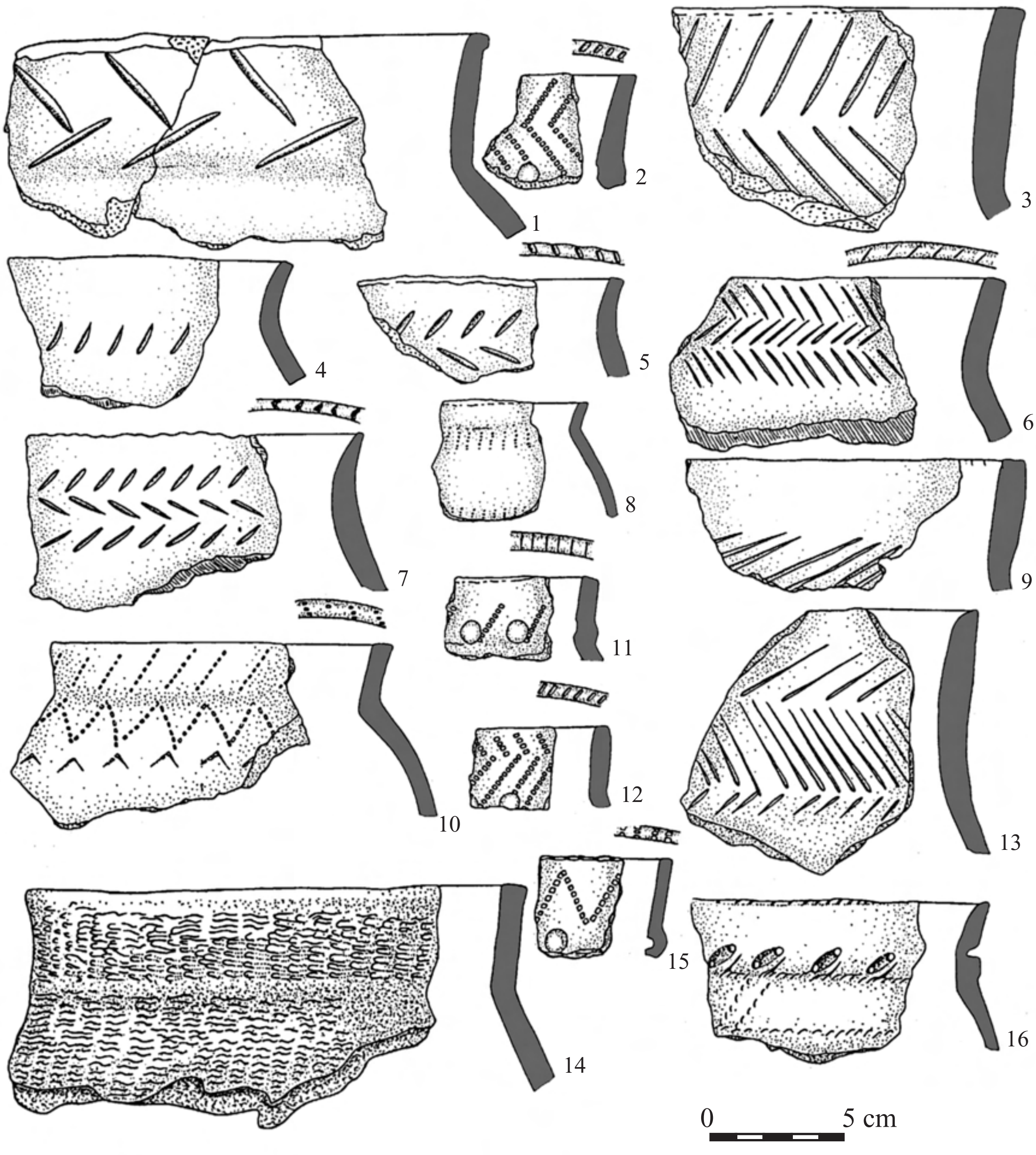
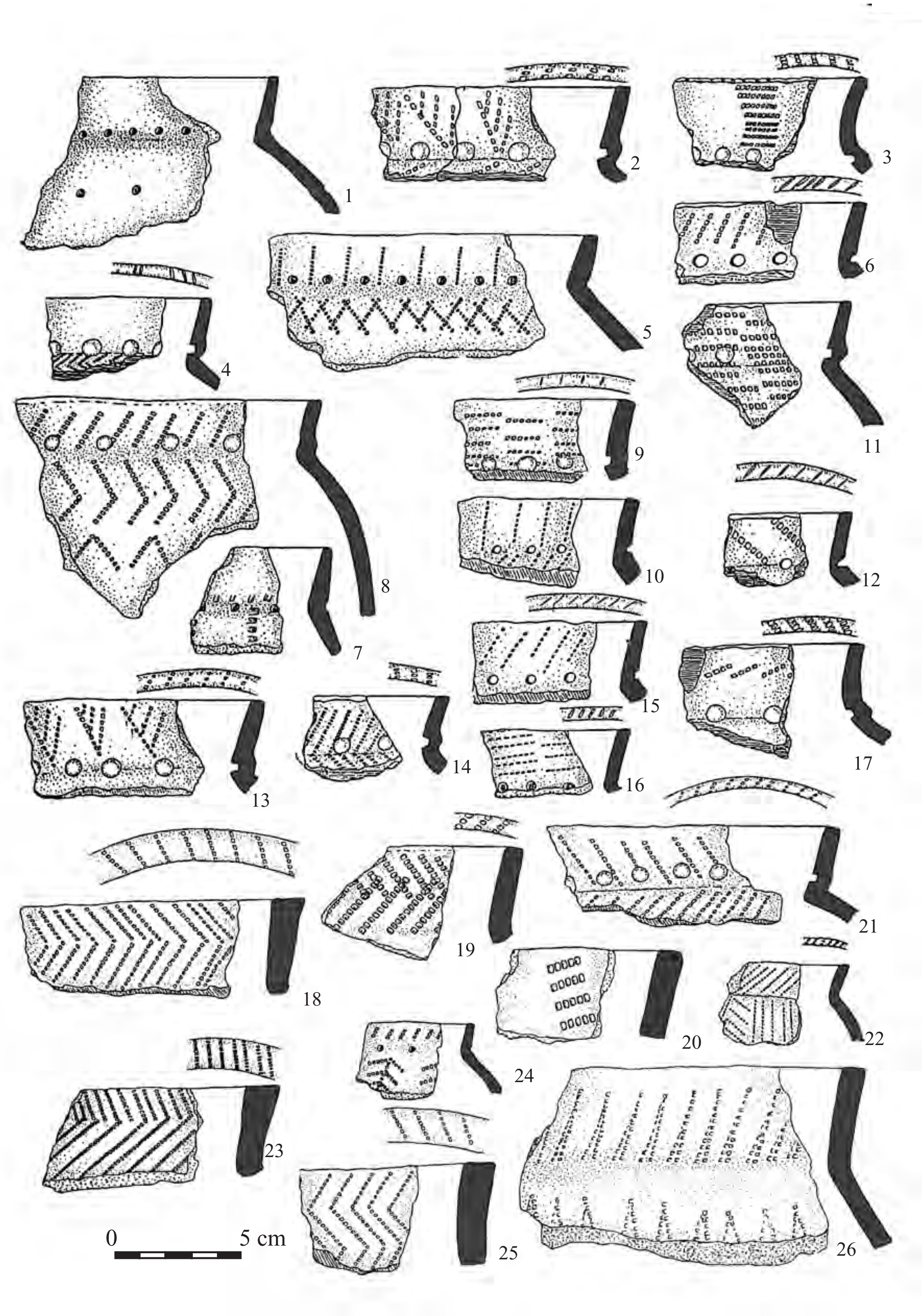


Figure 4.25 *Ceramics from the Baitovo settlement: 1 - Baitovo type; 2-17, 21, 22, 24 - Nosilovo type; 18-20, 23, 35, 26 - Vorobievo; (after Daire and Koryakova 2002, 193).*



No.	Site	Feature	Material	BP	BC/AD 1-*sigma* 65 % 2-*sigma* 98 %
Le-5039	Baitovo	Ex. 1	animal bone	320 ± 90	1457-1664 AD 1-*sigma*
					1951-1952 AD 1-*sigma*
					1428-1692 AD 2-*sigma*
					1728-1813 AD 2-*sigma*
					1920-1941 AD 2-*sigma*
					1950-1954 AD 2-*sigma*

Table 4.14 *Calibrated radiocarbon dates from the Baitovo settlement (unpublished radiocarbon laboratory report - on file at the Institute of History and Archaeology, Ekaterinburg, Russian Federation).*

4.23). The pottery remains can be divided among the following types (unfortunately, no raw data numbers were given in the report, only percentages): Baitovo – 83.7 %, Nosilovo – 10 %, Vorobievo – 3.2 %, Gorokhovo – 1.4 %, and Sargat – 1 % (Figs. 4.24 & 4.25). These percentages support the dating of the site to the very early phase of the Iron Age and although they indicate a broad range of ceramic types, there is clearly a predominance of the Baitovo type.

The relative dating of the excavated features of the site was based on typological dating of the artefacts, such as the numerous pottery fragments and the bronze arrowheads, and the stratigraphic associations of the encountered features. Unfortunately, only one radiocarbon sample was dated from the site, a camel bone fragment, and it yielded a range of dates associated with the Medieval Period (Table 4.14). This correlates with the range of dates provided by the camel bone fragment that was dated from the Prygovo settlement site, as was noted above. A discussion of these dates, and their relationship to the hypothesis of early caravan routes, will be presented in more detail at the beginning of the next chapter.

Nevertheless, the recovered bronze arrowheads from Baitovo provide a date of the 5th –2nd centuries BC, which also corresponds to the relative dating sequences for the ceramic types. Although the Baitovo site has yielded artefacts dating from the Neolithic Period, the main features associated with the fortification zone and the surrounding topographical area with the surface depressions clearly relate to the Late Bronze – Early Iron Age period.

Faunal Remains

The recovered faunal remains, like those from the Prygovo settlement discussed above, were analysed in Ekaterinburg by P.A. Kosintsev. Once again, very little information is given regarding the taphonomic characteristics of the recovered faunal remains. In the case of the Baitovo material, no concentrations were noted concerning the recovery of the remains during the excavation process. However, the density of the recovered bone materials within the cultural soil level (denoted as soil horizon (ii) above – grey sandy soil) produced an average of 8.5 bone elements or fragments per m^3.

Concerning the fragmentation characteristics of the bones, around 6 % were less than 3 cm in length while the majority of the recovered remains were more than 5 cm in length. The bones were 'hand collected' and no wet/dry sieving of the soil was undertaken. No other specific information concerning the deposition characteristics of the remains was reported. Additionally, like the Prygovo faunal materials, no micro-fauna was recovered or analysed from the excavations.

Species Composition

The general species composition of the recovered animal bones is presented in Table 4.15, as well as the general statistics concerning the total number of elements and fragments (NISP) and suggested minimum number of individual counts (MNI). The Baitovo faunal assemblage reveals the characteristic higher frequency of bone elements and fragments for horse remains (40.2 %), with cattle remains being the second most frequent (38.7 %), followed by sheep/goat (2.5 %) and then counts for the wild animal taxa and indeterminate bone counts.

Species	NISP	% of NISP	MNI
Bos taurus (cow)	1000	38.7	51
Ovicaprids (sheep/goat)	44	1.7	7
Ovis aries (sheep)	17	.8	7
Equus caballus (horse)	1038	40.2	56
Alces alces (elk)	11	.5	2
Capreolus pygargus (deer)	2	.07	1
Vulpes vulpes (fox)	1	.03	1
Lepus timidus (rabbit)	1	.03	1
Bird remains (species not Identified)	2	.07	?
Mammalia indeterminate	464	17.9	-
Total	**2,580**	**100**	**126**

Table 4.15 *General animal species representation from the Baitovo excavations (after Daire and Koryakova 2002, 197).*

The general skeletal element representation for the cattle and horse bone materials is provided in Table 4.16. This data shows that there is a broad range of skeletal elements represented within the assemblage for both species, that is, cranial elements as well as post-cranial elements including the extremities (metapodials and phalanges). Although this information represents fragmented remains, it is possible to note the existence of all types of main skeletal elements within the assemblage, which may indicate that the animals were killed and and the carcasses processed at the site. This may seem a rather straightforward point, considering that Prygovo is a large settlement site supposedly reflecting a distinct pastoral form of economy, however, one should note that there are several possibilities that animals could have been butchered in particular locations within the settlement with only certain remains being distributed to other locations (e.g. other dwellings or storage locations) within the settlement area. These are all important considerations when trying to interpret the types of human activities at the site as well as the connection between different animal bone deposits within the site itself and between different settlement locations. This is especially important when considering the hypotheses by Matveeva and Koryakova about Iron Age chiefdom level societies and hierarchical socio-economic relationships between larger fortified sites and the smaller peripheral settlements. How animals were managed

Skeletal Area	Cow		Horse	
	total #	% of total	total #	% of total
Crania/Mandible	167	30	155	30
Vertebrae/Ribs	69	13	60	12
Humerus/Radius/ Ulna/Femur/Tibia	161	29	155	30
Metapodials/ Phalanges	155	28	148	29

Table 4.16 *Skeletal representation for cattle and horse remains (Daire and Koryakova 2002, 197).*

Table 4.17 *Skeletal elements and fragmentation representation (whole and fragmented) for cow, horse and sheep/goat species (after Kosintsev 1995).*

Bone Element	Cow			Horse			Sheep/Goat	
	(whole)	(frag.)	(% frag.)	(whole)	(frag.)	(% frag.)	(whole)	(frag.)
Braincase	0	27	100	0	32	100	0	6
Facial	0	37	100	0	35	100	0	1
Mandible	5	103	95	1	88	99	2	3
Teeth	232	63	21	314	51	14	8	0
Vertebrae	3	34	92	6	38	86	0	5
Ribs	1	31	97	0	16	100	0	2
Scapula	12	24	67	19	16	46	0	1
Humerus	16	33	67	11	23	68	0	1
Radius	12	40	77	22	24	52	0	2
Ulna	1	10	91	2	13	87	0	0
Pelvis	0	30	100	4	29	88	0	2
Femur	6	18	75	0	18	100	0	1
Tibia	12	13	52	16	26	62	2	5
Calcaneus	12	7	37	8	6	43	0	0
Astragalus	24	6	20	18	3	14	0	0
Carpals	-	-	-	-	-	-	-	-
Tarsals	27	6	18	30	4	12	0	0
Sesamoids	-	-	-	-	-	-	-	-
Metacarpus	10	47	82	10	14	58	0	0
Metatarsus	13	34	72	11	40	78	0	1
Metapodials	0	3	100	7	0	0	0	0
Phalange - 1	18	10	36	31	15	33	0	0
Phalange - 2	15	0	0	19	2	10	2	0
5Phalange - 3	5	0	0	5	1	17	0	0
Total	**424**	**576**	**64**	**534**	**504**	**58**	**14**	**30**

between these varying locations is an important consideration when considering zooarchaeological analyses. However, I will explore these important issues in more detail at the beginning of the next chapter, which synthesises the zooarchaeological data from the settlement sites within the Middle Tobol River region.

Assemblage Fragmentation Characteristics

It may be said that the results of the analysis of the Baitovo assemblage differs from that of the Prygovo settlement faunal analysis in that there is a greater focus on providing fragmentation information and skeletal element representation for the horse, cattle, and sheep/goat species. For example, Table 4.17 provides useful information regarding these data and notes total numbers for whole bone elements, fragmented elements, and the percentage of fragmentation for each skeletal bone element. The results show that the basic fragmentation ranges for the cranial elements (i.e. that is the crania, maxilla, and lower mandible) of the cow and horse materials are 95-100 % and 99-100 % respectively. This high degree of fragmentation could relate to the processing of the remains for brain and tongue extraction as well as the rich marrow resources associated with the mandible. However, without more precise information regarding the fragmentation characteristics of the cranial elements, or the particular contexts in which they were found, it is difficult to make any further interpretations with a high degree of confidence.

The long bone fragmentation (humerus, radius, femur, tibia only) results for the assemblage were 52-77 % for the cattle bones and 52-100 % for the horse bones. The fragmentation for the metacarpals and metatarsals was 72-82 % and 58-78 % for the cow and horse materials respectively. This information provides a general picture of the high degree of fragmentation of the bones recovered during the Baitovo excavations. However, without more precise information regarding the general taphonomic characteristics of the remains from the site, or indeed more specific information about the degree of fragmentation of the elements, it is difficult to make specific interpretations about patterns of animal butchery and carcass disarticulation and preparation. Information of this type is particularly significant when trying to understand possible patterns of bone fracturing associated with certain practices, such as for cooking or specific materials processing (e.g. marrow extraction), and how these activities relate to each of the domestic species found within the assemblage.

Unfortunately, there is no information provided regarding the types of fracturing, such as the splitting of long bones or metapodial elements for marrow extraction or even perhaps fresh breaks that might have occurred during the process of excavation and subsequent handling, which clearly would have biased the fragment count. Furthermore, there is no information provided concerning the percentage, or wholeness, of the bone elements themselves. Therefore, we are left with only general indications regarding the high degree of fragmentation of the animal remains and a broad representation of the types of skeletal elements recovered. We are not, however, provided with further important information that would qualify the characteristics of the remains in terms of general taphonomy, site formation processes, or inferences about specific human activities that may have resulted in the types of disarticulation or fragmentation encountered with the bone remains.

Ageing

Data from the ageing analysis of the Baitovo assemblage, like the analysis of the faunal assemblage from the Prygovo settlement, is based on a combination of long bone and metapodial epiphysial fusion characteristics as well as tooth eruption (and general attrition for the horse teeth) sequences. Table 4.18 provides information about epiphysial fusion for the cattle and horse remains and Tables 4.19 and 4.20 provide tooth eruption/attrition information for the cattle and horse remains respectively. The results of the ageing analysis for the cattle remains suggest a slaughter profile indicative of both milk and meat production, as there are two main groups represented: (i) 23 % (n = 12) of the teeth are at the 18-28 month eruption period, perhaps reflecting the culling of young bullocks, and (ii) 61 % (n = 31) of the teeth reflect individuals over the age of 28 months, suggesting the keeping of female cows for milk and calf production. However, once again, this a rather small representative sample of the total number of teeth recovered (a total of 51 teeth analysed of the 232 whole teeth recovered).

Table 4.18 *Epiphysial fusion data for long bones and metapodial elements of cattle and horse remains: numerator - diaphysis/ denominator - epiphysis (after Daire and Koryakova 2002, 236).*

Bone Element	Cow			Horse		
	(fused)	(not fused)	(detached epiphysis)	(fused)	(not fused)	(detached epiphysis)
Humerus	0/26	2/0	2/0	1/15	1/0	0/5
Radius	29/11	0/2	0/2	7/3	2/8	12/3
Femur	6/1	1/0	2/3	1/5	0/0	3/0
Tibia	0/14	0/2	0/0	1/14	2/3	1/2
Calcaneus	10	4	0	17	2	0
Metapodials	26	13	3	14	6	4
Phalange-1	26	0	0	44	0	0
Phalange-2	15	0	0	21	0	0

The methodology used by Kosintsev to age the cattle teeth is unclear, as there is no mention in the report (Kosintsev 1995) or the recent publication (Daire & Koryakova 2002, 197) about the selection criteria for the aged teeth. As this methodology appears to focus on the eruption sequences, and to some degree on attrition features for the horse teeth, one might assume that this was based on the analysis of whole mandible elements. However, this is not clearly stated in the literature and one is therefore left without a clear sense of the methodology used for tooth ageing or how the actual sample of teeth for the cattle and horse remains was chosen (n = 51 and n = 56 respectively – Tables 4.19 & 4.20).

Tooth Eruption Stage	Age (months)	# of total teeth	% of total teeth
M3	>28	31	61
M2/ not M3	18-28	12	23
M1/ not M2	6-18	7	14
not M1	>6	1	2

Table 4.19 *Ageing data for cattle remains (after Daire and Koryakova 2002, 198).*

Nevertheless, Kosintsev suggests that the ageing of the horse remains indicate a split in the mortality profiles of the animals into three different categories. The first, juvenile individuals up to the age of three years, is represented by 36 % (n = 20) of the sampled teeth and likely represents the culling of stock for meat. The second main category, which is represented by 25 % of the sampled teeth (n = 14), indicates the use of animals for general work tasks such as riding. The third category of old adult individuals, represented by 25 % of the teeth (n = 14), indicates the keeping of horses past their prime age for what has been described as 'quiet work', i.e. light tasks (Daire & Koryakova 2002, 198).

Age Category	Total Number	Percentage
Juvenile	20	36 %
Sub Adult	8	14 %
Adult	14	25 %
Old Adult	14	25 %

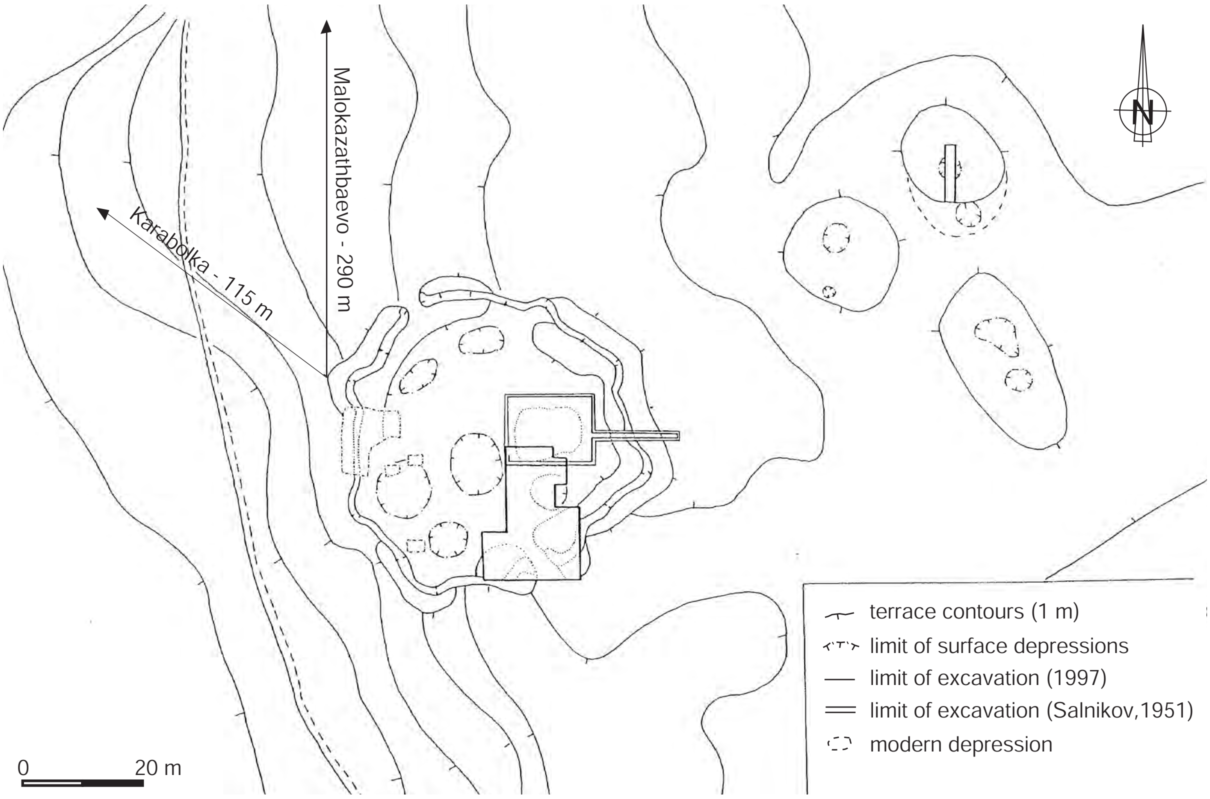
Table 4.20 *Ageing data from horse remains (after Daire and Koryakova 2002, 198).*

The wild fauna remains, represented by a range of five different species, yielded a small number of actual bone materials. Elk (*Alces alces*) and deer (*Capreolus pygargus*) commonly appear in the taxa lists from Iron Age settlements in the Middle Tobol region, however the frequency counts are generally quite small and likely represent the possible exploitation of elk and deer for supplemental food resources. In the case of the Baitovo assemblage, 11 fragments (representative of phalanges, humerus, radius, ulna and metapodial elements) are noted as representing a minimum of two individual animals for the elk, and 2 fragments (lower mandible and tibia) for the deer remains represent one individual (Kosintsev 1995). A further discussion of the occurrence of wild fauna within settlement sites will be undertaken in Chapter Five, where a more detailed description of their deposition characteristics will be presented.

4.6.3 The MaloKazakhbaievo Settlement

The third and final fortified settlement to be discussed, MaloKazakhbaievo, represents what has been interpreted as a semi-nomadic camp or frontier post (Koryakova & Daire 2000, 67). I feel that it will be useful to present a short discussion of this site, even though there are no data concerning recovered faunal remains. This particular site provides an important example of what have been considered as seasonal short-term occupational camps or settlements within the Middle Tobol region.

Figure 4.26 *Plan of the MaloKazakhbaievo settlement (after Daire and Koryakova 2002, 166).*



This is particularly important in regards to the discussions surrounding semi-nomadic pastoral economies and their relationship to regional occupational sequences.

V. N. Biryukov first investigated the Malokazakhbievo settlement, a site located along the Karabolka River, in 1949. K. V. Salnikov then undertook a subsequent excavation in 1951. Then in 1992, A. Yepimakhov completed a preliminary topographical survey and in 1997 an excavation was carried out at the site by the French-Russian team (Fig. 4.26).

The general physical features of the site reflect a small octagonal fortification complex comprised a ditch and bank system with two entrances. The 1997 excavation investigated an area in the southern area of the fortification 264 m^2 in size (Fig. 4.27). The features encountered during the excavation revealed the construction of the ditch and bank feature, the foundations of one dwelling structure, and evidence of hearths and other cultural debris such as ceramics and bone remains. The total number of material artefacts recovered was very low and the stratigraphy revealed a relatively shallow cultural stratum. This has in turn stimulated the hypothesis noted above, which suggests that the site was not intensively used for long-term occupation. Nevertheless, human activities at the site can be documented from the pottery remains from at least from the Eneolithic period (Fig. 4.28).

Unfortunately, although one animal bone concentration is noted on the general site plan (Fig. 4.26), no further information is given regarding the remains encountered or an achieved analysis for the faunal remains. The general construction and plan of the fortification (i.e. octagonal), coupled with the recovered pottery remains, indicates a main occupational phase associated with the Early Iron Age period, namely the Gorokhovo phase. Therefore, based on the recovered materials, the thin cultural level, and the construction features of the site, it has been postulated that the MaloKazakhbaievo settlement functioned as a seasonal outpost or settlement, perhaps during the winter period when shelter and fodder storage would have been required for the livestock of semi-nomadic groups occupying the region (Daire & Koryakova 2002, 177). Furthermore, the relative dating of the site to the Gorokhovo period (6th-3rd centuries BC) corresponds to other archaeological sites in the area, including both settlements and necropolises with kurgan burials such as at Bolshoikazakhbaievo. Considering the importance of this site regarding models of seasonal pastoral herding and semi-nomadic movements, it is unfortunate that further research has not been carried out at the site and that the recovered faunal remains have not been analysed for comparison with the larger settlements within the region.

4.7 Modelling Iron Age Settlement Patterns and Socio-Economic Developments

Through the discussion of the excavations at the settlement sites of Prygovo, Baitovo and MaloKazakhbaievo, and the presentation of the faunal data relating to these sites, it has been possible to gain a sense of some of the general characteristics of the settlement sites within the Middle Tobol River region associated with the Early Iron Age period. Although it may be said that each site is characteristically different in many respects (e.g. site layout and fortification construction), a similar range of questions can be asked of the material remains recovered regarding chronology, site construction phases, and general socio-economic patterning. In the case of the faunal remains, a number of questions arise regarding issues such as socio-economic activities at the sites, the possible seasonal occupation of the settlements (regarding semi-nomadic and nomadic practices), and of course what may be inferred concerning the general relationships between the settlements themselves. All of these are significant questions concerning the socio-economic development of the Iron Age, which can be seen to draw heavily upon interpretations of faunal remains data recovered from the respective sites.

As such, it will be quite helpful at this point to compare some of the zooarchaeological and socio-economic information gained from the more detailed discussion of the sites noted above with more general information taken from other published materials on investigated settlements in the region. In so doing, it will be possible to provide a more informed investigation of the hypothesised economic models for the Early Iron Age period, a critical evaluation of the methods used for the recovery and analysis of faunal remains, and finally to suggest an improved methodology for investigating zooarchaeological materials and addressing significant questions concerning pastoral economies and animal husbandry regimes. This will provide an important context for a discussion of my own fieldwork at the site of Pavlinovo, which will be presented in the next chapter.

Figure 4.27 *Excavation plan and profile of the MaloKazakhbaievo settlement (after Daire and Koryakova 2002, 168-69).*

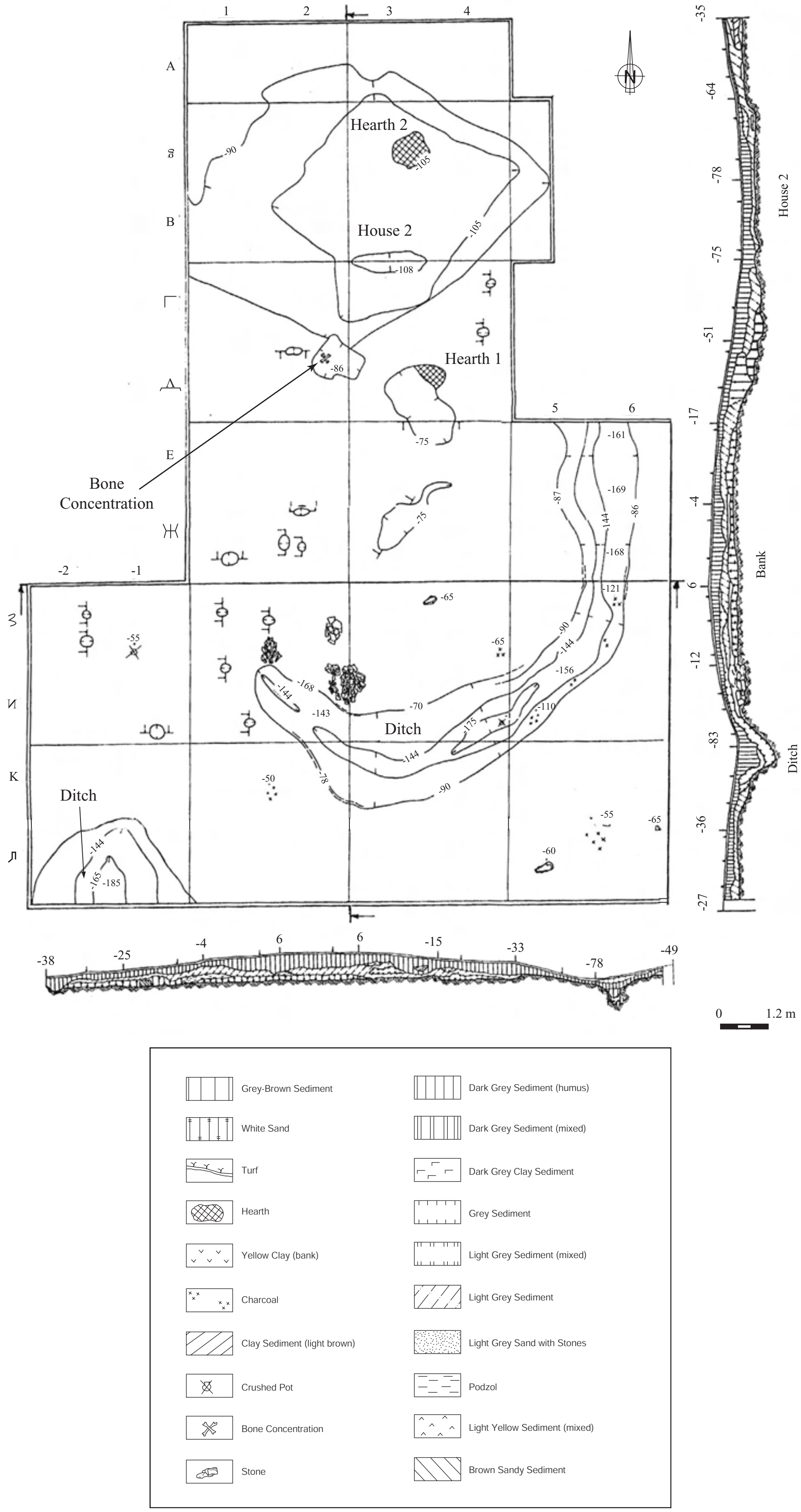
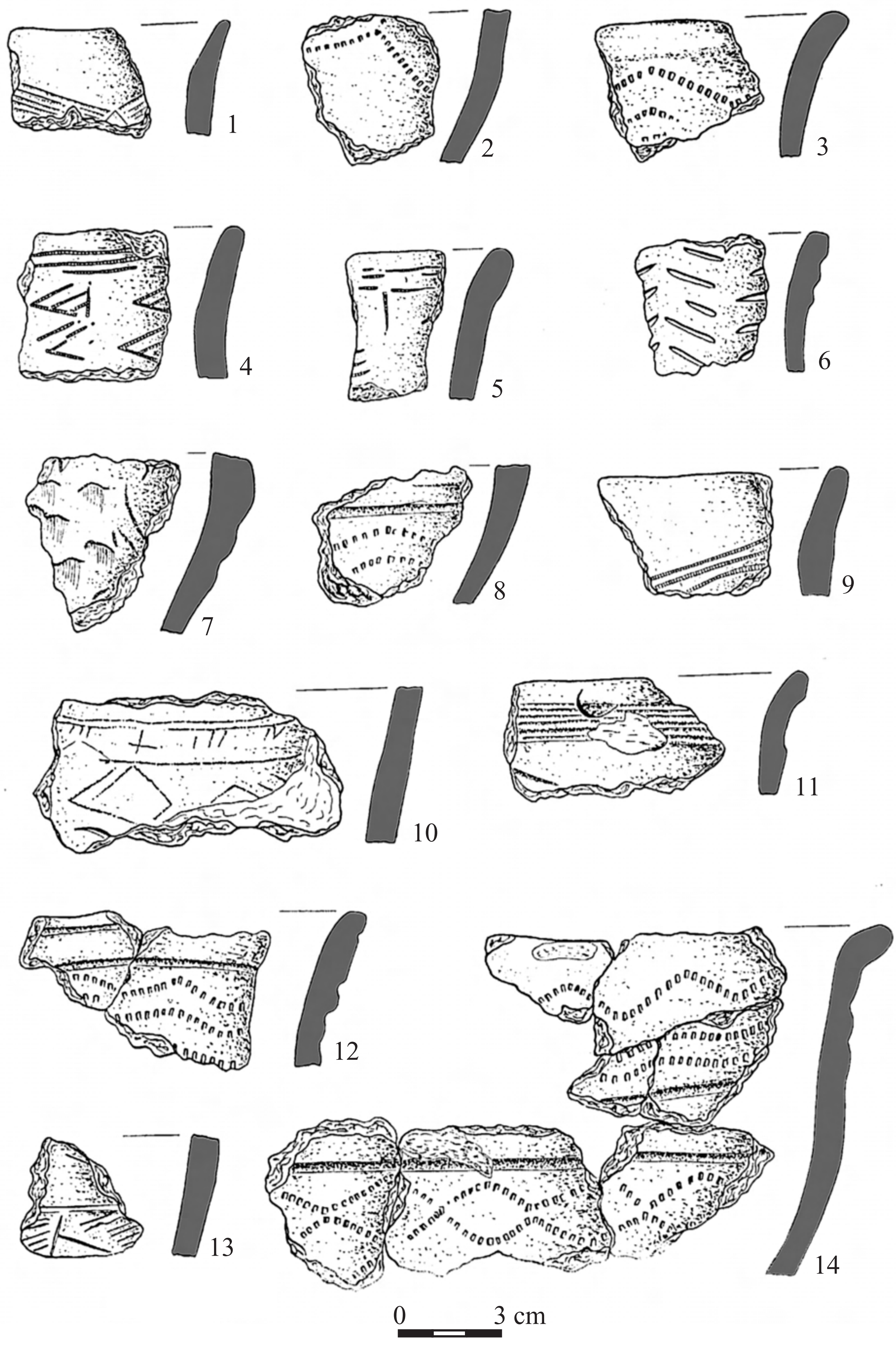


Figure 4.28 *Pottery types recovered from the MaloKazakhbaievo settlement: 1-5, 7-11, 13 - Bronze Age; 12, 14 - Eneolithic Period; 3, 6 - Iron Age Period (after Daire and Koryakova 2002, 172).*



4.7.1 Conventional Models: Stockbreeding Practices and Ethnographic Analogies

To begin with, it is necessary to review the conventional models currently proposed for the socio-economic patterns of the Early Iron Age period in the Trans-Ural region and to investigate the sources of their analytical foundations. The general hypothetical typology for the pastoral economies of the Trans-Ural region, as put forth by Koryakova and Daire (2000, 67), comprises three main types of pastoralism that have been based on settlement and faunal remains evidence:

1) *Semi-nomadic Pastoralism*:
   - temporary winter camps with relatively high annual mobility
   - more typical of the southern forest-steppe sites
   - generally correlates with Gorokhovo 'culture' phase
   - example: MaloKazakhbaievo settlement

2) *Semi-settled Pastoralism:*
   - permanent winter settlements with some annual transmigration
   - higher percentage of horse bones in settlement faunal assemblages
   - generally correlates with Sargat 'culture' phase
   - example: Prygovo and Pavlinovo settlements

3) *Settled Pastoralism*:
   - more settled patterns of habitation (winter and summer occupation)
   - predominance of cattle bones in settlement faunal assemblages
   - example: Baitovo settlement

It can be seen that each of these three economic models has been developed through a strong correlation between the interpretation of archaeological materials and direct historical analogies drawn from ethnographic information on pastoral populations in the Trans-Ural region. This ethnographic information was obtained through various accounts during the late 18th century up through the early 20th century and relates to the interaction between traditional pastoral populations, such as the Bashkir, Tatar and Kirghiz, and various Russian populations during the colonisation of the Trans-Ural and West

OWNERSHIP	ANIMAL SPECIES		
	Horse (%)	Cattle (%)	Sheep (%)
Trans-Uralian Bashkirs (Shadrinsk District)	31.6	48.3	20.1
Native Population of Tyumen District	35.8	29.1	35.1
Native Population of Yalutorovsk District	35.7	32.7	31.6
Native Population of Tarsky District	33.1	34.7	32.2
Kazakhs of Kokchetav District	36.4	8.2	55.4
Average	**34.5**	**30.6**	**34.9**

Table 4.21 *Representation of domestic animals in the Bashkir and Kazakhs districts of the Tobolsk county in the early 19 th century (after Sergeev 1993).*

Siberian regions (e.g. Rudenko 1955; Rafloff 1989; Vainshtein 1972; Popov 1813; Pallas 1786). Although this ethnographic information has provided very useful information about the characteristics of stockbreeding and the pastoral mode of subsistence within the region (Table. 4.21), I feel that caution must be exercised against drawing too close an analogy with the historical particularities of socio-economic and socio-political organisation. Nevertheless, such parallel analogies have been drawn and are quite characteristic for the conventional scholarship of the Trans-Ural region.

One particularly significant model for approaching mobile pastoralism, which has had a considerable impact on subsequent scholarship in the Trans-Ural region, was put forth by Petrov (1981).

Much like Cribb's model discussed in Chapter Three, Petrov also divides the pastoral economy into three main components:

1) **H** – *Human Group* (family, community, clan or tribal group)
2) **A** – *Animals* (herd composition)
3) **P** – *Pasture*, which can be stable (**SP**) or unstable (**UP**)

Petrov argues that these three variables can then be taken a step further to imply the following distinctions between nomadic and semi-nomadic forms of pastoralism:

E (economy) = H + UP + A (nomadic pastoral economy)

E = H + SP + A (semi-nomadic pastoral economy)

As such, in *semi-settled* stockbreeding the use of constant annual (seasonal) pastoral territory is analogous to one of semi-nomadic stockbreeding. There is no difference in the **SP**, rather the variation is in the component **H**, and the human community is divided into settled **(SH)** and mobile (**MH)** parts. Therefore, the formula of the economy may be suggested as the following:

E = H/ SH + MH

Concerning the Trans-Uralian Early Iron Age, Sergeev (1992) has applied Petrov's general structure in an attempt to account for the main variables inherent within the pastoral mode of production for the Gorokhovo-Sargat period. This is particularly important when one considers that this model was originally developed to fit a Marxist interpretation of the Early Iron Age period, and as such, was oriented towards identifying the principle 'productive forces' or 'means of production' of the particular society in question, in this case a pastoral mode of subsistence. Therefore, Petrov's model simply provides an appropriate structure for modelling the variation inherent within pastoral economies, such that one particular society may be divided into one or more 'productive' groups as defined by their various economic task e.g. herding or agropastoralism.

Within a wider sphere of interpretation, this factor of task variability is quite common among pastoral societies with distinct elements of seasonal mobility. For example, Cribb has investigated this pattern for Near Eastern pastoralism and found that, "partition into agricultural and pastoral sectors subjects one part of the community to pressure towards nomadization. It is interesting that this may last for no more than a year and that the 'nomadic' and 'sedentary' sectors of the community are actually interchangeable" (1991b, 25). The significance of this statement returns us once again to the arguments I set out in Chapter Two, that pastoralism with distinct elements of seasonal mobility can be dynamic and fluid in nature. And, as I also pointed out, this can have particular significance regarding the interpretation of settlement sites suspected of reflecting elements of a mobile pastoral economy.

This is precisely the problem with conventional interpretations of the Trans-Uralian Iron Age period, whereby terminologies such as semi-nomadic and semi-sedentary, as they relate to hypotheses about Gorokhovo-Sargat period mobile pastoralism, are generally based on ethnographic information obtained from direct historical sources. This situation has led to distinct problems concerning the interpretations and modelling of prehistoric herd compositions based on fragmentary bone remains. Furthermore, many scholars have tried to use ethnographic information, for example how the number of livestock (and the species composition) relate to the wealth of certain families, to infer similar analogies for the possible number of livestock that may have been associated with Early Iron Age settlements (e.g. Sergeev 1989, 170-171; Matveeva 2000, 116).

Concerning this issue, numerous scholars have been very outspoken about the problems of modelling prehistoric herd size and composition through the use of zooarchaeological remains, and more specifically, through the improper use of total fragment counts (NISP) and minimum individual counts (MNI) per species (Cribb 1987; Marciniak 1999; Antipina 1997). As Cribb notes, "a common misconception is that there is a direct link between the patterning revealed by excavated faunal material and the composition of a living herd in the past. What archaeologists study are kill-off patterns which are indicative of the structure of the live herd only under certain conditions" (Cribb 1987, 377). Nevertheless, one can still find within Russian literature, regarding the Early Iron Age period of the Trans-Ural region, a persistent utilisation of such inaccurate modelling. As Table 4.22 reflects, even recent publications have attempted to utilise percentages to characterise animal bones representation from various sites without giving any hint as to the actual number of raw data for the remains recovered. I will return to this important issue in more detail through a discussion of the Pavlinovo site in the next chapter where I compare and contrast past analyses of faunal assemblages from the site with my own zooarchaeological investigation of the faunal remains from the 1999 and 2001 excavation seasons. By examining this material, I sought to provide a better context for discussing in finer detail the methodological problems associated with modelling prehistoric herd sizes and composition and the use of general statistics concerning fauna quantification.

However, at this point, I wish to return to the issue of socio-economic models concerning pastoralism and the problems associated with conventional terminologies. I am in full agreement with Morales-Muñiz & Antipina when they state that, "…Russian archaeological literature seems to be still lacking a clear definition of concepts such as "nomadism", "semi-nomadism" or "sedentarism". One gets the impression that for many authors the important thing is the general idea rather than the implementation of procedures to test it" (Morales-Muñiz & Antipina 2000). This statement clearly reflects the general reaction of many scholars to the use of terminologies concerning nomadic socio-economic patterns that have little or no basis in factual data and lack a clear and explicit methodology for investigating such patterns within the archaeological record. As such, the criteria for characterising a particular settlement site as reflective of either semi-nomadic or semi-sedentary practices are often without clear scientific foundation. This can relate to several different areas of archaeological investigation, including paleobotanical, geomorphological as well as zooarchaeological. In order to continue with this argument, particularly as it relates to the underlying goals of this thesis, it is necessary to take a closer look at exactly how divisions have been made in terms of the models for Trans-Uralian prehistoric pastoral economies and to seek to identify some of the main problems associated with how zooarchaeological data has been improperly used to support them.

Settlement Site	Cow NISP %	Sheep/Goat NISP %	Horse NISP %	Camel NISP %
Kalachik-1, G.	42.9	-	57.1	-
Rafailovskoe, G	42.4	14.7	39.5	3.4
Rafailovskii O.	45	10	42.5	2.5
Kolovskoe, G.	33.3	25	41.7	-
Rechkinskoe-	31.2	18.8	50	-
Rechkinskoe-1	58.8	5.9	35.3	-
Duvanskoe-2	42.1	15.8	42.1	-
Duvansko1	50	-	50	-
Duanskoe-18	28.6	28.6	42.8	-
Bochantsevskoe-1	59.3	18.5	22.2	-
Verkhne-Ingal'skii Borok-2	40	30	30	-
Uzlovskoe	40	20	33.4	6.6
Ak-Tau	27.3	18.2	45.4	9.1
Gornaya Bitiya	30	10	60	-
Kokonovskoe	36.8	36.8	26.4	-
Bitiye Gorki	25	50	25	-
Bogdanovskoe, G.	22.9	20.3	56.8	-
Karganovskoe	50	-	50	-
Lozhkovskoe-4	40	20	40	-
Markovskoe-5	20	60	20	-

Table 4.22 *Frequency percentages (total fragment counts) of domestic species from Sargat period settlement sites (after Matveeva 2000, 55).*

4.7.2 Semi-nomadic Pastoralism

The first model noted above, *semi-nomadic pastoralism*, has been primarily used as a typology to describe the settlement characteristics of the southern forest-steppe zone in the Early Iron Age period and relates particularly to the Gorokhovo 'culture' development, discussed at the outset of this chapter. According to this model, there is generally a higher frequency of horse and sheep/goat bone remains recovered from these sites. In addition, the settlements themselves typically yield thin cultural activity layers (i.e. stratigraphic layering) with a much lower density of recovered artefacts (e.g. pottery remains and animal bones) than at other contemporaneous sites. The site of MaloKazakhbaievo, as discussed above, is an ideal example of this type of settlement.

Ethnographically, the semi-nomadic pastoralist model has been based on direct historical analogies with the Kazakh and South-Uralian Bashkir groups, population groups that practiced pastoralism up through the period of increasing Russian colonisation in the Trans-Ural region at the beginning of the 20th century. The Bashkirs, although having stable settlements, still moved elements of their pastoral livestock herds during the spring, summer and autumn seasons. This mobile pastoralism provided the animals with access to different varieties of grass and plant species, which sprout and blossom at different times of the year and provided important forage from early spring through late autumn (Koryakova and Hanks, forthcoming).

This type of annual or seasonal movement of the animal stock can best be described as local transmigration. For example, during the 18th century the Bashkirs of the Ekaterinburg district (Trans-Ural forest-steppe zone) annually (starting in the spring) migrated westward towards the Ural Mountains and transmigrated approximately forty to seventy kilometres from their settlements (Popov 1813, 16-17). The Bashkirs of the Shadrinsk district migrated mostly eastward towards the flat plain area of the West Siberian region (Murzabulatov 1979, 64).

From this regional ethnographic information, it is quite clear that the areas of transmigration, occurring during the spring through the fall seasons, could occur in various areas. This was based on the abundance of grass and water resources (lakes, springs, marshes and rivers) throughout the Trans-Ural region as well as the stimulation of new grass growth from heavy precipitation in the autumn period (Koryakova and Hanks, forthcoming). Historically, the movements of both animals and people would have been conditioned or restricted based on the control of specific areas or regions of land. In this case, I hesitate to draw too strict an analogy concerning patterns of annual stockbreeding movement, because it stands to reason that the population demographics and socio-political division of the Trans-Ural territory may have been markedly different during the Early Iron Age period, as compared to the socio-economic developments during the early 20th century when Russian colonisation began to take place (and I have debated this point at length with my Russian colleagues). Nevertheless, the utilisation of the ethnographic information does provide valuable insights regarding the general resource characteristics of the landscape and environment and the general productivity of the region in terms of stockbreeding and animal husbandry practices.

Concerning this issue, L. N. Koryakova and I met a Russian veterinarian (domestic livestock specialist) during a visit in the summer of 2000 to an old Soviet Period horse breeding farm near the city of Tyumen, which had been constructed and used throughout the 1960's – 1980's for the development of large numbers of horse stock. These animals were then used to re-populate Central

Asian horse stock (primarily in present day Kazakhstan), which were frequently decimated due to both cyclical disease epidemics as well as the harshness of the environment and climate of the steppe region. Our informant described to us that the Trans-Ural forest-steppe region had historically been an ideal environment for the breeding and development of horse herds and that this had been well recognised during the Soviet Period. Furthermore, our informant explained that Kazakh populations living in Northern Kazakhstan, where large horse herds are also quite common, were frequent customers of the Siberian horse farm, because they felt that the quality of horsemeat was considerably higher than that which was available for sale within their own region.

This issue of the Trans-Ural forest-steppe region being an excellent environment for raising horses and maintaining large herds raises some interesting questions concerning possible trade and exchange relationships within the prehistoric period. For example, as discussed in the earlier sections of this chapter, it has been hypothesised that nomadic populations in the southern steppe region (Saka and Sauro-Sarmatians) actively engaged in trading and exchange with the northern forest-steppe populations (Gorokhovo-Sargat) (Koryakova 1988; Koryakova & Daire 2000; Matveeva 2000). This model is predicated on the north-south transmigration of the southern nomads and their probable interaction with populations in the forest-steppe region, including the populations inhabiting the eastern side of the Ural Mountains (Itkul) who are believed to have engaged in intensive metallurgical practices and trade and exchange with both the Trans-Ural groups as well as the nomads of the southern steppe regions (Koryakova, forthcoming). Although difficult to prove with current zooarchaeological methods, future research with methods such as mtDNA and strontium isotope analyses may one day help in providing evidence of the movement of animals between various geographical areas within the prehistoric Eurasian steppe region. I am convinced that the application of scientific data of this nature will help to generate important new discussions and stimulate improved interpretations concerning the prehistoric trade and exchange of animals.

4.7.3 Semi-settled Pastoralism

The second model noted above, *semi-settled pastoralism*, is said to represent a mixed herding strategy of horses, cattle and sheep/goats, generally with a numerically higher number of horses within the herd. Archaeologically, this model has been applied to the interpretation of Early Iron Age settlements such as the sites of Pavlinovo and Prygovo in the Middle Tobol River region. It has been argued that these settlements may have represented permanent winter settlement locales during the Iron Age Sargat phase (Koryakova & Daire 2000, 67). Again, ethnographic parallels have been drawn upon, especially regarding the socio-economic patterns of the Bashkir and Siberian Tatar groups (e.g. Sergeev 1992). The ethnographic information obtained from these groups has underscored the importance of winter settlements, as the extreme temperatures of the Trans-Ural region necessitate various levels of protection or shelter for the animals from the wind and harsh winter weather. Therefore, suitable settlement sites were usually selected along low elevation river valleys and were chosen where there was some possibility of localised forest cover. In this case, protection from the wind could be gained and there would be an abundance of water and firewood, as well as the possibility of pasturing the livestock within areas where the snowfall was less, such as along rivers or within forested areas (Koryakova and Hanks, forthcoming).

It is a commonly known fact in the Trans-Urals that horses are well adapted to the harsh environment of the forest-steppe zone with its extreme continental climate and bitter cold winters. The informant from the horse farm noted above explained that within the Tyumen district horses are not usually stabled during the winter and are turned out into open pastures with only a primitive windbreak or limited tree cover. Even on the coldest winter days, often in excess of minus 20-25 degrees Celsius, horses can manage with only light shelters and windbreaks. Cattle, on the other hand, are more susceptible to extreme temperatures and require more protection from the elements. Also, as was noted in Chapter Three, horses have the ability to break through snow cover to obtain fodder below. As Khazanov notes, concerning the horses of nomadic populations, the pasturing of horses provided an answer to the problem of obtaining fodder below the snow as a result of its "unique ability….to uncover grass up to 10 centimetres deep with just three kicks. The horse can pasture grass covered with 30-40 centimetres of snow, sometimes even 50 centimetres" (1984, 50). This method, called *tebenyevka*, was an extremely important factor in the herding of horses in regions with heavy snowfall and extreme temperatures.

4.7.4 Settled Pastoralism

The third model noted above, *settled pastoralism*, has been considered to be more representative of the earlier stages of the Iron Age development within the Trans-Ural region, correlating with the Late Bronze–Early Iron Age transition. This pattern is generally held to be associated with a higher frequency of cattle bone remains from settlements and more developed cultural activity levels (stratigraphically recognised) with higher densities of material artefacts. The Baitovo site discussed above has been interpreted as representing just such a pattern (Koryakova & Daire 2000, 67).

Within this type of pastoralism, a more sedentary socio-economic regime is noted and the pastoral economy is mixed with a more focused seasonal exploitation of wild fauna and flora resources as well as the utilisation of fish associated with the river and lake environments. I will not continue with a further elaboration of this model, as I feel that it will be more productive to consider its relationship to the other models through a discussion of their relationship to conventional zooarchaeological analyses. As I have already noted, I will provide a more detailed approach to the discussion of settlement archaeology in the next chapter, which will focus on critically analysing the criteria conventionally used to interpret the rather wide range of suggested pastoral practices and settlement patterns noted for the Gorokhovo-Sargat period through the use of faunal data.

4.8 Discussion: The Inadequacy of Conventional Socio-Economic Models

It can be stated that between the three models outlined above there is a significant degree of overlap concerning inferred patterns of stockbreeding practices and their relationship to the faunal record. As such, there are significant problems with how faunal remains are recovered, analysed and interpreted in regard to the models of socio-economic activities (semi-nomadic, semi-sedentary, etc.) discussed above.

Scholars within the Trans-Ural region have theorised that the Gorokhovo-Sargat societies practiced a semi-nomadic/semi-sedentary form of pastoralism with stockbreeding representing the main economic production activity. However, it should be noted that this model should not preclude supplemental subsistence activities such as hunting, fishing and small-scale horticulture or agriculture. Indeed, the faunal evidence from numerous settlement sites within the Trans-Urals reflects wild taxa as well as the common three domesticate species. For example, Table 4.23 illustrates the fauna species from the fortified and island settlement locales at Rafailovo. The range of animal species suggests the utilisation of wild fauna for meat, skins/furs and other utilitarian type products. However, many of these animals also appear within purely ritual deposits, such as within funerary contexts associated with the kurgan form of burial in the same localised region. Therefore, there may have been symbolic significance associated with the animals as well, although this possibility has not been investigated within settlement site deposits and has only been discussed in relation to the ritual context of human burials.

The remains of riverine and lake fish (e.g. *Esox lucius* – pike; *Cyprinus carpio* – carp) are sometimes found in well-preserved deposits within settlement sites and evidence such as net weights and other fishing paraphernalia are also recovered (Matveeva 1993a, 120). This issue of the importance of fishing within steppe pastoralist societies has been largely underestimated within conventional interpretations. Although fishing has been acknowledged as being quite widespread within the steppe during the later Prehistoric period (Kislenko & Tatarintsev 1999; Rassamakin 1999) its potential significance in understanding pastoral economies has not been fully appreciated until recently with the work being initiated by O'Connell, Levine and Hedges concerning isotopic analyses on both human and animal bones as a way of identifying stable isotopic levels and their relationship to prehistoric diet within the steppe (O'Connell, Levine & Hedges 2000).

One must also consider the importance that small-scale agricultural pursuits may have had among Eurasian pastoralist societies. This was pointed out in Chapter Two and Three of this thesis, with regard to the important work being done by Rosen, Chang and colleagues (2000) in Kazakhstan

Animal Species	Rafailovo Settlement NISP (MNI)	% of total NISP	% of total MNI	Rafailovo Island NISP (MNI)	% of total NISP	% of total MNI
Cow	1744 (101)	37.02	35	309 (18)	43.5	34.7
Sheep/Goat	213 (35)	4.52	12.2	32 (4)	4.5	7.7
Horse	2401 (94)	50.98	32.6	314 (17)	44.2	32.8
Camel	47 (8)	1.0	2.8	6 (1)	.9	1.9
Total	**4405 (238)**	**93.52**	**82.6**	**661 (40)**	**93.4**	**77.1**
Elk	191 (15)	4.06	5.2	13 (2)	1.8	3.8
Deer	7 (3)	.15	1.0	6 (2)	.9	3.8
Bear	1 (1)	.02 .03	.03	-	-	-
Pig	4 (2)	.09	.07	14 (3)	2	5.8
Noble Deer	2 (1)	.04	.3	-	-	-
Northern Deer	2 (1)	.04	.3	1 (1)	.1	1.9
Hare	-	-	-	2 (1)	.3	1.9
Wolf	3 (2)	.06	.7	-	-	-
Fox	8 (4)	.17	1.4	-	-	-
Beaver	69 (12)	1.47	4.2	5 (1)	.7	1.9
Badger	1 (1)	.02	.3	-	-	-
Otter	1 (1)	.02	.3	-	-	-
Marmot	3 (1)	.06	.3	-	-	-
Total	**292 (44)**	**6.2**	**15**	**41 (10)**	**5.9**	**19.1**
Dog	13 (7)	.28	2.4	8 (2)	1.1	3.8
Total	**4,710 (289)**	**100**	**100**	**710 (52)**	**100**	**100**

Table 4.23 *Frequency percentages (total fragment counts) of wild and domestic animal species from the Sargat period Rafailovo settlement site (after Matveeva 1993a, 117).*

and their investigation of the palaeoenvironmental changes and agropastoral developments during the Iron Age Saka-Wusun period. Clearly, there is much more to be learned from more intensive palaeoenvironmental approaches to Early Iron Age period settlement archaeology within other regions. Hence, I feel that this significant issue also has a great bearing on conventional interpretations of the Gorokhovo-Sargat settlements, whereby most scholars have stressed that the soils within the Trans-Ural region, with their high saline contents, were not particularly conducive to prehistoric agricultural pursuits. However, one cannot overlook the material evidence recovered from Iron Age settlement site investigations in the Trans-Ural forest-steppe zone, which clearly indicate some form of agricultural pursuits (Matveeva 2000, 57-58): iron sickles and pointed hoes, grain seeds (Mogil'nikov 1976, 176), bone handle components from a plough implement, seed remains found in pit features (Kozhin 1972; Koryakova & Sergeev 1989), and possible evidence of field cultivation or irrigation near the settlement site of Pavlinovo (Ivanova & Batanina 1993).

Nevertheless, despite this evidence, Russian scholars have not actively pursued the investigation of palaeobotanical evidence in settlement archaeology within the Trans-Ural region. For example, there is a distinct lack of soil floatation carried out during archaeological investigations and soil sampling for phytolith evidence has not been undertaken within the region at all. Regarding this, as part of my field methodology during the 2000 and 2001 summer expeditions, I collected a number of soil samples for a future possibility of analysis. All the samples were taken from controlled contexts and a variety of locations within both a cemetery site during the 2000 season at Shushye & Karacye and from the 2001 season at the Pavlinovo settlement. It is hoped that there will be a future opportunity to examine these samples for possible paleobotanical evidence and that this may provide interesting results concerning agricultural practices or suggest a mixed form of agropastoralism.

4.9 Conclusion

At this point, I feel that it is necessary to move towards a conclusion of this chapter and thus provide a beginning for the next one. Although I have made several points regarding the socio-economic foundation of pastoralism within the Early Iron Age period of the Trans-Ural region, I have not presented a detailed discussion concerning the specific relevance and significance of zooarchaeological approaches. Therefore, I will begin the next chapter with a necessary discussion of the problems associated with the interpretation of faunal remains from settlement investigations within the Middle Tobol River region, which have been presented above relating to a variety of sites. The next chapter will also provide an important contextual grounding for an approach to zooarchaeological analysis and will also provide a framework for the discussion of an improved model for understanding pastoral practices and settlement patterns for the Trans-Ural Early Iron Age period.

This is particularly important, as this chapter has clearly shown that there is a direct relationship between settlement patterns and the presumed variation inherent in different forms of pastoral economies based on some range of seasonal or continuous mobility (e.g. semi-nomadic and semi-settled). Typically, the evidence which is cited to support such models is based on two main factors: (i) interpretations of the recovered faunal remains from the settlements, e.g. higher frequencies of particular species' remains and hypothesized herd compositions based on faunal remains quantification, and (ii) suspected evidence of short-term occupation, which has mainly been based on the construction patterns of the dwellings and other associated architectural features of the sites. These issues were noted in detail above within the discussion of the investigated settlements sites in the French-Russian project (Baitovo, Prygovo, MaloKazakhbaievo). Concerning the second factor, I will explore the relationship between the physical characteristics of the dwellings and other domestic architecture features in the settlement sites and the intra-site variation in animal bone deposits in more detail in the next chapter, where I offer a detailed contextual analysis of the faunal remains encountered at the site of Pavlinovo and their deposition within various areas of the settlement.

Therefore, in this rather dense chapter, I have provided a structured approach to the Early Iron Age archaeological patterns within the Trans-Ural Middle Tobol River region. As a result, I have outlined some of the main theoretical approaches to settlement patterns, occupation sequences, and inferred models concerning various types of pastoral economies and socio-economic organization. It is now time to take the discussion a step further by investigating the conventional approaches and interpretations for this region by presenting the analysis of my own original work with the faunal assemblages from the Pavlinovo settlement.

CHAPTER FIVE

The Pavlinovo Fortified Settlement: A Zooarchaeological Approach to Settlement Complexity

5.1 Introduction

In the first section of this chapter I wish to elaborate on some of the main points that were discussed in the previous chapter concerning problems with the analysis of faunal remains from settlement sites in the Middle Tobol River region. Regarding this, I wish to work from a general critique of the relationship between faunal analyses and socio-economic models regarding pastoralism to more site-specific arguments concerning excavation methodology, laboratory analysis, and final interpretations of settlement faunal remains. This will be achieved through the discussion of my thesis fieldwork and faunal analysis results from two seasons of archaeological excavation at the site of Pavlinovo, which was undertaken through collaboration with the French-Russian "Eurasian Crossroads" project discussed in the last chapter.

5.2 Conventional Zooarchaeological Approaches and Problems

It is necessary to begin with a general overview of the main methods of zooarchaeological analyses used for the Middle Tobol River region and to define some of the main problems associated with these approaches as they relate to traditional categories of pastoral economic regimes (i.e. semi-nomadic, semi-settled, settled, etc.). There are, of course, a range of considerations concerning the taphonomic process associated with faunal remains from the initial deposition sequences to the recovery, analysis and final publication of the materials. Some of the significant factors associated with these processes are exemplified in Figure 5.1. In the last chapter, I reviewed some of the general results from the zooarchaeological analyses of faunal materials from the settlement sites of MaloKazakhbaievo, Baitovo and Prygovo. Although my discussion of these sites provided only a small sample of information when compared with the total number of settlement sites investigated within the Trans-Ural forest-steppe region, it nevertheless provided a good indication of some of the main problems confronting the use of zooarchaeological data for the modelling of specific types of pastoral economies and Early Iron Age socio-economic organisation (Fig. 5.2). For example, although there has been a concerted effort to recover and analyse zooarchaeological materials from the settlements included within the French-Russian project, it can be pointed out that there are several

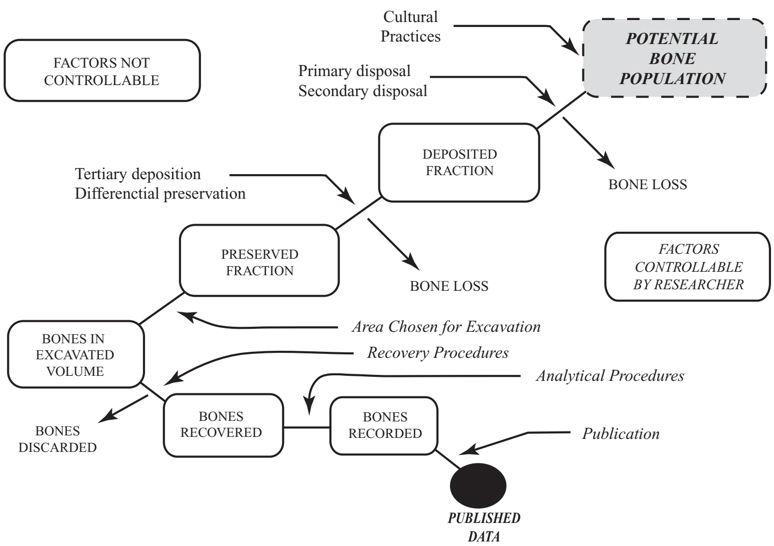


Figure 5.1 *Schematic illustrating the range of taphonomic biases affecting faunal remains and the loss of information from initial deposition through recovery to the final published results (after Meadow 1981).*

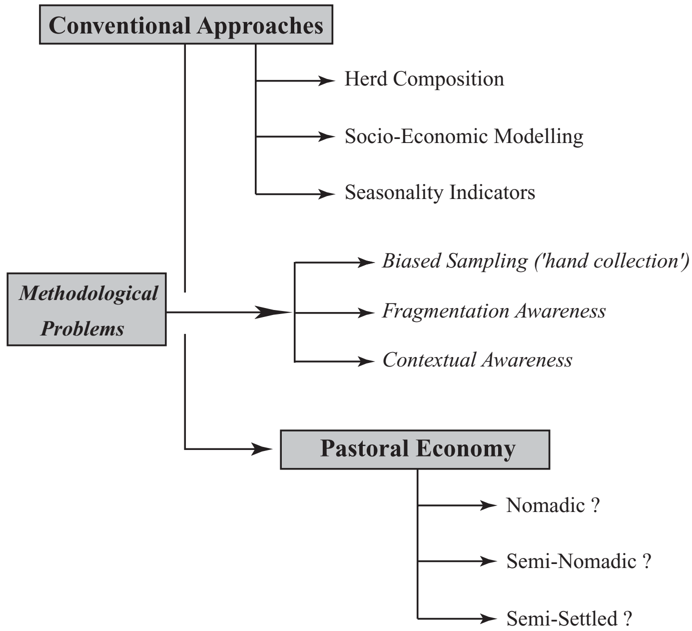


Figure 5.2 *Schematic illustrating main problems associated with conventional approaches to modelling Early Iron Age socio-economic practices.*

distinct problems regarding the achieved results and data. At this stage, I will only note the more apparent problems and then discuss the sampling biases that can be attributed to these conventional issues. I will address each of them more specifically as they relate to my analysis of the Pavlinovo faunal assemblages in the final component of the chapter, where I provide my interpretations of the data and present the outline of a structure for a more focused zooarchaeological approach for future studies which investigate settlement complexity in the Middle Tobol region.

Regarding the conventional zooarchaeological analyses of the settlement sites presented in the last chapter, the following main problems may be outlined:

- ‘Hand collection’ of animal bone remains without use of wet/dry soil sieving methods.
- Taphonomic characteristics (e.g. butchery, burning, fragmentation) of faunal remains not emphasised in analyses.
- Too strong an emphasis on modelling herd composition based on NISP and MNI bone fragments quantification.
- General ageing methods employed or lack of consistency in methods.
- Lack of representation for skeletal element variability within site deposits.
- Lack of intra-site and inter-site contextual interpretations of faunal deposits.

It can be stated that each of the above six points have created significant biases in the sampling, analysis and final interpretation of the Early Iron Age faunal remains from the Middle Tobol River region. Certainly, the first issue noted above is particularly important, as there has been a long line of discussion within Western literature over the problems associated with sampling biases created by ‘hand collection’ methods or screen size variability – if indeed soil sieving is employed as a methodology. These factors have a direct bearing on the representation of faunal remains recovered during excavation and it has been well documented that a lack of soil sieving significantly biases the species representation (over-emphasising larger fauna) within recovered assemblages and introduces a poorly controlled sampling strategy between varying archaeological contexts (O’Connor 2000; Cannon 1999; Lyman 1994a; Ringrose 1993). Moreover, the smaller fragments of animal skeletal elements will be under-represented in the assemblage, therefore also providing biased data regarding bone treatment and fragmentation, which is an issue that relates directly to butchery practices and other human activities regarding the processing, treatment, and disposal of animal bone remains.

Another critical problem relating to the lack of soil sieving is that any attempts to investigate statistically artefact densities, such as pottery remains and animals bones, will be both hampered as well as biased by the lack of a systematic sampling methodology. This fact is particularly pertinent when one considers that the study of artefact densities is one of the best ways of quantitatively approaching issues such as site occupation sequences, length of habitation of settlements and dwelling features, and possible seasonality indicators. A number of excellent approaches have been undertaken relating to such artefact density strategies and have clearly shown the utility of such methods for approaching the complexity of settlement site occupation sequences (Kent 1993a; 1993b; Cameron & Tomka 1993; Cameron 1991; Cribb 1991a; 1991b). Unfortunately, as many of the issues surrounding the Early Iron Age Trans-Ural region settlement patterns relate to questions of semi-nomadic or semi-settled patterns, the lack of soil sieving is a major concern with contemporary settlement investigations within the region as well as for any future approaches to the complexity of socio-economic modelling.

The second point noted above, regarding taphonomic characteristics, is an extremely important one when considering the question of how animals were utilised by people within the respective settlement sites as well as being indicative of the spatial variations that are inherent in faunal deposits. This factor relates to a multitude of different activities and practices associated with the management of animals, the butchery and processing of animal carcasses, and the use of animal remains in a variety of ways ranging from subsistence and utilitarian needs to complex ritual and symbolic associations.

As such, significant information can be gained from analysing burning or charring characteristics, cut marks and other indications of butchery or human agency, bone fragmentation, as well as general characteristics associated with the weathering and degeneration patterns of the bones and the physical factors and influences that have affected the remains throughout their taphonomic history (Lyman 1994a; 1985; Binford 1981; Fisher 1995).

The third point noted above was discussed in the last chapter and is perhaps one of the most important regarding the hypothetical modelling of Iron Age pastoral economies in the Middle Tobol region. In general, it can be noted that the methods employed in the quantification of animal bone remains have stimulated a great deal of discussion and debate among scholars (Todd & Rapson 1988; Marshall & Pilgram 1993; O'Connor 1996; Lyman 1985). This problematic issue relates to the use of quantified data for animal body-part representation, such as the Number of Identifiable Specimens (NISP) and Minimum Number of Individuals (MNI), to model ancient herd composition – such as estimating the supposed number of animals managed within a hypothetical herd.

This is a common problem among archaeologists seeking to extrapolate general information regarding past socio-economic practices relating to pastoralism or agro-pastoralism and it continues to be one of the main issues plaguing the interpretation of faunal remains from archaeological sites (Cribb 1987, 377). This is particularly the case for Central and Eastern European zooarchaeological studies as well as for the Eurasian steppe region (Antipina 1997; Marciniak 1999; Morales-Muñiz & Antipina 2000). It will be best to deal more explicitly with this issue through my discussion below of the application of a more rigorous approach to faunal remains quantification and skeletal element representation within my methodology for the Pavlinovo faunal assemblages.

Moving on to the fourth point noted above, concerning the use of general ageing methodologies for the faunal remains recovered from the Middle Tobol River sites, the analyses of tooth eruption and attrition patterns can offer substantial information regarding animal mortality patterns and occupational seasonality. This method is particular crucial when investigating problematic terminologies such as semi-nomadic and semi-settled socio-economic patterns. I briefly touched on this issue in the last chapter in regards to the zooarchaeological results obtained from the Middle Tobol River settlement sites. Although the utility of dentition studies has been emphasised in the traditional reports, more detailed methodologies are available and have been applied to the Pavlinovo faunal materials discussed below. Again, it will be best to return to this issue below with the overview of my methodological approach and again at the end of the chapter when I present the results of the dentition ageing. This work will provide an important comparison with conventional methods of ageing the domestic animal remains and the relevance of this issue to Early Iron Age animal husbandry practices.

The fifth issue concerning skeletal element representation is an area that has not been emphasised to a great extent in the published results from the archaeological investigations of the Early Iron Age Middle Tobol River settlements. Indeed, most of the emphasis has been placed on providing general species representation and NISP frequencies and MNI quantification, as was illustrated in the last chapter. This situation is in part a reflection of the current disjunction between one team of scholars excavating the materials and another group providing the zoological analyses. Hence, the incorporation of contextual information regarding the deposition of the faunal remains is not transferred as part of the analytical process for the faunal remains. The zoologist, unfamiliar with the excavation contexts, has the disadvantage of not being able to apply a more specific methodology that could potentially yield a different range of information relating to particular questions that the archaeologists may have about the materials and their relationship to the site in general. As such, the application of 'standard' methods within the zoological analysis, across a variety of materials representing very different contexts, will of course produce basic standardised information concerning the faunal remains. This situation is particularly accentuated within Russian scholarship, as the discipline of zooarchaeology has not as yet truly developed as a speciality within the larger study of archaeology or archaeological science. Rather, such faunal analyses are traditionally conducted by individuals with little or no training in archaeological excavation, or if they do have such training, are not familiar with the sites and contexts from which the faunal remains have originated.

The final point noted above, concerning contextual approaches to the analysis and interpretation of faunal remains, is one that deserves some discussion. Putting aside for the moment the debates surrounding the methodological side of faunal analysis, it should be stressed that zooarchaeological approaches provide a variety of interesting and significant data pertaining to animal husbandry regimes, variation within subsistence strategies, animal butchery and food preparation practices, as well as a host of other details regarding the contextual nature of faunal remains deposition within archaeological sites – all of which are indicative of the range of complex relationships and behavioural patterns created between humans and animals. While the underlying strategy of more traditional approaches (still prevalent within Iron Age Trans-Ural studies as noted above) to faunal remains recovery from settlement sites has been aimed at the economic reconstruction of the 'herd', particularly relating to hypothetically static socio-economic patterns (e.g. pastoral, agricultural, etc.), in recent years many scholars have begun to emphasise that animal bone remains reflect a variety of more complex behavioural patterns as well as natural site formation processes, many of which do not fall within hypothetical socio-economic categories (Crabtree 1990; Schiffer 1976; Cribb 1985; 1991a; Brewer 1992; Hesse & Wapnish 1985; Choyke 1994). As Marciniak has noted, "…archaeological artefacts, and archaeological cultures should not be indiscriminately identified and referred to any concrete social and economic system. Instead, they should be treated as a sort of model situation, a new structure which in the observed configuration (in the sense of a "physical find population") has never occurred in the past (Marciniak 1999, 301).

Recent approaches to these issues have moved towards defining new methodologies and rationales for the interpretation of animal bone remains from archaeological sites, many of which have emphasised the importance of stronger contextual interpretations of the evidence (Hesse & Wapnish 1985; Needham & Spence 1997). Certainly, an excellent example of such work are Hill's recent studies of British Iron Age settlement sites, which have illuminated the complexity associated with structured deposition patterns and the variability associated with artefact aggregation within settlement site locales (Hill 1989; 1995). Hill's work has quite successfully challenged many of the problematic dichotomies existing between such conventional interpretations as "secular:sacred" and "economic: symbolic" concerning deposition patterns, which has in effect challenged many of the traditional views of the British Iron Age period particularly in the case of the relationship between varying settlement locales such as hill forts and open settlement sites. Hill's research, through an explicit contextual approach to the analysis of archaeological materials and artefact densities, has identified intriguing patterns relating to the intra-site and inter-site variation of various categories of material culture, including faunal bone materials.

Other scholars have also applied such approaches to the investigation of settlement site remains, with a particular focus on the interpretation of archaeological remains formally identified as general "rubbish" or "midden" deposits. As such, deposits of this nature have become increasingly more important in terms of moving beyond pure economic interpretations in an attempt to address the proposed logic and rationale behind structured deposition patterns (Needham & Spence 1997). This general movement by scholars towards a stronger methodological and theoretical treatment of settlement artefact remains has clearly signalled the need to develop new approaches to understanding not only the basic nature of site formation processes, including cultural as well as natural factors, but also to explore potential ways of examining the interface between what is perceived of as prehistoric rationality and what may be interpreted as ritualised practice (Brück 1999).

Clearly, my discussion of these approaches to the issue of settlement site complexity and depositional sequences speaks to the need for a more explicitly framed theoretical approach to the interpretation of structured deposition, but one which is also absolutely dependent upon very thorough archaeological field work methodologies for the excavation and recovery of the remains to more detailed and question driven laboratory analyses of the faunal materials. With these important thoughts in mind, I now wish to turn towards a discussion of my archaeological fieldwork and faunal analyses relating to the Pavlinovo Iron Age fortification. It will be most useful to provide some general background to the earlier studies of the site as well as some of the main characteristics of the 1999 and 2001 excavations in which I participated. Since my work at this site has generated a great deal of information and more specific data regarding faunal remains, I will provide a rather straightforward discussion of the various remains and my results with a more detailed discussion at the end of the chapter. This will allow for a more coherent approach to the presentation of the details associated with the excavation of the faunal remains and their varying contexts within the site.

