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# **The Comparative Study of Chiefly Communities in the Eurasian Steppe Region**

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## **ABSTRACT**

*The chiefdom has been taken by many scholars to be a highly specific and unvarying societal type, but the emergence of the larger human communities that have often been labeled chiefdoms took a number of different paths in different regions. Comparative analysis of the kinds of archaeological evidence most directly relevant to the social organization of these chiefly communities demonstrates considerable variety within the Eurasian steppe. Chalcolithic Tripol'ye central communities grew exceptionally rapidly to very large size, with equally large hinterland populations; their developmental dynamic likely centered strongly on the accumulation of wealth based in the agro-pastoral subsistence economy. Larger communities and regional-scale sociopolitical organization also characterized Bronze Age Sintashta and Iron Age Gorokhovo-Sargat communities. Although these were later in time, they contained fewer inhabitants and showed less indication of different standards of living for different households. Much greater elaboration of burial ritual and fortifications suggests more elite emphasis on prestige competition and warfare in these two latter cases. This contrast between the scale and basis of social hierarchy in Tripol'ye communities, on the one hand, and Sintashta and Gorok-*

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*hovo-Sargat communities, on the other, does not match the way in which a greater dependence on specialized mobile herding sets Gorokhovo-Sargat subsistence and settlement systems apart from the other two.*

In the comparative study of the earliest complex societies the notion of chiefdoms has been, quite literally, pivotal. The speculative social histories created entirely from ethnographic information by cultural evolutionary scholars like Service (1962) and Fried (1967) – and their intellectual ancestors Tylor (1865), Morgan (1877), and Spencer (1880–1897) – inspired archaeology to pivot from its antiquarian preoccupations to serious empirically grounded study of ancient social dynamics. The conceptual inadequacy for such purposes of delineating and mapping ‘cultures’ based on descriptions of ancient artifacts and features became apparent, and archaeologists pursued a myriad of new methodological approaches to figure out what ancient human societies were like. The result was an avalanche of new empirical archaeological information about how ancient humans organized their affairs (Drennan and Peterson n.d.), and this has led to important insights into such topics as early economies, the integration of larger communities, and the emergence of political institutions and leadership. Quite a lot of the data gathering was inspired by the desire to figure out whether the societies of some particular place and time were, say, tribes or chiefdoms. Not surprisingly, arguments soon developed over just which pigeon-hole to place a particular society in. At first this was very productive; it drove archaeologists back to the field to find out more about just how that society was organized. With time, however, these arguments became largely definitional – and centered on what is the ‘correct’ definition of societal types like the chiefdom. It has become increasingly clear that the problem lies, not with imprecise or misguided definitions, but rather with the whole typological exercise. A scheme like band – tribe – chiefdom – state is finally inadequate to the task of characterizing the human social variety represented in the archaeological record in meaningful and useful ways – not because the types have not been properly defined, but because our empirical knowledge of the human past has simply outgrown the conceptual tools that initially enabled our knowledge to grow.

Some have advocated abandoning the notion of chiefdoms, along with all the rest of the cultural evolutionary intellectual baggage. We share with these scholars the view that evolutionary pi-geon-holing is an exceedingly blunt instrument. We observe, however, that jettisoning concepts like the chiefdom has not led to the development of new and more adequate tools that make the broad sweep of social evolution more comprehensible. More often it has led to a particularism that is the enemy of a fuller understanding of human history. It seems more productive to allow (or even help) concepts like chiefdom to evolve.

It is no longer speculation but firmly established archaeological knowledge that quite small-scale societies (numbering in the hundreds of people at the most and organized around face-to-face interactions and personal relationships) have been transformed into much larger scale social formations (numbering in the thousands or tens of thousands of people and necessarily with new organizational mechanisms). This has happened repeatedly in human history in innumerable regions all around the world. The result of the process is a highly varied array of larger human communities and ways of organizing them. Usually, although not always, these larger communities are supra-local in character. Usually, although not always, their forms of organization are hierarchical. Such hierarchy is sometimes only weakly developed, sometimes very strong. The patterns of both more hierarchical and not so hierarchical social interaction that emerge are highly varied in character. The transformation can be viewed from two complementary perspectives. On the one hand, a human community whose demographic scale grows to exceed the organizational capacity of personal relationships in face-to-face interaction must develop more potent means of organization. Otherwise it will fragment. The new forms of organization can in this sense be seen as a ‘solution’ to a ‘problem’. At the same time an increasing demographic scale of human interaction creates a social matrix in which actors can pursue the same, as well as new, aims in new ways and at new scales. Studying this social transformation in global comparative perspective offers remarkable opportunities to understand the origins and development of many of the social institutions and patterns that continue to be fundamental to social life for most of the world’s population today.

If we want to pursue the comparative study of this transformation we have to be able to talk about it. Some label for the set of societies we want to compare is needed. Many of these societies are ones that Service (1962) did (or would have) labeled chiefdoms, and the transformation we are concerned with is essentially the one that Service labeled the emergence of the chiefdom. True, Service did not conceive of the transformation in quite this way, and his work certainly did not recognize the highly varied forms that the emergent social organizations can take. But, instead of discarding the mid-twentieth-century typological straightjacket of chiefdom, we can alter it so as to create a more comfortable garment to clothe a larger and considerably more heterogeneous array of social bodies. The word ‘chiefdom’, used in this way, no longer refers really to a societal type but rather to a *process*. The trajectories of societies growing beyond small-scale local groups organized around personal relationships are the ones we want to compare. We refer to this investigation as the comparative study of chiefdoms, and whether any particular social trajectory belongs in this comparative set or not is a non-issue. If putting it into the comparison turns out to be enlightening about the nature of the transformation of small-scale local societies into something larger and more complex, then it belongs. The only way to find out is to put it in and see where the comparison leads. In this spirit we here attempt to put three Eurasian steppe social trajectories into this comparative frame. We make no assumptions about how these trajectories may be similar to or different from other trajectories where larger and more complex social formations emerged. The point is to investigate just what those similarities and differences may be.

Investigation of the variation in trajectories of chiefdom emergence can provide a major foothold for our efforts to understand better the dynamics of this social transformation, but it requires good conceptual tools – not for stating what chiefdoms, generally, are like, but for characterizing relevant ways in which they vary. This is precisely the task that a number of scholars have been up to – both those who advocate abandoning the chiefdom concept and those who advocate building on it. This effort has produced a number of additional constructs, fundamentally typological, and usually dichotomous: simple *versus* complex chiefdoms, heterarchy in contrast to hierarchy, self-organizing systems as opposed to

ones organized by elites, staple finance *versus* wealth finance, corporate *versus* network modes of organization, and more. Here we take a different tack by delineating several important dimensions or axes of variation – all scalar rather than typological. These ‘data threads’ have been discussed in more detail elsewhere (Drennan and Peterson n.d.). All are amenable to quantitative characterization and comparison by applying the same analyses to the same kinds of archaeological data from different trajectories (Drennan and Peterson n.d.; Drennan, Peterson, and Fox 2010), although the approach we take here is more approximate and more reliant on the social reconstructions arrived at by different investigators in different regions.

The data threads identified by Drennan and Peterson (n.d.) for characterizing different kinds of variation in chiefdom trajectories include the following:

- *Local community structure.* Such characteristics of small local communities as size, compactness, and mobility. The stereotypical local social community of chiefdoms is what we often call ‘the Neolithic village’, but these can actually vary considerably in population and degree of compactness. They can be absent entirely in settlement distributions consisting of scattered farmsteads, and, of special relevance to the Eurasian steppe, the small local community can be highly mobile.
- *Supra-local community scale.* The prototypical early chiefly polity consists of a regional-scale community encompassing multiple villages or hamlets clustered around a larger central settlement. This supra-local community is the entity that can grow to a demographic scale beyond that which can be organized by personal relationships in face-to-face interaction. Such supra-local community growth is the phenomenon at the heart of chiefdom emergence, as we use the notion here. The chiefly polities that emerge can vary substantially in demographic and spatial scale. An archaeological culture in the Eurasian steppe is a vastly larger entity than an early chiefly polity or supra-local community. To say it another way, there are many separate supra-local chiefly communities within any one archaeological culture.
- *Supra-local community centralization.* The settlement clusters by which we recognize early chiefly polities are sometimes very strongly centralized, with all settlement tightly clustered

around a larger central local community; sometimes much more dispersed. This presumably has to do with the nature and intensity of the centralized interaction patterns which are ultimately responsible for the centripetal forces that pull the clusters together.

- *Demographic density.* The number of inhabitants per km<sup>2</sup> across a large region of multiple chiefly polities also varies substantially, with implications for both subsistence and interaction patterns.

- *Public works investment.* Constructions of monumental scale have long been among the most obvious archaeological hallmarks of complex sociopolitical integration. The labour investment in such constructions varies widely in early chiefdoms. For the Eurasian steppe, both burials and fortifications have been mentioned in this connection.

- *Tax rate.* Considering the total estimated construction effort required for public works, together with the available labour force in a chiefly polity and the length of time over which construction was spread, makes it possible to assess how heavy a burden such labour investment placed on a community's population.

- *Conflict.* Conflict and warfare have been placed by many scholars in a fundamental developmental role, but their nature and intensity may also vary substantially from one early chiefdom trajectory to another and from one period to another within a single trajectory.

