

# **Archaeological supplement A to Damgaard et al. 2018: Archaeology of the Caucasus, Anatolia, Central and South Asia 4000-1500 BCE**

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## **ABSTRACT**

We present a brief archaeological summary of the main phases of cultural and social change in the Western, Central, and South Asia ca. 4000-1500 BCE as a contextual framework for the findings presented in Damgaard et al. 2018. We stress the role of the Caucasus as a conduit in Western Asia linking the steppe and Eastern Europe with Anatolia, Syria, Iraq, and Iran. We track the emergence of the Bactria-Margiana Archaeological Complex (BMAC) in Central Asia as a cultural melting pot between the steppe and the sown lands during a period of more than a millennium. And we highlight indicators of cultural and commercial exchange, tracking developments in technology as well as social and political organization that came about as part of complex processes of interaction in a region stretching from South Asia to the Mediterranean.

## **1. Anatolia and Caucasus**

We present a brief summary of the main phases of cultural and social change in the Caucasus and Anatolia from 4000–1500 BCE. Both were areas of dynamic mediation and innovation due to their control of rich mountain resources and their position between the steppe in the north and the urban civilizations of the south (Kohl 2007: ch. 3; Smith 2015; Wilkinson 2014).

*1.1. 4th millennium BCE: innovations in textile production and metallurgy, expansion of trade, rise in mobility. The Uruk Expansion, and Maykop culture of the northern Caucasus.*

During the 4th millennium BCE the Caucasus and Anatolia entered a period of dynamic exchange that coincides partially with the so-called “Uruk Expansion” in southern Mesopotamia (Sagona 2011). The latter is defined by an explosive growth in population, the rise of statehood, urbanization, technologies of communication, and a complete restructuring of social, political and commercial institutions (Algaze 1995). Surrounding the Mesopotamian urban centers along the mountainous arch that stretches from southwestern Iran to southern Turkey was a series of smaller settlements that shared their material and visual culture as well as their political institutions with the main cities. They seem to constitute a network of early trading posts that provided raw materials (timber, stone, metal, and possibly also workers) to the urban south, probably in return for costly textiles (Wilkinson in press: Fig. 3). Sites like Arslantepe on the Upper Euphrates in Turkey acted as conduits for this network and ultimately connected the dense urban regions to production sites as far away as the Caucasus.

Examples of southern luxury fabrics have been found in Maykop burials in the northern Caucasus (Kohl 2007: 72–86) together with an array of copper, gold, and silver objects, weapons, tools, buckets, and drinking cups. The Maykop culture of northern, and even southern Caucasus (Lyonnet et al. 2008), spread innovations in metallurgy and metalwork onto the steppe and eastern Europe (Hansen 2010), into Iran (Ivanova 2012), and into central Anatolia (Rahmstorf 2010: Fig. 3) as part of a cultural “bundle” that also included wheels, wagons, and knowledge of mining (Hansen 2014: Fig. 1). Along with the spread of goods and technology, we must assume that also people moved as traders and craftsmen in search of new sources of metal, patrons, and wealth. The expansion dates mostly to the late 4th millennium BCE, when we also find, e.g. at Arslantepe, a royal burial with connections to the northern Caucasus and the late Maykop culture, possibly as a sign of incoming new elites (Palumbi 2007) or dynastic intermarriage.

*1.2. 3rd millennium BCE: Kura-Araxes semi-urban culture of Transcaucasia, eastern Anatolia and northern Mesopotamia, followed by Trialeti kurgan culture from 2100 BCE.*

A second cultural group to emerge out of contact with the Uruk networks in Transcaucasia towards the end of the 4th millennium BCE was the Kura-Araxes / Early Transcaucasian Culture (ETC) (Kohl 2007: 86–102; Wilkinson 2014: 309–314). This “cultural historical community” remains poorly understood. It had a developed metal technology and fine pottery but shows little sign of social hierarchy. Most settlements are relatively small (under 5 ha), and the economy seems to have been mainly agrarian. The material culture is fairly homogenous across a large region in the Caucasus and Eastern Turkey with distinct assemblages stretching into Syria, the Levant, and western Iran. Its expansion has been associated with a sharp break at several central settlements of the former Uruk network as well as the introduction of new forms of architecture and material culture, again suggesting a movement of people.

Batiuk 2013 and Rothman 2015 have argued for a “rippled” process of migration from east to west, in which “push” factors in Transcaucasia and eastern Anatolia were balanced by “pull” factors in the destination zones. Batiuk 2013 used multiple lines of evidence, including settlement patterns, ceramic assemblages, and textual records, to postulate an association between the spread of ETC and the practice of viticulture, which has a long-recorded history in Transcaucasia. He states that the production of a consumable high-status commodity like wine by settlers moving west and identified by a use of Early Transcaucasian wares will have allowed these to keep a socioeconomic status and maintain a social identity in an archaeologically visible manner in their new homelands for extended periods of time.

It has been speculated whether settlers from the east also brought with them languages, such as early Hurrian or IE Anatolian. The personal names borne by individuals coming from the state of Armi in southern Anatolia attested in the archives as early as the 25th century BCE at Ebla (Archi 2011; Bonechi 1990) constitute a mixture of Semitic, Anatolian IE, and unknown background (Kroonen et al. 2018). A possible interpretation is that multiple groups moved into Anatolia from the Caucasus during the late 4th and early 3rd millennia BCE, including groups of proto-Hurrian and early IE Anatolian speakers. Clear from the written record of Bronze Age Anatolia, however, is also that language was not considered an ethnic marker there and that the region is characterized by its high population mobility and plurality of languages and traditions.