5.3 The Pavlinovo Research Project

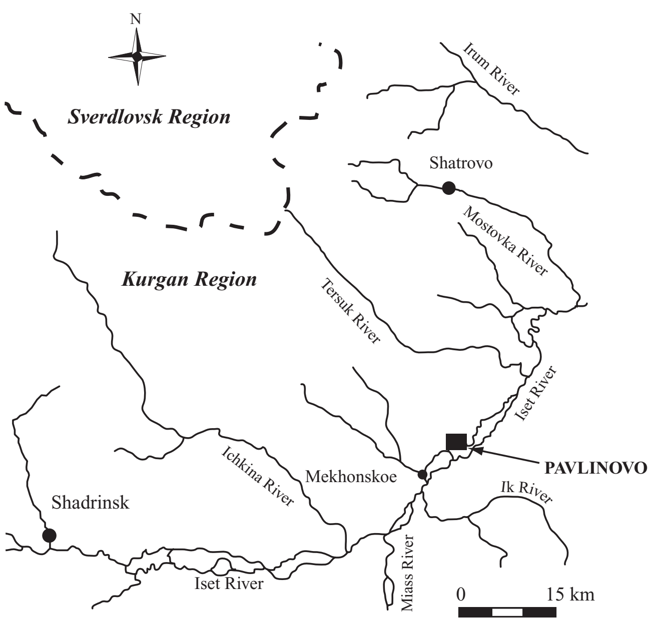
I must emphasise at this point that my work with the Pavlinovo materials should be understood in relation to a process of work that is part of a much larger team endeavour. In this respect, the work with the faunal materials is still on-going in the sense that further collaboration will be necessary with other analyses being done on soils, ceramics, site architecture, etc. A good deal of the information required for undertaking a thorough contextual approach to the excavation, analysis and interpretation of faunal remains is contingent upon meticulous excavation methods, detailed recording, and an interpretative strategy that correlates with other work being done on recovered aretfacts. Therefore, one of the realities of working within a larger project setting is that the completion of all results of the project often occurs at different periods. Concerning the 1999 season, the final unpublished Russian report (annually required documentation by the Russian Academy of Science) was actually not completed until approximately 1 month before the completion of this thesis in the fall of 2002. Unfortunately, there was insufficient time to incorporate a great deal of this information into this thesis, including the more detailed and finalised plans and sections, and many of the interpretations regarding the stratigraphic relationships of the upper cultural strata of the sites. Nevertheless, as part of my work with the 1999 materials (particularly during my stay in Ekaterinburg during 2000), I benefited greatly from personal discussions with A. Kovriguin, L. Koryakova and S. Panteleyeva concerning the preparation of the 1999 report and information regarding the variously proposed occupation sequences, pottery distribution and relative dating, and general stratigraphic characteristics. In addition, a brief seasonal report was prepared by M-Y. Daire and L. N. Koryakova for the French team in the fall of 1999 and preliminary interpretations regarding site construction phases (relating to the excavated domestic structures) and the inclusion of four sections (stratigraphic profiles) of the excavated area were prepared (Daire & Koryakova 1999). This preliminary report greatly aided my interpretation of the various stratigraphic characteristics of the excavated area and provided an important framework for an approach to interpreting the faunal remains.

As a result of the lack of information regarding the final interpretations of the site, I have decided to provide a more detailed presentation and interpretation of the bone remains recovered from the lowest cultural level encountered during the 1999 excavation. Although I have completed the analyses regarding all bones recovered from the 1999 season, I will only provide general information regarding the bones encountered within the upper stratigraphic levels, which have a high probability of representing mixed faunal deposits from the Early to Late Iron Age period as well as possible Medieval and historic period intrusion. Pottery sherds relating to this broad span of time were recovered from the upper levels during the excavation and a much more detailed approach to the analysis of the upper level faunal remains will be required for future interpretations. This future phase of work must be correlated with not only the recently completed report but also with current pottery analyses being undertaken by S. Panteleyeva as part of her PhD thesis at Ural State University, Ekaterinburg. I am hopeful that my work with the distribution patterns of the faunal remains (completed Excel database of all faunal remains) will fruitfully merge with Panteleyeva's similar approach to the pottery remains. This collaboration of approaches with different archaeological materials and artefact densities should provide significant information regarding differentiation in activity zones within the settlement as well as valuable information regarding occupation phasing, as discussed above. I had hoped that such an approach would be possible for my PhD thesis research; however, the collaborative results from the site project are not yet in a developed state for such a correlation. Nevertheless, I look forward to the future pursuit of this approach to the Pavlinovo materials.

In addition to the presentation of the results from my fieldwork during the 1999 season, I will also provide some preliminary results from my analysis of the animal bone materials recovered from the 2001 season. Again, the full collaborative site report has not yet been completed regarding this work and therefore I will only present some basic interpretations of three animal bone concentrations relating to the lowest cultural levels of the excavated area. The reason I have chosen to include this data within the thesis is because the excavated area adjoined the 1999 excavation, and there was a distinct connection regarding domestic structural features and animal bone deposition patterns. Although the data I will provide is general in nature, it does stimulate some intriguing questions when compared with the Iron Age structures and faunal remains encountered during the 1999 season and several interesting points can be raised about the Pavlinovo site. These issues will be discussed at the end of the chapter.

5.4 The Pavlinovo Fortified Settlement

The Pavlinovo site is an Iron Age period fortified settlement situated within the Shatrovo District of the Kurgan Region (Map 5.1). Situated approximately 5 km downstream from the town of Mekhonskoe, the Pavlinovo settlement is positioned along the northern bank of the Iset River on an ancient alluvial terrace, which rises approximately 12 metres above the primary river course and forms a southward projecting promontory (Fig. 5.3). As a result of these natural formations, the Pavlinovo site provided an excellent location for the development of a fortified settlement area during the Iron Age period.



Map 5.1 *Location of the Pavlinovo fortified settlement within the district of Shatrovo in the Kurgan Region.*

Based on the analysis of aerial photos, coupled with a series of on-site general topographical surveys, the settlement is known to cover an area of at least 100,000 m^2. Surface features located within the site include numerous semi-circular depressions that indicate ancient structural features and occupancy dwellings. (Fig. 5.4). In addition, the distinct surface traces of a fortification zone, with a series of ditch and bank features (Fig. 5.5, # 1), covers an area of approximately 2000 m^2 in the southwestern corner of the site along the edge of the terrace slope. This general pattern of topographical features is quite commonly known for settlement sites and fortification constructions relating to the Early Iron Age period in the middle Tobol River region and the Gorokhovo-Sargat period developments (as discussed in Chapter Four). In addition to the surface features associated with the settlement, there was an Early Iron Age kurgan mortuary mound situated in the south eastern area of the site located near the edge

Figure 5.3 *Photo oriented towards the southwest showing the alluvial terrace where the site of Pavlinovo is situated (photo by Marie-Yvane Daire).*

of the upper level of the ancient river terrace slope (Fig. 5.5, # 6).

Another significant physical feature of the site topography are the two large contemporary soil quarries situated in the centre (Fig. 5.5, # 14). These quarries have been extremely destructive to the site and have been dug to a depth of more than 30 metres in some areas. The surface area affected by these features is somewhat contained and is approximately 12,000 m^2 (Ivanova & Batanina 1993, 102).

Figure 5.4 *Photo oriented towards the south showing one of the ancient depressions associated with the Iron Age settlement structures. (photo by Marie-Yvane Daire).*

5.4.1 History of Investigation

An archaeological team from Chelyabinsk State University (Ural-Kazakhstan Archaeological Expedition) conducted the first series of investigations at the Pavlinovo settlement in 1982 and 1985. During these two expeditions, three primary areas of excavation were carried out: (i) excavation area # 1, situated in the southwest corner of the site, (ii) excavation area # 2, located in the eastern area of the site, and (iii) the excavation of a kurgan mound complex located approximately 40 metres to the east of excavation area # 2 (Fig. 5.6).

The second phase of investigation at Pavlinovo began in 1989, with a team of archaeologists affiliated with Ural State University and the Institute of History and Archaeology (Russian Academy of Science) from Ekaterinburg. Since 1989, archaeological investigations of Pavlinovo have been carried out in 1989, 1990, 1999 and 2001 (Fig. 5.6). Although the results of the 1982-1990 excavations will

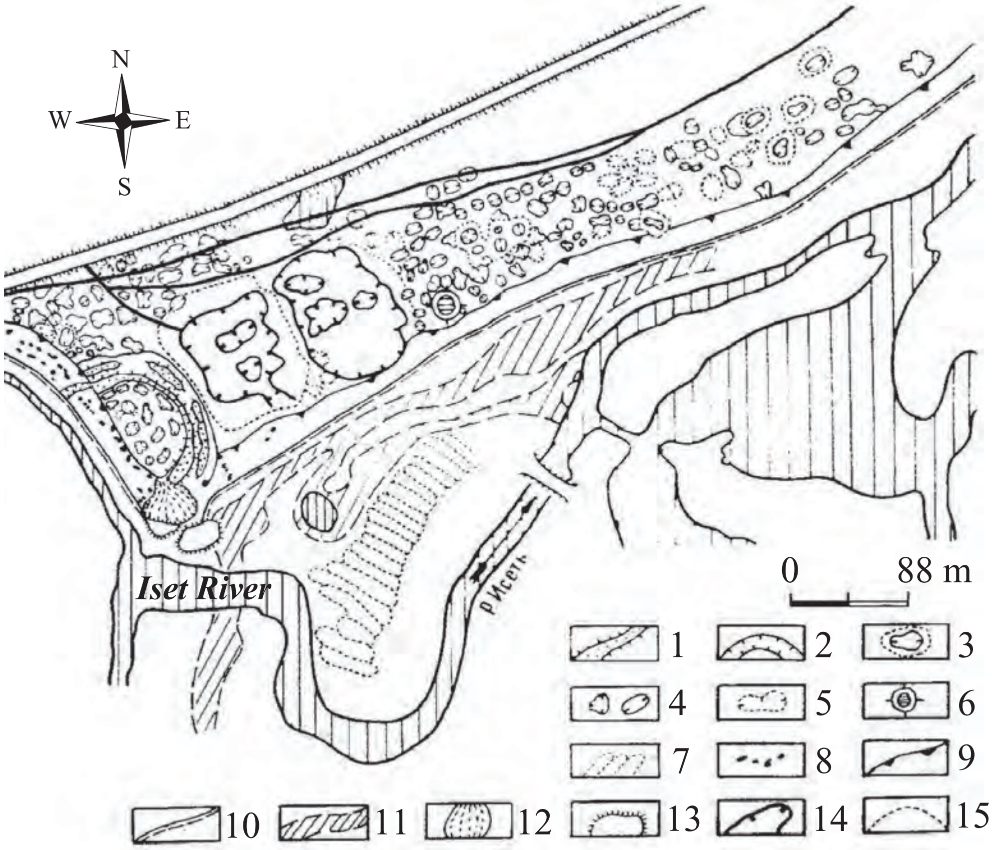


Figure 5.5 *Plan showing the topographical features associated with the Pavlinovo site: 1 – fortification ditches; 2 – ditch feature; 3 – depression from ancient structure with collapsed wall feature; 4 – depression from ancient structure without collapsed wall feature; 5 – depression from ancient structure with soil changes detected; 6 – kurgan; 7 – soil mounds with irrigation ditches; 8 – small pits in terrace feature; 9 – upper edge of alluvial terrace; 10 – lower edge of terrace feature; 11 – ancient channel of Iset River; 12 – depression in terrace relief; 13 – heaped pile of soil; 14 – inner limit of modern day quarry; 15 – outer limit of modern day quarry (After Ivanova & Batanina 1993, 104).*

be summarized below, the proceeding discussion will focus primarily on the excavation seasons of 1999 and 2001, which reflect the seasons I participated in archaeological investigations at the site.

5.4.2 Results from the 1982 and 1985 Excavations

As noted above, the 1982 and 1985 field expeditions at Pavlinovo focused on investigating three small areas within the site. These excavations were centred over two topographical depressions relating to Iron Age dwelling features and a third excavated area focused on a kurgan mound feature. Excavation I covered an area of 162 m^2 and revealed the foundations of two architectural features interpreted as dwelling structures that were oriented northwest to southeast (Fig. 5.7, S. # 1 & S. # 2). Excavation II investigated an area of 120 m^2 and revealed the foundations of another dwelling feature oriented northeast to southwest.

Both excavations revealed evidence of original wooden architectural features (postholes and foundations), fire pits and ash dumps, various scattered and concentrated faunal remains, numerous broken and whole pottery remnants, and small utilitarian items such as spindle whorls and iron implements.

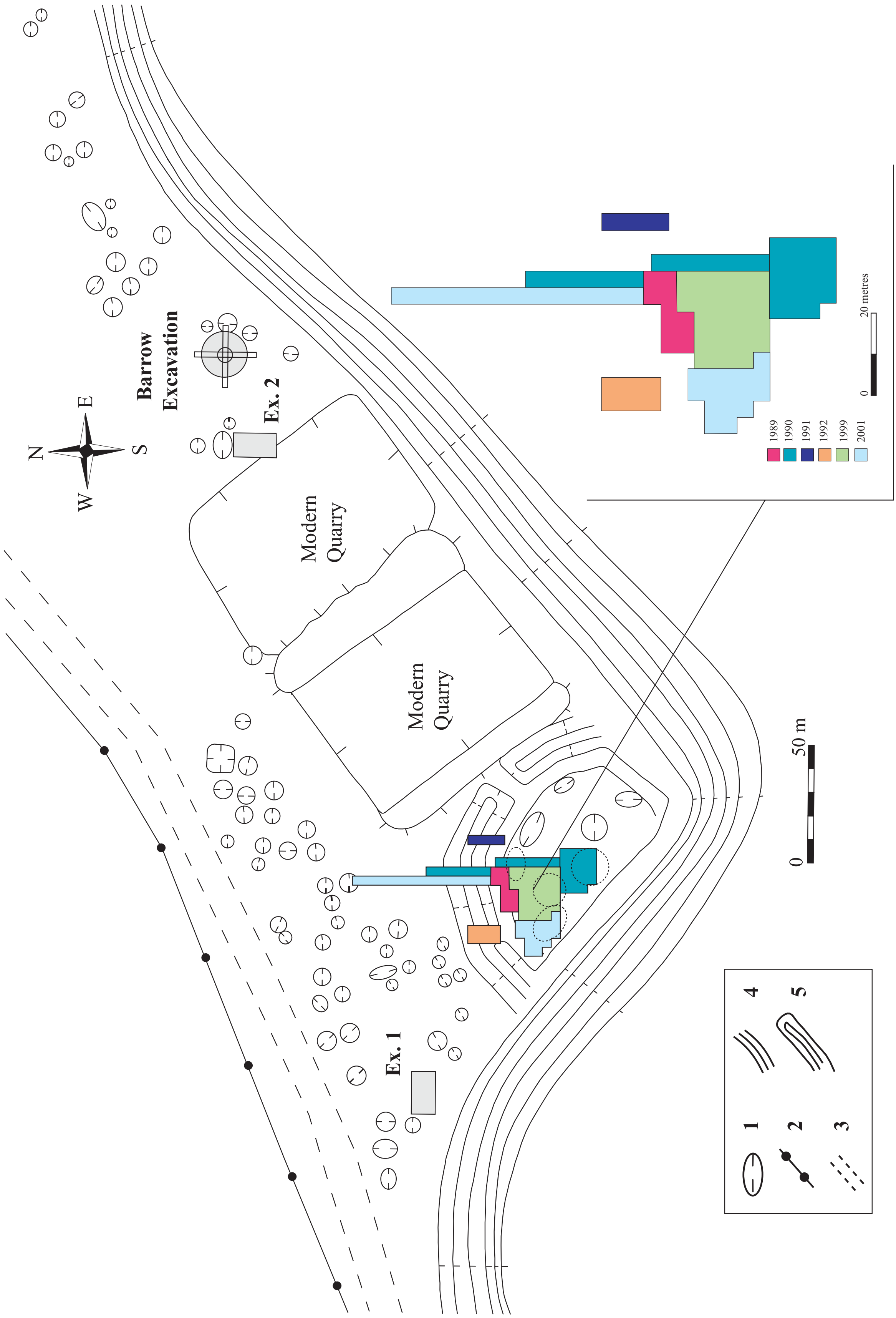


Figure 5.6 *Plan of Pavlinovo site showing main topographical features and phases of excavation from 1982-2001: 1 – Iron Age settlement depressions; 2 – modern power line; 3 – modern roadway; 4 – ancient alluvial terrace; 5 – Iron Age fortification features.*

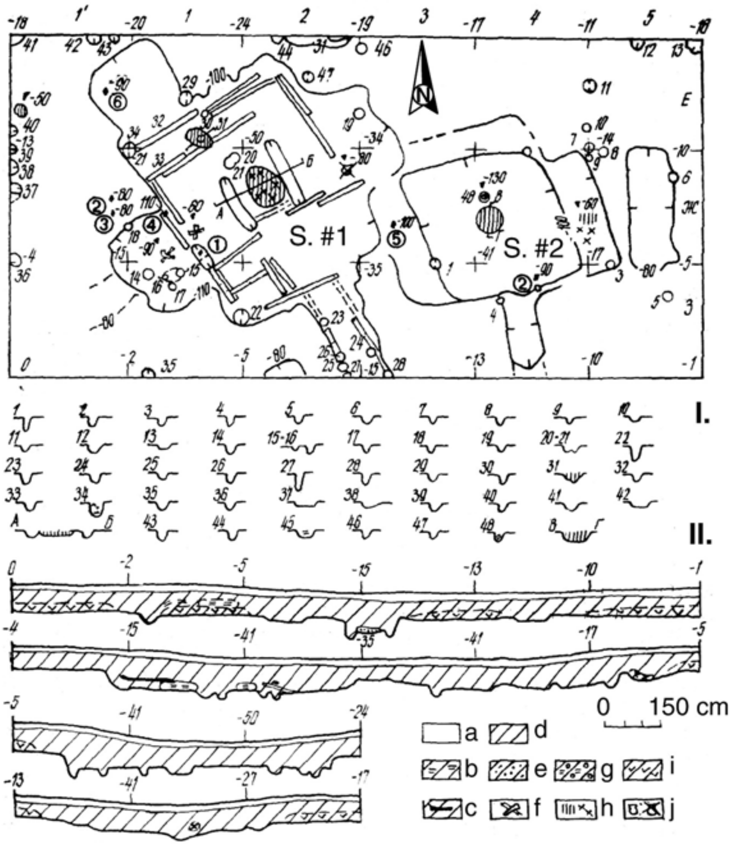


Figure 5.7 *Plan and profile sections of Excavation I at Pavlinovo; I. – plan and profiles of post hole depressions; II. – profile sections of excavated area; 1 – processed stone; 2 – bronze awl; 3 – processed bone; 4 –6 – spindle whorls; a – humus; b – yellow-grey colour loam; c – burned soil; d – humus infilling within structure depression; e – grey coloured sandy loam; f – bone assemblage; g – humus displaced with sterile subsoil; h – burned subsoil and charcoal accumulation; i – displaced soil from pit feature; j – whole pot/ pottery fragments (After Ivanova & Batanina 1993, 108).*

Unfortunately, no information regarding the identification of the faunal remains has been made available regarding the two excavation areas.

The barrow structure that was excavated in the southeastern area of the site was approximately 0.75 m in height and 14 m in diameter (Fig. 5.8). Four heavily disturbed (previously looted) grave pit features were uncovered and revealed evidence of scattered human and animal bone remains and wooden constructions associated with the grave pit constructions. No information has been published regarding the sex and age characteristics of the human skeletal material. Furthermore, as a result of the scattered nature of the human remains and the associated artefacts precise dating of the various burials and their phases within the kurgan mound has not been possible (no ^{14}C analysis undertaken). However, based on the stratigraphy

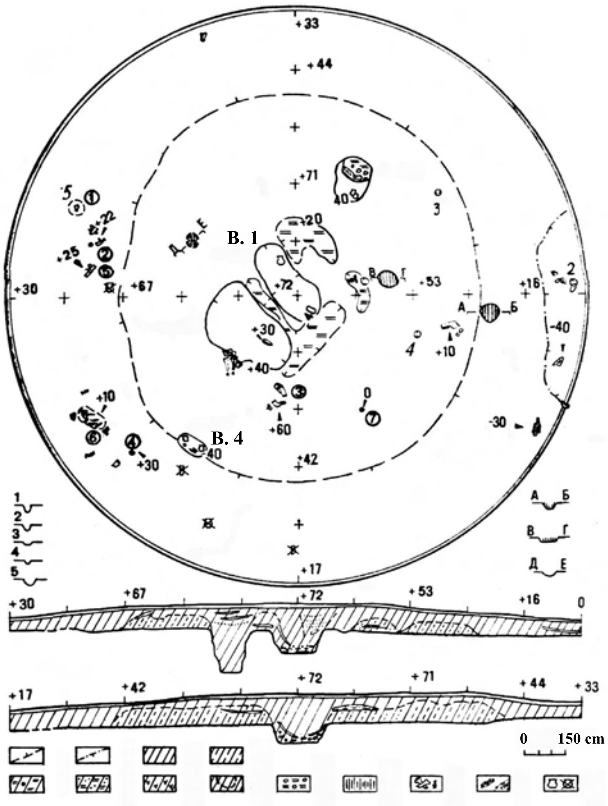


Figure 5.8 *Excavated Iron Age barrow at Pavlinovo (B1-B3 are burials) (after Ivanova & Batina 1993).*

of the kurgan mound and the associated settlement architectural features located near the periphery of the mound structure, it appears that the kurgan was built after the settlement ceased to function (Ivanova & Batina 1993, 121).

Based on the plan and style of the architectural structures, as well as the recovered artefacts during the 1982 & 1985 seasons, the investigated archaeological features at the Pavlinovo site were provisionally dated (no ^{14}C analysis undertaken) to the Sargat phase of the Iron Age period (Ivanova & Batina 1993).

5.4.3 Results from the 1989 and 1990 Field Excavations

Subsequent excavations at Pavlinovo were carried out during 1989, 1990, 1991, and 1992 by Ural State University and the Institute of Archaeology from Ekaterinburg under the direction of L. N. Koryakova. The 1989 excavation (152 m^2) focused on an area within the fortified zone of the southwest corner of the site. In 1990, another area (416 m^2) was excavated within the fortification zone and focused on a large depression feature. Additionally, two trenches were excavated on a north-south orientation and revealed evidence of bank and ditch fortification features. In 1991 and 1992, further trench excavations were conducted in the northern area of the fortification complex and produced additional evidence concerning the construction of the settlement defence system.

The excavations carried out between 1989 and 1992 provided additional evidence for Iron Age period settlement activities at the site and suggested an occupation phase relating to the Gorokhovo-Sargat period – 5th-3rd centuries BC (Table 5.1). This series of excavations yielded a variety of archaeological materials as well as information regarding the dwelling structures within the fortified zone and the complex nature of the bank and ditch defensive structures. Numerous artefacts such as pottery, animal bones, iron objects relating to the Iron Age occupation of the site were found. However, concerning the faunal remains, only the assemblages from the 1989 and 1990 seasons were analysed. The published data relating to these analyses will be compared with my results of the 1999 and 2001 seasons in the discussion at the end of the chapter.

The archaeological investigations carried out between 1982 and 1992 at Pavlinovo employed only a general strategy for the excavation, recording, and recovery of the encountered faunal remains. Although it appears that numerous bones were recorded (spatial coordinates and levels within site) during the earlier field seasons of 1989 and 1990, an explicit methodology for the recovery of the bones was not used and no sieving or flotation of soil was undertaken during any of the excavations. Moreover, only specific faunal bone remains exhibiting obvious diagnostic features (e.g. overall size, wholeness, presence of proximal or distal ends, loose teeth, etc.) were saved for post-excavation analysis. Smaller fragmented bone pieces, generally less than 5 cm in length, were either not collected

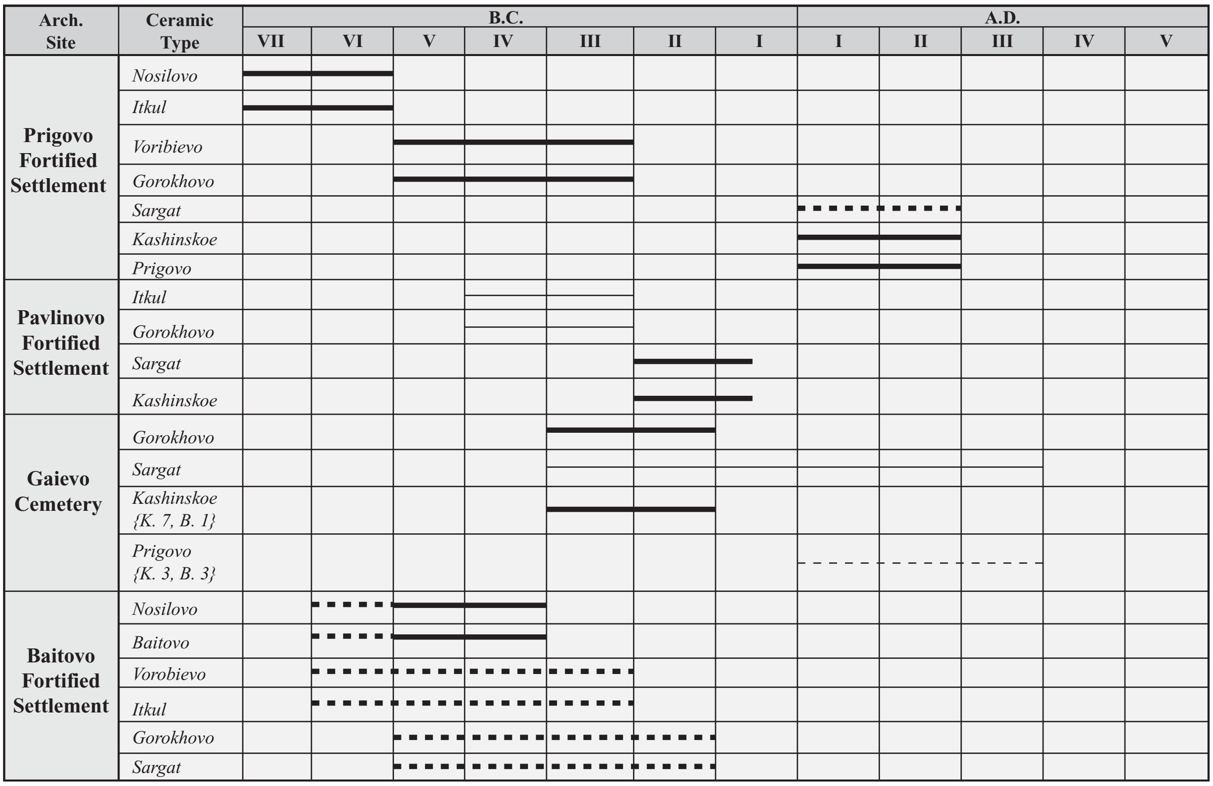


Table 5.1 *Chart illustrating the relative chronology of the Pavlinovo site in relation to other Early Iron Age period sites in the Middle Tobol River region. Chonologies are based on the relative dating of pottery types: solid lines indicate high confidence in dates and dashed lines indicate lower confidence level (after Sharapova 1999b).*

at all or were counted and approximate sizes (e.g. small, medium or large) noted within a field diary. These fragmented pieces were then reburied in a pit at the Pavlinovo site.

However, more emphasis was placed on the recovery of the large concentrations of faunal remains, particularly in the lower levels of the excavations where the remains appeared to relate to other archaeological features (e.g. pits, architectural structures, fire pits, etc.). These concentrations were often photographed and noted on the overall site plan. However, detailed notes or plans of the concentrations were not undertaken and very little information is available concerning the specific characteristics of these remains. The faunal remains from the 1989 and 1990 seasons were analysed by Dr. P.A. Kosintsev at the Institute of Ecology and Animal Science in Ekaterinburg and general information regarding species identification and NISP and MNI calculations has been published as well as data concerning element representation of the horse (*Equus caballus*) remains. The relevance of this data will be discussed in more detail below in connection with my analysis of the faunal remains from the 1999 and 2001 excavation seasons.

In this next section, I wish to present some of the specifics relating to the Pavlinovo 1999 excavation season. Figure 5.9 provides a plan of both the 1999 and 2001 excavations, general characteristics of the various archaeological features, and details the horizontal distribution of the main faunal remains concentrations that will be discussed below.

5.5 The 1999 Pavlinovo Expedition

The 1999 archaeological field expedition was undertaken by a team comprised of the Institute of History and Archaeology (RAS), staff and students from Ural State University, and members of the French research team from CNRS, Rennes. In addition, a group of foreign field school participants from England and North America took part in the project. In total, there were approximately 50-70 expedition members at any one time during the nine-week digging season, which was conducted between July and September.

The main excavation area # 7 was carried out in a square plan fashion and was centred over a large surface depression located within the fortification zone (Fig. 5.10). The excavation area abutted areas that had been excavated during 1989 and 1990. The total surface area of the 1999 excavation was 456 m^2 and was planned according to a grid system comprised of 2 m x 2 m squares. A series of balks were left throughout the process of excavation and were placed in 4 m x 4 m arrangements (Fig. 5.11). All of the sections were then drawn before removal and detailed stratigraphic information was recorded.

The positions of all diagnostic artefacts (including bones) were recorded and their respective spatial coordinates noted within a field registration notebook. The horizontal coordinates ('X' & 'Y') were measured from the southwest corner of each grid square and the respective depth ('Z') was measured with respect to a datum point situated near the northwest corner of the excavation area.

The soil excavation was carried out primarily through the use of flat shovels and was undertaken by both experienced and inexperienced students from Ural State University and Tyumen University. As was noted above for the earlier excavation seasons, no sieving or flotation methods were employed for the removed soil during the 1999 season. Excavation was carried out through the use of arbitrary levels (spits) of approximately 5-10 cm. These levels were then scraped or brushed clean, photographed, and all archaeological features were planned at a scale of 1:40. The 4 m x 4 m balks were left until the excavation level had reached a sterile yellow clay level situated below the palaeosoil level. At this time, the sections were drawn and the balks removed to allow the final phase of excavation to proceed whereby all remaining site features were dug (Fig. 5.12).

The general stratigraphy of the inner fortification area can be outlined in the following way (Fig. 5.13). The top stratum represented the turf level and was approximately .03-.05 m in depth. The next stratum was represented by alluvial soil and was approximately 0.03 m in depth in the central area and 0.02 m in depth near the periphery of the excavated area. The next level was represented by a stratum of grey humus sediments (0.3-0.4 m) that overlay a stratum of grey-brown nuances (0.3-0.35 m) – which related to the Iron Age occupational phase of the settlement site. The ancient surface level

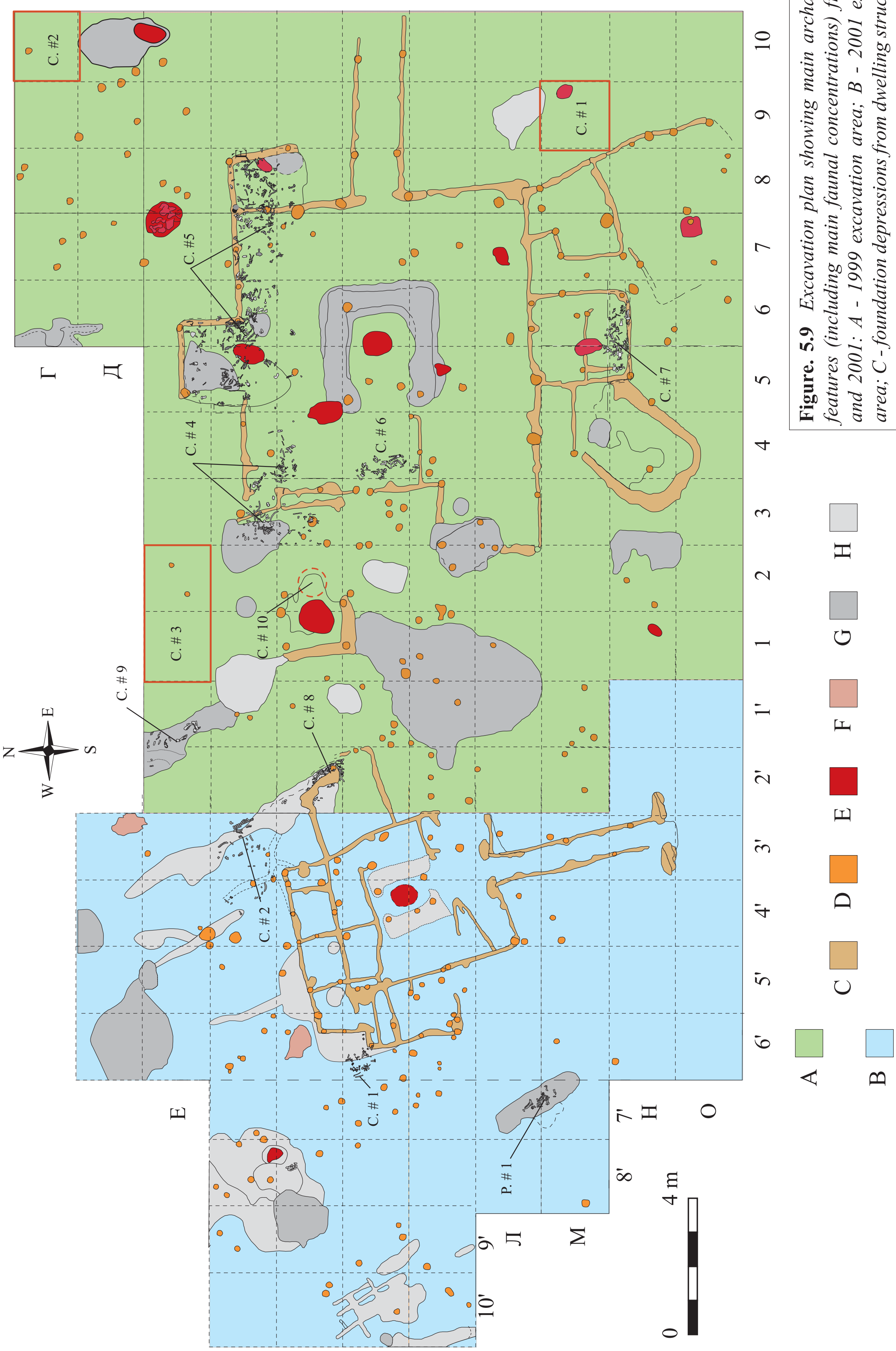


Figure. 5.9 *Excavation plan showing main archaeological features (including main faunal concentrations) from 1999 and 2001: A - 1999 excavation area; B - 2001 excavation area; C - foundation depressions from dwelling structures; D - posthole features; E - fire pits and burned soil; F - ash dumps and residue; G - pit features more than 20 cm in depth; H - pit features less than 20 cm in depth.*

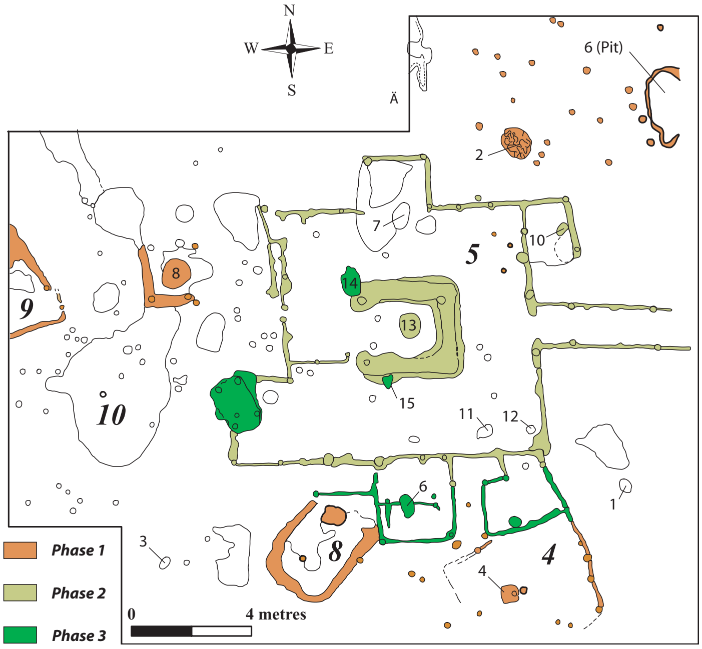


Figure 5.10 *Plan of the 1999 excavation season showing main domestic structures (large numbers) and smaller archaeological features (adapted from Daire & Koryakova 1999).*

(paleosoil) exhibited various colour nuances (dark and grey shades), which were noted as being associated with the outer limits of the domestic structural features (0.24-0.45 m). In some areas, soil characteristics such as small lenses of burned soil and small concentrations of clay and ash were noted between the palaeosoil level and the grey-brown stratum. The contact zone between the palaeosoil and the sterile subsoil was registered as a small lens of soil with a grey-yellow nuance (Koryakova et al., unpublished annual field report).

The Pavlinovo 1999 excavation season revealed the traces of six architectural structures. *Structure 4* (Fig. 5.10-4), which had been partly excavated in 1990, was completed during the 1999 season. The foundation area of this feature was approximately 4 m x 5 m and was oriented southwest to northeast. The northern corner of the structure was cut-through by the intrusive placement of a pit feature associated with the large *Structure 5* (Fig. 5.10-5). This feature comprised a foundation area of nearly 100 m^2 and was oriented in an east to west direction. The structure contained the remains of a large central hearth with an associated 'U-shaped' trough feature, as well as several other smaller fire pit features within various sectors of the dwelling. The limits of the dwelling were defined by small gutters and postholes (with some

Figure 5.11 *Photo of Pavlinovo 1999 excavation showing the 4 X 4 metre baulk excavation method (southwest view of Structure 5).*

Figure 5.12 *Photo of Pavlinovo 1999 excavation showing the final plan of the archaeological features (southwest view of Structure 5 - domestic dwelling with entrance in foreground).*

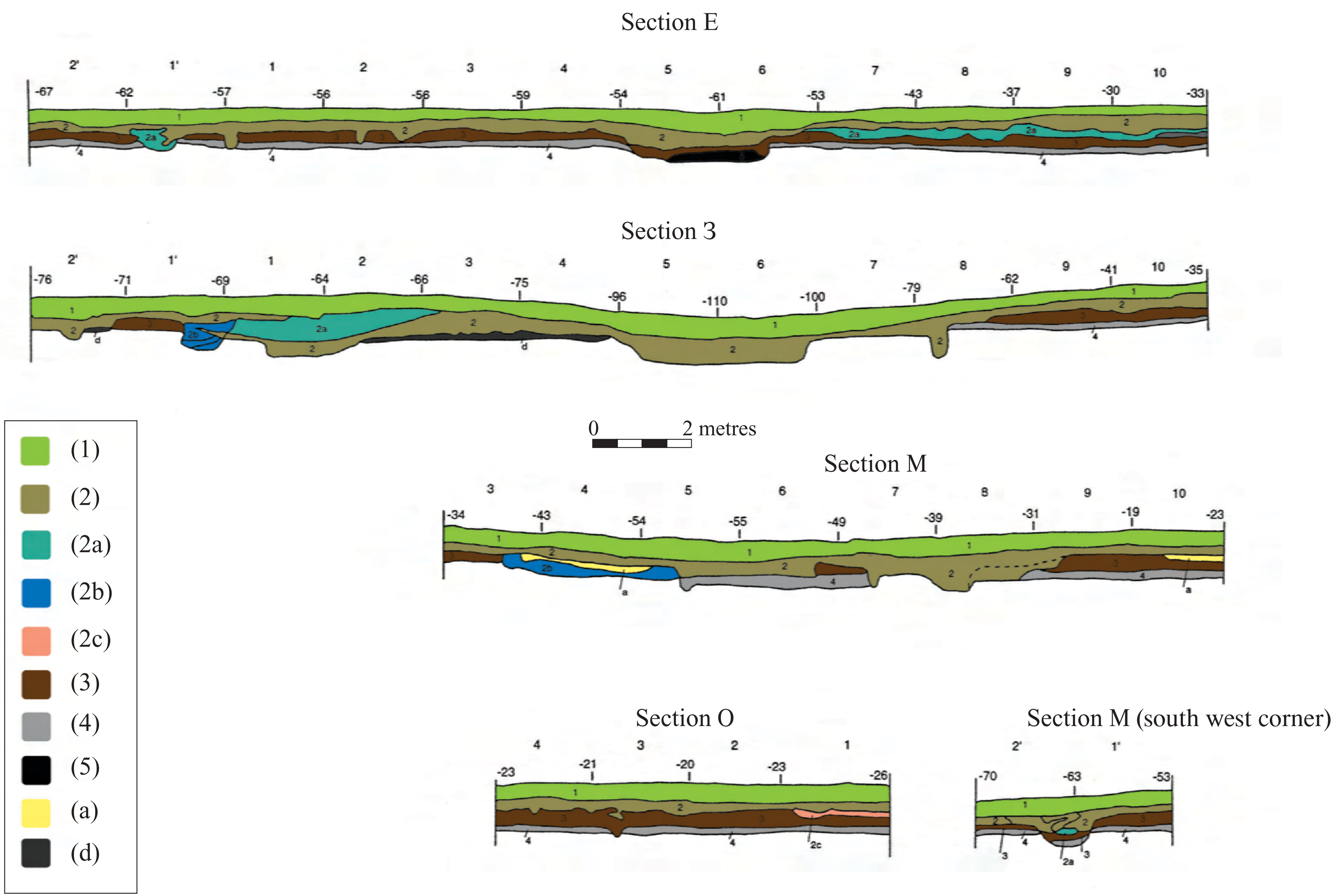


Figure 5.13 *General stratigraphy of the Pavlinovo 1999 excavation (sections are oriented east to west): 1 - modern turf stratum; 2 - grey-brown sediment stratum; 2a - grey-brown ashy sediment stratum (occupation level); 2b - dark grey-brown level (occupation level); 2c - brown sediment stratum (occupation level); 3 - palaeosol stratum; 4 - mixed sediment stratum (palaeosol and natural soil level); 5 - yellow clay stratum; a - ash horizon; d - occupation floor level (adapted from Daire & Koryakova 1999).*

preserved wooden remains being recovered) around the perimeter area of the structure and were cut into the lower sterile yellow clay stratum. Additionally, a large corridor feature on the eastern side appears to have provided the main entrance into the dwelling. *Structure* 5 was the most prominent architectural feature uncovered during the 1999 season and represented the distinct foundation of a typical, albeit rather large, Iron Age domestic dwelling.

Pit Feature 6 had been partly excavated during the 1990 season (Fig. 5.10-6). The area of this oval shaped feature was approximately 3.5 m x 3.6 m and was oriented north to south. The southern end contained evidence of burned soil, ash and charcoal residues. There was also a large hearth feature located near the southwest corner that contained a thick deposit of baked hardened soil (Fig. 5.10-2).

Structure 8 (Fig. 5.10-8) was rectangular shaped and was oriented southwest to northeast. Two postholes were noted within the central part of the uneven floor area, however no hearth feature was found associated with this structure. In addition, the southeast corner was cut-through by the intrusive foundation of dwelling *Structure 5*. The soil infilling of *Structure 8* had brown nuances and the middle soil horizon was mixed with yellow sediment.

Structure 9 (Fig. 5.10-9) was only partly excavated during the 1999 season (during the 2001 season the rest of the feature was uncovered) as it appeared at the far western edge of the excavated area and had a foundation that was oriented northwest to southeast. A series of small gutters and several posthole features, relating to the peripheral and inner walls, defined the limits of this structure.

Structure 10 (Fig.5.10-10) had unequal limits and was planned as a rectangular shaped architectural feature. Inside the northeast area, a hearth feature was uncovered. The soil infilling was mixed and was comprised of brown and yellow-brown ash sediments. Several small pit features were uncovered near the perimeter of the feature.

In addition to the domestic structural evidence, numerous artefacts were recovered during the 1999 season. Fragmented pottery vessels were the second most frequent find, with the Sargat type being the most common as well as Baitovo, Vorobievo, Gorokhovo and Kashino types also being presented. In addition, several bronze socketed arrowheads ('Scythian' and 'Sarmatian' types), bone awls, polishing tools, and bone darts and arrowheads were recovered as well (bone tools – Appendix # 2). However, the most frequently encountered material finds during the season were the numerous whole and fragmented animal bones encountered within the upper levels of the excavated area, as well as the recovery of ten distinct concentrations within the confines of dwelling *Structure 5* (Bone Concentrations # 4-10) and around the outside of the dwelling feature (Bone Concentration #'s 1-3) (Fig. 5.14).

Concerning the bones from the upper stratigraphic levels of the site, the exact spatial coordinates of all fragments over approximately 5cm in length were recorded. Smaller fragments were gathered according to their general position within the excavation grid (2 m x 2 m areas) and bagged separately as grouped lots. Photos and detailed plans and notes were completed relating to the large concentrations of bones encountered at the various levels of the excavation area. Unfortunately, the first three concentrations (#'s 1-3) were excavated before my arrival into the field that season and detailed recording of these remains was not done. Nonetheless, photos were taken and an attempt was made to recover all the bone remains encountered within the concentrations[1].

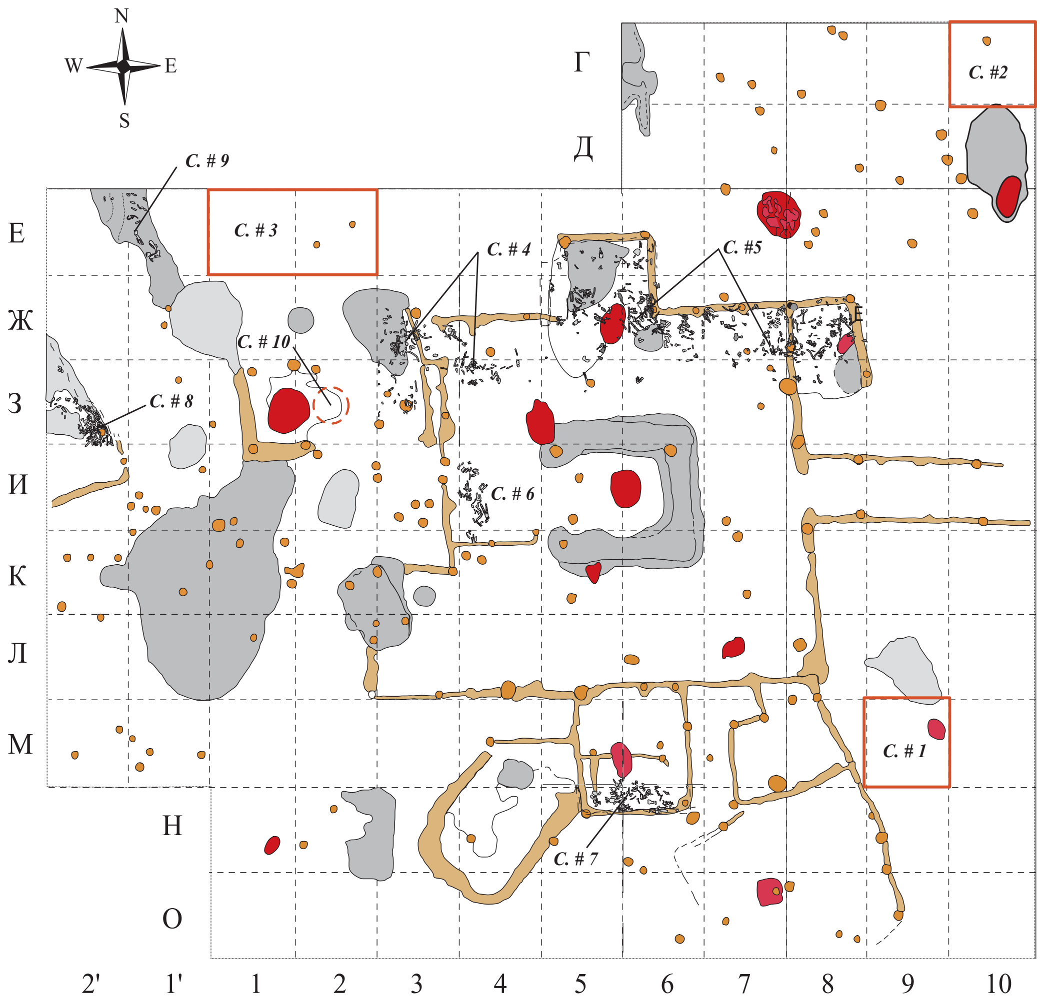


Figure 5.14 *Plan showing the distribution of the 10 animal bone concentrations from the Pavlinovo 1999 excavation (red squares indicate areas of bone remains where plans were not made: #'s 1, 2, 3).*

[1] I should note that my work during the Pavlinovo 1999 season occurred in the summer prior to my starting my PhD research at Cambridge University. As a result, my skills and knowledge concerning zooarchaeological methods were not very developed at this early stage. However, I realised the importance of the unique character of the faunal deposits and the excellent preservation of the remains and so made a concerted effort to produce detailed plans and notes regarding the individual faunal concentrations. In addition, I must acknowledge the advice, support, and patience of my Russian and French colleagues during the 1999 season at Pavlinovo, as my work with the faunal concentrations took a considerable amount of time during the excavation process.

5.6 Pavlinovo Faunal Analysis – Methods and Database Development

In the following sections I will provide a discussion focusing on the excavation and analysis of the faunal remains recovered from the 1999 excavation season at Pavlinovo. I will first discuss general information regarding the bone remains from the upper stratigraphic levels and then provide a more detailed presentation of the remains from each of the concentrations recovered from the lowest cultural stratum of the site. I feel that it will be most useful to provide a rather concise discussion of each of the concentrations by presenting photos and plans as well as tables presenting the following general information: 1) animal species recovered, 2) quantification of bone remains through the use of NISP, MNI, 3) general age characteristics, 4) a sample of some of the taphonomic characteristics associated with the faunal remains (e.g. bone splitting and types of burning), and 5) the frequencies and weights of the small fragments that were not identifiable to species but which were recognised as fragments relating to shaft elements, cancellous bone, ribs, and crania. In addition, the burning characteristics of these fragments have been noted as relating to calcined, carbonised and unburned categories.

I will provide more detailed information relating to the concentrations, particularly skeletal element frequencies, dentition eruption and attrition patterns and more specific taphonomic characteristics concerning weathering and fracturing patterns in a discussion at the end of the chapter. It should be noted that although I have presented my quantification of the Pavlinovo faunal remains through NISP and MNI methods in the general tables, I have also applied the use of an MNE (Minimum Number of Elements) and MAU (Minimum Number of Animal Units) methodology for the quantification of the remains (after Binford 1978; 1984). As noted above, there has been persistent debate over the various methods of quantifying bone assemblages, especially concerning approaches to minimum number counts (e.g. MNI). In my analysis, all of the concentrations were analyses as separate entities and the NISP, MNI and MNE counts were done independently from the other concentrations. Of course, it is highly likely that one animal may have been killed, butchered, and the various skeletal elements distributed to one or more of the bone concentrations, especially within the confines of the domestic dwelling structure. Nevertheless, I felt that my methods would be most explicit by treating each assemblage as a discreet entity and I considered that this would provide a better representation of the possible variation of human activities between the different concentration areas.

Because of the high frequency of skeletal element fragmentation, the MNE and MAU method was utilised in an attempt to offset the high total fragments counts (NISP) and to calculate a better representative minimum number. These methods were also done to provide an adjusted indication of the specific bone element fragmentation and representation within the various concentrations. The resulting data relating to this approach can be found in Appendices # 3 & # 4 and are provided for each of the species and skeletal elements recovered from the upper stratigraphic levels as well as each of the individual animal bone concentrations at Pavlinovo. Space will not allow a full discussion of all of the characteristics of this data, nevertheless I will draw upon various aspects of it to point out some of the interesting patterns associated with the concentrations and their contextual nature within the site.

At this point, I feel that it is important to say a few words about the coding system used for the Pavlinovo material, as my analysis of the faunal remains instituted a new and more detailed approach to the zooarchaeological analysis of materials from the Middle Tobol River region. This provided an interesting 'meeting point' between conventional approaches and new methods, which it can be said provided many hours of conversation and discussion with the zoologists at the Institute of Ecology and Animal Science in Ekaterinburg.

The coding method used to analyse the faunal remains in the laboratory consisted of both the conventional system used by Dr. P.A. Kostintsev at the Institute of Ecology and Animal Science (RAS) as well as a system (albeit modified somewhat for the Pavlinovo material) developed by Dr. P.T. Miracle and presently used in the Grahame Clark Zooarchaeology Laboratory, Department of Archaeology, University of Cambridge. Dr. Miracle's coding system provided an extremely important starting point for my analysis of the Pavlinovo faunal materials and provided a necessary analytical structure for the coding of very detailed information about the bone remains. Nevertheless, as part of my collaboration on the Pavlinovo project, I was required to analyse the bones with both methods and therefore had to complete hard copy sheet for both approaches. This was of course a small concession in terms of the enthusiastic support and help I received from my Russian colleagues at the Institute of Ecology and Animal Science; nevertheless, it did result in the addition of extra steps and time with the analysis of the materials. The whole of the year 2001 was spent living and working in Ekaterinburg in order to undertake the analysis of the Pavlinovo materials from the 1999 and 2001 seasons.

The conventional coding system (after P.A. Kostintsev) provided the following information for each analysed bone: 1) species, 2) bone element, 3) fragment (i.e. part of bone element represented), 4) relative age (i.e. infant, sub adult, adult, old adult), 5) element respective to side of animal, 6) and a comments column for noting any particular taphonomic characteristics of the bone such as burning, modification, pathology, etc.

By contrast, the secondary system (after Miracle), provided a more detailed analytical approach that emphasised issues relating to bone fragmentation and modification, skeletal representation, more precise relative age categories, and various taphonomic characteristics (coding system detailed in Appendix # 1). By using this as a framework, I added two supplemental categories relating to bone fracturing types and specific splitting characteristics. Both of these categories were added because of the unique nature of the Pavlinovo materials. As a result, the coding method accounted for the following characteristics of each identified bone fragment: 1) element identification (including part of element), 2) species, 3) whether bone exhibited recent breakage (fresh break from excavation or post-excavation handling), 4) overall greatest length of bone (mm), 5) weight of bone or bone fragment to nearest 1 gram, 6) articulation with other bones or bone fragments, 7) element respective to side of animal, 8) completeness of bone (degree of fragmentation), 9) anterior/posterior, 10) medial/lateral, 11) superior/inferior, 12) age criteria (i.e. how relative age is determined – epiphysial fusion, tooth eruption/attrition, bone texture/size, etc.), 13) relative age (i.e. infant, adult, old adult), 14) sex criteria, 15) sex, 16) degree of weathering, 17) weathering type, 18) breakage pattern, 19) type of burning, 20) percentage of bone burned, 21) gnawing type, 22) calcium carbonate presence, 23) number of cut marks, 24) impact scars, 25) splitting characteristics, 26) modification characteristics, and 27) a comments section for any additional information.

The information obtained from this system was coded through a numeric system and written on hardcopies in the laboratory during the bone analysis. This information was then entered into a computer spreadsheet form using the Microsoft program Excel. Moreover, all the information relating to the recording of the recovered bone materials on-site during the excavation was registered in a description or inventory booklet (*Opis'*). This data was entered into a spreadsheet form in the computer, again using the program Excel. A. Sakharova, whose assistance is greatly appreciated, entered all of the information from the inventory booklet into Excel, which then correlated with my own prepared database for the faunal remains. The two spreadsheets (i.e. laboratory coding analysis and registration booklet) were then combined to produce a complete spreadsheet of the faunal remains, providing an important database regarding individual bone information relating to the zooarchaeological analysis as well as the respective site contextual information. Although this work required an enormous amount of time and energy, it will provide a very important database for future contextual studies of the Pavlinovo site and will provide a necessary foundation for planned artefact density approaches in the future.

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5.7 1999 Excavation – Faunal Assemblage Analysis

In this section, my analysis of the faunal remains from the 1999 excavation at Pavlinovo will be presented and discussed. In general, the recovered bone remains can be divided into three main categories: 1) those from the upper mixed stratified levels of the site (dating from the Early Iron Age to the historic period), 2) remains from distinct bone concentrations associated with Early Iron Age period domestic structures (dwellings, outbuildings, middens, etc.), and 3) the bone remains associated with specific features within the site such as pits, trenches, hearth features, etc., which also relate to the Iron Age period stratum.

A total of 7,882 bones were analysed for the 1999 Pavlinovo faunal assemblage. As noted above, numerous bone remains were recovered from the various excavated levels within the site, however, there were ten specific concentrations (Figure 5.14) encountered both within the confines of the respective Iron Age period dwelling structures (concentration #'s 4, 5, 6, 7, 8 and 10) as well as concentrations that appeared outside the ancient dwelling features associated with the site (concentration #'s 1, 2, 3 and 9). However, one cannot discount the possibility of a connection with attached or other freestanding building structures as there were numerous posthole features encountered within the excavated area.

Unfortunately, the bone materials relating to concentration # 3 were registered in the field camp during 1999 but were somehow misplaced during storage in Ekaterinburg before I began working with the assemblage in the winter of 2001. A total of 63 bones were initially registered for this particular concentration and they have not been included within the presentation of the following Pavlinovo faunal data.

5.7.1 Methodology

In the following sections of this chapter, I will present information from the 1999 and 2001 faunal analyses through a combination of pictures, detailed site plans, and various tables and graphs. Concerning the tables, the data achieved from the Pavlinovo analyses are arranged according to individual concentrations (i.e. #'s 1, 2, 4-10) or upper stratigraphic levels of the excavated areas, which are grouped together at this stage (discussion following below). These tables provide information on species, bone remains quantification, relative ageing, and burning taphonomy. A series of comparative graphs for the faunal remains contexts will also be provided in the later discussion sections at the end of the descriptions for the 1999 and 2001 excavations.

The quantification of the bone remains was based on: 1) *NISP* counts, which relate to the Number of Identified Specimens per taxon; 2) *MNI* counts, which relate to Minimum Number of Individuals based on a comparison of bone elements following the conventional Russian methodology; 3) *MNE* counts, which relate to the Minimum Number of Elements that were obtained for particular skeletal elements of each taxon - following Binford 1978.

Taxa are classed according to species as well as more general categories such as *Large Ungulate* (i.e. horse, bovids, and elk), *Small Ungulate* (ovicaprids and small cervids) etc., which have been used when identification to a particular species was not possible. Numerous small bone fragments, generally less than 3 cm in overall length, were also abundant in the Pavlinovo assemblages and these remains have been grouped according to respective bone element type: *shaft, cancellous* (spongy bone), *rib*, *crania*, and *other* (indeterminate to element).

In addition, all bone remains were weighed to the nearest one gram with an electronic balance and the weights are provided for each of the bone specimen categories.

Relative ageing of the bone materials was based on a combination of epiphysial fusion/ non-fusion and dental eruption/attrition data. The following categories are provided in each of the following tables by context: 1) *Foetal/Neonat.,* 2) *S/Ad* - subadult, 3) *Ad* - adult, 4) *O/Ad* - old adult individuals. Moreover, data relating to the buring characteristics of the bone remains is provided in the following categories: 1) *Cal.* - number of bone specimens calcined from high heat exposure, 2) *Carb.* - number of carbonised bone specimens, 3) *% Burn.* - percentage of burned bones (calcined and carbonised) for each of the respective species (based on a percentage of the total NISP per taxon rather than NISP assemblage total).

Because of the extensive amount of data achieved from the Pavlinovo 1999 and 2001 faunal remains analyses, I have provided a series of appendices at the end of the thesis containing information regarding skeletal element frequencies and dentition ageing results. Appendices # 3 and # 4 provide information regarding the skeletal element frequencies of the Pavlinovo 1999 and 2001 faunal remains respectively. Appendices # 5 and # 6 provide more specific dentition ageing data, also relating to the faunal materials recovered from the 1999 and 2001 seasons at Pavlinovo. Appendix # 8 provides graphed NISP values for species by context and was included becuase it provides a very useful reference point for Russian scholars who are more familiar with using NISP and MNI figures than the MNE methodology.

Concerning the bone element frequencies presented in Appendices # 3 and # 4, a methodology following Binford's (1978) approach to differential skeletal element representation was utilised. Because of the high degree of fragmentation of the bones recovered from the 1999 and 2001 seasons, it was intended that this methodology would provide a better analysis of differential skeletal element representation (and issues associated with preservation) across varying horizontal archaeological contexts (e.g. distinct bone concentrations). Therefore, the tables presented within the two appendices are grouped according to the respective contexts from which the bones were recovered from within the settlement site. The NISP (Number of Identifiable Specimens) figures presented in the appendices refer to the total number of bones/ bone fragments identified for a particular skeletal element, the MNE (Minimum Number of Elements) figures represent the counts obtained from bone fragments that could not be repeated or counted twice for the same element, and the MAU (Minimum Animal Unit) figures were calculated by dividing the respective MNE counts for each element by the number of times that particular element occurs within the animal's skeleton. In this way, the MAU figure provides an adjusted frequency for the element.

The quantification of the skeletal element data in this way provides an excellent database for approaching issues of skeletal element representation and body-part economic utility, which are important indicators of animal butchery practices, differential preservation factors, and faunal remains deposition patterns. Regarding the Pavlinovo materials, this approach was particularly useful for examining issues associated with intensive bone fat exploitation and the horizontal variation in faunal remains deposition. The data presented in the appendices will also provide an important foundation for future studies of faunal remains from the site of Pavlinovo and other Early Iron Age sites in the region.

The dentition ageing data provided in Appendices # 5 and # 6 were based on eruption and attrition patterns and were achieved through a combination of methodologies. In regards to general tooth eruption patterns of subadult individuals, Silver (1969) and Schmid (1972) were used as general resources. However, the methods used by Levine (1982) for horse tooth ageing (eruption and crown height measurements), Grant (1982) and Payne (1973) for sheep/goat mandible ageing, and Grant (1982) for cattle ageing, were utilised more specifically within my analysis of the Pavlinovo materials. Moreover, I found the conversion charts in Hambleton 1999 very useful for comparing similar tooth wear stages between the Grant, Payne, and Halstead (1985) methods for ageing cattle and sheep/goat remains. This was particularly useful for ageing mandibles exhibiting only partially intact tooth rows.

Although the importance of ageing domestic animal remains has been shown to be extremely important for making inferences about possible animal husbandry practices, particularly for regimes associated with the raising of livestock for dairying, meat, or wool production, the recovery of insignificant numbers of intact tooth rows nevertheless creates a significant problem for applying statistical analyses (Hambleton 1999, 19). Indeed, as Shennan (1988) has noted, a sample of at least forty aged mandibles for each of the mortality curves would be required in order to apply the Kolmogorov-Smirnov statistical test for similarity. Unfortunately, the occurrence of such a 'sample' is rare among archaeological assemblages and therefore the use of a visual analysis of the remains across varying contexts is one of the most common approaches to interpreting data relating to the mortality patterns of domestic livestock (Hambleton 1999, 20).

This is also the case for the Pavlinovo materials, as the recovered dental remains yielded small samples when situated within their respective contexts. As noted in Chapter Four, it is quite common for the faunal remains from Early Iron Age sites to be grouped together as one assemblage. As I will discuss below, this method is particularly problematic as the settlement sites typically comprise a complex variety of occupation phases and animal bone deposition patterns, many of which may represent marked differences in domestic animal husbandry practices and socio-economic organisation. I feel that this is a very important issue, and I will return to a further treatment of this topic through a discussion of the ageing of the Pavlinovo materials below.

5.7.2 Upper Stratigraphic Levels

At this stage of my work with the 1999 assemblage, all animal bone remains from the upper stratified levels have been grouped together for discussion within the thesis. In the near future, it will be possible to connect the information gained from the analysis of these remains with other work being completed by my Russian colleagues. More specifically, it will be necessary to investigate in greater detail how the remains are distributed throughout the excavated area, how they relate to pottery and other artefact remains, and the temporal and

SPECIES	NISP	% of NISP	MNI	MNE	Wt. (g.)	Foetal/ Neonat.	S/Ad	Ad	O/Ad	Cal.	Carb.	% Burn.
Equus caballus (Horse)	993	25.5	10	356	32,255	0	315	293	0	6	114	12.1
Bos taurus (Cow)	683	17.5	9	259	17,509	0	127	321	0	5	57	9.1
Ovis/Capra (Sheep/Goat)	320	8.2	7	141	2,821	0	70	168	0	2	18	6.3
Capra hircus (Goat)	1	0.03	1	1	10	0	0	0	0	0	0	0
Ovis aries (Sheep)	6	0.2	1	4	76	0	0	0	0	0	0	0
Capreolus capreolus (Roe Deer)	11	0.3	1	4	54	0	0	10	0	0	0	0
Vulpes vulpes (Red Fox)	6	0.2	1	6	22	0	0	6	0	0	0	0
Canis familiaris (Dog)	2	0.05	1	2	16	0	0	0	0	0	1	50
Meles meles (Badger)	1	0.03	1	1	3	0	0	0	0	0	0	0
Castor fiber (Beaver)	2	0.05	1	1	5	0	0	2	0	0	0	0
Lepus timidus (Arctic Hare)	1	0.03	1	1	5	0	0	0	0	0	0	0
Large Ungulate	1,662	42.7	N/A	81	19,559	1	2	44	0	29	133	9.7
Small Ungulate	195	5	N/A	22	923	0	14	8	0	5	24	14.9
Small Carnivore	2	0.05	1	2	6	0	0	0	0	0	1	50
Rodent indeterminate	1	0.03	1	1	1	0	0	0	0	0	0	0
Smaller than rabbit	2	0.05	1	2	57	0	0	0	0	0	0	0
fish	2	0.05	1	2	1	0	0	0	0	0	0	0
bird	2	0.05	N/A	2	5	0	0	0	0	0	0	0
Subtotal	*3,892*	*100*	*38*	*888*	*73,328*	*1*	*528*	*852*	*0*	*47*	*348*	*N/A*
SMALL FRAGMENTS												
Cancellous	423	-	-	-	3,031	-	-	-	-	20	127	34.7
Cranial	22	-	-	-	186	-	-	-	-	0	3	13.6
Rib	0	-	-	-	0	-	-	-	-	0	0	0
Other (indet.)	122	-	-	-	1,302	-	-	-	-	2	16	14.7
Subtotal	*567*	-	-	-	*4,519*	-	-	-	-	*22*	*146*	*N/A*
TOTAL	**4,459**	**100**	**38**	**888**	**77,847**	**1**	**528**	**852**	**0**	**69**	**494**	**N/A**

Table 5.2 *Faunal data from Pavlinovo 1999 upper stratigraphic levels : species, general ageing, and burning characteristics.*

spatial phases of the settlement domestic structures within the site. It is apparent from the various remains analysed thus far that there are several periods of occupation represented at Pavlinovo and therefore future results from materials currently being radiocarbon dated will be of great significance for more precise interpretations.

A total of 4,459 bones were analysed for the upper stratigraphic levels of the Pavlinovo 1999 assemblage (Table 5.2). These remains represent ten distinct domestic and wild mammal species and an additional seven other general species categories. No microfauna remains were retained for analysis from the 1999 field season. Indeed, such remains are generally absent from site reports associated with the Early Iron Age period of the Middle Tobol region, as the lack of soil sieving during excavation impacts upon the recovery of smaller bone materials. As the species list illustrates, bird bones and fish remains were recovered during the 1999 excavation through standard 'hand collection' methods, however, the small rodent bones which were encountered were not retained for analysis. This recovery procedure was changed for the 2001 excavation at Pavlinovo and all bone remains were collected for post-excavation analysis. The bird, fish, rodent, and other small mammal remains are currently being analysed by a postgraduate research student at the Institute of Ecology and Animal Science in Ekaterinburg.

The general age characteristics of the recovered faunal remains from the Pavlinovo 1999 assemblage are also presented in Table 5.2. More precise ageing of the dentition eruption/attrition patterns will be discussed in a separate section below.

Concerning the long bone, metapodial, and phalange specimens from the upper levels, 11.5% exhibited distinct evidence of longitudinal splitting. Although this type of activity can relate to a variety of bone processing activities, this is also a common method used for the manipulation of bone elements for the extraction of within-bone fat resources such as marrow and bone grease. Other types of fracture patterns can also relate to this activity and these will be discussed in more detail in the discussion section of the 1999 assemblage, which follows below after the individual concentration descriptions.

Several of the bone remains recovered from the upper levels also revealed slight evidence of burning or charring and the following percentages (% of total assemblage NISP) can be given relating to this: 1.5 % - calcined, 11 % - carbonised and 87.5% - unburned. As one might expect, patterns of taphonomic weathering were quite mixed for the bone materials; with 8% showing no evidence of weathering, 41% indicating slight weathering, 39% showing marked weathering, and 12% exhibiting extreme weathering. The specific categories of weathering can be detailed in the following way: 8% not weathered, 19% with fine line fractures, 5% with root etching, and 68% with abrasion from environmental exposure (wind and waterborne particles). These weathering patterns are representative of the probable mixed patterns of deposition and post-depositional taphonomic processes affecting the bones, which were excavated from a variety of different depositional contexts associated with the mixed layers and various phases of occupation of the upper stratigraphic soil levels. A comparative graph of weathering characteristics will be provided for the concentrations in the discussion section further below for the 1999 faunal remains.

However, the taphonomic information gained from the analysis of the bone materials will be more useful when compared with the final interpretations of the site stratigraphy, which are still incomplete at this time. This is particularly the case for the application of an artefact density study which may provide a better representation of the deposition patterns within the site as they relate to different phases of occupation. Therefore, until these analyses and interpretations are completed the most secure information for the Early Iron Age occupation of the site comes from the analysis of the bone concentrations recovered from the lowest cultural stratum of the excavated site area. These distinct concentrations of bone materials provide interesting and valuable information regarding animal butchery and preparation practices as well as a host of other activities associated with the contexts of the dwellings and other domestic structures encountered during the 1999 excavation.

5.7.3 Bone Concentration # 1

Bone concentration # 1 was an aggregation (approximately 4 m^2) of fragmented bone materials found in Quadrant M/9 at a depth of -0.80 metres *below the site datum point* (labelled as 'BSD' from this point forward). The concentration (Fig. 5.15) was situated to the east of *Structure 5* and was located near a small area of burned soil with charcoal and ash residue and a large pit feature (Fig. 5.14, C-1). The vertical location of the concentration was within the grey-brown sediment stratum.

There were a total of 367 bone specimens recovered from this concentration and the data relating to their analysis is detailed in Table 5.3. This particular group of bone materials was excavated before my arrival into the field in 1999 and therefore no plan drawing was completed before the remains were removed. The identified bones are representative of the three main categories of domestic animals for the Iron Age period:

5.15 *View from the north of bone concentration # 1.*

SPECIES	NISP	% of NISP	MNI	MNE	Wt. (g.)	S/Ad	Ad	O/Ad	Cal.	Carb.	% Burn.
Equus caballus (Horse)	81	28.2	2	48	2,329	39	11	0	0	21	25.9
Bos Taurus (Cow)	36	12.5	2	23	696	9	13	0	0	9	25
Ovis/Capra (Sheep/Goat)	22	7.7	2	11	180	4	12	0	0	1	4.5
Large ungulate	134	46.7	-	15	1,415	9	3	0	0	8	5.9
Small ungulate	14	4.9	-	11	54	0	0	0	0	0	0
Subtotal	*287*	*100*	*6*	*108*	*4,674*	*61*	*39*	*0*	*0*	*39*	*N/A*
SMALL FRAGMENTS											
Cancellous	22	-	-	-	143	-	-	-	0	2	9
Cranial	25	-	-	-	115	-	-	-	0	2	8
Rib	28	-	-	-	61	-	-	-	0	0	0
Other (indet.)	5	-	-	-	42	-	-	-	0	0	0
Subtotal	*80*	-	-	-	*361*	-	-	-	*0*	*4*	*N/A*
TOTAL	**367**	**100**	**6**	**108**	**5,035**	61	39	**0**	**0**	**43**	**N/A**

Table 5.3 *Pavlinovo 1999 bone concentration # 1: species, general ageing, and burning characteristics.*

horse, cow and sheep/goat, with a higher frequency relating to the horse bone materials. The MNI figures show that the remains represent a minimum of 2 individuals for each of the three main species. The recovered bone remains for all three species are generally representative of both cranial and post-cranial skeletal elements (skeletal element representation for the three main domesticates will be provided in the discussion section below). Most of the skeletal elements exhibited a high degree of fragmentation and several of the proximal and distal ends of the long bones had been split longitudinally.

There was no indication of rodent or carnivore gnawing or chewing of the remains, however, the overall preservation of the concentration was quite poor with a strong indication of surface weathering on most of the bone specimens. There was also some indication of burning or charring, as approximately 11.7% of the bones were carbonised with the highest frequency being associated with the horse bone remains.

The relative dating of this bone concentration is based both on its stratigraphic position as well as the recovery of numerous ceramic sherds of both Early Iron Age (Gorokhovo and Sargat), transitional period ceramics (i.e. Late Bronze to Early Iron Age – Vorobievo, Nosilovo and Baitovo types), and an Iron Age bronze arrowhead. These recovered objects ranged in depth from -0.68 to -0.97 metres BSD within the same grid area as the bone concentration. Overall, the general characteristics of the concentration, and its location with respect to other

5.16 *View from the west of bone concentration # 2.*

archaeological features, would indicate that it is representative of an open air midden deposit of processed animal bones situated within a frequently used activity zone near the dwelling structures.

5.7.4 Bone Concentration # 2

Bone concentration # 2 was also a tightly compacted aggregation (approximately 4 m^2) of fragmented bone materials and was found in Quadrant Γ/10 at a depth of -0.61 to -0.68 metres BSD (Fig. 5.16). This deposit was also located within the grey-brown sediment level of the site stratigraphy and was situated on the northwest side of *Structure 6*. A total of 570 bone specimens were recovered from this concentration and the informaiton relating to their analysis is detailed in Table 5.4. Species representation was comprised of the three main domesticates as well as three bone remains representing the Roe Deer species. Again, this concentration was removed before my arrival into the field and before a plan drawing could be made of the spatial distribution.

The remains were representative of both cranial and post-cranial elements and generally revealed more evidence of burning and charring than bone concentration # 1, with approximately 4.2 % calcined and 17.4 % carbonised. The remains in the concentration were highly fragmented and yielded a number of small shaft, rib, crania, and cancellous fragments. Again, several of

SPECIES	NISP	% of NISP	MNI	MNE	Wt. (g.)	S/Ad	Ad	O/Ad	Cal.	Carb.	% Burn.
Equus caballus (Horse)	62	12.9	3	45	1,410	7	6	0	0	5	8.1
Bos taurus (Cow)	27	5.6	2	22	736	4	10	0	0	3	11.1
Ovis/Capra (Sheep/Goat)	35	7.4	1	24	241	7	6	0	24	9	94.3
Capreolus capreolus (Roe deer)	3	.6	1	2	14	2	1	0	0	0	0
Large ungulate	245	51.5	1	14	1,728	8	8	0	0	38	15.5
Small ungulate	105	22	N/A	11	356	5	3	0	0	20	19
Subtotal	*477*	*100*	*8*	*118*	*4,485*	*33*	*34*	*0*	*24*	*75*	*N/A*
SMALL FRAGMENTS											
Cancellous	33	-	-	-	212	-	-	-	0	7	53.8
Cranial	39	-	-	-	174	-	-	-	0	13	33.3
Rib	0	-	-	-	0	-	-	-	0	0	0
Other (indet.)	21	-	-	-	94	-	-	-	0	4	19
Subtotal	*93*	-	-	-	*480*	-	-	-	*0*	*24*	*N/A*
TOTAL	**570**	**100**	**8**	**118**	**4,965**	**33**	**34**	**0**	**24**	**99**	**N/A**

Table 5.4 *Pavlinovo 1999 bone concentration # 2: species, general ageing, and burning characteristics.*

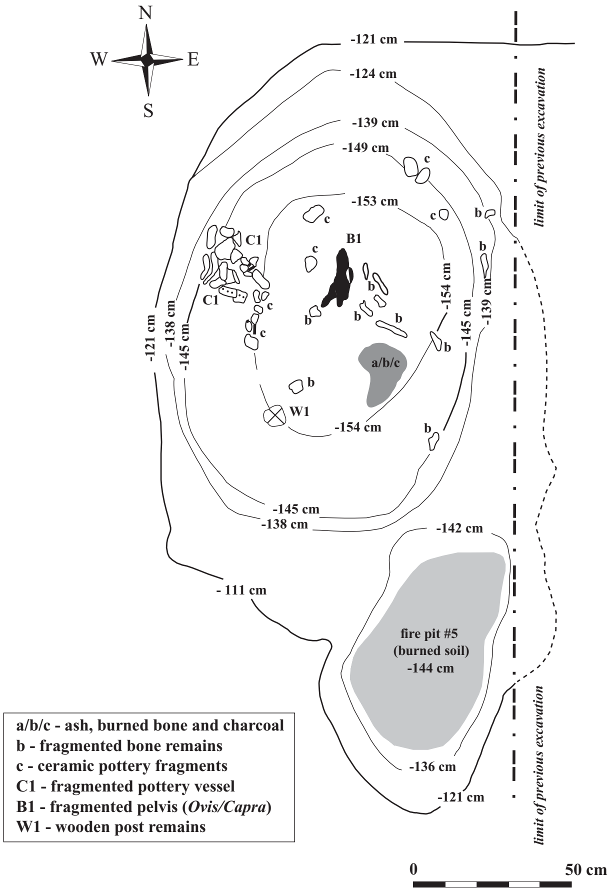


Figure 5.17 *Western area of Structure 6 detailing location of firepit and area of structured deposition with animal bone remains and ceramic fragments.*

the recovered proximal and distal ends of long bones, metapodials, and phalanges exhibited evidence of longitudinal splitting with 38 bone specimens indicating this type of treatment.