- *Wealth differentiation.* Differences between families with regard to the standard of living they enjoy may be large, small, or negligible. Burials are the kind of evidence most often used for addressing such wealth differentials, but the architectural, artifactual, and ecofactual remains of individual households are much more relevant.

- *Ritual differentiation.* The nature and intensity of participation in ritual and ceremony may also vary between families. Differences in the ritual artifacts, features, and facilities associated with different households may be so strong that some families are identifiable as ritual specialists. Even if ritual and wealth differentiation are both strongly present in a particular community, they may or may not be correlated. That is, the ritual specialists may or may not belong to the wealthy families.

- *Prestige differentiation.* Yet a third kind of social differentiation between families may involve social prestige as distinct from wealth, standard of living, or ritual participation. In many modern societies, for example, some professions are highly prestigious even though they are less well-paid than others that pay well but earn their practitioners little respect.

- *Productive differentiation.* Craft or subsistence specialization is often associated with chiefdoms, although the archaeological evidence from features and artifacts associated with specialized production makes it clear that in some chiefly communities this is only very slightly developed.

A number of additional data threads are easy to imagine. The list above is not intended to be exhaustive. It is also emphatically *not* a checklist of social features whose presence indicates a chiefdom. It is a list of different ways in which chiefdoms (as the notion is used here) may vary. Some societies transcend a purely local scale of social organization dramatically and rapidly while others creep over this threshold slowly and slightly. In one chiefdom wealth differentiation may be quite strong and ritual differentiation not detectable at all, whereas the reverse may be true in another chiefdom. Our intention here, then, is to look at three trajectories of chiefdom development in the Eurasian steppe in terms of their similarities and differences along these axes.

### **CHALCOLITHIC TRIPOL'YE COMMUNITIES (4500–3500 BC)**

Our first case study focuses on one of the most significant demographic developments known from the prehistoric Eurasian steppe and forest-steppe regions – that of the Cucuteni-Tripol'ye culture. The communities that comprised this culture appeared by the second quarter of the fifth millennium BC with the later, larger Tripol'ye C1 nucleated settlements emerging initially by the early to middle fourth millennium BC. The largest settlements were occupied over an approximately 500 to 700 year period (Kohl 2007: 39–42). The two largest settlements, Majdanetskoe and Tal'janki, encompass 270 ha and 400 ha respectively and are comparable in size to some of the earliest cities in Mesopotamia and the Near East (Videjko 1995: 47). Regional study indicates a three-tiered settlement hierarchy composed of large (100–400 ha), medium (20–60 ha) and small (2–10 ha) settlements. As Videjko notes (1995: 66–69), there

are usually one to two of the intermediate level settlements and/or two to three of the smaller settlements situated within 3–10 km of the largest settlements.

Population estimates for Tripol'ye communities have been based on 5–7 persons per household with specific clusters of up to 20 households identifiable within the settlements. A population estimate of 15,000 people has been suggested for the Tal'janki settlement, which contained an estimated 2,700 houses in total. If extending beyond this large nucleated settlement to include the populations of the additional settlements within its hinterland territory (as noted above), an estimate of 30,000 is possible (Kohl 2007: 44; Videjko 1995: 72).

The large populations estimated for Tripol'ye communities were supported by a well-established agro-pastoralist economy – stemming from the earlier diffusion of animal and plant domesticates into southern Europe in the Neolithic, Tripol'ye subsistence was based on a variety of cereals (buckwheat, millet, einkorn, bread wheat, naked and hulled barley), lentils, vetch and peas (Dolukhanov 2002: 17). Some sites also contain evidence for plums and wild and domesticated grapes. Domesticated animals included cattle (meat, dairy and traction), pigs, sheep and goats. Hunting and fishing were also practiced but appear to have been a supplemental subsistence activity stretching back to earlier traditions of the Mesolithic and Early Neolithic (Masson and Merpert 1982).

The emergence of the large-scale Tripol'ye settlements and their associated populations represents a substantial shift in the regional nucleation and distribution of Chalcolithic populations in the north Pontic zone. Settlement hierarchies also suggest a more structured pattern of ‘centre-hinterland’ relationships and integration of supra-local community organization and labour. Nevertheless, the actual forms of social organization and political authority connected with Tripol'ye settlements have been difficult to establish and associated cemeteries for these communities are unknown.

Connections with other steppe groups, such as the Skelya culture to the southeast, have been argued to reflect a broader inter-regional prestige-goods economy – one that linked the north Pontic steppe with the Balkan-Danubian region and Chernykh's Carpatho-Balkan Metallurgical Province of trade and interaction (Chernykh 1992; Rassamakin 1999: 111). Interestingly, the lack of Tripol'ye

mortuary evidence for differentiation stands in stark contrast to what has been identified among other Chalcolithic societies in these regions. For example, the contemporaneous Varna cemetery (Bulgaria), with its large accumulation of gold and copper artifacts, appears to represent the pinnacle of individual wealth or prestige for this period as represented through the deposit of valuable grave goods (Renfrew 1978). Skelya culture burials, located just at the periphery of the Tripol'ye region, also have yielded elite burials with flint javelin tips, stone axe-adzes and some of the only copper and gold objects known in the north Pontic steppe zone at this time (Rassamakin 1999: 79). Scholars have conceptualized the relationship between Skelya and Tripol'ye communities as a fairly symmetrical exchange wherein Skelya groups traded for worked flint, fine painted pottery and metal objects produced at Tripol'ye settlements. Typological and spectral analyses have indicated that metalworking was a feature of the Tripol'ye culture and that raw copper for this was likely coming from the Balkans region (Chernykh 1992: 39). The Skelya culture played a key role in this broader exchange system by facilitating the movement of raw materials and acting as consumers of prestige items produced in the Balkans and by local Tripol'ye communities. In fact, stone, metal and ceramic prestige goods can be found distributed across the steppe zone in burials from the Don River to the Volga and the Kuban – pre-Caucasus region, reflecting the scale of inter-regional exchange that developed at this time. Tripol'ye burial evidence, then, contrasts with its contemporaries because exotic prestige items are not conspicuously represented.

Tripol'ye communities have been understood largely from the excavation and interpretation of settlement and household patterning. Remote sensing and excavation of Tripol'ye settlements have indicated that house sizes fall into two categories, with a little over 80 % ranging from 60–120 m<sup>2</sup> and approximately 10 % ranging from 270–400 m<sup>2</sup> (although some houses are believed to have been two-story structures) (Videjko 1995). Other large structures, such as the 336 m<sup>2</sup> 'M' complex at Majdanetskoe, are more elaborately decorated (painted wall plastering) and are believed to be communal or 'public' structures. In general, however, public or private ritual activities are difficult to discern with any degree of regularity. Fragmented human remains and caches of prestige objects, in-

cluding ceramic figurines, are commonly recovered from pits at most sites but the nature of ritual does not appear to have been highly formalized, and significant community labour or participation is not represented. Remote sensing also has revealed large areas of open space within the settlements, and it has been suggested that these zones may have been important for the containment and protection of livestock, particularly cattle.

Evidence of craft specialization in Tripol'ye communities includes increasingly standardized pottery vessels; flint knapping (bifacial blades of 20 cm in length), metal smithing and even possibly weaving are indicated from recovered artifact inventories (Kohl 2007: 49; Videjko 1995: 71–72; see Monah and Monah 1997: 71 for weaving). Craft specialization appears to have developed both within individual settlements and between settlements. This is reflected in the clustering of houses and/or workshops in settlements such as Polivanov Yar on the Dniester River, which was located near a high quality flint outcrop, and at Varvarovka VIII where eight buildings were connected with ceramic production (Anthony 2007: 281, 493; Ellis 1984). Sites such as these show increasing development of craft production from the earlier Tripol'ye B1 period through to Tripol'ye C1/C2.

The decline and collapse of late Tripol'ye communities in the late fourth millennium BC ultimately led to the region being populated by much smaller more mobile pastoralist groups whereby a strong dependency on agriculture declined. This substantial transition relates not only to the collapse of Tripol'ye communities but also a general downward trend in social complexity, large-scale settlements and inter-regional trade within the north Pontic steppes and the Carpatho-Balkan region. These developments have been connected with a number of theories – ranging from invading mounted warrior nomads, on the one hand (Gimbutas 1973), to climate induced stress, on the other (Todorova 1995). Gimbutas' model has been overturned in recent years and scholars have become much more attracted to the climate shift – environmental collapse model. Kohl (2007: 52) recently reviewed the evidence for this and suggested that because of the increasing demographic scale of Tripol'ye communities the environmental impact of these groups on their local environments would have been severe including: deforestation for settlement (re)construction, soil depletion

through the shifting of fields or a swidden-form of agriculture, and extensive herding of cattle and pigs. Such practices would have made Tripol'ye communities, and their local catchment zones, particularly sensitive to prolonged climate shifts such as droughts.

### **Discussion**

Tripol'ye local community structure fits handily into the Neolithic village prototype for early chiefdoms. These were permanent year-round settlements relying heavily on domesticated plants and animals – just the kind of local community we have long been accustomed to imagine as the basis for chiefly organization. The populations of these villages ranged from as low as perhaps 100 up to a few hundred, a fairly normal size range for the agricultural village communities often found in chiefly polities elsewhere. Once the pattern of nucleated villages appeared, there was a lag of only about 250 years before some of these local communities grew substantially larger, forming the intermediate and upper tiers of the suggested settlement hierarchy. These larger communities were extremely large (as compared to chiefly central places around the world), and their growth was extremely rapid (again, as compared to chiefly central places around the world).

