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Differentiated Landscapes and Non-uniform Complexity among Bronze Age Societies of the Eurasian Steppe

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Archaeological research increasingly illustrates that Bronze Age societies of the Eurasian steppe were inherently more diverse in their ways of life than their related material culture might imply (D. Zdanovich 1997; Kosintsev 2001; Nelin 2000; Epimakhov 2003). Bronze Age steppe communities illustrate comparatively different scales of social, economic, and political organization, as well as local variability in their extents of mobility and geographic ranges of interaction (e.g., Anthony et al. 2005; Chernykh 2004; Shishlina 2003; Frachetti 2008a). Even in local settings, evidence suggests that Bronze Age steppe communities were organizationally heterogeneous – meaning they were not politically or economically centralized under a shared corpus of functional institutions. Yet widespread distribution of related forms of material culture has prompted archaeologists to define an expansive cultural community through the broad lens of culture history and economic interaction throughout the second millennium BCE. One may observe that the emergence of a seemingly extensive socio-economic landscape throughout the Bronze Age stands at odds with the organizationally small-scale and locally rooted societies that occupied this vast territory. Current archaeological models of social complexity to date do not adequately fit the Bronze Age conditions evident across the Eurasian steppe zone (see Koryakova 2002). The apparent disjuncture between the scale of socio-political institutions of steppe populations and the geographic extent of their functional economic arena provides
Models of Mesopotamian organizational dynamics define complexity as "the degree of functional differentiation among societal units or subsystems" (Rothman 1994: 4). This definition is fitting for Mesopotamia, because there is an ascertainable "societal" framework from which "units" or "sub-systems" may be derived (Stein 1994: 13). Archaeological signatures of a diverse yet integrated society were generated through an emerging world system of economic and social transactions, such as surplus exchange, specialized production, resource management, and bureaucratic management, which drew the region's populations into institutionally structured chiefdoms and states through time (Algaze 2001; generally, Stein and Rothman 1994). Rothman (1994: 4) has suggested that in this setting complexity is rooted in societal organization, which he defines as "the arrangements that structure the functioning of individuals and groups as they attempt to meet social, economic, political, or ideological needs." This definition reflects what new-institutional economists like Douglass North call "institutions." Merging these terminologies suggests that greater complexity comes with a wider applicable scale of institutional forces; a larger diversity of "functional units" can be organized in relation to one another through a common set of institutional constraints. Such a metric for qualifying and quantifying complexity is useful in Mesopotamian contexts and has been adapted in various forms to describe myriad other archaeological examples, ranging from the emergence of archaic states to the structuring of complex economic and social frameworks among chiefdoms of various forms (Carneiro 1970; Blanton et al. 1996; Earle 1977; for discussion, Chapman 2003).

But what if one cannot easily circumscribe the geographic boundaries of the participant communities or locate the growth of a shared or consistent institutional framework that applies to different populations intersecting across a shared geography? Socio-political or economic complexity cannot be charted as easily on a "functional scale of differentiation" if the societies that co-generate it subscribe to independent institutional parameters or exhibit non-uniform definitions of general institutions to begin with. In place of such models, I propose a theory of non-uniform complexity that builds from North's definition of institutions in order to chart institutional heterogeneity, consolidation, and fragmentation. This model supplies a useful metric for describing complexity among differentiated populations that nonetheless interact across a common geography.

For the purpose of this study, I employ North's definition of institutions as "the humanly defined constraints that shape human interaction" (1990: 3). These constraints can be informal or formal, but for the scope of this discussion we are primarily concerned with informal institutional constraints. From the perspective of Bronze Age steppe archaeology, we may further identify specific and general institutions. Specific institutions refer to culturally particular practices, such as specific taboos or certain practices that constrain behavior among discrete in-groups. For example, David Anthony describes a case of Bronze Age dog sacrifice at Krasnosamarskoe, which, although potentially part of a wider ideological treatment of dogs, is evidence of a specific institution that conditioned how that particular community behaved in a particular contextual setting (Anthony et al. 2005: 412-413). General institutions are conceived here as categorically broader constraints, such as trade parameters, building conventions, ideological symbology, or even human burial. These institutions reflect common currents that crosscut communities but are uniquely transformed by diverse groups given their individual motivations or vantage point (e.g., Freidel 1983). The rules of engagement for trade, for example, may be considerably differentiated between two participant groups, even though, functionally speaking, economic transactions may be carried out with mutually perceived success. Anyone who has shopped in a foreign market has experienced the often disparate expectations and assessments of relative value and client-agent responsibility that surface from the non-uniform institutional frame of reference that shapes such encounters. It is important to distinguish specific and general institutions because one might expect that different societies will have different specific institutions, but, as in the Mesopotamian examples cited previously, societal boundaries are commonly defined by the degree of identifiable homology in general institutions. Although complexity is typically predicated upon the establishment of durable and codified institutional frames, I suggest that the range of institutional constraints that shaped Bronze Age interactions on the steppe reflects a non-uniform degree of parity among related or neighboring groups. Non-uniformity is the result of some general institutional codes being homogenized between diverse groups or re-shaped among them for strategic purposes, while other institutions remain individually or specifically defined (Fig. 3.1). Thus, for each participant community, its degree of organizational consolidation or fragmentation vis-à-vis its neighbors depends on the scalar cohesion of various institutional structures and the periodic willingness of those communities to
adopt or develop similar constraints to their modes of interaction. As such, the degree of "complexity" for different Bronze Age steppe communities cannot be assessed as a societal whole, because their degree of institutional cohesion may be temporarily connected and organized in some aspects, while diverse and at odds in others. The social complexity of settled prehistoric agricultural societies of the Near East, Asia, and the Mediterranean is often assessed in terms of the durability of institutions over temporal and geographic scales. Complexity among steppe communities is better evaluated in terms of institutional integration or fragmentation at the interstices of diverse populations whose economic and political interests co-exist geographically but are not necessarily bound by a shared sense of society.