The secure dating of this bone concentration is difficult as it also appears to represent an open air midden deposit of processed bone materials. Several Early Iron Age ceramic sherds relating to the Gorokhovo and Sargat types were recovered at the lowest stratum of the concentration at levels of -0.69 to -0.89 metres BSD. However, because of its close proximity, this concentration has been interpreted as possibly relating to *Structure 6*, which exhibited at least two phases of structured deposition (Fig. 5.17) (Daire & Koryakova 1999). The earlier phase can be related to the Baitovo and Vorobievo type ceramic fragments, which were recovered from the lowest level of the feature (-1.48 m BSD), and an upper deposit of Gorokhovo and Sargat type ceramic fragments, which in all probability relate to a later phase of activity within the area of the structure (-1.20 m BSD). There were numerous bone fragments, ash, and charcoal remains also deposited throughout the levels of the structure. A very general relative chronology for *Structure 6* (based on ceramic typologies) can be proposed: the lowest deposits would date to approximately the 6th to 3rd centuries BC and the uppermost deposits would date to approximately the 6th to 1st centuries BC. Obviously, there is a strong chronological overlap with these relative dates, however, forthcoming radiometric dates may provide a better temporal framework for the interpretation of bone concentration # 2 and its relationship to the deposits associated with *Structure 6*.

5.7.5 Bone Concentration # 3

Bone concentration # 3 was excavated before my arrival into the field in 1999, and as I noted above, the remains relating to this concentration were registered in the field but were misplaced during storage in Ekaterinburg. The concentration was discovered in Quadrant E/1-2 at a depth of -1.0 metre BSD in a grey humus soil stratum. As Figure 5.18 illustrates, the

Figure 5.18 *view from the east of bone concentration # 3.*

bones were in a rather dispersed pattern with no strong aggregation (spread within an approximately 8 m^2 area). The nature of the deposited bone materials (species representation and taphonomic characteristics), and the spatial location of the concentration, suggest that it is associated with the Early Iron Age occupation of the site. Unfortunately, no other information about the materials is available at this time.

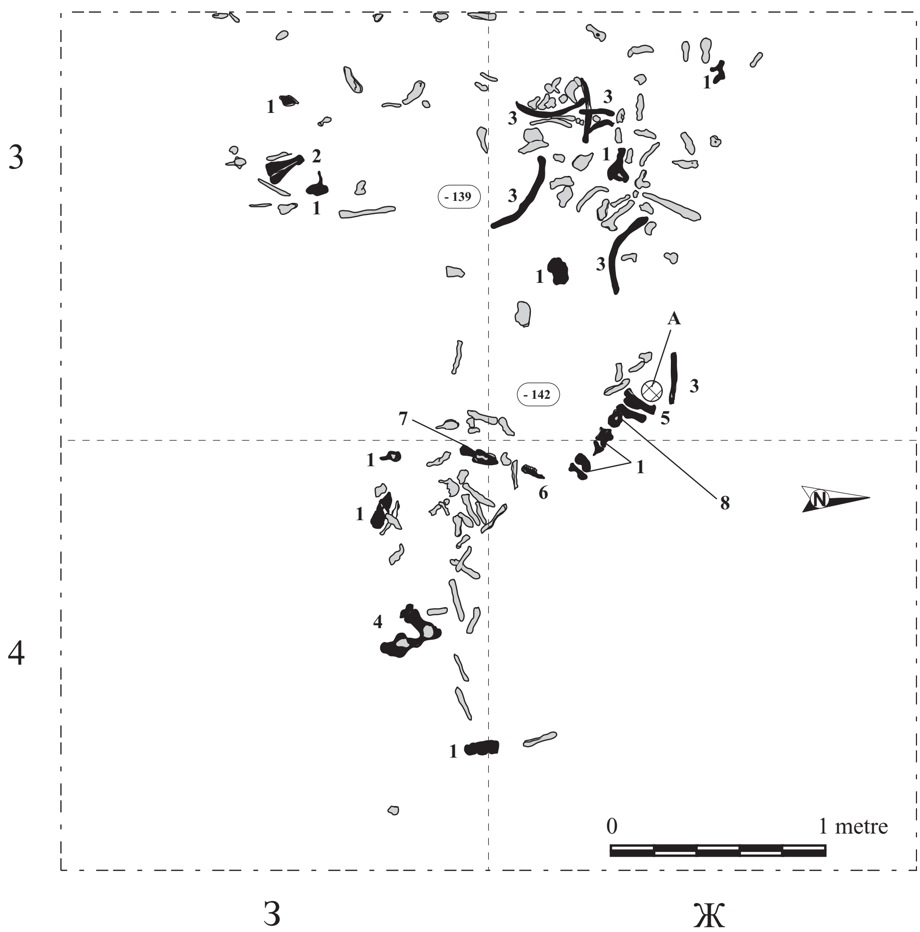
5.7.6 Bone Concentration # 4

This concentration of bone remains was situated in Quadrants Ж/3-4 at an approximate depth of -1.40 metres BSD (Fig. 5.19 & 5.20). The bone remains were distributed over a 16 m^2 area inside the northwest corner of *Structure 5* and were situated on what would have been the cultural floor level of the Iron Age period dwelling.

A total of 310 bones were recovered and represent the three main domesticates as well as the roe deer species (Table 5.5). The bone remains did not exhibit a high degree of fragmentation and many of the elements were 25-50 % whole. There was also very little evidence of surface weathering or cracking and most of the specimens were in a good state of preservation. There was very little indication of burning or charring with only 4 bone specimens indicating such treatment. Most of the bones also had a very 'fresh' surface appearance and were yellowish in colour.

Most of the bone remains were representative of post-cranial elements and there were very few cranial fragments or teeth recovered from the concentration (see Appendix # 3). In addition, there were several instances of articulated skeletal elements, such as the following for the horse remains: several lumbar vertebrae, an astragalus and calcaneus, and the proximal end of a fused radius and ulna (Fig. 5.20 – 1, 7 & 8). There were also several cow and horse ribs recovered which were nearly whole. However, 38 bone specimens

Figure 5.19 *View from the east of bone concentration # 4.*



5.20 *Bone concentration # 4 from Pavlinovo 1999 excavation: 1 - horse vertebrae; 2 - sheep scapula; 3 - large ungulate ribs; 4 - cow pelvis; 5 - horse tibia; 6 - sheep mandible; 7 - horse radius & ulna; 8 - horse astragalus & calcaneus; A - structural wooden post fragments (black bones represent bones which were identified during excavation).*

SPECIES	NISP	% of NISP	MNI	MNE	Wt. (g.)	S/Ad	Ad	O/Ad	Cal.	Carb.	% Burn.
Equus caballus (Horse)	61	21.9	2	44	3,103	1	21	0	0	1	1.6
Bos taurus (Cow)	27	9.7	3	21	908	1	12	0	0	1	3.7
Ovis/Capra (Sheep/Goat)	60	21.5	3	39	567	12	35	0	0	0	0
Capreolus capreolus (Roe Deer)	8	2.9	2	6	155	2	5	0	0	0	0
Large ungulate	88	31.5	N/A	7	1,192	1	1	0	0	0	0
Small ungulate	35	12.5	N/A	4	149	4	0	0	0	2	1.7
Subtotal	*279*	*100*	*10*	*121*	*6,074*	*21*	*74*	*0*	*0*	*4*	*N/A*
SMALL FRAGMENTS											
Cancellous	19	-	-	-	115	-	-	-	0	0	0
Cranial	8	-	-	-	79	-	-	-	0	0	0
Rib	0	-	-	-	0	-	-	-	0	0	0
Other (indet.)	4	-	-	-	47	-	-	-	0	0	0
Subtotal	31	-	-	-	241	-	-	-	0	0	0
TOTAL	**310**	**100**	**10**	**121**	**6,315**	**21**	**74**	**0**	**0**	**4**	**N/A**

Table 5.5 *Pavlinovo 1999 bone concentration # 4: species, general ageing, and burning characteristics.*

Figure 5.21 *View from the east of the northern area of Concentration # 5a along the inside of the northern wall of Structure 5.*

(representing long bones, metapodials, and phalanges) exhibited clear evidence of longitudinal splitting.

It would appear that because of the vertical and horizontal position of the concentration it is probably contemporaneous with the *Structure 5* dwelling. Moreover, ceramic fragments recovered from within and around the periphery of the bone concentration relate to the Gorokhovo and Sargat types and provide a relative date of the 4^{th} to 1^{st} centuries BC for the deposition of the remains. The particular characteristics of the concentration, its relationship to *Structure 5*, and a comparison with the other bone concentrations recovered from within the confines of the dwelling will be discussed in more detail below.

5.7.7 Bone Concentration # 5

This concentration was uncovered in Quadrants Е, Ж & З/5, 6, 7 & 8 and was the largest in terms of number of total bones recovered as well as the horizontal distribution of the remains. In total, 1,010 bone specimens were recovered from a 32 m^2 area and the level of the concentration varied between -1.36 to -1.50 metres BSD. The concentration was spread throughout the northern inside periphery of dwelling *Structure 5* (Fig. 5.21) and was associated with various fire pits and other pit type features as well as what appeared to be a small attached room or annex in the northeast corner (see previous Fig. 5.14 – C. # 5). All of the bone remains were generally situated at what appeared to be the lowest cultural floor level of the domestic structure. To provide a more coherent discussion of the bone remains and their contexts I have divided the concentration into two sections: 5a – relating to the westernmost area (Figs. 5.22 & 5.23) and 5b – relating to the easternmost area (Fig. 5.24 & 5.25). There were a total of seven wild and domestic animal species represented by the concentration in addition to the 2 fish bones and 3 bird bones that were recovered (Table 5.6). The horse remains represented the highest NISP frequency of the identified species (24 %) in the

Figure 5.22 *View from the south of bone concentration 5a (western zone).*

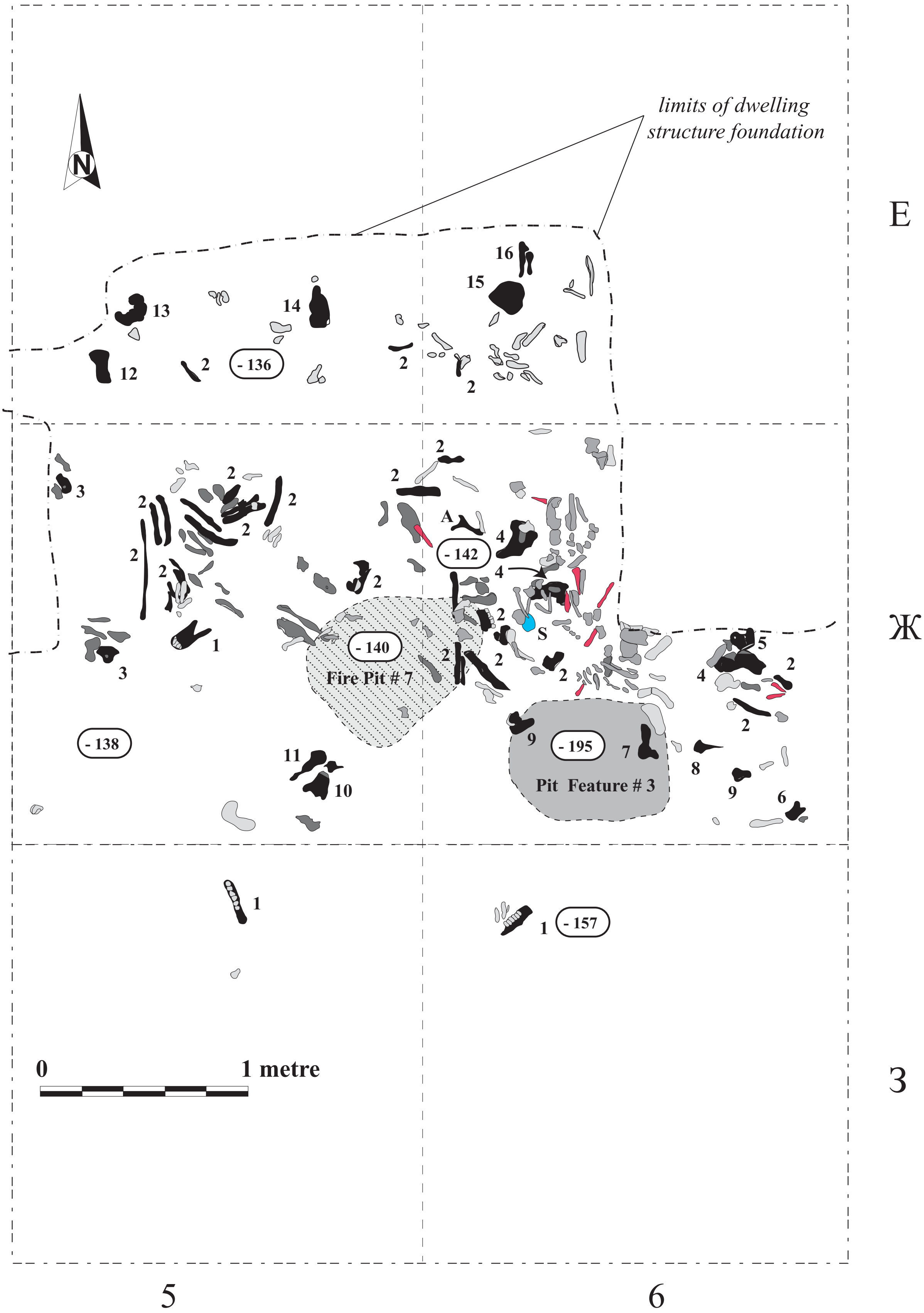


Figure 5.23 *Plan of bone concentration # 5a detailing the westernmost area of the bone deposit: 1 - horse mandible fragments; 2 - large ungulate ribs, 3 - large ungulate vertebra; 4 - horse pelvis; 5 - horse atlas; 6 - horse tibia; 7 - horse distal humerus; 8 - horse proximal tibia; 9 - articulated horse astragalus and calcaneus; 10 - horse proximal radius; 11 - horse proximal ulna; 12 - horse tibia; 13 - articulated horse astragalus and calcaneus; 14 - large ungulate pelvis (ilium) fragment with cut marks; 15 - large ungulate scapula; 16 - articulated sheep/goat proximal radius and ulna; A - elk antler fragment ; red objects are bone tools (shaped antler and antler bone arrowheads); blue object is flat stone scraper (black bones were identified during excavation, light grey bones were situated at a lower level than the darker grey bones - as indicated by plan).*

Figure 5.24 *View from the east of the eastern zone of bone concentration # 5b.*

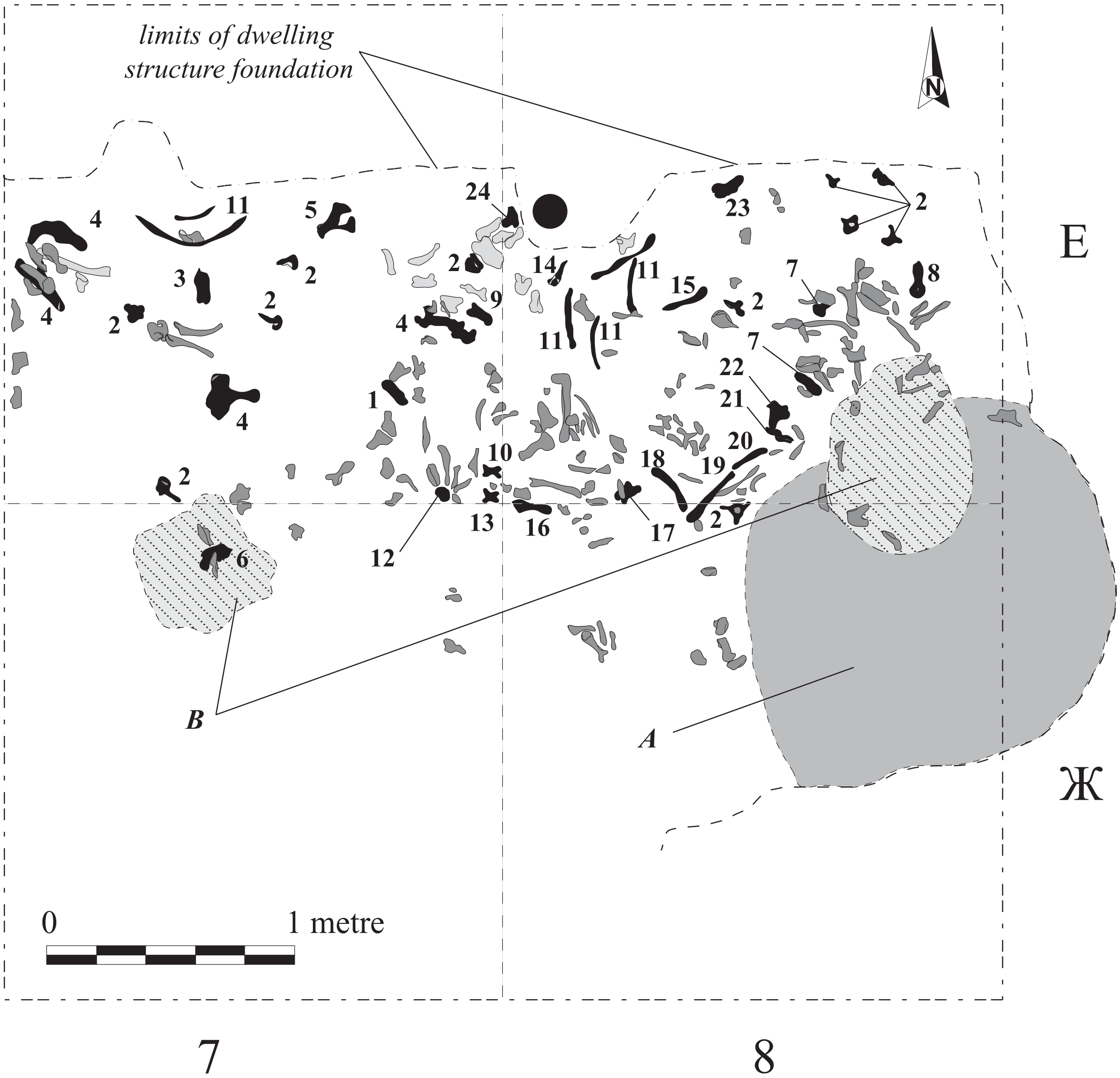


Figure 5.25 *Plan of the east zone of bone concentration # 5b: 1 - horse distal metacarpal;, 2 - large ungulate vertebrae; 3 - horse distal metacarpal; 4 - horse pelvis fragments; 5 - sheep/goat scapula; 6 - horse mandible fragment; 7 - sheep distal metacarpal; 8 - cow calcaneus; 9 - horse distal metapodial; 10 - horse phalanx I; 11 - horse ribs; 12 - horse phalanx II; 13 - cow astragalus; 14 - horse distal metacarpal (split); 15 - sheep/goat proximal radius; 16 - sheep/goat mandible; 17 - cow astragalus; 18, 19, 20 - large ungulate ribs; 21 - sheep/goat distal humerus; 22 - large ungulate sacrum; 23 - horse distal metacarpal; 24 - horse phalanx II; A - pit feature; B - fire pit features with burned bone fragments, ash, and charcoal residue.*

SPECIES	NISP	% of NISP	MNI	MNE	Wt. (g.)	S/Ad	Ad	O/Ad	Cal.	Carb.	% Burn.
Equus caballus (Horse)	219	24	4	126	9,453	41	72	5	1	16	7.7
Bos taurus (Cow)	62	6	4	46	1,975	2	66	0	0	12	19.4
Ovis/Capra (Sheep/Goat)	81	9	3	62	1,030	10	59	0	0	1	1.2
Capra hircus (Goat)	2	2.2	1	2	25	1	1	0	0	0	0
Alces alces (Elk)	15	1.7	2	15	258	0	0	0	0	0	0
Large ungulate	437	48	N/A	33	4,332	47	10	0	1	32	7.3
Small ungulate	70	7.7	N/A	13	287	9	1	0	1	0	0
Castor fiber (Beaver)	5	0.6	2	5	47	3	1	0	0	0	0
Lepus timidus (Arctic Hare)	4	0.3	2	4	5	1	3	0	0	0	0
fish	2	0.2	N/A	N/A	4	0	0	0	0	0	0
bird	3	0.3	N/A	N/A	10	0	0	0	0	0	0
Subtotal	*900*	*100*	*18*	*306*	*17,426*	*114*	*213*	*5*	*3*	*61*	*N/A*
SMALL FRAGMENTS											
Cancellous	51	-	-	-	317	-	-	-	0	11	21.6
Cranial	39	-	-	-	39	-	-	-	0	5	12.8
Rib	5	-	-	-	5	-	-	-	0	0	0
Other (indet.)	15	-	-	-	45	-	-	-	0	0	0
Subtotal	*110*	-	-	-	*406*	-	-	-	*0*	*16*	*N/A*
TOTAL	**1,010**	**100**	**18**	**306**	**17,832**	**114**	**213**	**5**	**3**	**77**	**N/A**

Table 5.6 *Pavlinovo 1999 bone concentration # 5: species, general ageing, and burning characteristics.*

concentration with the sheep/goat category representing the second highest (9 %).

Concerning burning characteristics, only 3 bone specimens were calcined with 77 exhibiting charring or carbonisation. However, as no sieving of the cultural floor level was undertaken, many of the small calcined and carbonised fragments were not collected and thus the total collected bone samples of small burned bone fragments are biased. A number of long bone, metapodial, and phalange elements were split longitudinally, with a total of 97 exhibiting such treatment. In general, the degree of fragmentation of the bone remains was high, with the most significant frequency relating to large ungulate shaft and rib fragments.

There were also indications of hack marks, cut marks, and carnivore gnawing on some of the remains. A total of 13 bone specimens, primarily elk antler fragments and large ungulate pelvises, revealed evidence of hacking or cutting and there were notable cut marks on 4 large ungulate ribs and on the one beaver scapula (Appendix # 2 – 3, 11, 12, 13, 14). A total of 10 bone specimens also exhibited strong evidence of carnivore gnawing and chewing, and this can probably be attributed to domestic dogs as some of the tooth puncture marks are quite large in size (Appendix # 2 – 15, 16).

This concentration of bone materials is particularly significant because of the range of taphonomic characteristics it exhibits as well as its vertical and horizontal position within the dwelling, which covers a large area of the northern floor space. Interestingly, in the westernmost area (5a) of the concentration, associated with an area of burned soil, small calcined bone fragments, ash and charcoal residue, several worked bone pieces were recovered and an oval flat stone tool (10cm x 5cm x 3 mm) with red staining on one side (Fig. 5.23). The bone tools were made primarily from elk antler (sp. *Alces alces*) and the assemblage was comprised of shaped and pointed pieces, longitudinally split specimens, and two bone arrowheads (Appendix # 2 – 3, 4, 5, 6).

The eastern section of the bone concentration (5b) revealed a number of bone elements from the cow, horse and sheep/goat species (Fig. 5.24 & 5.25). These faunal remains were scattered in an east-west axis parallel to the northern wall of the dwelling structure and were associated with two small fire pits and a larger pit feature in the northeast corner of *Structure 5*. This particular corner of the structure may have been constructed as either an attached or internally segregated annex room - which may be seen more clearly on the plan detailed in the previous Figure 5.14.

Based on the range of recovered bone specimens, the distribution of the remains, and their association with the fire pits and other pit features, bone concentration # 5 represents an excellent example of an activity zone within the dwelling for the processing of animal carcasses for cooking, tool making, and other utilitarian products. It is surprising, of course, that such a heavy concentration of bone materials and residue would be deposited and left within the dwelling structure itself, and this does raise some intriguing questions about the use of the structure, processes of site and dwelling structure abandonment, seasonal occupation, and the nature and range of human habitation practices which can be associated with the Early Iron Age period. I think that it will be most useful to return to these questions after presenting the data and a discussion of the other bone concentrations discovered within the site, as this will provide a better context for discussing the particular characteristics of the individual bone concentrations and their overall relationship to other archaeological features associated with the excavated site area.

5.7.8 Bone Concentration # 6

This very compact concentration of bone materials was discovered in Quadrants И-К/4, along the inside of the western wall of dwelling *Structure 5*, at a depth of -1.45 metres BSD (Figs. 5.26 & 5.27). The distribution of the remains was quite restricted and was contained

Figure 5.26 *View from the east of bone concentration # 6.*

within a 4 m^2 area. A total of 235 bone specimens were recovered and are representative of the three main domestic species as well as roe deer, squirrel, and arctic hare (Table 5.7).

Noteworthy characteristics of the concentration were the recovery of a nearly complete horse mandible (missing the M_3 teeth) and the fact that no cattle remains were recovered. There were numerous small bone fragments within the concentration and they were primarily representative of large ungulate bone shafts and ribs. None of the remains indicated any evidence of burning or charring and there were only 9 specimens which indicated longitudinal splitting. The general preservation of the remains was quite poor, with 44 % indicating marked surface erosion from weathering as well as root etching.

Although this concentration appeared to be situated within the western sector of *Structure 5*, it was not associated with any other archaeological features (e.g. hearths, pits, etc.). Although it is possible that the formation of concentration # 6 was contemporaneous with the construction and occupation of *Structure 5*, its orientation and compact distribution may also indicate an intrusive secondary deposit. In addition, no pottery sherds were recovered from within the concentration or around its periphery within the same stratigraphic level.

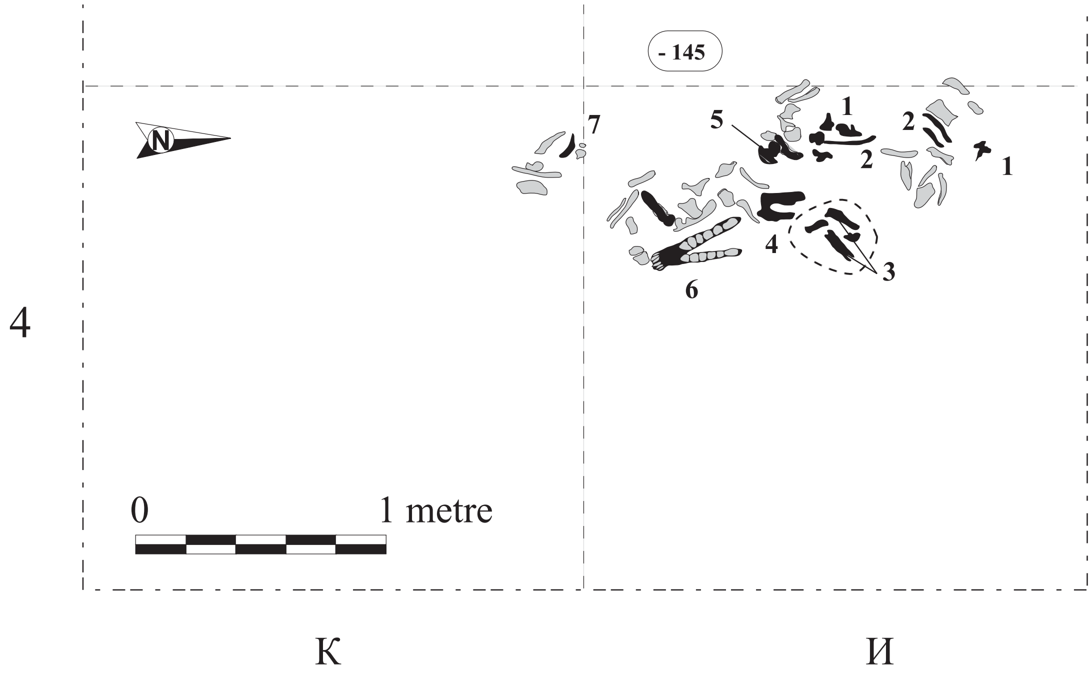


Figure 5.27 *Concentration # 6: 1 - large ungulate vertebrae fragments; 2 - large ungulate rib fragments; 3 - large ungulate long bone fragments; 4 - horse pelvis; 5 - horse astragalus and calcaneus in articulation; 6 - horse mandible with teeth; 7 - sheep/goat ulna.*

Species	NISP	% of NISP	MNI	MNE	Wt. (g.)	S/Ad	Ad	O/Ad	Cal.	Carb.	% Burn.
Equus caballus (Horse)	52	24.4	2	15	1,561	31	6	0	0	0	0
Ovis/Capra (Sheep/Goat)	20	9.4	2	18	315	10	5	0	0	0	0
Capreolus cap. (Roe Deer)	1	0.5	1	1	34	0	1	0	0	0	0
Large ungulate	82	38.5	N/A	10	794	0	0	0	0	0	0
Small ungulate	52	24.4	N/A	10	188	6	4	0	0	0	0
Sciurus vulgaris (Squirrel)	1	0.5	1	1	1	0	1	0	0	0	0
Lepus timidus (Arctic Hare)	5	2.3	1	5	3	0	5	0	0	0	0
Subtotal	*213*	*100*	*7*	*60*	*2,896*	*47*	*22*	*0*	*0*	*0*	*N/A*
Small Fragments											
Cancellous	11	-	-	-	43	-	-	-	0	0	0
Cranial	11	-	-	-	88	-	-	-	0	0	0
Rib	0	-	-	-	0	-	-	-	0	0	0
Other (indet.)	0	-	-	-	0	-	-	-	0	0	0
Subtotal	*22*	-	-	-	*131*	-	-	-	*0*	*0*	*N/A*
Total	**235**	**100**	**7**	**60**	**3,027**	**47**	**22**	**0**	**0**	**0**	**N/A**

Table 5.7 *Pavlinovo 1999 bone concentration # 6: species, general ageing, and burning characteristics.*

During the excavation of this area in 1999, there were several problems connected with the identification of the stratigraphic overlap between *Structures 10 & 5*. Although in all probability the bone concentration relates to the Iron Age period, its exact contextual relationship to *Structure 5* should be held as questionable at this time, as it may relate to later occupational activities at the site and the possible post-occupational use of *Structure 5*.

5.7.9 Bone Concentration # 7

This bone concentration was located in Quadrants H-O/5-6 at a level of approximately -1.40 metres BSD. This particular concentration of bone materials was compacted (2 m^2 area) and was clearly associated with the cultural floor level of *Structure 5*, as it was situated in a separated room or annex located along the southern wall of the dwelling (Fig. 5.28 & 5.29). There were a total of 423 bone specimens recovered from the concentration (Table 5.8). Only the three main domesticate species were represented by the remains with the highest frequency relating to the horse bone materials.

Figure 5.28 *View from the north of bone concentration # 7 situated along southern wall of the Structure 5 annex.*

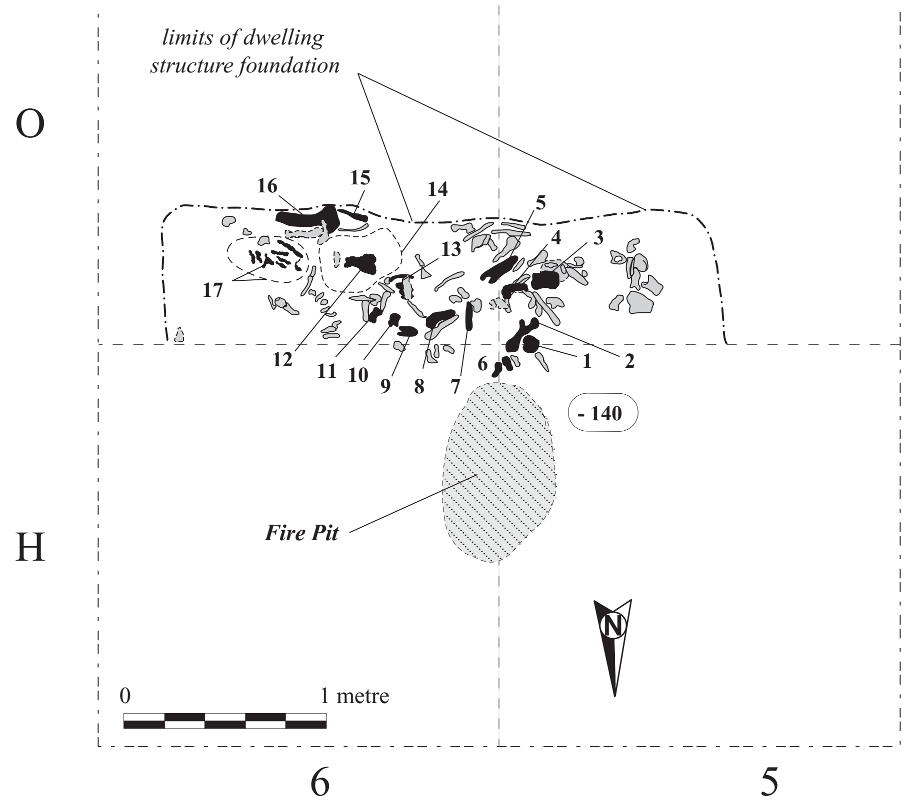


Figure 5.29 *Plan of bone concentration # 7: 1 - flat stone (possible scraper?); 2 - horse pelvis fragment; 3 - large ungulate cranium (strongly fragmented); 4 - large ungulate mandible fragment; 5 - cow mandible fragment; 6 - small stones; 7 - worked antler (sp. Alces alces) piece; 8 - cow humerus fragment; 9 - large ungulate vertebra; 10, 11 - horse phalanx I, II; 12 - horse distal femur; 13 - large ungulate vertebrae; 14 - area of dense concentration of small shaft bone fragments; 15 - shaped antler tool (sp. Alces alces); 16 - horse distal femur.*

Concerning taphonomic characteristics, 4 bone specimens indicated evidence of burning or charring and 24 revealed clear evidence of longitudinal splitting. In general, the bone remains were heavily fragmented with the highest frequencies reflecting large ungulate shaft and rib bone fragments. The preservation of the remains was also quite poor, as 55% of the bones exhibited marked evidence of surface erosion, indicative of environmental weathering, with an additional 41.7% showing slight surface erosion.

Several small flat stones were recovered as well as antler fragments (sp. *Alces alces*), which had been hacked to length and the points shaped and sharpened. The bone remains were very fragmented, particularly the long bones and rib elements, and it is possible that the antler fragments had been used in the processing of the remains for marrow deposits as the pointed antler pieces would have been very useful for the extraction of these resources from the medullary cavities of the long bone and metapodial elements.

The nature of the concentration, as it was associated with a small fire pit on the north side, suggests that it was a midden deposit area for processed bone materials. The remains were deposited against the inside wall of the structure and were tightly compacted. It is difficult to determine the exact function of this small room, whether it represented an attached structure or a small annex of the larger *Structure 5* dwelling. However, the context of the concentration

SPECIES	NISP	% of NISP	MNI	MNE	Wt.	S/Ad	Ad	O/Ad	Cal.	Carb.	% Burn.
Equus caballus (Horse)	99	27.5	2	58	2,622	39	60	0	0	0	0
Bos Taurus (Cow)	4	1.1	1	4	154	0	1	0	0	0	0
Ovis/Capra (Sheep/Goat)	14	3.9	1	8	83	8	3	0	0	0	0
Large ungulate	147	40.8	N/A	11	1,126	9	9	0	1	2	2.0
Small ungulate	96	26.7	N/A	5	274	1	0	0	0	1	1.0
Subtotal	*360*	*100*	*4*	*86*	*4,259*	*57*	*73*	*0*	*1*	*3*	*N/A*
SMALL FRAGMENTS											
Cancellous	52	-	-	-	188	-	-	-	0	0	0
Cranial	11	-	-	-	48	-	-	-	0	0	0
Rib	0	-	-	-	0	-	-	-	0	0	0
Other (indet.)	0	-	-	-	0	-	-	-	0	0	0
Subtotal	*63*	-	-	-	*236*	-	-	-	*0*	*0*	*N/A*
TOTAL	**423**	**100**	**4**	**86**	**4,495**	**57**	**73**	**0**	**1**	**3**	**N/A**

Table 5.8 *Pavlinovo 1999 bone concentration # 7: species, general ageing, and burning characteristics.*

is certain as Early Iron Age ceramic sherds (Gorokhovo and Sargat types) were recovered from the same grid area and stratigraphic level. In general, this concentration provides an excellent representation of bone remains associated with activities taking place within the domestic structure.

5.7.10 Bone Concentration # 8

This concentration was tightly compacted (2 m^2 area) and yielded 434 bone fragments. It was associated with the foundation traces of *Structure 9* at the far western edge of the excavation area (Fig. 5.30 & 5.31). The bone remains were located in Quadrant 3/2' at a depth of -1.36 metres BSD. Only a small section of *Structure 9* was revealed during the 1999 excavation (western section of small room or annex structure), however, the remaining area relating to this domestic feature was excavated during the 2001 season and further information relating to this will be discussed below. Interestingly, the bone remains recovered in this area during the 1999 excavation reflected a different composition. As Table 5.9 indicates, the three

Figure 5.30 *View from the north of bone concentration # 8.*

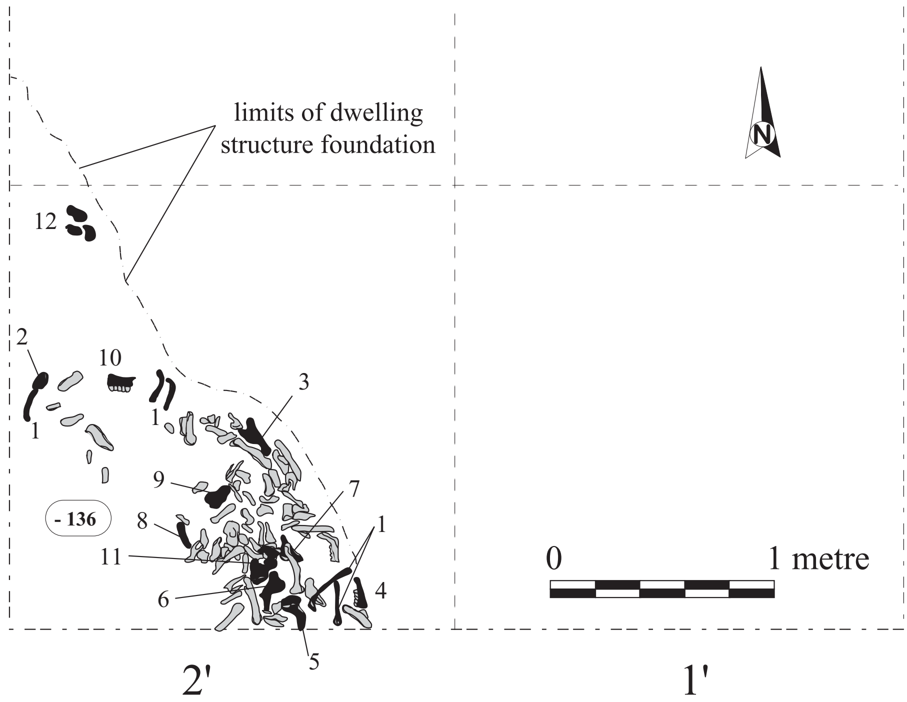


Figure 5.31 *Plan of bone concentration # 8: 1 - large ungulate rib; 2 - sheep/goat proximal femur; 3 - sheep/goat scapula; 4 - sheep/goat mandible; 5 - sheep/goat pelvis; 6 - horse distal humerus; 7 - cow distal metacarpal; 8 - sheep/goat radius; 9 - cow maxilla; 10 - cow mandible; 11 - sheep cranium; 12 - cow teeth.*

SPECIES	NISP	% of NISP	MNI	MNE	Wt.	S/Ad	Ad	O/Ad	Cal.	Carb.	% Burn.
Equus caballus (Horse)	13	3.5	1	13	326	5	3	0	0	1	7.7
Bos taurus (Cow)	130	35	3	65	2,974	29	51	0	0	0	0
Ovis/Capra (Sheep/Goat)	19	5.2	2	11	161	14	3	0	0	0	0
Ovis aries (Sheep)	3	0.8	1	2	47	0	0	0	0	0	0
Capra hircus (Goat)	2	0.6	1	2	30	0	0	0	0	0	0
Large ungulate	178	47.9	N/A	27	1,559	4	0	0	0	0	0
Small ungulate	26	7	N/A	0	76	0	0	0	0	0	0
Subtotal	*371*	*100*	*8*	*120*	*5,173*	*52*	*57*	*0*	*0*	*1*	*N/A*
SMALL FRAGMENTS											
Cancellous	31	-	-	-	173	-	-	-	0	0	0
Cranial	32	-	-	-	168	-	-	-	0	0	0
Rib	0	-	-	-	0	-	-	-	0	0	0
Other (indet.)	0	-	-	-	0	-	-	-	0	0	0
Subtotal	*63*	-	-	-	*341*	-	-	-	*0*	*0*	*N/A*
TOTAL	**434**	**100**	**8**	**120**	**5,514**	**52**	**57**	**0**	**0**	**1**	**N/A**

Table 5.9 *Pavlinovo 1999 bone concentration # 8: species, general ageing, and burning characteristics.*

main domesticate species are represented, although the cattle remains are clearly the most predominant. This stands in contrast to the other concentrations discussed thus far, which have reflected the higher frequency of horse bone materials.

The bone specimens recovered from concentration # 8 revealed little evidence of burning or charring, with only 1 specimen indicating such treatment. However, a number of the remains did show clear evidence of longitudinal splitting with a total of 64 exhibiting such processing. The preservation of the remains reflected a high degree of surface weathering and erosion, with 96% of the bone specimens exhibiting this kind of taphonomic condition. Of these remains, 59% showed a slight degree of such weathering with the other 37% showing a marked degree. As Appendix # 3 indicates, the recovered bone materials from the three species in concentration # 8 are represented by both cranial and post-cranial elements.

As noted above, concentration # 8 is associated with *Structure 9,* which was further excavated in 2001. This domestic dwelling structure also dates to the Early Iron Age period and may relate to a later phase of occupation or settlement at the Pavlinovo site. A further discussion of this feature will follow below in the section relating to the 2001 excavation season. Unfortunately, much of the information relating to this recent excavation is not currently available for inclusion within the thesis. Indeed, no soil sections representing the site stratigraphy have been finalised and I have only included the general plan of the excavated area in order to discuss the horizontal distribution of the faunal remains concentrations. Nevertheless, there are several interesting characteristics associated with the faunal remains recovered form this part of the site and they do provide an important comparative sample in terms of the bone remains recovered during the 1999 season. Therefore, it will be most useful to explore the context of concentration # 8 as it relates to the archaeological features uncovered during the 2001 excavation.

5.7.11 Bone Concentration # 9

Figure 5.32 *View from the west of bone concentration # 9 situated within ditch feature.*

This concentration was discovered within the infilling of a ditch feature located in Quadrant E/1-2 at the northwest edge of the 1999 excavation area (Fig. 5.32). The recovered faunal remains were distributed within the confines of the ditch and varied in depth from -1.30 to -1.57 metres BSD (Fig. 5.33). The three main domesticate species were represented by the bone

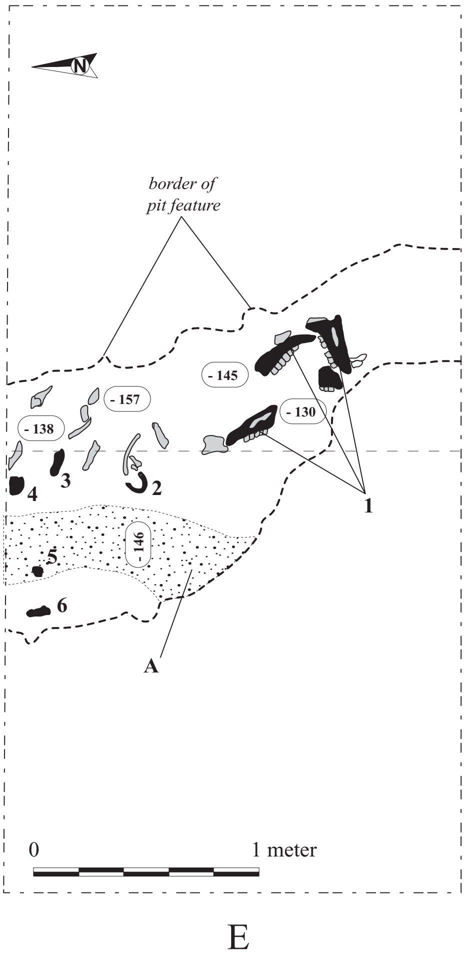


Figure 5.33 *Plan of bone concentration # 9 and ditch feature: 1 - horse mandibles; 2 - sheep/goat maxilla; 3 - horse tooth; 4 - sheep/goat astragalus; A - cross-cutting brown-white ashy clay horizon.*

1' concentration, with the horse remains being predominant. There were only 37 bone specimens recovered from within the ditch context (Table 5.10). In terms of taphonomic characteristics, the remains exhibited little evidence of burning or charring and only two bones revealed evidence of longitudinal splitting. The skeletal representation was indicative of both cranial and post-cranial elements for all three of the domesticate species.
2' This particular bone concentration was loosely distributed within the infilling of the ditch feature and did not appear to be related to any particular stratified level. Nevertheless, there were few artefact remains recovered from the feature and it did not represent a typical midden type deposit of processed bone remains. For example, the recovered horse mandibles were nearly whole and did not indicate the high level of fragmentation

Species	NISP	% of NISP	MNI	MNE	Wt.	S/Ad	Ad	O/Ad	Cal.	Carb.	% Burn.
Equus caballus (Horse)	17	47.2	2	8	856	3	6	0	0	0	0
Bos taurus (Cow)	6	16.7	1	2	287	12	0	0	0	1	16.6
Ovis/Capra (Sheep/Goat)	2	5.6	1	2	23	0	0	0	0	0	0
Large ungulate	11	30.5	N/A	2	66	7	0	0	0	0	0
Subtotal	*36*	*100*	*4*	*14*	*1,232*	*22*	*6*	*0*	*0*	*1*	*N/A*
SMALL FRAGMENTS											
Cancellous	1	-	-	-	24	-	-	-	0	0	0
Cranial	0	-	-	-	0	-	-	-	0	0	0
Rib	0	-	-	-	0	-	-	-	0	0	0
Other (indet.)	0	-	-	-	0	-	-	-	0	0	0
Subtotal	*1*	-	-	-	*24*	-	-	-	*0*	*0*	*N/A*
TOTAL	**37**	**100**	**4**	**14**	**1,256**	**22**	**6**	**0**	**0**	**1**	**N/A**

Table 5.10 *Pavlinovo 1999 bone concentration # 9: species, general ageing, and burning characteristics.*

(processing burning or charring, with only 1 specimen indicating such treatment. However, a number of of the rich marrow deposits in the medullary cavities) encountered within the other bone concentrations.

Concerning dating, the concentration appears to relate to the Early Iron Age period as the few recovered pottery sherds found within the ditch feature were representative of the Gorokhovo and Sargat types.

5.7.12 Bone Concentration # 10

This concentration of materials was encountered in Quadrant 3/2 at a depth of -1.52 metres BSD and represented 41 bone specimens. Unfortunately, the concentration was not photographed or a plan drawing made before its removal during the process of excavation. Overall, the concentration was quite small in size (1 m^2) and was situated near a large area of burned soil, ash and charcoal residue associated with *Structure 10* and fire pit # 8 (see previous Figure 5.14 for spatial location). The recovered bone remains were representative of domestic horse and cow and did not exhibit any indication of burning or charring (Table 5.11). Only one bone element, the distal end of a cow metacarpal, had been split longitudinally. The recovered bone remains are primarily represented by post-cranial elements, although there were a few cranial fragments as well as one upper M_3 tooth recovered for the cow species (Appendix # 3).

This concentration of bone remains appears to relate to deposits associated with *Structure 10* and therefore is probably representative of the suggested Phase 1 occupational sequence (Daire & Koryakova 1999).

SPECIES	**NISP**	**% of NISP**	**MNI**	**MNE**	**Wt.**	**S/Ad**	**Ad**	**O/Ad**	**Cal.**	**Carb.**	**% Burn.**
Equus caballus (Horse)	5	17.2	2	5	93	1	0	0	0	0	0
Bos taurus (Cow)	5	17.2	2	5	84	2	1	0	0	0	0
Large ungulate	19	65.6	N/A	3	141	0	0	0	0	0	0
Subtotal	*29*	*100*	*4*	*13*	*318*	*3*	*1*	*0*	*0*	*0*	*N/A*
SMALL FRAGMENTS											
Cancellous	8	-	-	-	27	-	-	-	0	1	12.5
Cranial	4	-	-	-	28	-	-	-	0	0	0
Rib	0	-	-	-	0	-	-	-	0	0	0
Other (indet.)	0	-	-	-	0	-	-	-	0	0	0
Subtotal	*12*	-	-	-	*55*	-	-	-	*0*	*1*	*N/A*
TOTAL	**41**	**100**	**4**	**13**	**373**	**3**	**1**	**0**	**0**	**1**	**N/A**

Table 5.11 *Pavlinovo 1999 bone concentration # 10: species, general ageing, and burning characteristics.*

5.8 Discussion of the 1999 Faunal Remains

Before I move towards a presentation of my analysis of the faunal remains recovered from the 2001 excavation season, it is necessary to provide a general interpretation of the bone remains discussed thus far relating to the 1999 season. As I indicated in the last chapter, there are numerous questions surrounding socio-economic practices and related occupational phases within the Iron Age settlement sites of the Middle Tobol River region. Commonly proposed models for Early Iron Age pastoralism include nomadic, semi-nomadic, semi-settled, and settled categories. However, each of these proposed models stimulates a number of questions regarding interpretations of recovered faunal remains from settlement archaeological contexts, as I have attempted to emphasise in the earlier chapters regarding the complexity associated with mobile forms of pastoralism and connected patterns of deposition relating to material artefacts and faunal remains.

As I described above, the conventional approach to the recovery, analysis, and interpretation of Early Iron Age faunal remains from settlement sites in the Middle Tobol region has been to treat them as one distinct assemblage without providing detailed information regarding the variability of the remains within and between respective spatial contexts (both vertical and horizontal). The traditional emphasis has clearly been on determining the range of species represented at the sites as well as the total number of fragments (NISP) and a minimum number count (MNI). Hence, little attention has been placed on trying to characterise the nature of the structured depositions or how they specifically relate to other domestic features within the site and a postulated range of human activities and behaviours and differing models of socio-economic organisation.

By contrast, the recovered faunal remains from the 1999 season provide a very interesting sample of the types of patterns of deposition associated with the Early Iron Age period as well as a strong indication of the spatial and temporal complexity of zooarchaeological remains from settlement sites of this period. Through the application of a more precise methodology for the contextual recovery and analysis of the bone materials, as outlined in the discussion of the faunal concentrations above, the complex variation associated with the deposits quickly becomes apparent.

Generally speaking, the recovered faunal remains from the 1999 season were indicative of the normal range of species recovered from Early Iron Age settlement contexts. The three main domestic animal categories of horse, cow, and sheep/goat were well represented within the various spatial contexts of the 1999 assemblage as well as a limited range of wild taxa.

Importantly, the recovery of fish remains from bone concentration # 5 provides an important indication of probable fishing activities at the Pavlinovo site.

I discussed the evidence for fishing activities in the Early Iron Age period within the Middle Tobol River region in the last chapter and I feel that this is an extremely important issue which necessitates further investigation regarding socio-economic models for the Early Iron Age period. Because of the general lack of soil sieving of settlement archaeological contexts, and the fact that ancient fish remains do not preserve well under normal taphonomic conditions, fishing is one dimension of subsistence activity that can be easily under acknowledged regarding prehistoric subsistence strategies. However, the recent work by O'Connell, Levine and Hedges (2000), regarding stable isotope signatures from human remains, has indicated that fish played a much more significant role in the diet of early pastoral populations within the steppe region. Further to this, current PhD research on stable isotopes being undertaken by K. Privat (Oxford University), which includes Bronze Age and Iron Age period samples from the Middle Tobol River region, has further supported prehistoric dietary signatures showing a high intake of fish resources (Privat 2001). The forthcoming results of Privat's research will add an important new dimension to current understandings of the development and complexity associated with the rise of nomadic pastoralism within the eastern Eurasian steppe region. With my assistance, Privat has gathered a number of human and animal bone collagen samples from Gorokhovo-Sargat period settlements (including Pavlinovo) and mortuary sites, and the final results of this research will be of great importance for understanding the range of subsistence practices of the Early Iron Age populations in the Middle Tobol River region.

5.8.1 Horizontal Context of the 1999 Faunal Assemblage

Through my discussion above of the Pavlinovo 1999 faunal assemblage, the recovered bone concentrations can be grouped into three main horizontal contexts (for spatial distribution refer to Fig. 5.14): (i) remains which are clearly associated with *Structure 5* (#'s 4, 5, 6 & 7), (ii) open air concentrations associated with subsoil ditch/pit features and surface level fire pits (#'s 1, 2, 3 & 9), and (iii) concentrations associated with domestic structures relating to other occupational or temporal phases (#'s 8 & 10) of settlement (see Figure 5.34 for comparative graph of NISP counts between concentrations). Obviously, the absolute dating of the bone materials and their probable relationships to the domestic archaeological features is problematic because of the current lack of radiometric dating. Nevertheless, the three proposed phases of construction and occupation within the excavated area, which has been based on the stratigraphic relationships of the archaeological features and recovered pottery and other artefact remains, provide a general framework for the interpretation of the faunal remains.

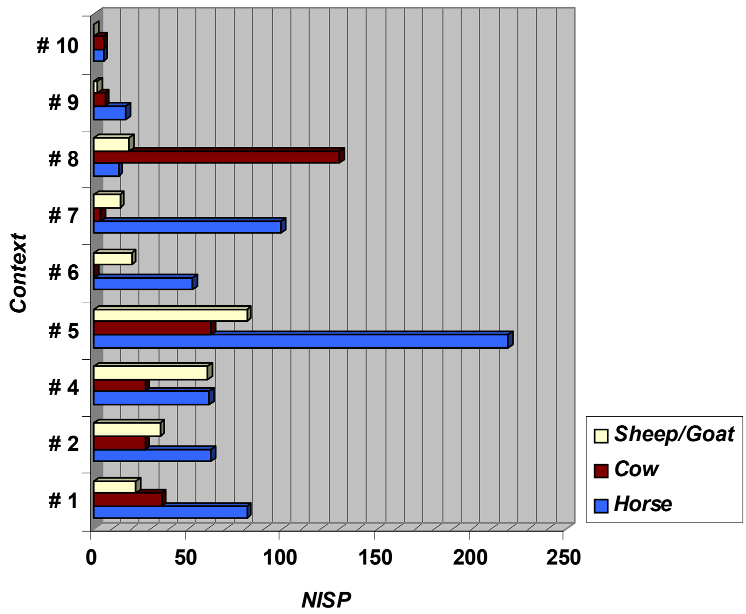


Figure 5.34 *Graph comparing species NISP totals by bone concentration.*

Therefore, regarding the interpretation of the faunal materials, I will first provide a brief discussion of the contexts and then follow with a more detailed examination of the particular patterns of bones recovered and their respective treatment. Lastly, I will discuss the ageing data achieved from the analysis of the eruption and attrition patterns of the dental remains, as this provides a better indication of the mortality patterns and animal husbandry practices associated with the faunal remains.

As noted above, the bone concentrations recovered from within the *Structure 5* dwelling were discovered at the lowest cultural stratum and clearly relate to activities either associated with the direct occupancy of the dwelling or possible post-occupational activities. Certainly, one of the most important considerations is the nature of the bone concentrations recovered from this context. The question quickly arises as to why such heavy concentrations of bone materials would be deposited *inside* the dwelling, especially when one considers the potentially unpleasant and unhealthy nature of such accumulations within an occupied structure. As I discussed above, the faunal remains recovered from inside the dwelling exhibited clear signs of processing activities that can be associated with bone fragmentation for marrow resource extraction (e.g. longitudinal splitting, high frequency of shaft fragments, mandible fragmentation, etc.), butchery and disarticulation of various carcass elements, and indications of food preparation or utilitarian processing based on the burning and charring of a percentage of the recovered bone remains. A comparison of the weathering patterns for the various bone concentrations are provided in Figure 5.35 and Figure 5.36 provides comparative information relating to burning characteristics. The fracturing patterns of the bones were coded during the zooarchaeological analysis by using the general typology published in Reitz and Wing 1999 (Fig. 5.37). General statistics for the types of fracturing associated with the bone concentrations are detailed in Table 5.12. This information, as discussed for the individual concentrations above, indicates a significant number of bones with longitudinal splitting and transverse-irregular breakage, which appears to indicate the marrow and bone grease extraction as noted above. Although this

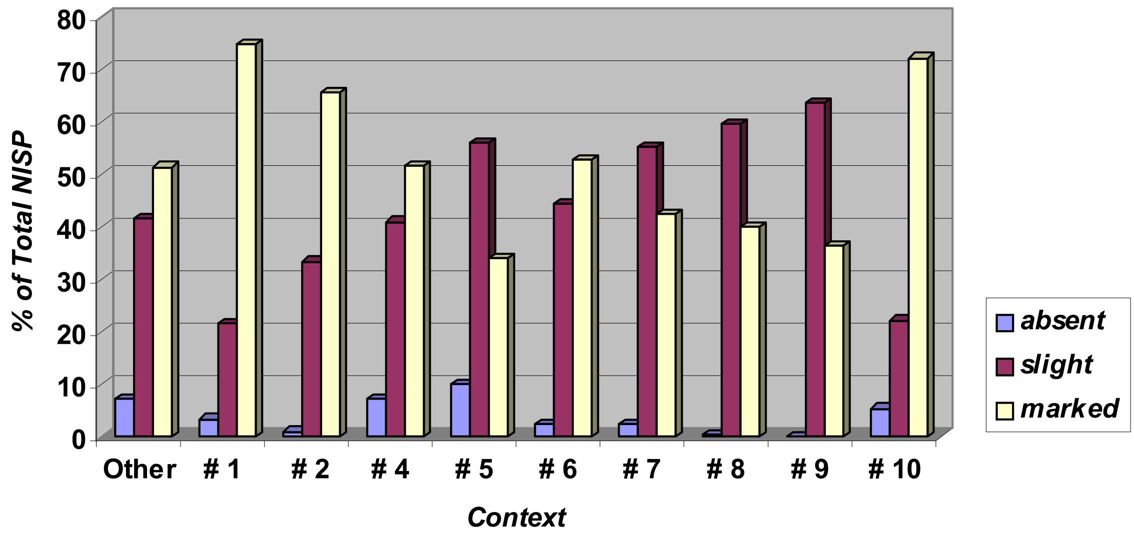


Figure 5.35 *Graph indicating degree of weathering of bone remains from individual concentrations.*

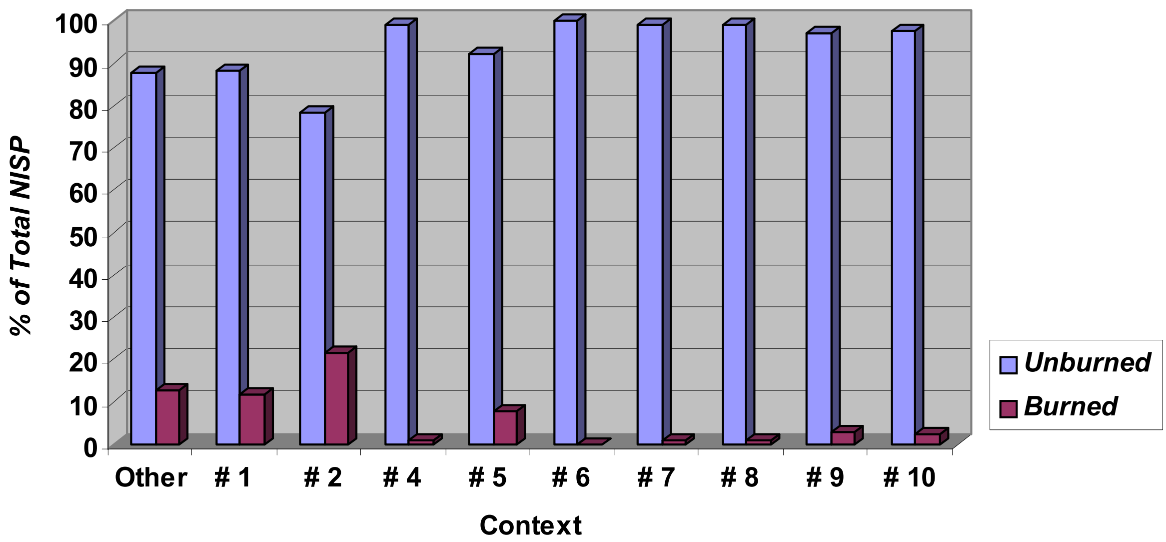


Figure 5.36 *Graph indicating burning characteristics of bone remains from individual concentrations.*

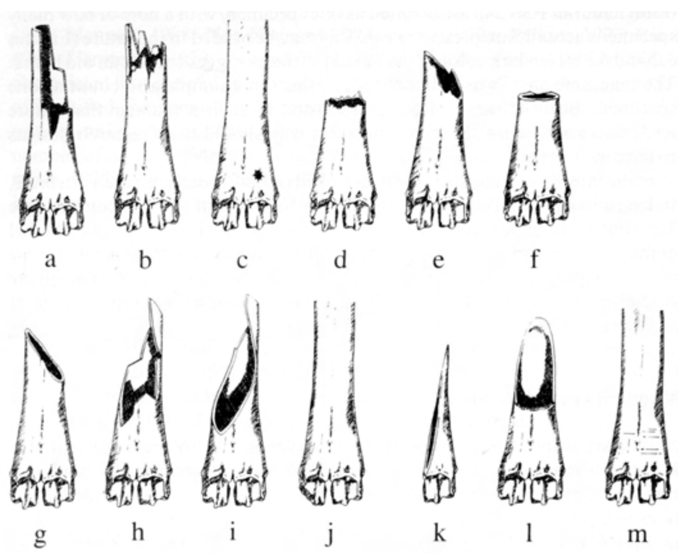


Figure 5.37 *General typology of bone modification characteristics - description of categories is provided for each letter in Table 5.12 (after Reitz & Wing 1999).*

FRACTURE TYPE	OTHER	# 1	# 2	# 4	# 5	# 6	# 7	# 8	# 9	# 10
A - stepped or columnar	14	-	3	-	-	-	-	-	-	-
B - sawtoothed or splintered	15	-	-	-	-	-	-	-	-	-
C - punctured	-	-	-	-	-	-	-	-	-	-
D - transverse, irregular	23	-	-	4	7	-	2	1	-	-
E - oblique, irregular	79	2	1	8	15	7	4	3	-	-
F - transverse, regular	7	-	1	-	-	-	-	-	-	-
G - oblique, regular	28	-	27	6	5	-	-	-	-	-
H - spiral, irregular	-	-	-	-	-	-	-	-	-	-
I - spiral, regular	9	-	-	-	3	2	14	2	-	-
J - irregular break	-	-	-	-	-	-	-	-	-	-
K - longitudinal split	268	28	-	27	100	8	24	64	1	4
L - grooved	-	-	-	-	-	-	-	-	-	-
M - cut	19	-	1	3	8	1	-	4	-	-

Table 5.12 *Data relating to bone modification types for the Pavlinovo 1999 assemblage.*

methodology is not as precise as some recent approaches (Fisher 1995; O'Connell & Hawkes 1992; Outram 2001; Todd & Rapson 1988), it nevertheless provides an important indication of the types of fracture patterns relating to the 1999 faunal assemblage. It must also be noted that a significant percentage of the bone remains from the 1999 assemblage indicated fresh breakage (Fig. 5.38) associated with excavation and post-excavation processing (e.g. washing, coding and transportation from the Pavlinovo site). This must also be considered as an important bias in terms of bone fragmentation (however, the data in Table 5.12 relates only to green bone breakage).

In terms of skeletal representation, as was detailed in the tables relating to the respective concentrations and in Appendix # 3, both cranial and post-cranial bone elements are represented in many of the concentrations and this raises an important question concerning the human activities associated with the animal remains. Logically, one would assume that the animals were first killed and at least partly butchered outside the dwelling structure with the various carcass elements brought into the dwelling for further processing. However, the bone remains recovered from within *Structure 5* reflect a variety of skeletal elements including vertebrae, metapodial elements (including carpals and tarsals), phalanges, and other elements that one would expect to be

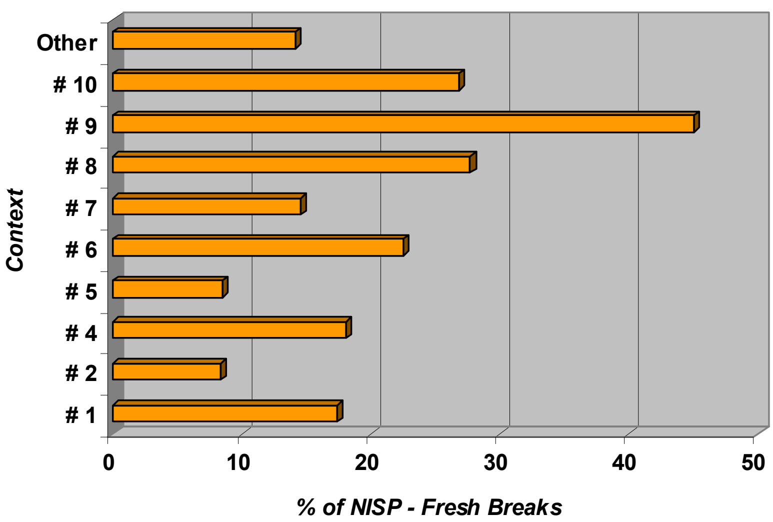


Figure 5.38 *Graphed percentage of bones from bone contexts indicating fresh breakage (the high number associated with # 9 and # 10 are reflective of small total concentration NISP numbers)..*

deposited outside the dwelling through the process of butchery and carcass disarticulation. Nonetheless, the skeletal representation of the concentrations generally indicates the presence of bones from all of the anatomical zones of the animals and suggests that much of the processing of the remains may have been carried out within the dwelling structure itself.

Concerning the character and distribution of the concentrations within *Structure 5*, some general remarks can be made. First of all, concentrations # 5 & # 7 appear to be the most representative of bone remains deposited on the actual cultural floor level of the structure. Concentration # 5 yielded a number of bone materials and as discussed above reflected numerous small fragments, worked bone and antler elements, as well as widely scattered bone materials along the whole of the northern area of the dwelling structure as well as within the small attached annex located in the north east corner of the structure. Interestingly, the accumulations near the fire pit features were more compact and indicative of smaller fragmentary bone remains mixed with ash, charcoal and small calcined bone pieces. By contrast, the upper deposit of scattered bone remains was comprised of various elements including vertebrae, ribs, and metapodial and phalanx elements. My general interpretation of these deposition patterns, during the process of excavation and field recording, was that the more widely scattered remains represented a final phase of activity and deposition and that the more concentrated and fragmentary remains associated with the fire pit features were indicative of a longer period of bone remains processing and deposition, perhaps occurring during a continuous occupation phase associated with the structure.

Concentration # 7 represented a very tightly compacted group of bones contained within a small room or annex, which is distinctly represented within the foundation traces of *Structure 5* (Fig. 5.14). This area may have either been a small attached outbuilding or may have contained a threshold in the northern wall which allowed movement between the main area of the *Structure 5* and the small room. The small fire pit associated with this accumulation of bone materials suggests that this was a bone processing area. My discussion of this concentration above emphasised the heavy fragmentation of the bone remains and I suggested that this was indicative of intensive marrow extraction activities. In addition, the heavy surface weathering of the remains indicates that this part of the structure was either exposed to the environment or that the decomposition of the dwelling structure after occupancy occurred in such a way that the concentrated bone remains were strongly affected by wind and waterborne particles. This particular structure, or structural addition, was interpreted as possibly relating to construction Phase 3 (see Fig. 5.10) by Daire and Koryakova (1999).

As I noted above, concentrations # 3, # 4 & # 6 may be intrusive to the dwelling structure area. Nevertheless, concentrations # 3 & # 4 are suggestive of the same scattered pattern of skeletal elements characteristic of concentration # 5. It is possible that these remains were deposited at the same time and in much the same manner (i.e. wide dispersal pattern). However, the exact intrusive overlapping nature of *Structure 10* is unclear at this time (without more detailed stratigraphic information) and I would prefer to interpret the context of the bones from concentrations # 3, # 4 & # 6 as Early Iron Age remains, but as questionable in relation to the cultural floor level of *Structure 5*.

Concentrations # 1 & # 2, which may be categorised as open air midden deposits, are suggestive of bone processing accumulations associated with activities taking place outside the main dwelling features. These particular features are what might be expected for the butchery and processing of animal livestock and the range of skeletal elements, including both cranial and post-cranial elements, indicates the processing of whole animal carcasses. The stratigraphic context of the materials, and associated pottery sherds, indicate that both of the deposits are from the Early Iron Age period, with concentration # 2 possibly relating to the earlier Phase 1 period and *Structure 6* (Fig. 5.10), which was excavated in 1990.

Concentration # 9, found within a small northwest to southeast oriented ditch feature, situated in the northwest corner of the excavation area, represents a particularly unusual pattern of deposition found within the Pavlinovo site. Similar ditch type features within the site have yielded mixed concentrations of faunal materials. The bone remains usually appear as loosely structured deposits and often yield cranial and metapodial elements. Two similar features were also excavated in 2001 and information relating to these will be presented below. The exact function of these ditches is unknown and they are generally found to be quite 'clean' in terms of artefact deposits, yielding little evidence of ceramic sherds or other materials that might be traditionally interpreted as domestic 'rubbish' associated with settlement site middens. It will be most useful to return to a discussion of these features below with a presentation of the 2001 faunal materials.

5.8.2 Bone Element Treatment, Fragmentation, and Marrow Exploitation

I have already covered many of the specific features regarding the recovered 1999 faunal remains in the individual descriptions above. However, there are a few issues that necessitate further discussion at this point. In terms of cut marks, hack marks, and other such surface treatment indicators, the faunal remains from Pavlinovo 1999 did not exhibit a great deal of information in terms of patterning for skin, tendon, or meat removal from the skeletal elements. Although such indications were noted for a few of the bone specimens for each of the bone concentrations, the highest frequency of such indicators related to bone concentration # 5 – which was discussed above.

In general, cut marks for the 1999 faunal assemblage were primarily noted as being associated with the heads of the ribs and as parallel cuts along the lateral sides of the thoracic vertebrae. These cut marks were likely a result of cutting actions to remove the rib heads from their attachment points along the thoracic vertebrae. Additionally, some cut marks were noted as relating to the scapulae and pelvises, where a good deal of cutting (filleting) and scraping is required in order to remove the large muscles associated with these anatomical zones (Olsen 2000).

Additionally, the innominates (ilium + ischium + pubis bones of pelvis) exhibited a significant amount of surface treatment in the form of hacking and the common pattern was associated with breakage through the narrow shaft areas of the pubic, ischim and ilium bones in order to separate the area where the proximal ball of the femur engages with the pelvic acetabulum (this was particularly the case for the horse remains). By hacking through these narrow bone shaft areas, the detachment of the femur from the pelvis could be done very quickly, as cutting through the surrounding tendons and muscle mass takes a considerable amount of energy and time. It is clear that the innominate area provides one of the heaviest concentrations of meat on the animal, and in the case of the horse, this hindquarter area can weigh as much as an entire live sheep (Outram & Rowley-Conwy 1997, 1).

In general, the lack of bone surface treatment indicators on the Pavlinovo 1999 assemblage may be caused not only by the high degree of fragmentation of the remains but also the generally poor surface erosion and weathering associated with many of the concentrations. These factors, coupled with a high percentage of the remains also being influenced by weathering and subsurface root etching, also complicates the detection of discernible surface treatments relating to human activities associated with butchering and carcass manipulation. Nevertheless, the faunal remains do provide strong indications of particular patterns of bone fracturing, with longitudinal splitting and midshaft spiral breaks (indicating the processing of fresh bones) being the most common. Numerous impact marks and hack marks were associated with these types of breaks, which were represented by all of the long bone and metapodial elements recovered from the concentrations.

The high degree of bone fragmentation, which was the predominant taphonomic characteristic of the 1999 faunal assemblage, is clearly exemplified by the high fragment counts (NISP) as compared to the relatively low estimated numbers for individual animals (MNI) and individual bone elements (MNE) for each of the concentrations. Although some degree of fragmentation may relate to the general butchery and disarticulation of the animal carcasses, many of the fragmentation patterns are directly related to bone processing techniques used for the intensive extraction of marrow resources from the medullary cavities of the appendicular elements and mandible and the obtainment of bone grease from the dense cancellous areas of the long bones (Outram 2001; Outram & Rowley-Conwy 1997). These activities are indicated by the common longitudinal splitting of long bone and metapodial elements and the high frequency of small shaft and mandible bone fragments within many of the faunal concentrations. More specific contextual information relating to this for the 1999 and 2001 Pavlinovo assemblages can be found within Appendices # 3 & # 4 of the thesis, which provide data relating to the NISP, MNE, and MAU counts for each of the skeletal elements of the species recovered from the Pavlinovo 1999 and 2001 excavations.

Concerning conventional approaches to bone fragmentation patterns, there has been little or no research undertaken with the faunal materials recovered from the Early Iron Age settlement sites in the Trans-Ural region. Moreover, the use of standard NISP and MNI quantification methods have not provided a suitable methodological framework for examining particular issues relating to skeletal element frequencies within archaeological contexts. As I discussed above, regarding my methodology for the Pavlinovo materials, the use of the MNE and MAU methodology provides for a more precise approach to examining issues relating to the economic anatomy of various animals and possible connections to the deposition of particular skeletal elements within and between varying archaeological contexts (as well as differential taphonomic preservation).

However, I must note that it is particularly at this point that my methodological approach to the Pavlinovo assemblages sharply deviates from conventional zooarchaeological analyses within the Middle Tobol region, and as such, moves away from providing a data set which is easily comparable to published data relating to other Early Iron Age settlement sites. Nevertheless, I am confident that my analysis of the Pavlinovo faunal assemblages has yielded new information as well as stimulated a host of important questions surrounding Early Iron Age animal butchery practices, animal husbandry regimes, and larger issues associated with pastoral socio-economic patterns. Certainly, one of the most important of these is the issue of extensive bone marrow exploitation at the Pavlinovo site.

Animal bone fat (marrow and grease) represents an important food supplement as well as useful craft and utilitarian resource (e.g. for tanning and waterproofing) among hunting and pastoral peoples. The range of activities associated with the utilisation of bone fat resources has been well documented in a number of ethnographic case studies (Binford 1978; Levin and Potapov 1964; O'Connell & Hawkes, 1988). Importantly, the obtainment of such rich fat resources can provide an important subsistence supplement for diets that may be high in lean meat and low in carbohydrates, which can lead to illness as a result of the problems associated with the metabolisation of protein in such unbalanced diets (Outram 2001; Speth & Spielmann 1983). Moreover, ethnographic research has also shown the important connection between the exploitation of bone fat and subsistence stress among various populations, which was well examined within Binford's 1978 study of the Nunamiut.

While the utilisation of bone marrow and grease may be recognised as a particularly useful aspect of general utilitarian practices, it is particularly the connection with dietary stress that stimulates an important perspective on prehistoric subsistence practices. With these important considerations in mind, the bone fracturing patterns associated with the Pavlinovo faunal remains may have important implications for understanding both paleodiet and dietary stress indicators for the Iron Age period as well as stimulating questions regarding larger socio-economic practices. This argument can also be connected with recent work completed as part of a PhD dissertation on the osteological analysis of human bone materials from the Sargat period in the forest-steppe region (Rajev 2001). This study indicated significant evidence of dietary stress (bone and dentition) among human skeletal evidence from cemetery sites believed to relate to local Early Iron Age settlements. Based on this important evidence, furture zooarchaeological studies clearly will need to investigate dietary stress in more detail with regard to faunal remains and other socio-economic evidence from settlement sites.

Through my discussion of the bone concentrations above, it is clear that the faunal materials recovered from the Pavlinovo site reveal evidence for the exploitation of marrow resources from all three of the main domestic species. However, the highest frequency of bone processing (in terms of NISP and MNI) certainly relate to the utilisation of horses. As I discussed in the last chapter, the recovery of a high number of horse bone remains is common for many of the Early Iron Age settlement sites in the Middle Tobol River region and it is apparent that horses were an important subsistence resource during this period.