Supra-local communities, each encompassing a major centre and a cluster of intermediate and small settlements, are also very much at the high end of the scale for early chiefdoms – both in terms of overall demographic scale and in terms of centralization (the extent to which population in the regional cluster was drawn to the central community). Information that can only come from systematic regional-scale settlement study is needed to make these broad comparative statements more precise, and to even approximate overall regional population density. From the estimates currently available, though, it is clear that the emergence of Tripol'ye supra-local communities represents a transition from small-scale social organization based on face-to-face personal relationships to more formally structured organization at a substantially larger demographic scale. In comparative perspective, the extent of the demographic growth of the social formation was especially dramatic, and it occurred very rapidly.

Public works construction is not a conspicuous feature of the Tripol'ye archaeological record. Large tomb structures and sub-

stantial fortifications are well-known features of various parts of the Eurasian steppe, and in even the most cursory archaeological examinations they are unlikely to escape notice. Their absence from the reported Tripol'ye archaeological record is thus telling. The decorated large house-like structures often taken to be communal or public in nature exceed the labour requirements of family residential structures only modestly and would not therefore represent a substantial labour burden on the population. Only some 10 % of Tripol'ye settlements were fortified and these were not massive fortifications requiring great labour investment. Tripol'ye communities are unusual among chiefdoms, then, in lacking much monumental construction for any purpose.

The lack of lavishly furnished burials gives the cursory impression that social and economic differentiations in Tripol'ye society were minimal. The evidence from residential architecture, however, is impressive. With the great majority of houses in a very unexceptional size range for nuclear families, the 10 % that are four or five times larger stand out strongly. If this size difference is related straightforwardly to standards of living, then wealth differentiation in the household realm was much more marked in Tripol'ye society than it was in many 'classic' chiefdoms with lavishly furnished 'elite' burials. On the other hand, this size difference might have related to different activities, such as hosting communal feasts or other events, in which case the architectural difference might better be considered to reflect prestige or even ritual differentiation. Deciding between such alternative interpretations of the substantial difference in sizes of residential structures will require rigorous analysis of the artifact and ecofact assemblages associated with different structures within the larger Tripol'ye local communities. The participation of Tripol'ye societies in long-distance networks of prestige-goods exchange would, of course, be consistent with substantial prestige differentiation even if it is not strongly reflected in the mortuary evidence. The concentrations of artifacts related to the production of various kinds of craft goods in association with particular residential structures also indicate much greater productive differentiation than is known to occur in some chiefdoms. All these classes of evidence could be analyzed systematically for more rigorous comparison with the same kinds of evidence from other early chiefdoms, but qualitative descriptions cer-

tainly give the impression that productive differentiation and likely wealth differentiation were quite marked in the Tripol'ye household evidence. Prestige differentiation may also have been substantial, even though it appears not to have been expressed in burial practices.

Overall, the archaeological record of Tripol'ye societies makes it easy to imagine prosperous farming families enjoying a rising standard of living (in the form of larger houses, differential access to raw materials, and in other ways that remain to be explored rigorously with the archaeological evidence). Relationships with less prosperous families (perhaps, with less access to productive subsistence resources) could become increasingly asymmetrical in a variety of ways. This dynamic of prosperity and inequality could have created a demand for labour to bring more land under cultivation and tend more animals. Such a demand for labour is among the factors widely accepted as promoting regional population increase, even if the precise links to fertility are not well understood. We emphasize that such a scenario is highly speculative, but the evidence for the Tripol'ye trajectory suggests a dynamic like this much more strongly than does the evidence for many other trajectories of chiefdom development. If substantial development of hierarchical social organization in Tripol'ye societies rested to a large extent upon the simple daily-life realities of differences in wealth accumulation, then the artifact and ecofact assemblages associated with the large *versus* small houses should reflect different standards of living in a number of other ways. And if this were the case, then the symbolic expression of prestige differentiation in burial ritual may just not have had much social importance, consistent with the absence of such mortuary evidence for the Tripol'ye trajectory. Such a cycle of wealth accumulation based on agricultural production leading to rapid demographic growth and further need to maintain and enhance already high levels of subsistence production could have given Tripol'ye societies very little resilience in the face of environmental fluctuations, leading to the sort of environmentally triggered demographic decline and simplification of social organization that has been suggested by other authors.

## **BRONZE AGE SINTASHTA COMMUNITIES (2100–1700 BC)**

Our second case study focuses on a regional development dating to the Middle Bronze Age in the steppe and forest-steppe zones of the Southern Ural Mountains region of Russia. In the 1970s and 1980s, Soviet archaeologists uncovered evidence of nucleated, fortified settlements and cemeteries with complex animal sacrifice, bronze and stone weaponry deposits, and some of the earliest dated spoke-wheeled chariot technology in the world (Anthony and Vinogradov 1995; Gening *et al.* 1992). Archaeological field research since that time has identified twenty-two fortified settlements distributed within a territory of approximately 82,000 km<sup>2</sup>. Several Russian scholars have labeled this development ‘proto-urban’ and labeled it a ‘country of towns’ (*strana gorodov*) based on the rather standardized nature of houses in terms both of their construction and of their spatial arrangement within the fortified complexes (Zdanovich 1989; Zdanovich and Zdanovich 2002; Zdanovich and Batanova 2002). The Sintashta settlements are unique in that no other similar settlement pattern is known at this time anywhere in the Eurasian steppe region.

Populations associated with the settlements have been characterized as either simple (Berezkin 1995; Epimakhov 2002a) or complex chiefdoms (Koryakova 1996). Population estimates suggest 20–30 individuals per household (house areas range from 100–250 m<sup>2</sup>) with up to 640 individuals living within the boundaries of the fortified sites (the largest sites range up to 160 m in diameter). Variation in house size is connected with the overall size and nature of phasing of the individual settlements and does not appear to represent differentiation between families within specific settlements. It has been suggested that fortified settlements were the centres of supra-local communities encompassing districts extending outwards 20–30 km. The populations of these centre-hinterland communities have been estimated to be 2,000–3,000 inhabitants (Zdanovich and Zdanovich 2002). This reconstruction, however, is based on a proposed hierarchy of fortified and smaller unfortified settlements and the assumption that the districts were filled to carrying capacity for pastoralism as the main form of subsistence (Masson 1980). Not all scholars agree about the evidence of hierarchical settlement patterning for all 22 fort-

fied settlements (Epimakhov 2002a: 142; Hanks 2009: 158), and the spacing of fortified sites in some cases does not permit a 20–30 km territory. For example, several fortified settlements of similar size, such as Ol'ginsokoe, Zhurumbai and Konoplyanka, are situated within the same river valley and are spaced only 8–12 km apart. Data available to date do not clearly document the hinterland populations proposed to form clusters around fortified settlements and comprise supra-local communities.

The fortification walls themselves varied from 3 to 5 m in width and were constructed of hardened clay and sod ‘bricks’ with wooden infrastructure. These walls abutted the outer wall of the internal houses and therefore were probably an integral part of house construction (adjacent houses shared walls). One or two concentric ditches formed an important part of the defensive works and the largest generally were 3–4 m across and 2–3 m deep (Zdanovich and Batanina 2002). The settlements of Alandskoe and Ol'gino also included stone surfacing of the ditches for anti-erosion. At Ol'gino stone was quarried only a few hundred meters away so transport costs for this material were minimal (Hanks and Donnan 2009). Therefore, while fortification complexes in these settlements demanded significant labour resources they were very closely associated with the planning, layout and construction of the internal houses and therefore probably only required the local labour of those living within the settlements. Moreover, the settlements generally represent several different chronological phases of development and construction and labour estimates should be based on this.

Craft specialization among Sintashta populations has been linked to the mining and production of copper metals (arsenical bronze). While the actual scale of production has been questioned (Chernykh 2004; Hanks 2009), metallurgical debris and furnaces have been found associated with most excavated houses in all previously excavated settlements. This suggests a very diffused technology for the region and little specific specialization by site or household. In terms of other artifact inventories from excavated households, there does not seem to be any substantial variation. Unfortunately, detailed reports on artifact densities and distributions have not been published to date for any of the seven settlements that have been partially excavated.

Five Sintashta cemeteries, with approximately 250 total individuals recovered, have been excavated within the broader zone of fortified settlements (southeastern Ural Mountains). Sintashta-type cemeteries, however, have been identified in the Cis-Urals, Volga and Kazakhstan regions and are not linked to fortified settlements. In general, the cemeteries associated with the fortified sites have produced comparatively rich grave goods inventories and complex animal sacrifice. Burials tend to be grouped into complexes with several grave pits (some with multiple individuals) surrounding one to two large central burials. A shallow ditch often encloses the clustered burials and a small earthen mound (kurgan) covers the complexes.