*1.3. 2nd millennium BCE (2100–1500 BCE). The Trialeti royal kurgans, micro-polities, Old Assyrian traders, and the formation of the Hittite state.*

By the end of the 3rd millennium, the Kura-Araxes, and Early Transcaucasian cultural sequence was broken by intrusions from the Caucasus, and ultimately from the steppe, seemingly associated with the re-emergence of royal kurgan mounds in Transcaucasia (Smith 2015: ch. 4) and a material horizon known as the Trialeti culture (Kohl 2007: 113–121). The kurgans, and with them a new subsistence economy based on herding, had already begun to spread towards Transcaucasia from the middle of the 3rd millennium BCE onwards. The movement reached its apex in the large and immensely rich kurgans characteristic of the Middle Bronze Age Trialeti. The mounds were constructed over huge timber-built burial chambers and had long stone paved procession roads leading to them (Narimanishvili and Shanshashvili 2010). These appear to be contemporaneous with the arrival of chariot warfare from the steppe (Kristiansen and Larsson 2005: Figure 79), and from the rich grave inventories it is clear that Trialeti elites traded with both Anatolia and northwestern Iran (Rubinson 2003). What they had to offer in return was probably silver and horses or mules, which begin to appear in Iran, Anatolia, and the Near East (Anthony 2007: 412–418, Fig. 16.3; Michel 2004). In return, they received prestige goods, such as golden drinking cups and fine textiles. There are cultural connections between Trialeti and the early Mycenaean shaft grave burials, presumably moving either via the steppe corridor or through Anatolia. The source of rich goods deposited in burials at both Mycenae and Trialeti appear to have come from Anatolia (Puturidze 2016).

During the Middle Bronze Age (ca. 2000–1650 BCE) Anatolia was divided into a number of micro-polities, probably numbering in the several hundred. Each was centered on an urban settlement and linked together in competitive and constantly shifting networks of political alliances that shared a common cultural and cultic horizon. Their history is reflected in the extensive archives kept by Old Assyrian merchants who operated a network of some forty trade settlements in Central Anatolia during the period in question (Barjamovic in press; Larsen 2015). They brought in tin and luxury textiles from distant Mesopotamia in return for silver and gold. Some 23,000 texts written on clay tablets in cuneiform signs reveal Anatolia as a multi-ethnic, polyglot, and cosmopolitan society with no visible markers (or even no clear notion of) any ethnic distinctions within the region. Instead, material and spiritual traditions were continually evolving

into new and hybrid forms (Larsen and Lassen 2014) in a pattern that persisted also during the subsequent centuries after 1650 BCE under the centralized political authority of the emerging Hittite state. A polyglot, highly mobile, and culturally hybrid population renders a discussion of ethnic distinctions along linguistic lines meaningless, and rather, the situation seems to mirror historical and contemporary cases in which language is tied to function and not identity. Sources suggest that a given individual would speak a handful of languages, including perhaps one or two at home, a third in trade, and a fourth during cultic services, etc. Currently, there is evidence of Hattian, Hittite, Hurrian, Luwian, Akkadian (Assyrian/Babylonian), and Palaic speakers within Central Anatolia, with additional languages leaving little trace behind, except perhaps through personal names.

To conclude, we observe a changing dynamic between southern Mesopotamian and Caucasian influences into Anatolia and northwestern Iran between the 4th–2nd millennia BCE. The Caucasus served as a conduit linking the steppe and Eastern Europe with Anatolia and Iran as well as ultimately Mesopotamia and the Eastern Mediterranean. Influences from the Caucasus first reached Anatolia during the mid- to late 4th millennium, through the Maykop culture, which also influenced the formation and apparent westward migration of the Yamnaya. A second wave of steppe influences entered during the late 3rd and early 2nd millennia with the chariot horizon and the Trialeti culture. Both of these expansions had a steppe corridor route and an inland Anatolian route reaching the Aegean.

## **2. Central and South Asia**

The following provides a summary of cultural developments observed in the archaeological record of populations residing within and adjacent to the piedmont strip located along the foothills of the Kopet Dagh mountains of southern Turkmenistan from the beginning of the Eneolithic Namazga culture (ca. 4000 BCE) to the end of the Bactria-Margiana Archaeological Complex (BMAC) during the middle of the 2nd millennium BCE. This is followed by a brief account of the Indus and Gandharan Cultures.

### *2.1. The Middle Eneolithic: Namazga [NMG] II (ca. 4000–3500 BCE)*

The Middle Eneolithic was a time of considerable transformation. The Geoksyur oasis sites represent the easternmost sedentary agriculturalist communities whose neighbors would have

been Neolithic hunting groups of the Kelteminar culture (Dolukhanov 1986). These ranged the nearby steppe and semi-desert regions further north and east. Moving northeastwards, it appears that part of the Geoksyur oasis population entered the northern reaches of the Murghab River delta, where a recent find exposed several widely scattered settlements with ceramics typical of the Geoksyur style (Salvatori 2008: 76).

During the Middle Eneolithic, lapis lazuli first came into systematic use. Efforts to provide a regular supply of this stone, whose main deposits lie in the mountains of northeastern Afghanistan (Badakhshan), likely played a significant role in the establishment of lasting trade and cultural ties over a vast territory. To Salvatori 2008: 76), the long-distance contacts of the Geoksyurian population to the east at Sarazm and perhaps to the northern reaches of the Murghab delta closer by at Kelleli 1 laid the exploratory foundation for considerable and extensive geographic knowledge as well as for an outward worldview in the quest for highly prized and non-locally available resources—a quest that only intensified over time and that characterizes the Late Eneolithic and Bronze Age in southern Turkmenistan. Yet, despite the far-flung contacts to the south, southeast, and east for the acquisition of metallic ores and semiprecious stones, there is no evidence of contact across the Aral Basin with the Neolithic populations of the steppe zone to the north (Hiebert 2002).