In recent years, a number of researchers have emphasised the importance of resources obtained from equids – including meat, bone fat and milk products (Levine 1998; 1999a; 1999b; Olsen 1996; 2000; Outram & Rowley-Conwy 1997). This research has been especially important for extending understandings of the development of horse domestication within the Eurasian steppe region and for raising awareness for the significant role that horses have played in terms of both technology and subsistence practices from the Neolithic to the historic period among hunter-gatherer and pastoral populations. These factors, in connection with the high frequency of horse bone remains recovered from archaeological sites, underscores the necessity of providing more precise methodological approaches to the recovery, analysis, and interpretation of ancient horse bone materials.

Regarding this, a recent experiment by Outram and Rowley-Conwy (1997) has established an important utility index for the mean meat and marrow weights of horses (Table 5.13). This work is particularly noteworthy because it establishes quantitatively the anatomical zones of the horse that provide the highest food values in terms of meat and marrow weight. This data may then be correlated with the skeletal element representation of horses from archaeological contexts in order to better theorise the rationale behind particular butchery patterns, bone treatment, and faunal remains deposition characteristics.

As Table 5.13 indicates, the major meat bearing areas on the horse are the thorax (including the thoracic vertebrae, ribs and sternum), neck (cervical vertebrae), and hind quarters (pelvis and femur) (Outram & Rowley-Conwy 1997, 1). In terms of bone fat, the long bones (humerus, radius/ulna, femur, and tibia), metapodial elements, and mandible provide the highest percentages, while the phalanges yield very little.

Concerning using this approach for an examination of the Pavlinovo materials, Figures 5.39, 5.40, & 5.41 represent the MAU % of the bone remains recovered from the horse materials in bone concentrations # 5, # 7, & # 2, respectively. These three concentrations were chosen because they provide a sample of the range of contextual variability present within the site (e.g. internal and external midden deposits) as well as deposition characteristics (i.e. dense

Anatomical Unit	Meat Weight (kg)	Standardised Meat Weight Index (MUI)	Marrow Weight (g)	Standardised Marrow Weight Index (MI)	Meat plus Marrow (kg) (GUI)
skull, brains	8.0	18.3	0.0	0.0	8.0
mandible, tongue	3.25	7.3	35.8	49.9	3.286
atlas/axis	3.5	7.6	0.0	0.0	3.5
cervicals 3-7	20.25	45.2	0.0	0.0	20.25
thorax	44.75	100.0	0.0	0.0	44.75
lumbar	10.0	21.8	0.0	0.0	10.0
scapula	6.75	15.2	0.0	0.0	6.75
humerus	5.75	12.3	40.6	56.5	5.791
radius/ulna	1.5	3.6	24.2	33.7	1.524
metacarpal	0.0	0.0	11.3	15.7	0.011
pelvis	23.75	53.7	0.0	0.0	23.75
femur	20.25	44.5	71.8	100.0	20.322
tibia	2.25	5.1	33.2	46.2	2.283
metatarsal	0.0	0.0	9.4	13.1	0.009
phalanges	0.0	0.0	1.0	1.4	0.001

Table 5.13 *Data relating to standard indices for anatomical meat and marrow weights of the horse (after Outram & Rowley-Conwy 1997).*

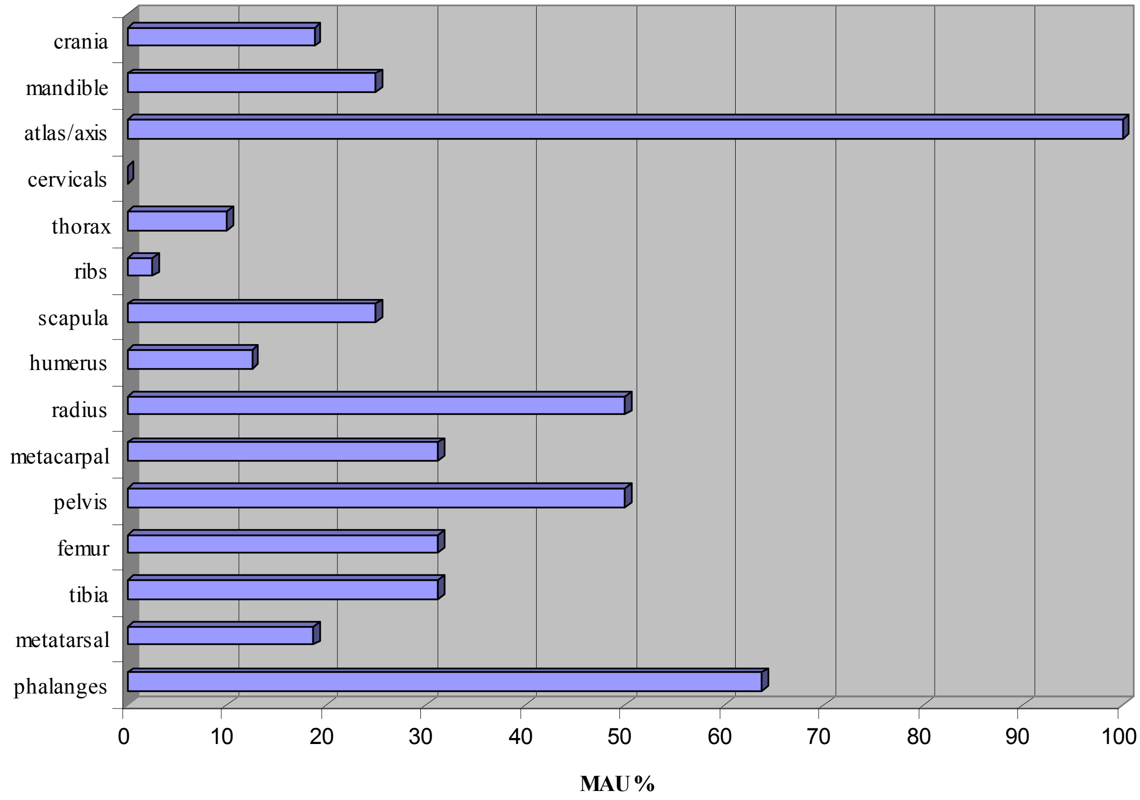


Figure 5.39 *Graph illustrating MAU % of horse elements from bone concentration # 5.*

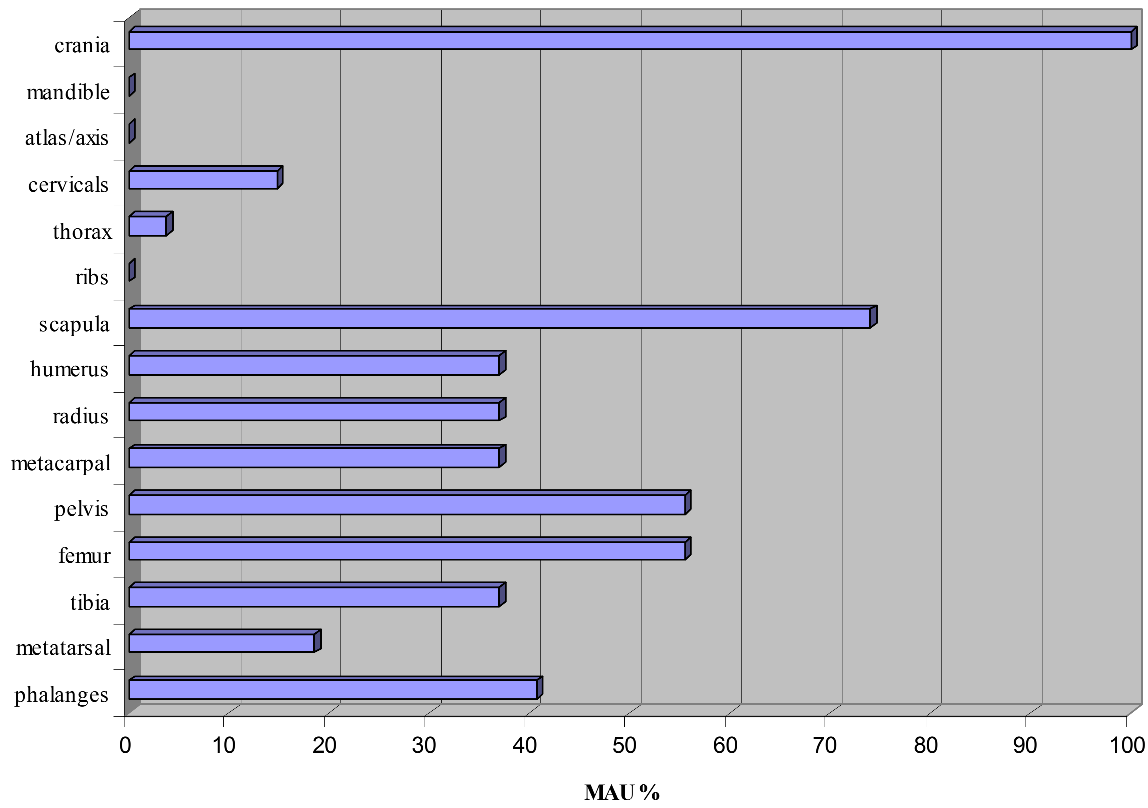


Figure 5.40 *Graph illustrating MAU % of horse bone elements from bone concentration # 7.*

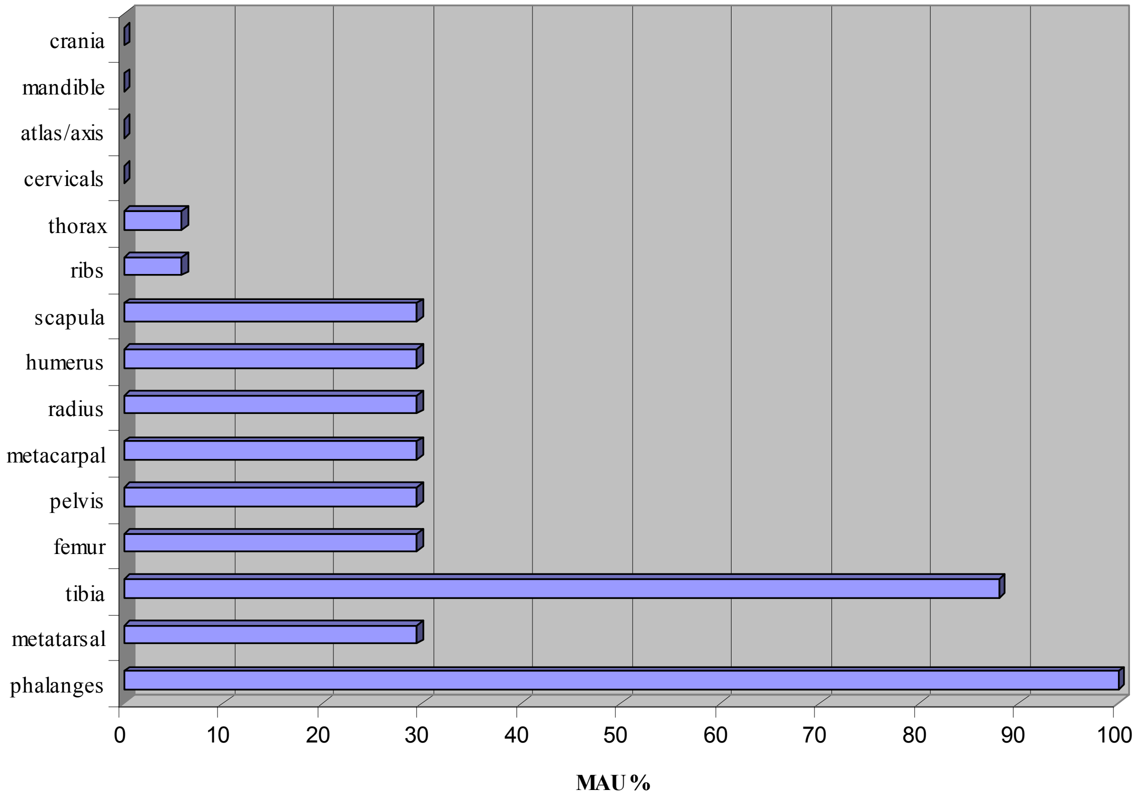


Figure 5.41 *Graph illustrating MAU % of horse bone elements from bone concentration # 2.*

midden or scattered distribution). Within the space of the thesis, it would not be possible to present graphic representations for all of the species from all the concentrations. Therefore, the data presented in Appendices # 3 and # 4 provide an excellent resource for generating any combination of graphic representations for the recovered faunal remains by context at Pavlinovo.

The MAU % for Figures 5.39 – 5.41 were calculated by dividing the MAU of each of the skeletal elements by the highest MAU number obtained from the respective concentration. These figures were then multiplied by 100 to provide a useful figure for comparing percentages. The data for these figures was obtained from the respective tables in Appendix # 3.

Not surprisingly, all three of the concentrations show a high percentage of upper limb bone elements (i.e. femur, tibia, humerus, radius/ulna), as these skeletal elements provide a useful resource for both meat and marrow exploitation. The relatively low figures obtained for the ribs and vertebra (thorax) areas can be explained by the difficulty of identifying these elements to a particular species based on the high degree of fragmentation of the elements. In this case, these remains from the concentrations were typically coded as 'large ungulate' remains and no specific species designation was given. If one reviews the NISP counts for the large ungulate categories in the tables in Appendix #3 as well as the small fragments representation tables for these elements, it is possible to see the relatively high frequency of these remains as well.

This is also the case with the cranial fragments, as much of the representation of these remains would also be indicated within the small fragments representation tables. However, the recovered teeth specimens provided a more reliable form of identification for the head region, especially for distinguishing between the upper crania (including premaxilla, maxilla and teeth) and the mandible area.

Two interesting patterns emerge from the graphs in Figures 5.39 – 5.41: (i) the relatively high representation of phalanges (between 40 and 100 MAU %) in all three of the concentrations, and (ii) the distinct lack of representation for cranial elements in bone concentration # 2. The first pattern, regarding the high number of recovered phalanges, is an interesting feature of the Pavlinovo 1999 assemblage. Although not all of the horse phalanges were split longitudinally, there were several cases where the 1st phalanx had been split (e.g. Appendix # 2 - # 17). As there were no indications of horse phalanges being specifically manipulated or worked for either utilitarian or artistic reasons, it is possible that the splitting of these elements related to the extraction of bone grease resources. Because of the relatively low amount of marrow found within these elements, it is likely that the phalanges were either split or placed as whole elements in boiling water in order to comminute as much bone grease as possible from the animal remains at hand. In addition, a number of carpals and tarsals were also split and it is possible that these small dense bones were also prepared for treatment by boiling in order to extract bone grease resources. The high frequency of metapodial and phalange elements in all the concentrations indicates that these bone elements, which provide little or no meat resources, were either being used for their associated tendon materials or were being split or otherwise processed for their minimal marrow and bone grease resources.

As I noted above, each of the concentrations yielded relatively low minimum number counts (MNI) for each of the species (generally four or less). Although it is possible that bone elements were being preserved or stockpiled for later processing, such as during the winter period when the marrow resources contained within the bones would preserve well in frozen conditions (Outram 2001; Olsen 2000), none of the concentrations yielded a higher frequency of these remains than what would normally be expected for the butchery and processing of a few animals. In other words, there does not seem to be a phase of the processing and deposition of a particular collection of lower metapodial elements from several animals within any of the midden deposits. Rather, the deposits appear to represent most of the skeletal elements of the animals in a variety of processed, fragmented, and preserved conditions. This leads me to conclude that many of the deposits represent single or relatively short-term multi-phases of butchery and animal carcass processing. This was perhaps done in order to extract all the meat and marrow/bone grease resources available at the specific time that the animal was slaughtered. It seems likely that the meat and other materials were obtained and processed for immediate consumption or use or were cured through smoking or salting for long term preservation, for example to provide food resources through the winter period. It will be useful to return to this issue below with my discussion of the animal dentition ageing and seasonality indicators for the Pavlinovo site.

As I noted above, bone concentration # 2 was somewhat peculiar because of its lack of cranial element representation for the recovered remains. As this concentration represents an open air midden deposit it is possible that the cranial remains were deposited in another location of the site. Although the concentrations located within the dwelling *Structure 5* yielded processed and fragmented cranial element materials (i.e mandibles, and upper and lower teeth remains), the deposits in bone concentration # 9 did not. In this case, the faunal deposits represent nearly whole mandibles (split into right and left sides). It is particularly at this point that one begins to cross the boundary between what may be considered practical animal remains treatment and deposition and those activities which seem to contradict any straightforward economic rationale.

It is clear that the cranium, including the mandible, represents an important anatomical zone in terms of meat and marrow resources. While on one hand the Pavlinovo 1999 faunal deposits indicate a very clear utilisation of this anatomical zone, on the other hand, one can encounter deposits of either whole or lightly fractured crania or mandibles situated with particular features of the site. This situation is represented by the ditch feature associated with concentration # 9 as well as the nearly whole horse mandible recovered from bone concentration # 6, as discussed above.

Understanding the prehistoric rationale behind these different deposition patterns is no easy task, nevertheless, one must acknowledge that the killing and butchery of animals among prehistoric societies in the Eurasian steppe has had a long trajectory of significance concerning cosmological and ritual associations (Mallory 1981; Baldick 2000). The variable nature of the deposit of 'head and hoof' bone elements is particularly widespread and this was discussed in some detail in the last chapter. These patterns occur in both mortuary contexts as well as settlement sites and are well known in Western Siberia from at least the Eneolithic period (Olsen 1999 - concerning the deposit of horse and dog crania within settlement site contexts). I will return to a discussion of these patterns below in the presentation of the faunal materials collected from the 2001 excavation season at Pavlinovo, where two similar types of deposits were encountered.

5.8.3 Dentition Analyses and Mortality Profiles

As discussed in the last chapter, one of the most important issues concerning the interpretation of animal husbandry regimes is the investigation of mortality profiles. In this respect, it is often possible to model the use of domestic livestock for dairying, meat, or wool production. My discussion in the last chapter of the ageing data obtained from the faunal remains from the settlement sites of Prygovo and Baitovo suggested that there were several mortality patterns represented for all three of the main domesticate species. While the slaughtering of subadult or prime adult individuals may relate to the seasonal culling of surplus males for meat production, there was also evidence for the slaughter of old adult individuals as well. This pattern was particularly the case for the horse remains from Baitovo, where it was suggested that older horses were kept past their prime for 'quiet tasks' (Daire & Koryakova 2002, 198).

One of the problems associated with the conventional ageing analyses from the Middle Tobol River sites is the lack of stated contexts for the recovered dental remains. Often, the aged samples of teeth are taken from a larger grouped assemblage of materials and it is difficult to know whether the mortality patterns presented are actually representative of particular settlement phases and activities or are actually a product of the selection of specific teeth (by the analyst) which 'fit' the main age categories. In response to this problem, the mandible, maxilla, and loose tooth remains from Pavlinovo were aged according to their individual contexts. In this way, it was hoped that even though the sample sizes would be smaller they would perhaps be more representative of the mortality patterns associated with the respective faunal remains deposits. Therefore, the data presented in Appendices # 5 and # 6 are grouped according to their respective contexts.

The results of the general ageing data from the Pavlinovo 1999 analysis, which was detailed in the tables above for each of the specific site contexts (relating to bone composition and size, deciduous and permanent teeth, epiphyseal fusion, etc.), indicates that there was a clear split in mortality profiles between subadults and adults, with each of the contexts yielding high percentages of both general age categories (for all three domesticate species). The more specific dentition ageing (attrition and eruption patterns) which I undertook also supports this pattern, with subadults and adults being represented as well as some old adult individuals with heavily worn teeth (occlusal surfaces).

Horse Mortality Profiles

Concerning the horse dentition ageing, the high degree of fragmentation of the mandibles and maxillas made the exact ageing of these materials difficult. However, dentition remains from each of the concentrations, as they relate to either partial or whole mandibles or maxillas or loose teeth, have been detailed in Appendix # 3. In general, the dentition remains from the upper levels yielded a range of loose teeth from deciduous to heavily worn permanent teeth. Based on eruption and attrition patterns (including measurable crown height - following Levine 1982), the suggested age ranges fell between 4 months to 20 + years; with the lower age estimate coming from deciduous teeth with various phases of occlusal wear to crown height measurements of permanent molars and premolars representing the higher age estimates.

One of the problems encountered with the Pavlinovo loose horse teeth was the high incidence of specimens with breaks, especially near the tooth root area. This made crown height measurements impossible on a number of the recovered teeth. Those specimens that were measurable are detailed within Appendix # 3. As Appendix # 3 indicates, recovered horse teeth from the upper levels yielded a variety of ages. Unfortunately, as these dentition specimens probably reflect several mixed phases of activity within the settlement site, the exact interpretation of these remains as they may relate to specific animal husbandry regimes or particular temporal phases of occupation is difficult to ascertain with any high degree of certainty. Nevertheless, recovered deciduous teeth from the upper levels indicate individuals from approximately 4 months to 3 years of age – clearly representing the slaughter of juvenile or subadult individuals before all the permanent teeth have erupted and are in full wear (approximately 5-6 years of age). Ageing of the permanent horse teeth (N = 20, premolars and molars) from the upper levels of the Pavlinovo 1999 excavation revealed adult individuals with a range of ages from approximately 7 to 20 years of age (Appendix # 3 – upper levels, *Equus caballus* loose teeth).

Concerning the ageing of the horse teeth from the individual bone concentration contexts (secure Iron Age cultural stratum), the results of this data have also been presented in the tables within Appendix # 3 and are based exclusively on the methodology detailed in Levine 1982. The ageing of these materials was based both on recovered full or partial cheek tooth rows from maxillas and mandibles as well as from recovered loose teeth. As the MNI estimates for the individual animal species are quite low for the individual concentrations, the ageing of the dentition remains by context provided a very useful approach for interpreting the ages of the animal remains represented within the concentrations.

Bone concentration # 1, with an MNI of 2 for the horse materials, yielded both loose and articulated teeth representing two main age groups: 8 months – 2 years and 1-4 years. Bone concentration # 2, with an MNI of 3 for the horse materials, yielded loose teeth only which represented two overlapping ages: 9-14 years and 12-13 years. It is possible that the recovered loose teeth came from one individual in this concentration and based on the averaged crown heights the age was between 9-14 years. Bone concentration # 4, with an MNI of 2, yielded only one loose tooth which provided an age range of 6-7.75 years of age. Bone concentration # 5, which provided an MNI of 4 for the horse materials, yielded several articulated and loose teeth which provided 4 main age groups: several heavily worn loose tooth suggestive of an old individual of 20 + years, upper incisors and one lower loose tooth suggesting a 9-13 year old individual, loose teeth suggesting a 16-18 year old individual, and one very worn deciduous tooth suggesting a broad range of 1yr 4 months – 4 years. These four distinct age divisions are very significant in that they were obtained from the same concentration of bone materials found within dwelling *Structure 5.* As such, the four divisions appear to match the MNI suggested for the concentration and hence reveal the wide variety of age groups exploited for slaughter relating to the deposited faunal materials. This is certainly an important factor concerning interpretations about the occupancy and settlement of the Pavlinovo site during the functioning of the dwelling structure.

Bone concentration # 6, with an MNI of 2 for the horse materials, yielded a nearly complete lower mandible (missing only the M_3 teeth). Unfortunately, because of the missing third molars, only an approximate age of 3.5 + years can be given (based on eruption and full wear of the first and second molars – crown height measurements were not possible). Interestingly, this was the only complete mandible recovered from the excavation and in this respect the pattern does not fit that of the other concentrations, wherein the mandibles are usually recovered in a highly fragmented state. The other recovered bone remains from the concentration suggested both adult and subadult aged individuals (based on bone size and epiphysial fusion).

Bone concentration # 7, with an MNI of 2 for the horse materials, yielded only 1 loose upper deciduous dp4 tooth (‘worn’ stage) giving a broad age category of 4 months – 3 years. However, the other bone remains recovered from the concentration were suggestive of both subadult and adult individuals. Unfortunately, no ageable horse teeth were recovered from bone concentrations # 8 and # 10, however, concentration # 9 produced two partial mandibles which were ageable. It is likely that the two mandibles, a left and right side, were from the same individual as the teeth exhibited similar patterns of wear and both contained a first molar in the first stage of eruption. This eruption stage provides an age of approximately 7 months – 1 year.

Generally speaking, the recovered horse dentition remains provide a broad mortality profile for the Early Iron Age occupation of the Pavlinovo site. Certainly bone concentration #

5 is the most revealing with a clear representation of 4 distinct age categories from juvenile to very old adult individuals. Of course the recovered number of horse teeth provide only a very small sample, especially in regards to the application of any statistical approach, but they do nevertheless give an indication that a broad range of horses were being selected for slaughter and butchery and the remains were clearly deposited within varying horizontal contexts within the Early Iron Age cultural stratum of the site.

As I have noted in several instances thus far within the chapter, it is clear that horses were one of the primary meat resources for the Iron Age populations in the Middle Tobol River region, however, the Pavlinovo 1999 faunal assemblage seems to indicate a rather flexible approach to the management and butchery of this particular category of livestock. While one might certainly expect the slaughter or culling of surplus males once they reach adult weight (5-7 years), with the occasional slaughter of an old animal out of its prime, the Pavlinovo materials seem to indicate the slaughter of horses from a variety of different age profiles within a similar temporal period. This factor, coupled with the intensive nature of marrow and bone fat exploitation, could be interpreted in light of the possibility of dietary stress among the Early Iron Age inhabitants. I discussed this possibility above and I will return to a more general review of the evidence in support of this theory below in the conclusion section.

Cattle Mortality Profiles

In contrast to the horse dentition ageing, the few ageable cattle tooth rows (4 mandibles and one maxilla for the concentrations and 10 mandibles for the upper level contexts) provided a more distinct mortality profile. Based on the data exemplified in Appendix # 3, a common pattern of approximately 18 - 24 + months was observed. The fact that few of the mandibles exhibited full tooth rows (especially in terms of missing second and third molars) complicated the ageing and therefore it was difficult to provide a more precise age profile for the remains beyond 18 months in some cases. Nevertheless, the cattle remains appear to fit a profile of subadult to adult slaughtering and therefore correlate with the cattle remains recovered from other Early Iron Age sites (as discussed in the last chapter) which reflect the probable culling of surplus subadult males for meat consumption.

Currently, a cementum analysis project is being undertaken on the cattle remains from Pavlinovo by O. Bachura at the Institute of Ecology and Animal Science, Ekaterinburg and forthcoming information regarding these analyses may provide a better understanding of the seasonal exploitation of cattle during the Early Iron Age period at the Pavlinovo site.

Sheep/Goat Mortality Profiles

A total of 9 mandibles from the lower bone concentrations and a total of 6 mandibles for the upper level contexts were aged for the sheep/goat remains (Appendix # 3). Because of the high degree of fragmentation of the faunal remains, and the relative experience of the author, more precise distinctions between the sheep (*Ovis capra*) and goat (*Capra hircus*) remains were not undertaken. Only when particular bone elements were encountered, where a high degree of confidence supported the interpretation, was a distinction made between coding the bone specimen as a sheep or goat.

Concerning the ageing of the sheep/goat remains, the upper levels revealed a variety of mortality patterns from juvenile to adult (ranging from 6 months to 10 years) with no distinct pattern discernable. The lower level bone concentrations also revealed a split in ages, although all the mandibles indicated subadult individuals. More specifically, concentrations 5, 7, and 8 yielded remains ageing approximately 1-2 years, while concentrations 4 and 5 yielded mandibles aged between 2-6 years.

Generally speaking, sheep/goat faunal representation at the Pavlinovo site is much lower than that of the horse and cattle remains. However, the presence of subadult aged animals, and the relative occurrence of sheep/goat remains in most of the bone concentrations, indicates that the animals were utilised for meat in addition to probable milk and wool production. The relatively young subadult ageing of the animals seems to indicate the culling of surplus individuals (probably males) for meat consumption. Unfortunately, the lack of a larger sample of ageable mandibles affects interpretations concerning the actual role and management of the sheep/goat species at Pavlinovo.

5.8.4 Discussion

At this point of the chapter, primarily through a discussion of my research with the animal bone remains recovered from the 1999 season, a number of issues have been raised regarding the recovery, analysis and interpretation of faunal remains from the Pavlinovo site. The one crucial concern that has been underscored throughout this discussion is the complex nature of both the horizontal as well as vertical contexts of the faunal deposits within the settlement site. Obviously, this relates to interpretations regarding temporal settlement and occupation activities as well as associated animal husbandry regimes and socio-economic organisation.

I feel that through my discussion above I have called into question a number of previously held conventions regarding faunal analyses from Early Iron Age sites within the Middle Tobol River region. In addition, through a more detailed and contextual approach to the analysis of the faunal remains a number of important new questions have been stimulated regarding the utilisation of animals within the Early Iron Age as well as the range of activities that may relate to the settlement and occupation of the sites. Therefore, at this point, I would like to complete the chapter with a discussion of the preliminary results of my analysis of the faunal remains from the 2001 field work season. In this way, it will be most useful to compare and contrast the two excavated areas in a final section at the end of the chapter, wherein I will provide a more structured overview of my results and interpretations regarding my work at the Pavlinovo site and how this relates to some of the larger aims of the thesis in general.

5.9 2001 Excavation – Faunal Assemblage Analysis

The 2001 field investigation of the Pavlinovo settlement was funded through the framework of a three year project grant (INTAS-00-119) entitled: *Iron Age Society and Environment: A Case Study from the Trans-Ural Region of Russia.* The aim of this project is to undertake new methodologies regarding both settlement and mortuary site excavations. As such, a multi-disciplinary approach was instituted in regards to the 2001 excavation season and a number of environmental sampling methods (geo-botanical; geo-morphological; zooarchaeological) were carried out. Unfortunately, at this early stage, no final results have been completed for the project and I will only be able to present the results of my faunal analysis and some preliminary interpretations at this time.

The 2001 field season was comprised of two separate areas of excavation: (i) Excavation # 8 (a 256 m^2 area) which abutted the 1999 excavation (west side) and provided for the completion of the excavation of *Structure 9* encountered during the 1999 season (Figs. 5.42 & 5.43), and (ii) Excavation # 9 (a 264 m^2 area), which was a north-south oriented trench unit in the northern area of the fortification zone near the previous excavation units of 1989 and 1990 (see previous Fig. 5.6).

The faunal remains recovered from the trench excavation, which extended north from the fortification approximately sixty metres through the outlying settlement area, are currently being analysed by E. Efimova (Ural State University) and Dr. P. A. Kosintsev (Institute of Ecology and Animal Science). Unfortunately, no final results are available at this time regarding the faunal remains recovered from this area.

My own individual task during the 2001 excavation was to supervise the recording and recovery of all encountered faunal remains and to provide zooarchaeological training for the student researcher E. Efimova during the fieldwork and post excavation phase of analysis. As part of my tasks for the INTAS funded project, I completed the analysis of all faunal remains

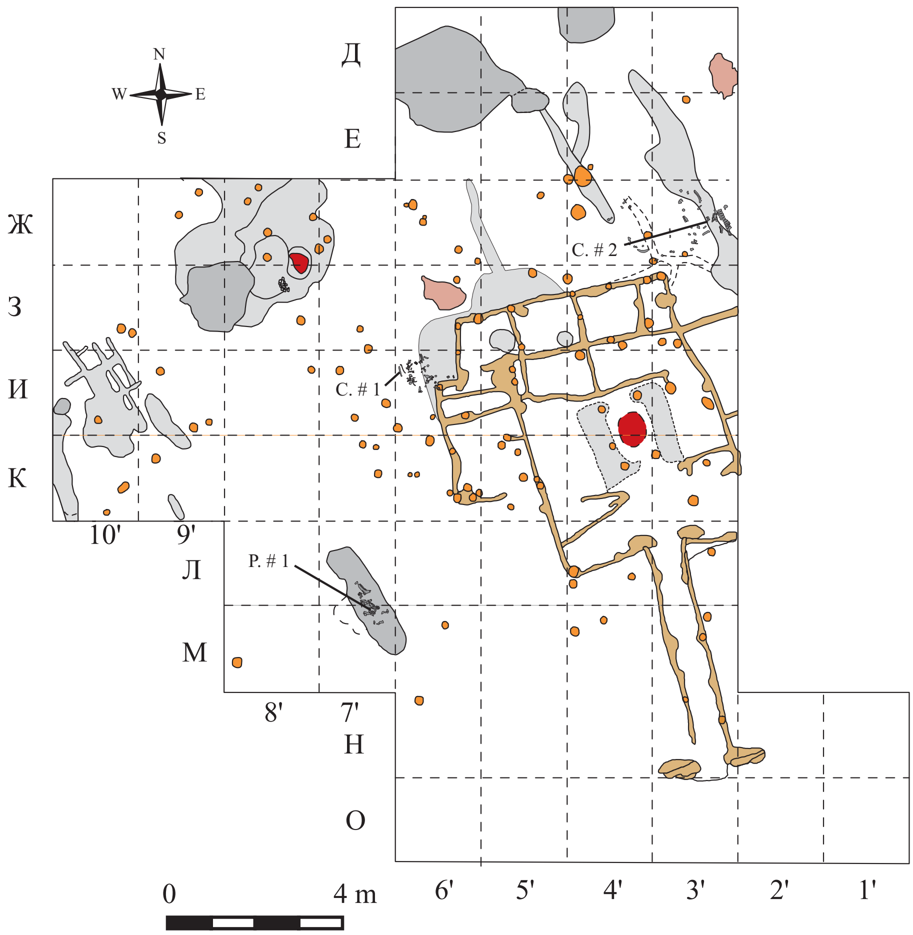


Figure 5.42 *Plan of excavation area # 8 from the 2001 season at Pavlinovo detailing the general distribution of archaeological features and bone concentration #'s 1 & 2 (C # 1, 2) and Pit Feature # 1 (P. # 1).*

from Excavation # 8 and general information regarding this research will be discussed below. I should stress, however, that there is still on-going work regarding the analysis of the faunal remains. Currently, I am collaborating with E. Efimova on the development of a faunal remains density study for Excavations # 8 & # 9.

A revised excavation methodology was used for recovering the faunal remains from the 2001 season. Therefore, in an attempt to test conventional 'hand collection' sampling methods, some soil sieving was employed during the excavation. Although this was not carried out systematically for all areas of the site, certain levels and concentrations were sieved in an attempt to collect as many of the bone remains

Figure 5.43 *View from the north showing the foundation of Structure 9.*

as possible. The size of the screen used was approximately 10mm, however the sieving of the small pit features and soils associated with hearth and bone concentration features was sieved through a smaller 2mm screen. In addition, soil flotation was undertaken within certain areas of the site and preliminary analyses have not revealed any indication of agricultural evidence from the sample contexts (Koryakova 2001 - INTAS seasonal report).

The methodology for the collection and fixation of the faunal remains was the same for both excavation areas, though somewhat different methods for the analyses of the bone materials were done respective to both excavation areas. As a result, even though sieving and flotation were carried out on a limited scale during the 2001 season, an attempt was made to collect all bone fragments encountered during the process of excavation.

In total, there were 971 identified faunal bones and 8,821 small fragments analysed for Excavation # 8. The bone remains can be divided into three general categories: 1) those from the upper stratified levels of the excavated area, 2) those remains recovered from two distinct bone concentrations (#'s 1 & 2) at the lowest cultural stratum, and 3) the bone remains relating to the Pit # 1 feature located in the southwestern area of the excavation (Fig. 5.42).

The methodology for the analysis of the faunal materials followed the same laboratory coding system (after Miracle) as detailed above for the 1999 analysis. Associated skeletal frequency data (Appendix # 4 & # 8) and dentition ageing data (Appendix # 6) also follow the same methodologies as outlined above. The following tables, plans and photos of the 2001 faunal analysis are also structured in the same way and provide categories of information regarding the contextual nature of the faunal remains.

5.9.1 Upper Stratified Levels

As noted above for the 1999 Pavlinovo excavation, the lack of more specific stratigraphic information has greatly affected my current interpretation of the faunal remains recovered from the upper stratified levels of the Pavlinovo site. Unfortunately, this is also the case for the 2001 season and at this time no completed site soil sections are available for use within the thesis. Nevertheless, a discussion of the recovered bone concentrations, and the horizontal distribution of the faunal materials as detailed in the following plans and pictures, does provide a useful contextual framework for a discussion and preliminary interpretation of the recovered and analysed bone remains.

A total of 812 identified bone remains and 4,220 small bone fragments were analysed for the upper stratified levels of Excavation # 8. The data relating to these remains are detailed in Table 5.14 and more specific information relating to skeletal element frequencies (NISP, MNE & MAU) can be found in Appendix # 4 & Appendix # 8. In addition, a comparative

SPECIES	NISP	% of NISP	MNI	MNE	Wt. (g.)	Fetal	S/Ad	Ad	O/Ad	Cal.	Carb.	% Burn.
Equus caballus (Horse)	337	41.5	6	145	10,550	1	74	101	21	5	62	18.6
Bos taurus (Cow)	223	27.5	4	92	5,221	0	58	52	9	4	17	9.4
Ovis/Capra (Sheep/Goat)	95	11.7	5	53	668	0	21	33	0	1	14	15.8
Capra hircus (Goat)	1	0.1	1	1	2	0	0	0	0	0	0	0
Capreolus capreolus (Roe deer)	4	0.5	1	4	57	0	0	0	0	0	0	0
Vulpes vuples (Red Fox)	13	1.7	1	5	22	0	0	11	0	0	0	0
Canis familiaris (Dog)	1	0.1	1	1	8	0	0	0	0	0	0	0
Castor fiber (Beaver)	1	0.1	1	1	6	0	0	0	0	0	0	0
Lepus timidus (Arctic hare)	2	0.2	1	2	3	0	0	0	0	0	0	0
Large ungulate	111	13.7	N/A	29	1,453	0	28	75	0	0	15	13.5
Small ungulate	21	2.6	N/A	11	89	0	0	4	0	1	2	14.3
Smaller than rabbit	2	0.2	1	2	5	0	0	0	0	0	0	2
Bird	1	0.1	1	1	2	0	0	0	0	0	0	1
Subtotal	*812*	*100*	*23*	*347*	*18,086*	*1*	*181*	*272*	*30*	*11*	*110*	*N/A*
SMALL FRAGMENTS												
Shaft	2,936	-	-	-	4,800	-	-	-	-	294	981	43.4
Cancellous	725	-	-	-	1,205	-	-	-	-	26	315	47.0
Crania	193	-	-	-	370	-	-	-	-	21	84	54.4
Rib	309	-	-	-	528	-	-	-	-	13	42	17.8
Other (indet.)	57	-	-	-	119	-	-	-	-	12	6	31.6
Subtotal	*4,220*	-	-	-	*7,022*	-	-	-	-	*366*	*1,428*	*N/A*
TOTAL	**5,032**	**100**	**23**	**347**	**25,108**	**1**	**181**	**272**	**30**	**377**	**1,538**	**N/A**

Table 5.14 *Pavlinovo 2001 upper levels: species, general ageing and burning information.*

graph of the NISP percentage as compared to the other contexts of the excavated area is detailed in Figure 5.44. The recovered bone remains from these levels represented the three main domesticate species as well as five wild species and four general mammal categories. In comparison to the 1999 assemblage, the faunal materials from the upper levels of Excavation # 8 also revealed a broad range of mortality age figures, ranging from one fetal bone specimen to 30 old adult specimens (heavily worn teeth). In addition, 127 bones exhibited clear indications of longitudinal splitting and 110 bones were carbonised and 11 calcined. More detailed information

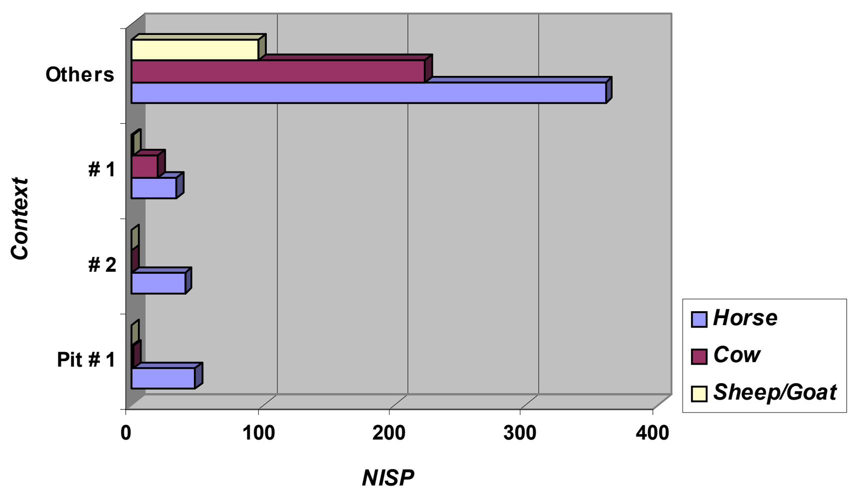


Figure 5.44 *Graph comparing NISP totals by concentration.*

concerning breakage patterns (including fresh breaks, as noted above for the 1999 assemblage), weathering and burning characteristics for the Pavlinovo 2001 assemblage is provided in Figures 5.45, 5.46, 5.47, and 5.48.

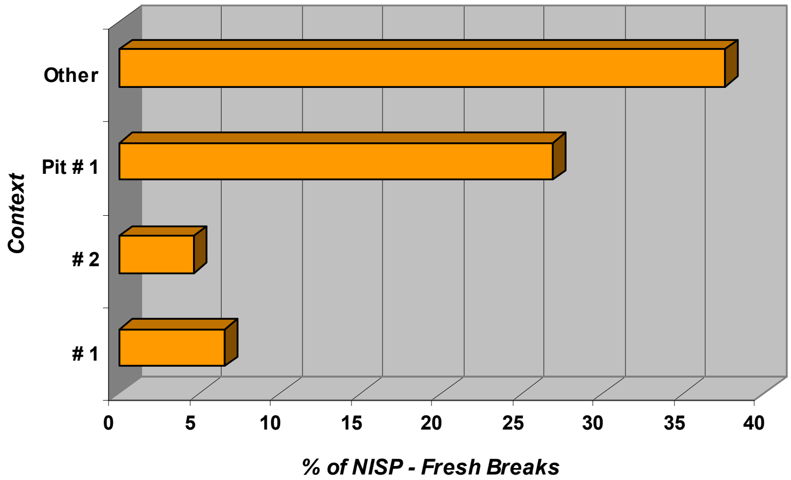


Figure 5.45 *Graph indicating percentage of bones indicating fresh breakage*

Concerning more precise mortality patterns of the faunal remains from the upper levels, based on the recovered and analysed dentition remains, there was a wide range of ages reflected. The data discussed below regarding the various species is exemplified in Appendix # 6.

Regarding the horse remains (MNI -6, for the upper level deposits): one left side mandible provided an early age of birth – 1 month; a mandible (left and right side) exhibited extremely worn teeth suggesting a very old to senile adult of 20 + years; one premaxilla with all incisors suggesting an age of 7.5-11 years; one right mandible suggesting an adult of 9-10 years; and one mandible (right and left sides) with the first permanent molar just erupting suggesting an approximate age of 7 months to 1 year.

FRACTURE TYPE	OTHER	# 1	# 2	PIT # 1
A - stepped or columnar	4	-	-	-
B - sawtoothed or splintered	-	-	-	-
C - punctured	-	-	-	-
D - transverse, irregular	6	-	3	-
E - oblique, irregular	26	1	-	-
F - transverse, regular	-	-	-	-
G - oblique, regular	3	-	-	-
H - spiral, irregular	-	-	-	-
I - spiral, regular	2	-	-	-
J - irregular break	-	-	-	-
K - longitudinal split	127	13	2	1
L - grooved	-	-	-	-
M - cut	2	-	-	-

Figure 5.46 *Data relating to bone modification types for the Pavlinovo 2001 assemblage (following typology above denoted for 1999 assemblage).*

The cattle dentition remains (MNI – 4) were represented by one right side mandible with extremely worn teeth suggesting a very old adult, one partial left side mandible indicating an individual of 30 + months, and one mandible with both right and left sides indicating a juvenile specimen of approximately 8-18 months.

The sheep/goat remains (MNI – 6) were represented by one right side mandible indicating an individual of 1-2 years, a left side maxilla also suggesting an individual of 1-2 years, and another right side mandible suggesting an adult individual of between 4-8 years.

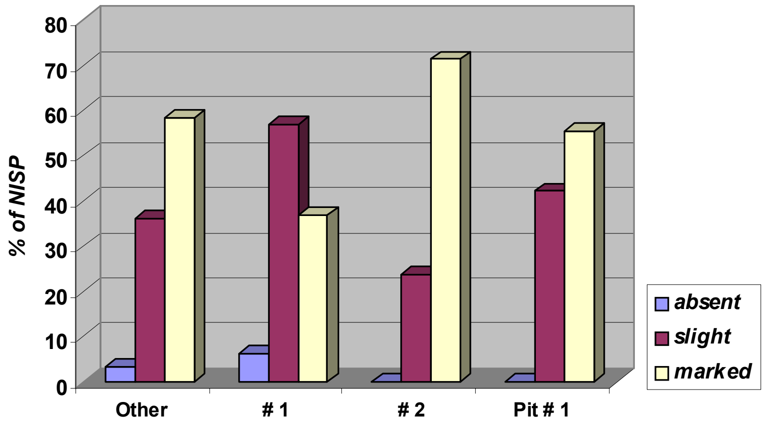


Figure 5.47 *Graph indicating degree of weathering of bone remains from individual concentrations.*

In general, the dentition ageing results of the 2001 upper levels is based on a very small sample of ageable tooth rows, however, the results are quite similar to the 1999 ageing data presented above.

More specifically, there appears to be a broad range of ages represented particularly for the horse species (however, this is based on a small sample). The cattle and sheep/goat ages appear more restricted and relate mainly to interface between subadult and adult. This mortality pattern is indicative of the slaughter of animals who have reached prime meat weight, however, I must stress that this interpretation is based on a very small sample of recovered teeth.

As I noted above, more detailed work with these upper level faunal remains will be conducted in the near future, as it will be necessary to correlate the zooarchaeological data with the finalised plans and profiles for the excavated site area as well as to correlate with the final results of the zooarchaeological analysis of Excavation # 9.

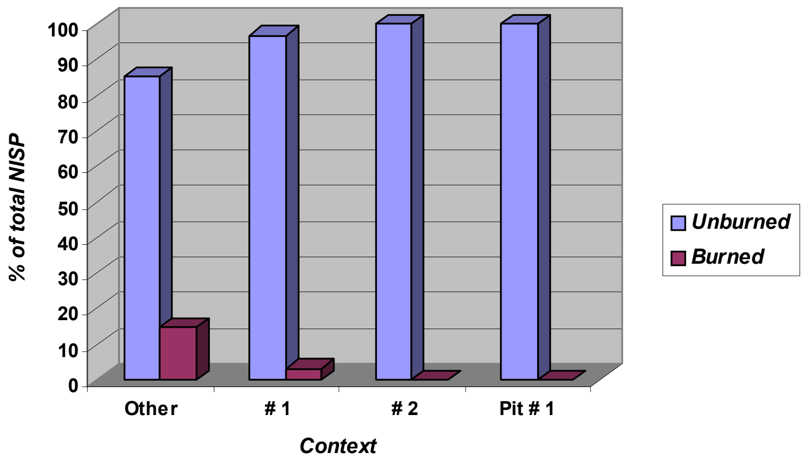


Figure 5.48 *Graph indicating burning characteristics of bone remains from individual concentrations.*

5.9.2 Bone Concentration # 1

In addition to the faunal remains from the upper stratified levels, there were also two main concentrations of processed bone remains encountered within the lowest cultural stratum (Early Iron Age) of the excavated area. For example, the faunal remains designated bone concentration #1 were recovered from within the confines of the И/'6 quadrant at an approximate depth of -1.10 metres BSD (Fig. 5.49 & 5.50). This particular level was synchronous with the cultural floor level of dwelling *Structure 9*. The horizontal distribution of the remains was contained within a 4 m^2 area. The general statistics for these remains, including the identified

Figure 5.49 *View from the south of bone concentration # 1.*

bone specimens and small fragment counts and weights, can be found in Table 5.15, which details the general quantification, relative ageing and burning characteristics of the concentration.

Interestingly, this concentration was situated just on the west side of dwelling *Structure 9* and contained primarily horse and cattle bone remains, with only one sheep/goat bone specimen (proximal metacarpal). Moreover, there was a small concentration of fetal calf bones recovered (Fig. 5.50-A) which included: an ulna, distal humerus, scapula blade portion, calcaneus, and vertebral fragment. The presence of the fetal remains indicates a winter or very early spring deposit. There were also fish remains recovered from within bone concentration # 1 and these are currently being analysed by A. Nekrasov at the Institute of Ecology and Animal Science, Ekaterinburg.

Concerning the taphonomy of the remains, there were no distinct indications of cut marks associated with skinning, butchery, or tendon removal. In general, only impact marks associated with the fracturing and splitting of the elements were noted. In terms of weathering characteristics, 57 % of the bone remains indicated a slight degree, 27.6 % a marked degree, and 9.2 % an extreme degree. This weathering related to surface abrasion from wind and waterborne particles, however, seven of the bone specimens also indicated evidence of root etching.

In general, it would appear that the concentration represented an open air short- term phase midden deposit reflecting the accumulation of processed bones from a number of species as well as other categories of material artefacts. Based on the physical characteristics of the deposit

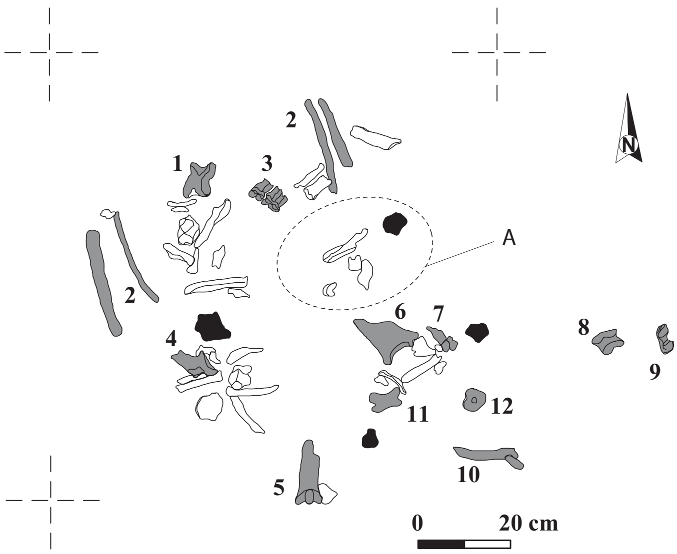


Figure 5.50 *Plan of bone concentration # 1: 1 - cow astragalus; 2 - horse ribs; 3 - horse upper cheek teeth; 4 - horse pelvis fragment; 5 - horse distal metatarsal; 6 - horse scapula; 7 - cow phalanx III; 8 - horse phalanx II; 9 - horse distal radius; 10 - horse metatarsal; 11 - cow phalanx I; 12 - spindle whorl; A - concentration area of fetal cow remains.*

SPECIES	NISP	% of NISP	MNI	MNE	Wt.	Fetal	S/Ad	Ad	O/Ad	Cal.	Carb.	% Burn.
Equus caballus (Horse)	34	22.7	2	24	809	0	5	26	3	1	1	5.9
Bos Taurus (Cow)	19	12.7	3	17	268	5	2	12	0	0	0	0
Ovis/Capra (Sheep/Goat)	1	0.7	1	1	5	0	0	1	0	0	0	0
Large ungulate	86	57.3	N/A	5	417	0	1	6	0	0	0	0
Small ungulate	10	6.6	N/A	2	25	4	0	0	0	0	0	0
Subtotal	*150*	*100*	*6*	*49*	*1,524*	*9*	*8*	*45*	*3*	*1*	*1*	*N/A*
SMALL FRAGMENTS												
Cancellous	30	-	-	-	66	-	-	-	-	0	0	0
Crania	0	-	-	-	0	-	-	-	-	0	0	0
Rib	97	-	-	-	42	-	-	-	-	0	0	0
Other (indet.)	8	-	-	-	28	-	-	-	-	0	0	0
Subtotal	135	-	-	-	136	-	-	-	-	0	0	N/A
TOTAL	**285**	**100**	**6**	**49**	**1,660**	**9**	**8**	**45**	**3**	**1**	**1**	**N/A**

Table 5.15 *Pavlinovo 2001 bone concentration # 1: species and general ageing information.*

(small size and relatively view bone specimens), and the presence of the fetal calf remains, it is possible to suggest that at least part of the deposit occurred during the winter or early spring period. This fact is important for establishing at least some degree of occupancy at the Pavlinovo site during the winter season.

In addition to the calf fetal remains, the fetal remains of a horse (scapula), found in Quadrant И-7' at a level of -1.30 BSD, as well as a partial mandible of a horse with a slightly worn (cusp only) deciduous fourth premolar tooth (Ж-5' at a level of -1.10 BSD) were also recovered. These remains are also indicative of winter to early spring activities at the site, however, the exact context of these remains must remain questionable until the full analysis of the field plans and soil profiles can be completed in order to ascertain whether possible intrusive structures and phases of occupation are associated with this area of the site.

In addition to the faunal remains associated with concentration # 1, a number of Early Iron Age pottery fragments (Gorokhovo and Sargat types) and a spindle whorl were recovered. The concentration was rather restricted in terms of horizontal and vertical displacement and did not appear to be a deposit that reflected a long period of deposition (Fig. 5.50). The concentration yielded a variety of both cranial and post-cranial bone elements for both the cattle and horse remains (Appendices # 4 & # 8).

The location of the remains, situated on the outer west side of dwelling *Structure 9,* would indicate a general type of household midden deposit, yielding a variety of artefacts including bones, pottery sherds, and other objects. Also near the northwestern corner of the dwelling structure a thick ash deposit was encountered (another similar ash deposit was also recovered in Quadrant Д/'3). It appeared that this ash material was removed from another location, probably relating to the cleaning of fire pits features, and then dumped in a pile near the outside corner of the dwelling, as no evidence of burned soil was encountered regarding the ash concentrations.

5.9.3 Bone Concentration # 2

Bone concentration # 2 was recovered from within the confines of the Ж/'3 quadrant at an approximate depth of –1.20 metres BSD (Figs. 5.51 & 5.52) in a shallow ditch feature. Most of the remains encountered within the concentration relate to the horse species and appear to be primarily connected with the deposition of one particular individual (although an MNI of 2 was indicated by the remains). General data relating to the bone remains and fragment counts and weights can be found in Table 5.16, which details the general quantification, relative ageing and burning characteristics.

Figure 5.51 *View from the west of bone concentration # 2.*

One complete male (based on developed canine teeth) horse cranium was recovered and has been aged according to upper incisor wear (after Levine 1982) and cranial suture fusion to approximately 5-11 years of age (Fig. 5.53). In addition, several mandible fragments and left lower molar teeth (M_1, M_2, M_3) were also recovered and in all probability articulate with the horse cranium noted above. Based on the crown height measurements of the lower cheek teeth, an approximate

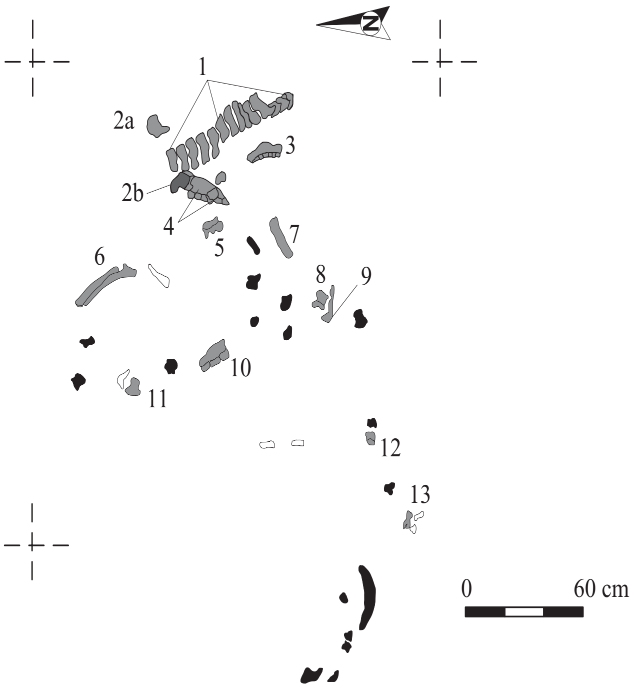


Figure 5.52 *Plan of bone concentration # 2: 1 -horse vertebral column; 2a - horse pelvis fragment; 2b - horse acetabulum fragment; 3 - horse mandible fragment; 4 - horse cranium; 5 - horse proximal radius; 6 - fused horse radius and ulna.; 7 - horse ribs; 8 - horse phalanx II; 9 - horse metapodial; 10 - horse mandible fragment with teeth; 11 - horse pelvis fragment; 12 - horse metapodial; 13 - horse lower cheek tooth; black objects are ceramic fragments.*

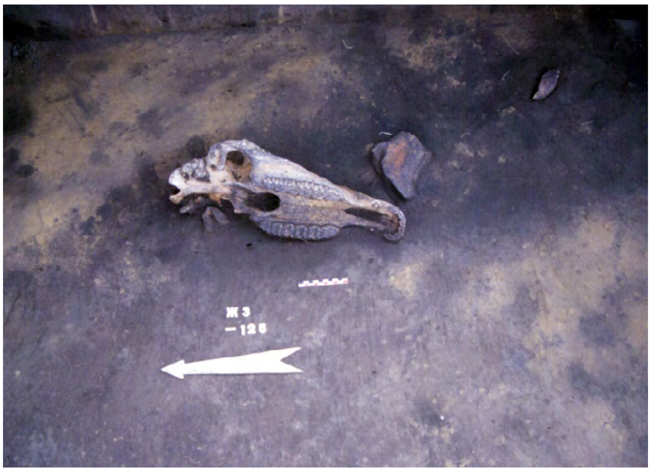


Figure 5.53 *View from the west of horse skull in bone concentration # 2.*

age of 6-7 years can be suggested (see Appendix # 6 for details).

An articulated segment of a horse vertebral column was also recovered from the concentration and a total of 12 vertebrae were found *in situ*, representing the thoracic area of the spine as well as an anterior portion of the sacrum. The epiphyses of the vertebrae were not completely fused and they indicated clear evidence of pathology (small cracks approximately 2mm wide and 3 mm in length) through the posterior epiphyses as well as on the posterior side of the centrums (Appendix # 2 – 18, 19).

It is possible to suggest that the horse may have been slaughtered because of this infirmity; however I should note that the cranium did not reveal any indication of pole axing or other impact damage. Although both cranial and post cranial elements were represented within the concentration, these were quite fragmented and a number of the bone elements from the horse carcass were not found within the deposit (see Appendix # 4 – *Equus caballus*, concentration # 2). It is possible that the horse was killed and butchered in the same location with many of the meat and marrow bearing elements being removed, processed, and distributed to different locations. Unfortunately, there were no distinct indications of butchery relating to cut marks, only the general impact evidence relating to the fragmentation of some of the bone elements.

The Early Iron Age context of the horse remains seem secure, as a number of Iron Age pottery sherds (Gorokhovo and Sargat types) were discovered in and around the bone concentration. In sum, concentration # 2 appears to reflect a low density accumulation of remains relating to the killing, butchery, disarticulation and deposition of primarily one adult individual horse that suffered from a significant pathology to the thoracic area of the spine. Moreover, the bone remains indicated a good state of surface preservation (especially the cranium) and it seems likely that the remains were covered soon after the initial deposit, before

Species	NISP	% of NISP	MNI	MNE	Wt. (g.)	S/Ad	Ad	O/Ad	Cal.	Carb.	% Burn.
Equus caballus (Horse)	40	80	2	21	4,325	18	20	0	0	0	0
Large ungulate	10	20	n/a	1	285	0	0	0	0	0	0
Totals	**50**	**100**	**2**	**22**	**4,593**	**18**	**20**	**0**	**0**	**0**	**0**

Table 5.16 *Pavlinovo 2001 bone concentration # 2: species and general ageing information.*

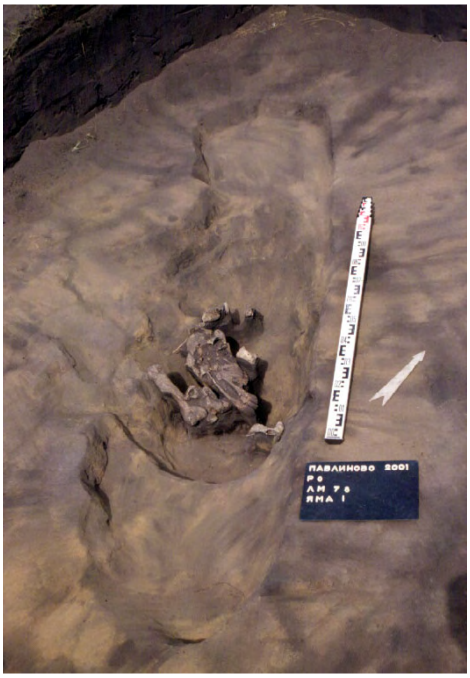


Figure 5.54 *View from the southeast of Pit Feature # 1 with faunal remains deposit.*

suffering any great degree of exposure to the open environment. This fact may relate to the small ditch feature in which the remains were associated with.

5.9.4 Pit # 1 Feature

The faunal remains recovered from the Pit # 1 feature were found in the Л-М"/7'-8' area at a depth of approximately -1.35 to -1.50 meters BSD (Fig. 5.54). The general statistics for the identified faunal remains and fragment counts and weights can be found in Table 5.17. The bone remains found within the pit feature were situated in a rather dense concentration in the middle of the pit feature (Fig. 5.55).

The surface characteristics of the bone remains exhibited strong evidence of surface weathering, with 22.7% indicating a slight degree, 56.8% a marked degree, and 11.3% an extreme degree. Generally speaking, this particular pit deposit revealed several interesting characteristics. For example, one complete horse humerus bone was recovered. This is quite unusual, as nearly all long bone elements from the three main domesticate species at Pavlinovo either indicate mid-shaft spiral fractures or longitudinal splitting of the distal or proximal ends. In addition, as noted above, all of the bone remains were quite heavily weathered. This would indicate that the remains were initially placed within an open air deposit and were susceptible to general environmental exposure. This seems rather odd, considering the nature of their deposit within the pit feature, which was clearly a subsurface feature. In addition, a lens of fine ash and burned soil was detected near the pit feature on the western edge.

Most of the bone remains within the pit feature (detailed in Appendices # 4 & # 8) were representative of the horse species (MNI – 1) and represent both cranial and post-cranial elements. One complete horse cranium and a right side mandible (with full tooth row) were recovered and aged according to crown height measurements to approximately 9-11 years of age (see Appendix # 6).

There was also one cow distal metatarsal element (longitudinally split) recovered. Associated ceramic fragments, including one piece with organic residue, related to the Early Iron Age period (Gorokhovo-Sargat types) and therefore the chronology of the pit in relation to the Early Iron Age phase of the site is secure. Nevertheless, this particular deposit of remains is quite unusual in terms of both characteristics of deposition as well as the particular materials

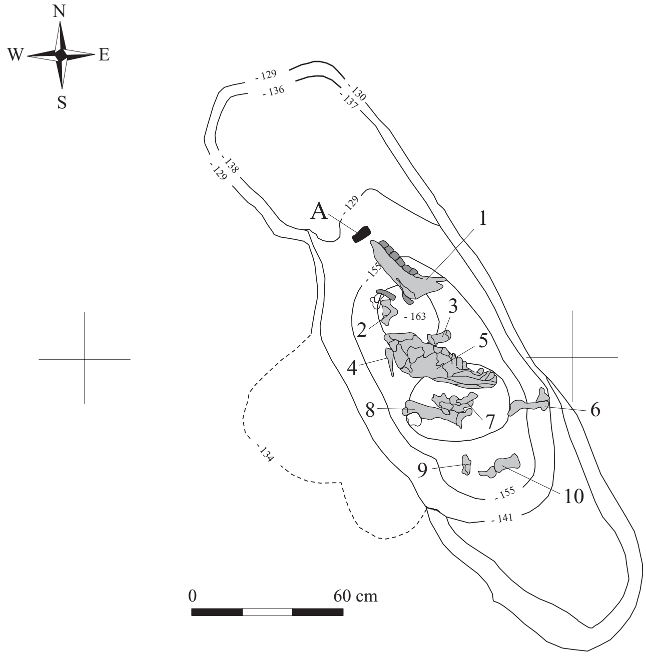


Figure 5.55 *Pavlinovo 2001 faunal remains from Pit Feature # 1: 1 - horse mandible (left side); 2 - horse vertebra; 3 - horse phalanx I; 4 - horse metapodial fragment; 5 - horse cranium; 6 - horse pelvis fragment; 7 - horse distal femur; 8 - horse humerus; 9 - horse calcaneus; 10 - horse phalanx I; A - Gorokhovo-Sargat ceramic fragment with organic resi-*

contained within the deposit. In this respect, the Pit # 1 faunal remains are similar to bone concentration # 9 discussed above for the Pavlinovo 1999 excavation. These unusual deposits do not seem to conform to the rather standard processed bone remains found within the numerous other concentrations and scattered deposits of animal bones associated with the site.

Unfortunately, the interpretation of these remains is highly problematic, as they are typically placed in what appear to be open air locations that are not clearly associated with entrances or foundations of dwelling structures or other possible architectural features. In this way, establishing an associative context in which to discuss possible ritual connections is very difficult. One can only note that the general orientation of both the pit features, as well as many of the shallow ditch features within the excavated areas, seem to conform to a northwest – southeast linear orientation (see previous Fig. 5.9). A fact which does not seem to correlate with the planning and layout of the dwelling structures in any way that is easily discernable. Therefore, at this time, it is only possible to designate the pit deposits as 'unusual' in terms of the other bone contexts of the site, and to look forward to not only further exploration of other contexts and structures of the site but also further analyses. More specifically regarding this, the ceramic fragment with organic residue, in addition to four soil samples, were taken from the Pit # 1 context during excavation. It is hoped that analyses of these samples will reveal evidence concerning other organic deposits

Species	NISP	% of NISP	MNI	MNE	Wt. (g.)	S/Ad	Ad	O/Ad	Ind.	Sp.	Cal.	Carb.	% Burn.
Equus caballus (Horse)	40	90.9	1	14	636	5	37	0	0	0	0	0	0
Bos taurus (Cow)	1	2.3	1	1	28	0	1	0	0	1	0	0	0
Large ungulate	3	6.8	N/A	0	10	0	0	0	1	0	0	0	0
Totals	**44**	**100**	**2**	**15**	**674 g**	**5**	**38**	**0**	**1**	**1**	**0**	**0**	**N/A**

Table 5.17 *Pavlinovo 2001 faunal remains from Pit Feature # 1: species and general ageing information.*

within the pit, which may help shed some light on the interpretation of features of this type within the Pavlinovo site.

5.9.5 Discussion

It is an unfortunate fact that my discussion of the 2001 faunal remains analysis detailed above cannot be correlated with other research currently being done with the materials recovered from the excavation. Several significant features were uncovered during the work associated with Excavation # 9 in the northern fortified area of the site; in particular, it appears that the fortification was comprised of two separate phases of construction; a smaller ditch feature (with numerous animal bone remains) and a later larger overlying ditch and bank construction.

As I noted above, the faunal remains relating to this area of the site (i.e. Excavation # 9) are still being analysed. Nevertheless, it is anticipated that the results of my analysis of the Excavation # 8 area will be compared with the Excavation # 9 remains in the very near future. At this moment, general discussion among members of the international archaeological team has stimulated the idea of producing a monograph publication regarding the recent archaeological investigations at Pavlinovo and it is anticipated that one chapter will be devoted to a thorough presentation and discussion of the analysed faunal remains from the various excavations.

Through the discussion of my preliminary results of the faunal remains from Excavation # 8, I feel that several very important issues were touched upon: general site seasonality, the low density of animal bone deposits in certain areas, and the general range of mortality ages suggested by the dentition remains.

The preliminary relative dating of the Early Iron Age dwelling *Structure 9* suggests that it dates to approximately the same period as the large dwelling feature *Structure 5*, which was discussed in detail above. This interpretation is based on construction similarities, general stratigraphic position, and the range and type of Early Iron Age ceramics (Sargat – Gorokhovo types) recovered from the lowest cultural stratum.

However, the possible temporal connection between these two structures stimulates some questions. First, *Structure 9* was very 'clean' in terms of the recovery of ceramic sherds, animal bone remains, and other material artefacts from within the dwelling feature. This stands in stark contrast to *Structure 5*, which revealed very dense concentrations of animal bones as well as scattered levels of ceramic pottery sherds. In addition, the faunal remains found associated with *Structure 9* (concentrations # 1, # 2, and # 8 from the 1999 excavation), were not suggestive of long term deposition sequences and therefore did not generate substantial faunal NISP figures or substantial vertical or horizontal distribution characteristics.

Therefore, I find that in terms of a preliminary interpretation of the Excavation # 8 faunal remains, I feel that although the remains are suggestive of a similar exploitation of domestic livestock, they are nonetheless indicative of a much different pattern of deposition. For example, the small bone concentration # 1 associated with dwelling *Structure 9* which yielded fish bones, foetal calf remains, and various processed cranial and post-cranial elements. It is my opinion, that dwelling *Structure 9*, based on its relatively small size, associated material artefact deposition, and the low density characteristics of the faunal remains, suggest it was occupied for a short term period. This raises a number of questions regarding the placement of the structure within the fortified zone of the site as well as its spatial and temporal relationship to the much larger, and seemingly more actively utilised, *Structure 5*.

Nevertheless, it is obvious that additional data from other materials currently being processed will add the necessary information required for a more informed interpretation of the archaeological features uncovered within Excavation # 8, as well as the relationship of the recovered faunal remains to this area of the site.

5.10 Conclusion

At this point, I feel that it is time to bring together many of the issues touched upon within this chapter and to put forth a more structured interpretation of how my analysis of the recovered faunal remains from the 1999 and 2001 seasons at Pavlinovo relate to many of the broader theoretical concepts I have engaged with thus far within the thesis.

Therefore, there are four main topics I wish to review within the conclusion to this chapter: 1) chronological problems relating to the Pavlinovo site; 2) complexity of the faunal remains deposits; 3) connected issues relating to the modelling of socio-economic organisation in the Early Iron Age; 4) development of new zooarchaeological methods and approaches.

Chronological Issues

It is certainly clear from my discussions within this chapter, as well as my review of other Iron Age settlements in the last chapter, that the current relative chronologies used to interpret settlement site occupation sequences in the Middle Tobol River region are unsatisfactory. The broad range of dates inferred for Early Iron Age settlement phases has been based primarily on pottery remains and other artefact typologies (e.g. bronze arrowheads).

The main problem exists with the frequent recovery of mixed pottery assemblages within similar vertical stratigraphic contexts, which creates too broad a chronological framework for interpreting site archaeological features as they relate to varying construction phases and proposed occupation sequences (Koryakova & Daire 2000). It is therefore not uncommon to recover

Gorokhovo, Sargat, Itkul, Vorobievo and Kashinskoe ceramics all within the same vertical and horizontal context (refer to Table 5.1 at beginning of chapter). This creates a number of problems in terms of a cultural historical framework of interpretation, which as discussed in the last chapter is the predominant paradigm for archaeological research within the Trans-Ural region.

Cultural types, based on associative artefact typologies, are the main structure for interpreting long term social and cultural development, organisation, and change. As such, connected relative chronologies stimulate a hazy boundary for understanding processes associated with settlement site organisation and change and the overlapping of two or more categories of material culture artefacts within the same cultural stratum. This situation is distinctly represented by the Pavlinovo settlement site, where recovered ceramic assemblages often represent a very significantly mixed cultural sample.

Nevertheless, the relative chronology suggested for the Pavlinovo site, which is based primarily on pottery typologies, can be presented in this way: ceramics relating to the Itkul, Baitovo, Nosilovo, and Vorobievo types can be dated to the 5th – 4th centuries BC. The Gorokhovo type relates to the (5th)4th – 2nd centuries BC, the Sargat type from the 5th century BC to the 4th century AD, and the Kashinskoe type from the 5th – 3rd centuries BC until the end of the Iron Age period (4th - 5th centuries AD) (Koryakova 2002, 47).

In addition to these proposed relative chronologies, one radiocarbon date has been established relating to the excavation of *Structure 3* (an Early Iron Age dwelling) during Excavation 2 in 1990: Le-5036 – 2120 +/- 60 BP or 170 BC, and calibrated as: 196-44 BC (1*sd*) or 360-286, 254-8 BC (2 *sd*). It is believed that *Structure 3* was synchronous with *Structure 5*, the main Iron Age dwelling feature encountered in the 1999 investigation (Koryakova 2002, 46).

As part of the INTAS project noted above, several new radiometric dates will be attained for Excavation # 8 & # 9 discussed above. This critical new data will provide an important framework for interpreting not only chronological issues linked with the construction phases of the fortification and Early Iron Age dwellings, but also possible sequences relating to occupation within the fortified area. This will have a great bearing on understanding the variation in animal bone deposits and their relationship to various archaeological features within the site. Clearly, in order to investigate issues of animal husbandry practices and changes in economic orientation, it is critical that more pragmatic approaches be made towards establishing finer scales of interpretation regarding the temporal and spatial contexts of archaeological features and associated faunal remains.

Faunal Remains Complexity

Certainly one of the key issues within my approach to the Pavlinovo faunal remains was the investigation of vertical and horizontal contexts. This approach, which also sought to introduce new methods of recovery and analysis, aimed at extending beyond conventional zoological analyses, which have traditionally treated site faunal assemblages as grouped remains. Through my discussion of the individual contexts of the faunal depositions, I attempted to raise a number of questions concerning both the horizontal and vertical distributions of the faunal remains deposits as well as the inherent complexity of the individual concentrations. Although this may seem a rather straightforward point, I feel that it is nevertheless one of the most important and problematic issues currently confronting the analysis and interpretation of faunal material from Early Iron Age settlement sites in the Middle Tobol River region.

Recovered faunal remains are too often grouped into one assemblage and are analysed and interpreted as such, thus appearing simply as 'laundry lists' within site reports. Through such conventional approaches, much of the distinct patterning and contextual nature of the remains is lost. This situation affects not only the mortality profiles of the materials, but also blurs the distinction between varying bone treatment characteristics, changes in animal husbandry practices, and wider issues concerning socio-economic organisation.

These problems can be most accurately demonstrated by looking at the data presented in Tables 5.18 and 5.19, which relate to the 1989 and 1990 analyses of the faunal remains recovered from Pavlinovo. While the range of information presented is useful, it is not successfully linked to contextual issues associated with the Pavlinovo site. Moreover, the remains represented within the tables have the potential of relating to a number of different activities concerning animal remains treatment and deposition as well as possibly relating to different temporal phases of settlement occupation.

By contrast, I feel that the work presented in this chapter has attempted to move towards a new approach in the contextual interpretation of faunal materials. Certainly, the deposition of animal remains need not follow inferred static patterns of human activity. Within each concentration or scattered distribution of animal remains, a complex variety of taphonomic characteristics can be called into question – ranging from human behaviours to dynamic elements of natural taphonomic processes that act upon deposited remains. It therefore seems clear that new methods and novel approaches for the excavation, analysis and interpretation of faunal remains must be developed for the Middle Tobol River region in order to examine the complex variables reflected by Early Iron Age settlement sites.