There has been substantial discussion over what Sintashta cemeteries represent in terms of social organization (Epimakhov 2002b; Vinogradov 2003; Zdanovich 2002). Epimakhov has argued that the high variability of grave goods patterning and spatial organization of grave pits does not seem to conform to a clear structure in terms of wealth and status (Epimakhov 2002a, 2002b). For example, grave goods linked to social status and power, which include spearheads, chariots and stone maces, have been found in central graves and peripheral graves within mortuary complexes (Koryakova and Epimakhov 2007: 80). Patterning of grave goods appears to correlate more specifically with age and sex of the interred. In contrast to these general patterns, the eponymous Sintashta cemetery, which contains the SM (*Sintashta mogila*) and SII (flat non-kurgan cemetery) complexes, did not have substantial above-ground constructions and contained numerous burials of single individuals with chariots. This cemetery has factored most importantly in discussions of Sintashta societies as chiefly communities.

Anthony (2009), in particular, has emphasized the Sintashta cemetery, where the SM component comprised seven large grave pits, each of which contained human burial(s), chariot, and accompanying animal sacrifice. He suggests that this indicates the emergence of chiefly societies wherein status was achieved through prestige in warfare and maintained via aggrandizing behavior through feasting and gift exchange. For example, a ritual pit complex excavated at the northern periphery of the SM cemetery contained the skulls and leg bones of four cattle, six horses and two

rams placed around an upturned ceramic vessel (Gening *et al.* 1992). Anthony (2009: 62) estimates that these animals would have produced approximately 6,000 pounds of meat – enough to provide 2 pounds each for 3,000 participants. Only a few meters away from this pit complex is the Bolshoi Kurgan (BK) mound (Gening *et al.* 1992: 234–235, 370), estimated to require some 3,000 person-days of construction effort. Anthony imagines that the BK mound was built rapidly as part of the same large feasting event of which the animals in the pit complex are food remains. The BK mound is the only one of its kind in the entire Sintashta region and therefore represents a very important but unusual public works construction. No other Sintashta cemetery or ritual construction appears to have required such a substantial labour demand. In fact, most other Sintashta cemeteries comprise mounds of only 1 m in height and multiple burials were likely added at different times. The labour required for constructing the mound and individual grave pits would have been substantially less than estimates for the BK construction noted above. Therefore, while feasting may have been an important component for the maintenance of individual, family and/or community status, such evidence at the scale of the BK construction is not widespread throughout the Sintashta region.

Non-local prestige goods seem largely absent for the Sintashta region, although Anthony has suggested that Central Asian decorative motifs (stepped pyramid design on Sintashta pottery) and a few artifacts of lead and lapis lazuli that have been recovered suggest contact with the Bactria-Margiana Archaeological Complex of Central Asia (Anthony 2009: 65). The key exports from the Sintashta region, as argued by Anthony, were horses and locally produced metals (*Ibid.*: 67–68). Nevertheless, wealth and prestige among Sintashta groups seems largely to have been reflected through the deposit of specialized stone and metal weaponry and chariot-related technology, all of which were available locally.

The MBA Sintashta societies emerged by 2100 BC, but within 150–200 years a sharp decline in the scale of fortification and funerary ritual (grave goods deposits and chariots) occurred with the transition to the Early Petrovka phase. By the Late Bronze Age (LBA – by c. 1800 BC), fortified settlements are practically nonexistent (replaced by more numerous, smaller unfortified villages) and mortuary ritual is extremely modest when compared to that of

Sintashta. There can be no doubt that the Sintashta pattern represented a substantial shift in social organization. Nevertheless, it appears to have been relatively short-lived (4–6 generations) and the development of larger settlement-centres and what might be thought of as institutionalized social power and authority may not have been firmly established enough to meet new, regional challenges that emerged by the LBA (*e.g.*, new trade networks, environmental shifts, over exploitation of locally available resources, *etc.*). Bronze objects, while important for warfare and social prestige and status, were by all indications produced locally by individual communities (Hanks and Doonan 2009). More specialized crafts production is simply not supported with currently available evidence. The same can be said for the production of chariots and other ‘wealth’ indicators for this time period.

### **Discussion**

Sintashta community structure is extremely difficult to discuss on the basis of present evidence. The fortified settlements are the only local communities that are much documented. Artifact scatters and sometimes house depressions visible on the surface do occur in the areas around the fortified settlements, but the nature and distribution of these more ‘ordinary’ settlements are almost entirely unknown. The fortified settlements themselves are extremely small and compact in comparative perspective. Their occupations were not short-term (all of the 22 show 2–4 phases of construction) yet none of them grew beyond approximately 3.5 ha of total enclosed area by their final phases. The Chalcolithic Tripol'ye settlement at Tal'janki covered 100 times this area. House structures and other evidence of occupation immediately outside the fortifications has been sought but not found (Hanks and Doonan 2009). The inhabitants of the fortified settlements were very tightly packed, but even so Tal'janki is estimated to have had nearly 25 times the population of the larger Sintashta fortified settlements. To put the comparison another way, the Sintashta central ‘towns’ had only very slightly larger populations than the villages that formed the lowest tier in the Tripol'ye settlement hierarchy (or those that preceded the emergence of the two higher tiers). Presumably, whatever other settlements comprise the Sintashta pattern were even smaller. Although Sintashta local community patterns are very incompletely docu-

mented, it seems clear that the interaction matrix in which Sintashta actors pursued their aims (at any level in the settlement hierarchy) was of a much smaller scale than that of Tripol'ye local communities. Even the degree of mobility or permanence of Sintashta 'ordinary' local communities is unclear, before, during, and after the MBA period of the fortified 'towns'. It may well be that Sintashta societies emerged from and were sustained by a local social interaction, settlement, and subsistence base very different from that of Tripol'ye societies. Fuller documentation of these aspects of Sintashta societies will be required for better understanding of Sintashta social dynamics.

Sintashta supra-local communities are no better known. If, as has been guessed, they included 2,000–3,000 people within and around a fortified settlement, they were only around one-tenth the size of Tripol'ye ones and considerably less strongly centralized. The engine of regional demographic growth, then, appears in Sintashta societies to have run at a far slower pace than suggested for Tripol'ye societies, and the centripetal forces exerted by central communities on the hinterland populations of Sintashta supra-local communities appear to have been weaker than in Tripol'ye supra-local communities. These would be extremely interesting comparative conclusions if they were based on any systematic or comprehensive knowledge of Sintashta settlement outside the fortifications (or, for that matter, on any systematic or comprehensive knowledge of Tripol'ye regional-scale settlement patterns). For now they remain tantalizing hints of differences in patterns of community organization between these two early Eurasian steppe trajectories of complex society development. In both instances, nonetheless, rather small regional polities emerged, apparently consisting of a central settlement with smaller settlements of some sort arrayed around it in a territory sometimes possibly only a few kilometers across, sometimes somewhat larger. Domination of multiple such units by any single yet larger settlement does not seem indicated in either trajectory.

In terms of monumental construction, Sintashta societies fit the archetype of chiefly societies more clearly than Tripol'ye societies do. Fortifications, and at least occasionally kurgans, required some substantial effort and provide unmistakable archaeological remains on the landscape of some degree of social complexity.

The public works burden placed on the Sintashta population for these constructions was clearly considerably heavier than any analogous burden placed on Tripol'ye populations, although, even taking the guesses of relatively small Sintashta supra-local community populations at face value, these burdens were not enormously heavy, surely amounting to at most a very few days' labour per year per worker.

The archaeological evidence for the Sintashta sequence speaks quite considerably more loudly of conflict and warfare than is the case for the Tripol'ye archaeological evidence. Chariots and weapons in elaborate burials together with crowding of populations inside substantial fortifications make it clear that the importance of warfare was both practical and symbolic. The suggestion that patterns of leadership involved military affairs, then, agrees much better with the evidence from the Sintashta trajectory than from the Tripol'ye one.

The archaeological evidence for differentiation in Sintashta society seems strong, as it did in our consideration of Tripol'ye society. When we look more closely, though, at the realms in which differentiation seems particularly marked in the archaeological record, the two trajectories are seen to be almost perfect mirror images of each other. In contrast to Tripol'ye, the evidence from Sintashta burials is spectacular and utterly irreconcilable with any notion that Sintashta society lacked strong inequalities in social relationships. So far as is now known, however, Sintashta household remains do not suggest that those who were eventually buried with large quantities of goods (including weapons and chariots) enjoyed a particularly higher standard of living than anyone else. (Recall that Tripol'ye house architecture at least did suggest precisely such differences in standards of living.) The importance of the individuals accorded special burials in Sintashta society, then, seems more likely to represent prestige or ritual differentiation than the wealth differentiation attributed to Tripol'ye society. In both cases, substantial inequalities between individuals and/or families are suggested, but they show up in different arenas of social life in the two sets of societies. The Sintashta evidence available thus far also suggests less productive differentiation than in Tripol'ye societies. Sintashta metal working evidence is abundant, but diffuse – not concentrated in a few households but spread across many. An im-

portant caveat, however, about both trajectories is that very little attention has been paid in either case to the nature of relationships (economic and otherwise) between residents of central and hinterland settlements within supra-local communities.