## *2.2. The Late Eneolithic: Namazga [NMG] III (ca. 3500–3000 BCE)*

The Late Eneolithic period is marked by a general continuation of the trends observable during the previous period. Throughout southern Turkmenistan there is a tendency for the major sites in a particular area to increase in size and for the overall number of sites within the region to decrease. Settlements appear to have been pre-planned and the multi-chambered residential units with their own courtyard characteristic also of the NMG II period continue into the Late Eneolithic (Masson 1992: 231). While the archaeological record provides abundant evidence for an array of contacts between populations of southern Turkmenistan and populations to the east (Sarazm) and south (Baluchistan, Seistan) during the Late Eneolithic, there is no evidence for any substantial contacts between NMG III populations to populations occupying the steppe zone to the north.

### 2.3. *Early Bronze or “Proto-Urban” Period [NMG IV] (ca. 3000–2500 BCE)*

The Early Bronze or “proto-urban” period appears to have been an age of important technological and social development but is less well-understood than the preceding Late Eneolithic and subsequent Middle Bronze periods. Technological developments include the introduction and increasing use of the potter’s wheel, improved furnaces for smelting copper, and the beginnings of monumental architecture. It also features a separation of settlements into either large, proto-urban sites (*e.g.*, Namazga-depe, Ulug-depe, Khapuz-depe, and Altyn-depe) or small villages.

### 2.4. *Middle Bronze Age, NMG V, and the BMAC culture 2500–2000/1900 BCE*

The term BMAC (Bactria-Margiana Archaeological Complex) is commonly used for the phase after 2500 BCE and also is sometimes called the Oxus civilization. The processes behind the formation, florescence, and dissolution of the BMAC culture remains poorly understood. Around 300 settlements are known, many of them heavily fortified. There is a rich material culture with links to steppe cultures, the Indus, and Iranian cultures (Kohl 2007: ch. 5; Parpola 2015: ch. 8).

Some have argued that the final BMAC is a candidate for one of the expansions of Indo-Iranian language to northern India/Pakistan and the Iranian plateau (Parpola 2015). Others would see the chariot riding pastoralists of the Sintashta and later Andronovo cultural horizons as the original cultural and linguistic influence behind Indo-Iranian (Kuzmina 2006). We return to the complexity of the situation below and presently address only the cultural and archaeological sequences and the interaction of BMAC with steppe, northern India/Pakistan, and Iran as it represented a cultural, and probably also a genetic and linguistic melting pot between the steppe and south Asia. We present a brief summary of the main cultural phases followed by a discussion of interactions as reflected in the archaeological record.

The Middle Bronze Age (2500–1900 BCE) represents a developed urban civilization based on irrigation but with a large settlement area stretching outside the oases. New standards appear in nearly all aspects of culture. A complex hierarchical settlement pattern suggests a developed political organization that ended around 1900 BCE with a collapse of the major settlements and a marked reduction in size when rebuilt (Salvatori 2016). New smaller settlements were constructed with fortified walls and round towers, which suggest smaller

political units. This change in settlement pattern has been linked by some to the first arrival of steppe metal objects and pottery (Anthony 2007: Fig. 16.6) and hybrid burials that combine BMAC and steppe grave goods (Anthony 2007: Fig. 16.8; Kohl 2007: 208–209). Central Asian trade goods also appear in the steppe (Anthony 2007: 433–434).

### *2.5. The Late Bronze Age (1900–1750 BCE) and Final Bronze Age (1750–1500 BCE).*

Understanding the gradual decline and final disintegration of the oasis civilization towards the end of the Bronze Age continues to defy common consensus (Kohl 2007: ch. 5). Increasing numbers of steppe pastoralists probably moved south and settled around the oases, but one could argue that trade with steppe populations was a driver behind some of these changes. At the time, Andronovo groups seemingly controlled the tin production and distribution from mines in central Asia (Parzinger 2003), which may help to explain their increasing influence and expansion into areas occupied BMAC populations. Their presence is reflected in numerous campsites and may have been a contributing factor in the final collapse of the BMAC settlements around 1500 BCE (Spengler et al. 2014).

### *2.6. Concluding Remarks*

Located at the crossroads between different environmental and cultural zones and bounded by the Caspian Sea to the west, the steppe and steppe/desert of Kara Kum to the north, the Iranian plateau to the south and southwest, and the Indus cities to the southeast, the Bactrian-Margianan Archaeological Complex emerged as a cultural melting pot between the steppe and the sown lands during a period of more than a millennium. It formed a distinct social and cultural entity located along a fertile strip of land just 80 km wide and 600 km long. It flourished during an arid period from 2400 BCE onwards, making the fertile land attractive to newcomers from both north and south and lending to it a characteristic cultural, and probably also genetic and linguistic admixture.

### *2.7. Indus-Harappa Culture*

The Indus Valley is largely located within present-day Pakistan and northern India, its watershed stretching from the Chinese frontier in the northeast, and bordering onto Afghanistan in the north and Iran in the west. The known settlement chronology of the area spans from the Neolithic Mehrgarh I–VI phases (7000–3300 BCE) to the Bronze Age, with its earliest evidence



of the Indus Valley Civilization (IVC) coming from the Harappa site ca. 2800 BCE. Scholars have suggested that populations forming the early Harappan phases of the IVC were farmers and lived here in very large numbers, up to 1 million people. The Indus civilization reached its high point during the period 2600–1900 BCE, with an overall standardization of material culture and a four-tiered settlement hierarchy across an area of roughly 500,000 sq. km. Since its primary urban centers were located mainly in the lowland floodplain, the cities were in need of importing most of their raw materials, including metal, stone, and quality timber, from beyond its area of control. This led to an extensive trade network with outside regions, and Indus cities maintained trade with faraway partners in Afghanistan, Iran and BMAC, the Persian Gulf, and Mesopotamia (Laursen and Steinkeller 2017; Ratnagar 2006; Wright 2010).