In the case studies presented here, I suggest that institutions were transmutable for strategically flexible pastoralists, meaning they were periodically reformed according to a number of changing contextual factors (e.g., economic prosperity, productive alliances, ideological cohesion, environmental change). According to this paradigm, various populations can be traced along different trajectories of structural complexity. From a relational perspective, the scope of various institutional constraints considered by different groups, such as genealogical ties, trade agreements, or political alliances, may expand or contract according to particular social, economic, and political relationships. For example, a group's economic institutions may reflect a long-lived and codified set of wide-scale relationships, while their functional political institutions are comparatively local and organizationally simple. Thus, the overall level of complexity for these communities—in terms of social organization—cannot reflect a uniform trajectory of growth or decline.

Recognizing the multitude of factors conditioning steppe social interaction, Ludmila Koryakova has proposed a flexible world system model to explain the long-term structural change in the western steppe region and Trans-Urals in the Middle Bronze Age (Koryakova 2002; Chapter 2 in this volume). She suggests that uneven economic and technological developments between centralized populations at fortified sites like Sintashta and clan-tribal groups living in surrounding territories led to the establishment of a variety of scales of core-periphery relationships (Koryakova 2002: 103). Koryakova argues that, around 2200 BCE, the structure of regional interaction was reflective of a complex chiefdom, though she also notes that the trajectory of social complexity in the Trans-Urals at this time did not reflect progressive evolution to an arbitrarily greater level of complexity—at least not until the start of the first millennium BCE. Rather, she argues for cycles in the rise and collapse of local and regional relationships throughout the Bronze Age, until the start of the Iron Age.

Although her characterization of the dynamic nature of inter-group relationships is accurate, a world system-type model may be partly supported by the archaeological evidence, especially considering the conditions typically cited for functioning world systems (see Kohl 1996). Starting with the paradigm of core-periphery relationships, large fortified sites, like Sintashta and Arkaim, may indeed have defined focal areas of greater social and political cohesion when compared to other sites within the broader regional landscape (Epimakhov 2003). A world system core (e.g., Algaze 1993), however, should also demonstrate the capability to maintain economic and political influence over both the materials and means of production in the periphery (Wallerstein 2000: 90–92). The fortified sites in the "country of towns" seem to demonstrate
only localized influence, although they participated in the wider circulation of a diversity of materials or technologies (Anthony, Chapter 4 in this volume). Rather than these larger centers dictating productive control over the periphery, it instead appears that decentralized pastoralist groups had more control over the source side and distribution side of exchange, especially in terms of one of the most precious technologies of the time—metallurgy.* Koryakova herself notes other ways in which the chiefdom-world system model may less exactly describe the diversity of ideological, political, and economic organization evident in the steppe in the Middle Bronze Age—specifically in terms of codified burial ritual and social hierarchy (Koryakova 2002: 107). Although a world system model is debatable, Koryakova's discussion of the disproportional scales of economic and demographic cohesion in Middle Bronze Age Trans-Uralia nonetheless provides valuable theoretical building blocks for the theory of non-uniformity presented here.

Scale and Non-uniform Complexity

A key variable in assessing complexity is scale. When systems are viewed at the widest geo-political scale (i.e., globally), vast differences in institutional structure among different societies are not surprising. Such global perspective has sparked powerful theoretical paradigms, such as Wallerstein's (1974) conception of the modern world system. Non-uniform complexity, however, describes a condition of scalar transformation of various general institutional forces that shape social interactions among differentiated local communities. At the most local scale, we might imagine groups whose institutional constraints at first serve to organize the immediate community, while enabling them to strategize among their neighbors. At this scale, non-uniform complexity may be comparable to better-known models such as heterarchy, discussed by Crumley (1995). In hierarchical systems, political power and social institutions may be expressed among related groups according to different measures. However, heterarchy and heterarchical processes, such as peer-polity interaction (Renfrew and Cherry 1986), more often describe coherent socio-cultural systems wherein regional "peers" participate in a shared socio-political process by manipulating common elements of cultural and material currency. Here the variability of scalar consolidation and fragmentation is a result of strategic institutional change, rather than the systemic variation of a shared societal fabric through different stages of organization (Wiessner 2002). Institutional change, as North (1990: 8) argues, "comes from the perception of entrepreneurs in political and economic organizations that they could do better by altering the existing institutional framework at some margin." It may be that some strategic alterations to a particular institution will expand its scalar resonance among interacting groups, while other institutions remain locally contextualized (i.e., specific). If we envision such transformations on the widest scale, some institutional alignments may help to shape the boundaries of a world system or facilitate the envelopment of populations into larger economic or political bodies. However, if such scalar transformations are formulated from groups with heterogeneous motivations, they are also prone to fragmentation or reform by subsequent transformations in other, parallel institutional arenas. Non-uniformity characterizes how independent communities find strategic mechanisms to shape their various modes of interaction using dynamic institutional parameters. Institutionalized practices, like the relation of metallurgy to prestige goods, may illustrate a relatively long-lived and wide-scale resonance, while other institutions, like burial form and ritual, may be comparatively more diverse and responsive to local social and political dynamics. Yet, for a period of time, burial institutions and metallurgical circulation reinforced one another because metal objects were commonly used to aggrandize buried individuals. As a result, contingent social motivations reciprocally impacted how each institution was experienced and translated among communities.