In sum, comparing the archaeological evidence for Tripol'ye and Sintashta trajectories suggests rather different patterns of leadership and dynamics of growth and change. Prestige and ritual connected to warfare and feasting are abundantly represented in the Sintashta archaeological record, but agricultural prosperity, wealth differentiation, and strong demographic growth are not. The scenario of growth and development imagined for Tripol'ye societies is just not a good fit with the Sintashta archaeological record. Both sets of chiefly polities possessed markedly hierarchical forms of organization, but the hierarchies seem to have had rather different characters and bases and grown out of rather different social dynamics. Neither set of societies achieved much real permanence; after a few hundred years at most, Sintashta regional polities, like Tripol'ye ones, disappeared from the landscape and regional populations probably declined considerably.

### **IRON AGE GOROKHOVO-SARGAT COMMUNITIES (500–200 BC)**

Our third and final case study is the Iron Age Gorokhovo-Sargat (G-S) development – an archaeological culture little known or published outside of Russian scholarship. It occurred within the forest-steppe ecological zone and is connected with the first millennium BC socio-political transitions within the larger West Siberian and Trans-Urals regions. As noted above, mobile pastoralism and mounted warfare as a significant technology emerged by the first millennium BC and completely transformed the possibilities for regional and interregional interaction, conflict and trade (Bokovenko 1996; Kradin 2002; Hanks 2002). This was also a period of large-scale, labour intensive, funerary monument construction at a level not previously seen in the Eurasian steppe region. The earliest, and one of the largest examples of this is the well-known Arzhan I kurgan (the 9<sup>th</sup> century BC, Tuva region of Western Siberia) that was 120 m in diameter and 4 m in height. Its massive larch log construction with overlying stone covering is estimated to have taken 1,500 individuals 7–8 days to build (Gryaznov 1980). Contained

within the kurgan were the deposits of over 160 sacrificed horses and a central burial of an elite couple (male and female) surrounded by six additional ‘attendants’ with horses. An additional seven ‘servants’ were buried in other parts of the massive complex. Importantly, analysis of the recovered artifacts from the site (horse bits, knives, *etc.*) suggest they were imported from several different neighboring regions (Kazakhstan and Mongolia) and therefore reflect the long-distance networks of the period (Bokovenko 1995: 273).

Large kurgan constructions also occurred in the steppe and forest-steppe zones and such constructions can be directly connected with early Gorokhovo-Sargat cultural developments. These constructions were at most 60 m in diameter and 5–8 m in height. The earliest contained at most one or two inhumation burials – usually of adult males interred with weaponry and horse riding equipment. Mound construction in some cases included wooden structures covered by soil but these kurgans do not compare in scale or complexity to the Arzhan I kurgan.

For the G-S development data exists for regional hierarchical settlement patterning in addition to kurgan cemeteries. The subsistence economy of these populations was based principally on pastoralism (horse, cow, sheep and goat) with some evidence for fishing, hunting and gathering. While small-scale agricultural production has been suggested, there is limited evidence in support of it, and the region has been characterized as the ‘northern periphery of the nomadic world’ (Koryakova and Epimakhov 2007: 277). Clearly, however, mobile residence patterns did not characterize the entire population. Permanent fortified centres with hinterland clusters of non-fortified settlements were spaced 30–40 km apart. This patterning has been identified in the Tobol, Ishim and Irtysh river valleys and their tributaries. The sizes of settlements with fortified zones range from 2 to 6 ha. The fortified zones themselves generally encompass 1 ha within the larger settlement, and may contain the residences of higher status families. The fortifications were not in all cases substantial and usually comprised one to two ditches that were 3–6 m in width and 1–2 m in depth and earthen ramparts 5–6 m in width and 1 m in height. The use of vertically placed palisades is identifiable at some sites but the use of segments of horizontally placed wooden timbers is also likely. At many sites a clear strategy was employed to use natural topographi-

cal features such as river bank promontories to reduce the amount of effort expended on ditch and rampart construction (Matveeva 2000: 42–46). A total of 10 fortressed sites in the Tobol, 5 in the Ishim, and 14 in the Irtysh basins have been identified (although some may predate or postdate the 500–200 BC interval). Houses are timber-built and vary by size and interior layout with one or more rooms and/or side additions. House sizes vary from 35 to 55 m<sup>2</sup> although larger houses in the range of 100 m<sup>2</sup> have been found (*e.g.*, Pavlinovo settlement; Koryakova and Daire 2004).

Population estimates generally have been based on 1 person per 4 m<sup>2</sup> of living space (Koryakova and Sergeev 1989). At large settlements, such as Rafailovo, which included two fortified zones, up to 160 individual houses have been estimated. Matveeva has suggested a population of 1,600–1,800 for this site based on an average house size of 45 m<sup>2</sup> with 10–12 individuals per household. If one considers territorial districts made up of fortified sites as centres, with adjacent unfortified sites situated in a hinterland territory of 20–30 km, then the local demography would have comprised several thousand people but probably not more than 5,000. More accurate calculations are difficult to produce as archaeological evidence indicates that settlement occupations shifted over time as a likely result of territorial conflict and overgrazing in the immediate areas of the settlements. As a general structure for settlement patterning, Matveeva (2002: 383–384) has suggested that settlements can be distinguished as: 1) leaders' residences, 2) common refuges, 3) watch-towers, and 4) tribal centres (*e.g.*, Rafailovo settlement). In addition to these four categories, numerous settlements have been identified that have very thin cultural occupation levels. These are interpreted as seasonal camps or short-term occupations and usually contain no more than a few dwelling structures.

The excavation of G-S cemeteries has produced clear evidence of status differentiation between individuals based on size of grave constructions, position of graves and accompanying grave goods. A study by Buldashov (1998) on Gorokhovo phase burials included eleven cemeteries, 81 kurgans and 104 graves. He surmised that social structure was generally reflected through three categories – upper, middle and lower level ranked individuals. Evidence of ascribed statuses comes from young individuals (12–14 years) buried with sets of riding gear and weaponry. In the earlier Gorokhovo phase, large kurgan mounds with single male interments pre-

dominated. By the later G-S phase, kurgans had become multi-burial constructions with central burials surrounded by numerous graves and smaller deposits of animal bone remains that were often enclosed with a ditch marking the boundary. G-S phase burials at the Sidorovka and Isakovka cemeteries (discussed below), which contained exceptional concentrations of non-local, valuable grave goods, were placed as peripheral burials rather than as central burials within the kurgans. This spatial relationship suggests that even though these individuals had obtained substantial social wealth and status they were buried in such a way as to connect with ancestral lines of social authority and power. Such spatial positioning stands in contrast to the first centuries of the first millennium BC when single interments were placed in large, conspicuous kurgans in the West Siberian and Trans-Urals regions.

Evidence of craft production is diffuse, and such evidence as exists seems more connected to zones within settlements than to individual households. Pottery in this region was hand-moulded and probably produced at the individual family level for household consumption. The first systematic soil sieving in 2001 at the settlement of Pavlinovo produced the first recovered metal droplets and slag connected with iron smelting (B. Hanks, personal communication). This does not necessarily invalidate the traditional belief that G-S communities obtained metals or metal objects from groups settled to the west in the Urals, where clear evidence of specialized metallurgical production has been found for the Itkul culture.

Interregional contacts were especially strong with southern steppe groups (Sauromatians, Sarmatians, Saka and Alans). This brought about the diffusion of similar mortuary rituals and valuable, non-local trade items (Koryakova and Epimakhov 2007: 328–330). A handful of burials from cemeteries such as Sidorovka and Isakovka have been recovered that are truly remarkable for the non-regional prestige goods they contained (Matushchenko and Tataurova 1997; Pogodin 1998). These artifacts include Central Asian pottery and silver bowls with inscriptions, gold torcs, silver phaleras, Chinese silks, and heavy weaponry (metal plated armor and helmets, spears, *etc.*). Such burials clearly attest to significant supra-local connections and participation in inter-regional trade and possibly foreign military campaigns.

The ability to cover, and control, vast distances over relatively short spans of time on horseback certainly opened a series of new possibilities for interactions across much longer distances than ever before. It is very tempting in this connection to think of the much later medieval conquests of Genghis Khan and the Mongol Empire; but reconstructing just how these interactions were organized in much earlier periods of the long trajectory of social change among Eurasian pastoralist societies is quite challenging. While chariot technology, and presumably horseback riding, is certainly part of the Sintashta development, the riding of horses for cavalry warfare is not substantiated in that context. Mounted warfare and more extensive use of animals in long-range transport clearly do characterize the Early Iron Age (including the Gorokhovo-Sargat societies).

### **Discussion**

Gorokhovo-Sargat local communities are highly varied. The settlements with and without fortified zones are estimated to be in the size range usually referred to as 'villages', although a large one (such as Rafailovo) might have had around three times the population of a large Sintashta 'town'. Taking the very thin occupation deposits as short-term occupations of small groups of mobile families adds an especially interesting dimension to patterns of social interaction. In highly sedentary populations, small local communities are classically thought of as people in virtually daily face-to-face interaction with each other and in substantially less intensive interaction with the residents of other local communities. The presence of an additional set of much more mobile families provides intermediaries who can interact directly and relatively intensively, if sporadically, with the residents of at least several different permanent local communities. This would seem to represent an important element in the matrix of interaction in which actors pursue their varied aims and offers interesting opportunities and complications for the organization of a large social formation.

