



The Bronze Age in the Western Tianshan, China: A new model for determining seasonal use of sites



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A B S T R A C T

The economy of the Western Tianshan Mountains from prehistory to present has been almost exclusively focused on transhumant pastoralism. Settlement sites are located in a variety of different ecological zones, but the location does not always provide a clear indication of the original season of occupation. Other tools for identifying seasonality of occupation for prehistoric pastoral sites presently rely largely on analysis of faunal and botanical data which may produce ambiguous results. In this paper we correlate an ethnographic study based on data from local informants with a NDVI-based model on vegetation cycles to analyze why and how modern herders in the Western Tianshan select their range lands, and whether these patterns are applicable to Bronze Age land use in the same region. Micro-climates play an important role in the choice of optimal locations for any given season, and despite small climatic fluctuations the data strongly suggest that the seasonality of the Bronze Age sites in the Bortala (Bo'ertala) Valley can be correlated with modern land use. Thus pasture analysis applied to the location of prehistoric sites in the Tianshan can provide significant insights on seasonal use.

1. Introduction

The Tianshan mountain range stretches east-west across Xinjiang as a high narrow band of young fold mountains (Fig. 1). The upper peaks are covered in permanent snowfields and glaciers; their melt waters have carved steep valleys down to the desert and semi-arid steppe below. Under the snowline is a tree belt; sparse in places and in others quite dense. Around, and scattered through the tree belt, are high mountain pastures; areas of alpine meadow. The lower slopes become gradually more arid as the spring growth is burned off early by the hot summer sun. At the western end of the Tianshan the range divides, split by the broad, fertile Ili Valley opening out onto the Semirech'ye at the south-east corner of the Eurasian steppe. North of the Ili the Bortala (Bo'ertala) River cuts a straight line from the mountains eastwards to Ebinur (Aibi) Lake (Fig. 2).

Today, and back into the historical past, the main economic activity in this region has been transhumant pastoralism, sometimes combined with supplementary agriculture or simply the production of fodder crops as insurance against hard winters. Commercial agriculture on the valley floor has been introduced only recently. New archaeological fieldwork in the Bortala (Bo'ertala) Valley has been exploring the use of this region in the Bronze Age (Jia et al., 2017). Since transhumant pastoralism involves seasonal movement between a number of locations

at different altitudes, a key question with regard to Bronze Age occupation sites is whether the population moved in similar patterns throughout the year, and if so, of the known sites, in which season they were used.

2. History of research

Archaeological research in the western Tianshan is in its infancy, primarily for political reasons, since the Chinese-Kazakh border runs across the peaks of the mountains. Up until the fall of the Soviet Union in 1991, the western slopes lay under Russian control, but very remote from Moscow, home to the Soviet Academy of Sciences, sponsor of archaeological research in Soviet times. The eastern slopes comprise the westernmost limit of Chinese controlled lands, separated by deserts, mountains and several notional time zones from Beijing. Until relatively recently, Chinese prehistoric research in Xinjiang mainly concerned rescue excavation of cemeteries (Jia et al., 2009; Chen and Hiebert, 1995; Debaine-Francfort, 1988, 1989). It is only in the past decade or so that problem oriented research has been undertaken on both sides of the border (Frachetti, 2008; Doumani et al., 2015; Jia et al., 2017; Caspari et al., 2017). Prior to 1991 research on the eastern Eurasian Bronze Age by Russian scholars was interpreted largely through ceramic typologies, burial practices and other aspects of material

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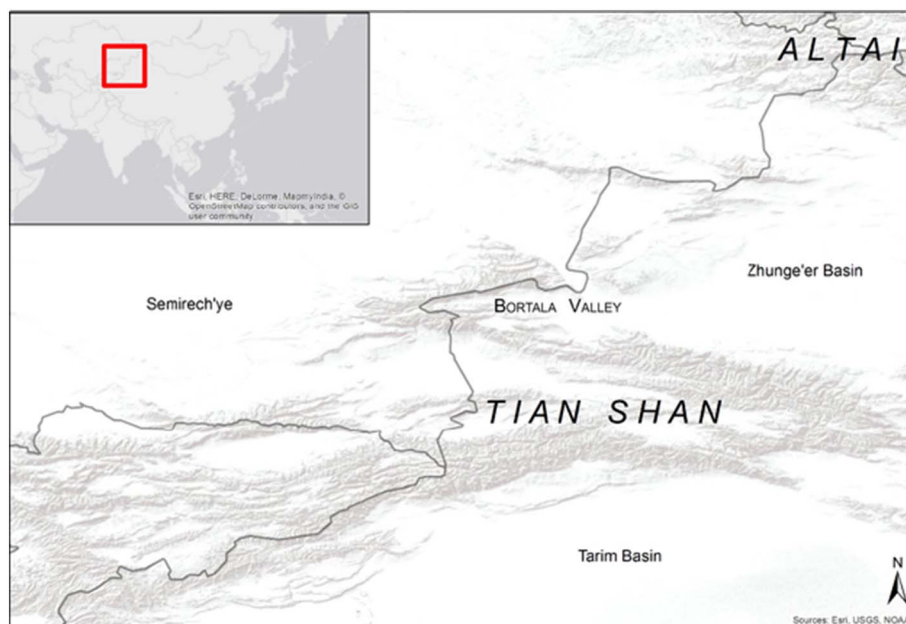


Fig. 1. Map of the western Tianshan.

culture, defined into broad cultural groups (Kuz'mina, 2007; Koryakova and Epimakhov, 2007). The largest and most diffuse of these was the Andronovo Culture. Problems associated with defining, or rather redefining, the Andronovo Culture are gradually being addressed as new data are presented and older material is reanalyzed (Hanks et al., 2007; Frachetti and Mar'yashev, 2007; Frachetti, 2008; Panyushkina et al., 2008; Molodin et al., 2012; Doumani et al., 2015). While this work has a long way still to go, at present it can be said that most of the Bronze Age sites so far investigated in the Bortala (Bo'ertala) Valley are associated with a local variant of the Federovo tradition, a cultural subset of the wider Andronovo phenomenon (Jia et al., 2017). Sites in the western Tianshan and the Ili Valley represent the easternmost extent of the Andronovo.

Within the study area of the upper Bortala (Bo'ertala) Valley there is very extensive evidence for Bronze Age occupation sites and burials dating between 1900 and 1500 cal BCE (Jia et al., 2017). It is also

possible, based on data from Semirich'ye (Frachetti, 2008; Doumani et al., 2015), that some earlier and more ephemeral Bronze Age sites may yet be found there. Iron Age burials are present in the same grazing areas as the Bronze Age sites, but there is less clear evidence for settlement sites. This may be in part due to a shift from built occupation sites to mobile organic residential structures, but this has not yet been confirmed by fieldwork.

While evidence for the Andronovo economy is still sparse, it is recognized, based on faunal remains, that they were primarily pastoralists (Kuz'mina, 2007: 145). Evidence for attendant agriculture is slight (Betts et al., 2013; Frachetti et al., 2010; Ryabogina and Ivanov, 2011; Spengler et al., 2014). While the idea originally developed that the Andronovo spread at least partly due to the adoption of horse herding (Kuz'mina, 2007: 145–151, Kuz'mina, 2008), it now seems that, at least in eastern Eurasia, the pastoral herds comprised predominantly sheep/goat and cattle. Horses, if present, were only there in small numbers



Fig. 2. General view of the Bortala (Bo'ertala) Valley at Wenquan in summer, looking north-west.

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