Scalar reorganization is well documented ethnographically among pastoralist groups (e.g., Irons 1974; Beck 1991). Pastoralists strategically negotiate their political and environmental landscape, periodically causing aspects of institutional parity to collapse, or fraction. In such periods, groups commonly regress to smaller-scale units, and their shared institutions and practices may be regionally reformulated to be relevant at the extant scale of political integration (e.g., Shahrani 1979). Fractioning is reflected archaeologically in periods of material diversity and landscape reform (changes in settlement geography, burial diversity, etc.). The inherent variability of mobile pastoral strategies often precludes long-term stability at a given state of organization; throughout the second millennium BCE, various steppe groups teetered on the edge of more highly institutional forms of social and political integration. These periods of social consolidation and fractioning, fundamental to the model proposed here, confound a conventional picture of progress from simpler to categorically more complex organization in a linear socio-evolutionary sense.
Viewed over the long-term, some social, political, and economic relationships across the steppe do seem to reflect consistent growth in terms of greater geographic distribution and structural stability. Certain conditions, such as metallurgical production and resource-trade relations, are less responsive to the fluctuation of non-uniform political dynamics, perhaps because of their obvious social and functional benefit. Once introduced, it is likely that even societies in a state of fractioning would not disintegrate so far as to sever all ties with certain economic or social networks. So, it follows that inter-regional resource trade and metallurgy, for example, developed along a fairly stable trajectory and seemingly promoted most steppe groups to a “higher” level of institutional coherency throughout the Bronze Age (Chernykh 1992; Chernykh et al. 2004).

Nevertheless, economic or technological prosperity does not necessitate categorical growth in socio-political organization. Characteristic forms of material culture may be distributed across the boundaries of local landscapes and have various impacts on each context. Formal characteristics and materials are transportable, but their meanings can be re-shaped and re-applied to fit the current socio-political setting and array of participants (Appadurai 1986; Urban 2001). On a larger scale, the archaeological data may reflect inter-regional interactions such as those identified across the steppe throughout the second millennium BCE, yet the overall state of complexity may still be described as non-uniform.

Depending on the degree of social solidarity or the duration of particular relationships among various groups, processes of assimilation, emulation, and transplantation of economic and socio-political forms may help to formalize the structure of wider scale geo-cultural arenas and relationships through time. Such geo-cultural extensions are specific to the motivations of particular actors and their strategies for maintenance or promotion of themselves, their group, or their institutions, but they are also subject to the historical reiteration of formalized relations of power. This may explain why some populations develop core-periphery relationships in some arenas, whereas other populations may selectively disengage from such interactions. These groups may variously benefit or lose out according to their proximity or association with neighbors with greater stability or geographic extension in their socio-political institutions (Sherratt 1993). I propose that periodic variability in the local economic and socio-political strategies of Bronze Age mobile pastoralists acted as a generative force behind the diversity of institutional expressions among steppe populations throughout the second millennium BCE.

At its most basic level, non-uniform complexity describes the scalar growth or decline of differentiated relationships between groups as they fluctuate through various levels of social integration or institutional cohesion across their landscape. A group’s social landscape (i.e., the geo-cultural extent of their interactions) is determined by its practices and strategies (e.g., mobility, resource exploitation, ritual, trade) set within the ambit of regional ecological settings and geo-history (Ingold 1993). From this perspective, a given social group may go through a series of stages of consolidation and disintegration, expressed by the extent of its political control and social consolidation of power (e.g., Marcus 1998). Bronze Age pastoralists of Eurasia, as well as agricultural civilizations of southern Central Asia, demonstrate this dynamic process of socio-political growth and decline throughout the second millennium BCE (Kohl et al. 2002; Hiebert 1994: 176-177).

Non-uniform Complexity in Three Archaeological Landscapes

Three Bronze Age landscapes can be used to illustrate the scalar transformation of institutional organization among regional steppe populations and between the diverse societies that co-occupied the territories between the “steppe and the sown” circa 1900 BCE. Here, we individually consider the conditions of organizational complexity within the Trans-Urals region, Semirech’ye (eastern Kazakhstan), and the Margiana Oasis (Fig. 3.2).

Non-uniform Complexity in the Trans-Urals Region

The economy and political structure of the Trans-Urals region in the Middle Bronze Age (ca. 2100-1700 BCE) appears to have been generated through a variety of relationships between differently organized communities. Some of the communities exhibit characteristic traits of “chiefdom-like” polities, with centralized settlements (e.g., Sintashta, Arkaim) and burials that indicate the existence of institutionalized structures of social and political hierarchy. Yet other contemporary groups in the neighboring steppe and forest-steppe regions were succeeding as mobile pastoralists and metallurgists and do not illustrate institutional coherency with these more centralized communities (Epimakhov
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Epimakhov (chapter 5 in this volume) provides a well-conceived reconstruction of social dynamics in the Sintashta cultural landscape at the start of the second millennium BCE, reflected in intensified interaction among pastoralists, hunter-herders, and other groups across the Circumpontic and Trans-Urals regions (also G. Zdanovich and Zdanovich 2002: 251). Differentiated settlement and burial scales provide a starting point from which we may trace the development of non-uniform institutional structures in the Trans-Urals region in the Middle and Late Bronze Age. Then, we focus on a few institutional trajectories related to exchange and production, and ritual expression, as well as the implications that various scales of settlement and burial have for institutional cohesion among neighboring communities.