Despite this novel element (when compared to Tripol'ye or Sintashta interaction structures), Gorokhovo-Sargat supra-local communities have considerable similarity to those we have already discussed. They are represented by clusters of relatively small settlements arrayed around larger central settlements. As in the Sintashta case, Gorokhovo-Sargat centres are fortified, although the Gorok-

hovo-Sargat centres also include populations living just outside the walls. Gorokhovo-Sargat settlement clusters are spaced farther apart on the landscape than Sintashta ones (and Tripol'ye ones are the most tightly packed together spatially, although they appear to be by far the largest in demographic terms). As with the other cases we have discussed, there is really very little reported archaeological evidence upon which to base a reconstruction of the interactions between hinterland populations and those of the centres from which emanated the centripetal forces that created the supra-local communities represented by the settlement clusters. Given that Gorokhovo-Sargat settlement clusters are the farthest apart, and the estimates of the populations of these supra-local communities are not much larger than those for Sintashta chiefly polities, regional population density must have been lower than in the other two cases.

If a very large kurgan required 12,000 person-days of labour to construct, then the total burden placed on the population was not large. A supra-local community estimated at a population of some 5,000 could certainly provide the 1,500 labourers who could accomplish it in 7–8 days, and kurgans actually associated with Gorokhovo-Sargat communities were much smaller than the Arzhan I kurgan for which this labour estimate was made. Such construction efforts would, in addition, be spaced a number of years apart, making the overall average contribution to such construction well below a single day per worker per year. There is no need to imagine that construction labour would necessarily need to be drawn from any larger area than a single supra-local community. The scale of fortification works, while larger, similarly does not suggest any very heavy tax or tribute burden on the population of a supra-local community. The consistency with which fortifications characterize Gorokhovo-Sargat central settlements suggests that armed conflict was as common as in Sintashta societies, and that its nature and organization may also have been similar.

Wealth, ritual, and prestige differentiation are more difficult to tease apart for Gorokhovo-Sargat societies than for the other two cases. Houses customarily taken to be those of 'leaders' are approximately twice as large as ordinary houses, so they do not suggest a sharply higher standard of living as the larger Tripol'ye houses do. Moreover, the larger houses do not comprise nearly as high a proportion of the total as the 10 % cited for Tripol'ye socie-

ties. A very small number of such special houses do not suggest numerous prosperous families (as in the Tripol'ye case) so much as ones qualitatively distinct from common people. The notion that they were the leaders of Gorokhovo-Sargat regional polities is certainly consistent with this observation. The prevalence of weapons in burials also suggests a symbolic/ritual principle connected with warfare as the basis upon which those who got special treatment when they died were distinguished from the bulk of the population. The fact that exotic non-utilitarian items were also important objects in burials also inclines one more toward prestige than wealth accumulation as the underlying principle of the differentiation seen in burial ritual. These hints, then, seem to point in the direction of substantial prestige differentiation based on participation in inter-regional networks of interaction and in warfare, as contrasted with accumulation of wealth from local economic production. The archaeological record for Gorokhovo-Sargat communities suggests considerably less developed productive differentiation than in the Tripol'ye case.

Finally, the patterns of differentiation and leadership and the dynamics of growth for Gorokhovo-Sargat supra-local communities sound much more like those imagined for Sintashta than for Tripol'ye. The Tripol'ye scenario of growing prosperity based on success in local subsistence production does not seem nearly as good a fit for either the Sintashta evidence or the Gorokhovo-Sargat evidence. Prestige acquired in warfare and/or through long-distance networks of interaction are elements of differentiation that the archaeological records left by these latter two sets of societies provide much stronger indications of. The comparative gap that appears to open up between Tripol'ye societies, on the one hand, and Sintashta and Ghorokovo-Sargat patterns of differentiation, on the other hand, does not correspond well with subsistence and settlement patterns. The formation of settlement clusters which we take to represent supra-local communities occurs in all three instances, although they seem larger for Tripol'ye societies. It is only the Gorokhovo-Sargat case, however, in which subsistence is heavily based on herding and in which seasonally mobile residence patterns characterize some (although clearly not most) of the population. The comparison, thus, does not support a connection between residentially mobile herding and social hierarchies founded on war-

fare and manipulations of prestige goods acquired through long-distance networks. The two societies in which such dynamics are more important to social hierarchy are, however, ones in which horses had a substantial impact on the technology of warfare and long-distance transport.

## CONCLUSIONS

We will not pretend to conclude with a pat account of how the three societies we have looked at emerged or came to share the features that they share and differ in the ways that they do. The comparative observations we have to make are an unruly lot, leading off in different directions, mostly toward unanswered questions rather than tidy answers. If the perspective we have adopted (and the way we have used the notion of chiefdom) have any utility, it is, for now at least, in focusing attention on the sort of empirical information about these ancient societies that would enable us to understand their nature and dynamics better.

The rough sketch we have made of the developmental dynamics of Tripol'ye societies is fuller and more complete than those we have attempted for either Sintashta or Gorokhovo-Sargat societies. This is not just because we have allowed our imaginations freer rein on this case; it is because of a greater abundance of archaeological information of the sort that speaks most directly to the varied strands in the skein of human interactions. There are estimates of the population size range of 'ordinary' small local communities as well as of larger 'central' communities. There are at least guesses about the relative numbers of these kinds of communities within the settlement clusters that comprise the supra-local communities whose emergence is, for us at least, the essence of the study of chiefdoms. And this kind of information is available for the periods preceding and following the very large Tripol'ye communities that attract so much attention. This is the information that makes it possible to identify as so unusual the demographic scale and rate of growth of these central settlements and of the supra-local communities they are central to. We have a good grasp on the subsistence systems that sustained these communities. There is information about the houses these people lived in, the range of sizes covered, and the frequency distribution of those sizes. This information makes it possible to think about wealth differentiation

as the particularly strongly developed aspect of hierarchy here. And information about artifact assemblages connected with craft production makes it possible to think about productive differentiation as strongly developed as well. Additional information about the artifact assemblages associated with different households could, when rigorously analyzed, turn out to confirm or deny such thinking about either aspect of differentiation.

The much more impressive burials left by Sintashta and Gorokhovo-Sargat societies certainly do give us vital information. Burial ritual is highly elaborated, weaponry is abundant, and exotic prestige items occur at least in Gorokhovo-Sargat burials. This is what leads our thinking toward prestige differentiation (more than wealth differentiation or productive differentiation) as the foundation of social hierarchy in these two societies. These burials, together with substantial fortifications as a constant element in central settlements, suggest some major organizational differences between these two societies and Tripol'ye ones. All three show unmistakable archaeological evidence of hierarchical organization, but the foundations of that hierarchical organization seem to differ. For Sintashta and Gorokhovo-Sargat, the readily accessible information about settlement location, settlement size, and differences between households (particularly with regard to artifact and ecofact assemblages) is somewhat patchier than for Tripol'ye. This can be attributed, at least in part, to the way in which monumental structures and elaborate burials tend to distract archaeologists' attention from these more mundane concerns. The patchiness of these classes of information for Sintashta and Gorokhovo-Sargat just does not encourage as much hypothetical thinking about social dynamics as in the case of Tripol'ye. Placing it in comparative perspective, however, does help us to realize that, even with their gaps, the archaeological records for Sintashta and Gorokhovo-Sargat are similar in several regards and contrast with that for Tripol'ye. These similarities and differences come into clearer focus when we use the data threads we have worked with here to align the three archaeological records for comparison. The result is an enhanced ability to imagine different social dynamics that might or might not accurately characterize these societies. These accounts of social dynamics are not, however, just fiction; they are at least inspired by different concrete characteristics of the archaeological

record. They are offered here not as answers that put to rest questions about social dynamics, but as hypothetical accounts to guide further research to evaluate them, correct them as may be necessary, or discard them entirely – not because some other kind of thinking has become more fashionable but because our empirical knowledge of ancient societies has grown.

Some kinds of research are particularly indicated for advancing our knowledge in much needed ways. For example, is the demographic scale of Tripol'ye societies really so much larger and their growth really so much more rapid than in the Sintashta and Gorokhovo-Sargat cases? Only systematic survey of complete landscapes for all evidence of human utilization at a regional scale (hundreds of square kilometers) will set such conclusions on a firmer empirical base because it provides the soundest and most accurate population estimates and the fullest information about population distributions that we can get for prehistoric periods (Kowalewski *et al.* 1989; Wilson 1988; Drennan 2006). Do the asymmetrical relationships between households in Tripol'ye communities have to do primarily with differences in economic prosperity? And do those in Sintashta and Gorokhovo-Sargat communities have more to do with prestige obtained through warfare or participation in inter-regional networks? What was the nature of interaction between central settlement and hinterland populations in any of these societies? Just how strong was differentiation between households? And did the character of such differentiation have more to do with wealth, prestige, or ritual? Information on more burials will probably not add much to our knowledge on these counts, although additional analyses might (nutritional comparison of skeletal remains from burials comes quickly to mind as a possibility). More rigorous and systematic analysis of household remains from local communities of different sorts (especially central and non-central ones) would enable great strides forward. This analysis should include not only the architectural remains of the houses themselves, but also statistical analysis of the artifact and ecofact assemblages, household by household. These provide sensitive indicators of how different activities are distributed across the households of a community and the nature of interdependences between households upon which interactions are based (Smith 1987; Hirth 1993; Drennan and Peterson 2006; Peterson 2006). Some of the information

upon which such systematic analyses could be carried out already exists (especially for central communities); some remains yet to be collected (especially for non-central communities).

