# ARCHAEOLOGICAL EXPLORATIONS OF BRONZE AGE PASTORAL SOCIETIES IN THE MOUNTAINS OF EASTERN EURASIA

## Michael D. Frachetti

University of Pennsylvania

nomadic Throughout history, societies of the Eurasian steppes are known to have played a major role in the transfer of technology, commodities, language, and culture between East Asia, the Near East, and Europe (e.g. The Silk Road). However, the organization of Eurasian steppe societies in prehistory is still poorly understood. The problem lies in the lack of scientifically analyzed archaeological data from the region, and in the ineffectiveness of previous archaeological approaches to provide a dynamic model of social interactions between pastoral societies during the Bronze Age (c. 2500-1000 BCE).

Geographically, the Eurasian steppe zone spans from the grassy plains north of the Black Sea to the steppes of Mongolia, and from the forest steppes of southern Siberia to the deserts and arid grasslands of Semirech'e, in southern Kazakhstan (Fig. 1). Academically, as a result of its huge geographic expanse and its geo-political role in the historical developments of the region, the Eurasian steppe zone is commonly considered a key part of the broader territory of Central Asia (present day Kazakhstan, Uzbekistan, Tajikistan, Turkmenistan, Afghanistan, and Xinjiang).

The Bronze Age of the Eurasian steppe zone (c. 2500-1000 BCE) is considered by archaeologists and linguists to be a time in prehistory when a number of major technological, linguistic, and cultural innovations changed the way societies of Eastern Europe, Asia, and the Near East interacted. Among these innovations are: 1) the proliferation of horse riding technology and the development of wheeled transport in the form of horse drawn chariots (Anthony and Brown 2000); 2) the transmission



Fig. 1 - Eurasian Steppe Zone and Study Zone

transfer of metallurgical and other material culture across the Eurasian Steppe Zone (Chernykh 1992). Each of these processes is documented by archaeological and/or historical linguistic evidence, and debates concerning these materials have produced an extensive and detailed literature, which cannot be fully addressed here. Commonly, however, all of these innovations of the second millennium BCE have been connected with the widespread development of "nomadic pastoralism" in the steppe zone, and framed in relation to the evolution of Bronze Age steppe societies (Kuz'mina 1994) — collectively known as the "Andronovo Cultural Community". The "Andronovo Cultural Community" is the name used to describe a cultural phenomenon that became widespread across the Eurasian steppes during the second millennium BCE (Sorokin 1966). Specifically, the Andronovo Culture is a general term that describes a widely distributed set of archaeologically documented materials including: 1) open form ceramic jars with incised geometric decorations; 2) stone-lined burials located under round mounds of earth or within rectangular stone structures; and 3) specific bronze objects such as axes,

and evolution of Indo-Iranian and Indo-European languages across the Eurasian Steppes (Mallory and Mair

2000); and 3) the widespread

weapons, and jewelry (Fig. 2, next page). These are the main elements used in the general classification of the Andronovo Culture, and there are "cultural" sub-groups that are based on variations in the decoration and attributes of this material package. Furthermore, the subcultures of the Andronovo are associated with different regions of the steppe zone as well as different time periods in the culture history of the region. This framework is commonly used to define the movements of people and artifacts in the region and over time (Zdanovich 1988). It is important to recognize that the basis for the traditional Andronovo classification is rooted in comparative material culture, which only in the past 5-7 years has come under serious



*Fig. 2. Archaeological Material of the Andronovo Culture* scrutiny by world scientists as to its standing of effectiveness in helping us to explain interaction, dynamic processes that occurred archaeologi during the Bronze Age (Lamberg-Karlovsky 2002; Renfrew 2002). fact, to date