At the start of the second millennium BCE, the Sintashta-Arkaim settlement type dominated the riparian valleys between the Ural and Tobol rivers, defining the “country of towns” (G. Zdanovich and Zdanovich 2002). These settlements were large, fortified, and centralized; the outer fortifications at Sintashta enclose roughly 6.2 hectares (Gening et al. 1992: 390). Trans-Uralian communities were primarily herding groups at this time, taking advantage of the rich ecological niche along the many rivers and tributaries in the region. Stable isotope analyses from bodies of the Bol’shekaraganskii cemetery (2000-1800 cal. BCE) illustrate a diet rich in protein from sheep and cattle, with limited proportions of plant foods (K. Privat in D. Zdanovich 2002: 168-170). Differentiated burial structures and burial treatment in the form of diverse grave materials from Bol’shekaraganskii reflect an emergent social hierarchy in the “country of towns,” although the reach of this political system was likely limited to a fairly localized landscape (G. Zdanovich and Zdanovich 2002: 249).

Articulated with the Sintashta cultural landscape were a number of smaller-scale groups that were likely less socio-politically centralized but were more extensive in their geographic scale of interaction, represented by Petrovka and Abashevo cultural materials (Tkachev 1998). Petrovka settlements such as Kulevichi III (Vinogradov 1982) are located within the territory of the “country of towns,” but are substantially different in their construction and permanence of habitation (G. Zdanovich and Zdanovich 2002: 252). The disparities in scale and density of settlements of the Petrovka type indicate that a diversity of groups contributed to the settlement landscape of the “country of towns” with different economic strategies and demographic organization from those of Sintashta.
folk (Tkachev 1998). Further points of institutional difference between these contemporary communities are evident in the diversity of burial traditions across the Trans-Urals. Tkachev (1998: 41) observes that for communities associated with the Petrovka type "a specific burial planigraphy [sic] was developed - one to two central graves containing adult remains under a kurgan and children's burials typically laid-out in a ring on the periphery." Sintashta-type burials are sometimes surmounted by kurgans as well, but reflect a greater focus on individual status of the person interred through elaborate tomb staging, animal sacrifice, and inclusion of high-status goods (e.g., cemetery "CM" at Sintashta; Gening et al. 1992). Sintashta-type burials illustrate a clear institutional departure from the family structure or extended lineage ritual of burial associated with the Petrovka typology. From a comparative perspective, we may infer that ideological institutions - at least as they pertain to burial and potentially to social organizational structures - were differentiated among these populations. However, a link between these populations is evident in their shared material forms (Potemkina 1993a), which may be explained through the strategic growth of mutual economic institutions related to the elaboration of metallurgy and emerging trade networks in the first centuries of the second millennium BCE (Kuz'mina 2004). Chapters 4, 5, and 9 in this volume, which deal directly with the growth of metallurgical and material exchanges throughout the Trans-Urals at the start of the second millennium BCE, demonstrate that a wide array of material and technological overlap was essential to the functional success of a variety of communities occupying the western steppe region. The success of such interaction was likely generated through the negotiation of institutionalized economic mechanisms that, at first, simply spurred a wider distribution of technology and material forms and later set the groundwork for more formal relationships between specialized communities of metallurgists, pastoralists, and others.

The geographic extent of shared economic relationships among various Trans-Uralian communities grew for more than 200 years, evident in the widening distribution of common ceramics, metals, and technologies (e.g., chariots) across the western steppe around 1900 BCE (Kuz'mina 2004; Anthony, Chapter 4 in this volume). Yet, by 1800-1700 BCE the institutional organization of the "country of towns" began to decline, demonstrated in the discontinuity of the Sintashta-Arkaim settlement type in the Trans-Urals and its ultimate complete replacement by smaller pastoralist encampments of the "late Petrovka" and the "Alakul" types (Kuz'mina 1994) (Fig. 3.3). Epimakhov cites environmental change and ethnic pluralism as the cause of decentralization in the Trans-Urals (Epimakhov 2003: 88). Whatever the reason, diversity in late Petrovka and Alakul cultural assemblages and settlements may index a process of institutional fractioning of the more centralized polity of the "country of towns" into a geographically dispersed social landscape of mobile pastoralists across the region (G. Zdanovich and Zdanovich 2002: 252).

Comparing the settlement and burial records from a wider temporal perspective shows that only some groups flourished at the transition to the Late Bronze Age. Although consolidation was evident in the settlement scale of the "country of towns" at the beginning of the second millennium BCE, it would seem that extant institutional mechanisms of power did not resonate for long among those living in these larger centralized settlements. This point is illustrated poignantly by the period after 1800 BCE, when the Sintashta-type settlements were in decline and expanding technologies, like bronze metallurgy, became even more pivotal to the political economy of the Trans-Urals region (Hanks, Chapter 9 in this volume). The scalar transformation of settlement...
geography indexes a process of fractioning in the shift to the Alakul' phase around 1700–1600 BCE in the Trans-Urals region. In fact, the distribution of late Petrovka-Alakul' ceramics extends both west and east, and the diversity of ceramic forms at sites such as Bol'shekaraganskii may indicate an increasing expansion of economic networks while the centralization of the "country of towns" had all but collapsed.

Viewing socio-political organization from the perspective of mobile and strategically flexible pastoralists reveals that there simply may have been an institutional reorientation of political and economic relationships and a restructuring of the geographic and social scale of interacting communities. The adaptation of institutional relationships, such as a new focus on production and resource exchange, is evident around 1700 BCE at sites such as Gorny and Kargaly, located at the southwestern boundary of the Sintashta territory.