The process and causes behind the decline of the Indus civilization after 1900 BCE are poorly understood, but they included an abandonment of the large urban settlements as well as the script and homogenous material culture associated with them. The region seemingly dissolved into smaller local and regional groups (Francfort 2001; Franke-Vogt 2001).

### *2.8. Gandhara Grave Culture*

The Gandhara grave sites were initially reported by the Italian Archaeological Mission to Pakistan and the Department of Archaeology at the University of Peshawar. These graves were first reported from the Swat and Dir regions of ancient Gandhara, a region, which is said to have extended from the western boundary to the Peshawar Valley to the Indus in the east and comprised the hilly tracts south of the river Swat and Buner in the north (Hassan 2013: 3). It was this region, which gave birth the Buddhist civilization of Gandhara, that emerged during the 3rd century BCE under the Mauryans (Hassan 2013: 5) and later on flourished under the Indo Greeks, Scythians, Parthians, Kushans, and Sassanians up until the invasion of the White Huns in the 5th century CE, who are held responsible for the decline of this civilization (Marshall 1951: 285).

The Gandharan Grave culture predates the Buddhist civilization of Gandhara. The term Gandharan Grave culture was coined by Dani (1968: 99) after having discovered and excavated many grave sites in the Dir, Swat, and Bajaur regions of Pakistan. Later archaeological surveys and excavations conducted by both Pakistani archaeologists and foreign missions revealed many similar grave sites outside of the Gandharan region, indicating that this culture was not confined

to ancient Gandhara but rather extended to include parts of the Chitral and Mansehra Districts of the present-day Khyber Pakhtunkhwa (KP) Province, Pakistan. Of these, the former district encompasses the greatest number of Gandharan Grave culture sites. Excavations at the grave sites in Chitral, especially at the sites of Parwak (Ali and Zahir 2005) in 2003–2004 and Singoor sites by the Directorate of Archaeology and Museums Government of KP in 2005, and later at Gankoreneotek (Ali et al. 2010) and Chakast sites by the Department of Archaeology at Hazara University, Mansehra, have yielded artifacts and skeletal remains. While recent archaeological surveys in the latter district have resulted in the discovery of four sites: Chansoor Dheri I, II and III as well as Naukot. Of these, the Chansoor Dheri III was accidentally discovered during the construction by the owner. This site yielded an urn burial of a male adult and a terracotta bead (Figs. 1, 2, and 3) (Hameed 2012: 14–15). Recent research has emphasized the complexity of the Gandharan Grave culture as resulting from both local and external processes (Zahir 2016). Recently obtained C14 dates place the Gandhara grave culture between 1000 BCE and 1000 CE (Ali et al. 2008), with those from Chitral District being more recent from those found in the lowlands of the Dir and Swat Districts.

### **3. Interactions between the Settled Communities of Southern Central Asia and Steppe Populations during the Bronze Age and their Relationship to the Gandharan Grave Culture of Northwestern Pakistan**

#### *3.1. Middle Bronze Age, NMG VI, and the BMAC ca. 2500–1500 BCE*

The transition from the Middle to the Late Bronze Age (MG VI) is a time of considerable change in southern Central Asia. It was once believed that the large urban centers of the Kopet Dagh piedmont suffered some kind of “urban crisis” near the end of the Middle Bronze Age (Biscione 1977; Hiebert 1994: 174–75, 2002b; Masson, 1992b: 342). However, it now appears that settlement of Margiana and perhaps the Bactrian oases occurred, not after the NMG V period, but contemporaneously with its later temporal range (ca. 2200–2000 BCE: Salvatori 2008: 77). It now seems more likely that the colonization of Margiana was, in fact, a consequence of population movement from the Kopet Dagh foothills, but rather than occurring at a time of crisis, it occurred when Altyn-depe was at its peak size (Hiebert 1994; Masson, 1992a). This is attested by the close similarities in ceramics, small finds, and architecture found in the deepest strata at numerous sites in Margiana to those found at contemporaneous NMG V deposits in the

urban centers of the Kopet Dagh (Hiebert and Lamberg-Karlovsky 1992: 4; P'yankova 1989; Salvatori 1994; Sarianidi 1990; Udemuradov 1986). Whether this colonization from the piedmont extended further to encompass the Bactrian oases situated along tributaries of the Amu Daya to the east is the subject of considerable controversy (Francfort 1984; Hiebert 1994; Khlopina 1972: 213–14; Sarianidi 1999).

It has long been assumed, because of close correspondences in artifact assemblages, architecture, and inhumation practices, that populations of the Kopet Dagh piedmont urban centers first settled in Margiana through a process of segmentation and that a portion of this population subsequently moved further east to establish urban centers in the unpopulated northern, southern, and eastern Bactrian oases (Boroffka et al. 2002: 138; Hiebert 1994; Masson 1992b: 345). Francfort 1984 finds this scenario unlikely for several reasons. First, given populations known to be found in arable lands to the north (Zaman Baba culture of the mid- to lower Zarafshan Valley, Sarazm of the Zarafshan Valley) and east (Shortughai, a Harappan outpost located in the eastern Bactrian oasis) it is unlikely the northern and southern Bactrian oases were unpopulated. Second, radiocarbon dates from the northern Bactrian urban center of Sapalli-Tepe are contemporaneous, not subsequent to the earliest settlements in Margiana (see Salvatori 2008). Third, there are numerous stylistic differences, especially with regard to the bronze pins and seals that distinguish small finds at Bactrian sites from those at sites in Margiana (Francfort 1984). Perhaps the most telling difference in the artifact assemblages from Bactria to those from Margiana involves the elemental composition of the bronze objects.