More precisely, the problem with the traditional classification is that similarities in the material artifacts from different regions are used as evidence for interactions, migrations, and regional relationships, yet there is little scientific research that explains how those interactions may have taken place. The most prominent explanation of the way materials, technology, and language "spread" across the steppe is provided by Elena Kuz'mina (Kuz'mina 1994), who models interaction as a result of migration, with "waves" of steppe societies slowing moving from the Ural region of south Russia to the southeastern boundaries of the steppe zone. According to Kuz'mina, migration to the southeast was a response to environmental change and population pressure during the second millennium BCE, and was made possible by increased mobility that was part of the pastoral economy of the Bronze Age, specifically through horse riding and wagon technology (Kuz'mina 1998). Although elsewhere migration models are widely questioned, Kuz'mina's model is echoed in the work of many other scholars (Kosarev 1984; Mallory and Mair 2000) — all of whom cite formal

associations between ceramics (or metals) as evi-26d ence for interactive conditions between mobile populations of the second millennium BCE (also Potemkina and Shilov 1985; Mej 2000).

Appendix of this of this stance have noted that the overriding that the overriding image of the "nomadic pastor-alists" that occupied the steppe region during prehistory is primarily based on an historical under-

standing of nomadic migration and interaction, rather than on detailed archaeological reconstructions (for discussion see Renfrew 2002). In fact, to date there are few archaeological approaches specifically designed to explain local systems of pastoralism in the steppe zone during the Bronze Age, and even fewer that illustrate how economic and social interactions between regional populations may have been generated by actual nomadic or seminomadic practices in prehistory. Notable research within the past 5-7 years has shown that the archaeological data have more to tell us when approached with modern

scientific methods, e.g. recent projects by David Anthony; Claudia Chang, Natalia Shishlina, and others (e.g. Miller-Rosen et al. 2000; Parzinger et al. 2003).

Although these new projects are beginning to improve our picture of Eurasian Bronze Age systems, the main problem remains that traditional claims concerning the role that the Andronovo Culture played in the innovations and developments that occurred across the Eurasian steppe zone in prehistory are not based in scientific reconstructions of the economic and socio-political characteristics of Bronze Age nomadic pastoral society. Therefore, the goal of my research is to contribute new scientific data and approaches to modeling systems of mobile pastoralism in Eurasia during prehistory, in order to develop an archaeologically based explanation of interaction and communication between regional populations during the Bronze Age. Only then can we begin to have a more detailed understanding of how language, technology, and culture may have spread across the region in prehistory.

#### THE DZHUNGAR MOUNTAINS ARCHAEOLOGY PROJECT: METHODS, RESULTS, AND QUESTIONS

The problem of Bronze Age mobile pastoralism in Eurasia is the main focus of my ongoing research and is the focus of the "Dzhungar Mountains Archaeology Project"



Fig. 3. Semirech'e and the Dzhungar Mountains

(DMAP). The goal of the DMAP is to develop theoretical and analytical approaches to the study of prehistoric pastoral societies of the steppe through new archaeological studies in the Semirech'e region of southeastern Kazakhstan. Specifically, the study zone is located in the Koksu River Valley, and includes the surrounding steppe meadows of the Dzhungar Mountains (Fig. 3, p.4). To date, archaeological studies have been carried out in the form of an extensive landscape survey and four small-scale excavations (one Bronze Age settlement and three Bronze Age burials).

The study region was selected for a number of reasons. First, the environment of southeast Kazakhstan varies drastically from sandy deserts, grassy steppe-lands, to alpine conditions, within a geographic extent of less than 100 kilometers (west to east). This variation enables concise investigation of various environmental contexts within a logistically reasonable territory, and allows for the correlation between archaeological materials and different environmental niches. Second, substantial ethno-historical documentation as well as previous archaeological research suggests that the river valleys of the Dzhungar Mountains had been host to pastoral societies since at least the Bronze Age.