These kinds of empirical research offer particularly direct paths toward empirical confirmation or rejection of the very hypothetical comparative sketches we have made here. While it is always gratifying when an educated guess turns out to have been a good one, we really would be equally delighted if this article helps to stimulate research that demonstrates conclusively on empirical archaeological grounds that our guesses are wrong. Either outcome would be a clear sign that our knowledge and understanding of ancient social dynamics have advanced.

## REFERENCES

- Anthony, D. W.  
 2007. *The Horse the Wheel and Language: How Bronze-Age Riders from the Eurasian Steppes Shaped the Modern World*. Princeton: Princeton University Press.
2009. The Sintashta Genesis: The Roles of Climate Change, Warfare, and Long-Distance Trade. In Hanks, B. K., and Linduff, K. M. (eds.), *Social Complexity in Prehistoric Eurasia: Monuments, Metals and Mobility* (pp. 47–73). Cambridge: Cambridge University Press.
- Anthony, D. W., and Vinogradov, N. B.  
 1995. Birth of the Chariot. *Archaeology* 48(2): 36–41.
- Berezkin, Yu. E.  
 1995. Arkaim as a Ceremonial Centre: Americanist's View. In Bochkaryov, V. S. (eds.), *Convergence and Divergence in the Development of Middle and Eastern Europe Cultures during the Eneolithic and Bronze Age* (pp. 29–39). St. Petersburg: IIMK RAN. *In Russian* (Березкин, Ю. Е. Аркаим как церемониальный центр: взгляд американиста. *Конвергенция и дивергенция в развитии культур эпохи энеолита – бронзы Средней и Восточной Европы* / ред. В. С. Бочкирев, с. 29–39. СПб.: ИИМК РАН).
- Bokovenko, N. A.  
 1995. Tuva during the Scythian Period. In Kimball, J.-D., Bashilov, V. A., and Yablonsky, L. T. (eds.), *Nomads of the Eurasian Steppes in the Early Iron Age* (pp. 265–283). Berkeley, CA: Zinat Press.
1996. Asian Influence on European Scythia. *Ancient Civilizations from Scythia to Siberia: An International Journal of Comparative Studies in History and Archaeology* 3(1): 97–122.

- Buldashov, V. A.
1998. *Mortuary Rites of Gorokhovo Culture*. Unpublished PhD Dissertation. Yekaterinburg. Institute of History and Archaeology, Russian Academy of Sciences. *In Russian* (Булдашов, В. А. *Погребальная обрядность гороховской культуры*: дис. ... канд. ист. наук. Екатеринбург. Институт истории и археологии РАН).
- Chernykh, E. N.
1992. *Ancient Metallurgy in the USSR*. Cambridge: Cambridge University Press.
2004. Kargaly: The Largest and Most Ancient Metallurgical Complex on the Border of Europe and Asia. In Linduff, K. (ed.), *Metallurgy in Ancient Eastern Eurasia from the Urals to the Yellow River* (pp. 223–237). Lewiston: The Edwin Mellen Press.
- Dolukhanov, P. M.
2002. Alternative Revolutions: Hunter-Gatherers, Farmers, and Stock-breeders in the Northwestern Pontic Area. In Boyle, K., Renfrew, C., and Levine, M. (eds.), *Ancient Interactions: East and West in Eurasia* (pp. 13–24). Cambridge: McDonald Institute Monographs.
- Drennan, R. D. (ed.)
2006. *Prehispanic Chiefdoms in the Valle de la Plata*. Vol. 5. *Regional Settlement Patterns*. Memoirs in Latin American Archaeology No. 16. Pittsburgh, PA: University of Pittsburgh.
- Drennan, R. D., and Peterson, C. E.
2006. Patterned Variation in Prehistoric Chiefdoms. *Proceedings of the National Academy of Sciences* 103: 3960–3967.
- n.d. Challenges for Comparative Study of Early Complex Societies. In Smith, M. E. (ed.), *The Comparative Archaeology of Complex Societies*. Cambridge: Cambridge University Press. In print.
- Drennan, R. D., Peterson, C. E., and Fox, J. R.
2010. Degrees and Kinds of Inequality. In Price, T. D., and Feinman, G. M. (eds.), *Pathways to Power* (pp. 45–76). New York: Springer.
- Ellis, L.
1984. *The Cucuteni-Tripol'ye Culture: A Study in Technology and the Origins of Complex Society*. British Archaeological Reports International Series 217. Oxford: Archaeopress.
- Epimakhov, A. V.
- 2002a. Complex Societies and the Possibilities to Diagnose them on the Basis of Archaeological Data: Sintashta Type Sites of the Middle Bronze Age of the Trans-Urals. In Jones-Bley, K., and Zdanovich, S. (eds.), *Archaeology of the Trans-Ural Region* (pp. 11–22). Moscow: Nauka.

- vich, D. G. (eds.), *Complex Societies of Central Eurasia from the 3<sup>rd</sup> to 1<sup>st</sup> Millennium BC*. Vol. 1 (pp. 139–147). Washington, D.C.: Institute for the Study of Man.
- 2002b. *The Southern Trans-Urals in the Middle Bronze Age*. Chelyabinsk: Izd-vo YuUrGU. In Russian (Епимахов, А. В. *Южное Зауралье в эпоху средней бронзы*. Челябинск: Изд-во ЮУрГУ).
- Fried, M. H.
1967. *The Evolution of Political Society: An Essay in Political Anthropology*. New York: Random House.
- Gening, V. F., Zdanovich, G. B., and Gening, V. V.
1992. *Sintashta: Archaeological Monuments of Aryan Tribes of the Ural' and Kazakhstan' Steppes*. Chelyabinsk: Iuzhno-uralskoe knizhnoe isdatelstvo. In Russian (Генинг, В. Ф., Зданович, Г. Б., Генинг, В. В. *Синтасhta: Археологические памятники арийских племен Урало-Казахстанских степей*. Челябинск: Юж.-Урал. кн. изд-во).
- Gimbutas, M. B.
1973. Old Europe c. 7000–3500 BC: The Earliest European Civilization before the Infiltration of the Indo-European Peoples. *The Journal of Indo-European Studies* 1(1): 1–20.
- Gryaznov, M. P.
1980. *Arzhan. Tsar's Kurgan of the Early Scythian Period*. Lenin-grad: Nauka. In Russian (Грязнов, М. П. *Аржан. Царский курган раннескифского времени*. Ленинград: Наука).
- Hanks, B. K.
2002. The Eurasian Steppe ‘Nomadic World’ of the First Millennium BC: Inherent Problems within the Study of Iron Age Nomadic Groups. In Boyle, K., Renfrew, C., and Levine, M. (eds.), *Ancient Interactions: East and West in Eurasia* (pp. 183–197). Cambridge: McDonald Institute Monographs.
2009. Late Prehistoric Mining, Metallurgy, and Social Organization in North Central Eurasia. In Hanks, B., and Linduff, K. (eds.), *Social Complexity in Prehistoric Eurasia: Monuments, Metals and Mobility* (pp. 146–167). Cambridge: Cambridge University Press.
- Hanks, B. K., and Doonan, R. C. P.
2009. From Scale to Practice: A New Agenda for the Study of Early Metallurgy on the Eurasian Steppe. *Journal of World Prehistory* 22(4): 329–356.
- Hirth, K. G.
1993. Identifying Rank and Socioeconomic Status in Domestic Contexts: An Example from Central Mexico. In Santley, R. S., and Hirth, K. G.

(eds.), *Prehispanic Domestic Units in Western Mesoamerica: Studies of the Household, Compound, and Residence* (pp. 121–146). Boca Raton, FL: CRC Press.

Kohl, P. L.

2007. *The Making of Bronze Age Eurasia*. Cambridge: Cambridge University Press.

Koryakova, L. N.

1996. Social Trends in Temperate Eurasia during the Second and First Millennia BC. *Journal of European Archaeology* 4: 243–280.

Koryakova, L. N., and Sergeev, A. S.

1989. Some Issues of Economic Activity of the Sargat Culture Communities (an Experience of Paleoeconomic Analysis of the Duvanskoye II Settlement). *Formation and Development of Producing Economy in the Ural* (pp. 165–177). Sverdlovsk: UrO RAN. In Russian (Корякова, Л. Н., Сергеев, А. С. Некоторые вопросы хозяйственной деятельности племен саргатской культуры [опыт палеоэкономического анализа селища Дуванско II]. *Становление и развитие производящего хозяйства на Урале*, с. 165–177. Свердловск: УрО РАН).

Koryakova, L. N., and Daire, M.-Y.

2004. Iron Age Society and Environment: Multi-Disciplinary Research in the Iset River Valley (Russia), Preliminary Results. In Dobrzańska, H., Jerem, E., and Kalicki, T. (eds.), *The Geoarchaeology of River Valleys* (pp. 185–215). Budapest: Archaeolingua.

Koryakova, L. N., and Epimakhov, A. V.

2007. *The Urals and Western Siberia in the Bronze and Iron Ages*. Cambridge: Cambridge University Press.

Kowalewski, S. A., Feinman, G. M., Finsten, L., Blanton, R. E., and Nicholas, L. M.