Metallurgical technology has a long history in southern Central Asia that likely can be traced to influences from Iran (Kohl 1984: 71). At sites in the Kopet Dagh piedmont and in Margiana, bronze objects are almost exclusively alloyed with lead and/or arsenic (Anthony 2007: 420; Gupta 1979; Hiebert 1994: 159–60; Hiebert and Killick 1993: 199; Masson and Kiiatkina 1981; Salvatori et al. 2003: 79; Terekhova 1981: 319). In contrast, the metal assemblages recovered from such BMAC sites in northern Bactria as Djarkutan and Sapalli-Tepe feature bronze that is alloyed with tin, which may account for as much as 50% of all bronze objects (Anthony 2007; Chernykh 1992: 176–82; Salvatori et al. 2003: 79). Hence, it appears that there were two centers of metallurgical production in southern Central Asia across the transition from the 3rd to the 2nd millennia BCE (Chernykh 1992: 179; Francfort 1984; Hiebert 1994: 384).

Indeed, later ceramic assemblages from sites in Margiana (Hiebert 1994's Takhirbai phase) and the latest Bronze Age occupation of the Kopet Dagh piedmont (the so-called NMG VI) containing the deeply burnished gray wares characteristic of northern Bactria suggest that cultural influences likely flowed from east to west, rather than exclusively from west to east as has long been assumed (Francfort 1979, 1984, 1989; Kohl 1993; but see Heibert 1994: 68–69). This dynamic, when coupled with the probable presence of a local resident population within the Bactrian oases prior to the Middle Bronze Age, likely accounts for the fact that phenetic affinities between the Middle Bronze Age inhabitants of Altyn-depe and those of northern Bactria are not especially close (Hemphill 1999b, 2013; Hemphill and Mallory 2004).

### *3.2. Interactions between BMAC Populations and Steppe Bronze Populations*

The Late Bronze Age in this region is known as the BMAC (Bactria-Margiana Archaeological Complex) in existence from ca. 2200-1500 BCE. The factors surrounding its formation, efflorescence, and dissolution remain enigmatic. Around 300 settlements are known, many of them marked by substantial fortifications. High quality wheel-thrown ceramic vessels were produced on an industrial scale and are found widely distributed throughout southwestern Central Asia (P'yankova 1989, 1994), including sites attributed to the Andronovo affiliated Tazabag'yab culture of the Aral Sea region (Khorezm) (Kohl 1993), the Zaman Baba culture of the middle Zarafshan Valley (Askarov 1962, 1981; Sarianidi 1979), as well as the Andronovo affiliated Vakhsh/Beskent cultures of southern Tajikistan (Kohl 1984, 1993).

BMAC artifacts have been discovered at a wide array of sites located on the Iranian Plateau as well as at the western margin of the Indus Valley (Hiebert 1994; Hiebert and Lamberg-Karlosky 1992; Jarrige 1994; Jarrige and Hassan 1989; Kohl 1993; Santoni 1984; Sarianidi 1999). These artifacts are not randomly present at these sites but tend to be associated with funerary contexts and include characteristic miniature columns of alabaster as well as bronze pins, brooches, and seals with characteristic BMAC motifs (Amiet 1986, 1989; Francfort 1994: 406–18; Hiebert 1994; Hiebert and Lamberg-Karlosky 1992; Sarianidi 1981). Intriguingly, the presence of non-BMAC artifacts at BMAC sites in Bactria and Margiana are exceedingly rare (Hiebert 1994 164, 366; Hiebert and Lamberg-Karlosky 1992: 12).

This unidirectional dynamic has led some researchers to consider the BMAC to have been a brief-lived imperial state (Hiebert and Lamberg-Karlovsky 1992: 12) while others see the BMAC as one of a number of participants in a vast *koiné* that involved populations residing on and about the peripheries of the Iranian Plateau (Anthony 2007; Jarrige 1994; Jarrige and Hassan 1989; Salvatori 1995; Salvatori et al. 2003; Santoni 1984). Coalescing during the mid-3rd millennium BCE and lasting to the end of the first quarter of the 2nd millennium BCE, these networks facilitated the circulation of highly desired “prestige” goods among elites, and among these were small finds made of tin bronze. It appears clear that the production center for the tin bronze objects was northern Bactria, but the origin of the tin-bearing remains debated.

Anthony 2007 has claimed recently that the discovery of tin mines along the Zarafshan River, the presence of a Petrovka settlement of Tugai 27 km west of Sarazm in the upper Zarafshan Valley, and a grave at Zardcha-Khalifa (1 km from Sarazm) all attest to: 1) the mining of tin by steppe bronze culture populations, 2) the presence of steppe populations in Khorezm near to BMAC populations in northern Bactria, and 3) actual contact between steppe bronze populations and BMAC. From this he constructs a scenario in which the southward expansion of these steppe populations wrested control over the trade in minerals and pastoral products, while their chariots gave them a military advantage over the oases and settlements of the BMAC resulting in the dissolution of this polity (Anthony 2007: 452–54). Each of these claims deserves close examination.

The tin mines include Mushiston, located 40 km east of Sarazm in the upper Zarafshan Valley, and Karnab in the middle Zarafshan Valley some 170 km west of Sarazm close to where sites of the Zaman Baba culture have been found. At the former, excavations of Boroffka et al. 2002: 141 revealed the presence of vast deposits of copper and tin in the form of stannite. However, it appears that the prehistoric miners who worked the deposits were not interested in the primary ore, for all of the ancient workings are in an oxidation zone containing secondary mineral, such as malachite that contain copper and cassiterite and others, which contain tin. Deep inside the excavated galleries were found several stone-grooved hammers and a few potsherds attributable to the Andonovo horizon. However, a wooden beam found in association with these artifacts yielded a radiocarbon date of 1515–1265 cal BCE, which almost completely postdates the BMAC.