Recent research by Alexei Mar'iashev (among others) of the Institute of Archaeology in Almaty (Kazakhstan) reopened interest in the archaeology of Dzhungaria in the 1990's, suggesting that the glacially carved valley of the Koksu River might be host to hundreds of prehistoric sites and thousands of rock-art panels — likely dating to the Bronze Age or earlier (Mar'iashev and Goriachev 1993). His excavations of the burials at Talapty and Kuigan demonstrated a regional variant of the Andronovo Culture, based on common ceramics and simple metal grave goods (Goryachev and Mar'yashev 1998). Of great interest is the abundant rock-art in the Koksu Valley, studies of which have recently intensified (Mar'iashev and Goriachev 1998).

New collaborative archaeological studies in the Koksu Valley began in 2002, within the structure of the Dzhungar Mountains Archaeology Project. The goal of the field research was to reconstruct the paleoenvironment and archaeology of the study region, so that scientifically collected data could be used to test hypotheses about the mobility patterns and areas of interaction of mobile pastoralists in prehistory. The primary focus of our archaeological excavations was at the site of Begash, which includes a Bronze Age settlement and two large Bronze Age cemeteries. The field research was carried out together with Dr. Alexei Mar'iashev from the Institute of Archaeology in Almaty (Kazakhstan), geologist Dr. Bulat Aubekerov, and botanist Dr. Saida Nigmatova, from the Kazakh National Academy of Science (also in Almaty). In addition to collaborative studies, each of these scholars has been able to develop their own research interests within the scope of the project (Mar'iashev and Frachetti in press; Aubekerov et al. 2003).

#### Field methods:

The overall project methodology builds on a number of archaeological approaches. These include: 1) surface survey and mapping; 2) archaeological excavation; 3) paleoenvironmental sampling; and 4) computer assisted spatial modeling using Geographic Information Systems (GIS). The project was equipped with state of the art technology for archaeological reconnaissance, mapping, and inthe-field analysis — including Global Positioning Systems, digital photography, dynamic satellite imaging, and GIS. These tools enabled the quick and accurate recording of archaeological sites and features, as well as timely summaries and trend analysis of our findings.

Archaeological survey: The main objective of the archaeological survey was to make a detailed database and digital map of the archaeological monuments (burials, settlements, rock-art, megaliths, etc.) based on field walking and surface reconnaissance. Conducted

in May 2002, the surface survey accounted for more than 1500 km<sup>2</sup> of total landscape analysis, and 106.7 km<sup>2</sup> (10,671 hectares) of fieldwalked polygons. For archaeological recovery, the Koksu River valley and floodplain was divided into ten topographic landscape polygons: two lowland polygons, five midelevation polygons, and three upland elevation polygons. Prehistoric sites were recorded in all of these areas.

*Excavations:* In order to have more scientific details concerning Bronze Age social and economic ways of life, excavations were conducted of a Bronze Age (2200-1000 cal BC<sup>1</sup>) settlement site and burial complex discovered near the village of Begash, during the archaeological survey phase. For the settlement site, the excavation strategy was designed to recover both ecological data as well as cultural material. With paleo-climatologists, botanists, and geomorphologists, our strategy also included botanical and soil sampling and the collection of archaeo-fauna and organic material suitable for radiocarbon dating.

In addition to the settlement excavation, three Bronze Age burials were excavated, revealing (Fig. 4) human remains as well as rare bronze and gold earrings. With the permission of the Kazakh authorities, the human remains were brought to the University of Pennsylvania for studies of DNA and physical anthropology. This is one of the few instances since the demise of the Soviet Union that a collection of Central Asian human remains is being studied within the United States.



Fig. 4. Excavated skull and bronze earring

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Fig. 5. Computer generated viewshed of the Koksu Valley and the study zone using GIS.

Computer Modeling and Scientific Analysis: Synthesis of the project database and computer modeling is still underway, which entails using GIS to understand the distribution of archaeological features and ecological conditions within the study zone. Computer simulations allow for the reconstruction of past landscapes (Fig. 5), as well as an understanding of how sites are statistically situated in the valley, by correlating the actual

monument types with various factors such as the environmental zones.