The settlement site of Gorny is located beyond the main regional extent of Sintashta-type settlements (Chernykh 2004). Gorny dates to the period when sites like Arkaim had been abandoned, roughly 1700–1400 cal. BCE. The scale of domestic structures in this period is comparatively smaller than the Sintashta period, although the region can still be categorized as regionally diverse. Gorny itself encompasses an activity zone of nearly 4 hectares (Chernykh 2004: 235), which reflects a considerable social investment in the ores available in the territory around Kargaly. Gorny's significance to the development of metallurgical trade relationships between populations in the north Caspian steppe region and Trans-Urals is evident in the scale of its metallurgical production and corresponding distribution of metal artifacts (Chernykh et al. 2004), but also in the corollary scale of consumption of domestic fauna recorded at the site, apparently fostered through exchange relations with regional pastoralists (Antipina 1999).

The regional exchange relationship evident at Gorny is important for two reasons. First, the population of Gorny was likely a specialized community of miners and artisans (Chernykh 2004) who, by and large, did not directly generate its own subsistence. Thus, its scale of consumption reflects an equally specialized production of domestic animals by neighboring populations. In comparison with earlier Arkaim, Chernykh rightly notes that Gorny was analogous in terms of its scale of impact in the local political economy and in shaping power relations between variously specialized groups. Thus, in comparison with earlier exchange relationships in the Sintashta phase, the amplification of a commodity-based trade institution at Gorny illustrates how comparably less-consolidated pastoral populations were able to adapt their economic institutions in spite of relative fractioning in the social organization of the region.

These brief examples illustrate how non-uniform institutional growth and decline describe the varied expressions of social and economic organization among different groups in the Trans-Urals region from the period 2100 to approximately 1600 BCE. Specifically, we may look to diversity in the scale and construction of settlements and differentiation in burial structure to illustrate heterogeneity in relevant social and ritual institutions between interlaced populations in these periods. I define this context as institutionally non-uniform, rather than simply diverse, because the populations organized by different practical constraints and opportunities generated a mutually functional institutional relationship in some realms, evident in the distribution of metal and ceramics through flexible networks of trade and material exchange, yet they were seemingly autonomous in other institutional arenas. Thus, the political economic complexity of this period may best be described from a paradigm of non-parallel but related trajectories of institutional cohesion and fragmentation through time.

Non-uniform Complexity in Semirech'ye

The Bronze Age of Semirech'ye (southeastern Kazakhstan) is less comprehensively studied than that of the Trans-Urals but nonetheless provides us with another view of non-uniform complexity in a Bronze Age steppe context. As recently as five years ago, archaeologists believed the earliest Bronze Age settlements in the region dated to about 1600 BCE (Kuz'mina 1986; Mar'yashv and Goryachev 1993; Frachetti 2002; Goryachev 2004). New radiocarbon dates from the settlement site of Begash illustrate that Semirech'ye was inhabited by pastoralists at least as early as 2450 cal. BCE (Frachetti and Mar'yashv 2007), which demands a re-conceptualization of our frameworks for understanding the development of pastoral societies in Semirech'ye and the nature of their political and economic organization throughout the Bronze Age.

Unlike the rapid consolidation of population that corresponds with the centralized settlements of the Sintashta-Arkaim "country of towns," the archaeological landscape of Semirech'ye illustrates a long duration of localized fluctuations in the scale of interaction and institutional cohesion among Bronze Age mobile pastoralists. Archaeological evidence from the Koksu Valley illustrates the establishment of large (~1200 square meter) stone-foundation villages and their associated quasi-megalithic Bronze Age cemeteries, which may reflect periods of
institutions and group cohesion among seasonally transhumant pastoralists. However, fluctuations in the geographic reach and social coherency of various institutional parameters are indexed by periodic shifts in the construction scale of pastoralist winter villages and in the size and elaboration of Bronze Age cemeteries, most notably in the Koksu Valley (Frachetti 2008a).

Organizational consolidation may have been spurred by favorable environmental conditions (i.e., ample pasturage), excellent leadership, or positive trade relationships—to propose a few likely factors. On the basis of environmental reconstruction and range capacity studies, I have suggested that growth at settlements such as Begash indexes a concentration in the extent of pastoral mobility, because elaborate winter settlements are located less than 20 kilometers from the rich upland pastures that supported domesticated cattle and sheep (Frachetti 2006). Unfortunately, it is difficult to document archaeologically exactly how long such periods of consolidation may have lasted. Chronologically detailed reconstructions of stratigraphic accumulation at Begash illustrate periods possibly as long as 500 years with no evidence of disruption in the local patterns of mobility and settlement (Frachetti and Mar'yashev 2007). Burials at large cemeteries such as Kuigan and Begash-2 contain prestige goods and exotic grave goods (Goryachev 2004), which may be evidence for emerging social differentiation within local political institutions. The structure and materials of these burials are not, however, suggestive of a wide-reaching institutionalized form of political hierarchy.