Ancient mining activity in the middle Zarafshan Valley was initially identified by Litvinsky 1962 in the 1940s–1950s at Karnab and Changali. Karnab was reinvestigated by Boroffka et al. 2002: 145, who found the cassiterite ore to be very low in tin with concentrations usually less than 3%. During excavations at the site 20 stone hammers and additional stone tool fragments were recovered, along with sherds of typical Andronovo horizon ceramics. A radiocarbon date was not obtainable from the strata in which these artifacts were recovered, but a date from the stratum above it yielded a date between 905–705 cal BCE. Thus, there is evidence for a steppe presence and the mining of tin, but there is no evidence so far that this tin mining was contemporaneous with the BMAC.

Excavation at the site of Tugai revealed the presence of copper-smelting furnaces, crucibles with copper slag still adhering to them, a bronze celt, and the remains of a semi-subterranean house (Kuzmina 2001: 20–21). Ceramic vessels were recovered and these have been identified by the excavator (Avanesova 1996) as attributable to the Petrovka culture, an eastern offshoot of the Sintashta complex. Recent revision of the chronology of the various steppe archaeological cultures by Hanks et al. 2007: 362, Fig. 4 places the Petrovka culture between 1950–1675 BCE, which overlaps considerably with the BMAC. Indeed, this contemporaneity is attested by the recovery of several red polished ware vessels that Kuzmina 2001: 21 finds similar to those found in Baluchistan and the Indus Valley as well as a black burnished vessel whose closest parallels are to be found in the BMAC assemblages of northern Bactria. Kuzmina attributes the presence of these vessels at Tugai to contacts with the inhabitants of Sarazm. If so, such contacts reaffirm contacts between the urban centers of the northern Bactrian oasis (*i.e.*, SapalliTepe, possibly Djarkutan) and Sarazm. Continued smelting of copper without alloying with tin to produce bronze at Tugai suggests that alloying technology had not yet reached populations in this region of Central Asia, a curious finding given the presence of bronze to the north (Sintashta) and to the south (BMAC) at this time and not at all expected of a new hegemonic presence. This may indicate that the source of the tin found in the bronze artifacts in northern Bactrian BMAC assemblages came from somewhere else.

The much-discussed burial at Zardcha-Khalifa (Anthony 2007: Fig. 16.8; Kohl 2007: Fig. 5.15), located in Pendzhikent along the left bank of the Zarafshan River, consists of an oval grave within which are the remains of a male buried on his right side in a flexed position with his head

to the southwest (Bobomulleov 1997; Bostonguhar 1998). The right arm was placed under his head while the left was positioned on his stomach. The remains of a horned ram are at his head. Such funerary treatment is typical of the Bactrian BMAC (Askarov 1977, 1981). The deceased is accompanied by a wealth of grave goods, and these include fine-quality wheel-thrown pink-colored globular vessels with narrow necks identical to those associated with the Djarkutan phase of the BMAC (Abdullaev 1979; Askarov and Abdullaev 1983). Of special interest is a bronze pin some 18 cm long topped with the figure of a horse (Kuzmina 2001: 23, Fig. 4.3). Pins with zoomorphic heads are widely known from Bactrian BMAC burials, but none of these show depictions of horses (Kuzmina 2001: 24). Anthony 2007: 431 interprets this grave as that of an immigrant from the north who had acquired many BMAC luxury goods. However, it is equally likely that this individual may have been a resident of one of the Bactrian urban centers of the BMAC who married into or traded with the local population residing along the upper Zarafshan Valley.

Tugai represents just one of a whole series of sites found across a wide swath of Central Asia that have been designated as “steppe bronze cultures” (Masson 1992b). The hand-made ceramic wares recovered from these sites are commonly attributed to the Alakul and Federovo variants of the Andronovo horizon, which have been radiocarbon dated to the period between 1900–1500 cal. BCE (Hanks et al. 2007: 362). The economy of these groups appears to have been a highly variable combination of animal husbandry and cultivation (Lightfoot et al. 2015), with cattle predominating among the livestock. Masson 1992a: 243 maintains that contacts with the sedentary populations of the BMAC provided a stimulus that resulted in economic changes and population growth during the first half of the 2nd millennium BCE as reflected by a dramatic increase in the number of steppe bronze sites. Indeed, Masson suggests that the southward expansion of these steppe-derived populations was met by an equal northward expansion of sedentary farming populations of the BMAC leading to greater sedentism and a greater reliance on agriculture among members of these steppe bronze cultures. Kohl 2002: 78 agrees, arguing that these cow herders from the north changed their way of life and material culture when they entered this more developed sedentary world

Two good examples of this cultural hybridization process are the Tazabag'yab culture (Tolstov 1962; Tolstov et al. 1963), which is known from some 50 sites located within the Amu

Darya delta, and the Zaman Baba culture (Askarov 1962, 1981; Gulyamov et al. 1966; Sarianidi 1979), which is represented by sites along the lower reaches of the Zarafshan River (Gupta 1979; Masson 1992a). At these localities, populations resided in sedentary villages, raised crops of wheat and barley on irrigated fields, raised domesticated cows, sheep, and goats, used hand-thrown steppe ceramics, but utilized bronze objects whose closest parallels are with those recovered from Bactrian BMAC sites (Masson 1992a, Kohl 1992) However, they employed catacomb burials of steppe type as well (Alekschin 1986: 92; but see Khlopin 1989: 83, 1994: 364–366). Thus, a complex cultural interaction whose exact nature is still debated took place between BMAC farming communities to the south and the Eurasian steppe societies.