1989. *Monte Albán's Hinterland, Part II: Prehispanic Settlement Patterns in Tlacolula, Etla, and Ocotlán, the Valley of Oaxaca, Mexico*. Memoirs of the University of Michigan Museum of Anthropology No. 23. Ann Arbor: University of Michigan.

Kradin, N. N.

1992. *Nomadic Societies*. Vladivostok: Dalnauka. In Russian (Крадин, Н. Н. *Кочевые общества*. Владивосток: Дальнаука).

2002. Nomadism, Evolution and World-Systems: Pastoral Societies in Theories of Historical Development. *Journal of World-Systems Research* 8(3): 368–388.

Masson, V. M.

1980. Early Agricultural Communities and Formation of Urban Settlements. In Butinov, N. A., and Reshetov, A. M. (eds.), *Early Cultiva-*

- tors: *Ethnographical Essay* (pp. 178–185). Leningrad: Nauka. In Russian (Массон, В. М. Раннеземледельческие общества и формирование поселений городского типа. *Ранние земледельцы: Этнографические очерки* / ред. Н. А. Бутинов, А. М. Решетов, с. 178–185. Ленинград: Наука).
- Masson, V. M., and Merpert, N. Ya. (eds.)  
1982. *Eneolith in the USSR*. Series Archaeology of the USSR. Moscow: Nauka. In Russian (Энеолит СССР. Серия Археология СССР / ред. В. М. Массон, Н. Я. Мерперт. М.: Наука).
- Matushchenko, V. I., and Tataurova, L. V.  
1997. *The Mound Sidorovka in the Irtysh River Valleys in Omsk*. Novosibirsk: Nauka. In Russian (Матющенко, В. И., Татаурова, Л. В. *Могильник Сидоровка в Омском Прииртышье*. Новосибирск: Наука).
- Matveeva, N. P.  
2000. *Socioeconomic Structures of the Population in Western Siberia in the Early Iron Age (the Forest-Steppe and Pre-taiga Region)*. Novosibirsk: Nauka. In Russian (Матвеева, Н. П. Социально-экономические структуры населения западной Сибири в раннем железном веке [лесостепная и подтаежная зона]. Новосибирск: Наука).
2002. Interpretation Models of Sargat Culture Settlements in Western Siberia. In Jones-Bley, K., and Zdanovich, D. (eds.), *Complex Societies of Central Eurasia from the 3<sup>rd</sup> to the 1<sup>st</sup> Millennium BC* (pp. 380–386). Washington D.C.: Institute for the Study of Man.
- Monah, D., and Monah, F.  
1997. Cucuteni: The Last Great Chalcolithic Civilization of Old Europe. In Mantu, C.-M., Dumitroaia, G., and Tsaravopoulos, A. (eds.), *Cucuteni: The Last Great Chalcolithic Civilization of Europe* (pp. 16–95). Bucharest: Athena Publishing and Printing House.
- Morgan, L. H.  
1877. *Ancient Society*. Chicago: Charles Kerr.
- Peterson, C. E.  
2006. ‘Crafting’ Hongshan Communities? Household Archaeology in the Chifeng Region of Eastern Inner Mongolia, PRC. PhD Dissertation. Department of Anthropology, University of Pittsburgh.
- Pogodin, L. I.  
1998. Lacquerware from Monuments of Western Siberia of the Early Iron Age. In Pogodin, L. I. (ed.), *Interaction of Sargat Communities with the Outer World* (pp. 26–38). Omsk: Omsk State University. In Russian (Погодин, Л. И. Лаковые изделия из памятников западной Сибири раннего Железного века. *Взаимодействие саргатских племен с*

внешним миром / ред. Л. И. Погодин, с. 26–38. Омск: Омский государственный университет).

Rassamakin, Y. Y.

1999. The Eneolithic of the Black Sea Steppe: Dynamics of Cultural and Economic Development 4500–2300 BC. In Levine, M., Rassamakin, Y., Kislenko, A., and Tatarintseva, N. (eds.), *Late Prehistoric Exploitation of the Eurasian Steppe* (pp. 59–182). Cambridge: Cambridge University Press.

Renfrew, C.

1978. Varna and the Social Context of Early Metallurgy. *Antiquity* 52: 199–203.

Service, E. R.

1962. *Primitive Social Organization: An Evolutionary Perspective*. New York: Random House.

Smith, M. E.

1987. Household Possessions and Wealth in Agrarian States: Implications for Archaeology. *Journal of Anthropological Archaeology* 6: 297–335.

Spencer, H.

1880–1897. *The Principles of Sociology*. New York: D. Appleton and Co.

Todorova, H.

1995. The Neolithic, Eneolithic and Transitional Period in Bulgarian Prehistory. In Bailey, D., and Panayatov, I. (eds.), *Prehistoric Bulgaria* (pp. 79–98). Madison, WI: Prehistory Press.

Tylor, E. B.

1865. *Researches into the Early History of Mankind and the Development of Civilization*. London: J. Murray.

Videjko, V. M.

1995. Großsiedlungen der Tripol'e-Kultur in der Ukraine. *Eurasia Antiqua* 1: 45–80.

Vinogradov, N. B.

2003. *The Bronze Age Burial. Lake Krivoye in the Southern Trans-Urals*. Chelyabinsk: Nauka. In Russian (Виноградов, Н. Б. *Могильник бронзового века. Кривое Озеро в Южном Зауралье*. Челябинск: Наука).

Wilson, D. J.

1988. *Prehispanic Settlement Patterns in the Lower Santa Valley, Peru: A Regional Perspective on the Origins and Development of Complex North Coast Society*. Washington, D.C.: Smithsonian Institution Press.

Zdanovich, D. G.

2002. *Arkaim: Necropolis (According to the Data on the Kurgan 25 of the Bolshekaraganskii Mound)*. Vol. I. Chelyabinsk: Yuzhno-Uralskoe knizhnoe izdatelstvo. In Russian (Зданович, Д. Б. *Аркаим: некрополь [по материалам кургана 25 Большекараганского могильника]*). Кн. 1. Челябинск: Юж.-Урал. кн. изд-во).

Zdanovich, G. B.

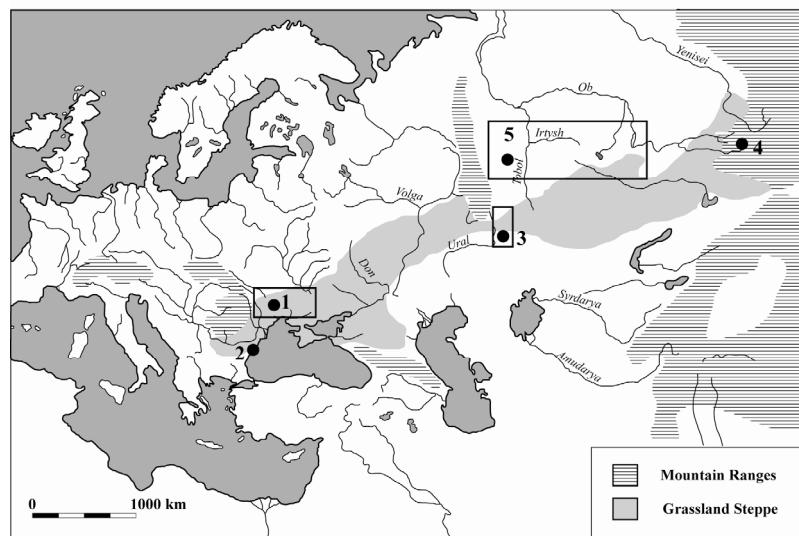
1989. Phenomenon of the Bronze Age Proto-Civilization in the Urals' and Kazakhstan' Steppes. Cultural and Social Dependency. In Masson, V. M. (ed.), *Interaction of Nomadic Cultures and Ancient Civilizations* (pp. 179–189). Alma-Ata. In Russian (Зданович, Г. Б. Феноменprotoцивилизации бронзового века Урало-Казахстанских степей. Культурная и социальная обусловленность. *Взаимодействие кочевых культур и древних цивилизаций* / ред. В. М. Массон, с. 179–189. Алма-Ата).

Zdanovich, G. B., and Batanina, I. M.

2002. Planography of the Fortified Centres of the Middle Bronze Age in the Southern Trans-Urals according to Aerial Photography Data. In Jones-Bley, K., and Zdanovich, D. G. (eds.), *Complex Societies of Central Eurasia from the 3<sup>rd</sup> to 1<sup>st</sup> Millennium BC*. Vol. 1 (pp. 121–147). Washington, D.C.: Institute for the Study of Man.

Zdanovich, G. B., and Zdanovich, D. G.

2002. The ‘Country of Towns’ of the Southern Trans-Urals and Some Aspects of Steppe Assimilation in the Bronze Age. In Boyle, K., Renfrew, C., and Levine, M. (eds.), *Ancient Interactions: East and West in Eurasia* (pp. 249–263). Cambridge: McDonald Institute Monographs.



**Fig. Map of Eurasia detailing key regions and approximate locations of archaeological sites discussed: 1 – Cucuteni-Tripol'ye cultural area and location of Majdanetskoe settlement; 2 – Varna cemetery, Bulgaria; 3 – Sintashta culture region and site of Sintashta cemetery and settlement; 4 – Arzhan I kurgan; 5 – Gorokhovo-Sargat cultural area and location of Rafailovo settlement**