#### Preliminary results

The preliminary results of the field work and initial stages of analysis have been useful for new models of the Bronze Age system of pastoralism, and for reconstructions of the nature of social interaction in the study zone. Within the scope of the archaeological survey, over 380 new archaeological sites were recorded in the study region. The sites included prehistoric settlements, cemecollected for scientific analysis. From the burial excavations, soil samples and skeletal material were collected. These samples enable a preliminary reconstruction of the domestic economy, trade practices, and practices of Bronze Age populations in the valley, and expose dynamic relationships through trade networks across the wider region. These networks are being modeled using computer simulations tied to the

teries, rock-art,

ritual construc-

tions, and stone monuments.

From excavations at the settlement

site "Begash" we

collected Bronze

Age ceramic frag-

ments, as well as

weaving artfacts,

grindstones, and

bone implments.

In addition to artifacts, over 50

kg of archaeo-

faunal remains, soil samples, bo-

tanical samples,

and radiocarbon

samples

and

were

spinning

scientific analysis of particular places in the Bronze Age landscape.

For example, geographic and spatial analysis of the survey data, in conjunction with detailed environmental reconstructions from paleo-botanical studies, has led to some compelling models for pastoral mobility patterns and social interaction within the study zone (Frachetti in press). These models suggest that during the Bronze Age pastoralists did not migrate beyond 50 km in mountain zones (Fig. 6), which contradicts ideas that pastoralists of this time were engaged in long distance migrations. In addition, I have used archaeofaunal data from our excavations to argue for patterns of local management of specific herd animals such as sheep and cattle. More comprehensive discussions of herd dynamics and herd management strategies are in preparation, while more complete analysis of the animal bones and more details concerning the formation of the settlement site are also underway. Furthermore, a major analytical priority of the DMAP was radiocarbon dating, which revealed that the settlement at Begash is the oldest dated Bronze



Fig. 6 - Calculated herding routes from BA settlements to summer pastures

Age settlement in the region (c. 2600 – 1000 cal BC).

## <u>Questions</u>

There are many questions that remain unanswered after the initial stages of field research in Kazakhstan. These include:

1) What is the structure of domesticated herds during the Bronze Age, and how do herd statistics relate to patterns of mobility in the Dzhungar Mountains?

2) What was the role of exotic material culture in the formation of social and cultural identities, and does the model indicated here, of localized interaction, provide an explanation for contacts at a wider scale?

3) What was the density of population and settlement in a region like the Koksu Valley, and how did such a local system articulate with a wider network of interactions in a practical and geographic manner?

4) How does the model of mobile pastoralism proposed for the Koksu Valley compare with other steppe regions? Can we apply the same modeling methods to other data sets?

The archaeo-fauna, paleo-botany, and skeletal data are still under continuing analysis, and the answers to these detailed questions remain to be established by ongoing and future scientific studies.

#### **F**UTURE DIRECTION OF RESEARCH

Recent archaeological studies of the steppe zone (east and west) represent the necessary step toward a scientifically grounded understanding of the movement patterns, social organization, and economy of prehistoric societies of eastern Eurasia, and will enable us to make reliable reconstructions of processes of social interaction, exchange, and communication among regional societies of the second millennium BCE. The Dzhungar Mountains Archaeology Project represents one such project focusing on the ecology and social organization of Bronze Age pastoral society in eastern Kazakhstan, placing attention on how mobile groups form social and political landscapes across the region more

widely. By reorienting our understanding of prehistoric steppe pastoralism, such archaeological initiatives can make an important contribution in re-writing the longterm history of Eurasia.

## About the author

Michael Frachetti has an M.Phil. from Cambridge University and is about to finish his Ph.D. in the Department of Anthropology, University of Pennsylvania. He has directed the Dzhungar Mountain Archaeology Project since 1999. He has also engaged in archaeological projects in Finland, the Italian Alps and Tunisia.

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## Notes

1. Cal BC is a convention in steppe archaeology designating "calibrated" Carbon 14 dates before the Common Era.