SPECIES	1989			1990			TOTALS		
DOMESTIC	**NISP**	**% of NISP**	**MNI**	**NISP**	**% of NISP**	**MNI**	**NISP**	**% of NISP**	**MNI**
Equus caballus (horse)	553	58.5	16	940	56.4	18	1489	57.1	34
Bos taurus (cow)	256	27.1	11	537	32.2	15	793	30.4	26
Ovis/Capra (sheep/goat)	136	14.4	8	191	11.4	9	326	12.5	17
Canis familiaris (dog)	1	-	1	21	-	2	22	-	3
Total	**945**	**99.4**	**36**	**1,668**	**97.9**	**44**	**2,608**	**98.4**	**80**
WILD	**NISP**	**% of NISP**	**MNI**	**NISP**	**% of NISP**	**MNI**	**NISP**	**% of NISP**	**MNI**
Alces ales (elk)	1	-	1	4	-	1	5	11.1	2
Capreolus capr. (roe deer)	3	-	1	26	-	4	29	66.7	5
Castor fiber (beaver)	-	-	-	2	-	1	2	4.4	1
Vulpes vulpes (red fox)	2	-	1	5	-	1	7	15.6	2
Total	**6**	**0.6**	**3**	**37**	**2.1**	**7**	**42**	**1.6**	**10**
Human	-	-	-	4	-	1	4	-	1
Bird	9	-	-	3	-	-	12	-	-
Fish	1	-	-	-	-	-	1	-	-
Indeterminate	331	-	-	1,036	-	-	1,367	-	-

Table 5.18 *Faunal species data relating to the 1989 and 1990 archaeological investigations at the Pavlinovo settlement (after Kosintsev 1991, 47).*

ELEMENTS	1989		1990		TOTALS	
Bones	**NISP**	**% of NISP**	**NISP**	**% of NISP**	**NISP**	**% of NISP**
Skull & Mand.	68	12.3	122	13	190	12.8
Loose Teeth	192	34.7	171	18.3	363	24.4
Vertebra & Ribs	27	4.9	38	4	65	4.4
Scapula & Pelvis	37	6.7	69	7.4	106	7.1
Humerus & Femur	89	16.1	204	21.8	293	19.7
Radius, Ulna & Tibia	-	-	-	-	-	-
Metapodials	44	7.9	157	16.8	201	13.5
Calcaneous & Astragalus	35	6.3	47	5	82	5.5
Tarsals & Carpals	23	4.2	42	4.5	65	4.4
Phalanges I-III	38	6.9	86	9.2	124	8.3
Total	**553**	**100**	**936**	**100**	**1,469**	**100**

Table 5.19 *Horse skeletal element representation relating to the 1989 and 1990 archaeological investigations at the Pavlinovo settlement (after Kosintsev 1991, 50).*

Modelling Socio-Economic Organisation

Much of the discussion in this thesis has centred around the problems associated with the modelling of prehistoric pastoral economies, and more particularly on issues surrounding possible mobile elements of such economic regimes. Concerning the Early Iron Age of the Middle Tobol River region, a great deal of discussion has focused on the concept of nomadic and semi-nomadic pastoralism. As outlined in Chapter Four, the recovery of faunal remains has been one of the primary tools used in the modelling of such prehistoric economies.

In the last chapter, a number of models were reviewed relating to the hypothesised Gorokhovo-Sargat developments in the Trans-Ural region. One of the main elements of these models is the proposed scale of social development and political organisation of this period. Importantly, Early Iron Age fortified settlements are traditionally interpreted as representing important regional centres relating to: leader's residences, common refuges, watch-towers, or tribal centres (Matveeva forthcoming, 330). However, through the presentation of the zooarchaeological analyses and results from Pavlinovo in this chapter, there appears to be little supporting evidence for what might be characterised a specialised regional or micro-regional economy based on connections between fortified and non-fortified settlements. For example, the faunal concentrations recovered from the two main dwelling structures (# 5 & # 9) at Pavlinovo, which yielded a restricted number of animals (based on NISP and MNE counts) and appeared to reflect a strong marrow exploitation strategy, would appear to represent a much smaller scale social and economic system than what has been conventionally inferred (e.g. chiefdom level societies), perhaps one operating at the individual household or extended family level.

However, it must be admitted that this argument is based on a small sample from the 1999 and partial 2001 excavation seasons at Pavlinovo. Nevertheless, the review in Chapter Four of Iron Age faunal data from other settlements in the Middle Tobol River region, coupled with the faunal evidence from previous excavations at Pavlinovo (Tables 5.18 & 5.19), would appear to support this argument. Based on a combination of the published data and the results of the 1999 and 2001 (area # 8) excavations, it is possible to outline some significant points:

1) Although there appears to be some variation in the representation of more horses than cattle at some settlement sites, which has been argued is evidence of more mobile pastoralist economies, one must take into account the traditional methods used for excavation, sampling and recovery of faunal remains. Furthermore, traditionally there has been no approach to providing more appropriate methods for the interpretation of bone fragmentation (e.g. MNE, MAU) and the emphasis has been clearly on using NISP and MNI counts for herd modelling. Therefore, the representation of one species over another must be approached with more methodological rigour in order to account for the high fragmentation patterns commonly associated with the Early Iron Age settlement sites.

2) The presentation of the Pavlinovo zooarchaeological analysis in this chapter helped to frame the chronological problems and stratigraphic complexities associated with Early Iron Age

settlements. Conventional approaches have treated faunal assemblages as single contexts without regard for variability in deposition and post-deposition processes. Although the information for the Pavlinovo 1999 and 2001 seasons is currently quite provisional, awaiting the results of other analyses and necessary excavation reports, the contextual analysis presented within this chapter underscores the following significant concerns: a) the wide range of possible human activities at the site relating to occupation and possible post-occupation behaviours and their effect on faunal deposits or midden formation, b) evidence of possible dietary stress indicators (intensive bone fragmentation and marrow and bone grease extraction) that necessitate further examination, c) the key problems connected with on-site zooarchaeological methods and subsequent socio-economic modelling based on the use of problematic MNI counts, and d) problems of defining seasonality of the settlements basing interpretations exclusively on faunal remains, which have not provided the necessary data for specific seasonality interpretations.

3) And, perhaps quite importantly, it must be reinforced that many of the questions surrounding occupation sequences, seasonality, and socio-economic complexity must draw on several lines of evidence for palaeoenvironmental reconstruction. The archaeological investigation of settlements and socio-economic practices for the Early Iron Age period cannot continue to rely solely on faunal evidence for the modelling of socio-economic practices.

As this chapter has investigated, particularly with the key points above in mind, there are numerous problems surrounding the methodologies used for zooarchaeological analyses of Early Iron Age faunal remains. This relates not only to the way in which the remains are excavated (biased sampling methods) but also in the way they are analysed and finally interpreted. As an example, I spoke at length about the problems associated with the use of general NISP and MNI figures for the modelling of prehistoric socio-economic patterns.

Certainly what is needed is a completely revised approach to theoretical modelling for the interpretation of recovered faunal remains. It is time for archaeologists to move past categorising ancient pastoral economies in rigid terms of nomadic, semi-nomadic, or semi-settled without stronger archaeological evidence and more sophisticated methods of ‘testing’ such socio-economic ‘models’. Such inferred static constructions rarely if ever exist among contemporary pastoral societies and as such probably did not exist in the past. I discussed the debates surrounding the classification of such economies among both anthropological research with contemporary pastoral societies as well as the archaeological investigation of prehistoric remains within the previous chapters of the thesis. As such, it is clear that there exists no clear-cut approach to analysing faunal remains within such black and white terminologies. If the wider ethnographic record has revealed anything, it is that pastoral societies can be incredibly dynamic, opportunistic, and fluid in their patterns of settlement, economic pursuits, and overall socio-economic organisation. We should expect the same range of variables for the past and therefore structure our approaches to the archaeological record with this complexity in mind.

So where does this leave zooarchaeological analyses for interpreting prehistoric pastoralism within the Early Iron Age of the Trans-Urals? It seems clear that what are needed are novel methods in terms of site contextual excavation as well as more sophisticated theoretical approaches to the complexity of settlement archaeology.

Zooarchaeology: New Methods and Approaches

Returning once again to Marcinak's quote (1999), noted at the outset of this chapter, I agree that archaeologists must come to grips with the complexity and variation within the archaeological record and therefore seek to achieve as much information as possible about the patterns and context of the cultural materials they wish to identify and interpret. In this sense, it is necessary to move beyond the identification of prehistoric artefacts and 'cultures' within the construct of a static social or economic system and attempt to approach the processes inherent within the materialisation of the archaeological record (Marcinak 1999, 301). With regard to this, the significance of zooarchaeology can be found within the vast range of information that it engages with – from cultural human behaviours to the importance of the taphonomic processes which ultimately affect the faunal record.

Nevertheless, these concerns can be given more meaning and significance within the various discussions and interpretations of the Pavlinovo faunal materials noted above. While the Pavlinovo faunal materials provided an excellent range of data in which to explore issues relating to Early Iron Age animal husbandry practices, socio-economic organisation, and settlement site characteristics, they do not provide a simple reflection of any one static pattern of human activity.

It is clear from the archaeological investigations at Pavlinovo that there were numerous phases of activity and occupation from the Bronze Age through to the historic period. Interwoven within this broad span of time were a wide range of practices associated with the utilitarian and symbolic utilisation of animals. The interpretation of these patterns in relation to their associated historical processes is contingent upon striving to underscore the complexity of the material record and to develop new approaches in which to sample, analyse and interpret the past. The faunal record can only be one such supportive element in the pursuit of this knowledge.

In this next chapter, the discussion will move towards mortuary evidence within the Middle Tobol River region and the significance of animals within Early Iron age burial rites and associated ritual activities. In Chapter Seven, the concluding chapter of the thesis, the discussion will return to the faunal evidence at Pavlinovo and set it within a broader interpretive perspective. Coupled with the archaeological record from associated Iron Age mortuary sites, a more coherent conclusion and outline of the significance of the Pavlinovo faunal remains can be put forward.

CHAPTER SIX

Mortuary Ritual and Animal Sacrifice in the Middle Tobol River Region

The meaning of ritual is deep indeed.
He who tries to enter it with the kind of perception that
distinguishes hard and white, same and different, will drown there.
The meaning of ritual is great indeed.
He who tries to enter it with the uncouth and inane
theories of the system-makers will perish there.
The meaning of ritual is lofty indeed.
He who tries to enter with the violent and arrogant ways of
those who despise common customs and consider
themselves to be above other men will meet his downfall there.

Xunzi (third century BC)

6.1 Introduction

Thus far within the thesis, my approach to the study of faunal remains from mortuary contexts has focused on a general comparative overview of some of the main funerary patterns of the Early Iron Age period in the eastern steppe and West Siberian region of Eurasia. Through my examination in Chapter Three of some particularly well documented case studies, I criticised conventional approaches to the interpretation of funerary ritual and related static models concerning socio-political organisation and socio-cultural development.

As I emphasised, one of the most important active variables associated with the appearance of new forms of ritual and material expression was the utilisation of animals and animal symbolism within changing constructs of ritual practice, the creation of new social identities, and social frameworks relating to power and prestige. As I argued, these developments were directly connected to widespread changes in the technology and ethno-cultural identity associated with the rise of the cavalry mode of warfare and the creation of an associated warrior ethos which extended across varying ethno-cultural boundaries.

With these important issues in mind, I now wish to extend this general framework of interpretation into a more focused discussion concerning the rise of new ritual traditions, the importance of animal symbolism within funerary practices, and the necessity of applying contextual archaeological approaches to the interpretation of Early Iron Age mortuary sites in the Trans-Ural forest-steppe region.

6.2 Socio-Cultural Dynamics and the Rise of New Ritual Traditions

In the first half of Chapter Four, I provided an overview of the conventional hypothesises regarding social, cultural, and economic changes relating to the Trans-Ural region, particularly the Gorokhovo-Sargat Early Iron Age phase within the Middle Tobol River area. Through this discussion, I outlined traditional models of interpretation regarding changes in both settlement and mortuary patterns and noted that one of the main factors associated with these changes related to the theorised increased interaction between Early Iron Age nomadic populations in the southern steppe region and semi-nomadic populations in the forest-steppe area.

From this perspective, the forest-steppe region has been traditionally interpreted as a northern peripheral zone to the greater 'core' entity of the southern steppe 'nomadic world'. As a number of scholars have argued, this core-periphery relationship linked the northern forest-steppe populations to many of the socio-cultural and socio-political dynamics that occurred within the southern steppe and the Central Asian region (Koryakova 1996; 2000; Tairov 1991; 1993).

Conventional Russian scholarship has stressed that one of the most notable elements of change associated with this north-south societal interaction was the appearance of new mortuary patterns within the Trans-Ural forest-steppe zone, a development that revealed many similarities with the kurgan form of burial associated with the nomadic societies of the southern steppe region (Scythian, Sauro-Sarmatian and Saka).

A number of scholars have interpreted these changes in funerary traditions in connection with the general spread of nomadic pastoralism, the rise of warrior nomadic societies, and issues relating to resource competition and control over land, metal resources, and regional and interregional trade (Koryakova 1988; 2000; Matveeva 1993a; 1999). From this conventional point of view, it is believed that the changing funerary patterns reflect the rise of more deeply stratified societies and the appearance of a distinct elite societal level among Early Iron Age indigenous populations within the forest-steppe region (e.g. Gorokhovo-Sargat phase of development). These developments have also been interpreted in connection with the appearance of fortified settlements and the creation of supposed micro-regions or territories within the forest-steppe zone (as discussed in Chapter Four). As Koryakova notes,

> The Sargat culture was thus formed through the inclusion of several components. Its sub-stratum was the local ancestral population; the super-stratum was presumably composed of nomadic and semi-nomadic clans. This group was probably not numerous, but more active and militant, possessing stronger ideological power in which the rising aristocracy played a consolidating role.
>
> (Koryakova, 2000)

Although I have argued against the use of the 'core-periphery' model of interpretation in earlier sections of the thesis, I am in agreement with the conventional view that an important contact zone was created in the forest-steppe region between northern and southern populations. Nevertheless, I believe that traditionally scholars have mistakenly sought to define and emphasise categories of vertical stratification and in so doing have not acknowledged that mortuary sites and ritual practices can reflect a much more complex and dynamic process of social organisation and individual and group representation. By contrast, I would argue that rather than providing a static reflection of Early Iron Age society, the mortuary sites associated with the forest-steppe region reflect the dynamic interaction of multiple cultural traditions, changing patterns of social identity and organisation, and the development of new forms of ideological representation and ritual practices. In this respect, more sophisticated approaches must be taken in regards to the analysis and interpretation of mortuary sites from this region.

Similar critiques have also been raised in regards to conventional approaches to the archaeological record of the Early Iron Age period of Western Europe (Dietler 1995; Wells 1995; 2001; Härke 1997b; Rowlett 1989). As Dietler has argued,

> An understanding of the social dynamics of European Iron Age societies has been hindered by typological approaches employing static models of socio-political structure that are focused on stages or levels of "complexity". Such approaches obscure the historical processes through which political and economic goals are pursued and contested and which are ultimately responsible for structural change.
>
> (Dietler 1995, 64)

Dietler's comments encapsulate an important interpretative perspective, one which seeks to identify contesting social structures and ideologies associated with prehistoric societal organisation. In this way, the active and variable nature of certain socio-cultural institutions, such as funerary practices, are perceived as existing within a highly charged political and socially competitive sphere of interaction and negotiation. As such, the significance of ritual practices may be seen as a key component within the legitimisation of power amid competing structures of social agency and socio-political dominance.

I feel that these are important considerations in regards to the proposed interaction and socio-cultural change noted above for the Trans-Ural forest-steppe region, particularly as they relate to the appearance of new patterns of ritual and mortuary practice and inferred models concerning the development of tribal societies and chiefdom level socio-political organisation. In this case, the archaeological interpretation of funerary remains plays a particularly key role in framing perceptions of Early Iron Age societal organisation.

One might argue that my comments thus far relate specifically to the application of new theoretical approaches to funerary interpretation, however, this is not the case. As I will discuss throughout this chapter, the conventional interpretation of funerary materials in the Trans-Ural region has also greatly affected the methodology used for the archaeological investigation of kurgan burial sites. In this respect, my comments above concern both theoretical approaches to interpretation as well as the field methods used for the excavation of Early Iron Age cemetery sites. This point of view relates directly to what might be described as an archaeology of ritual practice, which I feel has not been explored critically for the Trans-Ural region. Although traditionally there has been a very active investigation of cemeteries in this area, much of the research has focused on typological approaches to the analysis of funerary remains. I argue that it is necessary to understand patterns of ritualised practice as they relate to the symbolic interface between the living and the dead and the importance of funerary events as arenas for the renegotiation of social order and perception. Certainly, these interpretative themes have been at the forefront of much recent investigation regarding social practice theory and archaeological approaches to 'ritualisation' regarding funerary behaviours (e.g. Gramsch 1995; Parker Pearson 1993; 1995; 1999a; Chapman 2000; Bell 1992; 1997; Bowie 2000; Hanks 2000; 2001a; 2001b; 2001c; 2002).

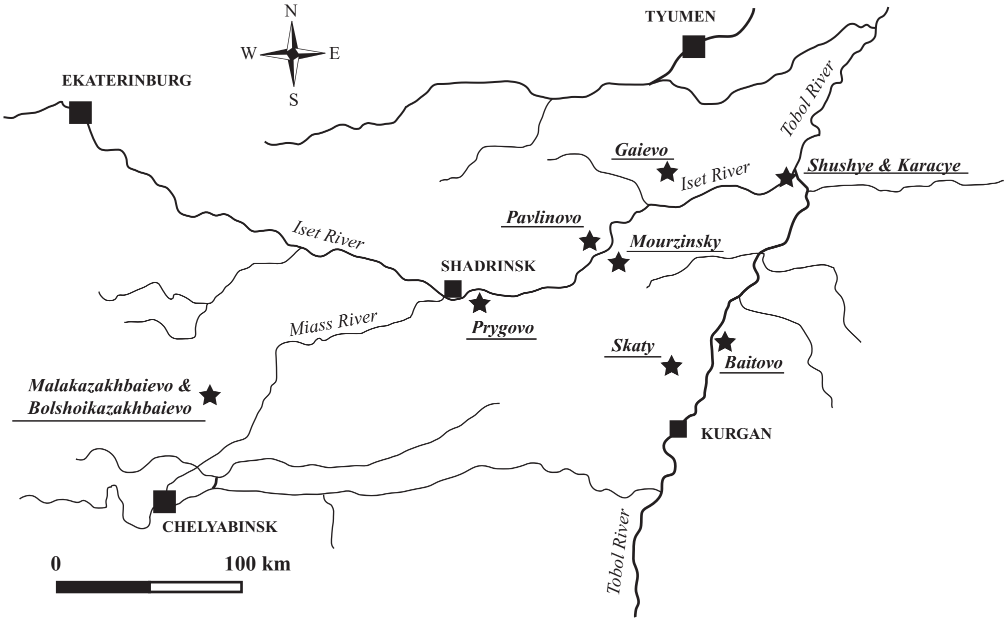


Figure 6.1 *Map showing the location of the settlement and mortuary sites (including Shushye & Karacye) excavated by the French-Russian archaeological team.*

Therefore, in this chapter I wish to explore the important models noted above concerning socio-cultural contact and change in more detail through a discussion of the funerary evidence associated with the Middle Tobol River region. The primary aim of this approach will be to identify the significant problems associated with conventional interpretations from both a theoretical as well as methodological point of view and to suggest a new framework for the investigation and interpretation of faunal remains associated with kurgan burial sites and contextual archaeological approaches to Early Iron Age ritual practices. As I have argued throughout the thesis, the utilisation of animals within the framework of ritual practices and attitudes surrounding death and animal symbolism acted as an important medium for the representation of social identity and the creation of symbolic fields of discourse within Eurasian Early Iron Age pastoralist societies.

To proceed with this approach, it will first be necessary to outline some of the general characteristics of funerary ritual in the Middle Tobol River region and conventional interpretations of these patterns. I will then present the results of my analysis of faunal remains recovered during my participation in the archaeological excavation of two Early Iron Age cemetery sites in 2000, which was undertaken by the joint Russian-French archaeological team discussed in the previous chapters.

As a participant in this excavation, I had the fortunate opportunity to assist in the investigation of five kurgan burial complexes located within the cemetery sites known as Shushye 1 and Karacye 8 & 9, both located at the confluence of the Iset and Tobol rivers (Fig. 6.1). As a result of this research, I gained an important first-hand perspective concerning the conventional methods used for the archaeological excavation of kurgan mortuary sites by Russian teams in the Middle Tobol region. This opportunity was crucial for not only developing my awareness of the methodologies used for the investigation of funerary sites but also the range of sampling and retrieval biases commonly affecting the recovery of faunal remains from such contexts. As I will discuss below, these issues have a significant influence on the application of contextual approaches to the interpretation of animal remains from funerary sites, and by connection, to larger issues concerning prehistoric ritual practices.

6.3 Funerary Ritual in the Middle Tobol River Region

My discussion of Early Iron Age funerary contexts in Chapter Three, particularly the Pazyryk tombs, illuminated the high degree of preservation of the faunal remains associated with these sites. However, such outstanding taphonomic preservation characteristics are very unusual for the Middle Tobol River region. This is not only because of a difference in natural environmental factors but also as a result of the significant number of barrows that have been consistently looted through the centuries in addition to the state organised campaigns undertaken during the reign of Tsar Peter the Great. Indeed, it is believed that a number of the finest gold and silver artefacts in the Siberian collection of Peter the Great (housed in the State Hermitage Museum in St. Petersburg) originate from Early Iron Age kurgans located in the Trans-Ural forest-steppe area.

Nevertheless, even though nearly all investigated kurgans within the Trans-Urals exhibit heavily looted and disturbed central burials, these monuments were intensely investigated by Russian archaeologists throughout the twentieth century and continue to be a primary source of archaeological investigation today. As a result, a majority of the proposed models relating to Early Iron Age social development and organisation are directly connected to interpretations of kurgan mortuary sites and their associated material cultural remains.

It will not be possible to undertake a detailed discussion of the many types of Early Iron age period kurgan complexes within the Trans-Ural forest-steppe region as this represents a very large geographical area and a significant temporal span. Therefore, it will be most productive within the main aims of this chapter to focus on some of the general patterns associated with the Middle Tobol River region and to discuss the significance of the mortuary patterns in this area and the frameworks of ritual practice and animal sacrifice associated with these sites.

6.3.1 Gorokhovo-Sargat Kurgan Complexes

In Chapter Four, I briefly discussed some of the main patterns of change associated with the appearance of new forms of mortuary ritual and kurgan burial construction. As I noted, it was particularly within the transition from the Late Bronze to the Early Iron Age that large kurgan complexes, typically containing a single central inhumation grave feature, appeared within the forest-steppe region (Fig. 6.2). These developments have been linked to the Gorokhovo phase in the western region of the forest-steppe (Middle Tobol region) and the early formation of the Sargat phase in the eastern forest-steppe area of Western Siberia. These changes in funerary tradition are believed to relate to general

Figure 6.2 *Photo of large kurgan mortuary mound at the site of Skaty (photo L. N. Koryakova).*

tribal interaction between the populations in the southern steppe and the northern forest-steppe, whereby increased cultural interaction and resource acquisition stimulated warfare, the development of fortified settlements, and general progression in the development of new military technology and weaponry within the Trans-Ural region (Koryakova 1996; 1998a; 2000; Matveeva 1993; 2000).

As such, many scholars have emphasised the general similarity between the kurgan complexes in the northern forest-steppe region, connected to the Gorokhovo-Sargat phase, and kurgan burial types located in the south eastern steppe zone and the southern Ural Mountain region connected with the Sauro-Sarmatian and Saka developments, which were discussed at the end of Chapter Four (Matveeva 1993; Smirnov & Petrenko 1963; Moshkova 1994; 1997; Khabdulina 1994).

The cross-cultural similarities associated with the kurgan mortuary complexes primarily relate to the placement of the corpses (inhumation burials with corpses in the supine position with head generally oriented to the north) and patterns of grave goods deposition – for example the presence of animal remains, weaponry, horse riding accoutrements, and pottery with male burials, and various ornaments and toiletry articles, craft production utensils, stone plates, animal remains, and pottery with women's burials (Koryakova & Daire 1997, 164).

In addition to grave goods similarities, the Gorokhovo-Sargat kurgan constructions themselves share some common characteristics with the southern Sauro-Sarmatian and Saka types. This is particularly the case for central burial features with elements of wooden construction (e.g. wood lined grave pits or above ground wooden structures) and the use of fire as an important component within the funerary ritual. The practice of placing multiple burials around larger central grave pits appears to have started in the Sargat period at the end of the 3rd century BC (Koryakova, 2000) (Fig. 6.3).

Figure 6.3 *Photo of excavated Kurgan 6 at Gaievo with multiple burial pits and ditch (photo L.N. Koryakova).*

In addition to some common characteristics, the Gorokhovo-Sargat period kurgans also represent specific elements that are unique to the region. For example, the common inclusion of single or multiple peripheral ditches are typical features for both small and large diameter kurgans. In addition, elaborate multi-level wooden structures (often in a radial arrangement) are also encountered, although these usually relate to the largest kurgan constructions (Fig. 6.4).

Nevertheless, it should be noted that these are only very general categorical patterns, as there is a great deal of variation associated with the types of grave materials included with the dead, their specific locations of deposition within the mortuary complexes, and the general construction patterns of the kurgans themselves. In this respect, one can perceive the Gorokhovo-Sargat funerary patterns as representing an important interface between past, present, and the formulation of new traditions of ritual practice reflecting new ideological frameworks of socio-cultural and socio-political organisation.

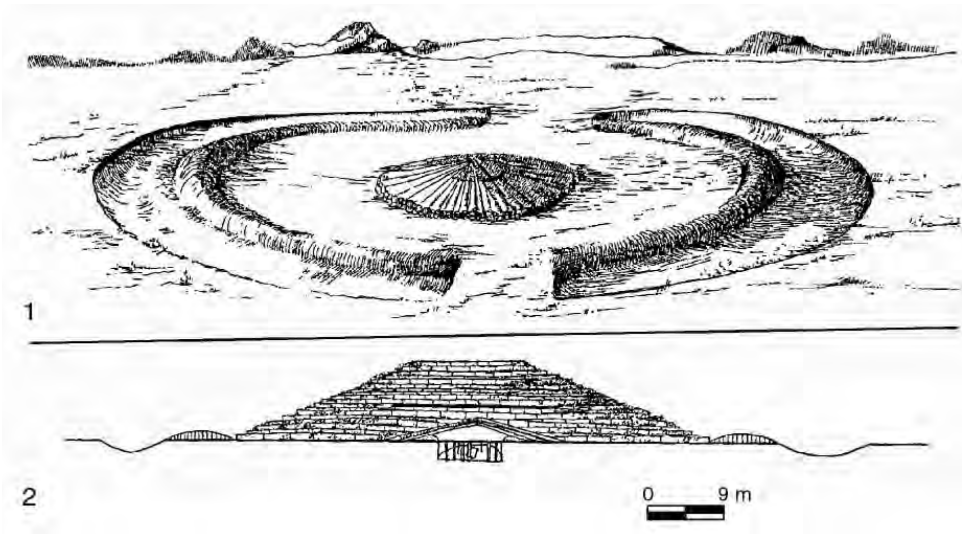


Figure 6.4. *Illustration of the main construction features of a Sargat type kurgan complex: open peripheral ditch area, central grave pit with wooden construction, and mound superstructure; 1 - initial phase of construction; 2 - final phase of constructions (after Matveeva 2000, 228).*

6.3.2 Conventional Mortuary Research

Generally speaking, the research associated with the Middle Tobol region mortuary sites can be compared to the conventional approaches I discussed in Chapter Three regarding funerary interpretations of funerary monuments east of the Ural Mountains (Khazanov 1975; Grach 1980; Koryakova 1996). In this respect, interpretations of most funerary monuments are based on a sliding scale of societal rank and status – generally relating to barrow and grave construction size and complexity and the nature of included grave good materials. In recent years, this approach has been the primary structure for the interpretation of the Gorokhovo-Sargat period funerary sites in the Trans-Ural region.

For example, a recent PhD thesis (Buldashov 1998) investigated the funerary patterns associated with the Gorokhovo development in the Trans-Ural region. Buldashov's study focused on the material remains relating to 11 cemeteries, 81 kurgans (including 18 isolated kurgans), and 104 graves. The primary structure for the interpretation of cemeteries relating to this research was based on a hierarchical

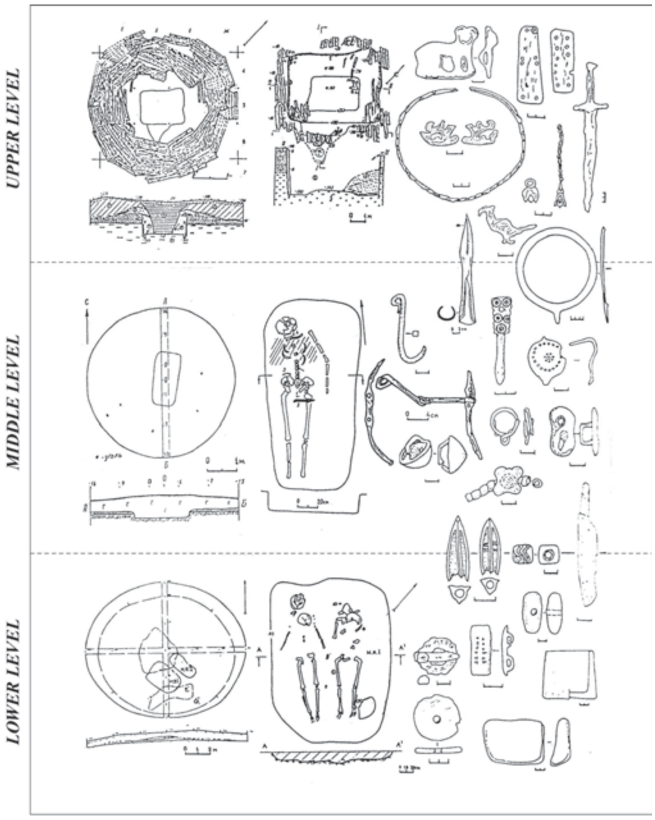


Figure 6.5 *Illustration detailing the proposed three main levels of societal structure relating to the Gorokhovo phase based on an analysis of funerary materials (Buldashov 1998, 318).*

scale of funerary monument size, number of associated burials (i.e. single central burials or multiple burials), and richness of included grave goods. Based on this methodological approach, Buldashov posited a three tiered societal structure of *lower*, *middle* and *upper* levels for the Gorokhovo "culture" (Buldashov 1998, 318) (Fig. 6.5). Buldashov's model generally follows that which was outlined in Chapter Three relating to the conventional vertical stratification model posited for the eastern Eurasian steppe region and warrior-based societies in the Early Iron Age period.

Of course, one of the most actively debated issues among scholars in the Trans-Ural region is the actual association between contemporaneous open and fortified settlements and what appear to be closely associated kurgan mortuary sites. While some scholars have accepted that the cemeteries are representative of the populations of the nearby settlements (e.g. Matveeva 1994; 2000), other scholars have taken a more cautious view of this interpretation (e.g. Koryakova & Daire 1997; Daire & Koryakova 2002) and have stressed that the demographics of the cemetery sites do not appear to match those proposed for the settlements. In this respect, the possibility of other forms of burial traditions for the Early Iron Age period has been considered (e.g. excarnation, flat grave cemeteries, cremation, etc.).

I consider the relationship between the settlements and cemetery sites to be one of the most important issues concerning the Trans-Ural region and it is one which is clearly linked to a number of important considerations relating to the conventional models discussed above concerning socio-economic development and changes relating to socio-political organisation in the Early Iron Age forest-steppe region.

Unfortunately, thus far, there have not been any detailed statistical approaches, such as the use of *principal component analyses* or *cluster analyses* for example, for the investigation of mortuary patterning relating to Gorokhovo-Sargat period cemetery sites. By contrast, such approaches have been undertaken for Sauro-Sarmatian period burials in the southern steppe and southern Ural Mountain regions, although these do not in fact relate to a correlation with settlement sites (Moshkova 1997; 1999).

In recent years, a database has been in development for the Trans-Ural region by Matveeva and associated scholars from Tyumen University (Matveeva 2000). Matveeva (1999) has published general information regarding this study, however, this related primarily to average mortality figures for 705 individuals from 43 cemetery sites scattered throughout the Trans-Ural region. The study was based around the comparison of data from two chronological periods: the early to middle Sargat period (5th – 3rd centuries BC) and the middle to late Sargat period (2nd – 4th centuries AD). The published data indicates a mortality average of 36 and 36.5 years of age for males between the two main chronological periods noted above and 32.9 and 34.5 years for females (Matveeva 1999, 88-89).

Matveeva's interpretations of the data from this study suggest that because of the lack of strong mortality representations for children, adolescents, and old age adults, there was a lack of practice of early marriages and childbirth for women and that there was a high mortality rate attributed to men in their 30's because of, "deaths from mutilations and wounds conditioned by [a] cattle breeding way of life [i.e. pastoralism] and permanent wars" (Matveeva 1999, 87). Matveeva's study also suggested significant evidence for skeletal trauma, pathology, and dietary stress. Unfortunately, more specific results of these funerary studies have not been published and the database relating to this research was unavailable during my PhD thesis study.

Other recent work concerning physical anthropological studies of the Gorokhovo and Sargat period have also been completed in recent years. For example, the recent work by Bagashov (2000) represents a strong compilation of data regarding the forest-steppe populations of Western Siberia during the Early Iron Age period. However, one of the main focuses of this research relates to the correlation of 'physical types' and archaeological cultures and therefore presents a great deal of data regarding craniological studies of prehistoric populations.

A recent PhD thesis (Rajev 2001) has also been completed regarding the analysis of cranial and post-cranial skeletal remains from the Gorokhovo-Sargat period in the forest-steppe region (313 individuals from 33 cemeteries). Certainly, one of the most important results of this work is the investigation and presentation of results on skeletal stress and traumas as well as indications of dietary deficiencies (as was discussed in Chapter 5). Unfortunately, this research was primarily aimed at the investigation of adult individuals recovered from a number of cemeteries spread throughout the Trans-Ural region (Tobol, Ishym, and Irtysh rivers), and as such, did not focus on a particular regional approach or more detailed research with adolescent (including children) or old adult skeletal materials, even though these do occur within funerary evidence from the forest-steppe region.

Concerning the conventional research briefly outlined here, there has clearly been a strong tradition of archaeological investigation and analysis associated with cemetery sites within the forest-steppe region. However, much of this work has focused on providing a general cross-section of the palaeodemographics for particular theorised societal formations and has therefore tended to error on the side of a normative view of culture and Early Iron Age social organisation. In other words, the implicit rationale is that there is a common socio-demographic model relating to the Early Iron Age which can be generally inferred for the forest-steppe region. Obviously, this critique is somewhat of an oversimplification; however, I must state that I am in general disagreement with many of the points of the approaches noted above because they appear to lack acknowledgement of the following three important issues:

- Although there is general acknowledgement for the potential of various cultural components (in an 'ethnogenetic' sense) in conventional research for the Early Iron Age, there appears to be a distinct lack of awareness for the multivariate nature of cultural development.
- A hyper-focus on vertical stratification (e.g. rank and status) regarding societal interpretations without acknowledging potential horizontal formulations (e.g. sodalities, moieties, etc.) and how these may be related to variations in patterns of funerary evidence.
- An emphasis on interpreting funerary traditions as relating to static indicators of societal order and structure across broad temporal and spatial contexts rather than acknowledging that transitions in ritual practice can relate to various constructs of human agency and multiple levels of social identification.

The criticisms I have made here are particularly important regarding the interface between theoretical perspectives and the methodologies that are used for the archaeological investigation of funerary sites. However, I feel that my point of view on this matter can be better supported through the discussion of my participation in the excavation and analysis of the faunal remains from the cemetery sites of Shushye and Karacye, which follows below. In this case, it will be possible to investigate more closely how conventional interpretations of recovered animal remains from Early Iron Age cemetery sites have been affected by many of the problematic issues outlined above.

6.3.3 Funerary Rites and Animal Deposition Patterns

The use of animals within funerary practices was a very common element associated with the Gorokhovo-Sargat period. Again, many of the general patterns of animal utilisation appear to have followed a basic structure of ritual tradition associated with the southern cultures of the steppe region. As such, animal bone remains are encountered within many areas of kurgan constructions during archaeological excavation, however, they are typically associated with the following main contexts: a) partial and/or fully articulated animal carcasses placed with or near the human corpse(s); b) faunal remains deposited either on the original ancient surface level of the mortuary site or distributed throughout various strata of the overlying mound structure; c) structured deposits placed at the boundary of the mound structure or within peripheral ditches; and d) the intrusive remains of burrowing animals such as rodents, foxes, badgers, and rabbits. It should be noted that in many cases the last category acted as a significant taphonomic agent for the addition of small mammal remains as well as the disturbance/ movement of various archaeological deposits within the grave pits and other associated mortuary constructions (Koryakova & Daire 1997, 114).

Concerning the inclusion of animal remains during the funerary process, the main domesticated animal species, i.e. horse, cow, sheep/goat, dog and occasionally camel or pig, are the most frequently represented remains associated with Gorokhovo-Sargat period kurgan complexes. However, wild taxa remains are also sometimes recovered (e.g. elk, roe deer, and the small burrowing animals noted above) in addition to the infrequent recovery of bone remains from various bird and fish species (Koryakova & Daire 1997; Matveeva 1993a; 2000).

Certainly, one of the most important issues regarding the utilisation of animals within Early Iron Age cemetery sites is how the animals were deposited through the process of ritual practice. Unfortunately, based on the traditional methods of kurgan excavation and post-excavation analysis, approaching correlations between species and/or specific anatomical elements of animals and the areas where these remains are recovered from within kurgan sites is highly problematic. As such, publications regarding data representation of faunal remains from cemetery sites generally provide only species lists with the total number of fragments recovered (NISP) and therefore make no note of

ANIMAL SPECIES	CEMETERY SITE				
	Rafailovsky	Tutrinsky	Savinovsky	Krasnogorsky-1	Kras. Borok
DOMESTIC ANIMALS					
Cow	3 (3)	none	18 (5)	none	68 (7) + 2c
Sheep/Goat	31 (7)	3 (3)	3 (2)	4 (1)	34 (6)
Horse	13 (10)	19 (7)	1 (1) + 1c	2 (2)	78 (7) + 1c
Camel	none	none	none	none	none
Sub Total	***47 (20)***	***22 (10)***	***22 (8)***	***6 (3)***	***180 (20)***
WILD ANIMALS					
Roe Deer	1 (1)	none	none	none	none
Rabbit	2 (2)	none	none	none	none
Beaver	1 (1)	none	none	none	none
Small Rodent	1 (1)	none	none	none	none
Sub Total	***5 (5)***	***0***	***0***	***0***	***0***
Total	***52 (25)***	***22 (10)***	***22 (8)***	***6 (3)***	***180 (20)***

Table 6.1 *Table detailing the animal remain srecovered from five Gorokhovo-Sargat period cemetery sites in the Trans-Ural region - numbers reflect NISP and MNI (in parentheses) totals, small 'c' represents the recovery of a complete animal skeleton (adapted from Matveeva 1993a, 120).*

the contexts from which the remains were taken or the types of skeletal elements recovered (Table 6.1).

However, Buldashov's recent PhD thesis research discussed above, regarding Gorokhovo period developments in the Middle Tobol River region, distinguished some general patterns of animal remains deposition associated with the 81 kurgans investigated within the study. Based on this analysis, a rather haphazard presentation of data is given regarding the deposition of animal remains. The following general percentages are given by Buldashov, however the information is not the same for each animal species or representative of the the same archaeological contexts – percentages relate to number of kurgans or archaeological features containing particular types of animal species:

- Animal bones recovered from peripheral ditch features – 3.8 %
- Horse bones recovered from overlying mound structure – 11.3 %
- Sheep/Goat bones recovered from overlying mound structure – 12.6 %
- Sheep/Goat bones recovered from grave pit – 66.6 %
- Kurgans with more than one animal species represented – 3.8 %
- Animal bones placed in the grave pit – 11 %
- Horse remains placed within the grave pit – 33.3 %

Although Buldashov's data provides some representation of the contextual nature of animal bone deposits, we are still left with a number of questions regarding the actual role of the animals within the process of the funerary ritual. For example, what specific bone elements were deposited as part of the process and how were they treated (e.g. burned, fragmented, whole, etc.)? How do faunal remains deposits vary in relation to other characteristics associated with the mortuary constructions (e.g. kurgan size, number of burials, other artefacts, etc.)?

However, a recent publication has sought to define more precise patterns of deposition for animal bone remains (Koryakova & Daire 1997 – faunal analysis by P. Kosintsev). In this case, faunal assemblages from ten cemeteries have been published with NISP and MNI estimates as well as skeletal representation respective to the sites (Tables 6.2 & 6.3). Although no specific contexts relating to archaeological features within the cemeteries are given (e.g. burial pits, mound, etc.), the data

ANIMAL SPECIES	CEMETERY				
	Rafailovsky	Tutrinsky	Savinovsky	Krasnogorsky-1	Kras. Borok
Cow	68 (7) + 2c**	3 (3)	-	18 (5)	-
Sheep/Goat	34 (6)	31 (7)	3 (3)	3 (2)	4 (1)
Horse	78 (7) 1c	13 (10)	16 (6)	1 (1)	2 (2)
Bird	-	29 (3)	1 (1)	-	-
Total	180 (23)	76 (23)	20 (10)	22 (8)	6 (3)

Table 6.2 *Table detailing the animal remains recovered from five Gorokhovo-Sargat period cemetery sites in the Trans-Ural region - numbers reflect NISP and MNI (in parentheses) totals, small 'c' represents the recovery of a complete animal skeleton (adapted from Matveeva 1993a, 120).*

Skeletal Elements (NISP)	Cemetery Sites									
	Abatskii-1	Abatskii-3	Savinovskii	Tutrinskii	Rafailovskii	Prygovskii-1	Krasnogorskii-1	Nizhneingal'skii	Gaievskii-2	Turunovskii
Horse Remains										
Crania	-	4	3	-	5	11	1	12	3	-
Ribs	47	41	8	4	-	-	-	20	-	-
Vertebrae	1	13	1	-	-	-	-	5	1	-
Scapula	2	7	-	1	-	-	-	-	-	-
Humerus	-	1	2	7	2	-	-	1	1	-
Radius/Ulna	-	-	1	-	1	-	-	4	1	-
Pelvis	7	7	2	7	2	-	-	1	1	-
Femur	-	1	-	-	2	-	-	-	-	-
Tibia	-	-	1	-	-	-	-	4	-	-
Metapodials and Phalanges	-	1	2	-	7	9	-	11	1	-
Cattle Remains										
Crania	1	1	-	1	5	-	-	12	1	-
Ribs	2	-	-	-	-	-	-	2	-	10
Vertebrae	-	-	-	-	-	-	4	2	-	2
Scapula	-	-	-	-	1	-	-	2	-	1
Humerus	-	-	-	1	-	-	2	-	-	-
Radius/Ulna	-	-	-	-	-	-	3	1	1	-
Pelvis	-	-	-	1	2	1	2	-	1	-
Femur	-	-	-	-	1	-	2	5	-	-
Tibial	-	-	-	-	3	-	3	3	-	-
Metapodials and Phalanges	2	1	-	-	9	-	4	12	-	-
Sheep/Goat Remains										
Crania	1	-	-	1	33	1	-	1	-	-
Ribs	13	-	-	3	-	-	-	-	-	-
Vertebrae	1	1	-	1	-	-	-	-	-	-
Scapula	1	-	1	5	2	1	-	-	-	-
Humerus	1	1	-	5	4	-	-	-	-	-
Radius/Ulna	1	1	1	4	3	-	-	-	-	-
Pelvis	2	2	-	2	-	-	1	-	-	-
Femur	-	2	1	2	-	-	-	-	-	-
Tibia	2	2	-	1	3	-	-	-	-	-
Metapodials and Phalanges	-	-	-	-	1	-	-	-	-	-

Table 6.3 *Table detailing the animal remains recovered from ten Gorohovo-Sargat period cemetery sites in the Trans-Ural region - numbers reflect NISP and MNI (in parentheses) totals; number of examined kurgans in each cemetery: Atatskii 1 - 3; Abatskii 3 - 5; Savinovskii - 6; Tutrinskii - 8; Rafailovskii - 1; Prygovskii 2 - 1; Krasnogorskii 1 - 2; Nizhneingalskii 1 - 1; Gaievskii 2 - 2; Turunovskii 1 - 1; (after Koryakova and Daire 1997, 123).*

nevertheless provides a good indication of the variation in animal deposition patterns between respective cemetery sites.

Matveeva notes that some of the most common patterns of animal utilisation within Early Iron Age funerary rituals in the Trans-Ural region relate to the inclusion of disarticulated horse, cattle, and sheep\goat remains, although occasionally complete skeletons are recovered (1993a, 138). Typically, crania are deposited separately and are often found either within the mound strata, at a level corresponding to the ancient palaeosol surface level, or within special pit deposits. Ribs, scapulae, and pelvises are also commonly recovered either from the mound strata or found as deposits within the grave pit near the head or feet of the human skeletons (ibid). In addition, lower limb elements, especially the metapodials, are commonly encountered and in many cases may relate to the ubiquitous 'head and hoof' type deposits (animal hide attached to crania and metapodials) which have a broad temporal-spatial representation within Eurasia and Europe.

I discussed this interesting pattern in Chapter Three, concerning the late prehistoric period of Eurasia, wherein I pointed out that such deposits (most commonly horses) were either deposited within certain locations of the kurgan structure or were hung on poles or scaffolding at the site. This practice of killing, skinning, consuming and depositing certain anatomical elements of animals as part of the funerary rite is well attested archaeologically as well as ethnographically for the Eurasian steppe region. Indeed, as recent as the eighteenth century, several travellers noted the significance of animal sacrifice and consumption during funerary activities within Mongolia (e.g. Roux 1963; Pallas 1783; Julien 1877). These events marked the complex and symbolic relationships between humans and animals, which were manifested through the structure and practice of funerary ritual and the formalisation of the relationships between the living and the dead (Roux 1963; Gmelin 1751-1752).

In recent years, scholars have begun to realise the importance of applying more coherent contextual approaches to the archaeology of the ritual practices associated with kurgan burial sites and have sought to use more sophisticated approaches in the investigation of animal sacrifice relating to this.

An excellent recent example of this approach is the work by Crubézy et al. (1996) relating to the archaeological investigation of a 9th century AD kurgan in the Baikal region of Mongolia. In this investigation, a very detailed approach is taken to the excavation and recording of the faunal remains. This information was then used to develop several hypotheses regarding the possible process of ritual at the site, which included elements of fire as well as the deposition of parts of a horse and sheep. This particular approach relied heavily on excellent contextual documentation regarding the recovery of the faunal assemblage as well as a very thorough discussion associated with the taphonomic characteristics of the site and the remaining bone materials.

Returning now to the Middle Tobol region, certainly some of the best recent research regarding the contextual analysis of faunal remains relates to the published results of the 1994 archaeological investigation of the Gaievo cemetery site (French-Russian collaborative project), which has provided a range of specific data regarding the recovery of faunal remains from five kurgan contexts (Table 6.4).

ANIMAL SPECIES	KURGAN				
	K-3	K-4	K-5	K-6	K-7
Cow	24 (3 *)	-	9 (1)	5 (3)	-
Horse	14 (3)	9 (1)	69 (3)	45 (2)	-
Sheep/Goat	2 (2)	12 (1)	17 (2)	29 (3)	-
Goat	1 (1)	-	-	-	-
Sheep	-	-	2 (1)	-	**
Camel	-	-	1 (1)	-	-
Pig	2 (1)	-	1 (1 ***)	****	-
Dog	-	-	6 (1)	-	-
Elk	1 (1)	-	2 (1)	-	-
Roe Deer	-	2 (1)	-	-	-
Wolf	-	-	1 (1)	-	-
Fox	1 (1)	1 (1)	9 (3)	4 (1)	-
Badger	-	-	1 (1)	-	-
Beaver	-	-	1 (1)	-	-
Mammal Indet	32	-	160	16	3
Black Grouse	-	-	6 (2)	1	-
Grey Canard	-	-	2	-	-
Mallard	-	3	-	-	-
Duck sp.	-	1	-	2	-
Pike	-	-	-	1	-
Total number of remains	**77 (12)**	**27 (5)**	**287 (21)**	**105 (13)**	**3**
Total number of species	**7**	**5**	**14**	**9**	**1**

Table 6.4 *Table providing faunal remains NISP and MNI (in parentheses) data from five kurgans excavated at the Gaievo cemetery site: * - complete calf skeleton; *** - anterior part of pig skeleton; **** - posterior part of pig skeleton (after Koryakova and Daire 1997,*

6.3.4 The Gaievo Cemetery

The Gaievo cemetery, which is situated near the Iset River (previous Fig. 6.1), contained five kurgans with multiple burials reflecting a long period of use from the 5th century BC to the 4th century AD (Koryakova & Daire 1997, 69). In combination, the kurgans represented twenty burials containing the remains of at least nineteen adults (including two old individuals), two adolescents, and two children. In all, the ages varied from between 2 years to 50-60 years of age.

Interestingly, the kurgans reflected two main chronological phases of funerary use. The first related to the construction of the kurgan mounds with central grave features during the 4th to 2nd centuries BC. The second phase related to the inclusion of secondary peripheral burials during the 1st to 4th centuries AD (previous Fig. 6.3). This particular phasing has been interpreted as possibly relating to the use of various cemeteries in different regions by specific familial or clan based groups (suggestive of mobile populations). A second hypothesis is that that not all members of a particular population within a specific area received a kurgan type of burial.

In regards to the latter hypothesis, it has been suggested that the cemetery represented the burial of a military social stratum during the Gorokhovo-Sargat period (Koryakova & Daire 1997, 165). This inference is based primarily on the recovery of a number of militaristic items (e.g. swords, arrowheads, etc.) associated with the male burials as well as frequent indications of skeletal stress and

Skeletal Element	Cow (mound)	Horse (mound)	Sheep/Goat (grave pit bottom)	Sheep/Goat (mound)
crania	3	3	-	2
teeth	5	13	-	1
rib	-	34	31	30
vertebrae	1	20	2	8
scapula	-	3	6	-
humerus	1	1	-	2
radius/ulna	1	1	-	3
carpal	-	1	-	-
metacarpus	-	3	-	-
pelvis	1	6	2	2
femur	4	4	-	7
tibia	-	1	-	8
tarsal	3	1	-	2
metatarsal	2	1	-	-
phalange	1	5	-	1

Table 6.5 *Table providing skeletal element NISP counts, by species, for the archaeological contexts of the Gaievo kurgans (after Koryakova and Daire 1997, 123).*

pathologies on many of the individuals. Some of the skeletal stress markers were most likely associated with a high degree of activity relating to horseback riding (Courtaud & Rajev 1997).

As I noted above, a much more coherent approach to the analysis of the faunal remains was undertaken for the Gaievo cemetery. More specifically, a correlation was sought between particular animal species, anatomical elements, and the archaeological features of the particular kurgans. For example, Table 6.5 illustrates the deposition of animal remains (species and skeletal element) relating to two main contexts: the kurgan mound strata and the burial pit features.

From the publication of this data, it appears that two main patterns of deposition are discernable: one relating to feasting during the construction of the kurgan (e.g. scattered remains found within the mound strata) and sacrificial deposits relating to the deposit of either whole animal carcasses or specific anatomical elements within special pit features or within the human grave pits.

In addition to these main contexts, there are some other general points that can be made. The data clearly show that horses were the predominant species used as part of the funerary process, although one can certainly find a degree of variation relating to this between the respective kurgans. This is also the case for the deposition of cattle remains, in which no remains were recovered from Kurgan 4. Kurgan 5 represented the greatest variety in terms of deposited animal remains (overall range of species and quantity of bone elements).

Certainly, the publication of the faunal materials from the Gaievo cemetery provides a much better approach to the representation of animal remains from Early Iron Age funerary contexts. Nevertheless, there are still several important issues which are not addressed in detail. For example, even though Koryakova and Daire (1997, 164) note that the utilisation of animals within the funerary rites helped to mark social differences among the deceased, there is no specific attempt to correlate the faunal data with other features of the burials to test this hypothesis. Nor is there a clear picture provided of how the deposited remains may relate to changes in funerary practices between the two main chronological phases, which is certainly one of the most interesting characteristics of the cemetery site. Furthermore, although Table 6.5 provides a general idea of some of the contexts of animal bone deposits it does not elaborate further on how remains were deposited within the mound (e.g. special pits or on the ancient palaeosol surface, etc.) or in other contexts such as the peripheral ditches, where the text of the publication mentions the deposit of animal bones and pottery remains but does not give specific information regarding this.

Therefore, while I find the description of the recovered faunal assemblage from the Gaievo cemetery to be excellent by comparison to other publications on the topic within the Middle Tobol region, it still appears that such analyses can be taken a step further in terms of contextual documentation and interpretation.

With these important points in mind, I would now like to move towards a discussion of my work with the French-Russian project relating to the investigation of the cemetery sites of Shushye and Karacye and my analysis of the faunal remains recovered from five kurgan contexts. Although the general faunal assemblage recovered during the 2000 season was very small in comparison to the Gaievo assemblage discussed above, this research offered me the important opportunity to participate in the excavation of faunal remains from Early Iron Age cemetery sites and provided me with a first-hand perspective of many of the problems noted above concerning the recovery and analysis of faunal remains and how this affects successful contextual interpretations of faunal depositions.

6.4 The 2000 Field Season – Shushye 1 and Karacye 8 & 9

In the summer of 2000, a joint international field excavation was carried out in the Trans-Ural forest-steppe region in the Zavodoukovsk district of the Tyumen region. The expedition was comprised of the following organizations and institutions: 1) the Institute of History and Archaeology, Ekaterinburg (RAS), 2) Ural State University, Ekaterinburg, and 3) CNRS, Rennes, France, and 4) the Tyumen Historical Institute and Museum. This archaeological expedition was carried out within the general research orientation of the international Russian-French project titled, *Iron Age Settlements and Cemeteries within the Eurasian Crossroads*, which was discussed in the last two chapters.

The mortuary sites selected for investigation, Shushye-1 and Karacye 8 & 9, were located within the confluence zone of the Tobol and Iset Rivers, an area with an abundance of ancient settlements and cemeteries relating to the Bronze and Iron Age periods. This particular geographical locale has long been considered an excellent location for archaeological investigation, as it has historically provided a rich and varied ecological environment and offered a geographically strategic point at the confluence of two main regional rivers. As such, this area has been particularly important for the investigation of issues relating to ancient settlement patterns, socio-economic practices, mortuary complexes and ritual practices, and regional chronologies for the early prehistory of the Trans-Ural area.

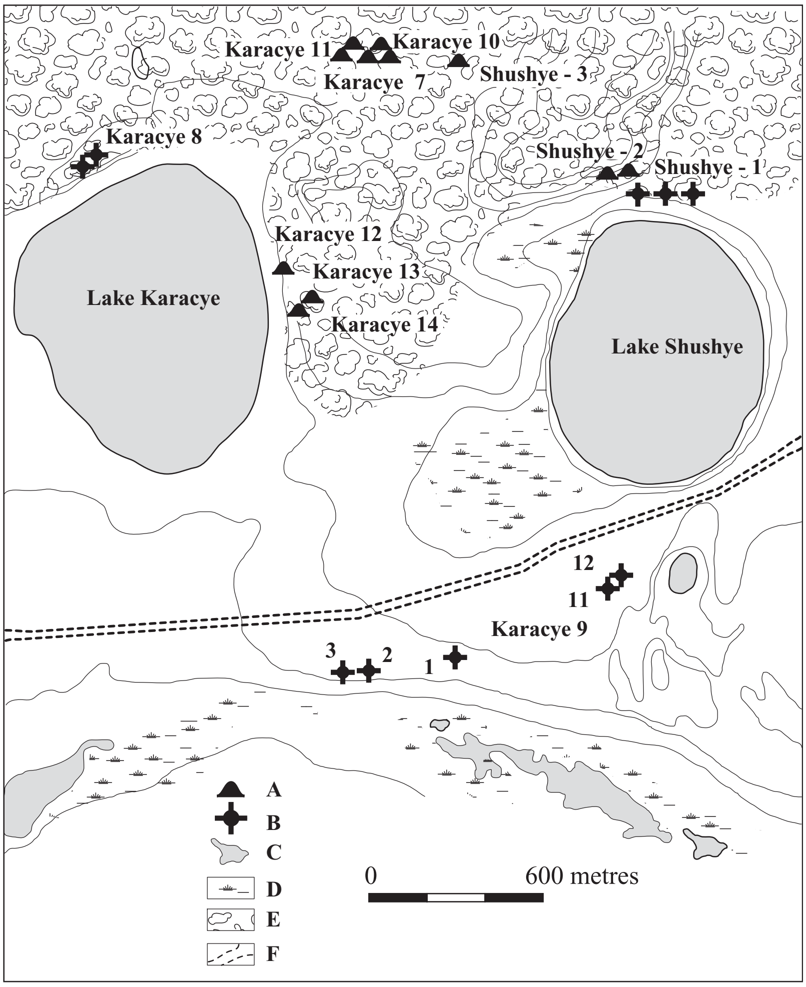


Figure 6.6 *Map detailing arrangement of the topographical features associated with the Shushye & Karacye archaeological sites: A – kurgan structures; B – excavated barrow complexes; C – water bodies; D – marsh; E – forest; F – modern roadway (adapted from Sharapova et al. 2000).*

6.5 The Shushye 1 Cemetery

The 2000 summer excavation was comprised of three teams working independently on five kurgan mortuary complexes in various locations: Shushye 1 – a total of three kurgan structures excavated, Karacye 8 – one small kurgan feature excavated, and Karacye 9 – one large kurgan feature excavated (Fig. 6.6). At the Shushye 1 site, three small kurgans were found situated in a close linear arrangement. All three of the kurgans were between 10-14 metres in diameter and 0.4-0.5 metres in height. Because of the small size of the kurgans, as well as their close proximity to each other, an excavation methodology conventionally used for settlement site investigations was used – rectangular plan of 2 x 2 metre controlled grid squares excavated in 10 centimetre arbitrary levels.

This approach allowed for the excavation of the kurgan mound features as well as the flat open areas between the kurgans. By contrast, most kurgan excavations carried out in the conventional manner focus on the visible mound structure. As a result of this strategy, any archaeological features that might be situated outside the perimeter of the excavated area would not be encountered.

With this problem in mind, the excavation methodology at Shushye 1 encompassed the placement of trenches running in all four cardinal directions (except eastwards from Kurgan 1) from each of the kurgan mound features (Fig. 6.7). This particular strategy was used to explore for possible archaeological features that may be located near the periphery of the kurgan mounds. As I discussed above, there has been frequent discussion among scholars concerning the possibility of flat grave burials existing within the more easily recognised kurgan mound cemeteries. Therefore, it was envisaged that the trenches would provide for the investigation of this possibility as well as the discovery of any

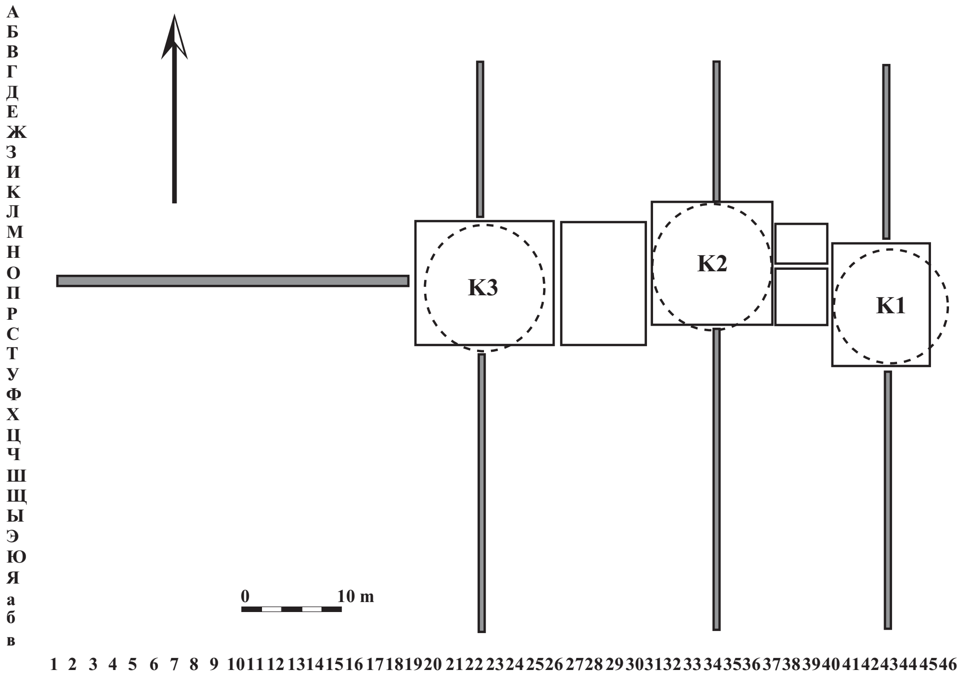


Figure 6.7 *Excavation orientation of the Shushye 1 kurgan features (K1-3) with grey areas representing trench excavations.*

other material evidence associated with the peripheral area of the kurgan mound structures that might relate to construction or post-construction ritual activities at the site.

The general excavation procedure for the removal of soil was undertaken by hand with the use of shovels and trowels. Areas with structured deposits, including the kurgan grave pits, were excavated with trowels, brushes and other small instruments. In general, sieving and flotation of the excavated soil was not carried out. However, some of the grave features were sieved in an attempt to recover small artefacts such as beads and fragmented copper-alloy ornaments which were associated with the human skeletal remains.

All recovered faunal remains were initially registered and numbered during post excavation processing. Each bone specimen was labelled with a context number corresponding to a respective number in a field registration book. This registration book provided the relevant contextual information (e.g. artefact position, soil horizon, association with archaeological features, etc.) regarding each of the bone specimens recovered. In general, all bones over 3 cm in length, and those under this size with distinct diagnostic characteristics (e.g. teeth, small mammal bone elements with proximal or distal ends, etc.) were recorded. Smaller fragments (e.g. shaft, rib, crania, etc.) were recorded as being recovered within a specific general coordinate area (2 x 2 metre grid squares).

Although animal bones and teeth represent one of the most frequently recovered material categories from mortuary site investigations, soil sieving is generally not carried out as part of the methodology. This obviously results in a strong bias in the recovery and representation of the potential faunal materials associated with the archaeological sites. Moreover, regarding the recovery of faunal remains from mortuary contexts, most Russian publications generally provide only basic information (typically quantitative) and rarely discuss significant issues such as: i) taphonomic processes respective to the site(s), ii) sampling and retrieval biases that may have occurred throughout the process of excavation, or iii) the more specific contextual information regarding the spatial and temporal relationships between the animal remains and other archaeological features within the site. In response to these conventions, and clearly in accordance with the goals of this thesis research, a more detailed approach to the recovery, recording, and analysis of the Shushye 1 faunal materials was undertaken.

Although the overall number of faunal remains recovered from the Shushye 1 kurgans was not significant in terms of quantity, and the overall preservation of the bone materials was very poor, the remains nevertheless provide a good illustrative case for the range of information that may be gained through a more precise methodology for faunal remains recovery and analysis.

6.5.1 Faunal Remains

Concerning the taxonomic representation for the recovered faunal assemblages several species could be identified. These remains represented domestic as well as wild taxa. The skeletal remains that could not be determined by species were coded according to small, medium or large ungulate categories and were analysed according to bone texture, composition, and size. Table 6.6 provides general species information relating to the three kurgans from the Shushye 1 cemetery and from the remains recovered from the trench excavation on the west side of Kurgan 3.

As noted above, the overall condition of the bone assemblage from Shushye 1 was very poor. Most bone specimens exhibited strong indications of weathering and abrasion and were in a highly

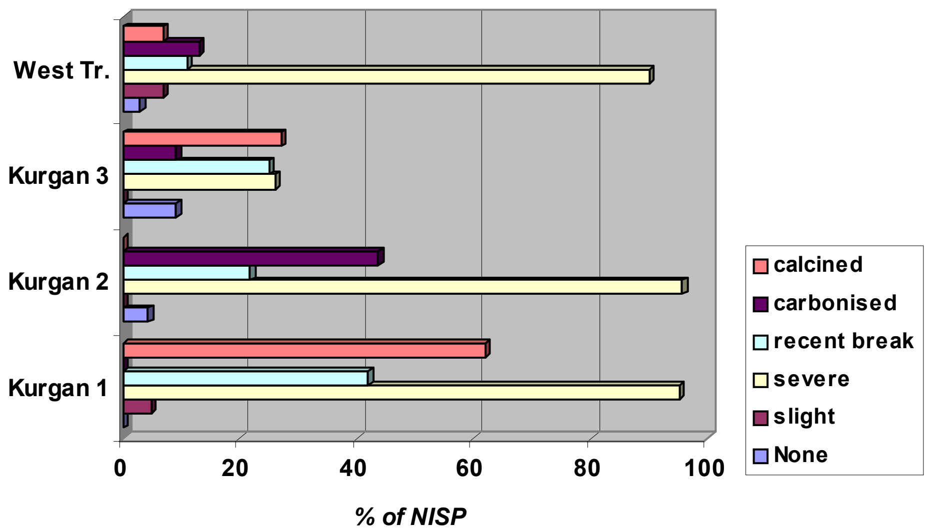


Figure 6.8 *Taphonomic information relating to burning (calcined and carbonised), weathering (severe, slight, none), and breakage (recent breaks) of bone materials at Shushye 1 in each of the kurgans and in the western trench area.*

SHUSHYE 1 (KURGAN 1)

Species	NISP	MNI	NISP %
Equus caballus (horse)	10	1	47.6
Mammalia indeterminate	11	-	52.4
Totals:	**21**	**1**	**100**

SHUSHYE 1 (KURGAN 2)

Species	NISP	MNI	NISP %
Bos taurus (cow)	1	1	4.3
Equus caballus (horse)	7	1	30.5
Ovis/Capra (sheep/goat)	1	1	4.3
Mammalia indeterminate	14	-	60.9
Totals:	**23**	**3**	**100**

SHUSHYE 1 (KURGAN 3)

Species	NISP	MNI	NISP %
Equus caballus (horse)	18	2	18
Canis familiaris (dog)	17	1	17
Bird Remains	9	-	9
Mammalia indeterminate	56	-	56
Totals:	**100**	**3**	**100**

SHUSHYE 1 (KURGAN 3 – WESTERN TRENCH AREA)

Species	NISP	MNI	NISP %
Bos taurus (cow)	3	1	3.5
Equus caballus (horse)	9	1	10.6
Mammalia indeterminate	73	-	85.9
Totals:	**85**	**2**	**100**

Table 6.6 *Faunal species recovered from Shushye Kurgans 1-3 and Western Trench Area.*

friable state. Figure 6.8 provides general percentages of the total NISP with regard to main taphonomic characteristics, including fresh breaks associated with excavation or post-excavation treatment. In addition, as the site was located on the fringe of a birch wood forest, the intrusive horizontal and vertical subsoil expansion of tree roots greatly affected many of the archaeological contexts as well as the associated bone materials.

The bone assemblages recovered from the three Shushye 1 kurgans were considerably fragmented and a substantial amount of time was spent refitting many of the specimens. In particular, the fragmented mandible sections and recovered loose teeth were reconstructed in an effort to establish more intact tooth rows for a better estimation of the mortality age of the remains.

Evidence of cut marks, hack marks, and other butchery indications was for the most part absent; however, one must consider the extremely poor surface preservation exhibited by most of the remains. In addition, the fractures associated with most of the remains were primarily associated with dry bone breakage and therefore occurred during the post-deposition phase (see Fig. 6.8).

Several of the bone specimens recovered also exhibited strong evidence of charring and burning, as did many of the human bones and birch bark debris found within the upper strata of the grave contexts. This was a characteristic common to all three of the kurgans and it will be discussed in relation to the interpretations of the Shushye 1 cemetery further below.

Unfortunately, many of the recovered animal bone remains were simply too small to provide information regarding respective bone element or species designations and were therefore coded as indeterminate. However, all fragments were coded according to their physical characteristics (e.g. cancellous, shaft, cranial or other fragment types), and the types of burning of the bones were noted as being charred or calcined. All burned and unburned remains were then counted and weighed to the nearest 1 gram (Table 6.7).

FRAGMENT TYPE	UNBURNED	CARBONISED	CALCINED	WT. (g.)
KURGAN 1				
Shaft	1	2	4	7
Crania	-	-	-	-
Cancellous	-	-	-	-
Rib	-	-	-	-
KURGAN 2				
Shaft	-	1	-	7
Crania	-	-	-	-
Cancellous	-	-	-	-
Rib	-	12	-	21
KURGAN 3				
Shaft	4	8	47	114
Crania	-	-	2	3
Cancellous	-	6	-	9
Rib	3	-	-	1
WEST TRENCH				
Shaft	62	8	-	101
Crania	8	-	-	14
Cancellous	7	-	-	9
Rib	-	-	-	-
TOTAL	**85**	**37**	**53**	**286**

Table 6.7 *Small fragments representation for the Shushye 1 cemetery site.*

6.5.2 Contextual Distribution

The contextual nature of the faunal remains followed the previously established parameters for faunal recovery within kurgan mortuary sites. That is, bone remains were recovered from the following contexts: 1) deposits within various levels of the kurgan mound structure, 2) remains associated with pits or other special features (e.g. burial pits, looter's trenches, or ancient features of the mortuary structure such as ditches), and 3) those remains that were most likely distributed and relocated through the burrowing activities of various animals.

Kurgan 1

The excavation of Kurgan 1 revealed few faunal remains or material artefacts. The one human grave feature, located in the centre of the kurgan structure, contained only fragments of carbonised human bone (primarily lower limb elements – age and sex of individual not determinable).

Additional recovered artefacts related to various scattered pottery sherds and two broken pottery vessels of the Gorokhovo and Sargat types. These ceramic remains were found deposited within the strata of the mound. Other artefact remains (beads and an indeterminate and poorly preserved bronze article) were found within the central burial pit feature. The additional trench excavations to the north and south of the kurgan mound did not reveal any artefacts, bone materials, or evidence of prehistoric excavation for the construction of the kurgan.

In terms of recovered faunal remains, most of the specimens were found in the east sector of the mound structure (Figure 6.9) and represented four loose cheek teeth (severely fragmented) from one juvenile aged horse (Tables 6.6 & 6.8) and small shaft fragments (indeterminate to species) which exhibited evidence of charring. The bone remains were recovered from the following grid coordinates and depths:O /44-45 at a depth of -22 to -44 cm, P/45 at a depth of -60 to -64 cm, and C/44 at a depth of -45 cm.

Based on the recovery of two deciduous horse teeth, an approximate age of 3 years or less can be suggested for these remains. Unfortunately, because of the generally poor condition of the

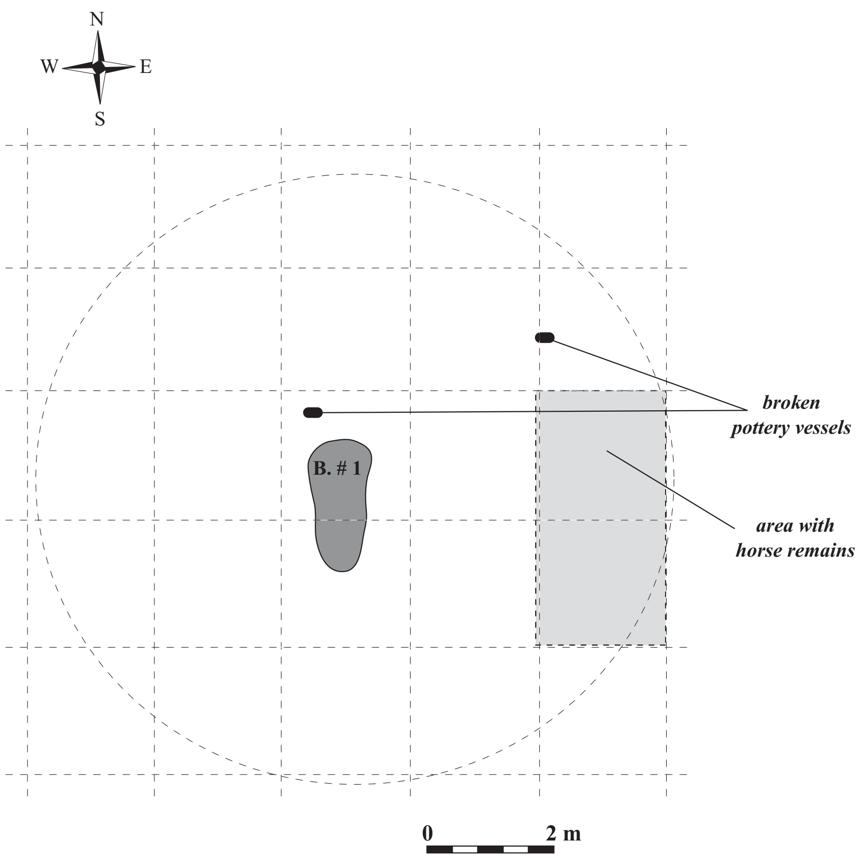


Figure 6.9 *Plan of Kurgan 1 with central burial and area of horse remains detailed. (adapted from Sharapova et al. 2000).*

teeth, a more precise age cannot be determined. Nevertheless, these remains appear to reflect primarily cranial bone elements from one horse which was deposited on the ancient soil surface level (palaeosol) as part of the process of the funerary ritual and prior to the construction of the overlying kurgan mound feature. Currently, no radiocarbon dates have been established for Kurgan 1, however, based on the

Table 6.8 *Recovered horse tooth fragments from Kurgan 1.*

#	Element	Side	Upper/Lower	Comments
24	Cheek tooth	Left	Upper	Molar possible/ little wear
38-44	Cheek tooth	Right	Lower	Juvenile – deciduous
1	Incisor	?	?	Deciduous – severely fragmented
51	Cheek tooth	?	Upper	Severely fragmented

typological characteristics of the pottery remains an approximate date of the 6th – 3rd centuries BC has been proposed (Sharapova et al. 2000).

Kurgan 2

The excavation of Kurgan 2 yielded two human burials, two smaller pit features, and a circular peripheral ditch (Fig. 6.10). The additional trench excavations to the north and south of the kurgan mound did not reveal any artefacts, bone materials, or evidence of prehistoric excavation for the construction of the kurgan. The overall preservation of the recovered organic materials was very poor and like Kurgan 1 there was distinct evidence of burning and charring associated with the recovered human, animal and wooden grave features of the burial mound.

The human remains from both Burials # 1 & # 2 were found in a highly scattered, fragmented, and charred state. Based on the few human bone remains recovered it appeared that two individuals, one child and one teenage individual (precise ages and sexes indeterminate), were buried within the kurgan.

Most of the faunal remains recovered from Kurgan 2 (Tables 6.6 & 6.9) related to mandible fragments and lower teeth from one juvenile horse (3 years or less based on presence of deciduous teeth), which were recovered from the northwest sector of the kurgan mound. This area of deposition again coincided with the palaeosol surface level (grid position M/34 at a depth of - 42 to - 45 cm).

There were also two other bone elements recovered, a second phalange from a cow and a sheep/goat tibia shaft fragment. The shaft fragment was recovered from Burial # 1 (Fig. 6.11) at a depth of -45 cm from the present surface level and it exhibited clear evidence of significant charring as well as some pathology associated with muscle and ligament attachment to the lower extremity of the

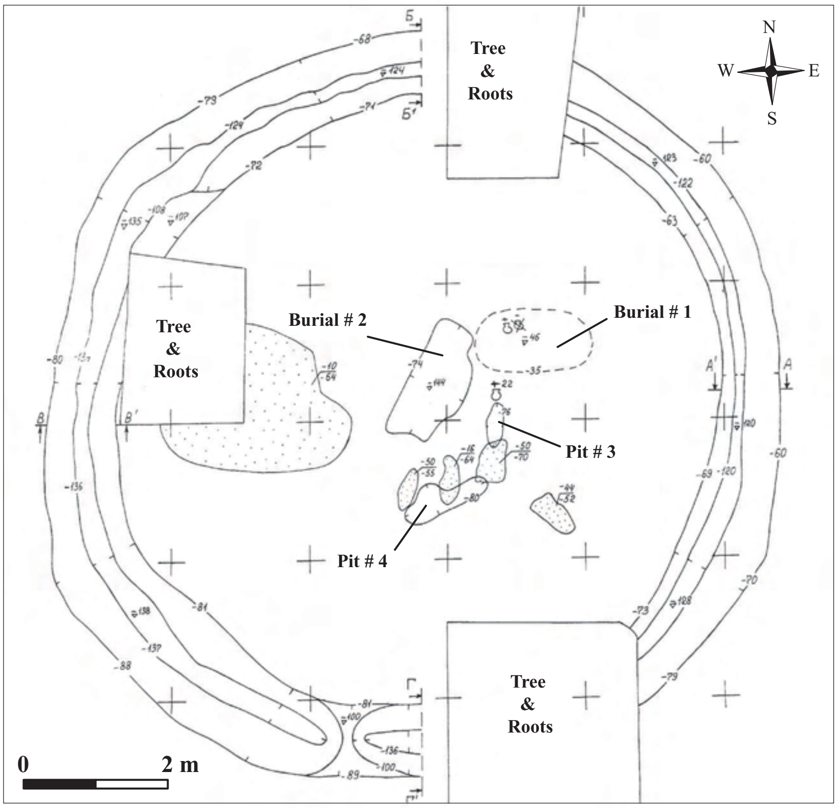


Figure 6.10 *Plan of Kurgan 2 with detail of archaeological features (adapted from Sharapova et al. 2000).*

Table 6.9. *Horse mandible and cheek teeth fragments from Kurgan 2.*

#	Element	Side	Upper/Lower	Comments
33	Molar	Left	Upper	M1 possible/ beginning wear stage
23	Mandible fragment	Right	Lower	With dP4 + M1
	dP4	Right	Lower	*
	M1	Right	Lower	*
32	M1	Left	Lower	Articulates with #34 and #35
34	dP4	Left	Lower	Articulates with #32 and #35
35	dP3	Left	Lower	Articulates with #32 and #34

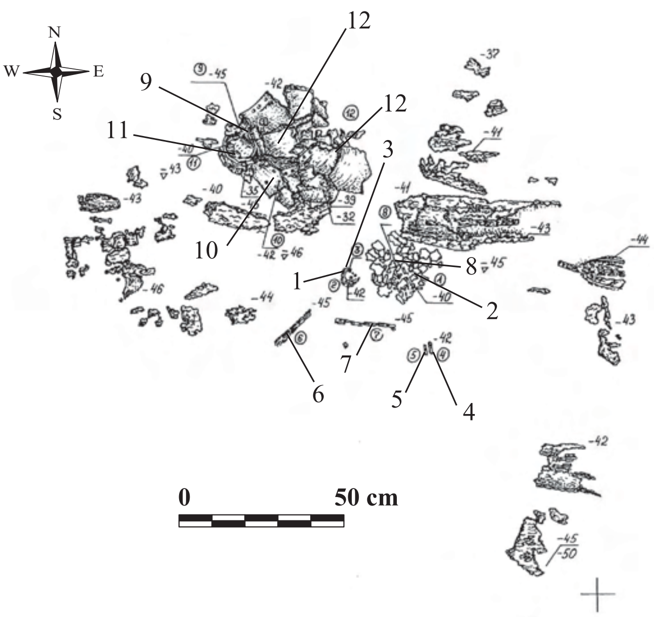


Figure 6.11 *Plan of Burial 1 from Kurgan 2: 1 - human crania; 2 - human mandible; 3 - bead; 4 - human ulna; 5 - human radius; 6 - sheep/goat femur; 7 - dog remains; 8 - bronze bracelet fragment; 9 - bronze fragment; 10 - tree bark; 11 - small crushed pot; 12 - large crushed pot (adapted from Sharapova et al. 2000).*

shaft. This particular burial, although poorly preserved, produced several small fragmented bronze artefacts, crushed pottery vessels, a glass bead, and a clay spindle whorl.