Much has been made of the fact that ceramic wares attributable to steppe bronze cultures have been found at such BMAC sites (Anthony 2007: 427–33; Heibert 1994: 69; Kuzmina 1986, 2003; Lamberg-Karlovsky 2002; P'yankova 1993: 116; Vinogradova and Kuzmina, 1986) and has led Lamberg-Karlovsky 2002 to conclude that there is little doubt that the nature of interaction between steppe and settled BMAC populations was both extensive and intensive, if not always peaceful. Yet, the specific Andronovo horizon from which such sherds are attributed varies from site to site and by researcher (Heibert 1994: 70; P'yankova 1993: 115–16; Vinogradova and Kuzmina 1986: Fig. 3), and these sherds appear to be more common at sites in northern Bactria than in Margiana (Heibert 1994: 70).

Sarianidi 1998: 42, 1990: 63 has long been adamant that the steppe presence in Margiana and Bactria during the BMAC has been much overstated, noting that “pottery of the Andronovo type does not exceed 100 fragments in all of southern Turkmenistan.” Apart from the beheaded remains of a foal adjacent to the so-called “royal tomb” at Gonur North, excavations of BMAC sites have failed to yield horse remains among the animal bones recovered from these sites. The “royal tomb” itself, however, yielded grave goods that included a bronze image of a horse’s head on what may have been the pommel of a wooden staff. Another horse head image was found on a crested copper axe obtained on the art market, and a BMAC-style seal, likely looted from a cemetery in southern Bactria, depicts a man riding atop a galloping equine that looks like a horse (see Anthony 2007: 427). Such evidence suggests the BMAC inhabitants of the Bactrian oases knew about horses but did not eat them or apparently place much interest in them.



A similar situation exists for other aspects of steppe culture often associated with the presence of Indo-Aryan or proto-Indo-Aryan speakers. Sarianidi 1981, 1993, 1999 has proposed that the BMAC be considered as an intrusion of Indo-Aryans based upon two lines of evidence. The first is the presence of a possible elite social stratum due to the recovery of ritual axes with horse head motifs. The second is the presence of Andronovo-style ceramic wares located in special “white rooms” used for the preparation of a ritual drink (*haoma* in the Iranian *Avesta*, *soma* in the Indic *Rig Veda*). Parpola 1988, 1993, 1995 has taken Sarianidi’s thesis further, not only suggesting that the BMAC urban centers signal the adoption of a new strongly stratified social system evidenced by luxury goods, monolithic architecture, fortifications as well as the construction and maintenance of complex irrigation works, but also suggesting that these northern invaders came in two waves: the first were the proto-Aryans (Dasas) during the early BMAC, while the second were the Aryans of the *Rig Veda* during the late BMAC as witnessed by the “white rooms” at Gonur South in Margiana and at Togolok 21 in Bactria.

Subsequent research, however, has failed to support the claims of Sarianidi and Parpola. As noted by Francfort 1992, there is nothing in the rich iconography of the BMAC that presents features that could be considered Proto-Indo-Aryan or Indo-Aryan. Examination of the seed impressions from vessels found in the “white rooms” at Gonur South and Togolok 21, claimed to contain impressions of the *Cannabis* and *Ephedra* used to make the ritual drink, were identified by palaeobotanists at Helsinki and Leiden University as likely made by broomcorn millet (*Panicum miliaceum*) (Bakkels 2003).

According to Lamberg-Karlovsky 2002: 71, Margiana, Bactria, and adjacent lands to the north (Khorezm) were what Pratt 1992: 6–7 calls a contact zone “in which peoples geographically and historically separated come into contact with each other” characterized by “radically asymmetrical relations of power.” (p. 71). Yet, while the movement of steppe influences far to the south, extending up to the middle reaches of the Amu Darya, is indisputable (Masson 1992b: 335–36), there are no traces of a violent incursion by warlike steppe-dwellers into the ancient cities (Lyonnet 1994). There is no evidence of burning, no evidence of systematic destruction, and apart from an alleged “sacrificial” tomb at Gonur South (Sarianidi 2008), no evidence of violent deaths.

The archaeological record shows an interaction between the world of the steppes and the settled agriculturalists on the plains of Bactria and Margiana (Anthony 2007: ch. 16). That record also documents a process of assimilation between peoples from the north with sedentary agriculturalists who already participated in a greater cultural tradition with millennia-old roots extending back into southern Turkmenistan and Baluchistan (Salvatori 2008). This is further supported by anthropological analyses (Hemphill and Mallory 2004). However, waters divide when it comes to the interpretation of the nature and implications of these interactions between the steppe and the sown.

### *3.3. Vakhsh/Beshkent Cultures and the Gandharan Grave Culture*

Alekshin 1986 maintains that not all of the steppe people who came to southwestern Central Asia in the early 2nd millennium BCE became farmers, some leading to the formation of the Vakhsh and Beshkent cultures found in the valleys of southern Tajikistan. Here, settlement sites such as Kangurt-tut and Teguzak (Kohl 1992: 192; Negmatov 1982: 61; Vinogradova 1993: 292, 294) have ceramic parallels with the northern Bactrian BMAC wares of the Molali phase, while cemetery sites, such as the Vakhsh catacomb burials, which are noteworthy for their elaborate construction with *dromoi* entrances and ritual use of fire, also contain metal artifacts that are similar to objects found on the northern steppes (Francfort 1981; Kohl 1992; P'yankova 1994: 369).