The periods of scalar consolidation at the settlement and burial grounds of Begash seem to alternate with phases of more stochastic habitation at the site. Specifically, phase 2 (1650–1000 cal. BCE) at Begash reflects higher mobility and less substantial occupation on the part of local pastoralists. Although the site never appears to go completely out of use, these periods also last as long as 300–400 years. Smaller settlements in more marginal ecological settings, however, are also evident in the valley at this time, and the occurrence of smaller, unassociated burial grounds seems to alternate with phases of more stochastic habitation at the site. For example, the occurrence of smaller, unassociated burial grounds, such as Begash-1 (Mar'yashev and Karabaspakova 1988), may also be indicators of periodic fractioning, perhaps when larger settlements were ecologically unappealing or when smaller groups sought social or political separation from dominant groups. As with periods of cohesion, social fractioning also may have resulted from a variety of conditions.

Because intensive archaeological survey was not a major thrust of research in Semirech'ye during the late Soviet era, there are few detailed archaeological studies that provide comparable archaeological documentation of local Bronze Age settlement geography. Alexei Rogozhinskii's work (and others') on the Bronze Age archaeology of Tamgaly is a notable exception that provides a well-documented case study of political differentiation to compare with the Koksu Valley.

Tamgaly is a site most noted for its spectacular Bronze Age rock art. Its main "sanctuary" boasts more than 10,000 skillfully carved rock engravings, which is why the site has been promoted recently to Unesco's world heritage list. The area around the heaviest concentration of rock art also provides a rich archaeological record of domestic and burial contexts, and Rogozhinskii's detailed excavations supply a distinct characterization of socio-political organization in this part of Semirech'ye (Rogozhinskii 1999). Tamgaly functioned as a social and ideological center for pastoralists whose practical scale of interaction may have been more extensive than other Late Bronze Age populations across Semirech'ye.

As Tamgaly's most abundant archaeological data, the site's rock art documents wide-scale regional communication, as many motifs are commonly found throughout the mountains from the Altai to the Pamirs (Samashev 1993, Mar'yashev 1994). Specifically, figures known as "sun dieties" (Fig. 3.4) have been regularly recorded throughout Semirech'ye, most notably at Byan-Zherek (Mar'yashev 2002), Eshkiolmes (Koksu Valley), and Anrakhai (Mar'yashev and Goryachev 2002). These images also show direct stylistic associations with sun dieties known from the Tian Shan Mountains at the sites of Saimaly-Tash and Chopan-Ata (Kyrgyzstan). "Sun-head" motifs are also well known in the shamanistic imagery of the Altai Mountains and southern Siberia (Devlet 1980). The
identifiable cords and hanging elements of the costumes of Bronze Age sun-head images in the Dzhungar Mountains, such as at Eshkiolmes and Byan-Zherek, have been convincingly associated with Eurasian shaman costumes of the Altai, suggesting that shamanism played a role in the ritual and ideological practices of Bronze Age peoples in the Koksu Valley and at Tamgaly (Samashev 1998).

Rogozhinskii argues that Tamgaly functioned primarily as a ritual center, while practical and economic life was carried out on the site's periphery. The first period of ritual centralization is represented by the burial ground Tamgaly-I, which chronologically correlates with the Alakul'-Atasu period (1600-1400 BCE), whereas the second period of intense construction (at Tamgaly-2 and 4) reflects a later, “mixed” cultural phase in Semirech’ye corresponding to the Final Bronze Age (1400-1000 BCE).

Throughout the second millennium BCE, the geography and environment of the Tamgaly region was semi-arid, much as it is today. Thus, the regional ecology would not easily sustain pastoral populations on a year-round basis. Given the seasonality of the landscape, the site’s social and ritual significance likely accumulated over time as annual rites and burial events were artistically memorialized in the canyons, serving as centralized ritual locales in the cultural geography of regional mobile pastoral groups. The wide geographic currency of Tamgaly’s most prominent motifs, the sun deities, suggests the growth of a shared ideological expression among numerous groups across Semirech’ye, such as those around Begash. The scalar resonance of these semiotic forms indexes a growth in ideological semantics around 1600 BCE, which may be correlated with the fractioning of social and political geography at this time.

The two major cemeteries at Tamgaly provide some indication of the scale of socio-economic interactions associated with those interred at this important ritual center. The stone cist burials at Tamgaly-1, which are arranged in a burial group with a central cist and associated cists around it, date as early as 1600 BCE (uncalibrated C14 – Rogozhinskii 1999). On the basis of Rogozhinskii’s comprehensive comparative analysis, the ceramics and metallurgy from Tamgaly-1 illustrate close stylistic similarities with Alakul’ and Atasu materials from as far as the southern Urals and central Kazakhstan (Rogozhinskii 1999: 17). In fact, the ceramic assemblage collected from the 14 burials at Tamgaly-1 is fairly consistent in its decoration, which may indicate that the dominant population was engaged in more highly institutionalized relations of exchange across an extensive but formally organized socio-economic arena. Given the ecological constraints of the region, the population was likely engaged in long migratory orbits, perhaps far north into the steppes of central Kazakhstan or beyond. Ethnographic studies of seasonal movements of nineteenth-century Kazakhs lend support to this hypothesis (Abramzon 1971), at least from an ecological point of view. What is clear, however, is that the rock art of Tamgaly represents a discrete set of semiotic forms whose wide-scale distribution alludes to the formalization of certain ideological and economic relationships among regional populations and those who controlled this important location.