No radiocarbon dates have been achieved thus far for the materials from Kurgan 2, however based upon conventional typologies for the artefacts a date of approximately the 5th – 3rd centuries BC can be put forth for Burial # 1. It would appear that based on the stratigraphy of the mound structure Burial # 2 preceded Burial # 1. However, no artefacts were recovered from Burial # 2 and therefore it is difficult to ascertain a more precise chronology for this feature.

Kurgan 3

The excavation of Kurgan 3 revealed the remains of four human burials, a large peripheral pit, a smaller pit with a horse and dog crania deposit, and a two-phase peripheral ditch feature (Figs. 6.12 & 6.13). The additional trench excavations to the north and south of the kurgan mound did not reveal any artefacts, bone materials, or evidence of prehistoric excavation for the construction of the kurgan. However, the western trench excavation did yield several artefacts and bone remains and these will be discussed in a separate section below.

The construction of Kurgan 3 appears to have been completed in two distinct phases, with Burials # 1 and # 4 being the primary burials of the kurgan complex. The initial ditch feature relates to

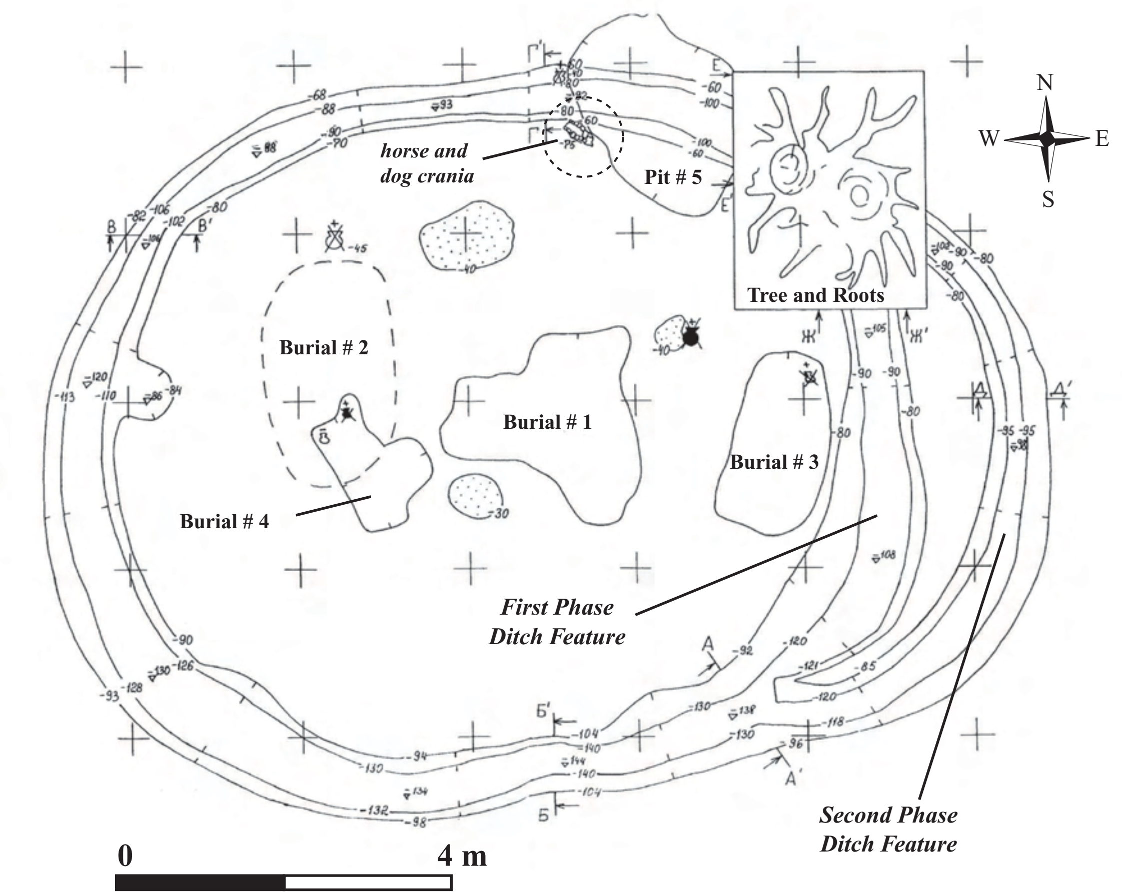


Figure 6.12 *Plan of Shushye Kurgan 3 detailing archaeological features and area of horse and dog crania deposit (adapted from Sharapova et al. 2000).*

Figure 6.13 *View from the east of Shushye Kurgan 3 showing ditch and grave pit features.*

this phase of construction and Pit # 5 also appears to relate to this sequence. However, no human remains were recovered from this particular feature. Burials # 2 and # 3 were part of a later series of interments within the mound feature. Relating to this, the secondary ditch feature can be seen as an extension of the earlier ditch and was probably constructed to accommodate the positioning of Burial # 3 in the eastern sector of the mound. It also appears that the ditches were left open and were not backfilled after the construction sequences of the mortuary complex.

The preservation of the organic materials was also very poor within this kurgan and most of the human skeletal material was discovered in a very fragmented and poorly preserved condition. Many of the human bone remains also exhibited evidence of charring. Because of the poor condition of the human skeletal material, precise ageing and sexing was not possible with most of the remains, however, tooth remains from Burial # 3 indicated a child of approximately 7 ± 2 years of age. Based on the characteristics of the recovered grave goods, Burials # 1, # 3, and # 4 were interpreted as being possibly related to female interments (Sharapova et al. 2000, 23-25). The grave goods associated with the burials included pottery remains (sherds and whole vessels), indeterminate bronze and iron objects, glass beads, and an iron knife.

The faunal remains from Kurgan 3 (Table 6.6) are representative of domestic horse and dog and were recovered from two specific locations within the mound complex. The first deposit represented a concentration of loose upper and lower cheek teeth (Table 6.10) recovered from the northwest area of the kurgan mound (grid position H/23 at a depth of -45 cm) at a depth that coincided with the palaeosol surface level. The loose teeth appeared to be from one juvenile individual aged 3 years or less based on the presence of a deciduous tooth (dPM4). More precise ageing was not possible because of the severe fragmentation of the teeth.

The second concentration of faunal remains relates to the deposition of a horse cranium and dog cranium placed together near the perimeter ditch feature and Pit # 5 in the northwest sector of the kurgan (grid position H/23 at a depth of -75 cm) (Fig. 6.14). Based on the stratigraphy, it seems likely that this deposit coincided with the first phase of the kurgan construction.

The dog cranium was placed above the horse cranium and was positioned with the top of the cranium facing upwards. The horse cranium was found in a turned over position with the fragmented

Table 6.10 *Upper and lower horse cheek tooth fragments from Kurgan 3.*

#	Element	Side	Upper/Lower	Comments
52-56	Cheek teeth	Right	Upper	Premolars/molars: determination difficult – fragmented state
210	Cheek tooth	Right	Upper	Possible 6th tooth/ articulates with 52-56
332	Cheek tooth	Left	Upper	Premolar/molar: determination difficult – fragmented state
206	Cheek tooth	-	Upper	Premolar/molar determination difficult – fragmented state
32	M1	Left	Lower	Articulates with #34 and #35
34	dP4	Left	Lower	Articulates with #32 and #35

Table 6.11 *Horse and dog ageing based on dentition fragments.*
Second Individual: Horse *(Equus caballus)*

Horse

#	Element	Side	Upper/Lower	Comments
480-484; 498; 499	Cranium	N/A	N/A	Cranium only (mandible missing) found below dog cranium

Dog

#	Element	Side	Upper/Lower	Comments
485-492	Cranium	N/A	N/A	Cranium only (mandible missing) found above horse crania

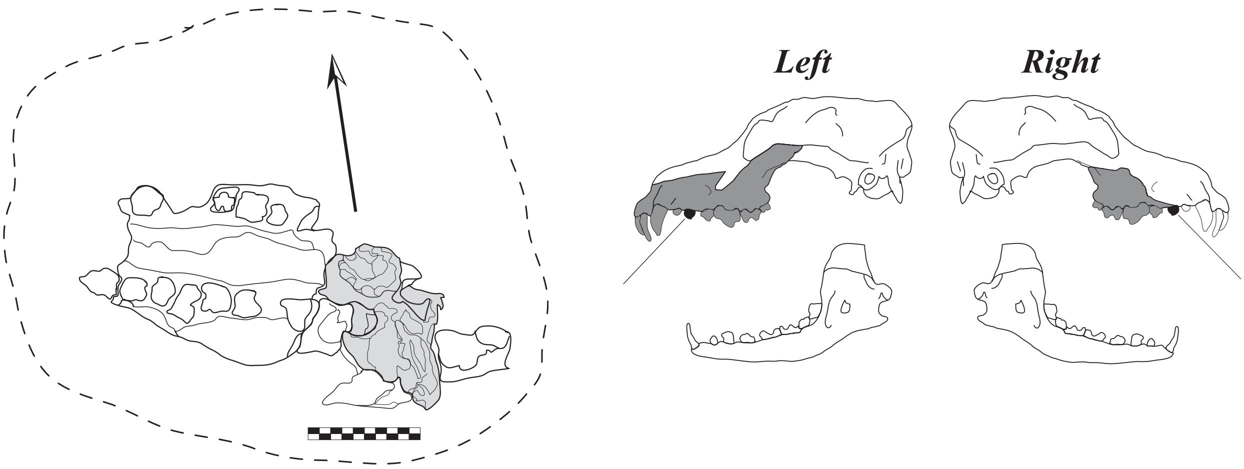


Figure 6.14 *Left - Plan of horse and dog crania (dog crania shaded) deposit; Right - illustration of dog crania detailing location of missing premolar tooth (shading in right illustration indicates portions of maxilla and premaxilla which were intact after removal).*

remains of the palatine and remaining premolars facing upwards. A significant portion of the upper structure of the cranium (parietal, frontal and occipital) was not preserved. In general, the preservation characteristics of both crania were extremely poor and they were found in a highly fragmented and friable condition.

The horse cranium reflects an old adult individual approximately 20+ years of age based on the advanced wear of the cheek teeth (low crown height). Unfortunately, because of the fragmented condition of the tooth remains precise crown height measurements were not possible (Table 6.11). The teeth associated with the dog cranium appear to represent a young adult specimen based on the insignificant incisor and canine tooth wear (Table 6.11).

One interesting feature associated with the dog cranium is that there was no formation of the upper second premolar tooth (PM2). An examination of the alveolar of the maxilla showed that the tooth was not missing but that it had in fact never been formed on either side of the maxilla (Fig. 6.14). This fact rules out a possible pathology and suggests that it may have been a feature associated with the particular breed of the dog (pers. comm. with P. A. Kositnsev).

In addition to the horse and dog remains, there were also a few fragmented bird bone elements recovered from within the mound structure (analysis being conducted by Institute of Ecology and Animal Science, Ekaterinburg). Regarding the deposit of the bird remains, the stratigraphy of the mound feature suggested that they were an intrusive element associated with a large animal burrow encountered near the centre of the mound feature.

The chronology of the Kurgan 3 mortuary complex is again based on the typological dating of the pottery and other associated grave furnishings. As noted above, Burial # 1 appears to be contemporaneous with Burial # 4 and dates to approximately the 5th – 3rd centuries BC. Burial # 2 appears to postdate Burials # 1 & # 4 and an approximate date of the 3rd century BC can be proposed. The pottery associated with Burial # 3 can be dated to approximately the 5th – 2nd centuries BC (Sharapova et al. 2000).

Kurgan 3 – Western Trench

In addition to the faunal remains found within the perimeter of Kurgan 3, there were also several artefacts (pottery sherds and two copper alloy button objects) and numerous animal bones recovered from a concentration of material found in the trench excavation undertaken to the west of the mortuary complex (grid location O/1-2). The faunal remains were comprised of both cranial (loose teeth and mandible fragments) and post-cranial elements and were representative of the domestic cattle and horse species (Table 6.6). In addition to the identified bone elements, numerous burned and charred bone fragments were also recovered (Table 6.7).

The horse remains represented loose teeth and mandible fragments as well as an astragalus and 1st & 2nd phalanges (MNI = 1). Based on the presence of a deciduous tooth and the lack of wear associated with the left lower premolar teeth (PM2-3), the dentition remains indicate a juvenile individual of 2.5 years or less (Table 6.12).

The cattle remains are suggestive of one juvenile individual (MNI = 1) and represent a metacarpal fragment (shaft), a loose deciduous (dPM4) upper tooth, and a proximal sesamoid. It appears that the faunal remains encountered in the western trench were part of a much larger archaeological

Table 6.12 *Mandible and tooth fragment information for horse and cow remains from the Western Trench.*

Horse

#	Element	Side	Upper/Lower	Comments
213	Mandible frag.	Left	Lower	With dP4 (absorption of roots) PM 4 missing
214	PM3	Left	Lower	Not in wear
215	PM2	Left	Lower	Not in wear (dP2 and dP3 missing)
212	Mandible frag.	Left	Lower	N/A
147	dPM2	Left	Upper	Loose tooth (strong root absorption)

Cow

#	Element	Side	Upper/Lower	Comments
81	dP4	Right	Upper	N/A

concentration. Initial interpretations during the process of excavation were that the concentration represented a random domestic midden deposit and therefore was unrelated to Kurgan 3 or the cemetery site in general. This was based on the recovery of pottery sherds that were believed to be from the Medieval Period as well as the small copper alloy fasteners (diameter 1.7 cm - most likely relating to clothing), which were also initially interpreted as dating to the Medieval Period. As such, a decision was made during the excavation not to widen or extend the trench excavation in the area of the encountered concentration.

Nevertheless, Early Iron Age pottery sherds (Gorokhovo and Sargat types) were also recovered from the concentration and, during the simultaneous excavation of Kurgan 9 in the Karacye cemetery, another copper alloy fastener of the same type was recovered. Post-excavation analysis revealed that the fasteners were actually of the Early Iron Age period (3rd – 2nd centuries BC) and were typologically similar to others recovered within the Trans-Ural region (Sharapova et al. 2000, 24).

Therefore, it is possible that the western trench excavation bisected a possible larger concentration of faunal remains and other material artefacts. Unfortunately, it is difficult to say with any certainty what the exact relationship of this feature is to the Kurgan 3 mortuary complex, however the remains do appear to date to approximately the same period.

6.5.3 Discussion

Based on the analysis of The Shushye 1 cemetery remains it would appear that all three kurgans mounds were constructed during approximately the same period of time, based on the similar construction features, close proximity to each other, and the associated artefacts. Because of the generally poor condition of the organic remains, a great deal of the information concerning the grave pits and human burials was not recoverable. Nevertheless, the general interpretation of the site, based on the recovered artefacts and general kurgan construction characteristics, is that the cemetery related primarily to the burial of women and children and was representative of the Gorokhovo-Sargat period. However, it must be noted that the sexing of the human osteological remains was not possible and that the gender of the graves have been inferred in relation to the recovered material artefacts.

Certainly, one of the most curious characteristics of the site was the high frequency of charring associated with many of the recovered bone materials and wooden grave constructions. This factor appeared to have taken place after the human remains were placed as regular inhumation burials and therefore did not relate to cremation activities). However, the exact nature of the burning is very odd and there was a great deal of discussion surrounding the interpretation of this issue during the process of excavation.

For example, one of the proposed interpretations suggested that this may have related to a singular event such as a forest fire, which may have affected many of the burials at the same time, perhaps shortly after the construction of the burials. Although how this would have affected graves placed within the mound structure is certainly unclear. Other interpretations suggested that the charring of the organic materials may have related to the burning of the mound surface for the inclusion of secondary burials, either for ritual purposes or for more practical reasons relating to the thawing of the ground for winter interments. Unfortunately, the stratigraphic sections of the kurgans did not reveal any clear patterns associated with ash horizons or large scale evidence of burning characteristics. Therefore, the interpretation of this issue is still very much open.

Concerning the recovered faunal remains, the generally poor state of preservation of the Shushye 1 assemblage (as discussed above) indicates the high degree of taphonomic effects associated with the remains. Nevertheless, the remains do provide some specific information about patterns regarding the utilisation of animals as part of the funerary process. Therefore, the main contexts of deposition can be summarised in the following way:

1) The deposition of horse and cattle cranial elements on the ancient surface level before the construction of the overlying kurgan mound structure: Kurgan 1 – east sector, Kurgans 2 & 3 – northwest sector.

2) The deposition of sheep/goat remains within the grave pit features: Kurgan 2, Burial # 1 – tibia bone.

3) The deposition of faunal remains within pit deposits during the construction phase of the kurgan: Kurgan 3, horse and dog crania deposited in north sector near peripheral ditch.

4) Scattered faunal remains associated with the palaeosol surface level: Kurgans 1, 2, and 3. These remains may relate to either deposited bone elements associated with ritual activities such as feasting or may simply be a result of the taphonomic characteristics of the site (e.g. the movement of remains through the activities of burrowing animals).

5) Faunal concentrations situated outside the periphery of the kurgan complexes: Kurgan 3, western trench. The exact nature of these materials in relation to the cemetery site and Kurgan 3 is unclear

As noted in the five general patterns above, animal sacrifice relating to the Shushye 1 kurgans is represented by a variety of deposition patterns. However, it must be noted that the higher frequency of cranial elements (particularly teeth) may also be a result of the overall poor preservation characteristics of the site, whereby the survivability of other less robust or dense bone elements may not have been very high.

Unfortunately, the poor preservation of the faunal remains limits the interpretations that may be drawn regarding the treatment of the animals during the funerary rites, especially concerning butchery, disarticulation, and deposition of certain elements. The predominance of cranial elements suggests that the sacrificed animals (juvenile individuals in most cases) were first sacrificed, the crania placed within specific pit features or on the ancient soil surface level, and the rest of the carcass either eaten by the funerary participants or included within the grave pit features with the dead. This activity was discussed earlier in the chapter regarding the general patterns of animal deposition within Gorokhovo-Sargat mortuary sites. Unfortunately, more specific interpretations cannot be made with any high degree of confidence regarding either the recovered remains or many of the post-cranial remains which were not recovered during the excavation of the site.

6.6 Karacye 8

The Karacye 8 cemetery excavation focused on the investigation of one kurgan mound feature, Kurgan 6, located near the north shore of Lake Karacye (due west of the Shushye 1 cemetery) (previous Fig. 6.6). The excavation of Kurgan 6 revealed a mound structure approximately 14 metres in diameter and 0.5 metres in height with three pit features and four ceramic concentrations (three of which contained animal bones) (Fig. 6.15). The central Pit # 1 burial feature, which exhibited strong evidence of previous looting, yielded disturbed human remains representative of a male individual approximately 35-45 years of age.

A number of artefact remains were also recovered from the central grave pit, the overlying mound, and the four distinct concentrations noted above. Most of the artefacts represented pottery

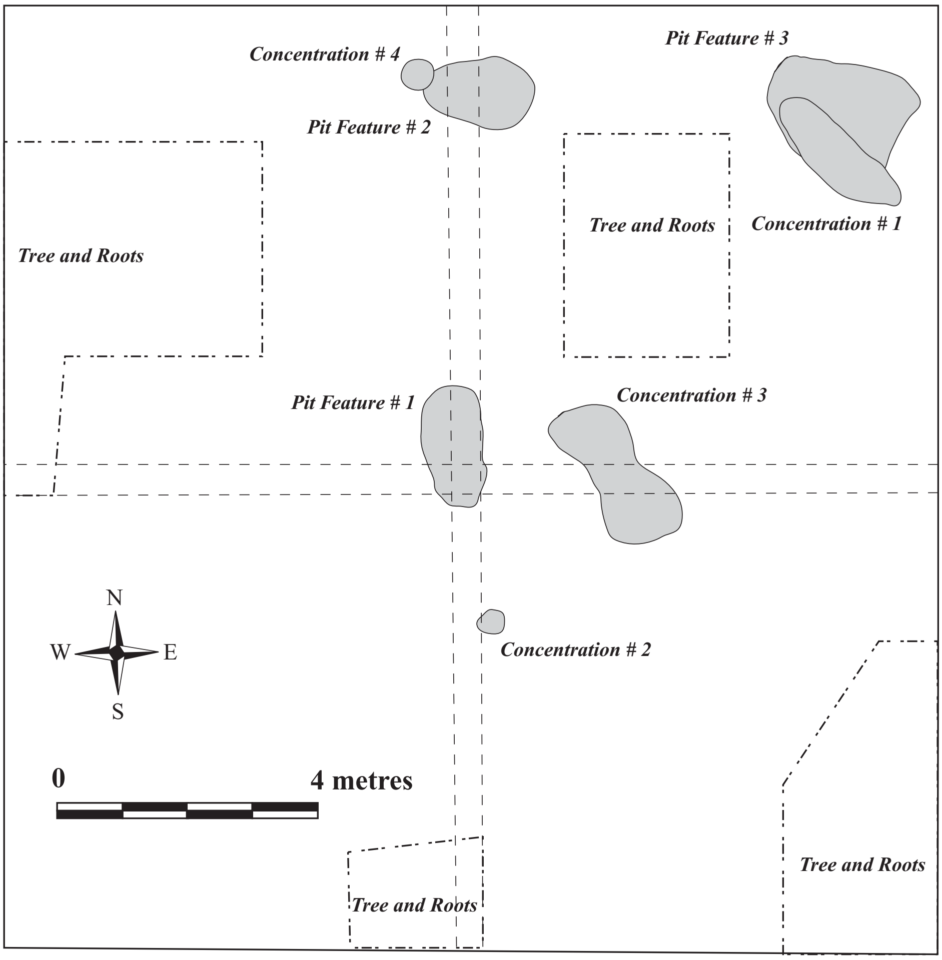


Figure 6.15 *Plan of Karacye 8, Kurgan 6 with grave pit features and artefact concentrations.*

sherds and crushed whole vessels and were indicative of the Gorokhovo, Sargat, and Baitovo Early Iron Age types. In addition to the pottery remains, two small beads and a clay spindle whorl were also recovered.

6.6.1 Faunal Remains Analysis

The faunal remains recovered from this kurgan were also very poorly preserved and were recovered in a highly friable condition with strong evidence of root etching (Fig. 6.16). This particular kurgan was also situated at the edge of the forest and therefore tree root damage was also a main taphonomic feature of the site. The faunal remains represented cranial elements (primarily mandible and lower teeth sets) from the three main domesticate species (horse, cow, and sheep/goat), as well as a number of small indeterminate bone fragments (Tables 6.13 & 6.15). The horse remains were recovered from section B/2-3 (northwest sector of kurgan) at a depth of -69 to -72 cm, the sheep/goat remains from sections -Б-В/5-6 (northwest sector) at a depth of -70 to -91 cm, and the cattle remains from concentrations 1 (depth of -80 to -90 cm) & 3 (depth of -53 cm). Based on the analysis of the dentition remains, minimum individual counts of 2 for the horse remains, 3 for the cattle remains, and 1 for the sheep/goat remains were determined (Table 6.14).

Table 6.13 *Faunal remains from the excavation of the kurgan complex at Karacye 8.*

Species	NISP	MNI	NISP %
Ovis/Capra (sheep/goat)	8	1	4.7
Bos taurus (cow)	47	3	27.8
Equus species (horse)	15	2	8.9
Non-identifiable	99	-	58.6
Totals:	**169**	**6**	**100**

Table 6.14 *Table showing mortality figures obtained from dentition remains at Karacye 8.*

First Individual – Cow *(Bos taurus)*

#	Element	Side	Upper/Lower	Comments
65	Mandible fragment	Left	Lower	With PM2-M1
*	PM2	Left	Lower	N/A
*	PM3	Left	Lower	N/A
*	PM4	Left	Lower	N/A
*	M1	Left	Upper	Broken at roots
105	Mandible fragment	Right	Lower	With PM2-M2
*	PM2	Right	Lower	N/A
*	PM3	Right	Lower	N/A
*	PM4	Right	Lower	N/A
*	M1	Right	Lower	N/A
*	M2	Right	Lower	N/A
151	M3 (loose)	Right	Lower	Possible match with mandible (in wear stage)

Second Individual – Cow *(Bos taurus)*

#	Element	Side	Upper/Lower	Comments
107 + 108	Mandible fragment	Right	Lower	With dPM2-4 + M1
*	dPM2	Right	Lower	N/A
*	dPM3	Right	Lower	N/A
*	dPM4	Right	Lower	N/A
*	M1	Right	Lower	Erupted but with little wear
29	M2 (?) loose	Right	Lower	Probable match with mandible fragment
53	Mandible fragment	Left	Lower	With dPM2-4 + possible loose M1-3
*	dPM2	Left	Lower	N/A
*	dPM3	Left	Lower	N/A
*	dPM4	Left	Lower	N/A
54	M1 loose	Left	Lower	Possible match with mandible (beginning wear stage)
35	M2 (?) loose	Left	Lower	Possible match with mandible (not in wear)
55	M3 (?) loose	Left	Lower	Possible match with mandible (Tooth bud only)

Third Individual – Cow *(Bos taurus)*

#	Element	Side	Upper/Lower	Comments
30	Mandible fragment	Right	Lower	With dPM4 + M1 (split in half)
9-11	PM3 (loose)	Right	Lower	Possible match with mandible fragment

Table 6.14 - continued. *Table showing mortality figures obtained from dentition remains at Karacye 8.*

Bos (loose teeth)

#	Element	Side	Upper/Lower	Comments
36	dP4	Right	Upper	Not strong wear/ possible match with #28 and may articulate with mandible fragments 107-108; 53
28	dP4	Left	Upper	Not strong wear/ possible match with #36 and may articulate with mandible fragments 107-108; 53
64	M1 or M2 (?)	Right	Upper	In wear/ possible match with mandible fragments 105, 106, 113

First Individual: Horse (*Equus caballus*)

#	Element	Side	Upper/Lower	Comments
38	PM3 or PM4 (?)	Left	Upper	N/A
34	PM2	Left	Upper	Heavy wear
41	Cheek tooth	Right	Upper	Heavily fractured – glued together
124	Cheek tooth	Left	Upper	Heavily fractured – glued together
26	Cheek tooth	?	Upper	Heavily fractured – glued together

Second Individual: Horse (*Equus caballus*)

#	Element	Side	Upper/Lower	Comments
112	dPM3 or dPM4	Right	Lower	In medium stage of wear

One Individual: Sheep/Goat *(Ovis/Capra)*

#	Element	Side	Upper/Lower	Comments
138	M3	Left	Lower	Just coming into wear

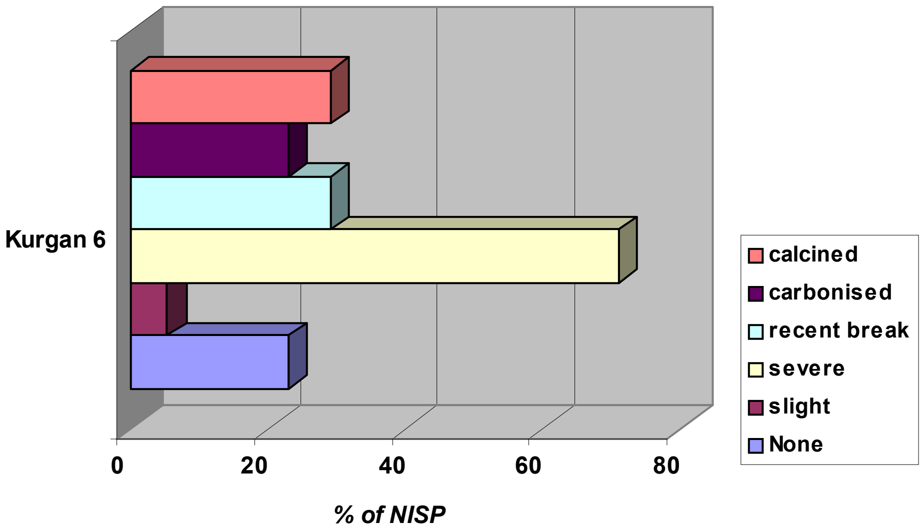


Figure 6.16 *Taphonomic information relating to burning (calcined and carbonised), weathering (severe, slight, none), and breakage (recent breaks) of bone materials from Kurgan 6.*

FRAGMENT TYPE	UNBURNED	CARBONISED	CALCINED	WT. (g.)
KURGAN 6				
Shaft	30	2	11	109
Crania	-	-	-	-
Cancellous	4	8	-	42
Rib	-	-	-	-
Total	***34***	***10***	***11***	***151***

Table 6.15 *Small fragments representation for Kurgan 6 (fragments are unidentifiable to species).*

It would appear that based on the eruption and attrition patterns of the recovered teeth that two adult cattle and one juvenile (approx. 6mths - 1yr) were killed and butchered as part of the funerary process with the subsequent deposition of the crania within the kurgan complex (Table 6.14). The eruption and attrition patterns of the horse teeth represent both an adult individual (more precise ageing not possible due to tooth fragmentation) and a juvenile aged 3 years or less (Table 6.14). The recovered sheep/goat mandible and lower tooth reflect an individual of approximately 2 to 2.5 years of age based on the eruption and slight wear of the 3rd permanent molar (Table 6.14).

The Kurgan 6 complex has been dated to approximately the 4th to 3rd centuries BC, based on the typological dating of the recovered pottery, the imported glass bead, and other artefact remains (Sharapova et al. 2000, 39).

6.6.2 Discussion

Although the relative date proposed for Kurgan 6 corresponds with the three kurgans excavated in the Shushye 1 cemetery, there are clearly some similarities as well as noticeable differences in regard to the construction patterns and faunal deposits. In the first case, the absence of a peripheral ditch is a key feature of Kurgan 6, as are the four distinct concentrations of ceramic fragments and faunal remains situated around the central grave feature. Interestingly, the recovery of the juvenile horse and sheep/goat cranial remains in the northwest sector of the kurgan, which were situated within the palaeosol surface level, matches the spatial pattern of faunal deposition in Kurgans 2 & 3 in the Shushye 1 cemetery.

Regarding the smaller pit features, Pit # 2 was intrusive to the kurgan mound and was probably associated with the digging activities of the looters. However, Pit # 3 actually appeared to predate the construction of the kurgan mound (Sharapova et al. 2000, 33). The four distinct concentrations of materials (animal bones and pottery remains) were deposited on the palaeosol surface level and relate to the ritual activities associated with the construction of the central burial feature and overlying kurgan mound. Therefore, regarding the inclusion of the faunal remains from the Kurgan 6 site the following points can be made about the context of the faunal remains:

1) The deposition of horse and sheep/goat cranial elements on the ancient surface level in the northwest sector prior to the construction of the overlying mound feature.

2) The deposition of cattle cranial elements with associated pottery remains in distinct concentrations placed on the ancient surface level: Concentrations # 1 & # 3.

3) The recovery of scattered small indeterminate animal bones from various levels relating to the ancient surface and mound strata. These remains may relate to either deposited bone elements associated with ritual activities such as feasting or may simply be a result of the taphonomic characteristics of the site (e.g. the movement of remains through the activities of burrowing animals).

Generally speaking, the recovered faunal remains from Kurgan 6 follow the same general pattern of deposition as that noted for the Shushye 1 cemetery above. Again, because of the very poor preservation characteristics of the remains more informed interpretations regarding the utilisation of the animals within the process of the funerary ritual is not possible. However, it is important to note the absence of the peripheral ditch as well as the inclusion of the three different types of Early Iron Age pottery (Gorokhovo, Sargat and Baitovo), which relate to the specific archaeological 'culture' categories commonly used within the Trans-Ural region. This suggests a very interesting combination of pottery vessels with the animal remains for the burial of the male individual in the central grave feature.

6.7 Karacye 9

The excavation of the Karacye 9 cemetery in 2000 (southwest of the Karacye 1 cemetery) focused on the investigation of Kurgan 11, a large barrow with a diameter of 32-34 metres and a height of approximately 1.3 metres (Figs. 6.17 & 6.18). Unfortunately, as is common practice within the Middle Tobol River region, the entire topsoil layer of large kurgans is typically removed with the aid of motorised earthmoving equipment (Figure 6.19). Obviously, this process creates the potential for an incredible bias concerning the retrieval of artefacts from the various strata of the kurgan mortuary complex and ancient soil levels. Although my Russian colleagues contend that the upper levels of the mound strata are significantly disturbed anyway because of the fact that the kurgans are often situated within agricultural fields, I nevertheless strongly disagree with this point of view, as the stratigraphy clearly revealed the depth of the intrusive modern-day agricultural ploughing, which had not reached the palaeosol stratum over the barrow construction.

For example, during the initial earthmoving phase, three concentrations of charred animal bones (all at approximately the same horizontal level) associated with charcoal and ash residue were encountered in a semi-circle in the southern sector of the site. These remains appear to have been associated with the inner periphery of the ditch at the approximate level of the palaeosol surface.

The removal of the upper soil level by bulldozer continued until the lowest sterile clay level was reached (including the removal of the palaeosol) and the main archaeological features of the kurgan construction were revealed (burial pits and peripheral ditch feature). As such, the depth of soil removed by the heavy equipment in the centre of the mound was approximately one metre. A central balk, on

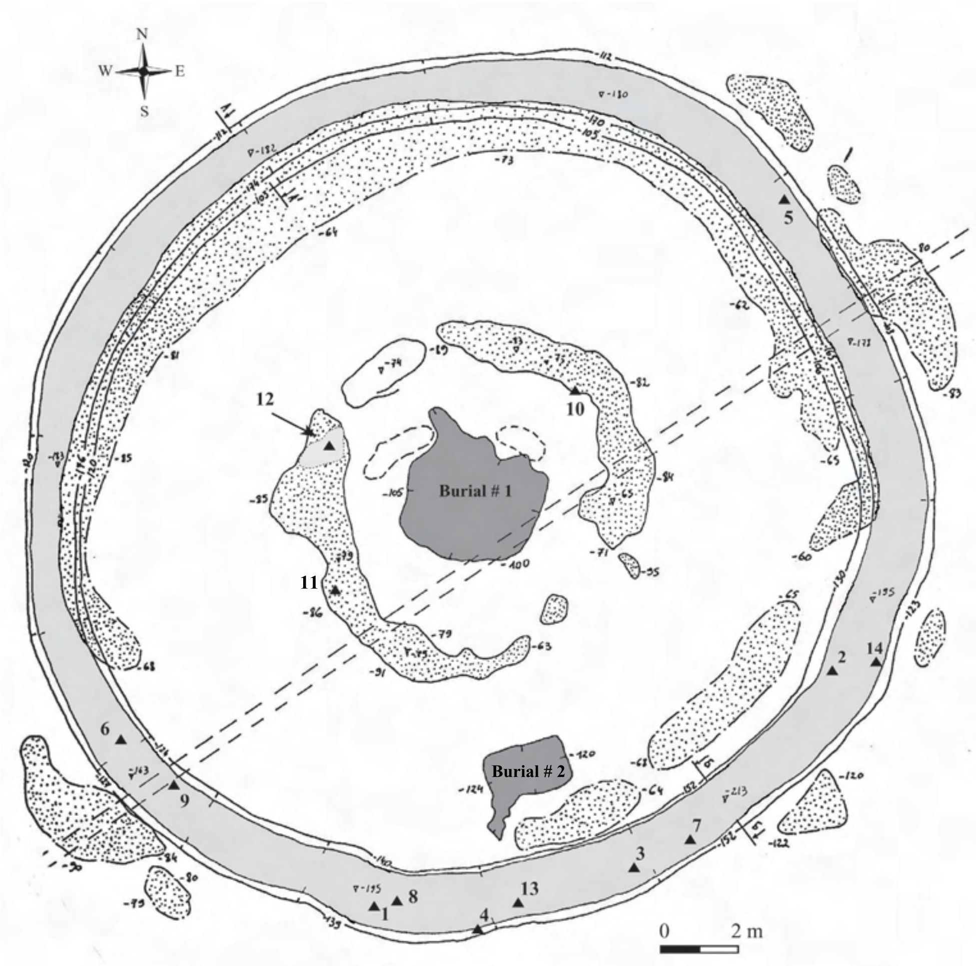


Figure 6.17 *Plan of Kurgan 11 showing burial (dark grey) and ditch features (light grey) as well as position of recovered bone remains by species: 1,4,7 - fox; 2, 8 - cow; 13 - green staining; 3, 5, 6, 9, 12 - horse; 10, 11 - human crania; 14 - bronze fastener (Adapted from Sharapova et al. 2000).*

Figure 6.18 *View from the west of Karacye 9, Kurgan 11, showing perimeter ditch and central grave pit features.*

a southwest-northeast orientation, was left during the machine removal of the soil and the remainder of the archaeological features of the kurgan were excavated by hand using shovels and trowels. No sieving of the soil was conducted during the excavation of the site.

As noted above, the main archaeological features represented a central burial feature (looted), a secondary peripheral burial in the southern sector (not looted), and a large peripheral ditch feature. As the central burial represented a disturbed context, the recovered human remains and associated artefacts were in a fragmented and scattered condition. The recovered artefacts related to pottery remains, indeterminate iron objects, small broken gold pieces, a glass bead, and small indeterminate fragments of silver. In addition, wooden fragments were recovered and the excavation of the grave

Figure 6.19 View from the northwest of the topsoil removal of Karacye 9, Kurgan 11.

feature revealed posthole features in the corners of the grave pit, which provided evidence of a wooden burial construction. Based on the analysis of the recovered human skeletal material two individuals were represented – 1 child of approximately 9-10 years of age (sex indeterminate) and one adult individual (sex and age indeterminate) (Daire & Koryakova 2000, 70).

The secondary burial in the southern sector of the kurgan yielded the undisturbed remains of a female skeleton (Fig. 6.20) of approximately 40-50 years of age with a particularly robust skeleton and distinct deformation of the occipital-frontal area of the cranium (indicative of cranial binding at a young age). This particular grave feature was undisturbed and all remains were found *in situ.* Interestingly, the human skeletal remains seemed to indicate that the body had been wrapped before burial and then had been kept for some time before final burial in the kurgan. This hypothesis was

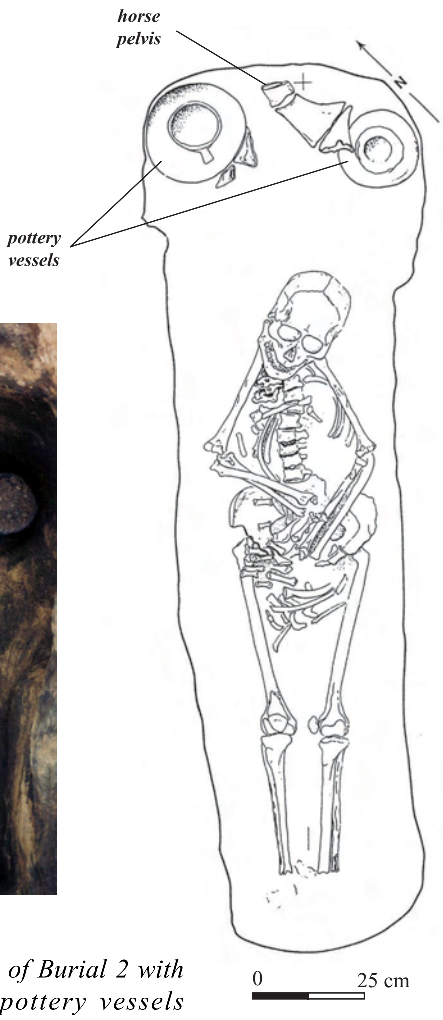


Figure 6.20 *Plan and photos of Burial 2 with horse pelvis remains and pottery vessels (adapted from Sharapova et al. 2000).*

based on the position of the arms and legs and the offset nature of the cranium, which appeared to be situated in an abnormal position relative to the rest of the body (Sharapova et al. 2000, 52-53).

Another interesting feature of the burial was that the two pottery vessels recovered from near the head of the female skeleton were made of local clay and were hand moulded, however, one of the pots (northeast corner of pit) was made to resemble a wheel-turned vessel similar to the types found in the southern Ural Mountain steppe region (associated with the Hunno-Sarmatian period – 1st to 4th centuries BC), which were imported wares from the Central Asian region (Chorasmia). Quite surprisingly, aside from the included faunal remains (to be discussed below), no other material artefacts were recovered from this burial feature. This is a surprising fact, considering the well preserved nature of the remains and the undisturbed context of the burial.

The third main archaeological feature of the site was the large peripheral ditch, which had a diameter of 21-22 metres, a width of 1.55 – 2.22 metres (upper level) and an approximate depth of 0.60 – 0.70 metres from the level of the lowest sterile soil level (yellow clay stratum - the lowest level reached through the machining of the upper levels). Overall, the ditch feature is one of the most interesting constructions associated with the barrow complex, as it clearly reflected evidence for the use of fire (e.g. ash lenses, charcoal, and burned human and animal remains) and the inclusion of structured deposits. In addition, the ditch appeared to have two main levels, the lowest level reflected the slow post-construction infilling of the feature through the normal process of erosion, however, the upper level (generally 15-30 cm above the ditch bottom) contained mixed deposits noted above relating to the use of fire and the deposition of various material artefacts and osteological remains. These deposits were quite variable in nature concerning horizontal distribution, however, the clearest evidence for the use of fire related to the northern and eastern sectors of the ditch, while most of the faunal materials were recovered from the southern and eastern sectors. These ditch deposits suggest that ritual activities took place at the site well after the construction phase of the barrow, as the initial deposit of soil infilling suggests.

6.7.1 Faunal Remains

In general, the faunal remains from Kurgan 9 were recovered from three main contexts: the central grave (Burial # 1), the peripheral grave (Burial # 2), and the peripheral ditch feature (Fig. 6.17). In all, the assemblage contained 93 bone specimens from seven different animal species (including 39 indeterminate small fragments) and included both cranial and post-cranial elements (Table 6.16). See Table 6.17 for data relating to small fragments and Figure 6.21 for taphonomic information relating to the kurgan remains.

The three main domesticate species (horse, cow, and sheep/goat) were represented as well as two domestic dog bones (MNI = 1). In addition, the assemblage also comprised wild fauna such as

Table 6.16 *Table of faunal species recovered from Kurgan 11.*

Species	NISP	MNI	NISP %
Ovis/Capra (sheep/goat)	1	1	1.1
Bos taurus (cow)	12	1	13
Equus species (horse)	12	1	13
Canis species (dog)	2	1	2.1
Alces alces (elk)	11	1	11.8
Vulpes vulpes (red fox)	13	2	13.9
Meles meles (badger)	3	1	3.2
Mammalia indeterminate	39	-	41.9
Totals:	**93**	**8**	**100**

FRAGMENT TYPE	UNBURNED	CARBONISED	CALCINED	WT. (g.)
KURGAN 11				
Shaft	11	-	1	41
Crania	-	-	-	-
Cancellous	2	-	-	2
Rib	6	-	-	11
Total	***19***	**-**	**-**	***54***

Table 6.17 *Small fragments representation for Kurgan 11 (fragments are unidentifiable to species).*

elk, fox and badger. The last two species reflect burrowing animals and most likely represent intrusive bone elements. Moreover, there were numerous small rodent and bird remains recovered from the site that also probably relate to the burrowing activities of small mammals. These remains are currently being analysed by a researcher at the Institute of History and Archaeology, Ekaterinburg.

The larger mammal remains represent species that were associated with the funeral practices and rituals relating to the construction of the kurgan site and the two grave features. Two rather interesting features of the assemblage were the recovery of several cattle bone fragments (humerus, ulna, and scapula) from the uppermost strata of the peripheral ditch feature which were stained completely green (Fig. 6.22). It seems likely that this staining effect was brought about through contact with a large bronze object, perhaps a cauldron in this case, as large bronze cauldrons are often recovered

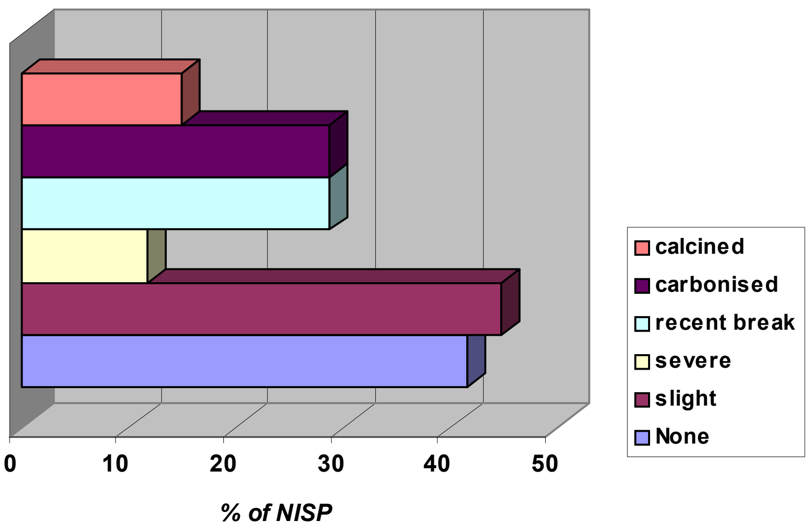
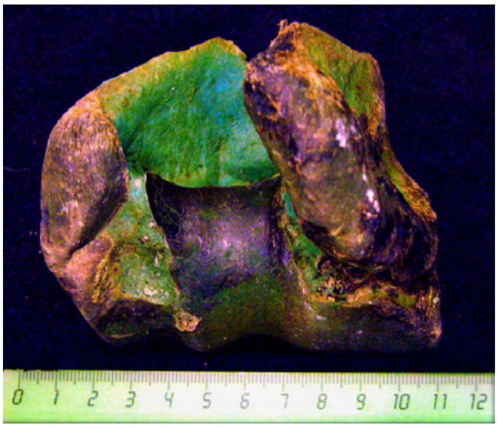


Figure 6.21 *Taphonomic information relating to burning (calcined and carbonised), weathering (severe, slight, none), and breakage (recent breaks) of bone materials from Kurgan 11.*



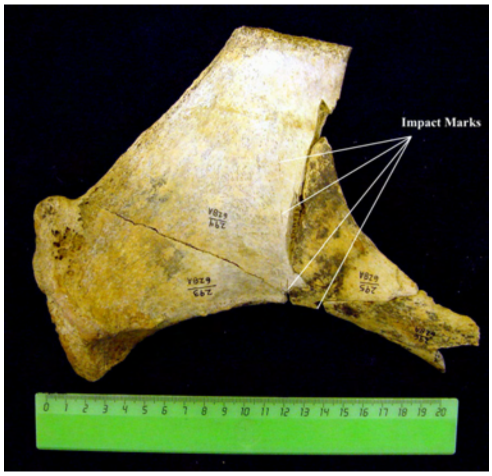


Figure 6.22 *Left Photo - distal end of cow humerus with green staining; Right Photo - horse ilium (pelvis) with hack marks indicating where acetabulum was seperated.*

from undisturbed Gorokhovo-Sargat kurgan contexts. Nevertheless, no such remains were found during the excavation of the site. It is also possible that the remains were displaced from the central burial either through the looting of this feature or from animal burrowing activities, as the remains did not appear to be *in situ* when discovered.

The only faunal remains recovered from the central burial feature were horse remains (rib fragments) found situated on the peripheral bank of excavated soil (spoil), which related to the ancient construction of the central grave pit (Fig 6.17 – 12). Burial # 2, however, yielded the very well preserved pelvis remains (left side ilium) from an adult horse. These remains were placed near the head of the corpse between the two pottery vessels (Fig. 6.20). A number of cut marks and hack marks are indicative of the process of butchery and disarticulation whereby the acetabulum (presumably still attached to the femur) was removed and the remaining left ilium of the pelvis with attached meat was deposited within the grave pit (Fig. 6.22 - right side illustration). This particular part of the pelvis represents the hindquarters area, which is one of the largest meat bearing areas of the horse. No other faunal remains were recovered from the grave pit feature.

As detailed on the plan in Figure 6.17, most of the faunal remains were recovered from the southern area of the peripheral ditch feature. However, this distribution is most likely quite biased because of the machine removal of the upper soil levels, which stripped away the palaeosol stratum as well as the overlying mound construction strata. Any bone remains associated with these soil levels would not have been recovered. The ditch feature, which was subsequently excavated by hand, therefore represented an undisturbed context. Nonetheless, it is an interesting fact that most of the remains recovered from the ditch feature were found in the southern and eastern sectors and the northern ditch area was for the most part quite clean. Based on an assessment of the stratigraphy, it seems quite clear that the ditch feature was left open (not backfilled) after the construction of the kurgan. A number of complex ash lenses, charcoal deposits, and small burned bone remains were recovered from different levels of the ditch feature. These remains are suggestive of possible ritual activities involving the use of fire and/or the deposition of various other organic remains (e.g. wood, animal bones, etc.) in this area of the mortuary site. Unfortunately, the ditch feature was excavated with the use of shovels and no soil sieving was undertaken. This is rather unfortunate, as the ditch feature yielded various ceramic remains as well as another copper-alloy fastener (as noted above for the Shushye 1 cemetery – western trench) and clearly revealed several interesting patterns of deposition relating to material artefacts.

The chronology of Kurgan 9 has been established through the relative dating of the kurgan construction type, pottery and other grave furnishings, and the characteristics of the female skeleton in the second grave pit (deformation of the skull). In general, recovered artefacts from the central burial and the kurgan construction type are suggestive of the Sargat funerary pattern of the 1st – 4th centuries A.D. Nevertheless, the exact chronological relationship between the central burial and Burial # 2 is somewhat problematic, as the ceramics found in Burial # 2 are not analogous to Trans-Ural forest-steppe types (as discussed above). Therefore, the kurgan itself relates to the Sargat type, however, Burial # 2 appears to represent a mixed pattern of funerary traditions (e.g. pottery characteristics) and is more analogous to the Hunno-Sarmatian burial patterns commonly associated with the Southern Ural Mountain region (Butalov & Gutsalov 2000; Sharapova et al. 2000, 59).

6.7.2 Discussion

The Kurgan 11 complex from Karacye 9 provided a very interesting contrast to the excavation of the Shushye 1 and Karacye 8 mortuary sites. This was not only because of the characteristics of the large kurgan construction but also because of the methods used for the archaeological investigation of the site. Based on the recovered faunal remains, several interesting patterns of deposition were suggestive of a rather complex series of activities at the site. However, I am confident that the interpretation of the faunal remains represents a biased perspective because of the loss of information relating to the machining of the upper soil levels. This is particularly the case for remains that may have been deposited on the ancient soil surface prior to the final construction of the overlying mound. This was a fact noted above regarding the Shushye 1 and Karacye 8 cemeteries and the deposit of domestic horse and cattle cranial elements on the palaeosol surface levels in specific sectors of the kurgan area.

Nevertheless, the recovered assemblage from Kurgan 11 does indicate some specific patterns of faunal deposition:

1) The placement of animal remains on the ancient surface level during the ritual process of the barrow construction: horse remains (ribs) recovered from the top of the surrounding spoil heap associated with the construction sequence of the central burial feature.

2) The placement of specific animal remains within grave pits: horse pelvis remains from Burial # 2.

3) The deposit of animal remains, other material cultural artefacts, and the use of fire associated with probable ritual activities in the peripheral ditch feature. This particular phase of deposition appears to have occurred sometime after the construction of the barrow.

These three general patterns of faunal deposition clearly indicate the importance of animal utilisation during the funerary process as well as later ritual activities at the site. Aside from the butchery indications associated with the horse pelvis remains from Burial # 2, and the green stained cattle remains from the ditch feature, no other specific taphonomic characteristics associated with the butchery and disarticulation of the remains were noticeable.

6.8 Conclusion: Animal Sacrifice as Ritualised Practice

My field research and laboratory analysis of the Shushye and Karacye faunal remains provided an important opportunity to participate in the archaeological investigation of Early Iron Age mortuary sites in the Middle Tobol River region. Although the recovered faunal remains did not provide particularly large assemblages, I nevertheless had the opportunity to work first-hand with bone materials relating to the sacrifice, disarticulation, and deposition of animals relating to Early Iron Age funerary practices. In addition, I was also given the important opportunity to observe the excavation methodologies used for the recovery of faunal materials from prehistoric cemetery sites, which as I discussed above is a very important consideration regarding possible recovery biases.

My work with the Shushye and Karacye mortuary material also provided some important information regarding the structure of ritual practice during the Early Iron Age period and how this corresponds to the construction sequences of the kurgans. While the 2000 excavation illuminated the variability associated with the cemetery sites, it also reflected a more general structure of ritual practice associated with the Early Iron Age period.

Therefore, I feel that based on a combination of my general discussion in the first half of the chapter, and the more specific description of my fieldwork research at the Shushye and Karacye cemeteries above, it is possible to make some specific remarks regarding the significance of animal sacrifice in the Early Iron Age period.

The Structure of Ritual Practice

The first point to be made relates to the connection between theory and field methodology and approaches to an archaeology of ritual practice. In the first half of the chapter I discussed the importance of understanding ritual as an actively negotiated social practice. In this case, even though there may be a formal and recognisable structure for ritual, it is one which is dynamically situated within varying social strategies and thus can play a vital role in issues relating to power and ideology as well as within what might be seen as general cosmological beliefs. As Bell emphasises, relating to ritual and social power, 'ritualisation' involves two basic dimensions: i) the dynamics of the social body and its relationship to a structured environment and ii) how ritual empowers those who seem to actually be controlled by the practice of ritual (1992, 206-207). Hence, it is imperative to acknowledge that ritual is a highly charged arena for social interaction and the renegotiation of various levels of socio-political structure through the process of human agency.

With this basic concept in mind, interpretations of the complex mortuary sites discussed within this chapter are clearly just as important for understanding how the living communicated with each other as they are for reflecting the dead who were buried within them. Therefore, it is important to understand how the physical characteristics of the kurgan constructions, including such features as peripheral ditches, the overlying mound features, and the placement of grave pits and associated artefacts, actually relate to specific frameworks of ritual practice and the social activities that would have been part of these communal endeavours.

While these theoretical perspectives may seem abstract and in many ways unconnected in regards to understanding the kurgan sites I have discussed above, I would argue that it is imperative to understand the importance of changing frameworks of ritual practice in the forest-steppe region during the Early Iron Age period. From my description of the kurgan mortuary sites, it is clear that they represent a very complex combination of social representation and ritual activity. In many cases they also reflect the dynamic meeting point between two or more cultural traditions and represent the development of new forms of mortuary behaviour. While conventional typological approaches to the interpretation of these sites have focused on scales of vertical stratification and ethno-cultural identification, I have argued within this chapter that more sophisticated readings of funerary behaviours and social representation must be sought. This is particularly the case for interpreting what may in fact be the representation of multiple levels of social identity as well as horizontal frameworks of social organisation rather, or in addition to, the conventional interpretation relating to vertically stratified societies.

Animal Sacrifice in the Middle Tobol River Region

Certainly, the sacrifice, consumption, and deposition of various animals were integral elements of the process of mortuary ritual during the Early Iron Age period in the Middle Tobol region. As I noted in the first half of the chapter, the development of new forms of mortuary ritual in the forest-steppe marked important changes in funerary practice. Based on the discussion of the Shushye and Karacye cemetery research above, in addition to some of the general characteristics I noted concerning the Middle Tobol River region at the outset of the chapter, there are several important points that can be made regarding the utilisation of animals:

· Kurgan constructions reflect communal activities in terms of both the construction of the sites as well as through the process of the ritual. Scattered animal remains recovered from kurgan contexts would appear to represent social feasting as an important part of these activities.

· It is clear that domesticated animals were the most commonly utilised species for consumption during mortuary feasts as well as for sacrificial inclusion within kurgan constructions.

· Horses appear to represent one of the most important sacrificial elements and can be associated with both male and female burials. Based on published data, it is very difficult to ascertain whether the inclusion of certain animal species was gender or age based in relation to the deceased.

· Kurgan constructions represent a complex structure for ritual practice and appear to reflect very symbolic arenas for the deposit of animal remains: i) peripheral ditch features which may represent a 'liminal' zone between the living and the dead, ii) palaeosol surface level represents area of feasting as well as the construction of special pit deposits, iii) grave pit features reflect the inclusion of animal remains (predominately meat bearing elements) as part of grave offerings by the living.

· The deposit of crania and/or metapodial elements is also well represented and relates to the symbolic importance of these remains. The deposit of these elements may follow a particular structural ordering, as was noted for the recovery of cranial elements in specific sectors of the kurgans (e.g. Shushye 1 – Kurgans 2 & 3, Karacye 8 – Kurgan 6).

While the points noted here are important in terms of recognizing some of the main patterns associated with animal utilisation through the process of mortuary ritual there are still a number of questions that remain very much unanswered. For example, questions concerning the development of animal sacrifice from the Early Iron Age period and the Pre-Sargat phase (8^{th} – 6^{th} centuries BC) through to the Late Sargat phase (approximately 4^{th} century AD) are very difficult to address based on the representation of faunal remains analyses within published literature. Few scholars have attempted to address any of the specifics regarding the chronological development of animal utilisation in the Trans-Ural region.

Furthermore, correlating patterns of animal deposition with specific categories of gender, age, kurgan construction, grave goods, etc. is also highly problematic as the analysis of animal remains has not figured prominently within conventional approaches to mortuary studies. This problem is clearly reflected in traditional publications regarding mortuary sites in the Trans-Ural region, as I discussed above relating to the 'lumping' together of cemetery data.

In order to investigate many of the important issues regarding the connection between the use of animals within funerary rituals and the general models of socio-cultural change I discussed in the beginning of this chapter it will be necessary to works towards the development of a much more coherent database regarding recovered faunal remains. This, however, will not be an easy endeavour as it will be necessary to work with primary sources concerning archaeological investigations and to gather information from a number of other sources which are unpublished. Such an endeavour would not have been practical considering the three year window of research represented by this thesis. Therefore, I sought to emphasis a strong investigation and critique of conventional approaches and methods, as well as to present the results of original field research relating to the topic of animal sacrifice and ritual in the Middle Tobol region.

However, many of the problems outlined above are also strongly tied to the way in which zooarchaeological remains are recovered during the process of excavation. As I have attempted to illuminate through my discussions in this chapter, there is a very distinct problem between a theoretical acknowledgment for the importance of animal remains as an element within funerary practices and the methodological practices used for the investigation and recovery of faunal remains from cemetery sites.

Zooarchaeological Approaches

Though my discussion in this chapter I have attempted to emphasise the importance of contextual approaches to the interpretation of faunal remains from mortuary sites. Nevertheless, this approach is clearly dependent upon very detailed recovery and recording methods. Conventional approaches to the study of faunal remains from the Middle Tobol River region have not emphasised the importance of context and therefore most published data relating to this issue only provide general species lists and basic numeration regarding NISP and MNI data. This information is often lumped together to represent whole cemetery sites, which in effect blurs the important variation between and within respective cemetery locales relating to the subtleties of animal ritual practices.

Moreover, the excavation methodology for the recovery of animal remains is also problematic. For example, while the placement of exploratory trenches at the Shushye 1 cemetery site represented an excellent approach to the investigation of peripheral archaeological features, the use of heavy equipment for the machining of the upper soil levels at the Karacye 11 cemetery clearly introduced a significant bias to the recovery of material artefacts and animal remains from the upper stratigraphic levels. This was particularly the case for remains that may have been associated with the palaeosol surface level under the kurgan mound structure, which is obviously one of the most important contexts for the recovery of faunal remains deposition.

New Approaches

In this chapter I have attempted to approach many of the questions concerning the mortuary practices of the Early Iron Age in the Middle Tobol River region through a discussion of the interpretation of recovered faunal remains from cemetery sites. Through this process, I was able to identify many of the general problems associated with conventional approaches to the excavation and interpretation of

Early Iron Age kurgan mortuary sites as well as to define more specific issues connected with traditional zooarchaeological methods. While it is clear that the archaeological investigation of Early Iron Age cemetery sites in the Middle-Tobol River region is a well developed one, it is necessary to look forward to the improvement of current approaches regarding the recovery and contextual analysis of zooarchaeological remains.

I feel that through the results of my own field work research I have gained an important awareness for the richness of the faunal record relating to the Early Iron Age mortuary practices. I have also come to understand that this topic is strongly connected to many of the larger questions regarding the socio-political and socio-cultural changes which took place within the complex socio-cultural interface which existed between forest-steppe and steppe populations during the later prehistoric period. Nevertheless, it seems obvious that in order to initiate more sophisticated and detailed approaches to these questions, it will be necessary to raise the current awareness regarding the importance of ritual practices as they relate to socio-cultural change and ethno-cultural identification as well as the significant role that animal sacrifice played within these developments. In order to accomplish this task, the relationship between archaeological theory and field methodology will have to change to meet the requirements of stronger contextual approaches and more detailed investigations of zooarchaeological remains associated with Early Iron Age mortuary sites.

CHAPTER SEVEN

Conclusion:

The Middle Tobol Region in a Wider Context

7.1 Introduction

In this final section of the thesis, I want to bring together many of the significant points that were developed within the previous chapters and to set out the main conclusions of the thesis research. In the introductory chapter, it was stated that as a general theme this thesis was concerned with examining human-animal relationships in the Early Iron Age period. The main objective of this approach was to investigate the theoretical and methodological frameworks conventionally used for the interpretation of animal utilisation among pastoralist societies within the Eurasian steppe Early Iron Age period. Through the evaluation of the effectiveness of these traditional approaches a number of issues were touched on – ranging from hypotheses associated with Early Iron Age economy and socio-political organisation to the interpretation of changing frameworks of ritual and religion. These significant issues were examined from the standpoint of current trends in archaeological theory and specific themes common to zooarchaeological investigation, analysis, and interpretation.

7.2 Conventional Approaches and Traditional Problems

In *Chapter Two*, a discussion of some of the most persistent problems currently confronting Early Iron Age scholarship of the Eurasian steppe region was developed. As viewed from both a theoretical and methodological point of view, the conventional cultural historical approach common to traditional studies of the Eurasian steppe region has created a number of distinct problems for understanding the complexity of late prehistoric socio-cultural developments. More specifically, issues such as prehistoric ethnicity, social organisation, trade and exchange, and ritual and religion have all been approached through strong socio-typological modelling and rigid interpretations of archaeological *cultures*. As argued, this orientation has in effect under acknowledged the complexity of the many historical processes associated with the dynamic changes of the first millennium BC, which relate specifically to questions of migration, societal interaction, and the use of static ethnonymic terminologies. Many of these issues have been traditionally supported through the use of historiography. The hypothesised “Scythian” developments in the Black Sea steppe region were examined with respect to these problems, where it was argued that the interpretation of these developments have been used incorrectly as a template for interpreting other pastoralist societal developments within the greater Eurasian steppe region.

The significance of the Marxist paradigm and its impact on the development of Russian archaeology and Eurasian Iron Age studies was also evaluated in Chapter Two. As noted, Marxist interpretations common to the Soviet Period have not been altogether abandoned in favour of completely new approaches to archaeological research. Rather, a strong cultural historical tradition still provides the primary framework of archaeological analysis and interpretation concerning prehistoric societal developments.

Chapter Three investigated several important issues regarding the social and economic organisation of Early Iron Age pastoralist societies east of the Ural Mountains. The main issue addressed was the conventional application of tribal and chiefdom level models with regard to the development of warrior nomadic societies in the first millennium BC. These significant topics were explored through a discussion of theorised scales of increased interaction, warfare, social stress, and a consideration of the effectiveness of new militaristic technology relating to mounted warfare and socio-political organisation. In connection with these developments, the significance of animal symbolism was examined in relation to concepts of social power, prestige and ideological frameworks.

It was argued that a warrior *ethos* developed in the Early Iron Age, which was linked to specific patterns of animal symbolism and new forms of ritual and mortuary practice. A number of examples was presented, ranging from the Pazyryk tombs of the Altai Mountains to Sauro-Sarmatian burial patterns in the southern Ural Mountain region, in which the variable nature of animal symbolism was connected to changing frameworks of social expression and identity.

The problematic "Scythian Triad" term was also criticised in relation to traditional views on Early Iron Age population migration and *ethnogenetic* developments (i.e. the origin and spread of "Scythians"). Recent perspectives on the archaeology of ethnicity and interpretations of the dynamic boundaries which exist between cultural formations were explored with regard to hypothesised *tribalisation* spheres of interaction between state and non-state societies. It was argued that such new approaches to the interpretation of cultural developments in the Early Iron Age must be constructed in order to examine the complexity and variability reflected in changing patterns of mortuary practices. It was suggested that these developments related specifically to new social institutions, which crosscut more formalised socio-cultural boundaries, and were founded on the effectiveness of mounted warfare. This interpretation contrasted with conventional models that typically scale *ethnonymic* tribal formulations according to a postulated template of vertical stratification for Early Iron Age pastoralist societies.

Chapter Three also investigated the conventional use of problematic socio-economic terminologies such as nomadic and semi-nomadic, which are commonly used within literature focusing on Eurasian steppe pastoralist societies. As discussed, very little progress has been made to date with the systematic testing of these models regarding the variable patterns of settlement which exist for the Early Iron Age period. These problematic terminologies were evaluated through a discussion of ethnoarchaeological research on nomadic pastoralism and the specific problems which exist with the use of direct historical analogies and conventional zooarchaeological approaches to the socio-economic modelling of pastoralist societies. It was suggested that new zooarchaeological methods focusing on stronger contextual interpretations of settlement evidence be integrated with approaches to the archaeology of pastoralist societies and the variable nature of mobile economic regimes.

In *Chapter Four*, a more focused examination of conventional scholarship in the Trans-Ural region of West Siberia was presented and the main models of interpretation for Early Iron Age social and cultural developments were evaluated with regard to traditional cultural historical frameworks of interpretation. An outline of the proposed relative chronology for the region was presented in connection with perceived changes in settlement patterns, mortuary practices, and hypothetical models of ethnogenetic developments during the Gorokhovo-Sargat phase. These interpretations were examined through the discussion of recent trends in archaeological theory, which have emphasised the multivariate nature of culture and the importance of acknowledging the active and vibrant nature of prehistoric ethno-cultural ethnicity and identity. These issues were seen as critical concerns, especially given the suggested high level of Early Iron Age cultural interaction among pastoralist societies within the forest-steppe area of Western Siberia.

Another significant issue addressed was the theorised hierarchical settlement patterning in the Middle Tobol River region. Recent socio-economic models put forward by Matveeva (1993a; 2000a; 2000b) were examined in relation to settlement site evidence and the postulated territorial zones of larger fortified sites. Questions surrounding these developments were reviewed in relation to economic and political organisation models where the usage of terminologies such as chiefdoms and tribal confederations is widespread among scholars (e.g. Koryakova 1988; 1996; Matveeva 1993a; 1993b). Nevertheless, even though these terms are commonly used, very little effort has been made to define more precisely what level of socio-economic organisation they relate to or exactly how these models may be tested with archaeological investigation. These important concerns were addressed more explicitly through the presentation and discussion of three settlement sites (i.e. Baitovo, Prygovo and Malokazakhbaievo) within the Middle Tobol River region, which have been excavated by the French-Russian team and the "Eurasian Crossroads Project" (also discussed in Chapter Four).

Through the discussion of these sites, a number of issues was examined relating to the traditionally used socio-economic models of nomadic, semi-nomadic, and semi-sedentary pastoralism. A thorough discussion of the faunal remains recovered from these sites was evaluated in light of the general species representation and mortality patterns. The examination of these characteristics provided an important foundation for criticising conventional zooarchaeological approaches to Early Iron Age settlement site complexity in the Middle Tobol region. This revealed that the standard models used for investigating hypothetical socio-economic patterns at the sites had been only supported implicitly through the description of the faunal remains and the interpretation of archaeological features. Consequently, no explicit methodological or theoretical framework had been established for testing the scale of economic or social organisation of the fortified sites and their relationship to other regional settlements. As a result, conventionally posited socio-economic models for the Middle Tobol region are presently unsupported by traditional interpretations of the archaeological and zooarchaeological evidence.

7.3 Modelling Settlement Site Complexity

Chapter Five extended the evaluative approach developed in Chapter Four with a more specific focus on the investigation and interpretation of domestic faunal assemblages associated with the Pavlinovo fortified settlement site. A complete overview of the fieldwork and laboratory analysis results from the 1999 and 2001 seasons was presented. The research relating to these field seasons was based on a strong contextual analysis of the intra-site distribution of the recovered animal bone remains and of general questions relating to animal butchery and carcass processing, site taphonomic considerations, herd mortality profiles, and animal bone deposition patterns.

In the first section of Chapter Five, a number of methodological problems was outlined regarding traditional archaeological methods of recovery, analysis and interpretation of faunal materials from Early Iron Age settlement sites. One of the main issues discussed was the typical lack of soil sieving and flotation, which has consistently introduced a significant bias in the recovery of osseous materials and other organic evidence relating to the Early Iron Age economy and Pavlinovo site environment.

Another important methodological concern reviewed was the traditionally incorrect use of NISP and MNI quantification data for the hypothetical modelling of prehistoric herd composition and size. This widespread and problematic issue has led to a great deal of misunderstanding regarding animal husbandry practices and theorised scales of socio-economic organisation for the Iron Age period.

Importantly, the site of Pavlinovo represents one of the large fortified settlements within the Middle Tobol River region and corresponds to the model posited by Matveeva regarding hierarchical territorial zones. Thus, the investigation of Pavlinovo provided an important case study for the examination of the conventional models discussed in Chapter Four regarding Early Iron Age pastoralist economies in the forest-steppe region.

Archaeological excavation at Pavlinovo during 1999 and 2001 produced a significant number of well-preserved animal bone assemblages. These remains were found associated with various Iron Age dwelling structures, pits, and other domestic features within the site. The zooarchaeological analysis of these faunal assemblages represented a methodology in complete contrast to conventional analyses, which typically combine bone remains from all areas of the excavated site area into one assemblage. The new methodology, which focused on a strong contextual approach, generated a substantial range of new data and information for understanding the characteristics and deposition of recovered animal bone materials from the Pavlinovo site:

1) Broad range of mortality patterns represented by the animal remains.

2) Taphonomic characteristics relating to primary and secondary deposition of faunal remains suggest high complexity and variability of site occupation sequences.

3) Clear indications of extensive bone fracturing for marrow exploitation, which is suggestive of possible phases of dietary stress.

4) Lack of distinct evidence for large concentrations of specific animal species and/or skeletal elements, which is suggestive of a smaller domestic scale socio-economic pattern of occupation and settlement organisation.

5) Variable nature of osseous deposits relating to occupation sequences and human activities connected with specific archaeological features (e.g. dwellings).

These results are particularly important for investigating currently hypothesised socio-economic models for the Early Iron Age period within the Trans-Ural region. For example, two general hypothetical models can be suggested for the Early Iron Age socio-economic organisation in the Trans-Ural forest-steppe region:

Model I. A specialised regional or micro-regional economy based on connections between fortified and non-fortified sites organised within a hierarchical structure.

Model II. A lower level of socio-economic organisation relating to smaller populations and less complex settlement and economic activities indicative of the household or extended family level.

With reference to *Model 1*, which generally corresponds to conventional interpretations of the Trans-Ural region, the idea of a specialised pastoral economy connected to the hierarchical patterning of settlement and political structures suggests that fortified sites would have played a special role within greater regional politics and economic organisation. Hypothetically, following such a specialised production model, one might envisage that these sites represented important focal points for population defence, local and long distance trade, centralised livestock production, regional markets, and as storage and redistribution centres for various commodities. These issues can be connected to the idea of a more centralised political structure, such as the model of a chiefdom level society, where a crucial relationship was established between fortified sites and peripheral non-fortified sites within smaller territories or micro-regions.

Following *Model 2*, and based on the zooarchaeological analysis detailed in Chapter Five, the fortified settlement sites appear to reflect a less complex level of social and economic organisation than what has previously been inferred (i.e. Model 1). In this respect, pastoral production might have been restricted to household or extended family levels with larger concentrations of population and herding occurring only in particular instances of stress – for example during warfare or animal herd deficits (e.g. disease, *jute*[1], etc.).

As argued in the concluding section of Chapter Five, the general patterns of bone remains from Pavlinovo and other Middle Tobol River settlements appear to support the second model and favour a much lower level of settlement and socio-economic complexity. This relates to a general pattern of animal utilisation which does not reflect complex deposits associated with specialised production, butchery, and consumption of larger stock herds within a vertically stratified society.

Admittedly, however, these suppositions are based on a limited data set recovered from two field seasons at Pavlinovo and its comparison with other published data from previous excavations at the site and other settlements sites in the Middle Tobol region. Nevertheless, the faunal analysis data are indicative of patterns which do not "fit" present models favouring hierarchical settlement patterns. Further research will be required to answer these questions with more analytical acuity; however, the contextual methodology outlined in Chapter Five clearly provides the range of information and data necessary for the investigation and testing of models relating to settlement site occupation patterns, levels of socio-economic activity, and general characteristics of pastoral production at the sites. Future studies with the application of such new methods will provide an important approach to persistent questions surrounding the organisation and economy of hypothesised stratified pastoralist societies in the Trans-Ural forest-steppe region during the Early Iron Age period.

7.4 Death and Animal Symbolism

In *Chapter Six*, an investigation of the mortuary patterns of the Middle Tobol region was undertaken with a particular emphasis on the discussion of animal bone remains recovered from complex kurgan funerary constructions. This approach was intended to investigate the supposed connection between hierarchical settlement sites, vertically stratified warrior-based societies, and the appearance of corporate cemeteries for the interment of individuals reflecting various levels of the Early Iron Age society.

Common interpretations of the burial sites were reviewed and it was noted that conventional research has emphasised rigid societal interpretations based on hypothesised levels of rank and status. This has been based primarily on the scaling of the size of mortuary sites and the quantity and quality of the associated burial artefacts. With regard to this, the tripartite model put forth by Buldashov (lower, middle, and upper societal levels) was criticised as a traditional example of such conventional approaches for the Gorokhovo period in the Trans-Ural region. Furthermore, it was argued that the rigid typological interpretations of the mortuary sites favoured static indicators of social order and structure across broad temporal and spatial contexts. These traditional approaches did not acknowledge that the

1 - Jute is a term used for the extreme loss of animal stock when late spring freezing conditions kill new grass growth.

burials and ritual practices may reflect a much more complex pattern of Early Iron Age social identity and relationships between the living and the dead.

One of the main issues investigated within Chapter Six was the utilisation of animals within the process of mortuary ritual and the construction of kurgan complexes. Traditional analyses of faunal materials recovered from these sites have clearly not underscored the importance of context, but through the discussion of fieldwork carried out at the Shushye and Karacye cemeteries in 2001 the importance of such an approach was highlighted.

Based on the investigation of conventional interpretations of the animal remains in the cemetery sites, it was suggested that more intensive methods and frameworks of interpretation be applied for understanding death and animal symbolism in the Early Iron Age. While traditional approaches have sought to emphasise the elite status level associated with hypothesised warrior-based societies of the Early Iron Age period, the funerary remains appear more indicative of highly active patterns of social and ethnic identification, particularly relating to the formation of steppe nomadic societies and their patterns of military weaponry and animal art symbolism.

It was therefore posited that the warrior burials within the Trans-Ural region were more reflective of adult men attaining social status through activities such as raiding, warfare, and regional trading rather than as elite members in control of large animal herds and specific territorial spheres in the forest-steppe zone. This interpretation contrasted with traditional views of both settlement patterning and associated mortuary sites, which are believed to relate to the chiefdom level model of socio-political organisation reflecting the control of territorial and domestic livestock production.