Parpola 1995 has suggested that the Vakhsh/Beshkent cultures correspond temporally with the Molali phase and are associated with the collapse of the BMAC. He writes, "It seems conceivable that nomadic tribes associated with the Vakhsh and Bishkent cultures took over the BMAC, as was once argued (Biscione 1977; Parpola 1988). Yet, there is no visible 'Andronovisation' of the culture ... This suggests that, once again, the conquerors had quickly taken over, and adapted themselves to, the earlier local culture, the BMAC" (Parpola 1995: 10). Thus, in Parpola's view, the BMAC was taken over by these semi-sedentary steppe nomads living in the adjacent highlands to the northeast of Bactria through a fairly peaceful *coup d'état*. This seems debatable given the low number and small size of sites attributed to these cultures. However, it illustrates the difficulty of interpreting political and social dominance from the archaeological record.

An alternative view has been offered by Vinogradova 1993: 300, who suggests that Vakhsh/Beshkent populations served as traders in a north-south exchange system along the western margin of the Pamirs. In her view, they served as the southern contact obtaining agricultural produce and ceramic wares from BMAC populations and moving these commodities northward in exchange with their northern counterparts in the upper Zarafshan Valley near Sarazm for tin and other metal ores. It may be that this trading conduit extended even further to the south to Shortughai and the eastern Bactrian oasis of northeastern Afghanistan and beyond (Vinogradova 1993: 300).

Drawing parallels between the Vakhsh/Beshkent cemeteries and those of the Gandharan Grave culture, Parpola 1995 has proposed that such connections may have spanned the Hindu Kush and spread to the valleys of Dir and Swat, as well as the Vale of Peshawar just to the north of the Indus Valley (see also Chlenova 1984; Kuzmina 2007; P'yankova 1994). However, until recently, no Gandharan Grave culture sites or artifacts had been found in the region in between where BMAC and Vakhsh/Beshkek sites occur on the one hand (northern Afghanistan, southern Uzbekistan, and southern Tajikistan) and the Gandharan Grave culture (Lower Dir, Lower Swat, and the Vale of Peshawar) on the other. Here we may also encounter a lack of systematic archaeological surveys. However, anthropological analyses provide no support of a change of population (Hemphill 1998, 1999; Hemphill and Mallory 2004).

In 1968, Stacul 1969: 69 discovered a number of protohistoric cemetery sites near Chitral town, the capital of Chitral District, and he identified them as bearing close similarities to the Gandharan Grave culture sites reported further south. This conclusion was corroborated by Allchin 1970's study of three ceramic vessels recovered from the town of Ayun in southern Chitral. These too, were found to bear close affinities to vessels recovered from Gandharan Grave culture sites. In 1999, a joint Pakistani-British team carried out a survey in Chitral and recorded 15 cist graves identified as likely Gandharan Grave culture sites (Ali et al. 2002). This initial effort led to further survey and excavation in Chitral by a team of Pakistani archaeologists that resulted in the identification of additional large cemeteries and the excavation of a series of graves at the sites of Sangoor and Gankoreneotek, located near Chitral town (Ali et al. 2005b), and at Parwak, located near Mastuj (Ali et al. 2005a; Ali and Zahir 2005).

Radiocarbon dates obtained from three of the newly excavated Gandharan sites in Chitral District (Ali et al. 2008), which range from 1000 BCE to 1000 CE, are more recent than the age estimates for the lowland Gandharan sites (ca. 1700–500 BCE), confirming Stacul's (1970: 101) suspicion that the highland expressions of this technocomplex represent a subsequent development. Viewed as a whole, the evidence for contacts between the Gandharan Grave culture and any of the southern steppe cultures of the Late Bronze Age remain disputed and would demand more systematic archaeological coverage of the regions between the two groups as well as settlement evidence.

### *3.4. Concluding Remarks*

This survey of the archaeological and biological record of southern Central Asia yields four important findings. First, contacts between the sedentary food-producing populations of the Namazga culture populations residing in Kopet Dagh piedmont and Geokyrur oasis of southern Turkmenistan who likely established the outpost at Sarazm had little to no contact with populations residing in the southern steppe zone. Second, contacts between Bronze Age steppe populations and NMG V and BMAC populations appears to have been one in which the dynamic of cultural influence was stronger on the side of the well-established sedentary food-producing populations, and this resulted in the partial assimilation of these initial newcomers to the region both culturally and, to a lesser degree, biologically as well. Third, not all of those who emigrated from the north turned to farming but may have continued a semi-nomadic existence in the highlands, which were unsuitable for the kind of intensive farming practiced in the BMAC homelands or in the regions of Khorezm. Fourth, if there was any Central Asian influence on South Asian populations, that influence likely long predated any development of Iranian, let alone Indo-Aryan, languages, and most likely occurred during the late NMG IV to early NMG V period (ca. 2800–2300 BCE) and even earlier during the Eneolithic from Kelteminar culture groups (4000–3500 BCE).

## **4. Implications**

The 4th and early 3rd millennia BCE mark a historical threshold linked to massive population growth and the rise of urban culture at the nexus of the African and Eurasian continents. Linked to this development were deep changes in technology as well as social and political organization.

The period saw the establishment of the first complex long-distance trade networks, which in turn advanced a trafficking in commodities, ideas, and people. The following period has previously been portrayed as one of large-scale movement across Central Asia and further into South Asia, the so-called chariot horizon. Such movements have been linked to the mass movement of Indo-European-language speakers. In recent years, simple notions of mass migration and language spread have been contested and qualified on the basis of both material and written evidence, gradually being replaced by more complex models that combine migration, interaction, co-option, and conquest. The complexity of the situation in Bronze Age Anatolia, where questions of ethnicity and language can be addressed through both written and material sources, warns us that similarly complex conditions were probably in play in south-central Asia as well. Our hope to refine our understanding of actual population movement (a major feature of most historical models) through the use of genetics was the main stimulus behind this paper.

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