Although the Koksu Valley also boasts impressive rock art, the sanctuary at Tamgaly presents a more substantially centralized and formalized ritual context. The control of this site, as well as the environmental demand to migrate longer distances throughout the year, may have prompted those groups to seek more highly institutionalized interactions than those living in more productive regions of Semirech’ye. Again, a comparison of Begash to Tamgaly shows that the Bronze Age ceramic assemblage from Begash in the Koksu Valley is highly differentiated and inconsistent when compared with that of other Bronze Age settlements of the region (Frachetti 2008b: 168). Of all the diagnostic sherds recovered in excavations at Begash, 25% are decorated vessels, and of these,
more than half can be associated stylistically with forms provenienced beyond Semirech'ye. The array of exotic ceramics at Begash includes sherds directly comparable with Fedorovo and Atasu ceramics known from central and eastern Kazakhstan, as well as the Altai and southern Siberia. Taken together, the ceramic assemblage at Begash reflects a variable expansion of interactive relationships in the Koksu Valley throughout the Bronze Age, which likely correlates with the periods of fractionalization of socio-political organization of pastoral groups.

Comparing the inventories of Begash with other Bronze Age settlements across Semirech'ye, we see that the stylistic details in the ceramic assemblages are different for each site, which suggests a relative variability in the institutional structure of each population's regional interactions. Although Bronze Age settlements across the Dzungar Mountains and Semirech'ye, such as Talapty, Kuigan, Acy, Kzyylbulak, and Tasbas, do share a common set of coarseware jar forms with Begash (likely domesticated produced quotidian ceramics), each of these sites also has a unique and rich set of decorated ceramics, which are associated with stylistic analogues from beyond the region, ranging in provenience from the Tian Shan Mountains, central Kazakhstan, southern Siberia, and the Altai Mountains (Goryachev 2001). There is surprisingly limited overlap in the occurrence of particular decorative motifs at settlements across Semirech'ye. This inter-site variation suggests that, rather than participating in a common, mutually organized trade economy, each population in Semirech'ye established suitable trade relations according to its own institutions within a regionally delimited context.

Ultimately, the pastoral population living in the Koksu Valley enjoyed a rich ecological setting, and only periodically or stochastically expanded the scale of its migrations and regional interactions. The settlement patterns in the valley and their associated ceramics illustrate that internal variation in local socio-political organization may have fueled occasional bursts of regional interconnection and diffusion, but institutional coherency among populations across Semirech'ye seems to have remained locally strategic and non-uniform. Communities in the Koksu Valley experienced scalar expansions and contractions, but geographic expansion in this case more likely reflected a reframing of socio-political institutions, rather than centralization or cohesion. Other Bronze Age sites in Semirech'ye seem to mirror the case seen for the Koksu Valley, wherein material diversity was likely a result of locally resonant institutional reform rather than wide-scale organizational consolidation. In fact, the development of a centralized ideological center at Tamgaly and the distribution and coherence of ideological forms is an indicator of exceptional scalar growth in a particular institutional realm among pastoralist populations of Semirech'ye.

Non-uniform Complexity in the Margiana Oasis

The two steppe contexts examined here illustrate how regional socio-political landscapes developed under the condition of non-uniform complexity. Both of these cases have presented predominantly pastoralist scenarios, for which we may expect a higher degree of organizational variability and scalar fluctuation in socio-political institutions. Yet non-uniform complexity is useful to describe how social interactions affect societies at a variety of structural scales. Because the Margiana Oasis is outside the geographic focus of the current volume, I explore only a few of the ways in which non-uniform institutional trajectories are evident in this context around the same period of prehistory.

Socio-political organization of the Margiana Oasis during the early and middle second millennium BCE can be fruitfully re-examined through the paradigm of non-uniform complexity. C. C. Lamberg-Karlovsky (2003) has rightly argued that the political organization of the Bactria-Margiana Archaeological Complex (BMAC) does not match well with our current attributions of chiefdoms, states, or simple tribes. Qala architecture at a number of settlement sites has been related to a khanate system for the BMAC, especially during the final phases (Hiebert 1994: 177). Ceramic standardization and stamp seals are two clear indicators of institutionalized production, social hierarchy, and bureaucratic organization in mature BMAC contexts (Hiebert 1994, 2002). The recovery of BMAC materials across the Iranian plateau and beyond provides convincing evidence of BMAC participation in a larger-scale emerging world system at the start of the second millennium BCE (Kohl 2007). There are considerable traces of steppe ceramics in BMAC contexts (Hiebert 2002) but not enough to argue for stable institutionalized relationships between the two regions.

Archaeologically, the BMAC lasted a little more than 200 years, after which, in the "Takhirbai period" (1800-1500 BCE), the settlement and socio-political organization of the region become obscured by the decline in large-scale architecture and a fractionalization of relationships amongst the major BMAC oasis centers.

Documented relationships between steppe pastoralists and agriculturalists in the Takhirbai period were far from clear, but simple inductive reasoning begs the question: when the BMAC fractioned, what
happened to the “complex” institutional relationships that promoted the proto-state-like system that enabled the BMAC to flourish? Perhaps the relationships among populations of the BMAC were less coherently institutionalized and hierarchically formulated than the material culture suggests? Although currently the archaeological record is not rich enough to illustrate why there was a political and social shift around 1800 BCE, we must conclude that the decline of sites such as Gonur, Togolok, and Altyn-Depe’ must have been coincident with a shift in the political economy of the region. In this sense, the processes that introduced both consolidation and fractioning into the socio-political organization of the Trans-Urals region and Semirech’ye may also be usefully applied to those in Margiana. These include the alternating scalar expansion and decline of ideological, economic, and political institutions that drew differentiated regional populations into complex interactions.

If we look across the steppe, it is difficult to identify a singular process or trajectory of economic, social, and political development during the Bronze Age, yet we are stuck with archaeological materials as the primary proxies for interaction between societies of the Eurasian steppe and beyond. Non-uniform complexity provides a model that allows local-scale variation to carry a wider-scale impact on the re-shaping of the cultural landscape of central Eurasia throughout the second millennium BCE.