As discussed in the conclusion of Chapter Six, based on the variable mortuary patterns and evidence of strong southern steppe contact, the utilisation of warriors (individuals or small groups) from the forest-steppe region in steppe warfare may have been a common occurrence within Early Iron Age political developments in the Eastern steppe region; such events would have stimulated and reinforced shared systems of ritual practice, common warrior ideologies (e.g. animal symbolism), and the overall low density movement of material artefacts from the steppe region. All of these variables are indicative of the mortuary patterns in the forest-steppe region.

7.5 Future Directions

Throughout the thesis, an attempt has been made to define and challenge the conventional interface between the theoretical modelling and archaeological investigation of pastoral societies within Early Iron Age Eurasian steppe research. However, the thesis has also endeavoured to provide a new structure for the application of zooarchaeological approaches to settlement complexity, socio-economic patterns, and the significance of death and animal symbolism within proposed frameworks of socio-political change and ethno-cultural identification. In this respect, the thesis has attempted to bridge a significant gap within the contemporary scholarship of the region. This is particularly the case for the application of zooarchaeological approaches to fieldwork investigation, laboratory analysis, and the contextual interpretation of faunal remains.

As discussed in Chapter Five, a significant part of the zooarchaeological analysis and research with the Pavlinovo settlement is still on-going. Therefore, the results of this thesis can be seen as an important stage within a more progressive approach to the zooarchaeological interpretation of Pavlinovo and for issues connected with the socio-economic modelling of the Early Iron Age period in the Middle-Tobol River region.

Nevertheless, as stressed throughout the thesis, zooarchaeological approaches can only provide one aspect of information regarding the complexity of prehistoric pastoral economic developments. Future data from soil and plant analyses will also help to either support or challenge the interpretations put forward within the thesis on the analysis of the faunal data from Early Iron Age settlement sites.

The completion of current work being developed on site density studies at Pavlinovo will also provide an important data set for examining with more precision settlement occupation sequences and phases of artefact deposition at Pavlinovo. Forthcoming information from radiocarbon analyses as well as completed stratigraphic information from the 1999 and 2001 field seasons will be crucial for the achievement of this work. The correlation of these areas of analysis will establish an important foundation for potential research which will in effect help to extend current understandings of the complexity of Early Iron Age settlement patterns and socio-economic organisation.

Concerning future investigations of Early Iron Age mortuary sites and the interpretation of animal symbolism and ritual practice, one of the most important areas of continuing work relates to the development of a more coherent database for recovered faunal remains from cemetery sites. As noted in Chapter Six, this will in no way be an easy task, as the information for such a study will be drawn from a number of published and unpublished sources. However, such work will provide a crucial basis for understanding in greater detail the important socio-cultural changes which took place within the Early Iron Age period with regard to transitions in traditional ritual practices and the development of new forms of mortuary behaviours. This is an area with strong potential for extending current understandings of later prehistoric societal organisation and ethno-cultural identification and it is one that will be at the centre of future hypotheses on the Gorokhovo-Sargat phase of development.

Finally, the interface between archaeological theory and method is an extremely important issue for archaeological research within Russia and it is a topic which has been approached repeatedly throughout the thesis. While this relationship is seen within Western scholarship as a quite reflexive one, it is generally perceived altogether differently within Russian archaeology.

For example, after giving a presentation at a conference in Russia in 1999, I was approached by a Russian scholar who was of the opinion that there was very little to say about the connection between theory and method in terms of how archaeological fieldwork is carried out. To him, a very standard set of practices was in place for the excavation, recovery, and post-excavation analysis of archaeological sites and associated material cultural remains. Theoretical approaches were simply something that was to be applied at the end of this process.

I, on the other hand, disagreed completely and stressed such important factors as excavation techniques, environmental sampling strategies, and general approaches and choices taken towards the archaeological investigation of prehistoric settlement and mortuary sites. For me, archaeological theory began as soon as the grid stakes were set on site. As such, we were in total disagreement with each other about the relationship between archaeological theory and method.

Therefore, in closing, I feel that this thesis in a general sense represents an important attempt to bridge the gap between Eastern and Western archaeological scholarship. In a more focused way, it also represents an advance forward in terms of my own future research and investigation of Russian prehistory and archaeology. To this end, the thesis has simply opened a doorway to a future path of professional discovery and development…one which I eagerly await.

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Ekaterinburg, Russian Federation
January 14, 2003

APPENDIX # 1

Faunal Analysis Coding System for Identifiable Elements
{after P. T. Miracle}

Pavlinovo 1999, 2001

Shushye & Karacye 2000

Pavlinovo Coding System for Identifiable Elements
(adapted from Pupićina system, Dr. Preston Miracle, Dept. of Archaeology, University of Cambridge)

PTM 3/87
PTM 3/91
PTM 1/96
BKH 7/2010

Field 1
Bone Identification number (Context)

Field 2
X coordinates (in cm taken from SW corner of grid square)

Field 3
Y coordinates (in cm taken from SW corner of grid square)

Field 4
Area in excavation grid (2m x 2m area)

Field 5
Depth (from surface)

Field 6
Depth (from datum)

Field 7
Concentration/UL designation

Field 8
Element Identification

999 indeterminate
001 calvaria (brain case)
002 occipital condyle
003 occipital
.1 paramastoid process
004 sphenoid
005 pterygoid
006 vomer
007 palatine
008 interparietal
009 parietal
010 frontal
011 petrous
012 temporal
013 zygomatic
014 lacrimal
015 nasal
016 antler base
017 antler beam
018 antler tine
019 antler palm
020 n/a
021 n/a
022 horn core
023 antler unidentified
024 hyoid

use same code for all vertebra
.01 complete except for spinous process
.02 centrum and neural area (one or more processes not present)
.03 neural arch only
.04 centrum only
.05 centrum epiphysis indeterminate
.06 centrum epiphysis anterior
.07 centrum epiphysis posterior
.08 odontoid process
.09 spinous process
.10 transverse process
.11 process indeterminate
.12 articular facet (zygapophysis)
.13 sagittal split (indicate side in "symmetry")
.14 transverse split (indicate anterior/posterior in portion present)

025 general vertebra
026 atlas
027 axis
028 cervical vertebra
029 thoracic vertebra
030 lumbar vertebra
031 sacrum
.1 sacral centrum
.2 sacral wing (lateral mass), indicate side in "symmetry"
.3 sacral body (neural area)

.4 sacral apex
.5 sacral fragment indeterminate

032 caudal vertebra
033 rib
.1 head (fused) or epiphysis
.2 neck
.3 head and neck
.4 head, neck, tubercle
.5 tubercle
.6 tubercle and neck
.7 shaft fragment
.8 sternal end

034 costal cartilage
035 sternum
.1 manubrium
.2 sternal body
.3 sternal body segment
.4 xiphoid process

036 scapula
.1 glenoid fossa only
.2 glenoid fossa and blade portion
.3 blade portion
.4 spine fragment
.5 neck
.6 acromion process
.7 coracoid process
.8 epiphysis of scapula

037 clavicle
038 humerus
.1 humerus proximal epiphysis
.2 humerus proximal shaft
.3 humerus proximal end (epiph+shaft)
.4 humerus shaft fragment
.5 humerus shaft with nutrient foramen
.6 humerus distal end (epiph+shaft)
.7 humerus distal shaft
.8 humerus distal epiphysis

039 radius
.1 radius proximal epiphysis
.2 radius proximal shaft
.3 radius proximal end (epiph+shaft)
.4 radius shaft fragment
.5 radius shaft with nutrient foramen
.6 radius distal end (epiph+shaft)
.7 radius distal shaft
.8 radius distal epiphysis

if radius and ulna are fused together, code them separately and indicate in “articulation” that they are fused and weighed together

040 ulna (fused and separate ulna)
.1 ulna proximal epiphysis
.2 ulna proximal shaft
.3 ulna proximal end (epiph+shaft)
.4 ulna shaft fragment
.5 ulna shaft with nutrient foramen
.6 ulna distal end (epiph+shaft)
.7 ulna distal shaft
.8 ulna distal epiphysis

041 carpal
042 radial carpal (scaphoid)
043 intermediate carpal (lunate)
044 ulnar carpal (unciform)
045 accessory carpal (pisiform)
046 first carpal
047 second carpal
048 third carpal
049 fourth carpal
050 radial+intermediate carpal
051 second+third carpal

use same code for all metacarpals
.1 metacarpal proximal epiphysis
.2 metacarpal proximal shaft
.3 metacarpal proximal end (epiph+shaft)
.4 metacarpal shaft fragment
.5 metacarpal shaft with nutrient foramen
.6 metacarpal distal end (epiph+shaft)
.7 metacarpal distal shaft
.8 metacarpal distal epiphysis

052 metacarpal 1
053 metacarpal 2
054 metacarpal 3
055 metacarpal 4
056 metacarpal 5
057 metacarpal 3+4
058 indeterminate metacarpal
059 anterior proximal sesamoid
060 anterior distal sesamoid
061 anterior sesamoid

use same code for portion for all phalanges
.1 phalanx proximal epiphysis
.2 phalanx proximal shaft

.3 phalanx proximal end (epiph+shaft)
.4 phalanx shaft fragment
.5 phalanx shaft with nutrient foramen
.6 phalanx distal end (epiph+shaft)
.7 phalanx distal shaft
.8 phalanx distal epiphysis (no shaft present)

062 anterior phalanx 1
063 anterior phalanx 2
064 anterior phalanx 3
065 anterior phalanx
066 innominate [ilium+ischium+pubis]
067 ilium+ischium
068 ilium+pubis
069 ischium+pubis
070 ilium
.1 acetabular end of ilium
.2
.3 ilium acetabulum+shaft
.4 ilium shaft fragment
.5 ilium shaft with nutrient foramen
.6 ilium shaft+iliac-sacral articulation (wing)
.7 iliac-sacral articulation (wing)
.8 iliac crest

071 ischium
.1 ischial acetabulum portion
.2
.3 ischium acetabulum+shaft
.4 ischium shaft fragment
.5 ischium shaft with nutrient foramen
.6 ischium shaft+ischial tuberosity
.7 iscial tuberosity
.8

072 pubis
.1 pubic acetabulum portion
.2
.3 pubic acetabulum+shaft
.4 pubic shaft fragment
.5 pubic shaft with nutrient foramen
.6 pubic shaft+ventral articulation
.7 ventral articulation of pubis
.8

073 acetabulum
074 baculum
075 femur

for proximal femur, code "medial" if head of femur, code "lateral" if greater trochanter, code "medial+lateral" if both
.1 femur proximal epiphysis
.2 femur proximal shaft
code lesser trochanter as posterior-medial
code third trochanter as posterior-lateral
.3 femur proximal end (epiph+shaft)
.4 femur shaft fragment
.5 femur shaft with nutrient foramen
.6 femur distal end (epiph+shaft)
.7 femur distal shaft
.8 femur distal epiphysis (only condyles present)

076 patella
077 tibia
.1 tibia proximal epiphysis
.2 tibia proximal shaft
tibial crest is anterior, medial+lateral
.3 tibia proximal end (epiph+shaft)
.4 tibia shaft fragment
.5 tibia shaft with nutrient foramen
.6 tibia distal end (epiph+shaft)
.7 tibia distal shaft
.8 tibia distal epiphysis

078 fibula
.1 fibula proximal epiphysis
.2 fibula proximal shaft
.3 fibula proximal end (epiph+shaft)
.4 fibula shaft fragment
.5 fibula shaft with nutrient foramen
.6 fibula distal end (epiph+shaft)
.7 fibula distal shaft
.8 fibula distal epiphysis

079 lateral malleolus
080 astragalus
081 calcaneus
.1 calcaneus articulation with lateral malleolus+cuboid
.2 calcaneus articulation with astragalus
.3 calcaneus articulation with astragalus, lateral malleolus and cuboid
.4 calcaneus shaft fragment
.5 calcaneus shaft with nutrient foramen
.6 calcaneus distal end (epiph+shaft)
.7 calcaneus distal shaft
.8 calcaneus distal epiphysis

082 tarsal
083 central tarsal (navicular)
084 first tarsal

085 second tarsal
086 third tarsal
087 fourth tarsal (cuboid)
088 central+fourth tarsal
089 first+second tarsal
090 second+third tarsal

use same code for all metatarsals
.1 metatarsal proximal epiphysis
.2 metatarsal proximal shaft
.3 metatarsal proximal end (epiph+shaft)
.4 metatarsal shaft fragment
.5 metatarsal shaft with nutrient foramen
.6 metatarsal distal end (epiph+shaft)
.7 metatarsal distal shaft
.8 metatarsal distal epiphysis

091 metatarsal 1
092 metatarsal 2
093 metatarsal 3
094 metatarsal 4
095 metatarsal 5
096 metatarsal 3+4
097 indeterminate metatarsal

use same code for portion for all phalanges
.1 phalanx proximal epiphysis
.2 phalanx proximal shaft
.3 phalanx proximal end (epiph+shaft)
.4 phalanx shaft fragment
.5 phalanx shaft with nutrient foramen
.6 phalanx distal end (epiph+shaft)
.7 phalanx distal shaft
.8 phalanx distal epiphysis (no shaft present)

098 accessory phalanx 1
099 accessory phalanx 2
100 accessory phalanx 3
101 posterior phalanx 1
102 posterior phalanx 2
103 posterior phalanx 3
104 posterior phalanx

use same code for all metapodials
.1 metapodial proximal epiphysis
.2 metapodial proximal shaft
.3 metapodial proximal end (epiph+shaft)
.4 metapodial shaft fragment
.5 metapodial shaft with nutrient foramen
.6 metapodial distal end (epiph+shaft)
.7 metapodial distal shaft
.8 metapodial distal epiphysis

105 accessory metapodial
106 indeterminate metapodial
107 proximal sesamoid
108 distal sesamoid
109 sesamoid

use same code for portion for all phalanges
.1 phalanx proximal epiphysis
.2 phalanx proximal shaft
.3 phalanx proximal end (epiph+shaft)
.4 phalanx shaft fragment
.5 phalanx shaft with nutrient foramen
.6 phalanx distal end (epiph+shaft)
.7 phalanx distal shaft
.8 phalanx distal epiphysis (no shaft present)

110 phalanx 1
111 phalanx 2
112 phalanx 3
113 phalanx
114 loose tooth upper
115 loose tooth lower
116 loose tooth
117 long bone fragment
118 spongy bone
119
120 premaxilla
121 premaxilla with teeth
122 maxilla
123 maxilla with teeth
124 premaxilla+maxilla
125 premaxilla+maxilla with teeth

130 mandibular symphysis
131 mandibular symphysis w/teeth
132 mandibular symphysis+diastema
133 mandibular symphysis+diastema w/incisors
134 alveolar
.1 diastema
.2 diastema with mental foramen
135 alveolar w/teeth
136 alveolar+diastema
137 alveolar+diastema w/teeth
138 mandibular base
.1 mandibular heel
.2 base+heel
139 base+diastema
140 alveolar+base

141 alveolar+base w/teeth
142 alveolar+diastema+base
143 alveolar+diastema+base w/teeth
144 alveolar+diastema+base+symph
145 alveolar+diastema+base+symph w/cheek teeth
146 alveolar+ascending
.1 ascending+heel
.2 ascending
.3 ascending+heel+alveolar
147 alveolar+ascending w/teeth
.1 alveolar+ascending+heel w/teeth
148 articular process
149 coronoid
150 articular+coronoid
.1 articular+coronoid+heel
151 articular+ascending
152 articular+ascending+coronoid
.1 articular+ascending+coronoid+heel
153 ascending+coronoid
154 complete mandible
155 complete mandible w/teeth
156 articular+asceding+coronoid+alveolar+base
157 articular+asceding+coronoid+alveolar+base w/teeth

199 deciduous canine
200 permanent canine
201 upper I1
202 upper I2
203 upper I3
204 upper C
205 upper PM1
206 upper PM2
207 upper PM3
208 upper PM4
209 upper M1
210 upper M2
211 upper M3
212 upper M4
213 upper dI1
214 upper dI2
215 upper dI3
216 upper dC
217 upper dPM1
218 upper dPM2
219 upper dPM3
220 upper dPM4
221 lower I1
222 lower I2
223 lower I3
224 lower C
225 lower PM1
226 lower PM2
227 lower PM3
228 lower PM4
229 lower M1
230 lower M2
231 lower M3
232 lower M4
233 lower dI1
234 lower dI2
235 lower dI3
236 lower dC
237 lower dPM1
238 lower dPM2
239 lower dPM3
240 lower dPM4
241 Upper P3-P4
242 Upper M1-M2
243 Upper P3-M2
244 Upper M2-M3
245 Upper M1-M3
246 Upper incisiform
247 Upper dp3-dp4
251 Lower P3-P4
252 Lower M1-M2
253 Lower P3-M2
254 Lower M2-M3
255 Lower M1-M3
256 Lower incisiform
257 Lower dp3-dp4

300 bird
500 fish
999 indeterminate

Field 9

Species (col. 12-14)

001 smaller than rabbit
002 rabbit-small carnivore
003 small ungulate (caprid, small cervid)
004 medium ungulate (red deer, pig, reindeer, ass)
005 large ungulate (elk, giant deer, horse, bovid, etc.)
006 n/a
007 *Capra hircus*
008 *Ovis aries*
009 *Ovis/Capra*
010 *Rupricapra rupricapra* (Chamois)
011 *Capra Ibex_* (Ibex)
012 *Chamois/Ibex*
013 *Capreolus capreolus_* (roe deer)

014	*Dama dama* (fallow deer)
015	*Dama/Cervus*
016	Cervid
017	*Cervus elaphus* (red deer)
018	*Rangifer tarandus*_ (reindeer)
019	*Alces alces* (European elk)
020	*Megaceros giganteus* (giant deer)
021	large cervid (elk, giant deer)
022	*Sus scrofa* (wild boar)
023	*Sus scrofa domesticus* (domestic pig)
024	*Bison priscus* (steppe bison)
025	*Bos primigenius* (auroch)
026	*Bos/Bison*
027	*Bos taurus*
028	*Dicerorhinos mercki*
029	*Coleodonta antiquatis*
030	*Equus caballus*
031	*Equus hydruntinus*(wild half-ass)
032	*Equus*_sp.
033	Rhino sp.
034	*Dicerorhinus hemitoechus*
035	small-medium sized carnivore
036	n/a
037	large carnivore
038	*Canis lupus* (wolf)
039	*Canis familiaris* (dog)
040	*Canis aureus*_(jackal)
041	*Cuon alpinus* (dhole)
042	*Vulpes vulpes* (red fox)
043	*Alopex lagopus* (arctic fox)
044	*Canis* sp.
045	fox
046	canid
047	n/a
048	*Ursus arctos* (brown bear)
049	*Ursus spelaeus*_(cave bear)
050	*Ursus* sp.
051	n/a
052	*Crocuta crocuta* (spotted hyena)
053	n/a
054	*Felis silvestris* (wild cat)
055	*Felis lynx* (lynx)
056	n/a
057	*Panthera pardus* (leopard)
058	*Panthera leo* (cave lion)
059	*Martes* sp.
060	*Martes martes*_(pine marten)
061	*Martes foina* (beech marten)
062	*Gulo gulo* (wolverine)
063	*Mustela erminea*_ (stoat)
064	*Mustela nivalis* (weasel)
065	*Mustela lutreola* (European mink)
066	*Mustela putorius* (European pole-cat)
067	*Meles meles* (badger)
068	*Lutra lutra* (otter)
069	
070	*Lepus europaeus* (brown hare)
071	*Lepus timidus* (arctic hare)
072	*Lepus* sp.
073	*Erinaceus europaeus* (hedgehog)
074	n/a
075	n/a
076	n/a
077	n/a
078	n/a
079	n/a
080	*Marmota marmota*
081	*Castor fiber*
082	*Cricetus cricetus*
083	n/a
084	n/a
085	n/a
086	n/a
200	Rodent
300	Bird
400	Reptile
500	Fish
999	indeterminate

Field 10

Bone Break Type

1	stepped or columnar
2	sawtoothed or splintered
3	punctured
4	transverse, irregular
5	oblique, irregular
6	transverse, regular
7	oblique, irregular
8	spiral, irregular
9	spiral, regular
10	irregular break
11	longitudinal split
12	grooved
13	cut

Field 11

Recent break

1	recent break, length reduced
2	recent break, length not affected
9	no recent breaks

Field 12
Greatest Length in mm

Field 13
Weight in grams

Field 14
Articulation
1 n/a
2 articulated see succeeding
3 fused with preceding
4 articulated with preceding, weighed together
5 articulated with preceding, weighed separately
6 probably articulated
7 possibly articulated
9 indeterminate/not articulated

Field 15
Side
1 left
2 right
3 right medial/left lateral
4 left medial/right lateral
5 medial
6 both right and left
9 indeterminate

Field 16
Completeness (relative to complete bone) expressed to closest of following percents
10
25
50
75
90
100

Field 17
Portion present (anterior/posterior) (col. 27)
1 anterior portion present
2 central portion present
3 posterior portion present
4 complete anterior-posterior
9 indeterminate

Field 18
Portion present (medial/lateral) (col. 28)
1 medial portion present
2 central portion present
3 lateral portion present
4 complete medial-lateral
9 indeterminate

Field 19
Age Criteria
01 Epiphysis fused
02 Epiphysis fusing (epiphyseal line)
03 Epiphysis unfused
04 proximal fused/distal fused (for vertebra, proximal = anterior, distal = posterior)
05 proximal fused/distal fusing
06 proximal fused/distal unfused
07 proximal fusing/distal fused
08 proximal fusing/distal fusing
09 proximal fusing/distal unfused
10 proximal unfused/distal fused
11 proximal unfused/distal fusing
12 proximal unfused/distal unfused
13-14 n/a
15 cranial sutures fused
16 cranial sutures unfused
17-19 n/a
20 tooth bud (root unformed)
21 n/a
22 erupting tooth
23 n/a
24 open tooth root
25-30 n/a
31 slight or no wear on tooth
32 moderate wear on tooth
33 marked wear on tooth
34 very heavy wear (worn to root)
35 resorption of alveolus
36 deciduous tooth
37 permanent tooth
38 dental arcade with both deciduous and permanent teeth
39 n/a
40 bone texture and/or size
41-49 n/a
50 measurement
51-54 n/a
55 antler/horn development
56-59 n/a
60 arthritic lipping
61-98 n/a
99 indeterminate

Field 20

Relative Age
1-2 n/a
3 fetal/infant
4 n/a
5 subadult
6 adult
8 old adult
9 indeterminate

Field 21
Sex criteria
1 antler or antler pedicle present/absent
2 os penis (baculum)
3 os clitoris
4 metatarsal spur (calcar) (some male birds)
5 bone measurement
6 tooth measurement
7 qualitative morphology
8 medullary bone (females of some bird species)
9 non-applicable or indeterminate

Field 22
Sex
1 male
2 female
9 indeterminate

Field 23
Minimum Number of Elements
1 MNE
9 not MNE

TAPHONOMY

Field 24
Weathering
0 absent
1 slight
2 marked
9 indeterminate

Field 25
Weathering type
0 absent
1 fine line fractures
2 spalling (flaking in planes)
3 root etching
4 chemical etching
5 abrasion (impact of wind and/or waterborne particles)
6 pitting
7 fine line fractures and spalling
8 water wear
9 other form (list in comments)
10 eroded

Field 26
Breakage pattern
0 unbroken
1 angular fracture (dry bone)
2 spiral fracture (green bone)
3 angular and spiral fractures
9 indeterminate

Field 27
Burning
0 unburnt
1 completely calcined (white/gray)
2 partly calcined
3 carbonized (black)
4 partly carbonized
5 burnt (reddish)
6 burnt (shiny)/partly burnt
7 possibly burnt

Field 28
Percentage Burned
10
25
50
75
90
100

Field 29
Split
0 not split
2 split longitudinally into medial/lateral parts
3 split longitudinally into anterior/posterior parts
4 split transversely
5 quartered longitudinally
6 split tranversely and longitudinally

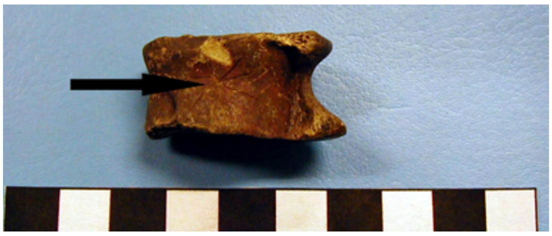
Field 30
Cut Marks
0 absent
Numbering following Binford 1981.

Field 31
Comments

APPENDIX # 2

Bone Tools and Other Specimens

List of Figures



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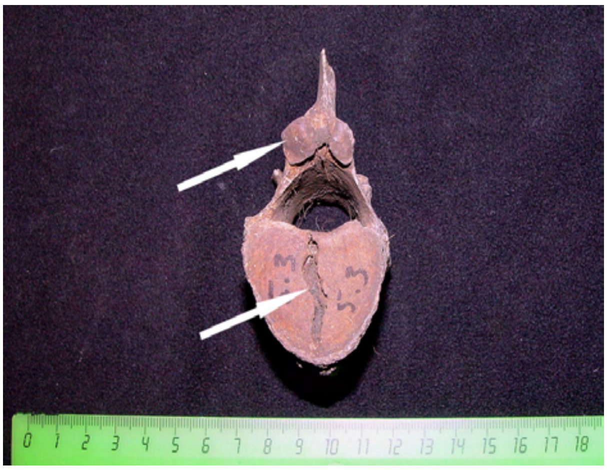

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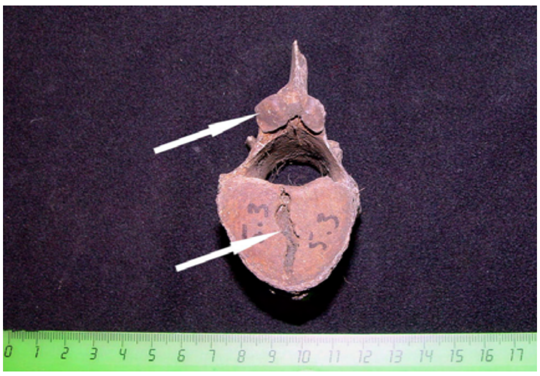

APPENDIX # 3

Element Frequencies

Pavlinovo 1999

{Pav 1999} Upper Levels: Large Ungulate							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Cranium	258	1	0	Ulna	4	2	1
Petrous	7	7	3.5	Pelvis	16	4	2
General vertebra	26	0	0	P-femur	2	1	.5
Atlas	7	3	3	Shft-femur	1	1	.5
Axis	2	1	1	D-femur	2	2	1
Cervical	31	5	1	P-tibia	2	1	.5
Thoracic	38	11	.8	Calcaneus	7	6	3
Lumbar	8	1	.2	Indet. metapodial	3	0	0
Rib	289	1	.03	Phalanx-I	1	1	.1
Scapula	27	10	5	Phalanx-II	1	1	.1
P-humerus	6	5	2.5	Phalanx-III	1	1	.1
D-humerus	4	2	1	Mandible	50	5	2.5
P-radius	6	5	2.5	Lower teeth	1	1	.1
Shft-radius	3	1	.5	Tooth fragments	101	0	0
D-radius	5	2	1	Shaft fragments	753	0	0
				Total	***1,662***	***81***	n/a

{Pav 1999} Upper Levels: Small Ungulate							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Cranium	12	1	.5	D-radius	1	1	.5
General vertebra	8	0	0	D-metacarpal	1	1	.5
Atlas	2	1	1	Pelvis	1	1	.5
Cervical vertebra	5	2	.3	P-femur	1	1	.5
Thoracic vertebra	6	3	.2	Shft-tibia	1	1	0
Lumbar vertebra	1	1	.2	D-tibia	1	1	.5
Caudal vertebra	1	1	.1	Calcaneus	1	1	.5
Rib	19	2	.1	Mandible	2	1	.5
Scapula	4	1	.5	Shaft fragments	113	0	0
D-humerus	2	2	1	Tooth fragments	13	0	0
				Total	***195***	***22***	***0***

{Pav 1999} Upper Levels: Roe Deer *(Capreolus capreolus)*			
Element	**NISP**	**MNE**	**MAU**
D-humerus	2	1	.5
P- radius	1	1	.5
Mandible	2	1	.5
Lower teeth	6	1	.5
Total	***11***	***4***	***n/a***

{Pav 1999} Upper Levels: Horse *(Equus caballus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Cranium	39	1	.5	D-femur	16	4	2
Petrous	14	14	7	Patella	5	5	2.5
Atlas	8	6	6	P-tibia	8	3	1.5
Axis	7	2	2	Shft-tibia	4	4	2
Cervical vertebra	2	2	.4	D-tibia	17	6	3
Thoracic vertebra	8	15	.8	Astragalus	13	11	5.5
Lumbar vertebra	4	1	.2	Calcaneus	22	12	6
Rib	61	15	.4	Tarsals	18	18	2.2
Scapula	16	7	3.5	P-metatarsal	22	5	2.5
P-humerus	4	2	1	Shft-metatarsal	3	1	.5
Shft-humerus	4	1	.5	D-metatarsal	11	4	2
D-humerus	18	11	5.5	#2, # 4 metapod.	11	11	1.4
P-radius	7	4	2	Indet. metapodial	5	0	0
Shft-radius	3	1	.5	P-sesamoid	9	9	1.1
D-radius	18	6	3	D-sesamoid	4	4	1
Ulna	14	6	3	Phalanx-I	76	29	7.2
Carpals	36	36	2.1	Phalanx-II	22	14	7
P-metacarpal	23	10	5	Phalanx-III	20	12	6
Shft-metacarpal	2	0	0	Maxilla	61	8	4
D-metacarpal	29	8	4	Mandible	9	2	1
Pelvis	35	10	5	Upper teeth	95	13	6.5
P-femur	11	6	3	Lower teeth	124	15	7.5
Shft-femur	10	1	.5	Teeth fragments	45	0	0
				Total	***993***	***356***	***n/a***

{Pav 1999} Upper Levels: Sheep/Goat *(Ovis/Capra)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Cranium	5	1	.5	P-femur	2	1	.5
Atlas	4	3	3	Shft-femur	4	4	2
Axis	4	3	3	D-femur	1	1	.5
Cervical vertebra	4	1	.2	Shft-tibia	9	8	4
Thoracic vertebra	3	2	.1	D-tibia	13	9	4.5
Lumbar vertebra	7	7	1	Astragalus	11	11	5.5
Rib	4	1	.03	Calcaneus	8	7	3.5
Scapula	10	6	3	Tarsals	2	2	.2
P-humerus	1	1	.5	P-metatarsal	10	8	4
Shft-humerus	1	1	.5	Shft-metatarsal	3	1	.5
D-humerus	10	8	4	Phalanx-I	6	5	.6
P-radius	6	3	1.5	Phalanx-II	7	5	.6
Shft-radius	4	2	1	Phalanx-III	1	1	.1
D-radius	1	1	.5	Maxilla	3	3	1.5
Ulna	2	1	.5	Mandible	26	4	2
P-metacarpal	4	4	2	Upper teeth	46	8	4
D-metacarpal	12	7	3.5	Lower teeth	74	10	5
Pelvis	15	6	3	Misc. frags	4	0	0
				Total	***327***	***146***	***n/a***

{Pav 1999} Upper Levels: Cow *(Bos taurus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Cranium	22	1	.5	Patella	1	1	.5
Atlas	4	3	3	P-tibia	4	1	.5
Axis	2	1	1	Shft-tibia	4	2	1
Thoracic vertebra	2	2	.2	D-tibia	9	7	3.5
Lumbar vertebra	1	1	.2	Astragalus	9	8	4
Rib	29	4	.2	Calcaneus	8	7	3.5
Scapula	10	2	1	Tarsals	9	9	1.1
P-humerus	1	1	.5	Fibula	3	3	1.5
Shft-humerus	2	1	.5	P-metatarsal	21	16	8
D-humerus	21	9	4.5	Shft-metatarsal	1	1	.5
P-radius	11	11	5.5	D-metatarsal	15	9	4.5
D-radius	9	2	1	Indet. metapodial	5	0	0
Ulna	2	1	.5	P-sesamoid	5	5	.6
Carpals	27	27	2.2	Phalanx-I	36	15	1.8
P-metacarpal	5	5	2.5	Phalanx-II	65	25	3.1
Shft-metacarpal	1	1	.5	Phalanx-III	15	12	1.5
Pelvis	9	4	2	Maxilla	15	1	.5
P-femur	5	4	2	Mandible	54	21	10.5
Shft-femur	4	2	1	Upper teeth	118	19	9.5
D-femur	3	1	.5	Lower teeth	116	14	7
				Total	***683***	***259***	***n/a***

{Pav 1999} Upper Levels: Badger *(Meles meles)*			
Element	**NISP**	**MNE**	**MAU**
Rib	1	1	.5
Total	***1***	***1***	***n/a***

{Pav 1999} Upper Levels: Beaver *(Castor fiber)*			
Element	**NISP**	**MNE**	**MAU**
Teeth	2	1	.5
Total	***2***	***1***	***n/a***

{Pav 1999} Upper Levels: Dog *(Canis familiaris)*			
Element	**NISP**	**MNE**	**MAU**
Crania	1	1	.5
Mandible	1	1	.5
Total	***2***	***2***	***n/a***

{Pav 1999} Upper Levels: Fox *(Vulpes vulpes)*			
Element	**NISP**	**MNE**	**MAU**
Axis	1	1	1
Lumbar vertebra	2	2	
D-femur	1	1	.5
D-humerus	1	1	.5
Mandible	1	1	.5
Total	***6***	***6***	***n/a***

{Pav 1999} Concentration #1: Large Ungulate							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Cranium	1	1	.5	Shft.-radius	1	1	.5
Thoracic vertebra	26	3	.6	Pelvis	1	1	.5
Lumbar vertebra	4	1	.2	D-femur	1	1	.5
Sacrum	5	1	.2	Mandible	17	1	.5
P-humerus	2	1	.5	Shaft fragments	58	0	0
Shft.-humerus	1	1	.5	Rib fragments	12	0	0
P-radius	5	3	1.5	***Totals***	***134***	***15***	***n/a***

{Pav 1999} Concentration # 1: Small Ungulate			
Element	**NISP**	**MNE**	**MAU**
Atlas	2	1	.5
Shaft fragments	12	0	0
Totals	***14***	***1***	***n/a***

{Pav 1999} Concentration # 1: Horse *(Equus caballus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Cranium	6	1	.5	P-tibia	1	1	.5
Cervical vertebra	5	2	.4	D-tibia	5	2	1
Thoracic vertebra	4	3	.2	Astragalus	3	3	1.5
Sacrum	1	1	.2	Tarsals	1	1	.1
Rib	3	1	.02	Calcaneus	7	2	1
Scapula	6	1	.5	P-metatarsal	1	1	.5
Shft-humerus	1	1	.5	D-metatarsal	1	1	.5
D-radius	4	3	1.5	Phalanx-I	3	3	.7
Carpals	7	7	.4	Phalanx-II	3	3	.7
Shft-metacarpal	1	1	.5	Maxilla	1	1	.5
Pelvis	1	1	.5	Mandible	3	1	.5
P-femur	1	1	.5	Upper teeth	5	2	1
Shft-femur	2	1	.5	Lower teeth	1	1	.5
D-femur	1	1	.5	Misc. fragments	2	0	0
Patella	1	1	.5	***Total***	***81***	***48***	***n/a***

{Pav 1999} Concentration #1: Cow *(Bos taurus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Cranium	2	1	.5	D-metatarsal	3	1	.5
Rib	4	3	.1	Phalanx I	4	4	.5
Scapula	1	1	.5	Phalanx II	2	2	.2
Shft.-radius	1	1	.5	Phalanx III	4	2	.2
D-radius	4	1	.5	Mandible	2	1	.5
Carpals	2	2	.2	Upper teeth	1	1	.5
D-femur	1	1	.5	Lower teeth	3	1	.5
D-tibia	2	1	.5	***Totals***	***36***	***23***	***n/a***

{Pav 1999} Concentration #1: Sheep/Goat *(Ovis/Capra)*			
Element	**NISP**	**MNE**	**MAU**
Rib	2	1	.03
Scapula	4	3	1.5
Pelvis	3	2	1
Phalanx I	1	1	.1
Phalanx II	1	1	.1
Mandible	3	1	.5
Lower teeth	8	2	1
Totals	***22***	***11***	***n/a***

{Pav 1999} Concentration #2: Large Ungulate							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Cervical vertebra	4	2	.4	Pelvis	9	1	.5
Thoracic vertebra	8	2	.2	D-femur	1	1	.5
Lumbar vertebra	8	1	.2	P-tibia	2	1	.5
Sacrum	4	1	.2	Misc. tooth frags.	3	0	0
P-humerus	2	1	.5	Mandible	25	1	.5
P-radius	2	1	.5	Shaft fragments	108	0	0
D-radius	1	1	.5	Rib fragments	65	0	0
Ulna	3	1	.5	***Totals***	***245***	***14***	***n/a***

{Pav 1999} Concentration #2: Small Ungulate							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
General vertebra	1	0	0	Scapula	1	1	.5
Axis	1	1	1	P-radius	2	1	.5
Thoracic vertebra	4	1	.1	Pelvis	1	1	.5
Lumbar vertebra	1	1	.2	P-humerus	1	1	.5
Sacrum	1	1	.2	Phalanx II	2	2	.2
Rib	34	1	.04	Shaft fragments	56	0	0
				Totals	***105***	***11***	***n/a***

{Pav 1999} Concentration #2: Horse *(Equus caballus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Cranium	1	1	.5	Astragalus	3	3	1.5
Thoracic vertebra	4	1	.1	Tarsals	1	1	.1
Rib	6	3	.1	Metatarsal (whole)	1	1	.5
Scapula	1	1	.5	P-metatarsal	2	1	.5
D-humerus	1	1	.5	Shft.-metatarsal	1	1	.5
Shft.-radius	1	1	.5	D-metatarsal	1	1	.5
D-radius	1	1	.5	# 2, # 4 metapod.	2	2	.2
P-metacarpal	1	1	.5	P-sesamoids	2	2	.2
Pelvis	1	1	.5	Phalanx I	7	3	.7
Shft.-femur	1	1	.5	Phalanx II	7	7	1.7
D-femur	1	1	.5	Phalanx III	5	5	1.7
Patella	1	1	.5	Lower teeth	4	1	.5
D-tibia	6	3	1.5	***Totals***	***62***	***45***	***n/a***

{Pav 1999} Concentration #2: Cow *(Bos taurus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Thoracic vertebra	1	1	.1	Astragalus	2	2	1
Sacrum	1	1	.2	Tarsals	1	1	.1
Scapula	1	1	.5	P-metatarsal	3	1	.5
P-radius	2	2	1	Indet. metapoidal	2	0	0
Ulna	2	2	1	Phalanx I	2	2	.2
Pelvis	1	1	.5	Phalanx II	1	1	.1
P-femur	1	1	.5	Phalanx III	2	2	.2
Shft.-femur	1	1	.5	Upper teeth	2	1	.5
P-tibia	1	1	.5	Lower teeth	1	1	.5
				Totals	***27***	***22***	***n/a***

{Pav 1999} Concentration #2: Sheep/Goat *(Ovis/Capra)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Axis	2	1	1	Shft.-tibia	3	3	.5
Thoracic vertebra	2	1	.1	Calcaneus	1	1	.5
Lumbar vertebra	3	3	.5	Tarsals	1	1	.1
Rib	1	1	.04	P-metatarsal	3	3	.5
Scapula	1	1	.5	Indet. metapoidal	2	0	0
Shft.-radius	1	1	.5	Phalanx I	1	1	.1
Pelvis	4	1	.5	Phalanx II	1	1	.1
P-femur	1	1	.5	Upper teeth	4	1	.5
D-femur	1	1	.5	Lower teeth	1	1	.5
				Totals	***34***	***24***	***n/a***

{Pav 1999} Concentration #2: Roe Deer *(Capreolus capreolus)*			
Element	**NISP**	**MNE**	**MAU**
Pelvis	1	1	.5
D-tibia	2	1	.5
Totals	***3***	***2***	***n/a***

{Pav 1999} Concentration #4 Large Ungulate			
Element	**NISP**	**MNE**	**MAU**
General vertebra	4	0	0
Thoracic vertebra	1	1	.1
Lumbar vertebra	3	1	.1
Sacrum	3	1	.2
Rib	22	1	.04
P-radius	1	1	.5
Shft.-radius	1	1	.5
P-tibia	1	1	.5
Shaft fragments	52	0	0
Totals	***88***	***7***	***n/a***

{Pav 1999} Concentration #4 Small Ungulate			
Element	**NISP**	**MNE**	**MAU**
General vertebra	4	0	0
Axis	1	1	1
Cervical vertebra	4	1	.2
Thoracic vertebra	2	1	.1
P-femur	1	1	.5
Shaft fragments	15	0	0
Rib fragments	8	0	0
Totals	***35***	***4***	***n/a***

{Pav 1999} Concentration #4: Horse *(Equus caballus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Crania	1	1	.5	P-tibia	2	1	.5
Thoracic vertebra	7	7	.4	Shft.-tibia	1	1	.5
Lumbar vertebra	5	1	.2	D-tibia	1	1	.5
Sacrum	1	1	.2	Fibula	1	1	.5
Rib	13	7	.2	Astragalus	2	2	1
Scapula	2	1	.5	Calcaneus	2	2	1
P-radius	2	2	1	P-metatarsal	1	1	.5
D-radius	2	2	1	#2, #4 metatarsal	2	2	.2
Ulna	1	1	.5	P-sesamoid	3	3	.4
P-metatarsal	3	1	.5	Phalanx I	1	1	.2
P-femur	1	1	.5	mandible	4	1	.2
Shft.-femur	2	1	.5	Lower teeth	1	1	.5
D-femur	1	1	.5	***Totals***	***61***	***44***	***n/a***

{Pav 1999} Concentration #4: Cow *(Bos taurus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Atlas	1	1	1	P-metatarsal	1	1	.5
Rib	5	2	.1	D-metatarsal	2	1	.5
Carpals	1	1	.1	P-sesamoid	2	2	.2
Pelvis	4	3	1.5	D-sesamoid	1	1	.2
P-tibia	1	1	.5	Phalanx I	4	3	.4
D-Tibia	2	2	1	Phalanx II	1	1	.1
Fibula	1	1	.5	Phalanx III	1	1	.1
				Totals	***27***	***21***	***n/a***

{Pav 1999} Concentration # 4 Sheep/Goat *(Ovis/Capra)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Cervical vertebra	1	1	.2	P-metatarsal	2	1	.5
Thoracic vertebra	3	3	.6	Shft.-metatarsal	2	2	1
Lumbar vertebra	5	5	1	D-metatarsal	4	2	1
Sacrum	1	1	.2	Phalanx I	7	7	.9
Rib	1	1	0	Phalanx II	2	2	.2
Scapula	1	1	.5	Phalanx III	1	1	.1
Shft.-radius	2	1	.5	Maxilla	1	1	.5
P-metacarpal	3	2	1	Mandible	7	2	1
D-tibia	2	2	1	Upper teeth	4	1	.5
Tarsals	1	1	.1	Lower teeth	10	2	1
				Totals	***60***	***39***	***n/a***

{Pav 1999} Concentration #4 Roe Deer *(Capreolus capreolus)*			
Element	**NISP**	**MNE**	**MAU**
Scapula	2	2	1
P-humerus	1	1	.5
Shft.-humerus	1	1	.5
P-tibia	2	1	.5
D-tibia	2	1	.5
Totals	***8***	***6***	***n/a***

{Pav 1999} Concentration # 5 Large Ungulate							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Antler beam	1	1	.1	D-radius	3	1	.5
General vertebra	27	5	.4	Pelvis	21	4	2
Cervical vertebra	16	3	.6	Shft.-femur	1	1	.5
Thoracic vertebra	6	2	.1	D-femur	2	1	.5
Lumbar vertebra	11	4	.7	P-tibia	2	1	.5
Sacrum	3	1	.2	Shft.-tibia	1	1	.5
Caudal vertebra	3	1	.05	Calcaneus	4	1	.5
Rib	147	1	.04	Mandible	12	1	.5
P-humerus	2	1	.5	Shaft fragments	169	0	0
P-radius	6	3	1.5	***Totals***	***437***	***31***	***n/a***

{Pav 1999} Concentration #5 Small Ungulate							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Crania	2	1	.5	Rib	24	1	.04
General vertebra	10	0	0	Ulna	1	1	.5
Cervical vertebra	2	2	.4	Shft.-femur	1	1	.5
Thoracic vertebra	3	1	.1	Shft.-tibia	1	1	.5
Lumbar vertebra	3	3	.5	P-metatarsal	1	1	.5
Caudal vertebra	1	1	.06	Shaft fragments	21	0	0
				Totals	***70***	***13***	***n/a***

{Pav 1999} Concentration #5: Horse *(Equus caballus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Crania	1	1	.5	Shft.-femur	9	4	2
Atlas	5	5	5	Patella	2	2	1
Axis	3	3	3	P-tibia	3	1	.5
Thoracic vertebra	5	4	.8	Shft.-tibia	1	1	.5
Rib	17	6	.2	D-tibia	6	2	2
Scapula	11	4	2	Astragalus	6	3	3
Shft.-humerus	1	1	.5	Calcaneus	4	3	1.5
D-humerus	2	2	1	P-metatarsal	4	1	.5
P-radius	1	1	.5	Shft.-metatarsal	1	1	.5
Shft.-radius	1	1	.5	D-metatarsal	6	2	1
D-radius	8	5	2.5	Indet. metapodial	7	0	0
Ulna	1	1	.5	Phalanx I	20	11	2.8
Carpals	20	20	1.3	Phalanx II	3	3	.8
P-metacarpal	2	2	1	Phalanx III	6	6	1.5
D-metacarpal	5	3	1.5	Maxilla	2	1	.5
P-sesamoid	4	4	.5	Mandible	4	2	1
D-sesamoid	1	1	.3	Upper teeth	17	2	1
Pelvis	13	8	4	Lower teeth	12	2	1
P-femur	5	1	.5	***Totals***	***219***	***126***	***n/a***

{Pav 1999} Concentration #5 Cow *(Bos taurus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Atlas	3	3	3	Astragalus	5	5	2.5
Cervical vertebra	1	1	.2	Calcaneus	4	2	1
Rib	7	7	.3	Tarsals	1	1	.1
Scapula	1	1	.5	P-sesamoid	3	3	.4
Shft.-humerus	1	1	.5	Phalanx I	4	3	.4
D-humerus	2	1	.5	Phalanx II	4	3	.4
Ulna	2	2	1	Phalanx III	2	2	.2
Carpals	1	1	.1	Maxilla	2	2	1
P-metacarpal	1	1	.5	Mandible	3	1	.5
P-tibia	1	1	.5	Upper teeth	6	1	.5
D-tibia	2	1	.5	Lower teeth	6	3	1.5
				Totals	***62***	***46***	***n/a***

{Pav 1999} Concentration #5: Sheep/Goat *(Ovis/Capra)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Axis	1	1	1	Shft.-femur	2	1	.5
Thoracic vertebra	2	2	.1	Shft.-Tibia	1	1	.5
Lumbar vertebra	7	7	1	D-tibia	4	2	1
Rib	4	4	.1	Astragalus	1	1	.5
Scapula	4	3	1.5	Calcaneus	4	2	1
D-humerus	2	2	1	Tarsals	3	3	.4
P-radius	4	4	2	D-metatarsal	2	2	1
Shft.-radius	1	1	.5	Phalanx I	2	2	.2
Ulna	2	2	1	Phalanx II	1	1	.1
Carpals	1	1	.1	Phalanx III	1	1	.1
P-metacarpal	1	1	.5	Maxilla	2	1	.5
D-metacarpal	3	3	1.5	Mandible	1	1	.5
Pelvis	1	1	.5	Upper teeth	16	5	2.5
P-femur	1	1	.5	Lower teeth	7	2	1
				Totals	***81***	62	***n/a***

{Pav 1999} Concentration #5 Goat *(Capra hircus)*			
Element	**NISP**	**MNE**	**MAU**
Axis	1	1	1
Scapula	1	1	.5
Totals	***2***	***2***	***n/a***

{Pav 1999} Concentration #5 Elk *(Alces alces)*			
Element	**NISP**	**MNE**	**MAU**
Antler base	2	2	1
Antler beam	9	9	1.5
Antler tine	4	4	.3
Totals	***15***	***15***	***n/a***

{Pav 1999} Concentration #5 Beaver *(Castor fiber)*			
Element	**NISP**	**MNE**	**MAU**
Rib	1	1	.1
Scapula	1	1	.5
P-tibia	1	1	.5
Shft.-Tibia	1	1	.5
Fibula	1	1	.5
Totals	***5***	***5***	***n/a***

{Pav 1999} Concentration #5 Arctic Hare *(Lepus timidus)*			
Element	**NISP**	**MNE**	**MAU**
P-radius	1	1	.5
D-radius	1	1	.5
Ulna	1	1	.5
P-tibia	1	1	.5
Totals	***4***	***4***	***n/a***

{Pav 1999} Concentration #6 Large Ungulate							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Atlas	1	1	1	Scapula	1	1	.5
Axis	1	1	1	Shft.-radius	2	1	.5
Cervical vertebra	2	1	.2	Shft.-femur	2	1	.5
Thoracic vertebra	2	1	.1	Mandible	1	1	.5
Lumbar vertebra	1	1	.2	Shaft fragments	57	0	0
Rib	12	1	.04	***Totals***	***82***	***10***	***n/a***

{Pav 1999} Concentration #6 Small Ungulate			
Element	**NISP**	**MNE**	**MAU**
Crania	1	1	.5
General vertebra	2	0	0
Cervical vertebra	2	1	.2
Thoracic vertebra	2	1	.1
Lumbar vertebra	6	5	.7
Sacrum	3	1	.2
Scapula	1	0	0
Shaft fragments	10	0	0
Rib fragments	25	1	.04
Totals	***52***	***10***	***n/a***

{Pav 1999} Concentration #6: Horse *(Equus caballus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Crania	4	1	.5	Astragalus	1	1	.5
Petrous	1	1	.5	Calcaneus	2	2	1
Cervical vertebra	3	2	.4	Mandible	17	1	.5
Sacrum	1	1	.2	Lower teeth	13	2	1
Scapula	1	1	.5	Incisor form	1	0	0
Ulna	2	2	1	Misc. shft. frags	5	0	0
Pelvis	1	1	.5	***Totals***	***52***	***15***	***n/a***

{Pav 1999} Concentration # 6 Sheep/Goat *(Ovis/Capra)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Axis	4	4	4	Pelvis	1	1	.5
Cervical vertebra	1	1	.2	P-femur	2	1	.5
Thoracic vertebra	3	3	.2	Shft.-tibia	2	2	1
Shft.-radius	1	1	.5	D-tibia	1	1	.5
Ulna	2	1	.5	P-metatarsal	1	1	.5
P-metacarpal	1	1	.5	Lower teeth	1	1	.5
				Totals	***20***	***18***	***n/a***

{Pav 1999} Concentration # 6 Roe Deer *(Capreolus capreolus)*			
Element	**NISP**	**MNE**	**MAU**
P-radius	1	1	.5
Totals	***1***	***1***	***n/a***

{Pav 1999} Concentration #6 Arctic Hare *(Lepus timidus)*			
Element	**NISP**	**MNE**	**MAU**
Calcaneus	2	2	1
Metatarsal	1	1	.1
Phlanax I	2	2	.3
Totals	***5***	***5***	***n/a***

{Pav 1999} Concentration #7 Large Ungulate							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Crania	2	1	.5	P-radius	1	1	.5
General vertebra	9	1	.07	Shft.-radius	1	1	.5
Cervical vertebra	1	1	.2	P-Tibia	1	1	.5
Thoracic vertebra	3	1	.1	Mandible	1	1	.5
Lumbar vertebra	2	1	.2	Tooth frags.	1	0	0
Rib	23	1	.04	Shft. frags	3	0	0
Scapula	1	1	.5	Shaft frags	98	0	0
				Totals	***147***	***11***	***n/a***

{Pav 1999} Concentration #7 Small Ungulate			
Element	**NISP**	**MNE**	**MAU**
Thoracic vertebra	2	1	.1
Rib	71	1	.04
Scapula	1	1	.5
Ulna	1	1	.5
Tibia	1	1	.5
Shft.-frag.	20	0	0
Totals	***96***	***5***	***n/a***

{Pav 1999} Concentration #7: Horse *(Equus caballus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Crania	14	1	1	D-femur	3	2	1
Cervical vertebra	10	2	.4	Patella	1	1	.5
Thoracic vertebra	1	1	.1	P-tibia	1	1	.5
Rib	2	2	.05	D-tibia	4	1	.5
Scapula	5	4	2	Fibula	1	1	.5
Shft.-humerus	1	1	.5	D-metatarsal	1	1	.5
D-humerus	4	2	1	#2, #4 metapodial	3	3	.4
Shft.-radius	1	1	.5	P-sesamoid	5	5	.6
D-radius	1	1	.5	D-sesamoid	3	3	.7
Carpals	9	9	.6	Phalanx I	4	1	.2
Metacarpal	1	1	.5	Phalanx II	3	3	.7
D-metacarpal	1	1	.5	Phalanx III	1	1	.2
Pelvis	4	3	1.5	Maxilla	1	1	.5
P-femur	2	1	.5	Upper teeth	9	3	1.5
Shft.-femur	2	1	.5	Shft. frags.	1	0	0
				Totals	**99**	**58**	**n/a**

{Pav 1999} Concentration #7 Cow *(Bos taurus)*			
Element	**NISP**	**MNE**	**MAU**
Shft.-humerus	1	1	.5
Mandible	2	2	1
Upper teeth	1	1	.5
Totals	***4***	***4***	***n/a***

{Pav 1999} Concentration #7: Sheep/Goat *(Ovis/Capra)*			
Element	**NISP**	**MNE**	**MAU**
P-radius	1	1	.5
Pelvis	2	2	1
Shft.-tibia	1	1	.5
D-tibia	1	1	.5
P-metatarsal	1	1	.5
Mandible	2	1	.5
Lower teeth	6	1	.5
Totals	***14***	***8***	***n/a***

{Pav 1999} Concentration #8 Large Ungulate							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Petrous	1	1	.5	Scapula	5	1	.5
Crania	2	1	.5	P-radius	3	1	.5
General vertebra	3	0	0	Ulna	4	2	1
Atlas	1	1	1	Shft.-metatarsal	1	1	.5
Axis	4	2	2	P-tibia	3	1	.5
Cervical vertebra	9	6	1.2	Maxilla	1	1	.5
Thoracic vertebra	7	1	.1	Mandible	6	3	1.5
Lumbar vertebra	10	3	.4	Shaft fragments	73	0	0
Sacrum	1	1	.3	Rib fragments	44	0	0
				Totals	***178***	***27***	***n/a***

{Pav 1999} Concentration #8 Small Ungulate			
Element	**NISP**	**MNE**	**MAU**
Rib fragments	26	0	0
Total	***26***	***0***	***N/A***

{Pav 1999} Concentration #8: Horse *(Equus caballus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Thoracic vertebra	3	3	.2	Carpals	1	1	.1
Rib	1	1	.03	Shft.-femur	2	2	1
Scapula	1	1	.5	P-metacarpal	1	1	.5
P-humerus	1	1	.5	Phalanx I	1	1	.5
Shft.-humerus	1	1	.5	Upper teeth	1	1	.5
				Totals	***13***	***13***	***n/a***

{Pav 1999} Concentration #8: Cow *(Bos taurus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Crania	3	1	1	Shft.-tibia	4	3	1.5
Atlas	1	1	1	D-tibia	1	1	.5
Rib	14	4	.1	Fibula	1	1	.5
Scapula	2	2	1	Astragalus	1	1	.5
Shft.-humerus	2	1	.5	Calcaneus	2	2	1
D-humerus	3	3	1.5	Tarsals	2	2	.2
P-radius	7	6	3	P-metatarsal	8	1	.5
D-radius	4	2	1	Shft.-metatarsal	1	1	.5
Ulna	4	3	1.5	D-metatarsal	4	3	1.5
Carpals	1	1	.1	Phalanx I	4	1	.1
P-metacarpal	4	4	2	Phalanx II	3	3	.4
Shft.-metacarpal	1	1	.5	Phalanx III	1	1	.1
Pelvis	6	4	2	Maxilla	3	1	.5
P-femur	3	3	1.5	Mandible	7	1	.5
D-femur	2	1	.5	Upper teeth	15	3	1.5
P-tibia	7	1	.5	Lower teeth	9	2	1
				Totals	***130***	***65***	***n/a***

{Pav 1999} Concentration # 8 Sheep/Goat*(Ovis/Capra)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Rib	1	1	0	Maxilla	1	1	.5
D-radius	2	2	1	Mandible	2	2	1
Pelvis	1	1	.5	Lower teeth	6	2	1
Calcaneus	1	1	.5	Upper teeth	5	1	.5
				Totals	***19***	***11***	***n/a***

{Pav 1999} Concentration #8 Sheep *(Ovis aries)*			
Element	**NISP**	**MNE**	**MAU**
Crania	2	1	.5
Scapula	1	1	.5
Totals	***3***	***2***	***n/a***

{Pav 1999} Concentration #8 Goat *(Capra hircus)*			
Element	**NISP**	**MNE**	**MAU**
Scapula	1	1	.5
Ulna	1	1	.5
Totals	***2***	***2***	***n/a***

{Pav 1999} Concentration #9 Large Ungulate			
Element	**NISP**	**MNE**	**MAU**
General vertebra	7	1	.08
Rib	1	1	.04
Shaft fragments	3	0	0
Totals	***11***	***2***	***n/a***

{Pav 1999} Concentration #9: Horse *(Equus caballus)*			
Element	**NISP**	**MNE**	**MAU**
Lumbar vertebra	3	3	.5
P-metacarpal	1	1	.5
Mandible	5	2	1
Lower teeth	8	2	1
Totals	***17***	***8***	***n/a***

{Pav 1999} Concentration #9: Cow *(Bos taurus)*			
Element	**NISP**	**MNE**	**MAU**
Mandible	1	1	.5
Lower teeth	5	1	.5
Totals	***6***	***2***	***n/a***

{Pav 1999} Concentration # 9 Sheep/Goat *(Ovis/Capra)*			
Element	**NISP**	**MNE**	**MAU**
Pelvis	1	1	.5
Astragalus	1	1	.5
Totals	***2***	***2***	***n/a***

{Pav 1999} Concentration #10 Large Ungulate			
Element	**NISP**	**MNE**	**MAU**
Cervical vertebra	1	1	.2
Lumbar vertebra	3	1	.2
Rib	4	1	0
Shaft fragments	11	0	0
Totals	***19***	***3***	***n/a***

{Pav 1999} Concentration #10: Horse *(Equus caballus)*			
Element	**NISP**	**MNE**	**MAU**
Atlas	1	1	1
Cervical vertebra	1	1	.2
Rib	1	1	0
Phalanx II	1	1	.2
Phalanx III	1	1	.2
Totals	***5***	***5***	***n/a***

{Pav 1999} Concentration #10: Cow *(Bos taurus)*			
Element	**NISP**	**MNE**	**MAU**
D-metatarsal	1	1	.5
P-femur	1	1	.5
Phalanx I	1	1	.1
Phalanx III	1	1	.1
Upper teeth	1	1	.5
Totals	***5***	***5***	***n/a***

Appendix # 4

Element Frequencies

Pavlinovo 2001

Upper Levels, Concentration # 1, # 2, Pit Feature # 1

{PAV 2001} UPPER LEVELS: LARGE UNGULATE							
Element	**NISP**	**MNE**	**MAU**	**Bone**	**NISP**	**MNE**	**MAU**
Crania	2	1	.5	P-radius	3	1	.5
Petrous	1	1	.5	Shft.-radius	3	1	.5
Hyoid	1	1	.5	Pelvis	17	1	.5
General vertebra	20	1	0	D-femur	3	1	.5
Cervical	4	2	.4	Shft.-tibia	1	1	.5
Thoracic vertebra	10	3	.2	Calcaneus	2	1	.5
Lumbar vertebra	5	2	.3	Phalanx I	1	1	.1
Sacrum	1	1	.2	Mandible	11	3	1.5
Caudal vertebra	5	4	.2	Lower teeth	1	0	0
Ribs	3	2	.1	Tooth fragments	8	0	0
Scapula	7	1	.5	***Total***	***111***	***29***	***n/a***

{Pav.2001} Upper Levels: Small Ungulate							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
General vertebra	1	0	0	Shft-radius	1	1	.5
Axis	1	1	1	Pelvis	1	1	.5
Thoracic vertebra	2	1	.1	P-femur	1	1	.5
Lumbar vertebra	2	2	.3	Shft-femur	1	1	.5
Ribs	4	0	0	Astragalus	1	1	.5
Scapula	5	1	.5	Lower teeth	1	1	.5
				Totals	***21***	***11***	***n/a***

{Pav.2001} Upper Levels: Arctic Hare *(Lepus timidus)*			
Element	**NISP**	**MNE**	**MAU**
P-femur	1	1	.5
Indet. metapodial	1	1	.5
Totals	***2***	***2***	***n/a***

{Pav.2001} Upper Levels: Roe Deer *(Capreolus capreolus)*			
Element	**NISP**	**MNE**	**MAU**
Scapula	1	1	.5
D-humerus	1	1	.5
Pelvis	1	1	.5
Astragalus	1	1	.5
Totals	***4***	***4***	***n/a***

{Pav.2001} Upper Levels: Horse *(Equus caballus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Crania	3	0	0	Patella	4	4	2
Petrous	1	1	.5	P-tibia	1	1	.5
General vertebra	2	0	0	Shft-tibia	3	3	1.5
Atlas	2	2	2	D-tibia	9	7	3.5
Cervical vertebra	6	1	.2	Astragalus	11	8	4
Thoracic vertebra	2	2	.1	Calcaneus	14	10	5
Lumbar vertebra	3	2	.2	Tarsals	12	2	.3
Ribs	1	1	.0	P-metatarsal	5	4	2
Scapula	3	2	1	Shft-metatarsal	1	0	0
Shft-humerus	2	3	1.5	D-metatarsal	7	3	1.5
D-humerus	1	2	1	#2, #4 metapodial	4	3	.4
P-radius	1	1	.5	Indet. metapodial	5	0	0
D-radius	9	1	.5	P-sesamoid	12	12	1.5
Ulna	3	3	1.5	D-sesamoid	1	1	.2
Carpals	23	3	.2	Phalanx I	22	13	3.2
P-metacarpal	6	6	3	Phalanx II	15	9	2.2
Shft-metacarpal	1	0	0	Phalanx III	6	4	1
D-metacarpal	5	2	1	Maxilla	1	1	.5
Pelvis	17	3	1.5	Mandible	22	5	2.5
P-femur	6	4	2	Upper teeth	26	4	2
Shft-femur	7	5	2.5	Lower teeth	36	6	3
D-femur	4	1	.5	Tooth frags.	19	0	0
				Totals	***337***	***145***	***n/a***

{Pav.2001} Upper Levels: Cow *(Bos taurus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Crania	7	0	0	D-tibia	5	5	2.5
Petrous	1	1	.5	D-fibula	1	1	.5
Hyoid	1	0	0	Astragalus	1	1	.5
Ribs	3	1	.0	Calcaneus	3	3	1.5
Scapula	12	4	2	Tarsals	7	4	.5
P-humerus	2	1	.5	P-metatarsal	2	2	1
Shft-humerus	3	3	1.5	D-metatarsal	1	1	.5
D-humerus	2	1	.5	Indet. metapodial	5	0	0
P-radius	4	3	1.5	P-sesamoids	3	3	.4
D-radius	2	2	1	D-sesamoids	2	2	.2
Ulna	5	5	2.5	Phalanx I	11	7	.9
Carpals	9	9	.7	Phalanx II	3	3	.4
P-metacarpal	8	4	2	Phalanx III	4	4	.5
D-metacarpal	2	2	1	Maxilla	6	0	0
Pelvis	3	1	.5	Mandible	21	3	1.5
P-femur	2	2	1	Upper teeth	32	5	2.5
Shft-femur	2	1	.5	Lower teeth	30	4	2
P-tibia	5	3	1.5	Tooth frags.	12	0	0
Shft-tibia	1	1	.5	***Totals***	***223***	***92***	***n/a***

{Pav.2001} Upper Levels: Sheep/Goat *(Ovis/Capra)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Thoracic vertebra	3	3	.2	Astragalus	7	7	3.5
Ribs	1	1	0	Calcaneus	3	3	1.5
Scapula	2	1	.5	Tarsals	2	2	.2
D-humerus	3	3	1.5	P-metatarsal	2	2	1
P-radius	1	0	0	Indet. metapodial	1	0	0
Shft-radius	3	3	1.5	Phalanx I	6	6	.7
Carpals	2	2	.2	Phalanx II	3	3	.3
Pelvis	4	2	1	Maxilla	1	1	.5
P-femur	1	1	.5	Mandible	9	3	1.5
Shft-femur	1	1	.5	Upper teeth	15	2	1
Shft-tibia	4	2	1	Lower teeth	16	3	1.5
D-tibia	2	2	1	Tooth frags.	3	0	0
				Totals	***95***	***53***	***n/a***

{Pav.2001} Upper Levels: Goat *(Capra hircus)*			
Element	**NISP**	**MNE**	**MAU**
Pelvis	1	1	.5
Totals	***1***	***1***	***n/a***

{Pav.2001} Upper Levels: Dog *(Canis familiaris)*			
Element	**NISP**	**MNE**	**MAU**
Shft-tibia	1	1	.5
Totals	***1***	***1***	***n/a***

{Pav.2001} Upper Levels: Beaver *(Castor fiber)*			
Element	**NISP**	**MNE**	**MAU**
Shft.-tibia	1	1	.5
Totals	***1***	***1***	***n/a***

{Pav.2001} Upper Levels: Red Fox *(Vulpes vulpes)*			
Element	**NISP**	**MNE**	**MAU**
Maxilla	1	1	.5
Mandible	4	2	1
Upper teeth	6	1	.5
Lower teeth	2	1	.5
Totals	***13***	***5***	***n/a***

{Pav.2001} Concentration # 1: Cow *(Bos taurus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
General vertebra	1	0	0	Calcaneus	1	1	.5
Scapula	1	1	.5	Tarsals	2	2	.2
D-humerus	1	1	.5	P-metatarsal	1	1	.5
P-ulna	1	1	.5	Phalanx I	3	3	.4
Carpals	1	1	.5	Phalanx III	3	3	.4
P-metacarpal	2	1	.5	Lower teeth	1	1	.5
Astragalus	1	1	.5	***Totals:***	***19***	***17***	***n/a***

{Pav.2001} Concentration # 1: Horse *(Equus caballus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Thoracic vertebra	1	1	.05	D-metatarsal	1	1	.5
Caudal vertebra	2	1	.06	#2, #4 metapodial	4	4	.5
Ribs	5	1	.03	Proximal sesamoid	6	6	.7
Scapula	1	1	.5	Phalanx I	1	1	.2
D-radius	3	2	1	Phalanx II	1	1	.2
P-metacarpal	1	1	.5	Mandible	1	1	.5
Pelvis	1	1	.5	Upper teeth	5	1	.5
P-femur	1	1	.5	***Total***	***34***	***24***	***n/a***

{Pav.2001} Concentration # 1: Large Ungulate			
Element	**NISP**	**MNE**	**MAU**
Crania	1	1	.5
General vertebra	1	0	0
Thoracic vertebra	2	1	.1
Rib	37	1	.03
Shaft tibia	1	1	.5
P-humerus	1	1	.5
Shaft fragments	43		
Total	***86***	***5***	***n/a***

{Pav.2001} Concentration # 1: Small Ungulate			
Element	**NISP**	**MNE**	**MAU**
Thoracic vertebra	1	1	.08
Mandible	1	1	.5
Misc. shaft frags.	8	0	0
Total	***10***	***2***	***n/a***

{Pav.2001} Concentration # 1: Sheep/Goat *(Ovis/Capra)*			
Element	**NISP**	**MNE**	**MAU**
P-metacarpal	1	1	.5
Total	***1***	***1***	***n/a***

{Pav.2001} Concentration # 2: Horse *(Equus caballus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Crania	1	1	1	Pelvis	1	1	.5
Cervical vertebra	1	1	.2	D-femur	2	1	.5
Thoracic vertebra	6	6	.3	D-metapodial	1	0	0
Lumbar vertebra	5	5	.8	Mandible	4	1	.5
Sacrum	1	1	.2	Upper teeth	10	2	1
Ribs	2	0	0	Lower teeth	1	0	0
D-humerus	1	1	.5	Tooth frags.	3	0	0
P-radius	1	1	.5	***Totals***	***40***	***21***	***n/a***

{Pav.2001} Concentration # 2: Large Ungulate			
Element	**NISP**	**MNE**	**MAU**
Mandible	1	1	.5
Shaft frags.	9	0	0
Total	***10***	***1***	***n/a***

{Pav.2001} Pit Feature # 1: Large Ungulate			
Element	**NISP**	**MNE**	**MAU**
General vertebra	1	0	0
Ribs	1	0	0
Misc. frag.	1	0	0
Total	***3***	***0***	***n/a***

{Pav.2001} Pit Feature # 1: Cow *(Bos taurus)*			
Element	**NISP**	**MNE**	**MAU**
D-metatarsal	1	1	.5
Total	***1***	***1***	***n/a***

{Pav.2001} Pit Feature # 1: Horse *(Equus caballus)*							
Element	**NISP**	**MNE**	**MAU**	**Element**	**NISP**	**MNE**	**MAU**
Crania	3	1	1	Tarsals	1	1	.1
General vertebra	2	0	0	Phalanx I	1	1	.2
Cervical vertebra	1	1	.2	Phalanx III	1	1	.2
Sacrum	1	1	.2	Mandible	1	1	.5
Humerus	1	1	.2	Upper teeth	18	2	1
Pelvis	1	1	.2	Lower teeth	6	1	.5
D-Femur	1	1	.2	Tooth frags.	1	0	0
Astragalus	1	1	.2	***Totals***	***40***	***14***	***n/a***

APPENDIX # 5

Dentition Ageing Data

Pavlinovo 1999

Pav 1999 Concentration # 1: *Equus caballus* Maxilla				
ID. #	Side	Teeth Present	Comments	Age Stage
3275	right	D4, M1-2	M1 - in wear; M2 = not erupted	8 mths - 2 yrs
Pav 1999 Concentration # 5: *Equus caballus* Maxilla				
ID. #	Side	Teeth Present	Comments	Age Stage
5576	both	premaxilla with all incisors	all incisors = wear stage '4' (after Levine 1982)	9yrs - 13 yrs
Pav 1999 Concentration # 6: *Equus caballus* Mandible				
ID. #	Side	Teeth Present	Comments	Age Stage
4867	both	left side: P2, P4, M1-2 right side: P2-4, M1-2	P4 (right side) = barely in wear	3yrs 6mths - 4yrs
Pav 1999 Concentration # 9: *Equus caballus* Mandible				
ID. #	Side	Teeth Present	Comments	Age Stage
7179	left	P2-4, M1-3	all teeth erupted and in full wear	3.5 ≤ yrs
7181	left	M2-3	teeth erupted and in full wear	3.5 ≤ yrs
Pav 1999 Upper Levels: *Equus caballus* Maxilla				
ID. #	Side	Teeth Present	Comments	Age Stage
4565, 4566	both	left side: D2-4, M1 right side: D2-4, M1	M1 just erupting through bone	7mths - 1 yr

Pav 1999 Upper Levels: *Equus caballus* Loose Teeth (deciduous)				
ID. #	Side	Tooth	Wear Stage	Age
87	left	Lower D3-4	very worn	1 yr 4 mths - 3 yrs 6 mths
1868	left	Lower D3-4	worn	4 mths - 3 yrs
1630	left	Lower D3-4	worn	4 mths - 3 yrs
2450	left	Lower D3-4	worn	4 mths - 3 yrs
2201	left	Lower D3-4	very worn	1 yr 4 mths - 3 yrs 6 mths
2252	left	Lower D3-4	worn	4 mths - 3 yrs
2481	left	Lower D3-4	worn	4 mths - 3 yrs
2605	left	Lower D3-4	worn	4 mths - 3 yrs

Pav 1999 Concentration # 1: *Equus caballus* Loose Teeth					
ID. #	Side	Tooth	Mesial-Distal	Crown Height	Age
3358	right	upper D2	very worn		1yr 4 mths - 4 yrs
3144	right	upper D2	very worn		1yr 4 mths - 4 yrs
3286	right	upper D4	very worn		1yr 4 mths - 3 yrs 6 mths
Pav 1999 Concentration # 2: *Equus caballus* Loose Teeth					
ID. #	Side	Tooth	Mesial-Distal	Crown Height	Age
3421	right	Lower M1-M2	24	35	9.75 - 14 yrs
3708	right	Lower P2	34	19	12-13 yrs
Pav 1999 Concentration # 4: *Equus caballus* Loose Teeth					
ID. #	Side	Tooth	Mesial-Distal	Crown Height	Age
?	right	Lower P3-P4	28	68	6-7.5 yrs
Pav 1999 Concentration # 5: *Equus caballus* Loose Teeth					
ID. #	Side	Tooth	Mesial-Distal	Crown Height	Age
5472	left	Upper P4	26	16	20 + yrs
5373	left	Upper M1-M2	27	11	20 + yrs
5371	left	Upper M3	33	18	20 + yrs
?	left	Upper P2	28	15	20 + yrs
?	left	Upper M3	23	9	20 + yrs
5546	right	Lower P3	27	21	16-17 yrs
5547	right	Lower M2	23	23	16-18 yrs
5545	right	Lower M1	23	18	20 + yrs
5413	right	Lower D4	very worn		1yr 4 mths - 4 yrs
5544	right	Lower P4	26	37	10-12 yrs
Concentration # 7: *Equus caballus* Loose Teeth					
ID. #	Side	Tooth	Mesial-Distal	Crown Height	Age
7564	left	Upper D4	worn		4 mths - 3 yrs

Pav 1999 Upper Levels: *Equus caballus* Loose Teeth					
ID. #	Side	Tooth	Mesial-Distal (mm)	Crown Height (mm)	Age
1540	right	Lower P3-4	29	56	7-8.75 yrs
1536	right	Lower P3-4	28	41	8.25-10.25 yrs
1668	left	Upper M1-2	24	23	14 + yrs
974	left	Lower P2	33	48	6-7 yrs
1711	left	Lower M1-2	25	69	5.25-7.25 yrs
1268	left	Lower M3	31	73	5-6 yrs
1970	left	Lower M3	33	39	11-12 yrs
1969	left	Lower M1-2	27	41	8-11 yrs
1742	left	Lower M3	30	55	8-9 yrs
354	right	Lower M1-2	27	64	5.25-7.5 yrs
1313	right	Lower M1-2	25	61	5.25-7.5 yrs
1413	right	Lower M1-2	27	22	11.75-20 yrs
1667	left	Upper P3-4	25	15	15 + yrs
268	right	Upper P3-4	30	55	7.25-9.75 yrs
756	right	Upper P3-4	30	73	3-6.5 yrs
2103	right	Upper P3-4	32	48	9-11.25 yrs
520	right	Upper P3-4	30	52	7.25-9.75 yrs
256	right	Upper P3-4	29	62	6-7.75 yrs
2401	right	Upper P2	36	33	10-11 yrs
1597	right	Upper M1-2	26	64	5.5-8 yrs

Pav 1999 Concentration # 1: *Bos taurus* Mandible				
ID. #	Side	Teeth Present	Comments	Age Stage
3346	right	P4, M1	P4 = 'd'; M1 = 'k'	18 + mths
Pav 1999 Concentration # 5: *Bos taurus* Maxilla				
ID. #	Side	Teeth Present	Comments	Age Stage
6143, 6144	right	P2-4, M1-3	P2-4 unerupted (deciduous teeth missing) M1-2 in wear, M3 unerupted	1-2 yrs
Pav 1999 Concentration # 8: *Bos taurus* Mandibles				
ID. #	Side	Teeth Present	Comments	Age Stage
6488	right	P4, M1-2	P4 = 'c'; M1-2 = 'g'	18 + mths
7454	left	D2-4, M1 loose	D4 = 'k'; M1 = 'f'	18 + mths
Pav 1999 Concentration # 9: *Bos taurus* Mandible				
ID. #	Side	Teeth Present	Comments	Age Stage
7180	right	P3, D4, M1-3	D4 = 'k'; M1-2 = 'g'; M3 = unworn	18-30 mths
Pav 1999 Upper Levels: *Bos taurus* Mandibles				
ID. #	Side	Teeth Present	Comments	Age Stage
2780	left	M2-3	M2 = 'f'; M3 just erupting w/ no wear	18-30 mths
644	right	D3-4	D4 = 'j'	1-2 yrs
2403	left	P3-4, M1-2	P4 = 'g'; M1-2 = 'g'	30 + mths
1824	right	D2-4	D4 = 'j'	1-2 yrs
4431	left	P4, M1	P4 = 'c'; M1 = 'k'	18 + mths
1801	left	D2-4, M1	D4 = 'g'; M1 = 'f'	1-2.5 yrs
2440	right	D4, M1	D4 = 'f'; M1 = 'd'	8-18 mths
4497	left	M1-3	M1-2 = 'k'	18 + mths
1640	left	M3 only	M3 = 'f'	young adult
7016	right	D2-4, M1-2	D4 = 'k'; M1 = 'c'; M2 = no wear	8-18 mths

Pav 1999 Concentration # 1 : *Ovis/Capra* Mandibles				
ID. #	Side	Teeth Present	Comments	Age Stage
3347	left	P3, P4, M1, M2, M3	M2 + M3 = 'g'	4-6 yrs
3067	right	D3, D4	D4 = 'e'	2-6 mths
Pav 1999 Concentration # 4 : *Ovis/Capra* Mandibles				
ID. #	Side	Teeth Present	Comments	Age Stage
4119	right	M3	M3 = (just in wear) 'c'	2-3 yrs
7430	left	P3, P4, M1, M2, M3	M1-2 = 'f'; M3 -= 'g'; P4 -= 'g'	4-6 yrs
4048	right	P2, P3, P4, M1	P4 = 'h'; M1 = 'h'	4 + yrs
Pav 1999 Concentration # 5: *Ovis/Capra* Mandibles				
ID. #	Side	Teeth Present	Comments	Age Stage
5878	left	P3, P4, M1, M2	P4 = 'f'; M1-2 = 'f'	2 + yrs
Pav 1999 Concentration # 7: *Ovis/Capra* Mandibles				
ID. #	Side	Teeth Present	Comments	Age Stage
6923	left	D2-4, M1-3	D4 = 'h'; M1-2 = 'h'; M3 erupting , not in wear	1-2 yrs
Pav 1999 Concentration # 8: *Ovis/Capra* Mandibles				
ID. #	Side	Teeth Present	Comments	Age Stage
7695	left	D4, M1-2	D4 = 'h'; M1-2 = 'g'	1-2 yrs
6489	right	D4, M1-2, M3 (not erupted)	D4 = 'h'; M1-2 = 'g'	1-2 yrs
Pav 1999 Upper Levels: *Ovis/Capra* Mandibles				
ID. #	Side	Teeth Present	Comments	Age Stage
5261	right	M1-3	M3 erupting w/ no wear	1-2 yrs
479	right	D2-4, M1	M1 just in wear	6-12 mths
2926	left	P2-4, M1-3	P4 = 'g'; M1-2 = 'h'; M3 = 'h'	8-10 yrs
2831	right	P3-4, M1-3	P4 = 'g'; M1-2 = 'h'; M3 = 'h'	8-10 yrs
2320	left	D2-4, M1 erupting (no wear)	D4 = 'f'; M1 = no wear	2-6 mths
7322	left	P2-4, M1-3	P4 = 'g'; M1-2 = 'h'; M3 = 'g'	4-6 yrs

APPENDIX # 6

Dentition Ageing Data

Pavlinovo 2001

2001 Upper Levels: *Equus caballus* Mandibles + Premaxilla				
ID. #	Side	Teeth Present	Comments	Age Stage
636, 637	left	D4, M1	D4 = slight wear; M1 = not erupted	birth to 1 month
817 +, 489.1 +	both	right: P2-4, M1-2 left: P2-4, M1	very heavy wear	old adult = 20 + yrs
727	both	Premaxilla w/ all incisors	wear stage 7 - round infundibulum (after Levine 1982)	7.5 - 11 yrs
937	right	P2-4, M1-3	P2 = 31 mm; P3 = 45 mm	9-10 yrs
4565, 4566	both	left side: D2-4, M1 right side: D2-4, M1	M1 just erupting through bone	7mths - 1 yr

2001 Bone Concentration # 2 *Equus caballus* Mandibles				
ID. #	Side	Teeth Present	crown height/ wear stage	Age Stage
526	left	M1-3	M1 = 59 mm	6-7 yrs
567	right	D2-3	D3, D4 = worn	4mnths - 3yrs
795	left	P4, M1-3	M1 = 55 mm	7-8 yrs

2001 Concentration # 2: *Equus caballus* Cranium				
ID. #	Side	Teeth Present	crown height	Age Stage
795.13 & 795.14	both	all upper teeth (cheekteeth, canines & incisors)	not measurable (teeth in maxilla)	5-11 yrs; based on incisor wear (WS-1)

2001 Pit # 1: *Equus caballus* Cranium				
ID. #	Side	Teeth Present	crown height	Age Stage
908	both	right: P3-4, M1-3 left: P2-4, M1-3	left P3 = 63 mm right P2 = 39 mm	7-10 yrs
794	left	P2-4, M1-3	P2 (crown height measurable = 28 mm	10-11 yrs

2001 Upper Levels: *Bos taurus* Mandibles				
ID. #	Side	Teeth Present	Comments	Age Stage
769	right	P3-4, M1-3	P4 = 'e'; M1-2 = 'k'; M3 = 'h'	old adult
211	left	P2-4, M1-2	P4 = 'c'; M1-2 = 'g'	30 + months
1024	both	right: D2-4, M1 left: D2-4, M1	D4 = strong wear; M1 = little wear (post cusp has no wear)	8-18 months

2001 Upper Levels : *Ovis/Capra* Mandibles & Maxilla				
ID. #	Side	Teeth Present	Comments	Age Stage
509	left	Mandible: P2-4, M1-3	P2-4 = still in crypt (deciduous teeth missing) M1-2 = erupted and in wear M3 = not erupted	1-2 yrs
506	left	Maxilla: M2-3	M2 = erupted w/ little wear M3 = erupting but w/ no wear	1-2 yrs
1032	right	Mandible: M3 (only)	M3 = 'g'	4-8 yrs

APPENDIX # 7

Graphs of Skeletal Representation:

domesticates (horse, cow, sheep/goat)

Pavlinovo 1999

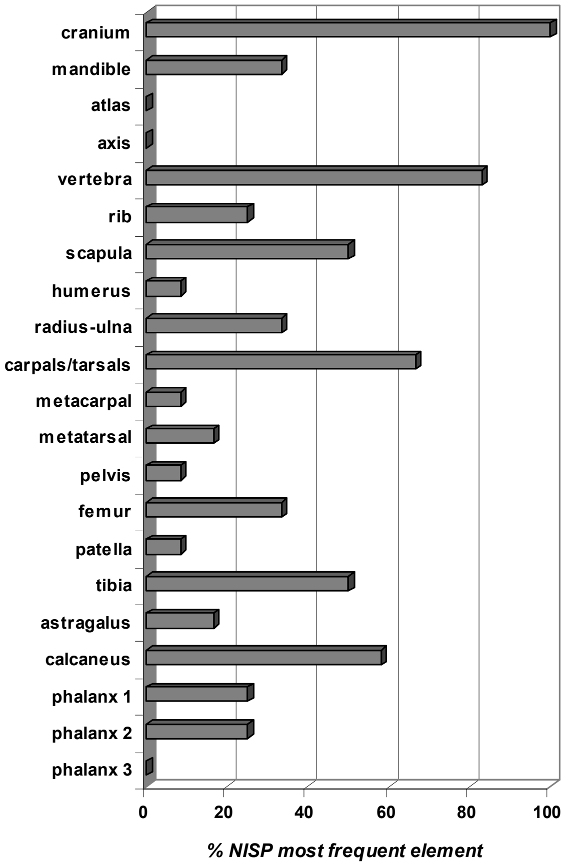

Table A-7.1 *Horse elements from concentration # 1 (N = 78).*

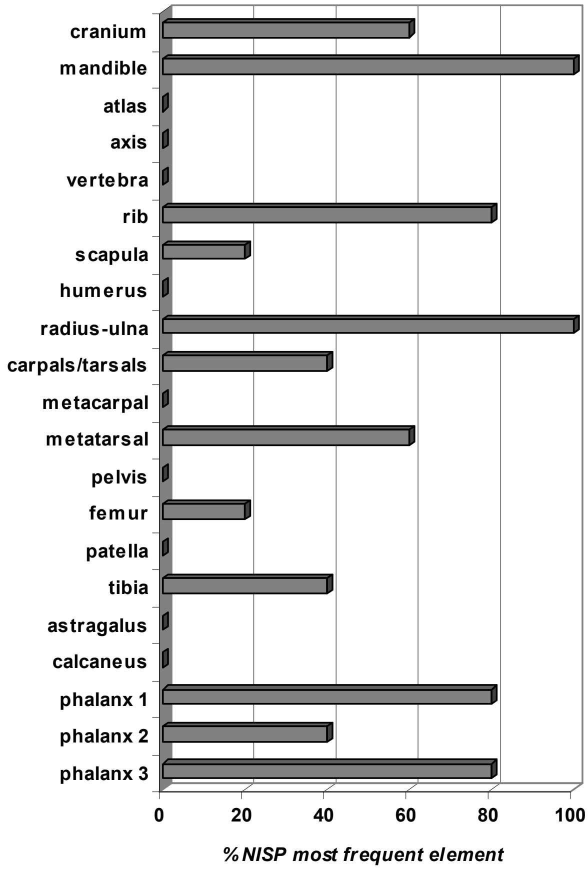

Table A-7.2 *Cow elements from concentration # 1 (N = 36).*

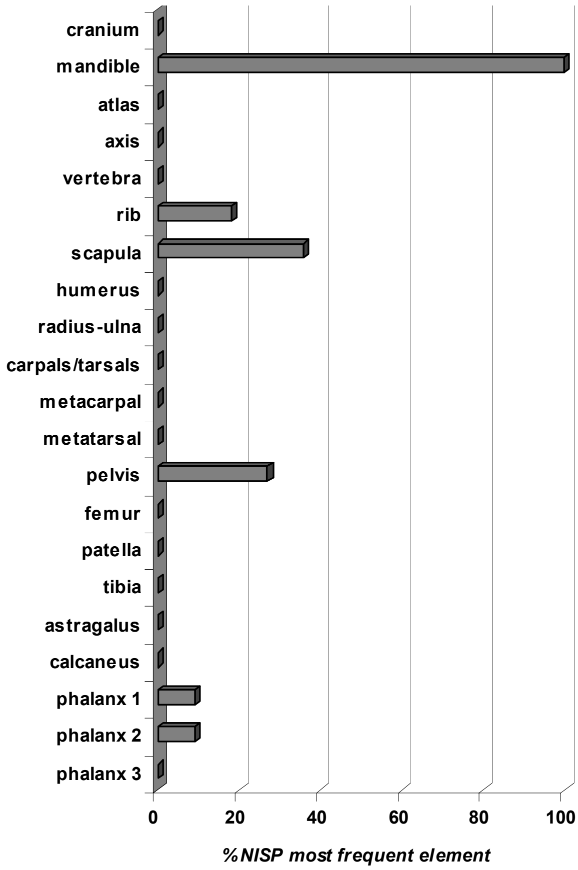

Table A-7.3 *Sheep/Goat elements from concentration # 1 (N = 22).*

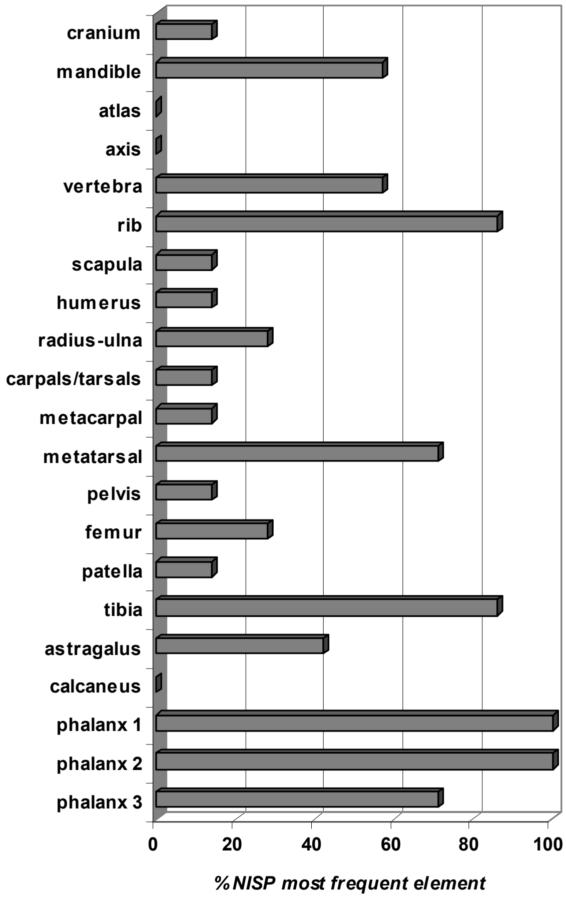

Table A-7.4 *Horse elements from concentration # 2 (N = 58).*

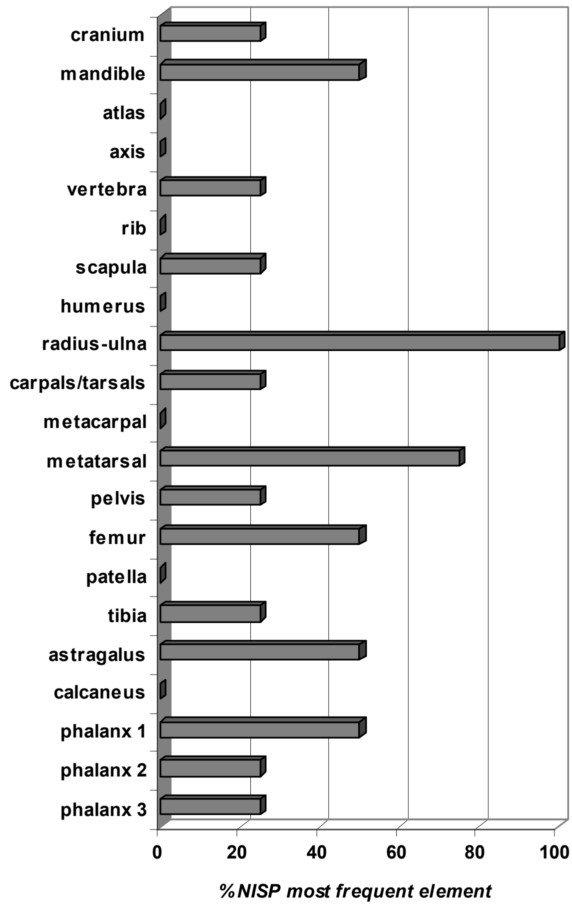

Table A-7.5 *Cow elements from concentration # 2 (N = 24).*

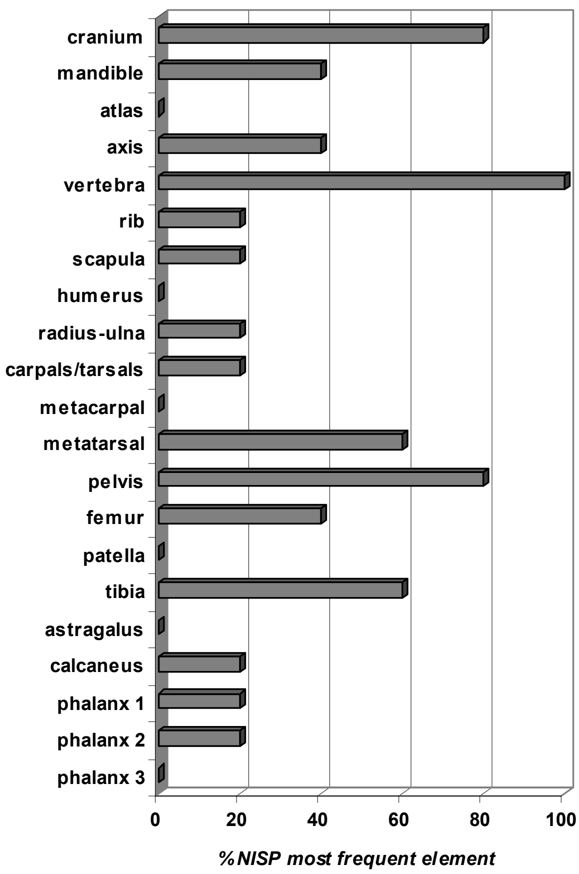

Table A-7.6 *Sheep/Goat elements from concentration # 2 (N = 32).*

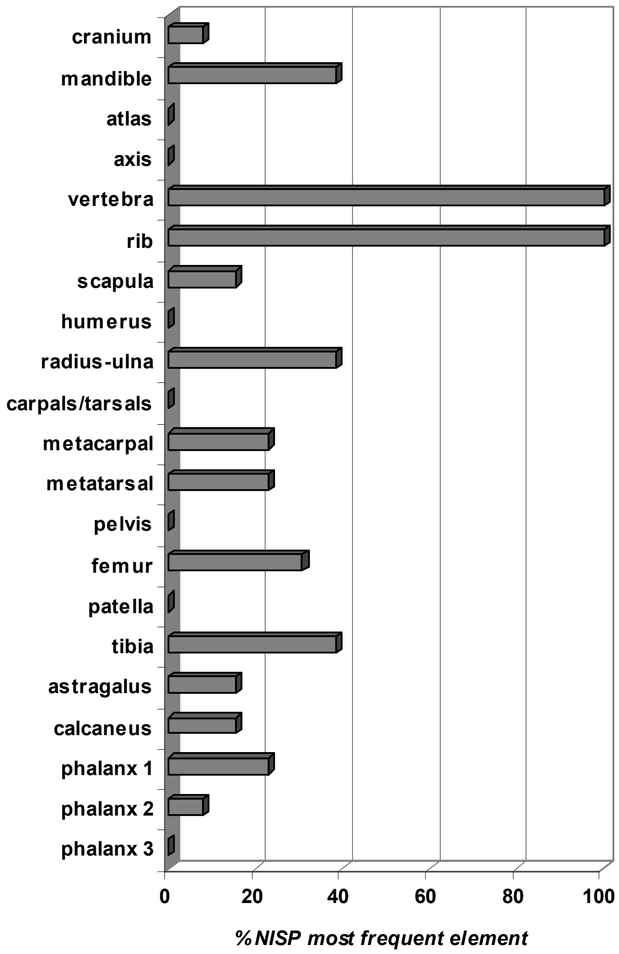

Table A-7.7 *Horse elements from concentration # 4 (N = 62).*

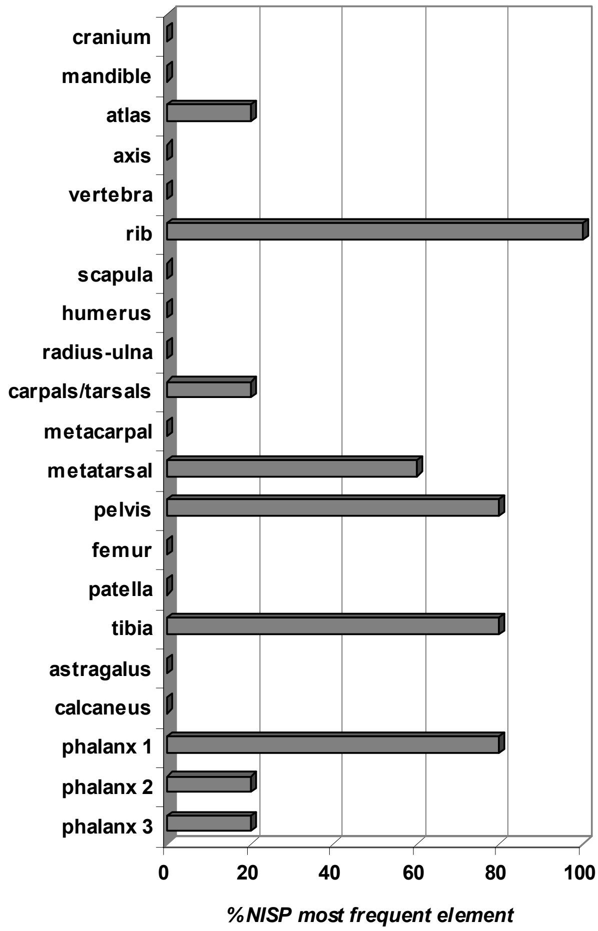

Table A-7.8 *Cow elements from concentration # 4 (N = 24).*

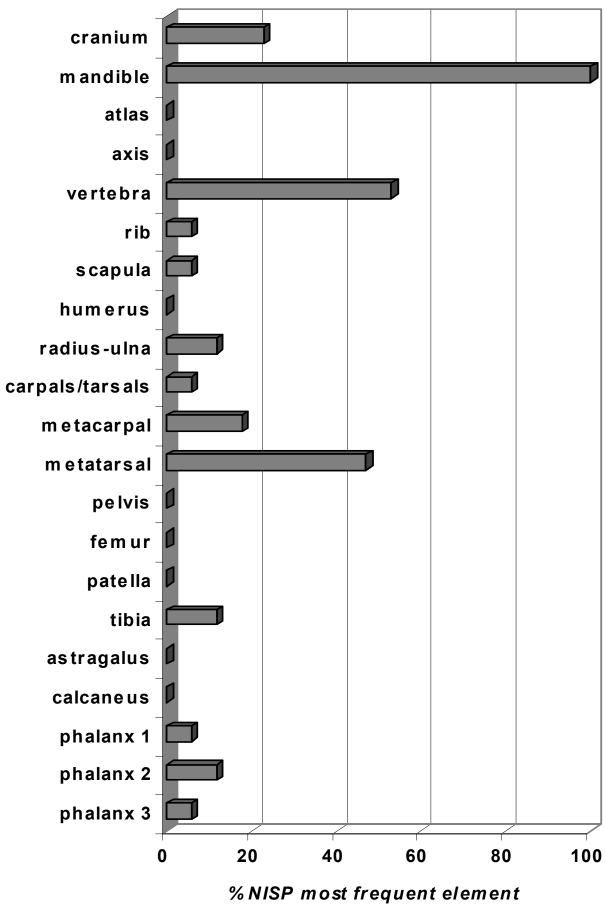

Table A-7.9 *Sheep/Goat elements from concentration # 4 (N = 58).*

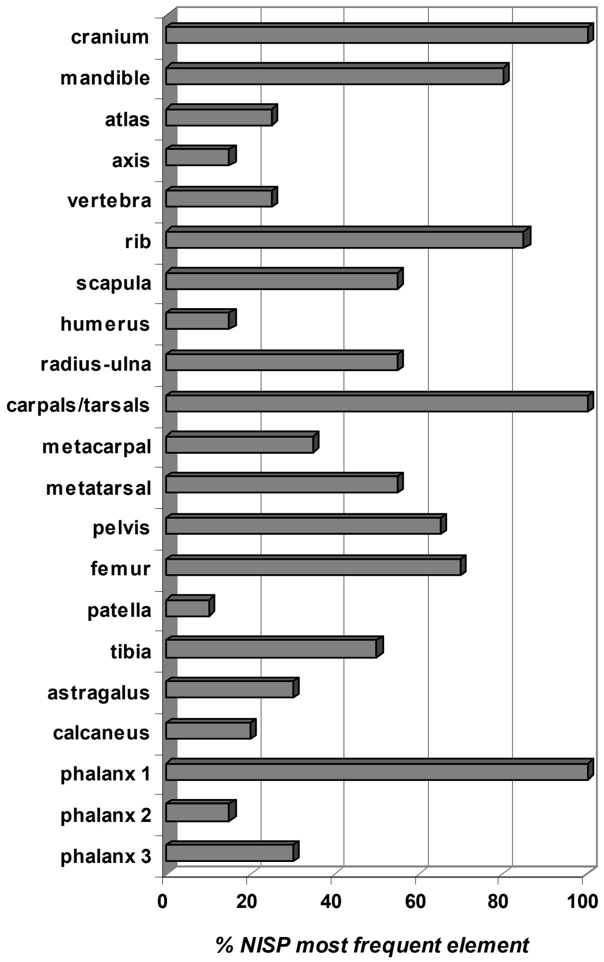

Table A-7.10 *Horse elements from concentration # 5 (N = 207).*

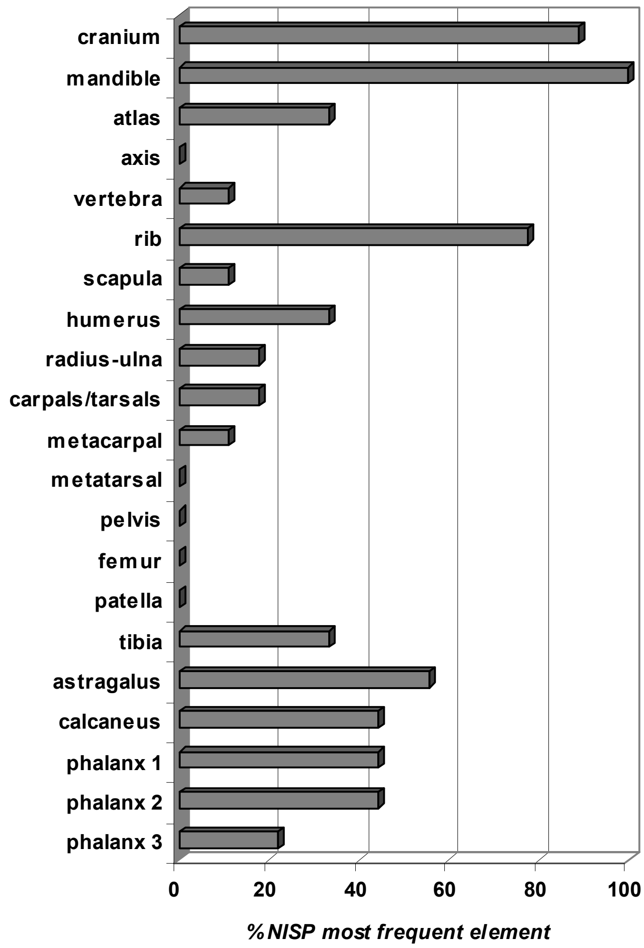

Table A-7.11 *Cow elements from concentration # 5 (N = 59).*

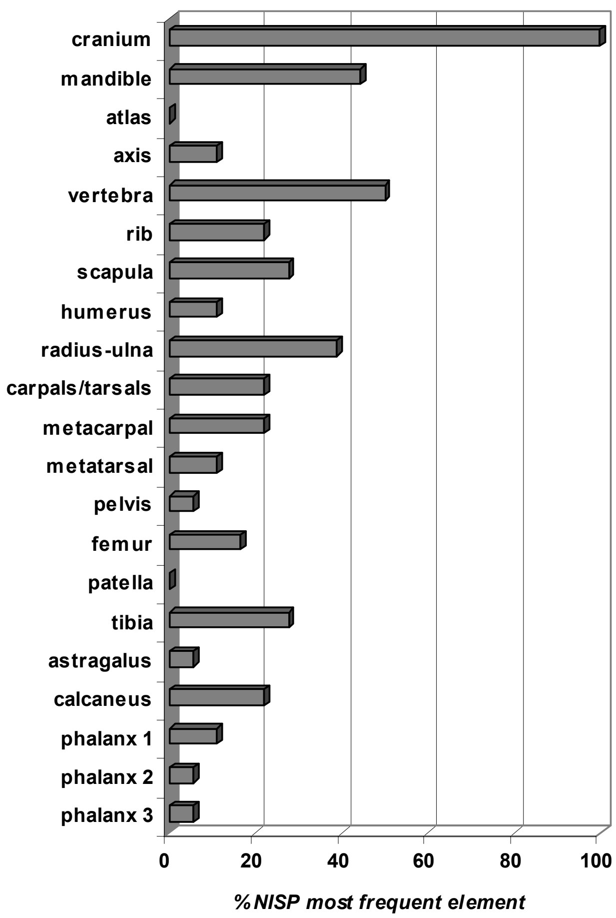

Table A-7.12 *Sheep/ Goat elements from concentration # 5 (N = 83).*

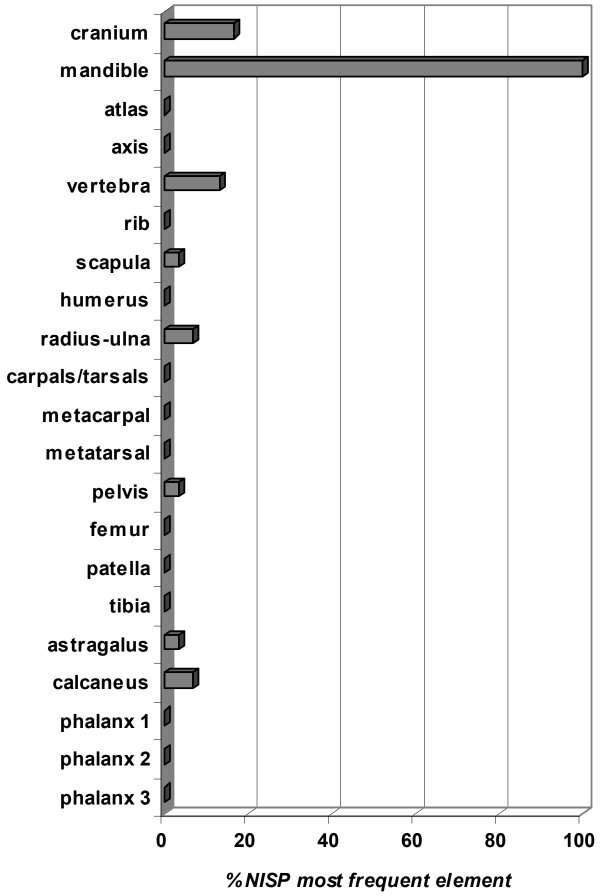

Table A-7.13 *Horse elements from concentration # 6 (N = 46).*

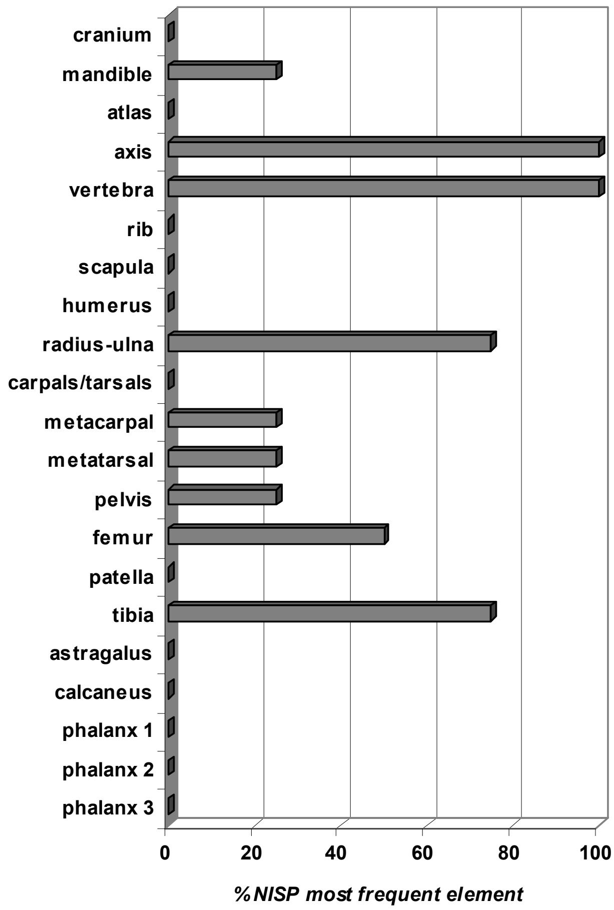

Table A-7.14 *Sheep/Goat elements from concentration # 6 (N = 20).*

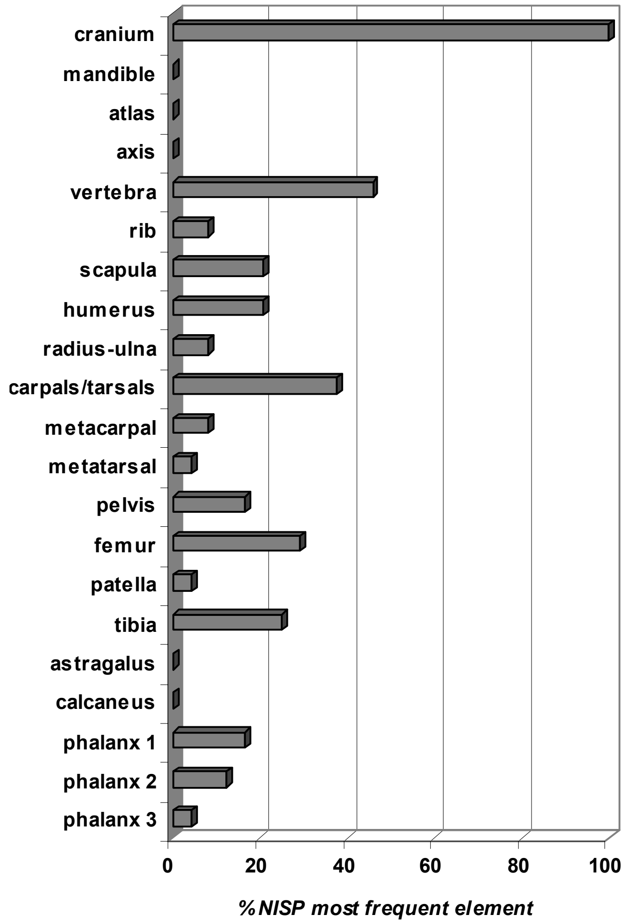

Table A-7.15 *Horse elements from concentration # 7 (N = 87).*

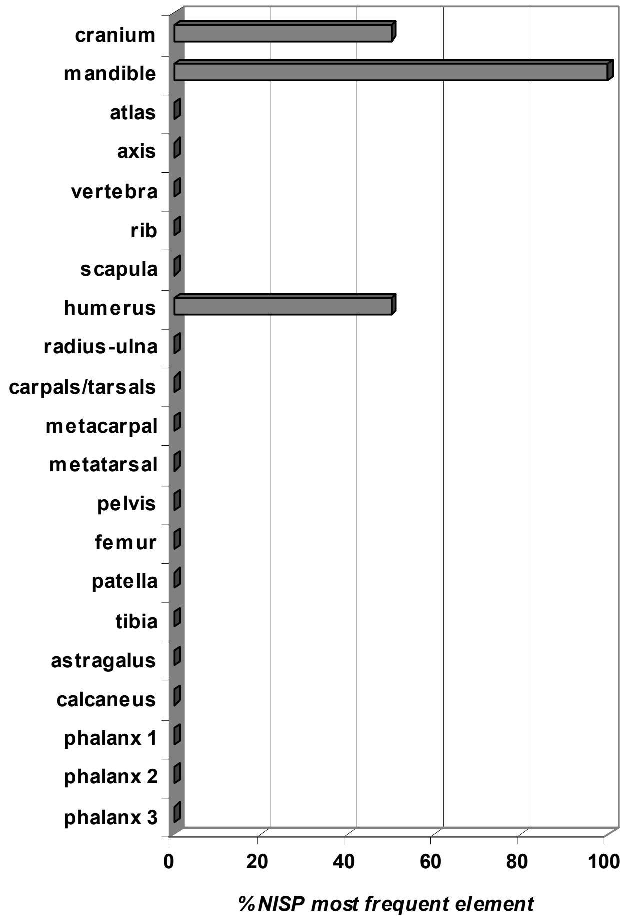

Table A-7.16 *Cow elements from concentration # 7 (N = 4).*

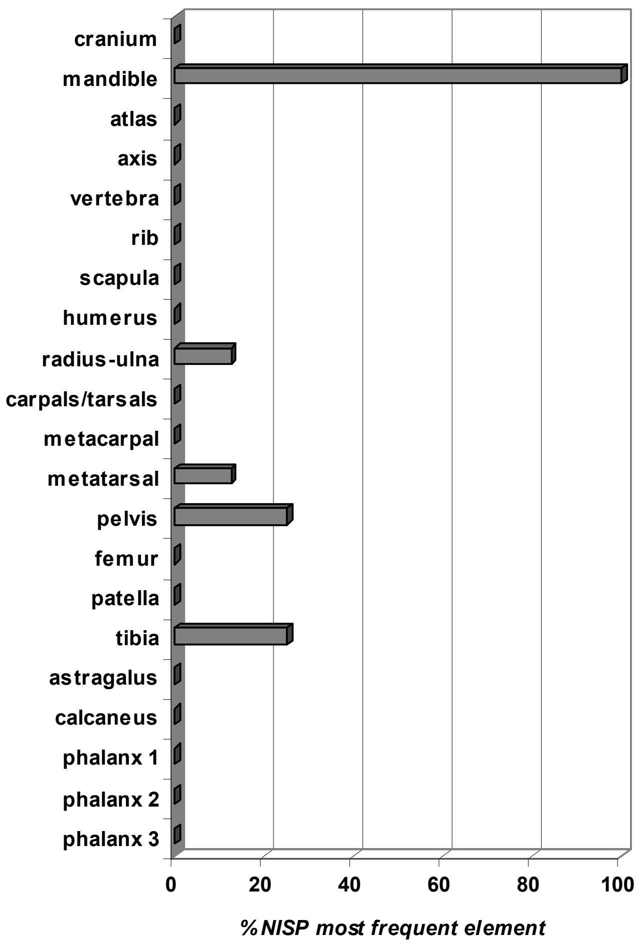

Table A-7.17 *Sheep/Goat elements from concentration # 7 (N = 14).*

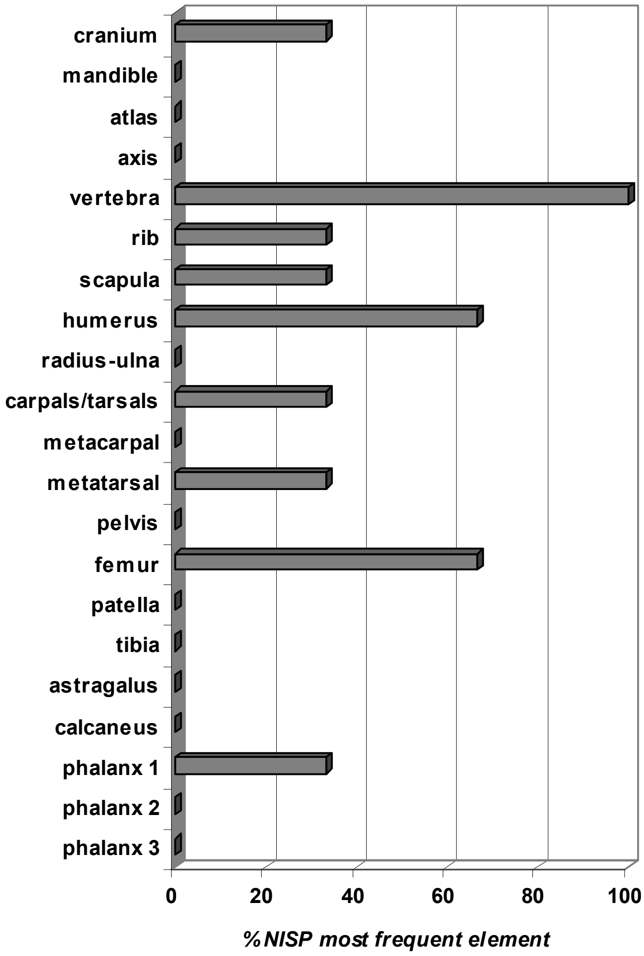

Table A-7.18 *Horse elements from concentration # 8 (N = 13).*

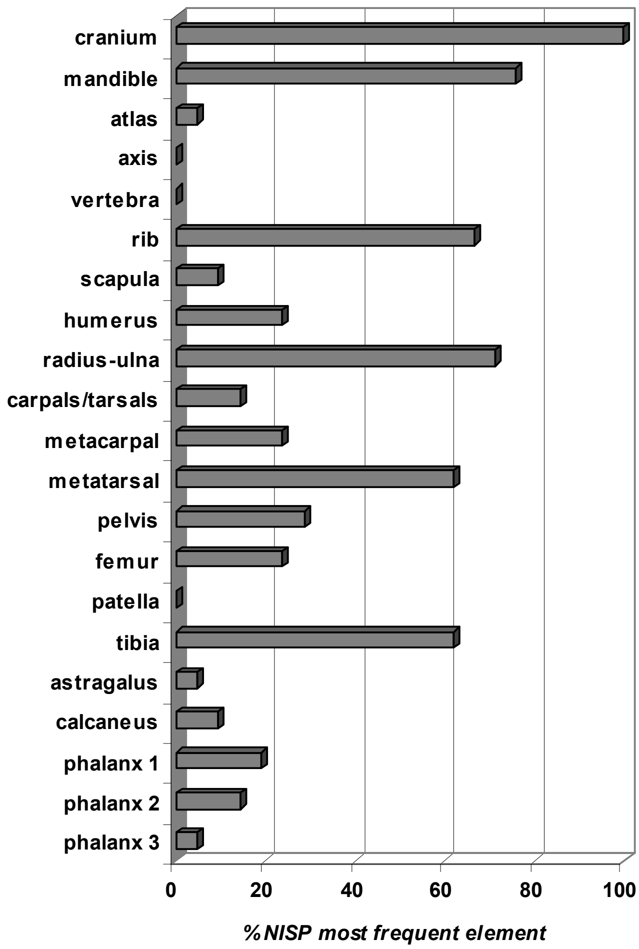

Table A-7.19 *Cow elements from concentration # 8 (N = 130).*

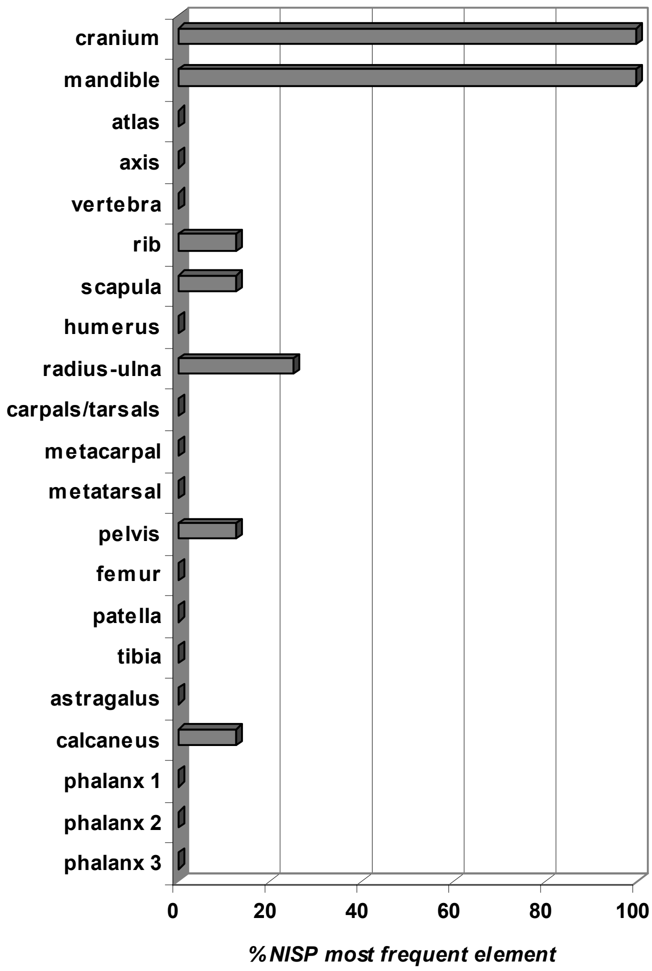

Table A-7.20 *Sheep/Goat elements from concentration # 8 (N = 22).*

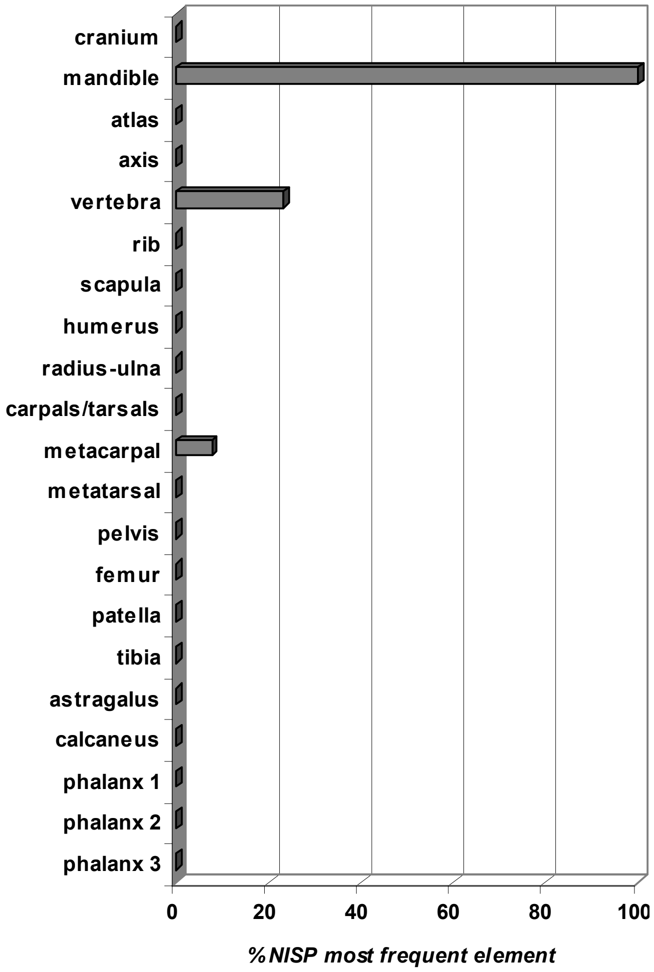

Table A-7.21 *Horse elements from concentration # 9 (N = 17).*

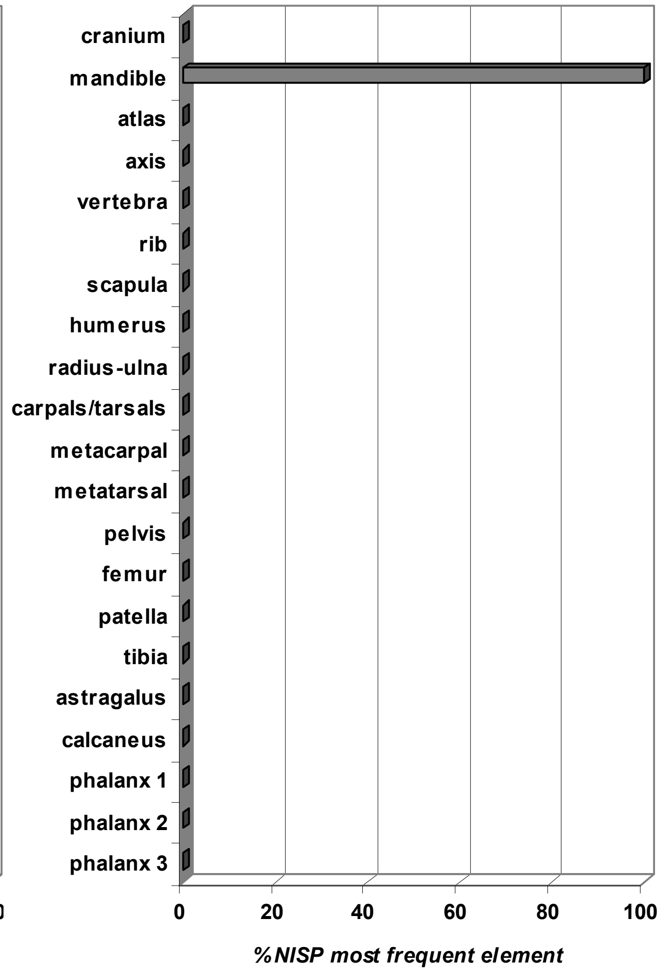

Table A-7.22 *Cow elements from concentration # 9 (N = 6).*

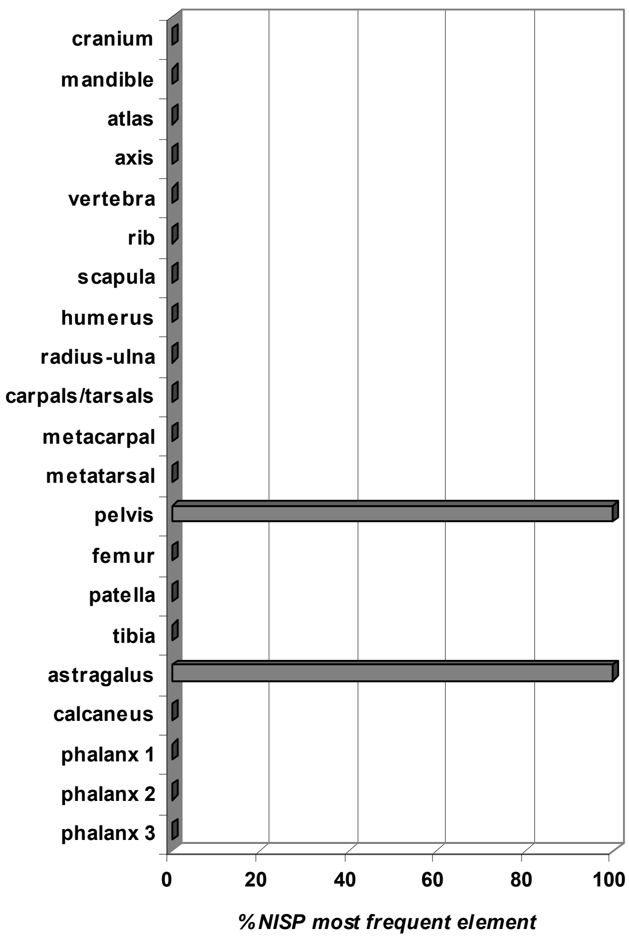

Table A-7.23 *Sheep/Goat elements from concentration # 9 (N = 2).*

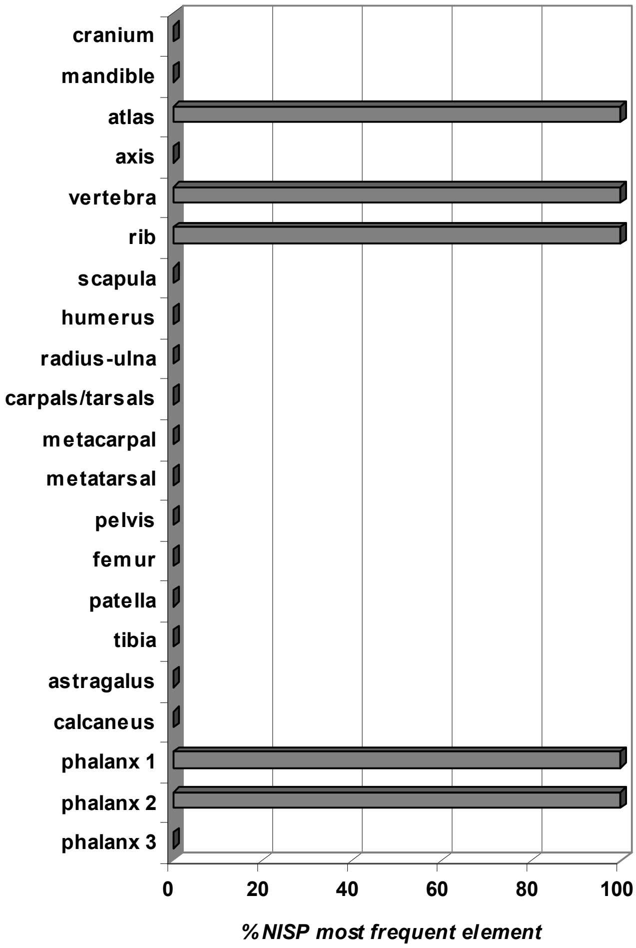

Table A-7.24 *Horse elements from concentration # 10 (N = 5).*

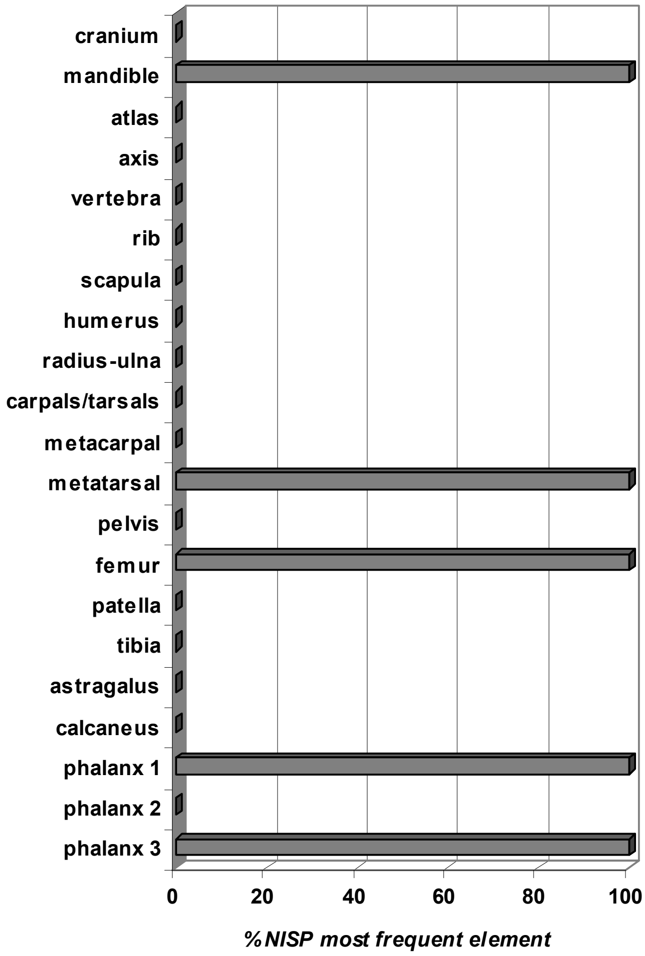

Table A-7.25 *Cow elements from concentration # 10 (N = 5).*

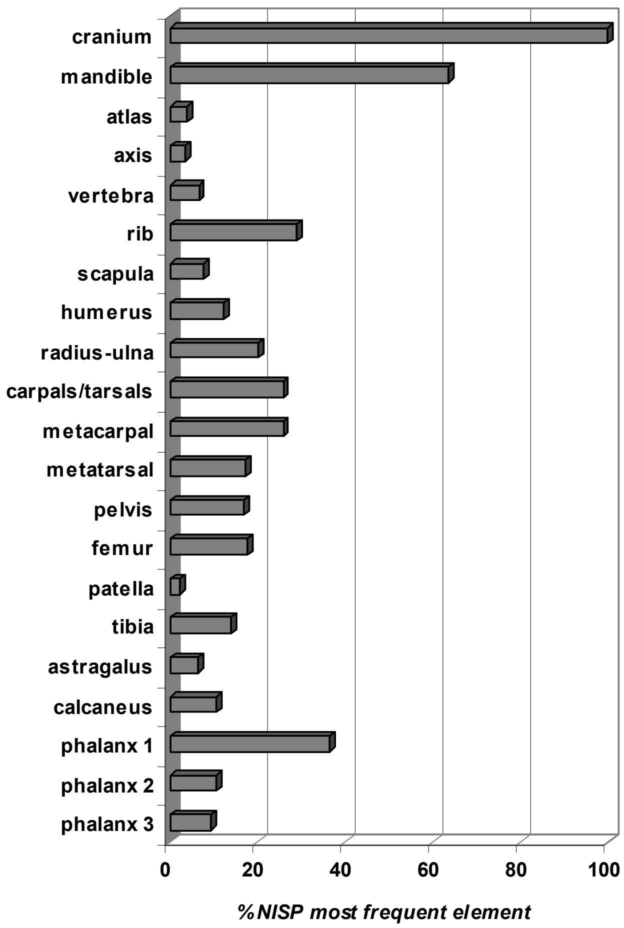

Table A-7.26 *Horse elements from upper levels (N = 919).*

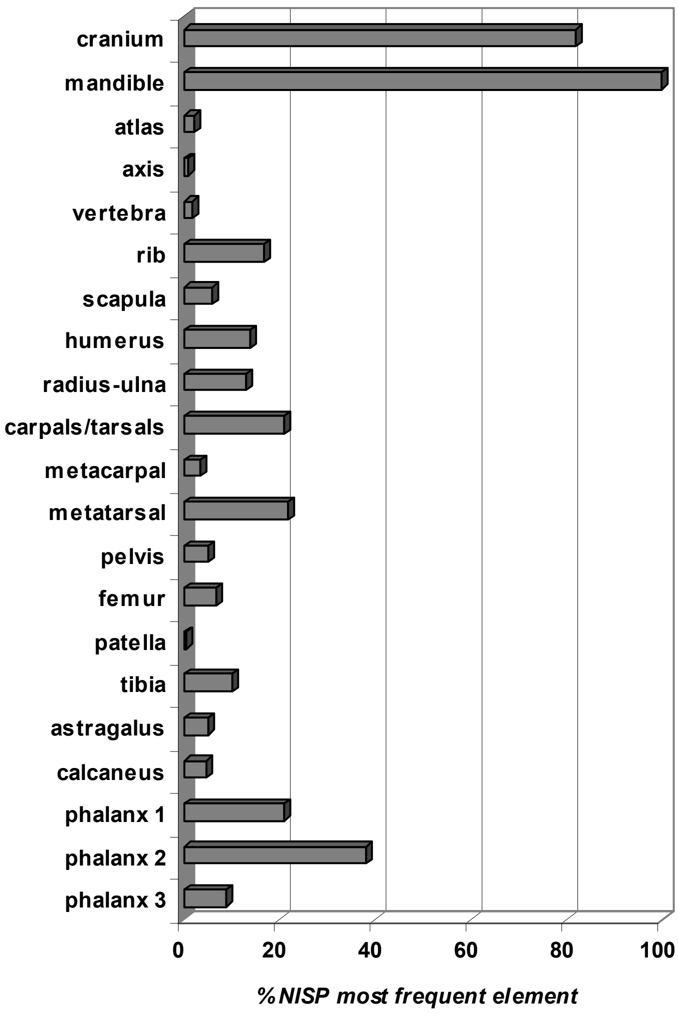

Table A-7.27 *Cow elements from upper levels (N = 655).*

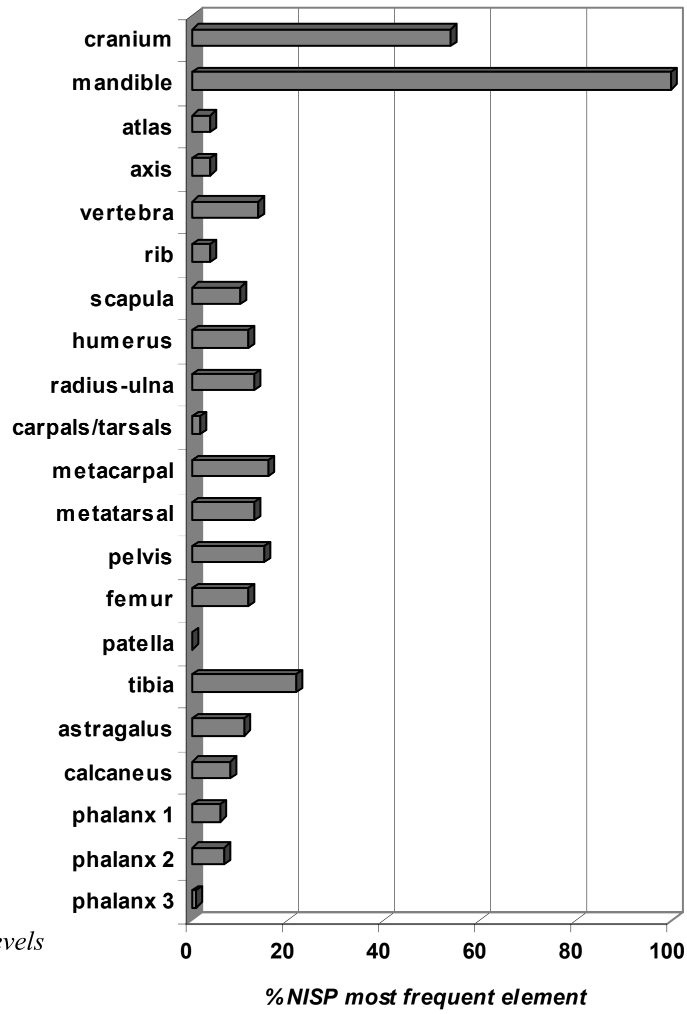

Table A-7.28 *Sheep/Goat elements from upper levels (N = 327).*

APPENDIX # 8

Graphs of Skeletal Representation:

domesticates (horse, cow, sheep/goat)

Pavlinovo 2001

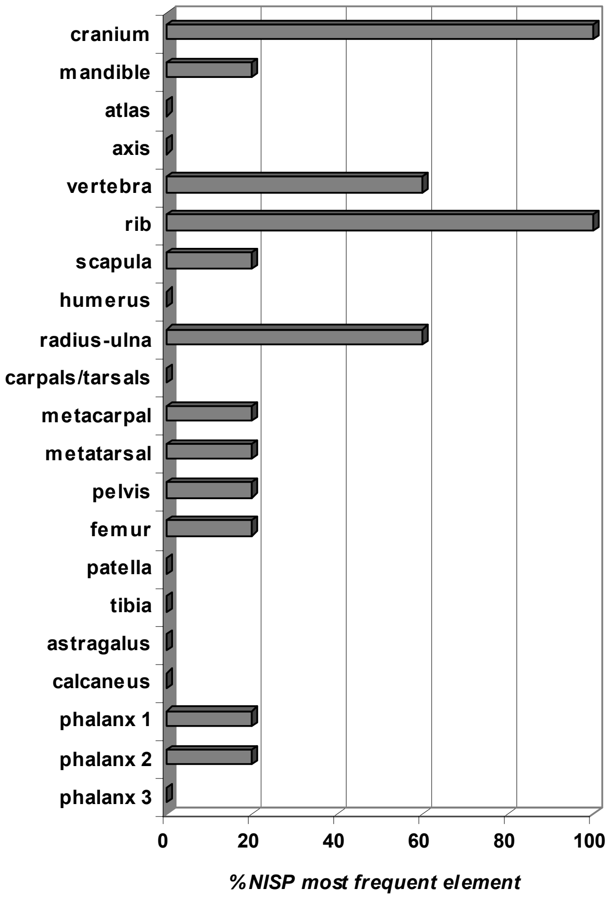

Table A-8.1 *Horse elements from concentration # 1 (N = 24).*

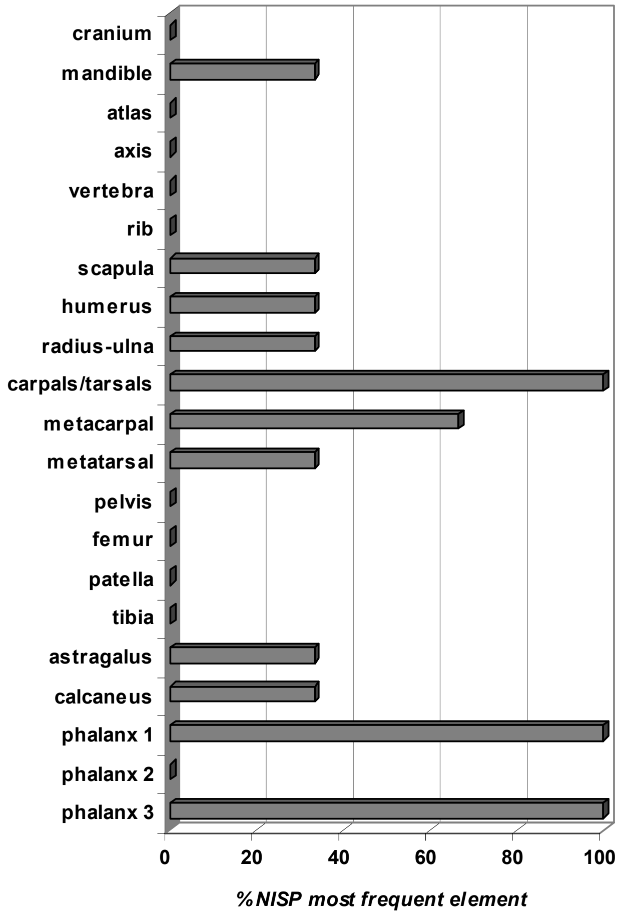

Table A-8.2 *Cow elements from concentration # 1 (N = 18).*

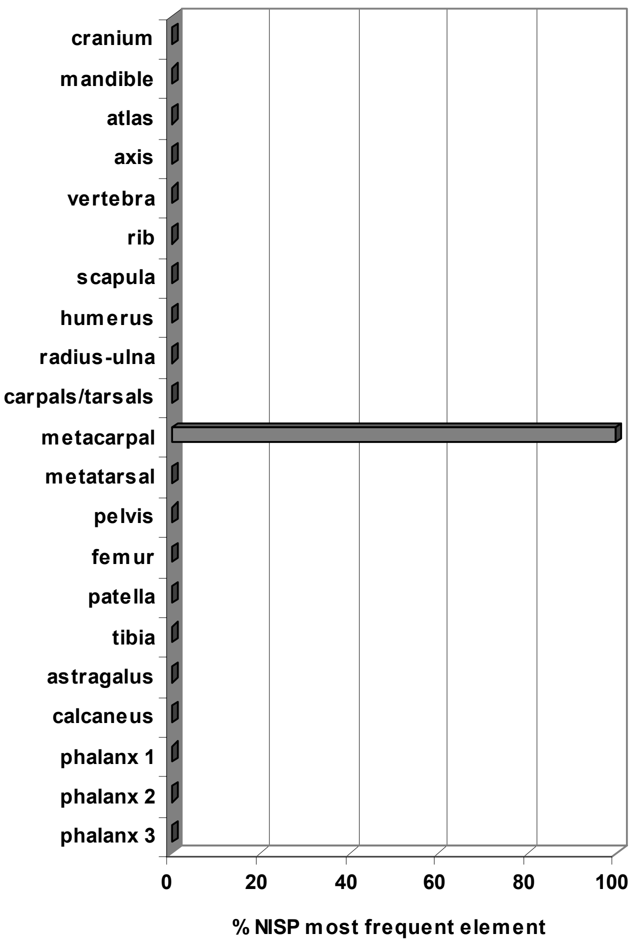

Table A-8.3 *Sheep/Goat elements from concentration # 1 (N = 1).*

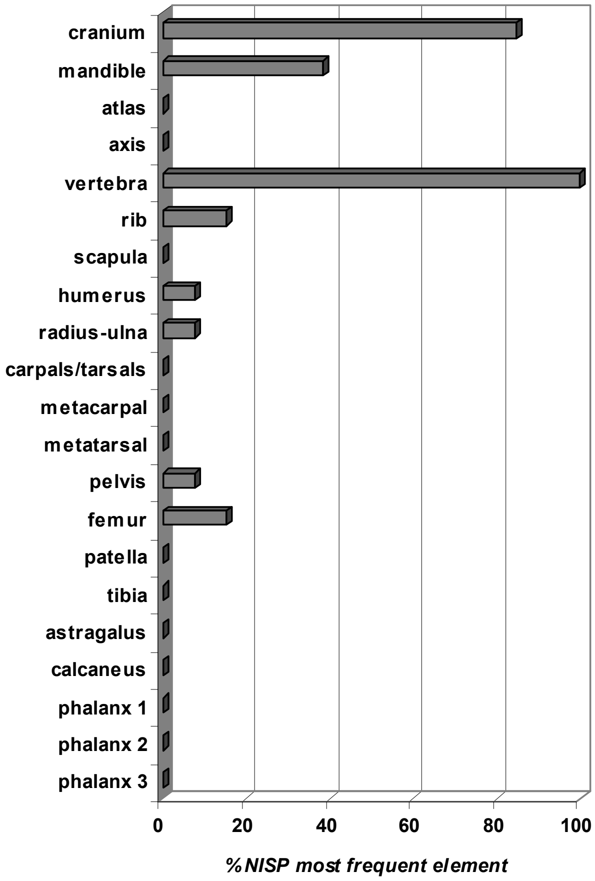

Table A-8.4 *Horse elements from concentration # 2 (N = 36).*

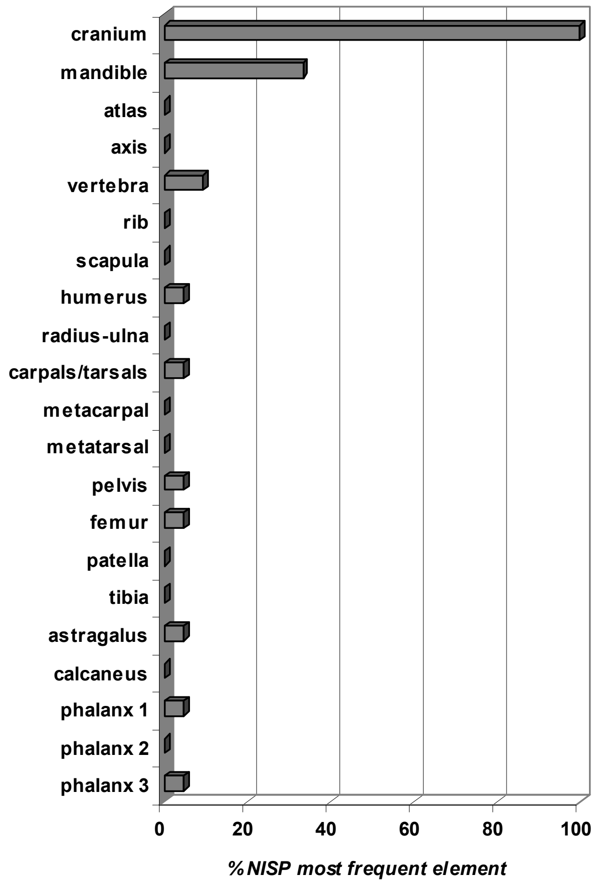

Table A-8.5 *Horse elements from pit # 1 (N = 37).*

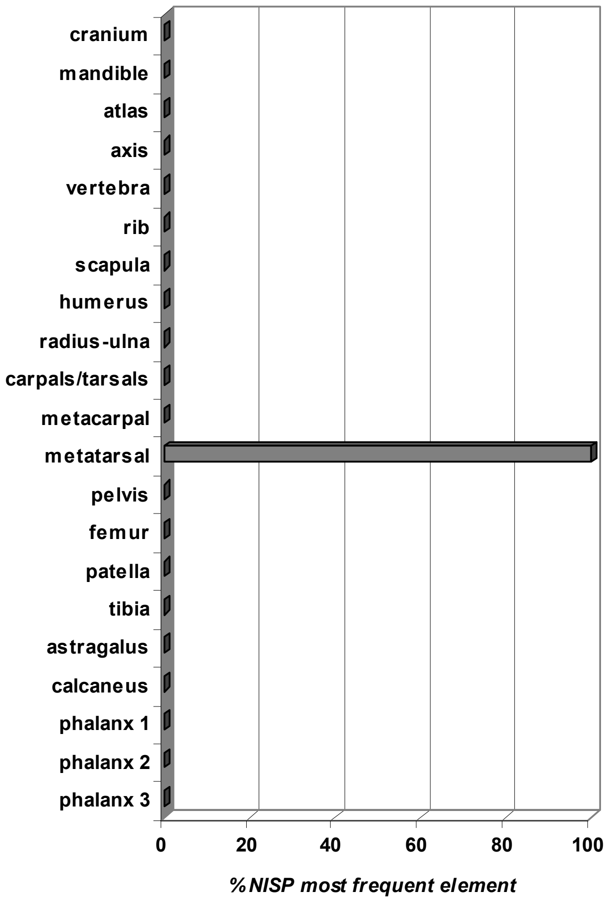

Table A-8.6 *Cow elements from pit # 1 (N = 1).*

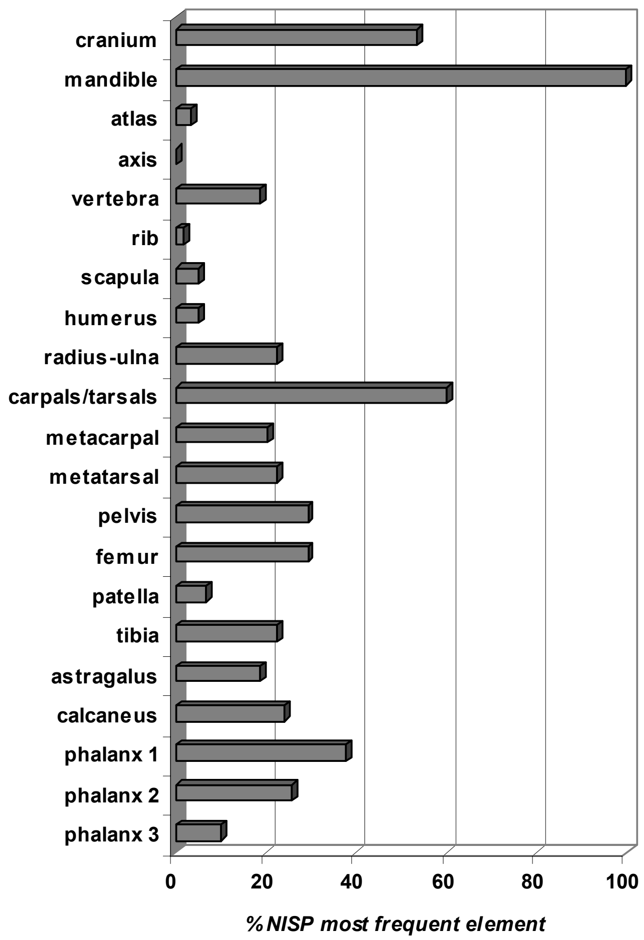

Table A-8.7 *Horse elements from upper levels (N = 301).*

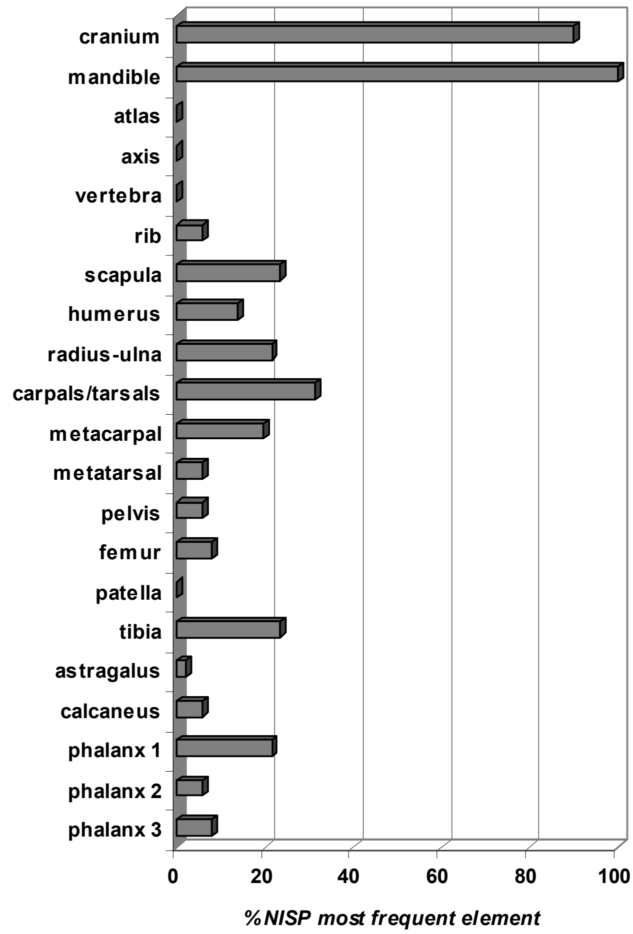

Table A-8.8 *Cow elements from upper levels (N = 200).*

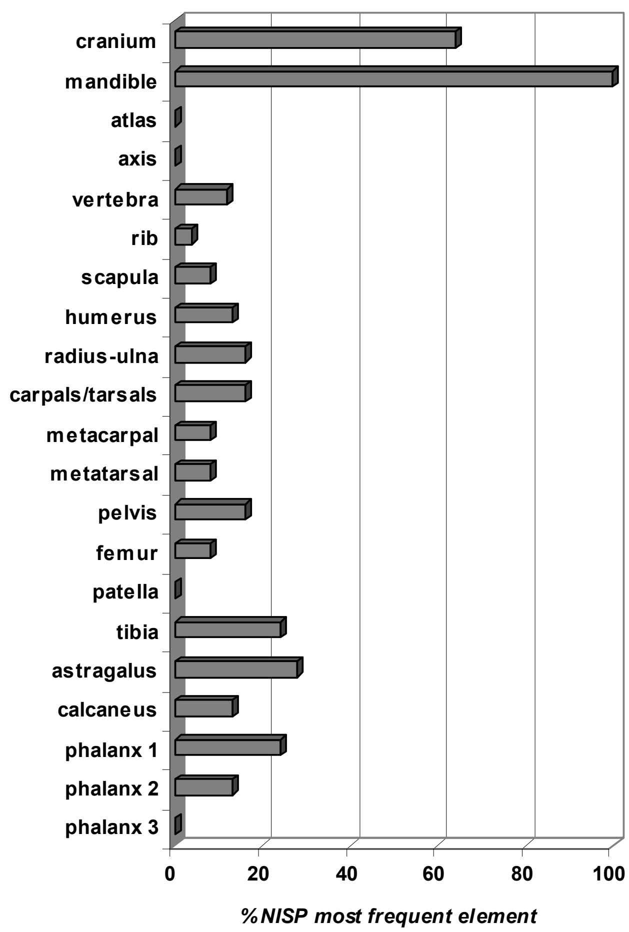

Table A-8.9 *Sheep/ Goat elements from upper levels (N = 93).*

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