Conclusion

In this chapter, I have suggested a condition of non-uniform complexity to explain the dynamic scales and character of social and political interactions across the steppe in the second millennium BCE. The cultural landscapes of the Trans-Urals and Semirech’ye were used to highlight some of the archaeological correlates of fluctuating institutional settings for pastoral populations, whereas the Bactria Margiana Archaeological Complex case suggests its application in contexts typically considered outside the steppe pastoralist world. Each of these regional landscapes illustrates that Bronze Age societies exhibited varied trajectories of social, economic, and political organization at the start of the second millennium BCE.

Steppe archaeology further illustrates that pastoralist strategies contributed substantially to the formation of distinct yet interlocking political economies across central Eurasia during the second millennium BCE (Koryakova 2002). The distribution of shared material forms and metallurgy across Eurasia, traditionally used as landmark evidence for the Andronovo culture historical model (Kuz’mina 1986, 1994; Potemkina 1995a, 1995b), can be best understood through the conditions of non-uniform complexity. Under this paradigm, opportunism and contingency facilitate material distribution within socially and ecologically structured patterns of regional interaction between pastoralists, metallurgists, and others. The Bronze Age archaeology of southeastern Kazakhstan illustrates how distant regional systems were articulated, albeit tenuously, through a network of pastoralist societies, whose own social and political organizations are inconsistent with linear, progressive models of social and political evolution.

From this viewpoint, the Bronze Age landscape of the steppe may be depicted as a “jigsaw puzzle” of fluctuating socio-economic arenas that served to link otherwise discrete and localized pastoral populations (Frachetti 2008b: 174). Pastoralist strategies, by definition, contribute to a heightened degree of variation in mobility and subsistence strategies, in settlement ecology, and in commercial activity – both within and across regions. In eastern Kazakhstan, local Bronze Age groups were practicing vertically transhumant pastoralism throughout the Tianshan and Dzhungar mountains as early as 2450 BCE, their cultural landscape shows incredible longevity because of the variability and adaptability of their economic and political practices. Differing degrees of mobility, productivity, and interaction, as well as environmental factors, are essential to the way pastoralists practically define and change the landscape within which they live, and this variation structures the venues and geographic extent of their interaction and assimilation with their neighbors (see Frachetti 2008b for discussion).

In terms of complex political organization, then, these variable contexts engender a flexible system wherein power relationships can be revamped in response to periods of greater social, environmental, and economic stability or volatility, either within a local territory or at broader geo-political scales.

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Notes

1. Interestingly, this is not what North (1990: 7) calls an organization. Organizations, for North, are the bodies or structures that result from the implementation of institutions – or put in Rothman’s terms, the resulting “functional units” of societal organization.

2. Informal constraints are those institutional boundaries that are not necessarily formalized through legal or bureaucratic mechanisms. North (1990) distinguishes informal institutions such as ideology and norms of behavior that are codified and enforced through common consensus from formal institutions such as written laws, constitutions, or religious dogma that are explicit and can be held to the letter.

3. North (1981: 94) discusses this most notably in the form of the state.

4. Chernykh and others have argued that the Seima-Turbino metallurgical phenomenon was controlled by a mobile population (Chernykh et al. 2004). Although the social details of such a group are not clear, the wide distribution of prestige-oriented artifacts suggests that metallurgical trade and production was brokered by groups operating across wide geographic ranges.

5. Author’s translation from the Russian.

6. Archaeological research in Semirech’ye during the late 1980s and early 1990s was mainly focused on single-site excavations.

7. In addition to steppe ceramics, Begash also revealed one of the few documented cases in the steppes zone with wheel-spun ceramics similar in form and production to those known in Period IA of the Bactria and Margiana Archaeological Complex (Frachetti 2004: 347–349). However, one should not overstate this evidence because only one diagnostic sherd was found, and it awaits spectrographic analysis to confirm its provenience.

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CHAPTER 4

The Sintashta Genesis

The Roles of Climate Change, Warfare, and Long-Distance Trade

DAVID W. ANTHONY

Introduction

Recent studies by Di Cosmo (1999, 2002) and Vehik (2002) have emphasized the transformational political effects of inter-tribal warfare in arid grasslands on two continents. Intensified warfare in both places encouraged greater political complexity, hierarchy, and elite-centered, distance-trading activities. This chapter argues that intensified warfare and long-distance trade played powerful roles in the origins of the Sintashta culture. Sintashta is defined by a group of fortified settlements and cemeteries dated about 2100-1800 BCE (calibrated) in the northern Eurasian steppe between the upper Ural and upper Tobol rivers southeast of the Ural Mountains. Outside the settlements were cemeteries that yielded whole-horse sacrifices, chariots, and many weapons. Inside the settlements, almost every excavated house yielded copper slag and remains of furnaces or intensely burned hearths. The metal was copper or arsenical bronze, usually in alloys of 1-2.5% arsenic. Pieces of crucibles were placed in two graves at Krivoe Ozero (Vinogradov 2003: 172), and broken casting molds were recovered from the Arkaim settlement. An estimated 6,000 tons of quartzitic rock bearing 2-3% copper was mined from the single documented mining site of Vorovskaya Yama east of the upper Ural River (Grigoriev 2002: 84; Zaikov, Zdanovich, and Yuminov 1995). The surprising evidence for metallurgical production inside every excavated structure suggests that the Sintashta settlements were the focus of intense metalworking activities, although the scale and organization of metal production is not well